International Journal of Advanced Technology in Engineering and Science
Vol. No.5, Issue No. 01, January 2017
www.ijates.com
ijates
ISSN 2348 - 7550

ACCIDENT BLACK SPOT ANALYSIS IN MANGALURU

Vikram R. Shetty[1], Chethan Kumar NT[2], Mithun[3]

[1]*Assistant professor & Resident Engineer, Civil Engineering Department, YIT, Mangaluru, Karnataka, (India)*

[2]*Assistant professor, Civil Engineering Department, SCEM Mangaluru, Karnataka, (India)*

[3]*Assistant professor, Civil Engineering Department, PACE, Mangaluru, Karnataka, (India)*

ABSTRACT

Transportation and communication is more important to civilization apart from direct tyranny and oppression, nothing is more harmful to well-being of society than irrational transportation system. Every day, 3600 deaths and 8100 injuries occur on the road in the world. Road accidents and persons killed in India have been reported to the tune of 530,383 and 226,258 respectively during 2013. On National Highways, major share of accidents (about 29%) and number of persons killed (35.3%) are observed out of total accidents.

Black spots are locations having a higher concentration of road accidents. Black spots can be improved through the application of accident investigation and prevention techniques. This involves scientific analysis of accident data, identifying the nature and cause of accidents, and designing appropriate low-cost engineering solutions. Black spots are road locations that have a record of large numbers of crashes.

Key Words: Accident, Black Spot &PCU

I. INTRODUCTION

1.1 General

National highways form the economic back bone of the country and have often facilitated development along their routes. Transportation and communication is more important to civilization apart from direct tyranny and oppression, nothing is more harmful to well being of society than irrational transportation system. Every day, 3600 deaths and 8100 injuries occur on the road in the world. Road accidents and persons killed in India have been reported to the tune of 530,383 and 226,258 respectively during 2013. On National Highways, major share of accidents (about 29%) and number of persons killed (35.3%) are observed out of total accidents. Realizing the seriousness of issue, corrective measures are being taken all over the globe.

In India National Road Safety Council is the apex body for road safety, requested all States/UTs in the year 2010 for setting up of State Road Safety Council and District Road Safety Committees and to hold their meetings regularly curb the menace of Road Accidents and give priority to road safety. For the identification of accident-prone spots an Accident Prevention Committee had been set up in the year 1997 by the Government of Maharashtra State. The committee had inspected 18027 kilometers of the rural highway and 7313 accident - prone spots were identified.

1.2 Statement of Problem

Black spots are locations having higher concentration of road accidents. Black spots can be improved through the application of accident investigation and prevention techniques. This involves scientific analysis of accident data, identifying the nature and cause of accidents, and designing appropriate low-cost engineering solutions. Black spots are road locations that have a record of large numbers of crashes. There are often common problems at these sites which can be treated with engineering methods.Examples of problem solving for intersection-related crashes:

1. conversion of un-signalized cross intersections to roundabouts
2. new or revised traffic signals
3. grade separation
4. staggered cross intersections
5. extension of median through intersections (turn prohibited)

a. Provision of protected right turn facilities ..

1.3 Main Objectives and Scope of Present Study

The main objectives and scope of study:

1. To identify the different accident black spots present in Dakshina Kannada.
2. To give remedial measures (short term &long term).
3. To set parameters for further investigations.
4. To provide prevention techniques.

1.4 Scope of the Study

The study investigated only those sites within the accident black spots program that were selected for treatment on the basis of their experienced accident history, and those sites which were included in the accident black spots program on the basis of perceived safety problem.

II. STUDY METHODOLOGY

2.1 Experimental Procedure

Methodology adopted mainly includes collection of existing data, experimental investigation and analysis of existing data.

2.2 Existing Data Collection

There are two methods to identify accident black spots. One is by conducting physical survey considering predominant causes of accidents and other is to analyze the existing accident data of a particular stretch. Methodology for this research includes identification of black spots by correlating the physical survey with existing accident data. Existing data was collected from following sources.

