

**TRENDS, PATTERNS AND FACTORS CONTRIBUTING TO
ROAD TRAFFIC ACCIDENT IN CHITWAN DISTRICT, NEPAL**



A Thesis

**Submitted to the MPhil Programme in Sociology,
Central Department of Sociology,
Faculty of Humanities and Social Sciences, Tribhuvan University,
in the Partial Fulfillment of the Requirement for the Degree of
Master of Philosophy
in
Sociology**

**Submitted By
Eak Narayan Poudel
Exam Roll No.: 503
TU Regd. No.: 11978-86
March 2025**

DECLARATION

This dissertation, entitled “**Trends, Patterns, and Factors Contributing to Road Traffic Accidents in Chitwan District, Nepal,**” has been prepared by me as a partial fulfillment of the requirements for the Degree of Master of Philosophy in Sociology. This thesis represents my original research work.

Wherever contributions from others are involved, I have made every effort to clearly indicate them, providing proper references to the literature and acknowledging collaborative research and discussions.

The work was conducted under the guidance of Professor Madhusudan Subedi, from the Central Department of Sociology, Tribhuvan University, Kathmandu, Nepal.

.....

Eak Narayan Poudel

Date: 2025

Tribhuvan University
Central Department of Sociology
Faculty of Humanities and Social Sciences
MPhil Program in Sociology

LETTERS OF RECOMMENDATION

This is to verify **Eak Narayan Poudel** has completed the MPhil-PhD Dissertation entitled “**TRENDS, PATTERNS AND FACTORS CONTRIBUTING TO ROAD TRAFFIC ACCIDENT IN CHITWAN DISTRICT, NEPAL**” under my Guidance and Supervision. Therefore, I Recommend the Dissertation committee for the evaluation and approval.

.....
Prof. Madhusudan Subedi
Dissertation Supervisor
Central Department of Sociology
Tribhuvan University, Kirtipur,
Kathmandu, Nepal

Date:

ACKNOWLEDGEMENT

I would like to extend my heartfelt gratitude to my dissertation supervisor, Prof. Madhusudan Subedi, for his exceptional mentorship, unwavering guidance, and invaluable support throughout this research journey. His insightful suggestions and constructive feedback have been instrumental in shaping this work. I am equally indebted to the esteemed faculty members of the MPhil Program in Sociology at the Central Department of Sociology, Tribhuvan University. Their dedication, encouragement, and thoughtful guidance have been pivotal in helping me navigate the various stages of this research.

I am especially thankful to Associate Professor. Pasang Sherpa, PhD, Head of the Department. I would also like to express my sincere thanks to my external examiners Associate Prof. Pasang Sherpa, PhD and Guman Singh Khatri, PhD for their guidance and constructive feedback. Equally, I am truly grateful to Professor Youba Raj Luintel, for their expert advice, critical observations, and invaluable contributions to this dissertation. My sincere appreciation also goes to the administrative staff and all other individuals who provided support and assistance, directly or indirectly, during this research.

I am profoundly grateful to the Chitwan Traffic Police Office and all the respondents who generously shared their time and information, contributing significantly to the success of this study. Their cooperation and support have been invaluable.

Lastly, I wish to express my deepest appreciation to my beloved family for their unwavering support and encouragement. Special thanks to Asmita Poudel, Antesh Poudel, and Dil Kumari Poudel, as well as my friends Subash Koirala, and Ashesh Mall, whose moral and technical support have been indispensable in completing this research.

Eak Narayan Poudel

ABSTRACT

Accidents are generally defined as unexpected, unplanned events that may cause injuries or deaths. They represent a major non-communicable disease epidemic today. A road traffic accident (RTA) occurs on a road or in a publicly accessible place, resulting in injury or death. This study investigates the patterns, trends, and contributing factors of road traffic accidents (RTAs) in Chitwan District, Nepal, over a five-year period (2075/76 to 2079/80). Employing a mixed-methods convergent-parallel design, it integrates primary data from interviews with secondary data from Chitwan Traffic Police Office.

Descriptive analysis of the secondary data and content analysis of interview responses were conducted. Results indicate a considerable rise in accidents, pointed in 2077/78 and 2078/79, with a slight reduction in 2079/80. Both injuries and fatalities pointed in 2078/79, followed by a decline. Males accounted for the majority of accidents and fatalities, with head and spinal injuries were most common in 2078/79. Key factors contributing to RTAs include impaired driving, aggressive behavior, speeding, vehicle neglect, and poor road conditions. The study underscores the importance of improved road maintenance, traffic management, and responsible road-user behavior. Given the scarcity of research in this area within Chitwan, these findings provide critical insights into RTAs and advocate for enhancing road safety in Nepal.

TABLE OF CONTENTS

	Page No.
Declaration	i
Letters of Recommendation	ii
Approval Letter	iii
Acknowledgement	iv
Abstract	v
Table of Contents	vi
List of Tables	x
List of Figures	xi
Abbreviations	xii
CHAPTER I: INTRODUCTION	1-5
1.1 Background of the Study	1
1.2 Statement of Problem	3
1.3 Research Questions	4
1.4 Research Objectives	5
1.4.1 General Objective	5
1.4.2 Specific Objectives	5
1.5 Significance of the Study	5
1.6 Organization of the Study	5
CHAPTER II: LITERATURE REVIEW	6-16
2.1 Conceptual Review	6
2.2 Theoretical Review	6
2.2.1 Routine Activity Theory (RAT)	7
2.2 Empirical Review	11
2.3 Research Gap	14
2.4 Conceptual Framework	15

CHAPTER III: RESEARCH METHODOLOGY	17-25
3.1 The Research Design	17
3.2 Site selection Justification	19
3.3 Tools and Technique of Data Collection	19
3.3.1 Structured Interview Schedule	19
3.3.1.1 Interview Process	20
3.3.1.2 Interview Strategies	21
3.3.2 Secondary Data Review	22
3.4 Universe, Sampling size, and Sampling Method	22
3.5 The Justification for Selection to Participants	23
3.6 Sources of Data	23
3.7 Justification of the Selection of Chitwan as Study Area	24
3.8 Methodological Reflection	24
3.9 Limitations of the Study	25
CHAPTER IV: INTRODUCTION OF STUDY AREA AND RESPONDENT	26-29
4.1 Introduction of Study Area	26
4.2 Introduction of Respondents	26
4.3 The Socio-Demographical Details	28
CHAPTER V: TRENDS AND PATTERNS OF ROAD TRAFFIC ACCIDENT IN CHITWAN DISTRICT	30-44
5.1 Trends of Road Traffic Accident in Chitwan District	30
5.1.1 Trends of Road Traffic Accident in Chitwan District	30
5.1.2 Trends of Casualties of road Traffic Accidents in Chitwan District	31
5.1.3 Trend of Sex Wise Distribution of Morality	33
5.2 Patterns of Road Traffic Accident in Chitwan District	35
5.2.1 Patterns of Injured Types of on Road Traffic Accident	35

5.2.2 Patterns of Occupations Types Involved in Road Traffic Accidents	37
5.2.3 Patterns of Types of Vehicle Involved in Road Traffic Accident	38
5.2.4 Road Traffic Accidents Patterns by Time of Day in Chitwan	40
5.2.5 Road Traffic Accidents Patterns by Day in Chitwan	41
5.2.6 Road Traffic Accidents Patterns by Month in Chitwan	42
5.2.7 Causes of RTA in Chitwan	43
CHAPTER VI: FACTORS CONTRIBUTING TO ROAD TRAFFIC ACCIDENT	45-66
6.1 Distribution of Theme	45
6.2 Behavioral Factors	47
6.2.1 Driver	47
6.2.2 Pedestrian	52
6.2.3 Passengers	54
6.3 Environmental Factors	57
6.4 Vehicle Factors	59
6.5 Law/system Factors	61
6.6 Suggestion to Reduce RTA	62
CHAPTER VII: SUMMARY, CONCLUSION AND THEORITICAL REFLECTION	67-72
7.1 Summary	67
7.2 Convergence and Divergence	68
7.3 Conclusion	69
7.4 Theoretical Reflection	71
REFERENCES	73-83
APPENDICES	84-94
APPENDIX-I: INFORMED CONSENT FORM	84
APPENDIX-II: QUESTION WITH PASSENGER	85

APPENDIX-II: QUESTION ACCIDENT VICTIMS	86
APPENDIX-IV: QUESTION WITH TRAFFIC POLICE	87
APPENDIX-V: QUESTION WITH PEDESTRIANS	88
APPENDIX-VI: QUESTION WITH EYE WITNESS	89
APPENDIX-VII: QUESTION WITH ROAD DIVISION OFFICE	90
APPENDIX-VIII: QUESTION WITH DRIVER	91
APPENDIX-IX: QUESTION WITH LOCAL GOVERNMENT	92
APPENDIX-X: GLIMPSES DURING DATA COLLECTION	93

LIST OF TABLES

		Page No.
Table 4.1	Socio-Demographic Details of Participant	27
Table 4.2	Distribution of Socio-Demography Variable	28
Table 5.1	Trends of Road Traffic Accidents in Chitwan Districts	30
Table 5.2	Trend of Casualties of Road Traffic Accidents in Chitwan District	31
Table 5.3	Trend of Morality in Road Traffic Accident in Chitwan District	33
Table 5.4	Patterns of Injured Types on Traffic Accident in Chitwan District	35
Table 5.5	Patterns of Occupation Types Involved in Traffic Accident in Chitwan District	37
Table 5.6	Distribution of Patterns of Types of Vehicle Involved in Road Traffic Accident in Chitwan	38
Table 5.7	Patterns of Road Traffic Accidents (RTAs) by Day of Occurrence in Chitwan	41
Table 5.8	Distribution of Road Traffic Accidents Patterns by Time of Day in Chitwan in Chitwan District	42
Table 5.9	Causes of Road Traffic Accidents in Chitwan District	44
Table 6.1	Theme and Sub Theme	45

LIST OF FIGURES

	Page No.
Figure 2.1 Conceptual Framework of Contributing Factors to Road Traffic Accident	15
Figure 5.1 Trend of Injured and Mortality in RTA in Chitwan	32
Figure 5.2 National Trend of Injured and Mortality in Nepal	32
Figure 5.3 Sex wise Trend of Morality in Chitwan District	34
Figure 5.4 Patterns of Injured Types on Traffic Accident in Chitwan District	36
Figure 5.5 Occupation Types Involved in Road Traffic Accident in Chitwan District	37
Figure 5.6 Distribution of Patterns of Types of Vehicle Involved in Road Traffic Accident in Chitwan District	39
Figure 4.7 Distribution of Road Accidents by Time of Day in Chitwan:	40

ABBREVIATIONS

IFRC	:	International Federation of Red Cross
MIC	:	Middle Income Countries
MVC	:	Motor Vehicle Collision
RAT	:	Routine Activity Theory
RCS	:	Red Crescent Societies
RTA	:	Road Traffic Accident
RTI	:	Road Traffic Injuries
TARTB	:	Traffic Accidents Risk-Taking Behavior
WHO	:	World Health Organization

CHAPTER I

INTRODUCTION

1.1 Background of the Study

Accidents are generally defined as unexpected, unplanned events that may cause injuries or deaths. They represent a major non-communicable epidemic in the present day. Since the advent of vehicles, the number of road traffic accidents (RTAs) has risen in proportion to the number of vehicles manufactured. In the context of RTAs, the term ‘killed’ refers to a person who dies on the spot or within thirty days due to injuries sustained in the accident (WHO, 1984).

Road traffic accidents are a leading cause of death globally, particularly affecting certain demographic groups more severely. They are the leading cause of death for children and young adults aged 5–29 years (WHO, 2023). These incidents are especially prevalent in low- and middle-income countries, which account for the majority of global road fatalities.

An accident is an event that occurs without warning and usually results in negative consequences (Gulzar, Yahya, & Zafar, 2012). Factors such as being male, having low levels of education, fatalistic beliefs, not obeying traffic rules, and inadequate traffic education significantly influence the likelihood of traffic accidents. According to Erjem (2007), there are integration problems within the traffic system that exacerbate this issue.

A road traffic accident (RTA) occurs on a road or in a location accessible to the public and results in the injury or death of one or more people. It may also be referred to as a traffic collision, motor vehicle collision (MVC), traffic accident, motor vehicle accident, or road traffic collision (Lum & Reagan, 1995).

When road accidents occur, they not only result in death but also leave many people with disabilities, limiting their ability to participate in economic activities and affecting the income of families responsible for their care. The International Federation of Red Cross (IFRC) and Red Crescent Societies (RCS) describe the situation as “a worsening global disaster destroying lives and livelihoods, hampering

development, and leaving millions in greater vulnerability." Without appropriate action, RTAs and their resultant injuries are predicted to escalate dramatically as a global burden of disease by 2020 (WHO, 2013).

Currently, RTAs are the ninth leading cause of death, with more than a million people dying worldwide annually and over 2,500 deaths occurring daily. RTAs are anticipated to increase, potentially becoming the seventh leading cause of death worldwide by 2030 if no rigorous actions are taken to mitigate them. According to the World Health Organization, road traffic injuries are already among the three major causes of death for people aged 5 to 44 years. Approximately 90% of RTA-related deaths and injuries occur in developing countries (WHO, 2015).

The largest proportion of road traffic deaths occurs in Middle-Income Countries (MIC) (49.6%), followed by low-income countries (41.9%), with the remaining 8.5% in high-income countries (WHO, 2009). The trend in RTA injuries and fatalities is increasing at an alarming rate in Nepal. In 2009/10, RTAs killed more than 1,734 people and injured an additional 11,000 (Sharma, 2016). About half of all RTA injuries in Nepal occur in the Kathmandu Valley, although fatalities are higher outside the Valley.

Each year, road accidents claim the lives of between 250 and 400 people across the 10 districts of Bagmati Province. Traffic police data from Bagmati Province reveals that, in the past fiscal year alone, there were 252 fatalities and 1,750 injuries resulting from 1,110 traffic accidents. Historical data shows 413 road accident fatalities in fiscal year 2078/79 BS, 335 in 2077/78 BS, and 444 in 2076/77 BS. Chitwan District experiences the highest number of road accidents and fatalities within Bagmati Province. Over the past four and a half years, 487 deaths occurred due to road accidents in Chitwan. The District Traffic Police Office attributes this high number to the district's growing population and increasing number of vehicles.

Research indicates that people between 15–40 years of age are the most affected by RTAs. Most motorcycle accidents occur in urban areas, while bus and truck accidents predominantly occur in rural regions. About 40% of accidents happen after sunset, even though traffic flow decreases during this time (Sharma, 2016).

It is cautioned that, over the next 15 years, unless immediate action is taken, the number of people dying annually in road traffic accidents may rise to 2.4 million.

Therefore, as Nepal is one of the countries heavily affected by road traffic accidents, this study aims to analyze the factors contributing to RTAs in Chitwan District to identify relevant issues.

1.2 Statement of Problem

Road traffic accidents (RTAs) are a significant global issue, particularly affecting developing countries like Nepal. The rising number of road accidents poses a serious threat to the country's social and economic development. Despite ongoing efforts to improve road infrastructure and enforce traffic regulations, RTAs continue to increase, resulting in loss of life, disabilities, and financial hardships for families. While the primary objective of developing transport infrastructure is to enhance social well-being and economic growth, unintended consequences such as RTAs undermine this goal.

