

**DEVELOPMENT OF ROAD SAFETY MANAGEMENT
FRAMEWORK FOR THE NATIONAL ROAD
NETWORK**

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DECLARATION OF THE CANDIDATE & SUPERVISOR

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ABSTRACT

Development of road safety management framework for the national road network

Road safety is a fundamental aspect of sustainable transportation systems, playing a vital role in protecting human lives, ensuring public well-being, and supporting socioeconomic development. However, many countries face persistent challenges in managing road safety at the national level due to insufficiently structured frameworks, inadequate data utilization, and limited analytical tools for identifying and addressing high-risk road segments. These limitations hinder the ability of road authorities to identify methodologies for effectively identifying critical safety issues, prioritizing high-risk road sections, and implementing targeted interventions within constrained budgets. To address these limitations, it is essential to adopt evidence-based approaches that enable the prioritization of road safety projects while considering financial and operational constraints. Furthermore, identifying long-term funding needs for high-priority safety improvements is crucial for sustaining progress. To achieve substantial progress in reducing road crashes and enhancing overall safety, it is imperative to adopt a structured road safety management framework that integrates systematic assessment procedures, clear operational roles, and accountability at all levels.

The framework begins by identifying the key objectives of the national road safety strategy and developing criteria for road segmentation using fixed or variable lengths based on the available crash data. Then the road segments are initially screened and classified as high-risk road segments through the combined application of comprehensive crash data analysis and appropriate black spot identification method.

This study proposes a comprehensive approach that includes three key road safety assessments: roadway environment assessment (which categorizes the roadside land use context as urban, suburban, or rural), road infrastructure safety assessment (which evaluates safety issues arising from roadway deficiencies), and crash risk assessment (based on historical crash data). The high-risk road segments identified during the initial screening are further evaluated through these three safety risk assessments.

The level of service of each road section (road safety performance) is then evaluated based on the outcomes of each risk assessment, through the development of performance matrices. Finally, a macro-level decision-making matrix and appropriate risk rating method are developed to determine the overall safety performance of the relevant sections. According to the safety management strategy, relevant road agencies and authorities will decide on the safe treatment strategies and the location of safety priorities they can adopt based on their budgetary restrictions.

Keywords: Road Safety, National Road, Road Segmentation, Risk Assessment, Crash data

TABLE OF CONTENT

Declaration of the candidate & supervisor	i
Acknowledgement	ii
Abstract.....	iii
Table of content	iv
List of tables	vii
List of figures.....	ix
List of abbreviations	xi
List of appendices	xii
Chapter 1.....	1
Introduction	1
1.1 Research Background	1
1.1.1 The global burden of road traffic accidents	1
1.1.2 Road safety in low- and middle-income countries (LMICs).....	1
1.1.3 Global commitments and the safe system approach	3
1.1.4 Towards safer rural mobility: integrating low-volume roads into national road safety management framework.....	3
1.2 Problem Statement	5
1.3 Research Objective and Organization.....	6
Chapter 2.....	7
Literature review.....	7
2.1 Road safety management tools and their effectiveness	7
2.2 Influence of land use characteristics on road safety outcomes	13
2.2.1 Functional Classification of Roads	14
2.2.2 Analyzing the influence of land use patterns on Annual Average Daily Traffic (AADT) behavior	14
2.2.3 Relationship between AADT and crash collision frequency	19
2.3 Influence of roadway deficiencies on road safety outcomes	19
2.4 Road network segmentation strategies and their impact.....	20
2.5 Data mining and clustering techniques for black spot identification in road safety analysis.....	23
Chapter 3.....	25
Methodology.....	25
3.1 Data collection	27
3.2 Segmentation of national road network	28
3.3 Identification of high-risk road sections	29

