"IMPLEMENTATION OF INNOVATIVE TOOLS AND TECHNIQUES IN HIGHWAY SAFETY IMPROVEMENT PROJECT"

Mrs. Sweta R. Patil
Assistant Professor

Prathamesh Ahire
B.E Student

Shubham Shitole
B.E Student

Umesh Deore
B.E Student

DEPARTMENT OF CIVIL ENGINEERING
Sinhgad Institute of Technology and Science, Narhe, Pune
Savitribai Phule Pune University

ABSTRACT:
There is a growing public demand for safer streets and highways. In response to this demand, state and national transportation agencies have developed safety programs that emphasize public education, accelerated highway renewal, community-sensitive street systems, and innovative technology to facilitate safe highway design. Historically, information about the safety effect of a design component has been supported by anecdotal evidence, laws of physics, before-after studies, or comparisons of site safety (i.e., sites with and without the planning component). However, the accuracy of this information is suspect thanks to the inherent random nature of crash data and thus the various factors (some of which pertain more to the drive and therefore the vehicle than the roadway) which will cause a crash at a selected location.
As a result of this uncertainty, engineers have traditionally come to believe design standards and policies to guide them within the design process, with the underlying premise that compliance with warrants and controls will yield a "safe" roadway.

***Keywords*:** traffic,road safety , Highways, Driving laws

INTRODUCTION

There is a growing public demand for safer streets and highways. In response to this demand, state and national transportation agencies have developed safety programs that emphasize public education, accelerated highway renewal, community-sensitive street systems, and innovative technology to facilitate safe highway design.
Historically, information about the safety effect of a design component has been supported by anecdotal evidence, laws of physics, before-after studies, or comparisons of site safety (i.e., sites with and without the planning component). However, the accuracy of this information is suspect thanks to the inherent random nature of crash data and thus the various factors (some of which pertain more to the drive and therefore the vehicle than the roadway) which will cause a crash at a selected location.
As a results of this uncertainty, engineers have traditionally come to believe design standards and policies to guide them within the design process, with the underlying premise that compliance with warrants and controls will yield a "safe" roadway.

PROBLEM STATEMENT:

The level of safety provided by a roadway is directly linked to the extent to which safety was explicitly considered throughout the planning , design, and construction stages. Although one design exception for a specific highway

element or the use of a minimum design value may end in an acceptably small reduction in safety, internet effect of several exceptions or the use of several minimum values can create an unsafe design condition.

Fig: Road Survey

The goal is to create a traffic and road safety management system for intelligent route planning, road usage and maintenance that fulfills the constraints imposed by the Indian scenario. this technique should work under varied road conditions, chaotic, dense and unstructured traffic and an outsized kind of vehicles. It should be cost effect, easy to deploy (no need to dig or build overhead structures) and wish minimal maintenance.

We should avoid the necessity for specialised equipment. so as to satisfy these somewhat conflicting requirements, we are willing to be content with system that does an approximate, aggregate traffic analysis and near real time reporting. we do not need a particular count or classification of vehicles but rather some information through which we'll deduce the state of traffic on a road segment.

Hence, we are willing to tradeoff accuracy of reporting with simple deployment. we would like to make a road monitoring system that's able to better quantify a road anomaly. Thus, our efforts are getting to be to undertake determine ways to report severity, intensity or dimensions of a pothole or a damaged road segment.

OBJECTIVES

- To conduct traffic survey at Intersections on road.
- To study all the safety systems for application on highway safety.
- To identify the safety issues at the survey site.
- Develop a prototype model showing the highway management system designed at the study site.
- To introduce Intelligent transportation system at the location of necessity.
- To develop a prototype model for interpretation of simulation for the safety of traffic in Northern Pune.
- To approach town planner of the area and recommend about Intelligent Transportation Systems(ITS)
- To Identify blackhole spots and implement suitable measures.
- To study all safety systems for application on highway safety.

BASIC IDEA:

Methodology

This research is aimed to provide a model with safety systems and innovations for highway safety. The survey will be conducted in Residential, commercial and construction companies in Pune. The case study has been conducted on the site at Wakad Location, Pune for analysis.