The impact of RTAs extends beyond individuals, affecting family dynamics, economic stability, and overall societal development. The burden of injuries, disabilities, and loss of income places significant strain on families and communities.

The Chitwan District is experiencing a high and rising rate of RTAs, making it critical to understand the complex patterns, trends, and contributing factors that drive these incidents. Although some studies have addressed aspects such as the demographic characteristics of drivers or the condition of road infrastructure, these factors have not been studied comprehensively in conjunction with each other. Additionally, little is known about the influence of socio-cultural norms, economic disparities, and the effectiveness of existing road safety interventions. This lack of an integrated analysis limits policymakers' ability to develop effective, targeted strategies to reduce accidents and improve road safety in the district.

Despite the abundance of data on RTAs in Chitwan District, much of the current research focuses on individual factors in isolation, such as demographics, infrastructure quality, or law enforcement. What remains lacking is an integrated analysis that considers how these factors intersect to influence the patterns, trends, and underlying causes of RTAs in the region. Existing studies have yet to thoroughly explore the combined effects of demographic, temporal, and geographical factors on accident rates, limiting the understanding necessary for creating targeted interventions.

On a societal level, RTAs result in the loss of productive workforce members, negatively impacting economic output and increasing healthcare and social security costs. The healthcare system faces additional pressure due to the demands for emergency response, ongoing medical treatment, and long-term rehabilitation for accident victims. Moreover, low-income families are particularly vulnerable to the consequences of RTAs, given their limited access to quality healthcare, insurance, and legal resources.

A significant gap exists in evaluating past and current road safety interventions in Chitwan. Few studies have examined the long-term effectiveness of road safety measures, leaving unanswered questions about which strategies are most effective in reducing accidents and fatalities. Furthermore, the potential of emerging technologies, such as advanced driver assistance systems and improved traffic management systems, to mitigate accidents has not been adequately studied in this region.

This study aims to fill this gap by providing a holistic examination of the patterns, trends, and contributing factors to RTAs in Chitwan District. It will analyze road conditions, driver behavior, law enforcement practices, and environmental factors. Additionally, it will explore the role of cultural and social attitudes toward driving and evaluate the impact of current road safety measures and emerging technologies. The study's goal is to provide evidence-based recommendations for reducing RTAs and enhancing road safety in the district

1.3 Research Questions

- 1, What is the trend of road traffic accidents in Chitwan District?
2. What are the Patterns of road traffic accidents in Chitwan District
3. What are the contributing factors for road traffic accidents in Chitwan District?

1.4 Research Objectives

1.4.1 General Objective

The general objective of this study was to analyze trends, Patterns and the major contributing factors of road traffic accidents in Chitwan District Nepal.

1.4.2 Specific Objectives

1. To examine the trends of road traffic accidents in Chitwan District.
2. To examine the Patterns of road traffic accidents in Chitwan District
3. To identify underlying factors contributing to road traffic accidents in Chitwan District.

1.5 Significance of the Study

In Nepal, only a limited number of studies have been conducted to assess the patterns, trends, and contributing factors of road traffic accidents. Therefore, this study will provide valuable insights into the magnitude and factors associated with road traffic accidents in Chitwan District. It will help assess and describe the factors related to RTAs in the district. Moreover, this study will recommend potential prevention and control measures to decision-makers and other stakeholders to reduce deaths and disabilities caused by road traffic accidents in urban areas. Finally, this study may also serve as baseline data for future research on RTAs in Chitwan District and as a reference for other cities in Nepal.

1.6 Organization of the Study

This study has been organized into five Different chapter, firstly it is started from introduction chapter, which is comprised that introducing the research issue, research, problem, Research question, significance of the study and organization of the study. Second chapter represents the literature review on national and international studies, Research papers, journal Article. The third chapter represents about Research Methodology of the study along with population size and data collection method. Fourth chapter represent introduction of study area and respondent fifth chapter Represent trends and patterns of road traffic accident in Chitwan District. Chapter sixth include factors contributing to road traffic accident chapter seventh represent summary, conclusion and theoretical reflection and last included References and Appendix.

CHAPTER II

LITERATURE REVIEW

2.1 Conceptual Review

Road traffic accidents (RTAs) represent a significant public health issue globally. Road traffic accidents (RTAs) are a major global public health and social concern, leading to significant morbidity and mortality. Understanding the trends, patterns, and contributing factors to RTAs is essential for developing effective prevention strategies. The global incidence of RTAs has been rising, particularly in low- and middle-income countries, where rapid urbanization and motorization outpace the development of road infrastructure and safety measures (Peden et al., 2004). RTAs are more common during peak traffic hours, typically in the mornings and evenings, due to increased traffic volume and congestion (Gårder, 2006). Previous study about pattern of age and gender mentioned young males are more frequently involved in RTAs. This pattern is consistent across different regions and countries (Jessor, 1987). There are some studies that mention human factors as contributing factors to Road Traffic Accidents Risk-Taking Behavior (TARTB): High levels of risk-taking behaviors, such as speeding, reckless driving, and driving under the influence of alcohol or drugs, are significant contributors to RTAs (Simons et al., 2005).

Similarly, few researches mention inexperienced drivers, particularly young ones, are at higher risk of being involved in accidents due to lack of skills and overestimation of their driving abilities (Williams, 2003). Traffic Management: Effective traffic management systems, such as traffic lights, pedestrian crossings, and roundabouts, are essential for reducing RTAs. The absence of such systems increases the likelihood of accidents (Elvik, 2000). Vehicle and Law also play an important role in RTAs. Blows et al. reported that condition and safety features of vehicles play a crucial role in preventing RTAs and reducing their severity. Older vehicles with outdated safety features are more likely to be involved in severe accidents (Ivler et al., 2003).

2.2 Theoretical Review

A theoretical review is a structured approach to analyzing and synthesizing the theoretical concepts, frameworks, and models relevant to a specific research topic. It involves examining how various theories have been used in existing studies,

evaluating their applicability, and identifying gaps or inconsistencies in theoretical understanding. The purpose of a theoretical review is to establish a strong conceptual foundation for research, clarify theoretical relationships, and guide the Research.

2.2.1 Routine Activity Theory (RAT)

Sociological theory contains a variety of frameworks and perspectives used to understand and analyze social phenomena, relationships, and structures. Issues such as crime and social deviance, including road traffic accidents (RTAs), are extensively explored in sociological literature, offering a multifaceted understanding of the various factors contributing to these incidents. These factors often intersect with broader social, cultural, and economic contexts, influencing the behaviors of drivers, pedestrians, and other road users. I have chosen the Routine Activity Theory (RAT) to understand the patterns, trends, and contributing factors of road traffic accidents. This choice is rooted in the observation that when social structures become dysfunctional, crime and deviance, such as RTAs, is likely to occur. Here, crime and deviance correspond to road traffic accidents. Applying Routine Activity Theory (RAT) provides a micro-level approach to studying the patterns, trends, and contributing factors of RTAs.

This theory, developed by Marcus Felson and Ronald Clarke in 1979 (and further refined in 1998), examines how everyday patterns of behavior and the convergence of key elements create opportunities for crimes, accidents, or other harmful events. It argues that criminal events occur when three key elements converge in space and time: While the original application of RAT focused on crime which can corresponding with RTA to explore its potential in understanding and preventing RTAs. Provides a framework to understand how everyday behaviors, circumstances, and environmental factors create opportunities for accidents. RAT was developed to explain how criminal or harmful events occur based on the convergence of three elements: a motivated offender, a suitable target, and the absence of a capable guardian. In the context of RTAs, the original elements are follows:

Likely Offenders: These are individuals who are motivated to commit a crime. According to RAT, such offenders are not special or inherently criminal; rather, they are ordinary people who may find themselves in situations where they have the

opportunity to commit a crime. Their motivation could stem from a variety of factors, including financial desperation, desire for excitement, or personal grievances. However, RAT doesn't delve deeply into what makes someone a motivated offender, instead assuming that motivated individuals will always exist in society.

Suitable Targets: For a crime to occur, there must be an attractive target. A suitable target could be a person, object, or place that is vulnerable to the offender. The attractiveness of the target depends on factors such as value (the worth of the object or person), visibility (how noticeable the target is), accessibility (how easy it is to reach), and vulnerability (how easy it is to overpower or steal). For example, an unlocked car or a solitary pedestrian in a dark alley could be considered suitable targets for offenders.

Absence of Capable Guardians: The third element of RAT is the absence of guardians who could protect the target from being victimized. A capable guardian can be anyone or anything that acts to prevent crime, such as police officers, security systems, neighborhood watch groups, or even attentive bystanders. When these guardians are present, they serve as deterrents to offenders by increasing the risk of getting caught. However, when they are absent, crimes are more likely to occur because offenders perceive the environment as safe and conducive to their actions.

Routine Activity Theory (RAT) is Applicable for the Following Reasons

Identity Formation: RAT can help study how drivers form their identities based on interactions with other road users, social expectations, and their perception of safety. Drivers may develop identities as risk-takers or cautious individuals, which influences their behavior on the road and how they interact with others in traffic.

Socialization: Through socialization, individuals learn traffic norms, values, and expectations from peers, family, and society. This process shapes driving behavior, with some individuals internalizing responsible driving habits, while others may adopt risky driving patterns, contributing to RTAs.

Everyday Life: RAT is particularly effective for analyzing how routine, everyday activities—such as commuting or walking along busy streets—create opportunities for RTAs. Understanding how individuals navigate their daily lives in traffic environments provides insights into behaviors that lead to accidents.

Micro-Level Analysis: RAT focuses on the micro-level interactions between individuals and their environment. This makes it valuable for studying the specific moments and social interactions that lead to RTAs, such as face-to-face encounters between drivers, pedestrians, and enforcement agents, or momentary lapses in attention that result in accidents.

Link to Routine Activity Theory (RAT) and Road Accident

Trend refers to the general directions in the frequency and characteristics of accidents over time. These trends can involve changes in accident rates, the types of vehicles involved, and demographic shifts among victims or offenders.

In the context of Routine Activity Theory (RAT), Likely Offenders: 'Drivers who engage in risky behaviors, which have increased with urbanization and economic growth leading to more vehicle ownership. Offenders often violate traffic rules, such as speeding due to congestion or drunk driving, exacerbated by the weak enforcement of alcohol regulations, especially at night or following social events. The Absence of Capable Guardians plays a key role, as traffic law enforcement has not kept up with rising traffic volumes. The lack of speed cameras, road patrols, and police checkpoints allows dangerous driving behaviors to persist. Suitable Targets include vulnerable road users like pedestrians and cyclists, who are at greater risk due to increasing traffic, poor road infrastructure, inadequate pedestrian crossings, and insufficient street lighting.

Patterns of RTAs refer to recurring features such as the time, location, and types of road users most affected. Time Patterns indicate that many accidents in Chitwan occur during peak traffic hours, at night, or during festive seasons when drivers are more prone to risky behaviors. During these times, Likely Offenders, particularly drivers, take advantage of the reduced law enforcement presence, leading to an increase in speeding, drunk driving, and traffic rule violations. Location Patterns show that accidents are more frequent at poorly maintained intersections, narrow roads, or highways with inadequate traffic management, making Suitable Targets like pedestrians and cyclists more vulnerable. The Absence of Capable Guardians, such as traffic police, in these high-risk areas further increases accident frequency, as drivers face no immediate consequences for violating rules. Victim Demographics often

involve younger drivers and motorbike riders, who are more likely to engage in reckless behavior, such as speeding or distracted driving, particularly in the absence of strict enforcement.

Several factors contribute to RTAs: including underlying situational and environmental causes. Likely Offenders exhibit risky behaviors, such as drunk driving, speeding, and failure to follow traffic rules, often driven by cultural attitudes, peer pressure, and traffic frustrations. Insufficient road safety education, lenient enforcement, and lack of penalties further promote these behaviors. Suitable Targets, such as pedestrians and cyclists, face heightened risks due to inadequate infrastructure like missing sidewalks, pedestrian crossings, or bike lanes. Vehicles are also at risk in poorly designed areas with unmarked intersections or dimly lit roads. The Absence of Capable Guardians, such as ineffective traffic management, inadequate policing, and poor infrastructure, is a significant contributing factor. In Chitwan, these gaps include the lack of traffic signals at key intersections, limited traffic police presence, and dangerous driving conditions due to potholes, missing road signs, and insufficient street lighting, all of which exacerbate the frequency and severity of RTAs. In the society Exiting every activities have their purpose through Accidents, stated by above elements. so that elements emphasis that Human behaviour is not just a response to internal Motivation but it shaped by the external Factors. Road traffic accidents (RTAs) are individuals who engage in risky driving behaviors such as speeding, reckless driving, or driving under the influence. Their likelihood to commit these offenses is influenced by perceived opportunities, especially in low-traffic or poorly lit areas, as well as factors like peer pressure and past leniency from law enforcement. Additionally, offenders often exist in social contexts that normalize risky behavior, particularly in communities with high rates of traffic violations. Suitable targets for RTAs include vulnerable road users like pedestrians, cyclists, and motorcyclists who are at higher risk due to a lack of physical protection, as well as poorly maintained roads and inadequate signage. The absence of capable guardians, such as weak law enforcement, limited community engagement in traffic safety initiatives, and insufficient technological measures (e.g., traffic cameras), further exacerbates the issue by allowing risky behaviors to go unchecked.

Understanding the interplay of these elements through Routine Activity Theory can help develop targeted interventions to enhance road safety and reduce the incidence of RTAs. A micro-level understanding of how specific behaviors and situations contribute to accidents and a macro-level view of how broader social systems and structures either prevent or contribute to RTAs. This integrated approach will allow you to create a more comprehensive analysis of road traffic accidents in Chitwan District and suggest effective multi-level interventions.

2.2 Empirical Review

Trends and Patterns of Road Accidents

Road traffic accidents (RTAs) have become a critical Social and public health issue worldwide, with millions of lives lost and countless others affected each year. The dynamics of these accidents are shaped by a range of factors, including technological advancements, demographic shifts, socioeconomic conditions, infrastructure quality, and law enforcement practices. This research aims to explore the evolving trends and patterns of RTAs at global, regional, and national levels, focusing on the underlying causes that contribute to the rise or fall in the incidence of such accidents. According to the WHO, over 1.2 million people die and 20-50 million are injured or disabled due to RTAs each year (Peden, 2008). Developing countries, despite having fewer vehicles, bear the brunt of fatalities and injuries, highlighting disparities in road safety measures (WHO, 2009). Sub-Saharan Africa and Southeast Asia report higher death rates, reflecting challenges in road infrastructure and safety protocols (Murray et al., 2012).

Globally, the trends in road traffic accidents have evolved significantly, driven by technological developments and increased motor vehicle use. According to the World Health Organization (WHO, 2020), there were an estimated 1.35 million fatalities resulting from RTAs worldwide in 2018. While many developed nations have seen a reduction in accident rates, attributed to advancements in road infrastructure, vehicle safety technologies, and stricter traffic laws, the rise in motor vehicle ownership in low- and middle-income countries has led to an increase in accidents, particularly in urban areas that lack sufficient infrastructure.

