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Planning of Facilities for Pedestrian Movement in Urban Area: A Case Study of Vadaj Circle, Ahmedabad

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ABSTRACT

The pedestrian is one of the most important and yet neglected feature in urban transport planning. From scrappy evidence, it seems that in most of the large cities, about 50% or more trips are made entirely on foot or by bicycle and virtually all others are made partly on foot.

A 'pedestrian' is any person on foot or who is using a means of conveyance propelled by human power, other than a bicycle. Today, European and other cities that have world-class pedestrian environments have high standards of living and quality of life. in present work pedestrian traffic planning is taken up, to improve the pedestrian facilities. The problem is identified after analyzing the existing situations with the help of the data obtained throngs the pedestrian survey i.e. pedestrian volume count and interview survey were conducted. Results of this analysis show that the selected study area is heavily congested and not proper facilities for pedestrian movement.

This paper represents to study about the pedestrian facilities, in the urban context and identify the nature of movements and conflicts to ensure improved pedestrian facilities. The case study for at Vadaj circle for pedestrian facilities gives the information of lack of facilities for pedestrians and disables. There are activity centers which attract people for interaction, and have to take a mode of travel. People need to walk to satisfy the purpose of the activity, but there is a need for facility to access.

Keywords : Pedestrian, Pedestrian Safety, Pedestrian facilities, Pedestrian Volume

1. INTRODUCTION

One of the most controversial issues, which citizens have to face in modern society, is how to deal with the rapid pace of change in urban areas. In particular, the sheer impact of traffic has been Dramatic in cities. Pedestrians are one of the most important components of any transportation system. A person walking on the road is a pedestrian. As a transport mode, walking has characteristics like availability at will, ubiquitous routine, easy maintenance and reliable service, free of cost, non-polluting, non energy consuming and healthful relaxing exercises. People walk for many purposes, every journey starts and ends as walk trips. . Many people do not have access to transport at all and motorized vehicles cannot satisfy all their transport needs

A national review has shown that nearly 60 per cent of deaths and injuries on national highways are among pedestrians and hospital-based studies indicate pedestrian deaths to vary from 22% to 35%, and population based studies reveal that 1/3rd to 1/4th of road deaths are among pedestrians. The precise number of pedestrians injured and killed is difficult to ascertain and could be approximately 40,000 deaths annually in India.

2. OBJECTIVE

The following study objectives are formulated.

· ***Identification of the problems related to pedestrian movement in Vadaj circle.***
· ***To find the existing pedestrian flow characteristic based on the hourly volume.***
· To find pedestrian level of service.
· To recommend appropriate facilities / measure to make the pedestrian's journey, safe, convenient, comfortable, and enjoyable.

3. METHODOLOGY

The proposed methodology developed for the study is shown in each step below.

· Problem statement
· Study area location.
· Survey framework (includes in road inventory, traffic volume count, pedestrian volume count and pedestrian interview survey.)
· Data collection and analysis.
· Conclusions

4. STUDY AREA LOCATIONS

Ahmedabad is a main center of attraction for people searching for better job opportunities and living standards The case study for Vadaj circle for pedestrian facilities gives the information of lack of facilities for pedestrians and disables.. The study locations were identified based on following characteristics:

· High Pedestrian Traffic
· Heavy Conflict of Pedestrian-Vehicular Traffic
· Major Trip generator and attractor areas
· The flow is continuous

And also some major problems for pedestrian in this circle are as below.

· 1. Faulty circle design
· 2. Two lane converted into single lane (merging).
· 3. No any proper facility for pedestrian such as footpath, pedestrian signal, median, guard rail, zebra crossing etc.
· 4. Less street lights and also very less enforcement by police.

The history of past pedestrian accident data record are as below.

Year	Total accident	Vehicular Accident		Pedestrian Accident	
		Fatal	Non Fatal	Fatal	Non Fatal
2007	69	4	39	3	23
2008	58	5	29	3	21
2009	78	5	42	4	29
2010	89	8	47	6	28
2011	108	11	51	8	36

Table 1.Past Accident data record
(Source: Vadaj police station)

The shown in fig.2 at selected area. This circle is connected from Subhash Bridge, Usmanpura, Bhimjipura and Ranip.