1. NHAI
2. Police Station

2.3 Experimental Investigation

2.3.1 Selecting Parameters for Ground Survey

There are many parameters that can cause accidents on national highways but only the parameters that are more predominant in the study area had to be selected.

These factors were finalized on the basis of following factors:

1. International Journal Papers
2. Reconnaissance Survey
3. Interviewing Local Commuters

2.3.2 Ground Survey

Ground survey was carried out to find the severity index,

1. Field Work

2. Analysis of ground survey

Further the analysis of ground survey was done by two methods

2.3.3 Analysis of Existing Data

Existing data collected from NHAI and Police station was to be correlated with the data collected from physical survey to identify accident black spots. It was analyzed by following methods.

1. Method of Ranking and Severity Index
2. Accident Density Method
3. Weighted Severity Index

2.4 Existing Data Collection

In order to determine the accident locations following data was collected and used.

1. Regular accident locations as suggested by the Police station.

2. Chain age wise accident data obtained from related with the Causes of accident, Nature of accident classification of accidents, Road features, weather condition.

2.5 LOCATION: KULUR CROSSING ON NH 66
DISTRICT: DAKSHINA KANNADA

POLICE STATION: MANGALORE

2.5.1 Bypass at Mangalore

Mangalore is an important city of Karnataka, having a population of 619,664 (2011 Census). It has a major port, several industries, educational institutions and an airport. It is the headquarters of the Dakshina Kannada District. The Mumbai-Kanya Kumari coastal highway, NH-66, passes through the city. The Mangalore-Bangalore National Highway (NH-48) takes off from the city. Since the above roads through the city were congested, a bypass has been built for NH-66, to the east of the city. Several residential and commercial activities have sprung up on either side of the bypass.

2.5.2 Katakana Crossing

Kuloor Ferry Road crosses the NH 66 at Kulur . The topographical survey data has been plotted and is given in Fig. 2. In order to negotiate this cross-road, a one-way fly-over has been constructed recently and is in use for the Mangalore-Mumbai bound traffic. The traffic in the reverse direction (Mumbai-Kanyakumari) uses the ground level road by the side of the fly-over. Thus, though the Kuloor Ferry Road is accommodated through one of the spans of the fly-over, this road crosses the Mumbai-Kanyakumari (NH-66) traffic at an acute angle at ground level.

The NH 66 traffic is quite heavy, and the Kuloor Ferry road traffic has to find suitable gaps to cross the NH-66. Being an acute angled crossing, and located just ahead of the fly-over opening, the Kuloor Ferry road traffic does not have adequate sight distance to perceive the speeding NH 66 traffic. Though no fatalities have been reported in 2011 at this spot, it is a potentially dangerous crossing. It is a wrong decision to have a fly-over only for one direction. Such a design can be good for a T-junction, and not for a cross-road. Now that the one direction fly-over has been constructed, the only solution lies in improving the ground level acute angle crossing.

The traffic survey has been done during two peak hours of the day . The total PCU count in the morning is 1820.5 and in the evening is 1854.5.

The following suggestions should be implemented:

1. Provide road hump on the Kuloor Ferry Road before it meets the Kanyakumari-Mumbai direction service road and before it meets the Mumbai-Kanyakumari NH 66 at ground level.
2. Install the following warning and regulatory signs on the ground level Mumbai-Kanyakumari NH 66, and on the Kanyakumari-Mumbai service road.
3. Cross-road ahead
4. Speed limit of 50 Km/hr.
5. Built-up Area
6. Danger Warning
7. Install the following warning and regulatory signs at either end of the Kuloor Ferry Road:
8. Pave the road under the fly-over opening with Paver Blocks so as to make the vehicles reduce the speed.
9. Pave the 100 m stretch of the NH service road with paver blocks.
10. Provide rumble strip on the NH service road before its junction with the Kuloor Ferry Road and the Kuloor Ferry Road at either end.