3.3.1 High risk segments identification using sliding window method 1	30
3.3.2 High risk segments identification using sliding window method 2	32
3.3.3 High risk segments identification using k-mean clustering algorithm.....	33
3.4 Evaluation of high-risk road segments according to the casualties per an accident	34
3.5 Evaluation of high-risk road sections using roadway environment assessment.....	35
3.5.1 Development of guidelines and limitations of the roadway environment categories	36
3.5.2 Finding roadway environment contexts using land use pattern from high-resolution satellite images	38
3.6 Evaluation of high-risk road sections based on road infrastructure assessment.....	42
3.6.1 Development of road safety index	43
3.6.2 Road Safety Index attributes and Valued Scores	44
3.6.3 Road infrastructure safety assessment process.....	47
3.7 Evaluation of high-risk road sections based on crash severity assessment	47
3.7.1 Crash data analysis based on accident severity	47
3.8 Development of decision matrix based on the three risk assessment results.....	49
3.8.1 Development of Risk Rating Index (RRI).....	49
3.9 Case study	51
3.9.1 Application of the Road Safety Management System in Sri Lanka.....	51
3.9.2 National road network of Sri Lanka	51
3.9.3 Introduction to study area.....	53
Chapter 4.....	54
Analysis and results	54
4.1 Data collection: analyzing data through the Sri Lankan accident data management system (SLADMS).....	54
4.2 Identification of high-risk road segments along the A002 (colombo-wellawaya) road .	55
4.2.1 Results of analysis done using sliding window method 1.....	55
4.2.2 Results of identifying high-risk road segments analysis done using sliding window method 2.....	57
4.2.3 Identification of high-risk road segments using K-mean clustering method	63
4.3 Analysis for identifying high risk road segments based on number of casualties per accident	66
4.3.1 Graph visualization of High-Risk Area with regards to the Casualties per Accident	67
4.4 Application of roadway environment assessment in the case study	71
4.4.1 Road segment classification for safety assessment	71
4.5 Application of road infrastructure assessment in the case study	73
4.6 Application of crash severity assessment in the case study	75

Chapter 5.....	82
Conclusion and recommendations.....	82
5.1 Recommendations and actions needed to be followed	82
References	87

LIST OF TABLES

Table 1.1 Overview of crashes in Sri Lanka for the years 2008-2022	2
Table 2.1 Road safety risk assessment tools based on crash data applications	7
Table 2.2 Road safety risk assessment tools based on risk index and rating methods.....	8
Table 2.3 Road safety risk assessment tools based on road safety audit and inspections	10
Table 2.4 Road safety risk assessment tools based on hybrid and specialized tools.....	11
Table 2.5 Road safety risk assessment tools based on HSM models	12
Table 2.6 Behavior of AADT with Urban, Suburban and Rural Road Context.....	16
Table 2.7 Representing of AADT data in Urban and Rural Areas.....	17
Table 2.8 Average daily traffic data for different land use area in Sri Lanka	18
Table 2.9 AADT Levels Across Different Roadway Environments	19
Table 2.10 Definition of high crash road segments in some regions.....	22
Table 3.1 Common sources of road crash data collection	27
Table 3.2 Crash data sources used by different countries	28
Table 3.3 Identification of roadway environment context according to the speed, mobility and access	36
3.4 Regulations and Guidelines for the identifying roadway environment context	37
Table 3.5 Risk Exposure Levels Across Different Road Environments	41
Table 3.6 Road characteristics and their respective weightages	43
Table 3.7 Desired level of services and class based on road safety index value.....	44
Table 3.8 Attributes relating to the Roadway Characteristic.....	44
Table 3.9 Attributes relating to the Traffic characteristic	45
Table 3.10 Attributes relating to the Roadside characteristic.....	46
Table 3.11 Attributes relating to the Pavement characteristic	46
Table 3.12 Attributes relating to the Miscellaneous characteristic	46
Table 3.13 Performance classification classes based on calculated Severity Index.....	48
Table 3.14 Recommended actions for road segments based on desired grade and safety risk assessment results	49
Table 3.15 Risk assessment matrix between road environment and infrastructure assessments	50
Table 3.16 Development of Risk Rating Index for all risk assessments	50