In South Asia, RTAs contribute substantially to the burden of injury and mortality. Factors such as rapid urbanization, inadequate road infrastructure, and varying enforcement of traffic laws exacerbate the problem (Peden, 2008). Countries like India and Bangladesh report high incidences, influenced by factors including population density, vehicle volume, and socio-economic disparities (Zhang et al., 1998). In South Asia, countries such as India, Bangladesh, and Nepal experience rapidly rising road traffic fatalities, driven by increasing motor vehicle use, urbanization, and inadequate infrastructure. South Asia is home to some of the highest rates of RTAs, with human error, particularly reckless driving, being a dominant factor (Sultana & Chowdhury, 2018).

As urban populations in South Asia continue to grow, the number of vehicles on the road has surged, overwhelming existing road networks and leading to congestion, accidents, and fatalities (Chatterjee & Banerjee, 2020). Road traffic accidents disproportionately affect low-income individuals who are more likely to engage in risky driving behaviors due to limited access to education, healthcare, and road safety initiatives (Chatterjee & Banerjee, 2020).

In Nepal, road traffic accidents have become an increasingly serious concern, exacerbated by rapid urbanization and rising vehicular traffic. According to Rai and Bhatta (2020), RTAs have risen significantly in Nepal over the past decade, with motor vehicle accidents now being a leading cause of death.

Nepal's mountainous terrain and poorly maintained road networks substantially increase the risk of accidents. Roads in rural and semi-urban areas are often inadequate, which contributes to unsafe driving conditions and accidents (Rai & Bhatta, 2020).

Although traffic laws exist in Nepal, their enforcement is weak. The combination of insufficient law enforcement and cultural attitudes toward traffic violations perpetuates risky driving behavior, such as speeding, driving without helmets, and ignoring pedestrian rights (Bhandari & Upreti, 2019).

Public awareness campaigns in Nepal are limited, and the general population's understanding of road safety practices is inadequate. Education initiatives focused on

the dangers of driving under the influence, wearing helmets, and adhering to speed limits could play a vital role in reducing the frequency of accidents (Bhandari & Upreti, 2019).

Nepal faces significant challenges in road safety, with increasing accidents attributed to factors like poor infrastructure, non-compliance with traffic rules, and inadequate safety measures (Thapa, 2013; Pandey, 2013). Motorcycles and pedestrians are particularly vulnerable, with accidents often occurring due to reckless driving and lack of driver training (Huang et al., 2016; Thapa, 2014).

Factors Contributing to Road Accidents

In global terms, factors contributing to RTAs include human behavior (e.g., speeding, alcohol consumption), vehicle conditions, road conditions, and enforcement of traffic laws (Joshi & Shrestha, 2009; Majumder et al., 1996). Economic and social impacts are substantial, with road crashes affecting productivity and socio-economic development (Ericson & Kim, 2014).

In South Asia, similar factors contribute, with rapid motorization and inadequate infrastructure compounding risks (Majumder et al., 1996). Cultural factors and seasonal variations (e.g., festivals increasing alcohol-related accidents) also play roles in exacerbating the problem (Joshi & Shrestha, 2009).

Nepal's specific challenges include the dominance of motorcycles in accidents, driver negligence (particularly speeding and reckless driving), and limited emergency response capacities (Subedi, 2016; Thapa, 2014). The impact on vulnerable groups like pedestrians and young adults underscores the need for targeted interventions (Huang et al., 2016).

Despite efforts to alleviate RTAs, the literature highlights persistent challenges and evolving dynamics in global, regional (South Asia), and Nepali contexts. Future research should focus on comprehensive interventions addressing infrastructure improvements, behavioral interventions, and policy enforcement to effectively reduce the incidence and impact of RTAs in these contexts.

2.3 Research Gap

A comprehensive examination of existing research on road traffic accidents (RTAs) highlights several key areas where understanding is still lacking, particularly in the context of Nepal. Although RTAs are widely studied, with significant consequences for individuals and society, there is limited research that integrates the complex factors influencing RTAs in Nepal, particularly when considering technological advancements, human behavior, and cultural influences within a unified framework. While international and regional studies offer useful insights, few specifically address the intricate factors contributing to RTAs in Nepal, especially in the Chitwan District.

The literature indicates that RTAs in Nepal result from the interaction of human, vehicular, environmental, and systemic elements. However, existing studies primarily focus on broad trends and fail to offer a nuanced view of how these factors vary between different regions, such as urban and rural areas. Additionally, while sociological factors like driver behavior, attitudes toward traffic laws, and law enforcement practices have been explored in general terms, the specific patterns of RTAs in Chitwan remain under-researched. This creates a substantial gap in knowledge concerning the contributing factors, social dynamics, and trends of RTAs in this part of Nepal.

Moreover, there is a noticeable absence of long-term studies that assess the impact of policy changes, technological innovations, and public education campaigns on accident rates over time. Comparative studies, both within Nepal and internationally, could provide valuable lessons on effective strategies for reducing RTAs and improving road safety. To address this gap, more detailed research is needed on the role of technology adoption, driver education, infrastructure improvements, and law enforcement in reducing accidents. To fill these gaps, future studies should focus on::

- Investigating the sustained effects of policy changes, technological advancements, and public safety initiatives on RTA frequency and severity.
- Focusing on the distinct factors that contribute to RTAs in various districts, with particular emphasis on Chitwan, which has been relatively unexplored in current literature.

- Combining human, vehicular, environmental, and systemic factors to offer a comprehensive understanding of RTA causes in Nepal.
- Analyzing RTA patterns and trends across different regions within Nepal and internationally to identify effective interventions.

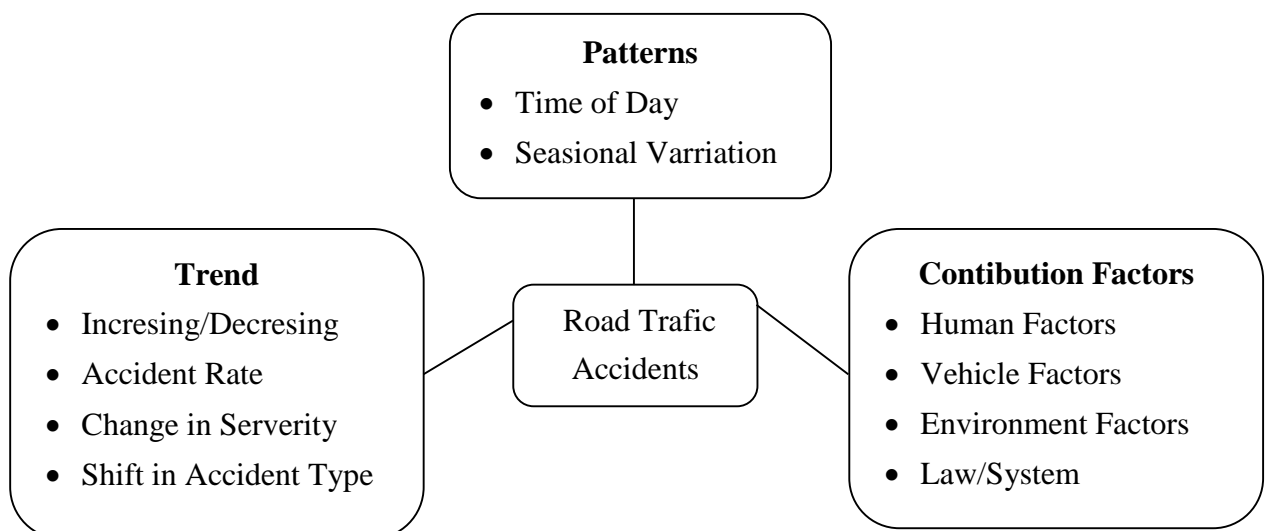
By addressing these research gaps, future studies will be better positioned to propose targeted, evidence-based solutions for reducing RTAs in Nepal, particularly in Chitwan, while contributing to the global effort to mitigate road traffic accidents and their societal impacts.

2.4 Conceptual Framework

A conceptual framework provides a structured way to study the complex interplay of factors contributing to road traffic accidents (RTAs) through the lens of structural functionalism. This framework will help in understanding how various social structures, norms, and functions influence road users' behaviors and opinions, ultimately affecting road safety. This conceptual framework focuses on behavioral factors, environmental factors, vehicle factors, and laws/systems. Each component is analyzed from the perspective of routing activity theory, which considers how these factors interact to maintain stability and order on the roads. in Chitwan District, Nepal. The Trends, Patterns and contributing factors of The Road traffic accident corresponding to the routing activity Theory (Fig. 2.1)

Figure 2.1

Conceptual Framework of Contributing Factors to Road Traffic Accident



- a. Motivational Offender: Driver Behavior, Pedestrian Behavior, Attitudes towards Safety
- b. Suitable Target: old Vehicle, delay to repair, dangerous Road condition, poorly designed intersection.
- c. Absence of Capable: guardianship: Legal and Regulatory Frameworks: Traffic Laws, Driver Licensing Systems

This conceptual framework illustrates how the routing activity theory can be applied to understand the complex interactions between societal elements influencing trends, patterns, and contributing factors of RTAs. By analyzing the interplay of infrastructure, legal frameworks, effective strategies can be developed to mitigate the impact of RTAs and enhance road safety.

CHAPTER III

RESEARCH METHODOLOGY

3.1 The Research Design

Research on the trends, patterns, and contributing factors of road traffic accidents (RTAs) encompasses a variety of methodologies and approaches. This study employed a descriptive-explanatory mixed-methods research design, selected for its ability to provide equal value to both quantitative and qualitative data in understanding the research problem.

Philosophical Worldview: This research was guided by a pragmatic worldview, which emphasizes practical solutions, real-world applications, and the usefulness of ideas rather than strict adherence to a single methodology or theoretical framework. It adopts a pluralistic approach, integrating qualitative, quantitative, or mixed methods based on the nature of the research question. practical problem-solving by integrating multiple methods to provide a complete and actionable understanding of the issue.

Methodology Integration: The mixed-methods approach integrates findings from both data types, which are merged after analyzing and interpreting the two datasets. The research design adhered to evidence-based procedures, protocols, and guidelines, establishing the tools and framework necessary for conducting a comprehensive study. Specifically, a convergent parallel mixed-method design was utilized to gain a holistic understanding of the research problem.

Purpose: The study aimed to identify trends, patterns, and contributing factors of road traffic accidents while also exploring the experiences and perceptions of those affected. This dual focus ensured a comprehensive perspective that combined statistical rigor with contextual depth.

Data Collection Methods: The study comprised two primary methods First was Quantitative Method. This involved a review of secondary data, including RTA records from the District Traffic Police Office spanning fiscal years 2075/2076 to 2079/2080. The analysis focused on identifying patterns and trends in RTAs. Quantitative methods enabled statistical comparisons and the aggregation of data to uncover significant trends.

Second was Qualitative Method, it involved conducting in-depth interviews with various road users, including drivers, pedestrians, eyewitnesses, passengers, victims, traffic police, representatives of local authorities, and road division officers. These interviews aimed to explore their perceptions of the factors contributing to RTAs. The qualitative approach facilitated an understanding of life experiences, shared meanings, and social realities, providing rich contextual insights (Limb, 2001). By integrating these methods, the study successfully combined statistical rigor with a deeper exploration of human experiences, ensuring a comprehensive analysis of the factors influencing RTAs. Use purposive sampling to select participants based on their relevance to the study's objectives and their experience with RTAs. Purposive Sampling was used, targeting specific roles to capture diverse perspectives on road traffic accidents. This method ensures that participants with relevant experiences and expertise are included, providing a comprehensive and nuanced view of the issue. A total of 34 participants were selected for interviews, consisting of 8 drivers, 4 pedestrians, 4 passengers, 8 traffic police officers, 1 road division officer, and 1 local authority representative. These participants were deliberately chosen to ensure a diverse and holistic understanding of the factors contributing to road traffic accidents and the experiences of those directly impacted.

Timing: The study employed a convergent parallel design, wherein quantitative and qualitative data were collected simultaneously and subsequently integrated during the interpretation phase to ensure a comprehensive analysis.

Weighting: The study gave equal weight to both quantitative (statistical analysis of secondary data) and qualitative (in-depth interviews) methods to ensure balanced insights into road traffic accidents.

Integration Point: The integration occurred during the interpretation phase, where findings from quantitative trend analysis were combined with qualitative insights from interviews. This triangulation strengthened the study's conclusions by validating statistical patterns with real-world experiences.

This approach combines quantitative scope with qualitative complexity, aiming to comprehensively address both statistical trends and personal experiences related to road traffic accidents in Chitwan District.

3.2 Site selection Justification

This section aims to provide a rationale for selecting the Chitwan District as the study site for examining the trends, patterns, and contributing factors associated with road traffic accidents (RTAs). The primary objective is to analyze various elements that lead to RTAs, including driver behavior, pedestrian activity, and road conditions.

Chitwan District, situated in the central region of Nepal, features diverse geographical characteristics. A key roadway, the East-West Highway (Mahendra Highway), traverses this district, accommodating significant traffic volumes traveling at high speeds. The combination of different vehicle types, pedestrians, and livestock, alongside prevalent speeding and overtaking behaviors, increases the likelihood of accidents.

In urban areas like Bharatpur, roads are often congested, characterized by numerous intersections and pedestrian crossings. Accidents in these urban settings frequently occur due to traffic congestion, inadequate road maintenance, and poor signage. Conversely, rural roads in Chitwan are typically narrow and not well maintained, often featuring sharp curves and limited visibility. These conditions become especially hazardous during the rainy season, as wet surfaces can lead to skidding and loss of vehicle control.

Statistical data reveal that between 250 and 400 fatalities occur annually due to road accidents across the ten districts of Bagmati Province. Within this province, Chitwan has been reported to have the highest incidence of road accidents and related deaths, attributed to the growing population and increasing number of vehicles. The annual rise in RTAs underscores the urgency of addressing this issue.

3.3 Tools and Technique of Data Collection

Interview and Record Review technique was used .the tools were structured interview schedule and Record Review Format were Tools of This Study.

3.3.1 Structured Interview Schedule

While in-depth interviews are often conducted in an unstructured or semi-structured format to allow for open-ended responses, this study specifically employed a

structured interview schedule. This approach was chosen to ensure consistency in the data collection process, facilitating the comparison of responses across participants while still capturing qualitative insights.

A structured interview schedule consists of a pre-determined list of questions designed to guide the interview process. This format ensures that all participants are asked the same questions in the same order, promoting uniformity and reliability in the data collected. It is especially beneficial when the research requires both focused qualitative insights and the ability to analyze data systematically.

3.3.1.1 Interview Process

Developing the Interview Guide:

A semi-structured interview guide was developed to allow flexibility while ensuring all key themes were covered.

This guide was tailored to each group of participants, focusing on their specific roles and experiences related to road safety."

Selection of Participant:

A purposive sampling method was used to select participants from different backgrounds, ensuring that a wide range of experiences was captured.

