Proposal of Walking Zone in the Market Area-A Case Study of Surat City, Gujarat

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Abstract: Every trip begins and ends as a pedestrian activity, so every person is a pedestrian at regular and various times and places in their lives. These pedestrian are facing problem due to regular movements on road at peak hours which may lead to collision and accidents. To improve these urban pedestrian facilities, existing infrastructure must be retrofitted. The key to improving walking condition is to manage pedestrian flows so they are appropriately isolated from vehicles. Areas with high intensity of pedestrian activity are often priority zones for improving walkability. These areas are typically public transport nodes, commercial areas and educational centers. In Surat city of Gujarat where traffic congestion leads to inconvenience to localities as well as pedestrian, walking zone is an easy solution.

Keywords - Walking Zone, Traffic characteristics, Merchant and Public survey, Commercial vehicle per hour (CVPH), Non-Motorized Transport (NMT).

I. INTRODUCTION

Safety is the primary need for pedestrians, who are often the most exposed to the dangers of high speed traffic. The pedestrian should be safe. Sidewalks, walkways and crossing should be designed to minimize conflicts with motorized and non-motorized vehicle traffic and promote personal safety. One of the convenient solutions for traffic management is Walking zone. A Walking Zone is simply an area where vehicles are restricted and reserved for pedestrians who are free to occupy the entire space. The zone entrances and exits are often designated with signage to make all users of the road aware when they are entering or exiting such an area. Walking Zone is beneficial in many ways such as high rates of walking and cycling, less land taken for parking and low level of car use which results in less traffic on surrounding roads.

Shekhar Rahane (2013) carried out a case study on traffic congestion in Talegaon city. The prime cause of traffic congestion is street parking. Traffic congestion constraints can be solve by various strategies such as road capacity expansion, improved road infrastructures, restricting routes for Rickshaw, financial penalty to the traffic law breakers and application of Fly over. Most importantly, proper traffic management system along with appropriate implementation of traffic rules is necessary. Anna Ibraeva (2014), the concept of Pedestrian Street appears as a response to complicated traffic circulation. The streets with intense pedestrian pressure must be declared as “Walking Zone” where pedestrian are allowed to walk freely.

II. STUDY AREA

The case study in this research is Chauta Bazaar Street (Total Distance of street surveyed: 126.91m) in Surat city. Present work is related to pedestrian priority zones and traffic prone areas in city. In this context, the concept of Pedestrian Street appears as a response to complicated traffic circulation. The streets with intense pedestrian pressure must be declared as “Walking Zone” where pedestrian are allowed to walk freely.

2.1 Demographic and Vehicular Population

Surat is a city located on western part of India in state of Gujarat. It is one of the dynamic cities of India with one of the fastest growth rate due to immigration from various parts of Gujarat and other states of India. In the last decade, the population of the city doubled up and is likely to touch the figure of 5 million by the end of decade. The growth rate of Surat city is 11.5%. According to census 2011, the population of Surat city is 44 lakhs and Population density is 1379/km².
All roads in the Surat city are congested due to high volumes of traffic and constrained widths varying from 12m to 18m. The traffic condition on routes have been increasing day by day which has leads to accidents and collision among people and vehicles.

In this research, it was observed that there is practical difficulty for pedestrian to walk and across the road just because of no regulations. People park their vehicles haphazardly on streets. Haphazard parking automatically reduces the carriage way width which creates conflicts and delay to through traffic, apart from congestion problems. Encroachment by the street hawkers as well as illegal parking of the users to the non parking side creates problems to traffic and pedestrians.

2.2 Data Sources

The population data of Surat city according to 2011-census was collected from the Surat Municipal Corporation (SMC). The vehicles growth rate of Surat city was collected from the Regional Transport Office (R.T.O) to calculate traffic density using population data.

