

## **BICYCLE AND PEDESTRIAN VOLUME ANALYSIS FOR IMPROVEMENT OF BICYCLE AND PEDESTRIAN INFRASTRUCTURE PLANNING: CASE OF EAST ZONE, SURAT**

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*Abstract*— presently a day, in urban ranges confronting issues is activity blockage. Vehicular traffics are expanding on everyday. Vehicular activity is specifically impact on the person on foot and bike developments, wellbeing and solaces. Passerby is one of the enormous street client gatherings. Diverse necessities of walker ought to be considered in the plan of the street transportation offices. Surat is a principle creating city in the locale. It is drawing in the people groups for doing various types of exercises. For example, finding new employments, business, training and social exercises and so on. Presently a day's civil partnership and government are centering in the territory of successful transportation offices for street client. The person on foot offices are watched poor in a portion of the territories in Surat city. In this work, fundamental walker activity arranging is taking for enhance and compelling person on foot offices at East zone. By utilizing the different sorts of activity studies, to check the walker offices and its behavior. Bicycling is considered as a standout amongst the most proficient method of manageable transportation for shorter drives in actuality, modular share of bicycling is declining step by step in India. Despite the fact that it is relied upon to be alluring alternative for short drive trips in India because of its to a great degree minimal effort of operation, it is not in any manner an appealing mode among worker having a place with high and center wage gathering. Bike clients in India are prevalently hostage clients like lower wage bunch individuals and understudies. *Keywords*—Pedestrian, Bicycle users, pedestrian and bicycle volume

### **I. INTRODUCTION**

India is the second most crowded nation on the planet, with more than 1.28 billion individuals. India is a likewise one of the creating nation. Our country assumes essential part in the whole world market. Transportation office is a first necessity of any countries for the social and foundation advancement. Many individuals in India don't have entry to the transportation by any means; they just walk or by utilization of NMV for their day by day transportation needs. Strolling is vital method of transport. In urban ranges, a noteworthy extent of excursions up to 1-2 kms. long is performed by walking. Each excursion essentially begins and as a walk trip. Since walkers are more powerless against being required in mischance. A well-working street framework must satisfy necessities of all street clients.

With regards to the present financial substances of most creating nations, people on foot, bicyclists and other moderate moving vehicles can't be wiped out from urban scene. People on foot, bicyclist and non-mechanized rickshaws are the most basic components in blended or homogeneous movement. On the off chance that the foundation configuration does not meet the prerequisites of these components all methods of transport work in problematic conditions. In urban ranges, there is a positive relationship amongst openness and wage security. Openness not just decides the work environment and time assumed to achieve the position additionally much of the time, the sort of accessibility of work. With quick urbanization in low pay nations and in India specific, the interest for entire arrangement of administration is expanding. Many individuals either stroll to work or utilize bike to drive to work. It for the most part includes making a trip to short and medium separation. It including going to schools/universities, conveying products and so on however people on foot and bike clients nearness is regularly overlooked by approach creators, organizers, and specialists. In this manner there are no arrangement, arranges and programs for people on foot and bike users in Indian urban communities.

## II. PEDESTRIAN INFRASTRUCTURE

### A. Foot Path (Side Walk)

TABLE I: CAPACITY OF SIDEWALK

Width of side walk(meter)	Capacity in number of persons per hour	
	All in one direction	In both direction
1.50	1200	800
2.00	2400	1600
2.50	3600	2400
3.00	4800	3200
4.00	3600	4000

### B. Pedestrian Crossing

1) **At – Grade Crossing:** Where the pedestrian cross the carriageway at the same level of vehicular movement.



Fig. 1. Zebra Crossing with Guard Rail

2) **Grade Separated Crossing:** Where the pedestrian are require to cross the carriageway at a level different vehicular movement.



Fig. 2. Typical Foot Over Bridge

C. Pedestrian Island & Signal

An asylum island is otherwise called a passerby shelter or walker island where people on foot can stop before wrapping up a street. It is ordinarily utilized when a road is wide, as the person on foot intersection can be too ache for a few people to cross in one movement light cycle.



Fig. 3. Pedestrian Island



Fig. 4. Pedestrian Signal and sign

III. BICYCLE INFRASTRUCTURE

Cycle tracks have been planned in the areas, based on the availability of ROW. Moreover, 2–2.5 meter wide cycle tracks have been provided, as well as 1.8 meter wide cycle lanes along the corridor depending on the ROW. Bicycle parking has been planned along the corridor near bus stops and junctions in cities like Pune, Jaipur and Indore.



Fig. 4. Separated bicycle track

IV. LITERATURE REVIEW

A. Planning of Basic Pedestrian Facilities at Selected Intersection of Rajkot City(2016)Mr.Rahul M. Kasundra, Prof. Praful A. Shinkar

Road inventory survey is clearly show that the actual condition of road marking, foot-path conditions, bus-points etc. there is observed no markings on the road. So, there are first requirement of pedestrian is to provide proper road markings (e.g. zebra crossing) at intersection. Traffic volume count survey indicates the actual volume of traffic on the intersection. Which is directly affects on the pedestrian movements. Based on all the pedestrian opinions and analysis, various recommendations and pedestrian facilities are proposed on the selected intersections. 92% pedestrian sample gives the negative feedback on the safety questions. There is also required public awareness program because 62% have no idea about the zebra crossings.On this data collections, required basic facility of pedestrians required are zebra crossing, pedestrian sign & signal for safety, foot-path widening and foot-

over bridge. Civil court road have no foot-path. So, there are required foot-path for easy pedestrian movements.