Participants were selected from a diverse group of interviewees, including Driver, Pedestrian -Passenger-, traffic Police, Road Division Officer-and Local Authority as this would allow the research to compare safety conditions across different localities.

Informed Consent:

Prior to each interview, I obtained informed consent from participants. This involved explaining the study's purpose, potential benefits and risks, and their right to withdraw at any time

Participants were assured that their identities would remain confidential and that the data collected would be used solely for research purposes

Interview Setting:

Face-to-face interviews were conducted in locations familiar to participants, such as their homes, workplaces, bus stops, or public spaces.

This approach was adopted to ensure participants felt comfortable and free to express their views. For local authorities, interviews were conducted in their offices.

Interview Technique:

I employed active listening techniques (e.g., eye contact, verbal confirmations) to encourage open communication. Where applicable, interviews were audio-recorded with participant consent for accurate transcription and analysis.

Data Analysis: Recorded interviews were transcribed precisely. This involved coding the transcripts, identifying key themes, and drawing conclusions.

3.3.1.2 Interview Strategies

Several strategies were employed to ensure the effectiveness of the interview process and the reliability of the data collected:

- **Building Rapport:** I prioritized establishing a positive and trusting relationship with each participant.
- **Active Listening:** I paid close attention to participant responses, utilizing clarifying questions to explore their perspectives further.
- **Open-Ended Questions:** I utilized open-ended questions to encourage detailed and insightful responses.
- **Maintaining Neutrality:** I maintained a non-judgmental and objective posture throughout the interview process.
- **Ensuring Confidentiality:** I assured participants that their responses would be treated with the utmost confidentiality.
- **Flexibility:** I adapted the interview process to the individual needs and preferences of each participant.

3.3.2 Secondary Data Review

Secondary data, previously collected by relevant entities, was utilized in this study. Quantitative data was obtained from the Chitwan Traffic Office through a record review technique and a structured Secondary Data Review Format, ensuring alignment with the study objectives. The data collection process involved an official visit to the Chitwan Traffic Office, where a formal request was submitted to the Chief of the Traffic Office for access to digital records and printed accident logs including information such as the date, time, location, cause, parties involved, injuries, and damages,

3.4 Universe, Sampling size, and Sampling Method

The study's universe, sample size, and sampling methods can be defined for both the quantitative and qualitative components as follow.

Quantitative Study

Universe: All recorded road traffic accident cases in Chitwan District, totaling 3,898 incidents (3,299 injuries and 599 fatalities) from 2075/76 to 2079/80.

Sample Size: The quantitative analysis included 1,824 cases of recorded accidents documented at the District Traffic Police Office in Chitwan District.

Sampling Method: Census was likely applied here, as all recorded cases in the specified period (2075/76 to 2079/80) were included in the analysis, ensuring comprehensive coverage of available accident records.

Qualitative Study

Universe: All individuals with direct involvement or experience in road traffic accidents in Chitwan District, including drivers, pedestrians, passengers, traffic police, road division officers, and local authorities. A total of 34 participants were selected to interview where Driver 8, Pedestrian -4, Passenger-4, traffic Police 8, Road Division Officer-1 and Local Authority-1 participants were selected.

3.5 The Justification for Selection to Participants

- Drivers (8 participants): Drivers were selected because they are often at the center of road traffic accidents, either as the cause or as a party involved. Their insights into driving behaviors, road conditions, and their experiences during accidents are crucial for understanding the primary factors leading to such incidents.
- Pedestrians (4 participants): Pedestrians are one of the most vulnerable groups in road traffic accidents. Their inclusion helps to understand the challenges they face, such as road safety concerns, visibility issues, and the impact of road infrastructure on their safety.
- Passengers (4 participants): Passengers provide a unique perspective as they are directly affected by the behavior of drivers, road conditions, and overall traffic management. Their experiences and perceptions are valuable for understanding the impact of road accidents on non-driving road users.
- Traffic Police Officers (8 participants): Traffic police officers were selected for their expertise in managing road traffic, enforcing laws, and responding to accidents. Their professional insights are essential for understanding the causes and patterns of accidents, as well as the challenges in enforcement and accident prevention.
- Road Division Officer (1 participant): The road division officer was included to provide an understanding of how road design, maintenance, and infrastructure contribute to road safety. This perspective is critical for identifying potential areas of improvement in road management and accident prevention.
- Local Authority Representative (1 participant): The local authority representative was chosen to offer insights into policy-making, regulation, and community-level interventions related to road safety. This participant's perspective helps to contextualize road traffic accidents within broader governance and public safety frameworks.

3.6 Sources of Data

Primary data was used for qualitative analysis, collected through interviews, while secondary data was used for quantitative analysis, obtained from the District Traffic Police Office in Chitwan District

3.7 Justification of the Selection of Chitwan as Study Area

The selection of Chitwan as a study area to investigate patterns, trends, and contributing factors of road traffic accidents (RTAs) can be justified based on several key factors:

Chitwan district, located in the central region of Nepal, has been noted for a significant incidence of RTAs. This provides a fertile ground for studying the patterns and trends of accidents in both urban and rural settings. Chitwan encompasses a mix of road types ranging from national highways to local roads, each presenting unique challenges and contributing factors to RTAs. High prevalence of road traffic accidents in Chitwan and a transport hub or urban center Availability of secondary data and research feasibility. This diversity allows for a comprehensive analysis of accidents across different road infrastructures. The district hosts a diverse population, including various age groups, socioeconomic backgrounds, and occupations. Studying RTAs here can provide insights into how demographic factors influence accident patterns and severity. Chitwan is a region experiencing rapid economic growth and urbanization, influencing traffic volumes and patterns. Understanding the relationship between development factors and RTAs can inform policy and infrastructure planning. Chitwan benefits from relatively accessible data through local hospitals, police records, and community reports, facilitating robust quantitative and qualitative analyses of accident trends and contributing factors.

3.8 Methodological Reflection

In this research on the trends, patterns, and contributing factors to road traffic accidents, I aimed to analyze the trends and patterns and explore the experiences of road users, including drivers, pedestrians, and passengers. I employed a mixed-methods approach, combining quantitative surveys with qualitative interviews. This design allowed for a comprehensive understanding of both statistical trends and personal experiences. For data collection, I conducted in-depth interviews with 34 individuals who had experienced or witnessed road traffic accidents. The survey data were analyzed using statistical software, while interview transcripts were thematically analyzed. Recorded data were also reviewed to analyze trends and patterns.

Justification of Methods: The mixed-methods approach was chosen to balance the breadth of quantitative data with the depth of qualitative insights. Surveys provided a broad overview of common experiences and attitudes.

Evaluation of Methods: The primary strength of this approach was its ability to capture a wide range of data. However, the small interview sample may not fully represent the diversity of experiences.

Ethical Considerations: Ethical approval was obtained, and participants gave informed consent. Privacy was maintained, and sensitive topics were approached with care to minimize distress.

Reflexivity: As a researcher with a background in sociology, I was aware of my potential biases in interpreting the data. I made efforts to remain objective and sought feedback from peers to enhance the credibility of my findings.

Lessons Learned and Future Directions: This study highlighted the importance of methodological consistency and reflexivity. Future research could benefit from a larger and more diverse sample, as well as the inclusion of observational methods to complement self-reported data.

3.9 Limitations of the Study

Every research study has its limitations. This study's generalizability is restricted as it is based on primary data collected from interviews with 34 respondents. The use of purposive sampling for qualitative data collection may have caused delays in obtaining research findings. The study primarily relied on interview techniques and open-ended questionnaires for qualitative data, while quantitative data was collected using record review techniques and standardized formats. Additionally, the study was limited to analyzing recorded road traffic accident cases from fiscal years 2075/2076 to 2079/2080 at the Traffic Police Office in Chitwan District. This geographical and temporal focus further limits the applicability of the findings to the broader population.

CHAPTER IV

INTRODUCTION OF STUDY AREA AND RESPONDENT

4.1 Introduction of Study Area

The study area was Chitwan District, one of the 77 districts in Nepal, located in the southwestern part of Bagmati Province. Chitwan District, situated in central Nepal, is characterized by its diverse geography and strategic road network. Geographically, the district spans lush plains and subtropical forests, intersected by the Narayani and Rapti rivers. Chitwan is well-connected by a network of roads linking its urban centers, including Bharatpur, the district headquarters, with neighboring districts and major cities like Kathmandu and Pokhara. However, road conditions vary, with some areas experiencing challenges due to seasonal weather and terrain. Chitwan faces development challenges such as environmental conservation amidst urbanization pressures and infrastructure improvements. Efforts are ongoing to balance economic growth with sustainable practices, including road safety initiatives and environmental conservation efforts.

According to the 2021 census, the population of Chitwan District is approximately 719,859. It comprises one metropolitan city, six municipalities, and 99 wards

4.2 Introduction of Respondents

The respondents were of diverse nature and those who experience road traffic accidents. The participants were selected local people such as victims, traffic police, passengers, drivers, pedestrians, eyewitnesses, road division officers, and local authorities with road accident experience. A total of 34 participants were selected for interview where Driver 8, Pedestrian 4, Passenger 4, traffic Police 8, Road Division Officer 1 and Local Authority 1 participants

Table 4.1*Socio-Demographic Details of Participant*

Participant Years	Age	Gender	Profession	Ethnicity	Years of work experience
P1	27	Male	Traffic	Tharu	10
P2	35	Male	Traffic	Gurung	15
P3	30	Male	Traffic	Magar	12
P4	25	Male	Traffic	Kumal	5
P5	30	Male	Traffic	Magar	8
P6	30	Male	Traffic	Chhetri	10
P7	27	Female	Traffic	Brahamin	6
P8	26	Female	Traffic	Brahamin	7
P9	45	Male	Pedestrian	Newar	5
P10	38	Female	Pedestrian	Newar	3
P11	36	Female	Pedestrian	Chhetri	4
P12	53	Female	Pedestrian	Brahamin	6
P13	29	Female	Passenger	Brahamin	
P14	35	Male	Passenger	Magar	
P15	37	Male	Passenger	Chhetri	
P16	42	Male	Passenger	Tharu	
P17	35	Male	Driver	Brahamin	9
P18	42	Male	Driver	Pariyar	17
P19	29	Female	Driver	Gurung	4
P20	32	Male	Driver	Newar	7
P21	40	Male	Driver	Newar	17
P22	25	Male	Driver	Gurung	5
P23	23	Male	Driver	Brahamin	4
P24	32	Male	Driver	Newar	7
P25	35	Male	Victim	Magar	
P26	27	Male	Victim	Chhetri	
P27	42	Female	Victim	Newar	
P28	29	Male	Victim	Chhetri	
P29	30	Male	Eyewitness	Chhetri	
P30	37	Female	Eyewitness	kumal	
P31	45	Female	Eyewitness	Chhetri	
P32	42	Male	Eyewitness	Sunar	
P33	33	Male	Road Division Officer	Yadav	5
P34	43		Local authority	Newar	2

Source: Survey, 2080

4.3 The Socio-Demographical Details

The study includes a diverse group of participants in terms of age, gender, profession, and ethnicity. The majority are young to middle-aged males, with Brahmin, Chhetri, and Newar ethnicities being the most common. The participants hold various roles related to traffic, and most have between 0 to 10 years of work experience. This diversity provides a comprehensive overview of different perspectives on road traffic issues in the Chitwan district.

Table 4.2

Distribution of Socio-Demography Variable

Category	Sub-category	Number of Participants
Age Distribution	Young Adults (20-30 years)	16
	Middle-aged Adults (31-45 years)	15
	Older Adults (46+ years)	3
Gender Distribution	Male	23
	Female	11
Professional Roles	Traffic Personnel	8
	Pedestrians	4
	Passengers	4
	Drivers	8
	Victims	5
	Eyewitnesses	4
	Road Division Officer	1
	Local Authority	1
Ethnicity Distribution	Brahmin	8
	Chhetri	7
	Newar	7
	Magar	4
	Gurung	3
	Tharu	2
	Kumal	2
	Pariyar	1
	Sunar	1
	Yadav	1
Years of Work Experience	0-5 years	12
	6-10 years	11
	11-15 years	5
	16+ years	3
	Not Specified	3

Source: Survey, 2080

The socio-demographic analysis of the participants reveals several key insights. Age distribution indicates that the majority are young to middle-aged adults, with 16 out of 34 participants being young adults (20-30 years) and 15 being middle-aged adults (31-45 years). This suggests a significant portion of the study population falls within the early to mid-adult age range. Gender distribution shows a higher representation of males, with 23 male participants compared to 11 females. This disparity highlights a potential gender imbalance in the sample. In terms of professional roles, traffic personnel and drivers are the most represented groups, with 8 participants each, followed by victims (5), pedestrians (4), passengers (4), and eyewitnesses (4).

Additionally, there is one road division officer and one local authority, indicating a diverse range of professional roles among the participants. Ethnicity distribution is varied, with Brahmin (8), Chhetri (7), and Newar (7) being the most common ethnic groups. Other ethnicities represented include Magar (4), Gurung (3), Tharu (2), Kumal (2), Pariyar (1), Sunar (1), and Yadav (1), showcasing the ethnic diversity of the participants. Regarding years of work experience, most participants have between 0 to 10 years of experience, with 12 having 0-5 years and 11 having 6-10 years. There are fewer participants with 11-15 years (5) and 16+ years (3) of experience, while 3 participants did not specify their work experience. This distribution indicates a mix of relatively new and moderately experienced individuals in the study.

CHAPTER V

TRENDS AND PATTERNS OF ROAD TRAFFIC ACCIDENT IN CHITWAN DISTRICT

5.1 Trends of Road Traffic Accident in Chitwan District

5.1.1 Trends of Road Traffic Accident in Chitwan District

This chapter examines the findings of a study analyzing road traffic accidents based on data from the Chitwan Traffic Office over the past five years. The detailed investigation identifies the causes of accidents and assesses the severity ranking of these accidents within Chitwan district. This evaluation aims to provide recommendations for minimizing road traffic accidents.

The review focuses on accident victims documented at the Chitwan Traffic Office between the fiscal years 2075/76 and 2079/80. Information was systematically collected and manually organized from records maintained by the Chitwan Traffic Police. A structured questionnaire served as a guide to extract individual details of these accident victims. It is important to note that the findings exclusively pertain to accident victims within Chitwan District recorded at the Traffic Police Office.

A comprehensive overview of the trends in road traffic accidents across Chitwan district, and the entirety of Nepal from fiscal year 2075/76 to 2079/80.

Table 5.1

Trends of Road Traffic Accidents in Chitwan Districts

Chitwan			National	
Year	No. of Accident Cases	Percentage	No. of Accident Cases	Percentage
2075/76	295	16.1	8511	4.8
2076/77	261	14.3	10038	5.6
2077/78	435	23.8	95545	53.9
2078/79	530	29.0	39379	22.2
2079/80	303	16.6	23597	13.3
Total	1824	100	1,77,070	100

Source: Traffic Police office Chitwan, 2080

Table 5.1 presents a comprehensive overview of the trends in road traffic accidents across Chitwan district, and the entirety of Nepal from fiscal year 2075/76 to 2079/80. The analysis of Table 2 reveals that both Chitwan and national data experienced a significant peak in accident cases in 2077/78. Following this peak, Chitwan district saw a continued rise in 2078/79, followed by a decrease in 2079/80. In contrast, the national trend exhibited a sharp increase in 2077/78, followed by a steady decline in subsequent years. Although Chitwan district proportion of national accidents is relatively small, it demonstrates notable year-to-year fluctuations. The year 2077/78 stands out for both regions, indicating shared factors contributing to the surge.

