

A REVIEW PAPER ON GEOMETRIC CHARACTERISTICS OF HIGHWAY SAFETY

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Abstract - Geometric design elements play an important role in defining the traffic operational efficiency of any roadway. Key geometric design elements that influence traffic operations include number and width of lanes, width of shoulders and highway medians, and the horizontal and vertical alignment of the highway. Generally, skidding any evaluation of road safety, such as in the driving dynamic field, has been conducted more or less qualitatively. It is safe to say, from a traffic safety point view, that no one is able to say with great certainty, or prove by measure or number, where traffic accidents could occur or where accident black spots could develop. Highway geometric designs that are intuitive and consistent can ease the decision-making burden and thus minimize the chances of driver errors.

Key Words: accident block, highway geometric design, road safety.

1. INTRODUCTION

Geometric design elements play an important role in defining the traffic operational efficiency of any roadway. Key geometric design elements that influence traffic operations include number and width of lanes, width of shoulders and highway medians, and the horizontal and vertical alignment of the highway. Generally, speaking any evaluation of road safety, such as in the driving dynamic field, has been conducted more or less qualitatively. It is safe to say, from a traffic safety point view, that no one is able to say with great certainty, or prove by measure or number, where traffic accidents could occur or where accident black spots could develop.

However, everyone agrees that there exists a relationship between traffic safety and geometric design consistency. By all means, alignment consistency represents a key issue in modern highway geometric design. A consistency alignment would allow most drivers to operate safely at their desired speed along the entire alignment. However, existing design speed-based alignment policies permit the selection of a design speed that is less than the desired speeds of majority of drivers. Much of the research in highway safety has focused on different factors which affect roadway safety. The factors are categorized as traffic

characteristics, road geometrics, road surface condition, weather and human factors. Previous research has shown that geometric design inconsistencies, operations (traffic mix, volume, and speed), environment, and driver behavior the common causes of accidents. Most of the studies have shown the influence of various geometric design variables on the occurrence of accidents and have concluded that not all variables have the same level of influence in all places. From the relation of factor mentioned above, different researchers have developed the relationship of roadway safety in terms of crash frequency and crash rates, fatality and injury rates and the road elements, traffic characteristics, and pavement conditions. Many of these previous studies investigated the relationship of crash rates or frequency in terms number of lanes, lane width, presence of median, median width, type of median, shoulder width, access density, speed limit, vertical grade, horizontal curvature, weather condition.

LITERATURE REVIEW

Many studies have been carried out on the accident rate dependency on geometric features. Some of the studies are as under:

Abdulla Galadari, et al., (1994) [1] concluded that the factors affecting accident severity levels based on the accident type, driver-at-fault details and signal configurations by using an ordered logistic model.

Ali Abdi Kordani, et al., (1998) [2] studied to discover the correlation between side friction factor (demand) and longitudinal grade on horizontal curve by three dimensional simulation model.

Jaeyoung Lee, et al., (2011) [3] explained on the development of the relationship between poor pavement conditions and crash severity levels using a series of Bayesian ordered logistic model for low, medium and high speed roads and single or multiple collision cases.

Neeraj, et al., (2015) [4] stated formulas in pavement widening on horizontal curves. To prevent off tracking, extra widening of pavement is provided at horizontal curves which is called mechanical widening.

Stergios Mavromatis, et al., (2016) [5] discussed SSD adequacy investigation carried out on left-turn curved divided highways is based on the difference between the available and the demanded SSD.

METHODOLOGY

The methodology involved for the study is as follows:

- 1) Selection of site to find out geometric characteristics on highway road safety
- 2) Data will be collected from different sources, i.e. police station, PWD and site survey.
- 3) Data analysis will be done with respect to collected data.

OBJECTIVES

The main objectives of the study are:

- 1) To find the role of the geometric factors of road on accident rate in the case of plain terrain and also find the extent to which these factors affect the accident rate on roads.
- 2) To find the impact of factors on the accident rate.
- 3) Find the significant factors causing accidents with respect to road geometry.

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