Table 3.17 Current Sri Lankan Road network types and length	51
Table 4.1 Recorded attributes provided from the crash database of Sri Lanka police	54
Table 4.2 Representation of sample data analysis done from machine learning algorithm	55
Table 4.3 The list of high-risk road sections identified using sliding window method 2	62
Table 4.4 Results of High-risk areas and coordination with distances.....	65
Table 4.5 Sample output results generated from algorithm for casualty per accident ratio	66
Table 4.6 High risk area from both high frequency and casualties per accident method.....	70
Table 4.7 Risk assessment for the high-risk section based on Roadway Environment context	73
Table 4.8 Calculation of Road Safety Index value based on different characteristics	74
Table 4.9 Results of Road Safety risk assessment based on crash severity level for the identified high risk road sections.....	76
Table 4.10 The final results of road safety assessment for the selected high risk road sections along A002 road	78
Table 4.11 Measured Risk Rating Index for the identified high risk road segments of A002 road	80
Table 5.1 Recommendations and actions suggested from the analysis for the identified high risk road sections	82

LIST OF FIGURES

Figure 2.1 Distribution of Crash collisions with AADT	19
Figure 2.2 Illustration of static and dynamic road segmentation method	21
Figure 3.1 General flow chart for the methodology	26
Figure 3.2 Illustration of extension version of moving average sliding window method 1	31
Figure 3.3 Illustration of Sliding Window Technique for Accident Data Analysis	32
Figure 3.4 Identification and visually illustration of extension of roadway environment from urban core to rural areas	36
Figure 3.5 The process of identifying roadway context using google satellite data	39
Figure 3.6 Illustration of different roadway functional contexts based on google satellite image (source: Google earth pro)	40
Figure 3.7 Assessing risk exposure in different geographic areas	42
Figure 3.8 Extension Road map of Sri Lankan National Road Network	52
Figure 4.1 Plot series 1: Accident frequency along the A002 road Sri Lanka	56
Figure 4.2 Identification of high-risk road sections from sliding window algorithm	57
Figure 4.3 Accidents frequency analysis and identification of high-risk area for k=2 (1 km sections)	58
Figure 4.4 Accidents frequency analysis and identification of high-risk area for k=4 (2 km sections)	58
Figure 4.5 Accidents frequency analysis and identification of high-risk area for k=8 (4 km sections)	59
Figure 4.6 Accidents frequency analysis and identification of high-risk area for k=12 (6 km sections)	59
Figure 4.7 Accidents frequency analysis and identification of high-risk area for k=16(8 km sections)	60
Figure 4.8 Accidents frequency analysis and identification of high-risk area for k=20 (10 km sections)	60
Figure 4.9 Comparison between coefficient of variation and window sizes	61
Figure 4.10 Variation of crash frequency for the different window sizes	62
Figure 4.11 Visualization of accident frequency with distance of A002 road Sri Lanka	64
Figure 4.12 Visualization of high-risk road sections using K-mean clustering algorithm	64
Figure 4.13 High risk road section based on casualties per accident (95% of threshold)	67
Figure 4.14 High risk road section based on casualties per accident (85% of threshold)	68
Figure 4.15 High risk road section based on casualties per accident (75% of threshold)	69

Figure 4.16 Spatial visualization of high-risk road segments along the A-002 road	71
Figure 4.17 Classification and highlight of A002 road as per roadway environment guidelines	72
Figure 4.18 Classification and highlight of A001 road as per roadway environment guidelines	72
Figure 4.19 Illustration of severity index values for A-002 road	76
Figure 5.1 Graphically illustration of high-risk areas and desired level of service along A-002 road	84

LIST OF ABBREVIATIONS

Abbreviation	Description
HIC	High Income Countries
LMICs	Low- and Middle-Income Countries
RSMF	Road Safety Management Framework
WHO	World Health Organization
SDGs	Sustainable Development Goals
RDA	Road Development Authority
PRDA	Provincial Road Development Authority
AADT	Annual Average Daily Traffic
IRR	Infrastructure Risk Rating
ADB	Asian Development Bank
SLADMS	Sri Lankan Accident Data Management System
CSI	Cumulative Safety Index
SPF	Safety Performance Function
HSM	Highway Safety Manual
RSI	Road Safety Index
CMF	Crash Modification Factor
ECDF	Empirical Cumulative Distribution Function
RRI	Risk Rating Index

LIST OF APPENDICES

Appendix	Description	Page
Appendix - A	Road safety audit checklist and field observations	92-100
Appendix – B	Sample calculations for the road safety index (RSI)	101-105
Appendix – C	Code-based supplementary materials for road safety analysis	106