This sudden rise in 2077/78 may be attributed to various factors such as increased traffic volume, significant alterations in road infrastructure, or socio-economic changes prompting greater mobility. Possible deficiencies in enforcement or abrupt changes in traffic regulations might also have played a role in the rise of accidents.

5.1.2 Trends of Casualties of road Traffic Accidents in Chitwan District

Data on casualties resulting from road traffic accidents in Chitwan over a five-year period spanning Nepali calendar years 2075/76 to 2079/80 BS.

Table 5 2

Trend of Casualties of Road Traffic Accidents in Chitwan District

Year	Injured		Mortality	
	Chitwan No.	National No.	Chitwan No .	National No.
2075/76	558	4276	146	2789
2076/77	486	4615	107	2251
2077/78	703	6448	128	2500
2078/79	971	7282	140	2882
2079/80	581	5728	78	2378
Total	3299	24191	599	12800

Source: Record of Chitwan Traffic Police Office, 2080

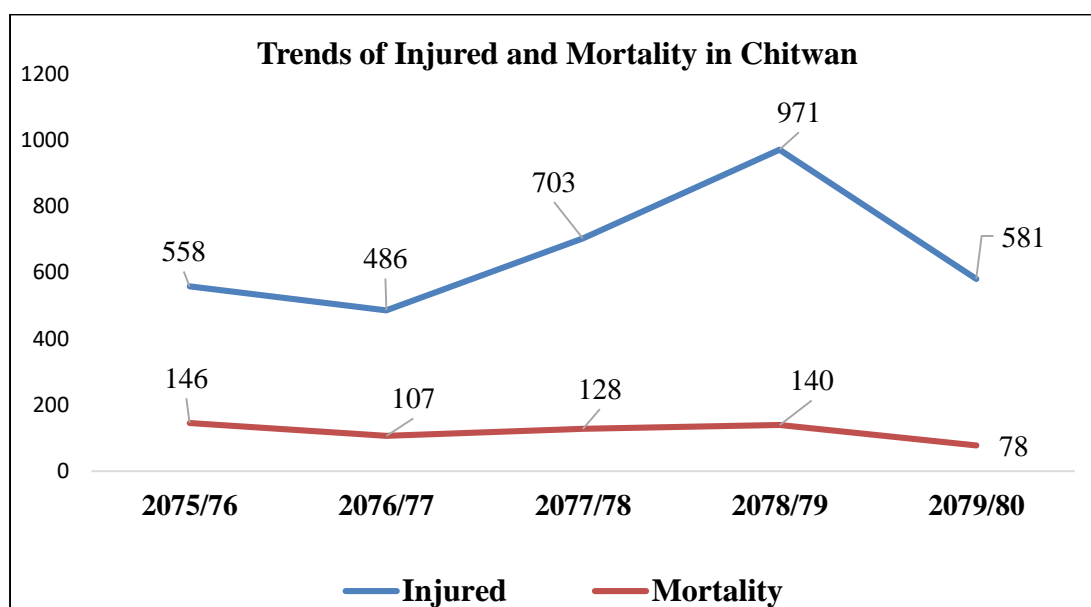
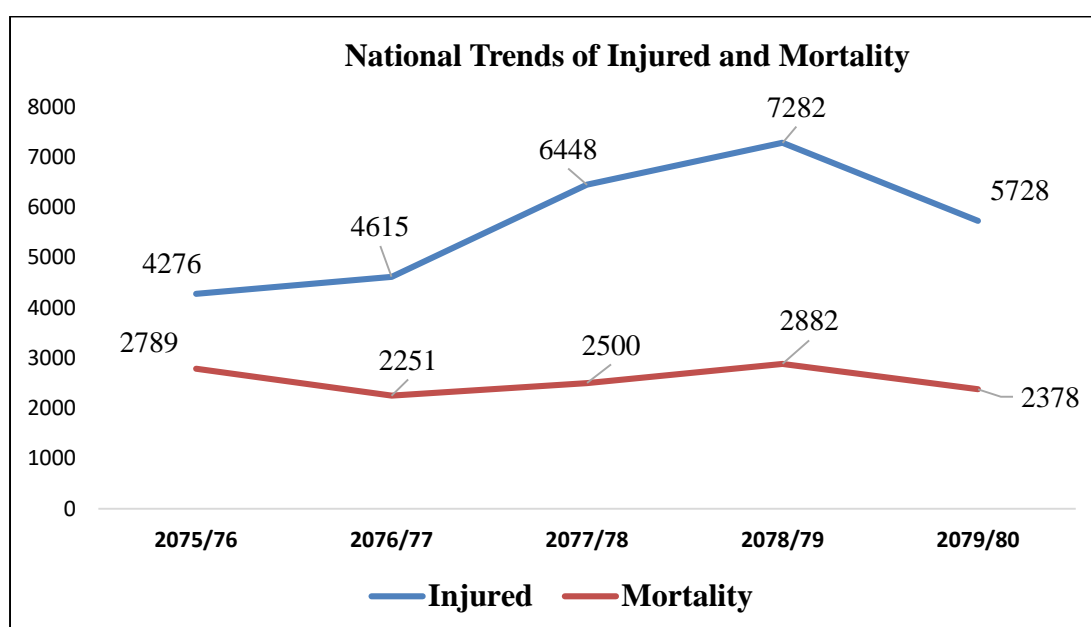
Figure 5.1*Trend of Injured and Mortality in RTA in Chitwan***Figure 5.2***National Trend of Injured and Mortality in Nepal*

Table 5.2 presents data on casualties resulting from road traffic accidents in Chitwan over a five-year period spanning Nepali calendar years 2075/76 to 2079/80. The data includes figures for accident cases, injuries, deaths, and total casualties each year, along with their respective percentages over the five-year period. Below is an analysis of this data:

According to Table 2, the total reported road traffic accident cases in Chitwan district from fiscal year 2075/76 to 2079/80 amounted to 2485.

In Chitwan, injuries initially declined but then sharply increased, peaking in 2078/79 before declining again in 2079/80. This pattern is mirrored nationally, suggesting similar trends in accident-related injuries. The surge in injuries could be attributed to factors like increased traffic volume, inadequate road conditions, or insufficient safety measures. The subsequent decline in 2079/80 may indicate improvements in road safety practices, enhanced traffic management, or more effective emergency response systems.

Fatalities in Chitwan fluctuated, with an initial decrease, followed by an increase, and a significant drop in 2079/80. The national data also shows a decrease in fatalities by the final year. These fluctuations in fatalities may be influenced by factors such as changes in traffic patterns, enforcement of road safety regulations, and advancements in medical emergency responses to accidents.

The analysis of casualty trends in road traffic accidents in Chitwan district compared to national figures from 2075/76 to 2079/80 provides valuable insights. Both injuries and fatalities initially increased but showed declines in the final year, indicating potentially effective interventions in road safety measures.

5.1.3 Trend of Sex wise Distribution of Morality

Data on the distribution of fatalities by gender in road traffic accidents within Chitwan district, Nepal, spanning the years 2075/76 to 2079/80.

Table 5.3

Trend of Morality in Road Traffic Accident in Chitwan District

Fiscal Year	Accident Cases	Mortality		
		Male	Female	Total
2075/76	295	118	17	135
2076/77	261	88	14	102
2077/78	435	101	22	123
2078/79	530	106	22	128
2079/80	303	66	7	73
Total	1824	479	82	561

Source: Record of Chitwan Traffic Police Office, 2080

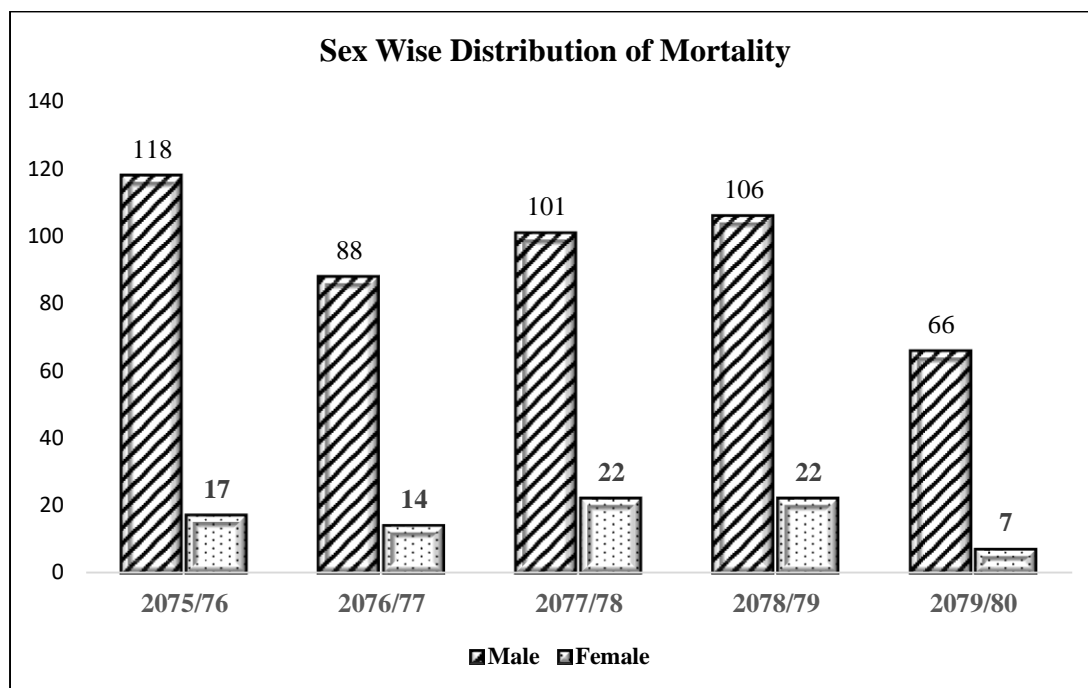
Figure 5.3*Sex wise Trend of Morality in Chitwan District*

Table 5.3 presents data on the distribution of fatalities by gender in road traffic accidents within Chitwan district, Nepal, spanning the years 2075/76 to 2079/80. The table details the number of accident cases and mortality rates categorized by sex during this period.

Over the five-year span, there were a total of 2485 reported accident cases in Chitwan district. Out of these, 479 involved males and 82 involved females. The total number of fatalities was 561, with males accounting for 85.3% of the deaths and females for 14.7%.

Male mortality consistently exceeds female mortality across all years analyzed. The number of male deaths fluctuates similarly to the overall mortality trend, peaking at 118 deaths in 2075/76 and reaching a low of 66 deaths in 2079/80. Female mortality, significantly lower than male mortality, peaks in 2077/78 and 2078/79 with 22 deaths each, and drops to 7 deaths in 2079/80.

The data highlights a higher susceptibility of males to road traffic accidents, with peaks in both accident cases and deaths around 2078/79, followed by a decline in 2079/80. This decline suggests potential effectiveness of interventions or changes in traffic conditions during that period.

The notable reduction in both accident cases and fatalities in 2079/80 indicates possible successful implementation of road safety measures or policy adjustments.

The trend analysis of road traffic accident mortality in Chitwan district reveals critical patterns, particularly the heightened risk faced by males and the significant decrease in accidents and deaths in the final year.

Continuous monitoring and targeted interventions are essential to sustain and enhance road safety efforts, particularly focusing on reduce risks for males. Understanding these trends can inform the development of effective strategies aimed at further reducing road traffic accidents and fatalities in Chitwan district.

5.2 Patterns of Road Traffic Accident in Chitwan District

5.2.1 Patterns of Injured Types of on Road Traffic Accident

The analysis of injury patterns resulting from traffic accidents in Chitwan district underscores the urgent need for targeted interventions aimed at improving road safety and mitigating the incidence of severe injuries. (Table .5)

Table 5.4

Patterns of Injured Types on Traffic Accident in Chitwan District

Year	Head Injury	Pelvis	Spinal Injury	Face	Chest Injury	Upper extremity	Lower extremity	Total
2075/76	26	5	8	19	10	21	32	121
2076/77	55	19	29	40	25	78	87	334
2077/78	36	14	23	34	28	60	114	309
2078/79	174	73	182	167	147	105	123	971
2079/80	80	32	67	76	85	76	142	581
Total								3299

Source: Record of Chitwan Traffic Police Office, 2080

Figure 5.4

Patterns of Injured Types on Traffic Accident in Chitwan District

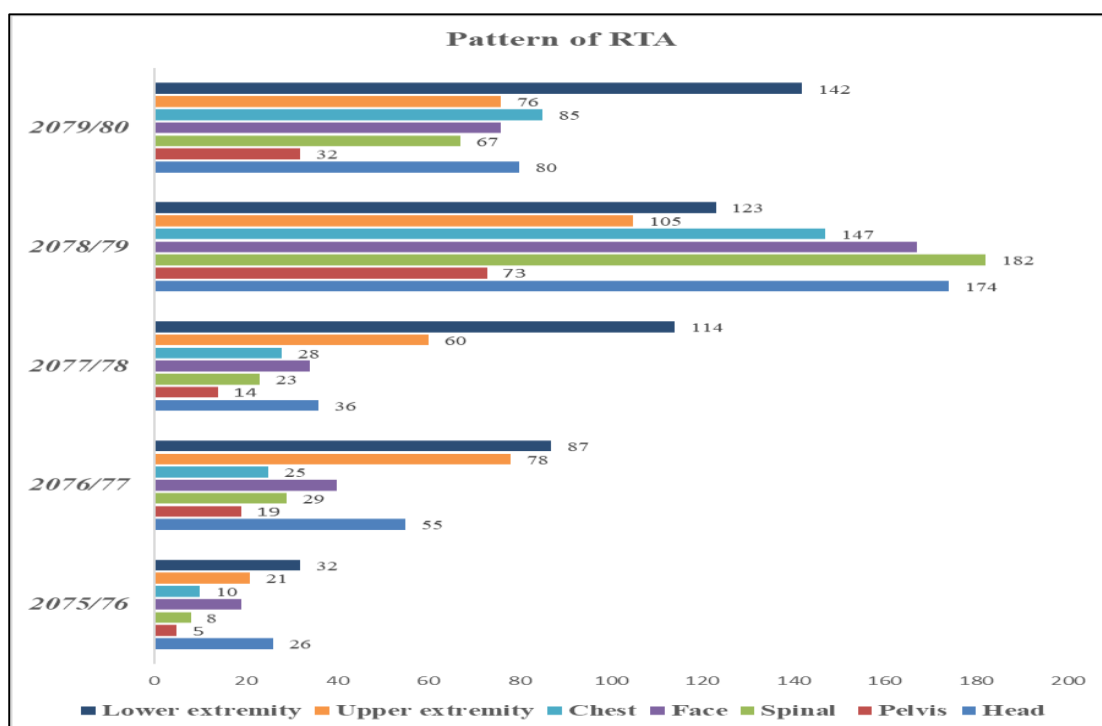


Table 5.4 outlines the distribution of Patterns injury resulting from traffic accidents in Chitwan district, Nepal, spanning five fiscal years from 2075/76 to 2079/80. The injuries are categorized into types such as head injury, pelvis injury, spinal injury, facial injury, chest injury, upper extremity injury, and lower extremity injury.