This part of the chapter describes the data collection activities undertaken to assemble a database suitable for developing frontage-road safety evaluation tools. The first section outlines the criteria used in the segment selection process. The second section describes the characteristics of the crash data. The last section describes the process used to collect traffic flow and geometry data. In the proposed model, we are not using a machine and operating it automatically by fixing sensors rather operating by manual efforts.

In this research we place the ultrasonic sensor to one side of the road to detect whether there is any traffic congestion or not, if there is a congestion then the safety system will get activated, and when there is no congestion, the system will operate normally. And if there is a congestion then a message is sent to the nearby traffic control police stating that traffic congestion has occurred. So this is a simple and can replace the heavy machines.

The various systems that can be included in construction of the models are:

- Vision based pothole detection
- ground penetrating radars
- accelerometers
- Moving Dividers.
- Sensor based signals
- Densitometer
- Special Structures
- Sign boards
- Adaptive head lighting
- Active suspension control.

CONCLUSION:

Road accidents are increasing every year in India. It has been stated in this study that accidents on India's roads are a major concern for road safety management and to decrease the road accidents, some measures also have been suggested by Road Safety Management. The main reason is that the people and drivers are not aware of road safety. In this study attempt will be made to develop a new module for interpretation of simulation for the safety of traffic in Pune

ACKNOWLEDGEMENT

We express our gratitude to my guide Prof. Shweta Patil for her competent guidance and timely inspiration. It is our good fortune to complete our project under her able competent guidance. This valuable guidance, suggestion, helpful constructive criticism, keeps interest in the problem during the course of presenting this "IMPLEMENTATION OF INNOVATIVE TOOLS AND TECHNIQUES IN HIGHWAY SAFETY IMPROVEMENT PROJECT" successfully. We would like to thank our project coordinator Prof. S.D.Kamble and all teaching, non-teaching staff of our department. We are very much thankful to Mr.I.M. Jain, Head, Department of Civil Engineering and also Dr.R.S. Prasad, Principal, Prof.S.A. Kulkarni, Vice Principal, Sinhgad Institute of Technology and Science, Narhe for their unflinching help, support and cooperation during this Paper publication and project work.

REFERENCES

[1] S. Cafiso, G. La Cava, A. Montella, G. Pappalardo. "A Procedure to Improve Safety Inspections Effectiveness and Reliability on Rural Two–Lane Highways." The Baltic Journal of Road and Bridge Engineering - Vilnius: Technika, 2006, Vol I, No 3, p. 143-150, ISSN 1822-427X

[2] Cafiso, S., La Cava, G., Montella, A., Pappalardo, G., (2008). Manuale per le Ispezioni di Sicurezza delle Strade Extraurbane Secondarie e Locali – Operative Procedure for Safety Inspections on Two – Lane Rural Roads Project TREN – 03 – ST – S07.31286 – Aracne Editrice. ISBN 978-88- 548-1429-5. Gennaio 2008.
[3]Cafiso, S., Di Graziano, A., Giudice, O., Pappalardo, G. (2014). Tools for Road Inspection and Safety Management. 3rd International Conference on Transportation Infrastructure, Pisa, April 22-25, 2014.
[4] Cafiso, S., Kiec, M., Milazzo, M., Pappalardo, G., Trovato, F. (2014) Application of safety inspections for evaluation of two – lane regional roads in Poland", Archives of Civil Engineering - LX, 4, 2014 PP. 453 – 473, DOI 10.2478/ace-2014-0031
[5] S. Cafiso, S. Heller, G. Pappalardo, F. Trovato "Visualization Tools in Support of Road Asset Management" ICTTE Belgrade 2016 International Conference on Traffic and Transport Engineering, 24-25 November 2016, Belgrade, Serbia, ISBN 978-86-916153-3-8
[6] Fletcher, J., Mitchell, B., Bedingfeld, J., Silverman, K.K., (2015). Road Safety Model, Project Report PPR770, Transport Research Laboratory Landis JR, Koch GG. The measurement of observer agreement for categorical data. Biometrics 1977;33:159-74.