Figure: 2 selected circle

5. DATA COLLECTION AND ANALYSIS

The following sets of studies were conducted during peak peak period to obtain various basic input requirements for planning pedestrian movements at selected circle.
1) Road inventory survey
2) Traffic volume count survey
3) Pedestrian volume count survey
4) Pedestrian interview survey

5.1 Traffic volume count survey
This survey is carried out during morning peak hours at time 8:30 to 11:30 am and also evening peak hours at time 4:30 to 7:30 pm the date of 6/02/2012 by employing enumerators at each of the above location, covering both directions i.e. inflow and Outflow. Manual count with 15-minute interval is used to obtain the traffic volume data. The data collection table and analysis of this data figure showed as below.

Table: 2 Traffic Distribution at All leg

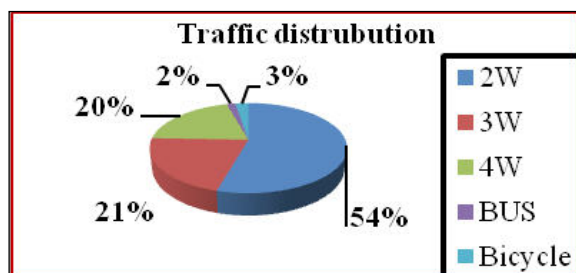| Leg	2w	3w	4w	Bus	Bicycle
A	37554	8099	9083	965	1425
B	21727	5129	5684	573	961
C	23970	7844	6402	625	1224
D	2692	667	567	157	344
E	1122	155	38	0	80
F	3288	1844	529	120	406
Total	90353	23738	22303	2440	4440

Figure: 3 Traffic composition of at selected circle

Figure: 4 Traffic Volume Count in All Directions in PCU/Hour

5. PEDESTRIAN VOLUME COUNT SURVEY

Pedestrian volume counts were taken at all legs in this circle. this survey is carried out morning peak hours at time 8:30 to 11:30 am and also evening peak hours at time 4:30 to 7:30 pm the date of 6/02/2012 by employing enumerators at each leg. To conduct pedestrian surveys, at all leg A, B,C,D, are the points in this circle where pedestrian disperse . At each of these legs two enumerators were employed, one of them has counted number of inflow and other counts outflow pedestrian .This counting process is carried out for all legs.

Table: 3 Total pedestrian hourly volume

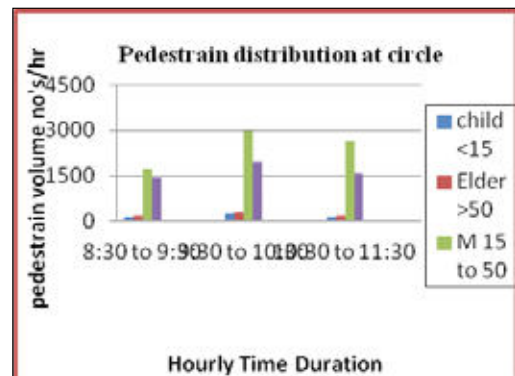| time	child <15	E>50	M 15 to 50	F 15 to 50
8:30 to 9:30	145	188	1717	1422
9:30 to 10:30	249	281	2981	1945
10:30 to 11:30	159	194	2625	1582
4:30 to 5:30	163	167	1844	1242
5:30 to 6:30	239	238	2642	2245
6:30 to 7:30	219	251	2245	1396

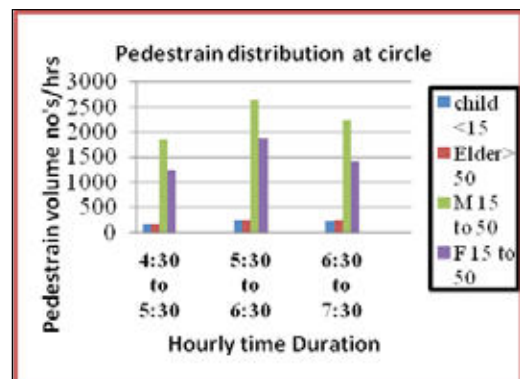**Figure: 5 Pedestrian volume distributions at circle in morning peak hours**