B. Effect of bicycle friendly road infrastructure on bicycling activities in urban India(2013)Samyajit Basua, VinodVasudevanb

Based on the results of this study, it can be concluded that dedicated bicycle lanes must be the given more importance than another infrastructure or policy to promote bicycling. In case when it is not possible to make all the roads favorable for bicycling, safety and congestion freeness should be compromised over travel time to some extent. Bicycle sharing service and policies like incentive for employers for using bicycle can act as a supportive measures to the before mentioned infrastructures. Intersection modification must be done judiciously as public opinion in this regard is very much skeptical. Facility to carry bicycle on public transportation is hard to implement in a country like in India where amount of crowd in public transportation is very high. Result from Delhi shows that public perception about safety and feasibility got considerably changed after the implementation of some bicycle friendly infrastructures in certain areas. This must be taken as a positive feedback from public and more alternative strategies must be found out for Indian context using the global experience to improve the level of bicycling in urban India.

C. Towards A Sustainable Urban Transport System: Planning for Non-motorized Vehicles in Cities,GeetamTiwari

This paper shows that pedestrians, cyclists and non-motorized rickshaws are the most critical elements in mixed traffic. If infrastructure design does not meet the requirements of these three all modes of transport operate in sub-optimal conditions. It is possible to redesign existing roads to provide a safe and convenient environment for non-motorized modes of transport. This also results in the improved efficiency of public transport vehicles and an enhanced capacity of the transport corridor when measured in number of passengers per hour per lane.

## V. DETAILS OF STUDY AREA

There are some special types of land use activities, which played an important role for East zone, Surat. Below are some of these land use activities for the selected location.

1. Diamond trading: Surat is mainly famous for its diamond industry. It is one of the major industries that has taken deep roots in recent years in Surat. Diamond cutting, polishing and trading which in addition to being labour rigorous, requires very little space. Diamond cutting and polishing markets are situated on the North-East periphery of the walled city, majorly in Varachha, Hirabag, Kapodra and Katargam area.
2. Textiles Industry: Surat is also known for its textile industry and jari industry. Areas engaged in these industries all well mixed with residential areas.
3. Educational Buildings: There are about 9 schools (primary, secondary and higher secondary schools), 1 commerce college, 1 diploma college and 1 engineering college in east zone. Due to this, bicycles and foot trips are more observed in 6:30 am to 7:00am, 11:30 am to 12:30 pm and 5:15 pm to 6:30 pm
4. Railway Station and GSRTC bus stop: To reach at railway station and Bus station, East zone is majorly dependent on varachha main road.

Pedestrian and bicycle count and classified volume count is carried out for east zone, Surat at the following locations.

TABLE II: LOCATION FOR DATA COLLECTION

Type of road	Name of road	TPS No.	Width of road
arterial road	Varachha main road	T.P-4 (final) & T.P-17(final)	36m & 45m
sub-arterial road	Mangdha road	T.P-4 (final)	25m
local street	Dharamnagar road	T.P-15 (final)	15m
junction	Hirabaug circle	T.P-17 (final)	4-arm intersection

### VI. DATA COLLECTION

Classified Vehicle Volume count survey is carried out by manual counting method for different location at east zone, Surat. Survey was conducted for Monday to Friday normal working day except Holliday. During morning 7:00 to 2:00 and during evening 4:00 to 9:00 survey was carried out. Inventory data collect from the town planning scheme of the east zone, surat.

**TABLE III: PEDESTRIAN AND BICYCLE COUNT**

Type of road	Pedestrian Count	Bicycle Count
	In both direction	In both direction
arterial road	24044	8136
sub-arterial road	14318	5960
local street	9788	4840
junction	26422	4398

### VII. DATA ANALYSIS

Derive the peak value and peak time of the pedestrian and bicycle from the data collected on the field at selected location of east zone, surat.

**TABLE IV: PEDESTRIAN SURVEY ANALYSIS**

Type of road	Avg. value of pedestrian	Peak value(peak time)
	In both direction	
arterial road	2000	1645 (9:00 to 10:00 am)
sub-arterial road	1194	789 (11:00 to 12:00 am)
local street	817	639 (11:00 to 12:00 am)
junction	2202	3953 (8:00 to 9:00 pm)

**TABLE V: BICYCLE SURVEY ANALYSIS**

Type of road	Avg. bicycle count	Peak value(peak time)
	In both direction	
arterial road	678	552 (8:00 to 9:00 am)
sub-arterial road	498	529 (9:00 to 10:00 am)
local street	604	529 (9:00 to 10:00 am)
junction	367	634 (8:00 to 9:00 am)

### VIII. CONCLUSION

From the study we conclude that there are poor facility of pedestrian and bicycle infrastructure at selected location of east zone, Surat. From the analysis of the pedestrian and bicycle volume count survey derive that very high volume of pedestrian and bicycle users.so

as per irc code required a widening footpath and provide separate bicycle lane and ensure the safety of pedestrian and bicycle users.

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