

Identification of black spots and junction improvements in Visakhapatnam city

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Abstract

Transportation contributes to the economic, industrial, social and cultural development of any country. Transportation by road is the only mode which could give maximum service to one and all. Due to the increase in population, number of vehicles is increasing day by day which leads to the increase in road network. It has been estimated that over 30,000 persons die and over 10 to 15 million persons are injured every single year in road accidents throughout the world. The present work intended in identifying various black spots (accident prone location) in Visakhapatnam city. The causes of accidents are studied and suggested different remedial measures to reduce number of accidents.

Keywords: Black spot; Accidents; Road network.

Abbreviations: NH - National highway.

Introduction

As the mobility increases, the probability of accidents also increases. The basic elements in traffic accidents are road users, vehicles, road, its condition and environmental factors etc.,. The fatality rate is considerably increasing in developing countries than the developed countries.

Moreover, road accidents have been shown to cost around 1% of annual gross product resources of the developing countries. Road accidents cannot be totally prevented, but by suitable traffic engineering and management measures, the accident rate can be decreased considerably. One of the most important factors is identification of hazard locations.

About Visakhapatnam

Visakhapatnam is a port city in the Indian state of Andhra Pradesh. It is located on eastern shore of India, nestled among the hills of the Eastern Ghats and facing the Bay of Bengal to the east. It is the second largest city in Andhra Pradesh with an area of 550 km², it is primarily an industrial city, apart from being a port city. It is also home to the Eastern Naval Command. Vehicle population & its growth According to official records 7 lakh

vehicles are currently plying on the Visakhapatnam roads (Fig.1). The traffic volume of Visakhapatnam city is about 59% of the total traffic volume of the district (Gopala raju, 2011).



Fig 1: Location Map of Visakhapatnam city

Black Spot

The term black spot is used to describe locations that have a higher average accident rate. The identification, analysis and treatment of road crash black spots are widely regarded as one of the most effective approaches to road crash prevention. Black spots could be at an intersection, mid block

section or a short section of the road with a proven history of high crash density. Generally hazardous locations are selected on the basis of formal road safety audits.

Methodology

Road accident data has been collected from the respective police stations and traffic departments. Major accident prone locations (Black Spots) have been identified based on the number of accidents, severity of accidents and number of fatalities. Field surveys were conducted using total station to collect the geometric features of the black spots (Tuenjai Fukuda, 2005). The reasons for the accidents are studied and analyzed.

Results and Discussions

Four locations have been identified as major accident prone areas namely, Gajuwaka junction, Venkojipalem junction, Spencers Junction and Hanumanthawaka junction. The Gajuwaka junction is highly densely populated built up area. As per the surveys conducted, many commercial places

meeting the highway. Road joining from MVP is meeting the NH-5 at an inclination where there is no better view for the vehicles moving on NH with greater speeds. Position of bus stop is also responsible for accidents to some extent.

Spacers' junction is one of the important and busiest commercial areas in Visakhapatnam city which is located on the Maddilapalem-RTC complex route. The junction is very busy with traffic inflow and outflow due to shopping complexes, stadium, petrol bunk, junior colleges etc., There is no proper traffic signal control system to control traffic. It is observed that the traffic is more in peak hours.

Hanumanthawaka junction is located along the NH-5 where the road diverts to Simhachalam. The major cause of accidents is due to the speedy traffic from highway. It is observed that there is no proper sign board placed at this junction. Improper sight distance for the road users of Arilova and NH-5 of Hanumathawaka is one of the main reasons for the accidents at this location.

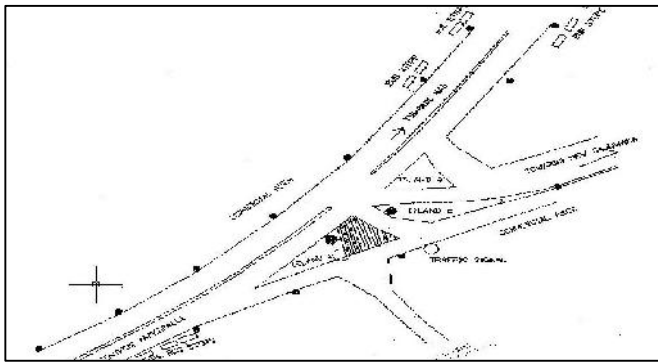


Fig.2 Gajuwaka junction

are noticed at the junction, which include shopping complexes, entertainment centers due to which the whole junction is being sprawled with huge traffic inflow and outflow rates. It is observed that the geometric design mainly contributed for the accidents (Fig. 2).