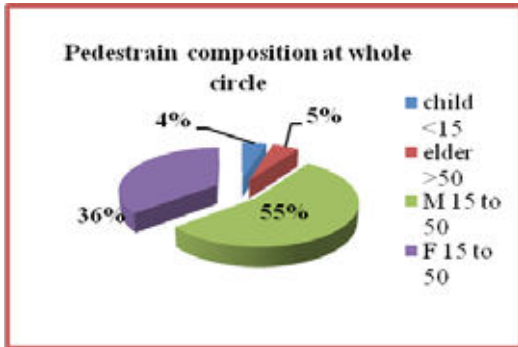**Figure: 5 Pedestrian volume distributions at circle in Evening peak hours**

Figure: 6 Total pedestrian composition at whole circle

6. PEDESTRAIN INTERVIEW SURVEY

Pedestrian user preference survey, sample size 200 has been taken by interviewing pedestrians in the study locality. This survey is conducted morning and evening peak hours at 6/02/2012. At each of these leg one enumerators were employed by interviewing pedestrian. This process is carried out for all legs. Above mentioned issues have been discussed below under following parameters.

Sample characteristics
Gender and age distribution
The gender characteristics analysis has been presented in chart. It clearly indicates that people walking in this circle are males falling in age group 15-30 years prefer to walk more compared to females.
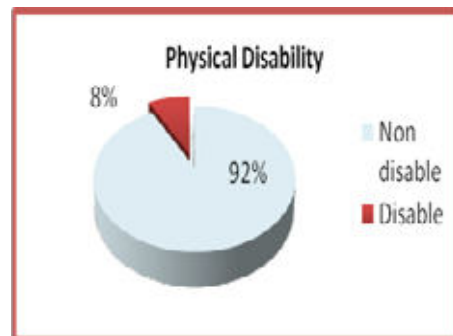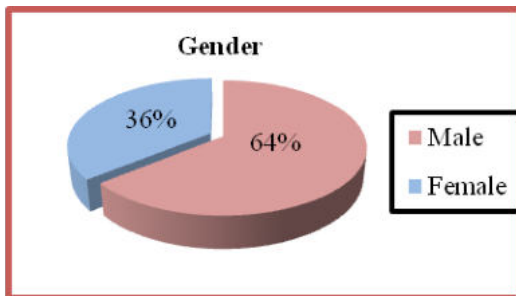

Purpose of trip and Frequency
The purpose of trip and frequency analysis has been presented in chart.It clearly indicated the people go to in different purpose for different frequency.
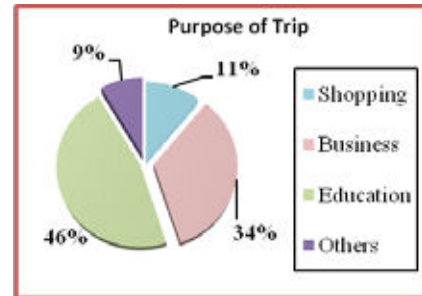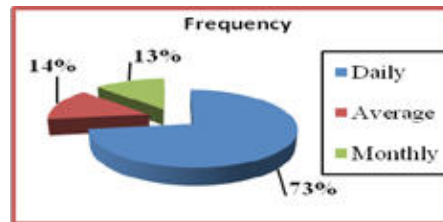
Physically Disabled
The analysis shows that the people who are physically disables are 8%. And cannot be neglected for the facilities for the walk.
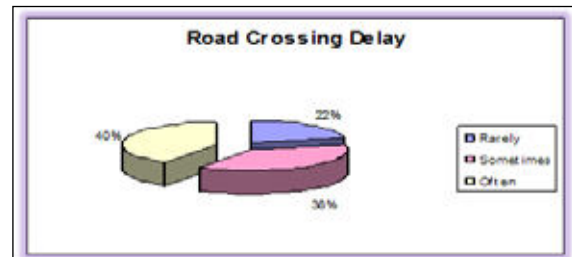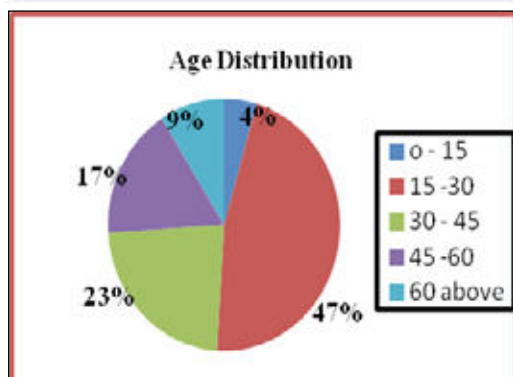

Time Spent for Walking per day:
People walk 16-30 min per day for walking.