2.5.3 Second Fly-Over for Mumbai- Kanya kumari Traffic

As a permanent measure, a second fly-over for Mumbai-Kanyakumari Traffic must be constructed. This can be taken up immediately.

2.5.4 Estimated Cost of Improvements

The cost of temporary measures is Rs 16 lakhs and cost of permanent measures is Rs.37.50 Lakes.

III.RESULTS AND DISCUSSIONS

Estimated Cost of Improvements

1.	Provision of Road Signs Junction signs (S_5, S_6, S_7) – 3 Median Opening (S_3) – 2 Stop Sign – 1	6 @ 19,000	1,14,000
2.	Zebra Crossing (M_6) 2 x 7 m = 14 m @ 600 8,400 ii) Arrows LS = 10 sq. m @ 600		6,000
3.	Directional Arrows M_1, M_3 – 2 x 2 = 4 @ 19,000		76,000
4.	Cluster of Red Reflectors – 2 @ 19,000		38,000
5.	Bus Lay bye – 2 @ 19,000		38,000
6.	Solar Blinkers – 2 @ 10,000		20,000
7.	Solar Studs L.S.		1,00,000
8.	Speed Breaker Humps 5 x 2 = 10 m 2 x 7 = 28 m	38 m @ 2300 per m	87,400
9.	Raised Footpaths	4x 100 x 2.5 = 1000 sq. m @ 2950	29,50,0004
10.	Consultancy charges for preparation of Detailed Project	2,75,000Report (DPR)	
		Total	**37.12 Lacks**

1. The study covered Accident Black Spot kulur crossing on NH 66.
2. The salient features relating to engineering of the roads are:-

a. Faulty design of intersections.

b. Non-provision of grade separation at locations of high traffic volume.

c. Provision of depressed pedestrian subways instead of ground level subways.

d. Sharp curves, inadequate super-elevation and non-availability of proper sight distance.

e. Absence of recessed bus-bays.

f. Lack of provision of service roads.

g. Inadequate provision of road signs and road markings.

h. Non-availability of guard rails at medians to prevent pedestrians crossing randomly.

i. Absence of raised footpaths in urban locations.

j. Provision of median openings at wrong locations.

k. Lack of illumination at urban intersections.

l. Provision of flyover with one carriageway at a cross-road junction.

m. Lack of speed breakers at junction

3. Engineering measures to improve the safety include

a. Provision of signalization at some busy intersections, with a pedestrian phase.

b. Provision of rumble strips to control speeds.

c. Provision of other safety devices such as solar blinkers, object markers, traffic impact attenuators, etc.

d. Construction of grade-separated structures at important junctions.

e. Adequate illumination

f. Median railing in medians to prevent pedestrians crossing road.

4. In addition, some enforcement measures to improve the safety are:-

a. Provision of Ambulance Services at the vulnerable sites.

b. Enforcement of traffic rules, such as over speeding and drunken driving.

c. Shifting of vehicle repair shops

5. Traffic Engineering Cells should be established in the PWD, which will analyze the causes

IV.CONCLUSSION AND SCOPE FOR FUTURE STUDIES

Finally we conclude our project with satisfaction of completing the project by the parameters causing accidents were selected by referring international journal papers, preliminary survey, interviewing local commuters. The analysis of Field survey data and existing data was collected by district commissioner office & local police station. The data was further analyzed by Accident Density Method and was correlated with the results obtained from above methods to give remedial measures for prevention fatal accidents effectively.

V. SCOPE FOR FUTURE STUDY

The identified accident black spots can be studied with respect to degree of slope, degree of horizontal curve, super-elevation and corrected if necessary. After finding the identified accident black spots of the study area if the rate of accidents decreases then the accident density method can be used to identify accident black spots on all types of roads

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