There was a significant rise in total injuries in 2078/79, reaching 971 cases. Subsequently, in 2079/80, although lower than the peak year, injuries still totaled 581, marking a notable decrease compared to the previous year but higher than earlier years.

Over the five-year period, there is a general upward trend in the number of injuries, particularly highlighted by the peak observed in 2078/79 followed by a decline in 2079/80.

The analysis of injury patterns resulting from traffic accidents in Chitwan district underscores the urgent need for targeted interventions aimed at improving road safety and mitigating the incidence of severe injuries. The substantial increase in injuries in 2078/79 emphasizes the importance of conducting a thorough investigation to identify root causes and implement effective preventive measures.

5.2.2 Patterns of Occupations Types Involved in Road Traffic Accidents

The occupations considered include farmers, students, businesspeople, employed individuals, unemployed individuals, self-employed individuals, and others.

Table 5.5

Patterns of Occupation Types Involved in Traffic Accident in Chitwan District

Year	Farmer	Students	Business Man	Employed	Unemployment	Self-employed	Others	Total
2075/76	25	65	43	32	72	24	34	295
2076/77	19	51	39	27	68	27	30	261
2077/78	37	75	87	39	108	65	23	435
2078/79	27	95	97	39	126	91	45	530
2079/80	20	67	63	49	54	35	15	303
								1824

Source: Record of Chitwan Traffic Police Office, 2080

Figure 5.5

Occupation Types Involved in Road Traffic Accident in Chitwan District

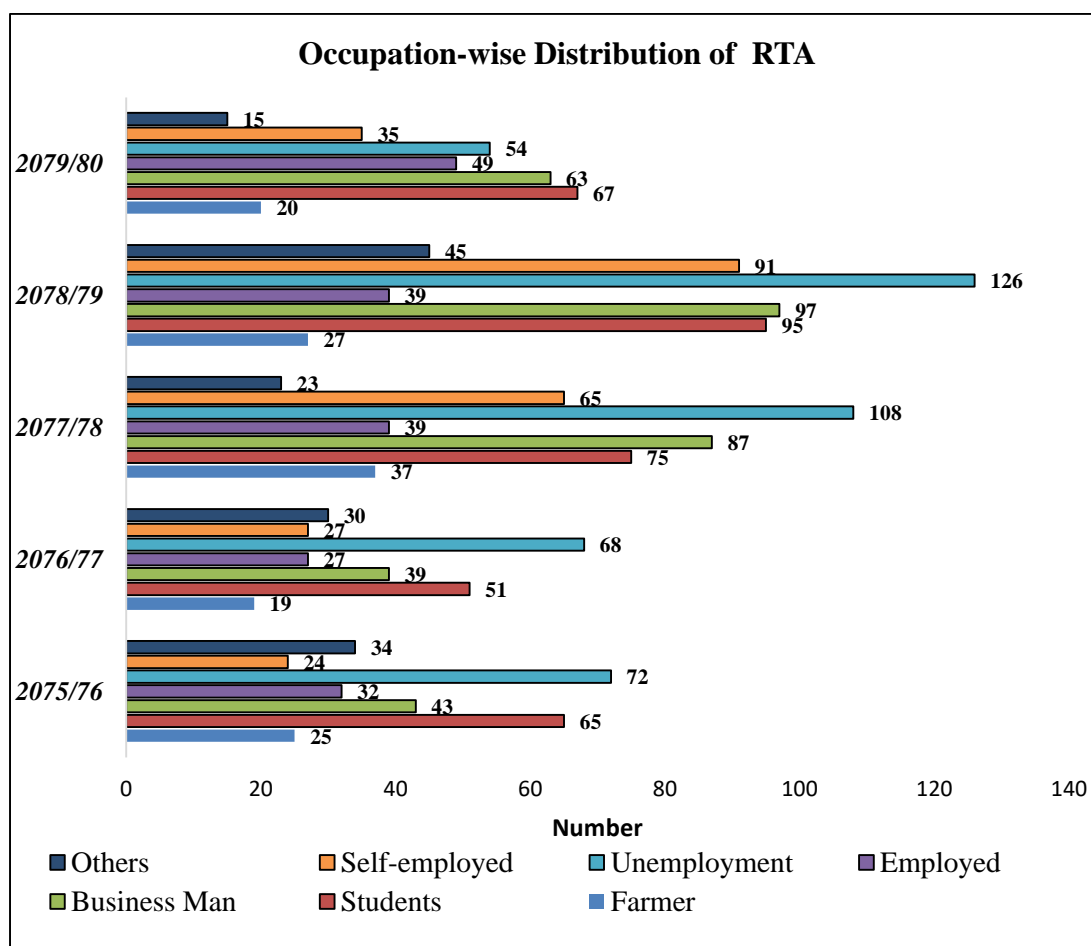


Figure 5.6

Distribution of Patterns of Types of Vehicle Involved in Road Traffic Accident in Chitwan District

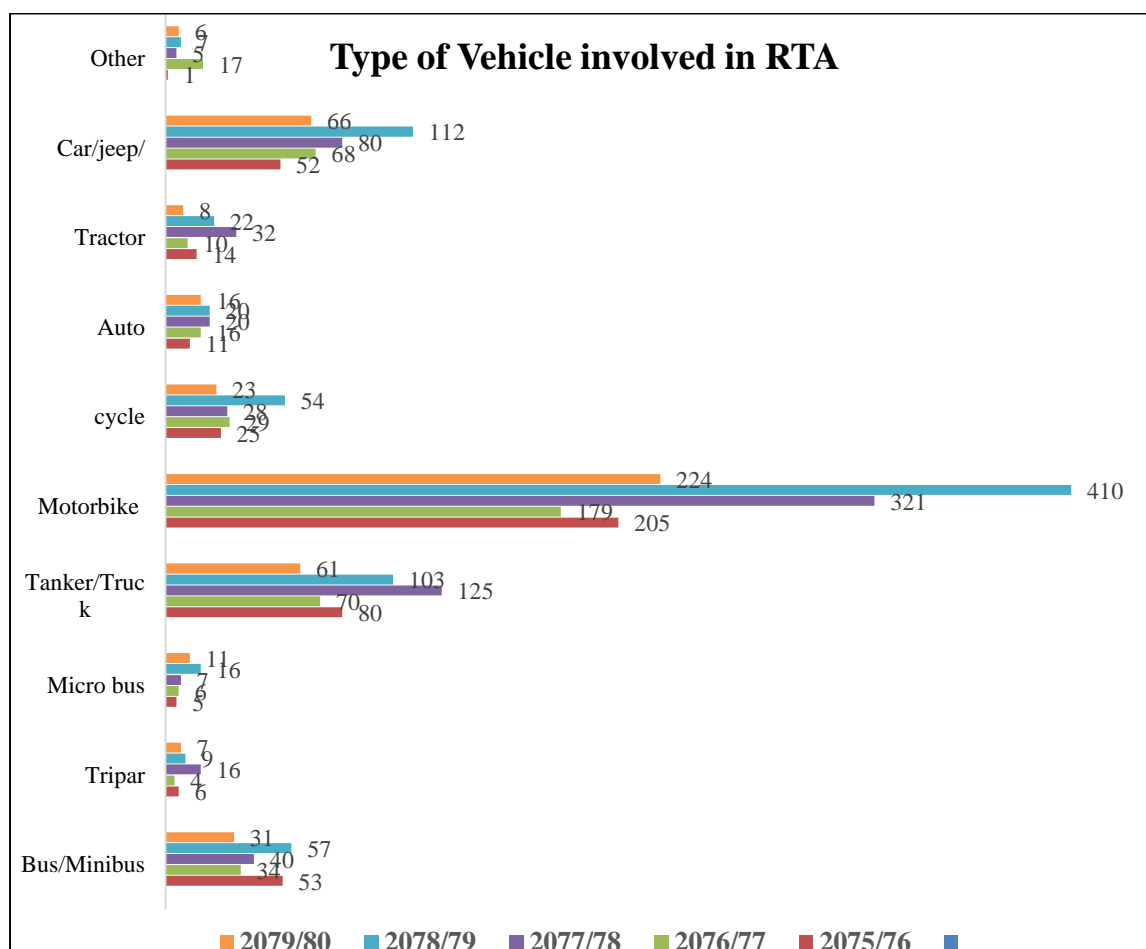


Table 5. 6 provides data on the Patterns of vehicles involved in road traffic accidents (RTAs) in chitwan district , Nepal, spanning five fiscal years from 2075/76 to 2079/80. There was a significant rise in the total number of vehicles involved in RTAs during 2077/78 and 2078/79, peaking at 810 in 2078/79. In 2079/80, this number dropped to 453, which, while lower than the peak years, is similar to the figures from 2075/76 and 2076/77.

The upward trend in RTAs until 2078/79 points to worsening road safety conditions or increased vehicle usage. The subsequent decrease in 2079/80 may reflect the positive impact of enhanced road safety measures or other influencing factors.

The analysis of vehicle types involved in RTAs over these five years indicates the need for targeted road safety interventions, especially for motorbikes, which are the

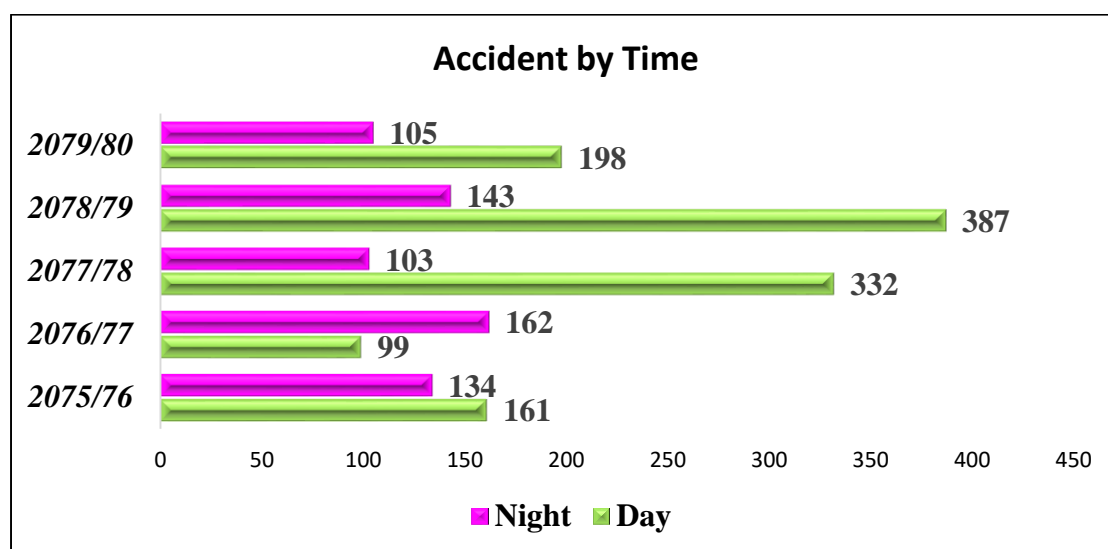
most frequently involved. The significant involvement of trucks and cars also underscores the necessity for stricter safety regulations. The overall trend of increasing accidents until 2078/79, followed by a reduction in 2079/80, suggests that recent safety measures might be effective, but ongoing efforts are essential to sustain and improve road safety.

5.2.4 Road Traffic Accidents Patterns by Time of Day in Chitwan

Categorizes accidents by time of day, distinguishing between day and night, over five fiscal years from 2075/76 to 2079/80.

Figure 4.7

Distribution of Road Accidents by Time of Day in Chitwan:



Source: Record of Traffic Police Office Chitwan, 2080

Figure no 4.7 Show the distribution of Road accident by time of day, distinguishing between day and night, over five fiscal years from 2075/76 to 2079/80. The table provides the total number of accidents each year and their distribution between daytime and nighttime, along with the overall totals and percentages for each category. Daytime accidents totaled 1,177 over the five years, accounting for 64.5% of all accidents. Nighttime accidents amounted to 647, representing 35.5% of the total, with the overall total being 1,824 accidents. The data shows an increasing number of accidents up until 2078/79, which had the highest number of accidents at 530, followed by a decline in 2079/80.

The trend indicates that more accidents occur during the day compared to night over this period. This finding is significant for local authorities and policymakers in Chitwan, suggesting the need for targeted safety measures during the day when accidents are more frequent. Additionally, the unusual data from 2076/77, where nighttime accidents exceeded daytime accidents, requires further investigation to understand and address the specific factors contributing to this trend.

5.2.5 Road Traffic Accidents Patterns by Day in Chitwan

It categorizes the number of accidents occurring on each day of the week over five fiscal years (2075/76 to 2079/80), and provides a total count for each day during this period.

Table 5.7

Patterns of Road Traffic Accidents (RTAs) by Day of Occurrence in Chitwan

Year	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Total
2075/76	76	27	32	31	28	67	34	295
2076/77	70	43	25	17	22	58	20	261
2077/2078	97	63	33	47	51	76	64	435
2078/2079	98	79	67	57	62	94	73	530
2079/2080	52	42	34	21	54	60	40	303
Total	301	184	127	98	161	277	88	1824

Source: Record of Traffic Police Office Chitwan, 2080

Table 5.7 categorizes the number of accidents occurring on each day of the week over five fiscal years (2075/76 to 2079/80), and provides a total count for each day during this period.

Sunday has the highest number of accidents, totaling 301, followed by Friday with 277 accidents. Saturday records the lowest number of accidents at 88. Sunday consistently shows high accident numbers each year, peaking at 98 accidents in 2078/79.

Both Monday and Friday also have relatively high accident numbers, particularly in 2078/79. In contrast, Wednesday consistently has the lowest number of accidents each year, peaking at 57 in 2078/79, yet still lower compared to other days.

The year 2078/79 marks the highest total number of accidents at 530, indicating a peak in occurrences across most days of the week. This number significantly dropped to 303 in 2079/80, suggesting an improvement or changes in traffic patterns or reporting.

The data indicates that road traffic accidents in Chitwan are more frequent on Sundays and Fridays, with a significantly lower occurrence on Saturdays and Wednesdays. This trend could be attributed to factors such as increased weekend traffic, social activities, and different road usage patterns on these days. Policymakers and traffic authorities can use this information to implement targeted measures on high-risk days to red

5.2.6 Road Traffic Accidents Patterns by Month in Chitwan

The monthly breakdown of accidents from Shrawan to Asar over five fiscal years (2075/76 to 2079/80), including the total number of accidents for each month during this period.

