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SHORT COMMUNICATION

Road Accident Analysis, Evaluation and Development of Alternative Safety Management Strategies

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Abstract

Road safety refers to measures and methods for reducing the risk of a person using the road network being killed or seriously injured. In this study, we have investigated how road accident gets affected due to road factors. The road factors in this study are generally the manmade features. Manmade features refers to the features made by man i.e. roadway obstacles, adjacent structures which are present very nearer to the road and the posters present along the road. The accidental data for three types of factors were collected from National Highway Authority of India of National Highway No. 2 between Palwal to Hodal, Haryana (India). The obtained accidental data are analyzed and corresponding safety management strategies and future suggestion is recommended.

Keywords: Road safety, road factors, roadway obstacles, adjacent structures, safety management strategies.

Introduction

Road safety is a shared responsibility and it has to be based on cooperation and coordination by all the state agencies, the general public and the private/business sector, working together at every level–national, regional, local and community to develop effective and innovative road safety initiatives and interventions. It is also the responsibility of every road user to ensure their own personal safety on the roads and to make a contribution to the safety of others through responsible road use (Wegman *et al.,* 2010). The term “manmade features” mainly refers to any object on the side of the road that, by virtue of its placement and structure, results in or is likely to cause, a maximum probability of vehicular damage, occupant injury or fatality. In this case, we have considered three features such as roadway obstacles, obstacles very near to road and posters though it will not cause obstruction, but it can affect human’s mind. The transportation industry, possibly more than mainly of other industries is inundated by accident. If these accidents are not deal adequately there is an utmost probability of financial loss and loss of life, consequential in disappointment of client and public (Salmon *et al.,* 2012). Against these backdrops, this study investigated accidental risk identification, analysis and evaluation and development of alternative safety management strategies.

Materials and methods

Collection of data: Collection of data is based on the survey which includes the accident due to the road factors on the National highway No. 2. In this study, the accidental data for three types of factors were collected from National Highway Authority of India of National Highway No. 2 between Palwal to Hodal, Haryana, India.

Data analysis: The average value of the entire factor was calculated and compared. The value of accident due to adjacent structure was found to be very high as compared to the roadway problem and poster. The result shows that the accident rate on the National Highway-2 between Palwal to Hodal was very high because of the adjacent structures. The accident rate is also noticeable because of roadway problem and poster (Wegman *et al.,* 2010).

Safety enhancement: Having recognized the accidental coverage and evaluated probabilistically its possible impact, it is time to take accomplishment and try to develop safety management strategies based on the accident. These strategies are usually based on the nature and likely consequences of the accident. The main aim of these strategies is to eliminate as much as probable the possible impact and to increase manage of accident rate. With this in mind, the safety management composed of two steps (Salmon *et al.,* 2012).

1. Development of alternative safety management strategies
2. Proposal and assignments.

Safety management strategies: Following are the efficient safety management strategies:

(a) Accident prevention
(b) Developing a road safety culture
(c) Emergency response and care
(d) Engineering measures
(e) Avoid distraction.

Table 1. Accidental data collected from National Highway Authority of India of National Highway No. 2 between Palwal to Hodal, Haryana, India.

Year	Number of accident		
	Adjacent structure (AS)	Roadway problem (RP)	Poster (PR)
2002	110	20	28
2003	98	22	20
2004	96	18	16
2005	88	18	12
2006	68	26	18
2007	67	24	10
2008	86	15	8
2009	92	10	14
2010	54	12	16
2011	54	08	22
2012	62	10	7
Average	79.54	16.63	15.54

Fig. 1. Graph of the accidental data.

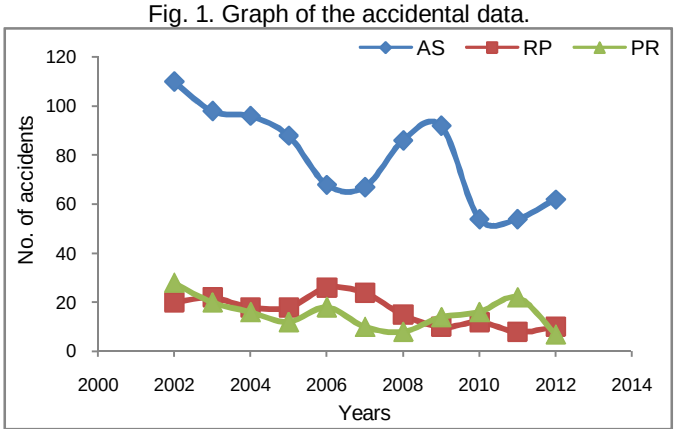

Table 2. Accidental factors and their safety management strategies.

Factors	Safety measures
Adjacent structure	The distance of telephone and electrical poles from the road should be sufficiently distant apart, construction of building near the road should be avoided and trees should be avoided in accident prone area.
Road problems	Speed limit should be followed, divider should be made of soft materials so that in case of accident it gives minimum fatality, use of road breaker at every 5 km, Use of sign board and poster related to road safety and safety manuals.
Poster	Poster should be banned in accident prone area, it should be away from main roadway, iron or any heavy material should not be used for poster making and they should be either on the divider or distantly away from the road.

Results and discussion

The graph plotted between year and the total No. of accidents clearly suggests that the accident due to adjacent structure is very high as compared to other which further suggests laying more emphasis on it (Table 1 and Fig. 1). An error to facilitate does not happen frequently desires to have a methodical, dependable advance that method its accident.

Estimates of intensity of accidents are based on the possibility of an incident taking place and the implication of any significance of such an incident (Aram *et al.,* 2010). Totally for 20 km of road length between Palwal to Hodal (Haryana) on National Highway No. 2, the survey was carried out and accidental data is collected. Based on the result of the survey there is an urgent need to improve the safety situation, accident avoidance safety rules, Implement public education/awareness campaigns which target the main causal factors for collisions, deaths and serious injuries for all road users but in particular the high risk groups. Conduct a public education/awareness campaign to improve road users' understanding of how and why speed limits are set (Yulong and Ma, 2003). Based on the findings of the survey, there is an urgent need to improve the safety situation, accident avoidance, safety rules, Implement public education/awareness campaigns which target the main causal factors for collisions, deaths and serious injuries for all road users but in particular the high risk groups. Table 2 shows accidental factors and their safety management strategies. It concludes that road safety management is highly essential in minimizing losses and enhancing safety.

Conclusion

The following are some of the conclusive points and recommendations for avoiding accidents:

- Carry out targeted operations of traffic law enforcement with a particular emphasis on safety offences. These priority offences are:
  - ❖ Excessive and inappropriate speeding
  - ❖ Impaired driving (alcohol and drugs)
  - ❖ Restraint/helmet use
  - ❖ Mobile phone use.
- Develop distance design guidelines for telephone, electric and buildings structure from the main road.
- Ensure that every vehicle should contain basic road safety materials.
- Undertake annual surveys of speed, seatbelt usage and other road user behaviors and publish findings each year.
- Remove the poster, sign board wherever it is not necessary.
- Establish a technology assessment panel to evaluate new and emerging road safety related technologies and advise on how appropriate technology can be implemented in India (Aram *et al.,* 2010).

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