To determine the traffic characteristics for a particular stretch of street (Chauta Bazaar), the survey has been conducted to collect volume of vehicles and questionnaire survey has been conducted to collect various data related to road user vehicular characteristics from merchants and publics/peDESTrians.

III. TRAFFIC CHARACTERISTICS

Pilot survey includes Volume study and Land area used by vehicles. Thus, this study includes Calculation of number of vehicles on both side of street as CVPH and determining peak hours of maximum traffic. Volume of vehicles was calculated on normal day (04 August 2015) and Diwali festival day (07 November 2015).

Figure 2 and 3 clearly shows that during evening hours (Peak hours) i.e. 04:00-07:00 PM, 30% and 35% of average vehicles
were observed on regular and festival day respectively. Hence, vehicles are creating hindrance for pedestrians.

Similarly, Figure 4 and 5 clearly shows that 60% and 70% of average pedestrians were observed on regular and festival day respectively which is huge amount of traffic especially during festival period.

IV. PARAMETRIC STUDY

This survey includes response of merchandise shopkeeper on street and public coming for shopping or work purpose on street. This survey was carried out on 09 October 2015 and 12 March 2016 respectively. The survey responses were used to explore ideas of traffic on Particular Street. It was introduced to promote a healthy, Progressive and Safe city.

4.1 Merchant’s Responses

Chauta Bazaar Street is a shopping street. Thus, based on the location, Merchant responses and data were collected and estimated by Questionnaire survey method. Out of the approximately 250 businesses located in Chauta bazaar area, 100 participated in this survey.

As a part of survey, Figure 6 clearly states that 76% of daily people were observed on street during 04:00-09:00 PM. Off peak hours indicate morning hours typically (10:00 AM - 01:00 PM) and after 09:00 PM. Thus maximum people use to shop during evening hours. Figure 7 show that 51-75% of customers/clients are estimated to drive on street and park in the area during 04:00-09:00 PM. Half range of people use to park the vehicle on street for their convenience.

4.2 Public Responses

Chauta Bazaar Street is a shopping street. Thus, based on the location, Public responses and data were collected and estimated by Questionnaire survey method. Out of the approximately 150 localities presented during specific duration in Chauta Bazaar Street, 100 participated in this survey.
Figure 10 clearly states that 42% of public are coming to market by 2-Wheeler compared to 18% of people (pedestrian) coming to market by Walking. Thus, localities use to carry their personal vehicle more rather than healthy walking. While in Figure 11, 45% of public respond for parking their vehicle inside street which is near to half range of people.

Figure 12 shows that only 5% of Vehicular Persons are using Multi-Level Parking provided which is at the distance of approximately 25 meters from street shows worst case scenario and irregularity of public and localities. In Figure 13, 26% of pedestrian were injured while walking on street due to collision with vehicles.

In Figure 14 shows that 45% of pedestrian respond for unsafe of pedestrian. While in Figure 15, 47% of pedestrian respond for only 3/4 Wheeler, 40% of pedestrian respond for all vehicles, 11% of pedestrian respond for 2 Wheeler respectively. Thus, three to four-wheeler vehicles should be banned for the safety of pedestrian.

V. CONCLUSION

Considering the safety of pedestrian, it can be concluded that maximum pedestrian were observed on street during peak hours i.e. 04:00-09:00 PM. Since, in transportation engineering, 3-E’s rule i.e. Education, Enforcement and Engineering is most important. Heavy vehicles should be banned during peak hours on daily basis. While 2-Wheeler has roughest driving sense, they should be banned during peak hours. During Festival period, maximum pedestrian were observed on stretch. Thus, complete prohibitions of all vehicles are required during festival period to reduce traffic congestion. The major problem is parking of vehicles. Multi-Level parking which is approximately at 25m distance from street should be use efficiently and judiciously on regular basis. Thus, Chauta Bazaar Street should be declared as “Walking Zone” or “Pedestrian street” as if itself defines as restriction of vehicles for free and safe moving space for pedestrian.
REFERENCES