Table 5.8

Distribution of Road Traffic Accidents Patterns by Time of Day in Chitwan in Chitwan District

Year	Shrawan	Bhadra	Asajhoj	Kartik	Manasir	Push	Magh	Falgun	Chaitra	Baisak	Jestha	Asar	Total
2075/76	22	31	32	24	26	26	21	24	24	22	23	20	295
2076/77	21	26	34	32	35	19	23	21	10	7	14	19	261
2077/2078	28	19	36	36	52	45	43	38	39	41	20	38	435
2078/2079	51	42	43	41	47	40	29	51	47	53	41	45	530
2079/2080	44	28	34	32	24	21	15	16	24	15	30	20	303
Total	250	146	179	165	184	151	131	150	144	138	128	142	1824

Source: Record of traffic Police Office Chitwan, 2080

Table 5.8 provides the monthly breakdown of accidents from Srawan to Asar over five fiscal years (2075/76 to 2079/80), including the total number of accidents for each month during this period.

Shrawan has the highest number of accidents, totaling 250, followed by Mangsir with 184, and Ashoj with 179. Jestha records the lowest number of accidents at 128, followed by Bhadra with 146, and Chaitra with 144.

There is considerable fluctuation in the number of accidents each month over the years. Shrawan consistently shows high accident numbers each year, peaking at 51 accidents in 2078/79. Baishak and Asar also have notably high accident numbers, particularly in 2078/79. Conversely, the number of accidents in Push and Magh is relatively lower compared to other months.

The overall trend shows that 2078/79 had the highest total number of accidents at 530, marking a peak across most months. This number significantly dropped to 303 in 2079/80, indicating an improvement or a change in traffic patterns or reporting.

5.2.7 Causes of RTA in Chitwan

It categorizes the causes of accidents into various categories, including driver negligence, pedestrian negligence, overtaking, high speed, drinking and driving, vehicle technical faults, overloading, and cattle on the road, weather conditions, and road conditions across five fiscal years (2075/76 to 2079/8

Table 5.9*Causes of Road Traffic Accidents in Chitwan District*

Year	Negligence by Drivers	Negligence by pedestrian	Overtaking	High speed	Drinking and driving	Technical faults of vehicle	Overloading	Cattle on the road	Weather conditions	Road conditions	Total
2075/76	123	6	3	14	1	4	0	0	0	0	295
2076/77	150	16	45	12	12	4	13	0	3	3	261
2077/2078	180	10	3	42	24	4	5	3	0	0	435
2078/2079	106	6	9	109	40	3	9	1	12	0	530
2079/2080	118	7	9	75	32	4	6	0	3	7	303
Total	677	45	69	252	109	19	33	4	18	10	1824

Source: Record of Traffic Police Office, Chitwan, 2080

Table. 5.9 categorizes the causes of accidents into various categories, including driver negligence, pedestrian negligence, overtaking, high speed, drinking and driving, vehicle technical faults, overloading, cattle on the road, weather conditions, and road conditions across five fiscal years (2075/76 to 2079/80).

The data reveals that driver negligence is the primary cause of RTAs in Chitwan, followed by high speed and drinking and driving. This indicates a need for targeted interventions to improve driver behavior, such as stricter enforcement of traffic laws, awareness campaigns about the dangers of speeding and drunk driving, and enhanced driver training programs. Additionally, the significant number of accidents due to overtaking and technical faults highlights areas where vehicle safety checks and road safety measures could be enhanced. Policymakers should use these insights to develop comprehensive strategies aimed at reducing RTAs.

CHAPTER VI

FACTORS CONTRIBUTING TO ROAD TRAFFIC ACCIDENT

Qualitative data was examined using a content analysis approach, a systematic method for handling scientific data. Recorded interviews were transcribed verbatim and repeatedly reviewed to grasp the overall sense of the information. The transcripts were then condensed into meaningful units, which were coded and categorized into themes based on similarities and differences. This process aimed to uncover drivers' perceptions of risky behaviors on the road, regardless of their age or experience level. Data during the interviews was captured through both note-taking and audio recording.

6.1 Distribution of Theme

Data were analyzed using the content analysis approach. The units were coded and divided into themes regarding similarities and differences to reveal drivers (of all ages and level of experiences) perceptions of traffic-risky behaviors in using the road. During the interviews, the data was recorded through note taking and tape recording.

Table 6.1

Theme and Sub Theme

Opinion	Theme	Sub theme
Toward Driver Behavior	1. Impaired Driving:	1. Concerns about alcohol and drug use, and distractions
	2. Reckless Driving/Fatigue	2. Speeding, aggressive driving, and not maintaining a safe distance
	3. Vehicle Maintenance:	3. Driving for long periods and falling asleep:
	4. Lack of Awareness	4. Neglecting vehicle repairs
	5. Inexperience	5. Worries about young or inexperienced drivers:
	6. Driver Responsibility	6. Failing to use signals and misjudging distances Complete negligence vs.

Opinion	Theme	Sub theme
.Respondent Perception toward Pedestrian Behavior	1. Unpredictable Crossing and Inattentive Behavior 2. General Lack of Knowledge 3. Safety Concerns and Unpredictable Movements 4. Pedestrian Intoxication: 5. Negligence and Selfish Behavior:	external factors
		1. Unfamiliarity with traffic rules
		2. Not knowing how to use the road
Respondent Perception toward Passenger	1. Safety Concerns 2. Disruptive Behavior	1. Passenger Distraction: 2. Reckless Behavior:
Respondent Perception toward Environment	1. Road Conditions 2. Visibility Issues and Difficult Terrain 3. Unpredictable Obstacles 4. Traffic Management Challenges	1. Poor maintenance 2. Limited Visibility 3. Homeless Animals 4. Unmarked Hazards 5. Managing Traffic Flow
Respondent Perception toward Vehicle	1. Using Out-of-Date Vehicles 2. Neglecting Vehicle Maintenance	
Respondent Perception toward Lay and System	1. Fear, Confusion, and Ineffective Enforcement Plague Traffic Law Systems	1. Fear of Penalties and Knowledge Gaps 2. Unclear or Unfair Rules and Ineffective Enforcement 3. Ineffective Enforcement:
Road Users Suggestion	1. Strengthening Enforcement and Education 2. Infrastructure Improvements and Road Safety Measures 3. Effective Driver Training and Licensing 4. Pedestrian Safety Measures	1. Stricter Enforcement 2. Focus on Education: 3. Fair and Consistent Enforcement 4. Shared Responsibility 5. Public awareness 6. Victim Education 7. Stricter Driver Testing

6.2 Behavioral Factors

6.2.1 Driver

The participants' opinions highlight several recurring themes related to impaired driving, reckless driving, vehicle maintenance, lack of awareness, and driver inexperience. The agreement is that these factors significantly contribute to RTAs. There are, however, differing opinions on the distribution of fault in accidents and the degree of driver responsibility, with some attributing accidents solely to driver negligence, while others recognize external factors and shared responsibility.

Impaired Driving:

In this study Many road users have expressed similar types of deep concerns regarding drivers operating vehicles under the influence of alcohol and drugs. This impairment severely hampers their judgment, reaction times, and overall ability to drive safely, leading to a higher risk of accidents. Participants have pointed out that driving under the influence not only endangers the driver but also poses a significant risk to passengers, pedestrians, and other road users

Concerns about alcohol and drug use, and distractions

Concerns about alcohol and drug use, and distractions among road users significantly contribute to road traffic accidents (RTAs). The opinions collected from different participants emphasize how these impairments and distractions reduce from drivers' abilities to operate vehicles safely. Most of participant mentioned their opinion toward Road traffic Accident in similar ways. Some opinion are:

“Eating marijuana, drinking alcohol, driving vehicles recklessly, keeping a girl on the side, talking on the phone, keeping a short distance from other vehicles on the road.” (Interview no. 1 Driver)

“Talking to a young woman, driving a car Talking on a mobile phone. Driving a car, Drunk driving, sleepy, overload, high speed, Driving a car Over speed, age.” (Interview no. 2 Driver)

“Driving under the influence of alcohol, allowing students or sailors to drive, driving too close to passengers and honking the horn, using a mobile phone while driving can lead to an accident.” (Interview no.9, Pedestrian).”

“Human error, not caring, driving under the influence of drugs.” (Interview no. 18, Traffic Police)

Victims participant add to their opinion work for long time for money.

“Drinking alcohol, driving recklessly, driving for a long time for more money.” (Interview no. 25, Victim)

“When the drivers compete, while driving after taking drugs.” (Interview no. 15, Eyewitness)

The concerns about Sub theme highlight the critical need for stricter enforcement of traffic laws, increased awareness campaigns, and comprehensive driver education programs to mitigate these risks and enhance road safety for all users.

Reckless Driving

Reckless driving, characterized by aggressive behavior, excessive speeding, and a general disregard for traffic laws and safety, is a major contributor to road traffic accidents (RTAs). Participants from various perspectives highlight how reckless driving endangers not only the drivers themselves but also passengers, pedestrians, and other road users. Speeding, aggressive driving, and not keeping a safe distance. Majority of participant emphasized on the Speeding, aggressive behavior. They express their opinion as same ways .The opinion is:

“All drivers are not the same, not repairing the vehicle on time, Negligence, driving recklessly on the road.” (Interview no. 3 Driver)

“Some drivers speeding because they are young, competing for passengers and hurrying, not paying attention to the vehicle behind them.”(Interview no.6,Driver)

“Driving at high speed, Forced driving in rush hour fares.” (Interview, no. 10 Pedestrians)

“The driver is reckless while driving, unable to control the vehicle in rush hour.” (interview, Traffic Police no. 19)

“Overloading the car, hurrying, talking on the mobile phone, driving with many passengers, parking the car everywhere, driving for a long time causes accidents due to fatigue.” (interview, Victim no. 28)

“Behavior of drivers such as uncontrolled driving, how far to overtake, trying to overtake even on the road.”(Interview no. 13 Eyewitness)

“Most of the drivers are busy on the phone rather than on the road, they don't stop the car until there are more passengers, they get tired when driving competitively, they can't control the distance to stop.”(Interview no.33,.Road Division Officer)

To reduce the RTA Addressing comprehensive strategies, including stricter law enforcement, public awareness campaigns, and improved driver education programs to promote safer driving practices and reduce the incidence of RTAs.

According to a 30-year-old male witness explore his experience toward the driver's Reckless Driving and their Consequences. Two motorcycles collided while trying to overtake, causing both riders to fall on the road. He remembers and share his experience ...

"This is incident happened on 3rd of Falgun, 2076, when I was standing to cross the road on Bharatpur bypass, 2 people on a motorcycle were gossiping at 25-30 speed. At the same time, another motorcycle was coming double and when they were trying to overtake, the legguard of both motorcycles hit, both of them fell on the road and both of them fell on the road".

Vehicle Maintenance:

Vehicle maintenance plays a crucial role in road safety, and concerns about it are frequently highlighted by various participant in similar opinion about road traffic accidents (RTAs).

Neglecting Vehicle Repairs:

Few participant mentioned that One of the primary concerns raised is the negligence towards timely vehicle repairs. which can lead to accidents, especially at high speeds or in challenging road conditions. Only few Driver participants mentioned:

“All drivers are not the same, not repairing the vehicle on time, Negligence, driving recklessly on the road.”(Interview no.3, Driver)

“In the event of an accident, drivers drink alcohol, drive fast, and fail to repair the vehicle from time to time.”(Interview no.7, Drive)

Lack of Awareness

In the context of road safety refers to a significant factor contributing to road traffic accidents (RTAs), in this study few participant agree to lack of knowledge Failing to use signals and miscalculating distances:

Lack of knowledge among drivers regarding road rules, traffic signs, and safe driving practices emerges as a common concern across various perspectives few participant mentioned:

“Drivers drive in a careless manner, fail to use the signals (lights, site lights, lights) in the vehicle in all places, cross the road without looking ahead and back, and fail to consider how far to cross the road, in overtake Not being able to take care of the distance...” (Interview no.8 , Driver)

“Accidents are caused by the behavior of drivers overtaking, talking on mobile, Stop the vehicle wherever you can while during driving.”(Interview no.16, Eyewitnesses)

Inexperience:

Lack of experience increase the risky behaviour not knowing how to drive a Vehicle, approaching the passenger and honking the horn cause accidents

Worries about young or inexperienced drivers:

“Road accidents can occur due to not knowing how to drive a car, drivers who have stolen their license, speeding, and angry behavior.” (Interview no.12, Pedestrians)

“While driving a car/motorcycle, talking, not having a good knowledge of the road, driving in a hurry, approaching the passenger and honking the horn cause accidents.” (Interview no. 27 victim)

Fatigue

It refers to the state of feeling tired, exhausted, or sleepy due to prolonged physical or mental exertion, lack of sleep, or extended periods of wakefulness.

Driving for long periods and falling asleep:

“Driving without thinking about the road, when the driver goes to a new place because he does not know the place, when he drives for a long time, he falls asleep due to fatigue.” (Interview no. 11, Pedestrians)

“Overloading the car, hurrying, talking on the mobile phone, driving with many passengers, parking the car everywhere, driving for a long time causes accidents due to fatigue.” (Interviewno. 28 ,victim)

There are some participants focus Differently Fault Distribution in Accidents they consist common Responsible fail to consider how far to cross the road, in overtake Not being able to take care of the distance, drinking.

Driver's only fault vs. common responsibility:

“In an accident, the entire fault is not only the driver's, but fatigue, mental stress, other small vehicles panic after seeing the tipper, but the tipper driver does not care.” (Interview no. 5, Driver)

“In the event of an accident, drivers drive in a careless manner, fail to use the signals (lights, site lights, lights) in the vehicle in all places, cross the road

without looking ahead and back, and fail to consider how far to cross the road, in overtake Not being able to take care of the distance, drinking and driving, getting angry while driving with girls while talking on the phone.”(Interview no.8,Driver)

This statement suggests drivers are largely at fault. The opinions of various road users highlight recurring themes related to impaired driving, reckless driving, vehicle maintenance, lack of awareness, inexperience, and fatigue. There is a consensus that these factors significantly contribute to RTAs. However, there are differing opinions on the distribution of fault in accidents and the degree of driver responsibility. Some participants recognize external factors and shared responsibility, while others attribute accidents solely to driver negligence

6.2.2 Pedestrian

Various road users regarding pedestrian behavior, here is a categorization of similar themes and opposite opinions:

Unpredictable Crossing and Inattentive Behavior:

Both drivers and pedestrians express concerns about pedestrians crossing roads suddenly or without using designated crosswalks. There is also mention of pedestrians not paying attention to traffic signals or oncoming vehicles. They Mentioned Similar Way:

"Crossing the road without looking ahead and back" (Driver no.8)

"Not knowing how to cross the road, not looking right and left while crossing the road" (passenger no.30).