Followed by 0-15 min Main purpose of walk can be considered as the work from the chart.

Walking Convenience
 The analysis shows that people response to walking convenience on Vadaj circle a road is medium followed by bad walking experience.


Road Crossing Convenience
 Road crossing convenience is bad as it has been responded by the people. People have to walk long distances to cross the roads. This is because of the high traffic and no provision of road crossing facilities.
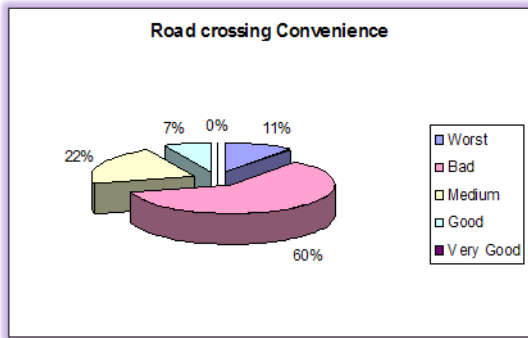
Feedback on present facility

The analysis show that people identified to the present tarffic and pedestrain facility problem.show in chart give various feedback by pedestrain on present condition at this circle.
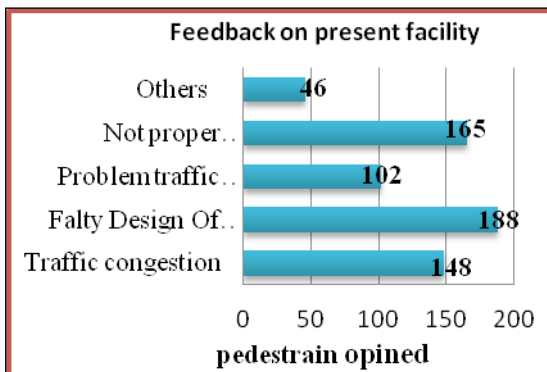
Suggestion

People have to walk long distance to cross the roads at this circle. This is because of the high traffic and no provision for pedesrain road crossing facilities. Hence, it give pedestrain opined for future suggestion of the better facilities for pedestrain. The chart show that various opined by pedestrain for the present problem.
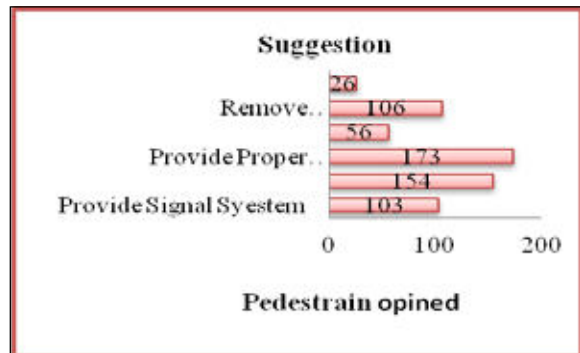
CONCLUSION:

Pedestrians, bicyclists and non-motorized rickshaws are the most critical elements in mixed traffic. In the context of above discussion, it can be seen that we should have proper planning for Safety of pedestrians on busy, congested and over-crowded at this circle. Some remedial measures are required to be taken, as listed below.

1. Walkways and footpaths should be provided with Railing to prevent Encroachment from vehicles or Carts of hawkers for movement of pedestrian to increase safety
2. Strict enforcement of laws should be exercised for shop owners for their misuse of sidewalks.
3. To provide high rise platform or rotary slab type foot over bridge because the vehicle flow is continuous and there is no any chance to cross the road for the pedestrians.
4. Pedestrian signals should be installed at busy intersections to help the pedestrians by providing all red phases to vehicular traffic.

Thus, proper planning would help to pedestrian safety and in turn it will improve traffic scenario on urban areas. This benefits all road users including motorized transport

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