SYSTEMATIC RATING OF ACCIDENT PRONE T – INTERSECTIONS ON NATIONAL HIGHWAYS

Arichandran Arulrasa

138302U

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Department of Civil Engineering

University of Moratuwa
Sri Lanka

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DECLARATION OF THE CANDIDATE AND SUPERVISOR

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ABSTRACT

Road Traffic accidents and the resulting deaths have now emerged as a major safety and public problem. In this study intersection geometry of roads were considered to rate accident prone T – Intersection locations in national highways.

The only source of accident data in Sri Lanka is available with the Traffic Police. Availability of accident data is vital for identifying accident prone locations in the traditional data analysis process. However, insufficient data for statistical analysis and changes to the geometry of the intersection with improvement are major drawback of analyzing the available data. In this study, a method is introduced to find and rate the accident prone T – Intersections with respect to road geometry without depending on traffic police accident data. The parameters of road geometry such as road width, vertical profile and type of movement and combination of these: are considered as main influence elements and identified vulnerable factors of each element. The lane width was classified as single lane, two lanes and multi-lane and approach road profile was divided into flat, medium and adverse. The turning movement types were classified into four types: M1, M2.M3 & M4 based on centre median configuration for traffic movement at the junction. Then the relative contribution of the elements to the accident prone T – Intersections were determined by using Analytical Hierarchy Process (AHP) with a rating system. The ratings of each element were suggested by experts of Roads and Traffic Engineering. Expert ratings were subjected to consistency testing and AHP determines the weightage of each element. It was found that road width is the most critical element of the road geometry and followed by vertical profile and turning movement type. The intersections that did not comply with the model were further studied and the causes for lower or higher number of accidents in those locations were identified.

Most vulnerable accident prone T-intersections had the combination of flat gradient of approach road, single lane width and open centre median in the major road of the intersection.

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LIST OF ABBREVIATIONS

AHP - Analytic Hierarchy Process

PDO - Property Damage Only

F - Flat

R - Rolling

M - Mountainous

AADT - Average Annual Daily Traffic

RDA - Road Development Authority

CR - Consistency Ratio

RW - Road Width

VP - Vertical Profile

CM - Centre Median

TOM - Type of Movement

LHS - Left Hand Side

RHS - Right Hand Side

λ_{max} - Maximum Eigen value

CI - Consistency Index

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