Venkojipalem is located along the National Highway 5. It is thickly populated built up area. The main cause of accidents at this junction is due to improper geometric design and no traffic signal systems installed. Accidents in this area are due to uncontrolled traffic coming from MVP colony

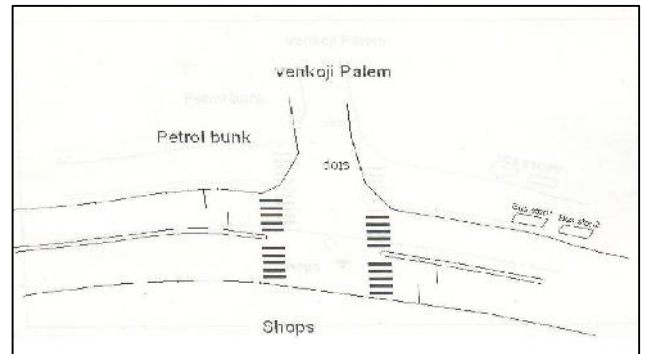


Fig.3 Venkojipalem Junction

Modifications suggested to Gajuwaka Junction

- Some part of the traffic island has to be truncated, maintaining the width of Guntavanipalem road.
- Traffic control system has to be introduced for the traffic proceeding from old Gajuwaka towards Anakapalli marking sure that the traffic does not disturb the traffic of Guntavanipalem.
- Busstops which are dwelling at the entrance of Guntavanipalem road have to be shifted to 50 m away from its original position.

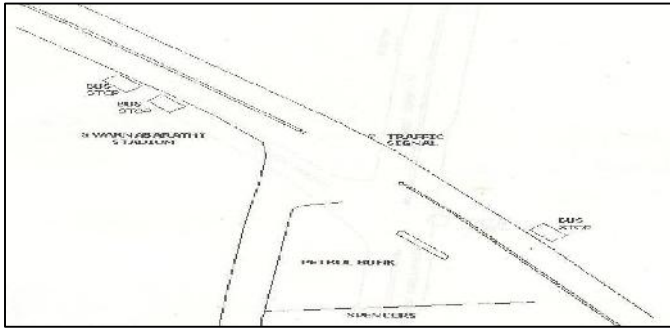


Fig.4. Spancers Junction

Modifications suggested to Venkojipalem Junction

The only remedy possible to this junction is that the speed of the vehicles should be curtailed by providing speed breakers as shown in Fig.3.

Modifications suggested to Spancers Junction

- The median present at the spancers supermarket junction is to be adjusted as shown in Fig. 4 to facilitate the movement of the traffic from bullah college road into complex road.
- Installing traffic signals to control traffic movement
- Shifting of bus stops away from junction.

Modifications suggested to Hanumanthawaka Junction

- The divider at this junction is too long, which must be adjusted for free movement of traffic.
- Bus stops should be shifted few meters away from the original place to avoid accidents.
- Installation of efficient traffic signal system (Fig. 5).

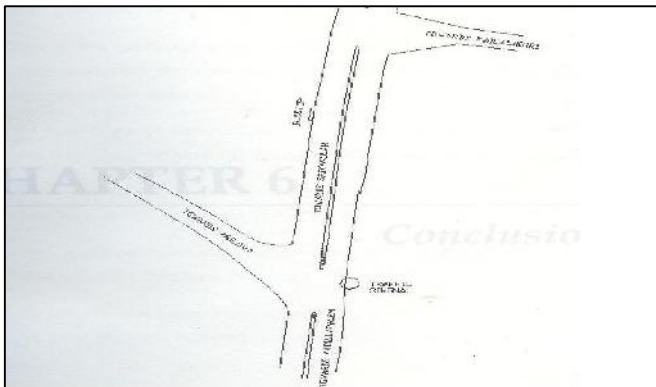


Fig.5 Hanumanthawaka Junction

Conclusion

Most of the road accidents occur due to heavy vehicles and public utility vehicles like auto rickshaws and taxis. Accidents due to auto rickshaws may not be fatal but number of accidents is more, when compared to other mode of transportation.

- As all the black spots are identified on the highway, consider it is observed that the reasons for the accidents are widely due to the speed of the vehicles.
- An efficient traffic control system would reduce the number of accidents

Road Geometry also plays an important role in reduction of accidents.

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