

**DEVELOPMENT OF A RATING SYSTEM TO RANK
HAZARDOUS LOCATIONS ON NATIONAL
HIGHWAYS**

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Declaration of the Candidate and Supervisor

I declare that this is my own work and this dissertation does not incorporate without acknowledgement any material previously submitted for a Degree or Diploma in any other University or institute of higher learning and to the best of my knowledge and belief it does not contain any material previously published or written by another person except where the acknowledgement is made in the text.

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ABSTRACT

In highway safety plan, identification of hazardous locations on highways is one of the most important factors. In this study, the geometry of road is considered to identify the hazardous locations with the concern of design standards used in Sri Lanka.

Availability of accident data is a significant requirement in identifying hazardous location of roads. However, for roads with poor accident data sets or no accident records, a method is needed to find and rank road segments with respect to road geometry, independent of the accident records. In this study, *Geometric Design Standards of Roads* published by Road Development Authority on 1998 was considered as the design standards of National Highway in Sri Lanka. According to the design standards; hazardous locations or road stretches were initially identified. Then major parameters of road geometry such as horizontal alignment, vertical profile and road side activities and combination of these were considered as main influence elements. Thereafter essential factors of the each element were identified. After that the relative contribution of the elements to the safety of critical location or road sections was determined by using the Analytical Hierarchy Process (AHP) with a system of scores which were suggested by an expert panel subject to a consistency test of the expert responses. AHP determines the weight of the elements on which the horizontal radius was identified as the most critical parameter of the geometry element, which creates accident prone hazardous location followed by long straight section or series of curves with small straight section with added effect of site condition.

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LIST OF ABBREVIATIONS

AHP	- Analytic Hierarchy Process
DEA	- Data Envelopment Analysis
PCU	- Passenger Car Unit
F	- Flat
R	- Rolling
M	- Mountainous
R_{\min}	- Minimum Radius
e_{\max}	- Maximum Super – elevation
f_{\max}	- Maximum values of Coefficient of Side Friction
RDA	- Road Development Authority
λ_{\max}	- Maximum Eigenvalue
CR	- Consistence Ratio
RI	- Random consistency Index
CI	- Consistency Index
MFNSV	- Multi Function Network Survey Vehicle
accels	- Accelerometers
gyros	- Gyroscopes
ADT	- Average Daily Traffic
APSs	- Accident-Prone Sections
LHS	- Left Hand Side
RHS	- Right Hand Side

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