General Lack of Knowledge:

There is a agreement among drivers, pedestrians, and traffic police about a lack of pedestrian awareness regarding traffic rules and safe road crossing practices. Similar opinion toward pedestrian: "Unfamiliarity with traffic rules" and "Not knowing how to use the road, talking on the phone while walking on the road"

“Pedestrians cross the road carelessly without using the zebra cross, do not listen when honking” (Driver no. 3)

“Not knowing how to use the road, talking on the phone while walking on the road” (Traffic Police no. 19)

Safety Concerns and Unpredictable Movements:

All opinion not similar Some participant focus quit difference opinion toward accident than other participant. While drivers and some pedestrians express concerns about pedestrian behavior such as unpredictable crossing and inattentiveness, there are mentions from other perspectives that highlight pedestrian negligence and selfish behavior. Most of them mention Pedestrians disregarding traffic rules and safety, prioritizing their convenience over others' safety. Few participant explored their opinion:

“Pedestrians do not cross the road everywhere, do not listen” (interview no. 3, driver, victim no. 26)

All opinion not similar Some participant focus quit difference opinion toward accident than other participant. While drivers and some pedestrians express concerns about pedestrian behavior such as unpredictable crossing and inattentiveness, was mentions from other perspectives that highlight pedestrian negligence and selfish behavior. Most of them mention Pedestrians disregarding traffic rules and safety, prioritizing their convenience over others' safety.

Pedestrian Intoxication:

In this ways Traffic police specifically mention concerns about pedestrian intoxication, which is importance contributor in RTA. there are also differing opinions regarding the extent of negligence or selfish behavior among pedestrians, as well as specific concerns like pedestrian intoxication highlighted more prominently by traffic police.

“Drinking alcohol and walking everywhere on the road” (interview no 18, Traffic Police).

All opinion not similar Some participant focus quit difference opinion toward accident than other participant. While drivers and some pedestrians express concerns about pedestrian behavior such as unpredictable crossing and inattentiveness, there are mentions from other perspectives that highlight pedestrian negligence and selfish behavior. Most of them mention Pedestrians disregarding traffic rules and safety, prioritizing their convenience over others' safety.

6.2.3 Passengers

Passenger are also key to produce the road accident .most of Road users emphasis the similar opinion and some express the different opinion This analysis explores the opinions of various road users on passenger behavior and its link to road traffic accidents (RTAs). Here's highlighting similarities and differences across participant groups:

Everyone involved in traffic safety (drivers, pedestrians, passengers, victims, eyewitnesses, police, and road authorities) acknowledges passenger behavior as a potential factor in RTAs.

Safety Concerns

Safety concerns in Road Traffic Accidents (RTA) refer to factors that can lead to or exacerbate the severity of accidents involving vehicles, pedestrians, and cyclists. Addressing these concerns is essential for reducing the incidence and impact of road traffic accidents. Most of all road users emphasis to driver, pedestrian, passenger, Road condition, vehicle condition infrastructure. Similar concern across the group. Passengers not looking for oncoming traffic when exiting (Drivers no. 1, Drivers no. 4, driver no7, Pedestrians no.10)

“The quarrelsome habit of passengers, the habit of getting off the car without looking right or left “(Interview no.4,Drivers)

Passengers are rushing to get on or off vehicles Passengers rushing to get on or off vehicles, such as buses, can create safety concerns, leading to accidents and injuries. Majority of road user agree Passengers may trip or fall while hurrying, leading to injuries, Hurrying can lead to overcrowding at doors, increasing the risk of accidents

and impeding safe entry and exit. most of road user similar Widely shared concern. views (Drivers no.4; Pedestrians no.11, Pedestrian12; Eyewitnesses No.15; Local Authority no 34)

A Local Authority Shared a Wider Views:

“Rushing while getting on and off the vehicle, jostling at the fare, causing the driver to get angry and unable to guess where the vehicle is going, may lead to an accident.” (Local Authority no. 34)

Few participant shared their concern between pedestrians and police on Overloading vehicles; a Traffic Police focus on

“Passengers stop and get off the vehicle, carry more luggage during the journey, which causes fights with other passengers while getting off and on and causing accidents.” (Police no. 18)

“Climbing in a hurry, overcrowding, overloading, staying larger than the limit” (Pedestrians no.10)

Disruptive Behavior

Disruptive behavior of passengers on public transportation can pose significant safety and security risks, affecting the well-being of other passengers and the smooth operation of the transport system.in this study Primarily a concern for drivers and those witnessing it. Some participant Arguing with drivers or staff (Drivers P2, Driver no.6; Eyewitness No.13)

An eyewitness shared their opinion:

“Behavior of drivers such as uncontrolled driving, how far to overtake, trying to overtake even on the road” (Eyewitness no. 13)

Shared concern across multiple groups On Distracting the driver. (Drivers no.2; Traffic Police n0.17; Victims no.25; Local Authority no.34)

A victim and Traffic police mention:

“A habit of fighting without stopping wherever he says” (Interview no. 17, Traffic Police)

“Trying to get off by stopping the vehicle, crowding and pushing others while getting off, not paying attention to the Vehicle coming from the left when getting off the Vehicle” (Interview no 25, Victims)

Passenger Distraction:

Some participants focus a specific concern for some accident victims to large groups getting on or off vehicles. Passengers causing disturbances can distract the driver or operator, potentially leading to Road accident a victim focus on

“When traveling with a lot of luggage and children, while getting in and out of the car, vomiting by sticking the head out of the window, crowding around the door.” (Interview no 28, Victims)

Reckless Behavior:

Reckless behavior in various contexts, including in RTA can position significant safety risks. Addressing reckless behavior is essential to prevent accidents, injuries, and damage. Driving significantly above the speed limit, increasing the risk of collisions. Running red lights or stop signs, endangering other road users. Most of participants A serious concern highlighted by road safety officials to Jumping off moving vehicles.

A road division Officer mentioned:

“Behavior like yelling and making the driver angry, jumping when the car is on the wrong side.” (Interview no 33, Road Division Officer)

Passenger behavior can significantly impact road safety. Common concerns include inattention, disruptive actions, and behaviors that create distractions or safety hazards for drivers and others on the road.

Addressing these issues through public awareness campaigns and promoting responsible passenger behavior is crucial for improving overall road safety.

6.3 Environmental Factors

This analysis explores the opinions of various road users on passenger behavior and its link to road traffic accidents (RTAs). Poor environmental factors like maintenance leading to potholes, uneven surfaces, and sudden hazards. Unorganized construction materials left on the road Limited visibility caused by fog, dust, or overgrown vegetation." Narrow road, bushes around the road, trees, fog in winter, dust in summer Leaving domestic animals, mainly goats, cows, Construction materials placed on the road, telephone junctions on the road and potholes can lead to accidents

Poor Maintenance

Poor maintenance can have negative consequences in many areas, and road safety is one of the most critical. Most of the accident occurs due to the poor maintenance of road.

Majority of participant emphasized Poor maintenance leading to potholes, uneven surfaces, and sudden hazards. Most of driver, pedestrian, agree to similar opinion like, Unorganized construction materials left on the road. (eyewitness no.15) Slippery roads due to rain, snow, or loose sandy soil. (Driver no 2, Driver no, 3, Driver no, 5, Driver no. 8) Saturated road, unorganized parking, breakers placed without signs, frequent road maintenance due to congestion, not being able to find the road in confusion when there is water." (Driver no.5) A participant express in his word.

“Saturated road, unorganized parking, breakers placed without signs, frequent road maintenance due to congestion, not being able to find the road in confusion when there is water.” (Interview no. 5, Driver)

Visibility Issues and Difficult Terrain

Visibility Issues and Difficult Terrain is contributor factors, limited visibility due to fog, dust, or inadequate lighting, which pose risks particularly on difficult

Limited Visibility

Majorities of Participant note limited visibility on downhill turns or during specific weather conditions, exacerbating safety risks for pedestrians. Majorities of driver

shared Limited visibility caused by fog, dust, or overgrown vegetation (Driver no. 1, Driver no 3, Driver no 4, Driver no 5, Driver no 8) terrains and during adverse weather conditions. Some passengers mention fog as a factor affecting visibility and causing accidents, particularly during road maintenance or construction

They note limited visibility on downhill turns or during specific weather conditions, exacerbating safety risks for pedestrians. More than half Pedestrians note limited visibility on downhill turns or during specific weather conditions, exacerbating safety risks for pedestrians. (Pedestrian no.9, Pedestrian no 10, Pedestrian no 12) similar opinion shared by some road users Inadequate lighting on turns or during nighttime. Narrow road, bushes around the road, trees, fog in winter, dust in summer." (Driver no. 4) Fog, delaying road construction and creating obstacles." (passenger no.30)

Another participant mention quite differ view toward road accident he expressed Accidents happen due to sudden changes in the weather,

"Accidents happen due to sudden changes in the weather, getting irritated."
(Interview no 19, Traffic police)

Unpredictable obstacles pose a significant threat to road safety for all users: drivers, pedestrians, cyclists, and passengers. These obstacles can appear suddenly, leaving little time for reaction and increasing the risk of accidents. Most of participant Shared similar opinion toward road accident due to Unpredictable obstacles and express Stray animals like cattle or dogs.((Driver no 1 Driver no 7, Driver no 8, Passenger no 31 Passenger no 32, Victim no 26, Victim no.28, Local authority no 34)

Environmental factors like a wet Road, under-construction road ply important causation in RTA. A 35 years old Victim told his experience of incident it was the rainy season I traveled on the Hilly and constructed road when I saw car slipped ant hit to our vehicle when I got hurt in my parts of body. He share his experience in his word :

"In the year 2079 Bhadra, I was sitting in the cabin of a bulero car and was going towards Munclin. The road was under construction and there was water on the road. At the same time, another car also slipped and hit the same bulero. Although it was not a big loss, I got hurt on my head and knee."(35 year old ,Victim)

Traffic Management Challenges

A traffic management challenge refers to any difficulty or obstacle that hinders the smooth and safe flow of traffic on roads and streets. These challenges can arise from various factors and can have a negative impact on drivers, pedestrians, cyclists, and the overall efficiency of the transportation system. All traffic police emphasized on Traffic Management challenge.

“Geographical reasons for accidents include potholes, landslides, hills, winding roads, unnecessary crossings, drying of grain on the road, keeping house construction materials on the road, anger, not seeing the vehicles ahead in the construction area, bad condition of the road under construction.”(interview no18 ,Traffic police)

6.4 Vehicle Factors

This analysis reveals a strong consensus among all road users (drivers, pedestrians, passengers, police, victims, eyewitnesses, road authorities) that neglecting regular vehicle maintenance significantly contributes to road traffic accidents (RTAs)

Neglecting Vehicle Maintenance

Participants across various roles highlighted the neglect of regular vehicle maintenance as a significant factor contributing to RTAs. This neglect includes failure to perform regular inspections, delaying repairs, and using worn-out parts.

Limited Regular Checks:

Drivers, pedestrians, and passengers all emphasize the importance of frequent vehicle inspections and timely servicing. Drivers, pedestrians, and even passengers all agree that vehicles should be checked frequently, with some suggesting daily inspections. Regular checks are seen as crucial for identifying potential problems before they lead to accidents. This includes checking tires, lights, brakes, and other critical component Participants highlight the dangers of driving vehicles with known issues and postponing repairs. Concerns include using old tires, faulty parts, and unreliable replacements. Most of the Road user mentioned the same way.

"Not repairing the vehicle on time, not checking daily, not replacing the parts that need to be replaced on time." (interview no. 1, driver)

"Brakes and clutches of the car are not checked daily, even if the car is damaged, it will be postponed until tomorrow." (Interview no.12 pedestrian)

" Driving the vehicle without checking the currents, trying to operate with old equipment, driving without backup of the most important parts of the vehicle." Interview no24)

"Ignoring the malfunctions of the vehicle, ignoring the failure of brakes and steering." Interview, (traffic police no. 17)

Over Use of Old Vehicles

Participants also emphasized the dangers posed by using outdated vehicles without proper safety features and the risks associated with continuing to operate these vehicles despite known issues. Most of participants focus to Continuing to drive vehicles with known engine problems Disturbance in the engine of old vehicles will continue to run even if they break down. (Pedestrian no 11) "Use newer and older parts in the car, don't change the engine oil on time, not maintaining the vehicle on time, the habit of operating with old tires. (Passenger no.31) Over use of old vehicles. Repair today, tear the next day. Change the speed of maintenance. (P34) All groups agree that neglecting regular vehicle maintenance is a significant contributor to RTAs. Participants universally mentioned the use of old and worn-out parts as dangerous. There is a common concern across all roles about the risks posed by outdated vehicles.

"Overuse of old vehicles. Repair today, tear the next day. Change the speed of maintenance" (interview ,Local authority no .34)

Some Drivers and traffic police emphasize the challenges during road maintenance and the need for better traffic management. But Pedestrians focus more on road design issues, particularly downhill turns and lack of clear warnings. Passengers and victims highlight the presence of unattended animals and construction materials left on the road as critical concerns. They mention

“Ignoring the malfunctions of the vehicle, ignoring the failure of brakes and steering “(interview, Traffic Police no. 17)

“Vehicles are not repaired on time, even when they hit the road, they keep breaking down” (interview no. 29, Eyewitness).

By categorizing and analyzing these opinions, it becomes clear that addressing these environmental factors requires a multi-faceted approach involving better road maintenance, improved visibility measures, and stricter control over obstacles on the road.

6.5 Law/system Factors

Law and system are important factor to RTA. Rigid traffic law unclear can increase the Accident This analysis of road user opinions reveals a central theme: a dysfunctional traffic law system characterized by confusion, fear, and ineffective enforcement.

Fear of Penalties and Knowledge Gaps

Many drivers expressed similar opinion of fear of fines for even minor infractions, leading to risky behavior like fleeing traffic stops (interview, Driver no. 1, interview, Driver no 2, and interview, Driver no 4). Drivers, pedestrians, and eyewitnesses highlighted a lack of understanding of traffic rules, suggesting a need for improved public education (eyewitness no 14, and 15).

“When trying to run away saying that he has to pay a fine” (interview, eyewitness no. 14)

Lack of proper knowledge of traffic rules” (interview, eyewitness no 15)

Unclear or Unfair Rules and Ineffective Enforcement

The analysis of road user opinions reveals a major problem in traffic law systems - a vicious cycle created by unclear rules and ineffective enforcement. Most of road user focus Pedestrians, drivers, and police officers criticized unclear or poorly communicated traffic regulations .unclear law of the traffic. Some user focus similar views (Driver no 7, pedestrian no 12, Traffic Police no20).

*“Lack of clear traffic rules, drivers are not responsible for traffic rules”
(Traffic Police no. 20) Ineffective Enforcement:*

Ineffective enforcement in traffic law systems refers to situations where the way rules are enforced doesn't achieve the desired outcomes of safety and responsible driving behavior. Most of Road users Emphasis might be placed on checking documents during traffic stops, potentially taking attention away from more critical safety concerns like distracted driving or vehicle condition. Some

“Traffic rules can't be implement and followed properly” (interview no. 26, Victim)

Another participant road division officer mentioned that a focus on paperwork over which is the disturbance to in hurry users.

“Making the rules loose, being careless, taking revenge, making the rules strict and walking without taking the driver and vehicle documents, trying to run away as soon as they see the traffic, they end up in a pothole, and collide with a Vehicle”. (road division officer no. 33)

So ineffective enforcement creates a situation where traffic laws are not taken seriously, potentially leading to a chaotic and unsafe environment on the roads.

6.6 Suggestion to Reduce RTA

This analysis of road user suggestions reveals a central theme achieving a significant reduction in RTAs requires a multifaceted approach that addresses several key areas.

Strengthening Enforcement and Education

Most of drivers emphasized the need for stricter enforcement of existing traffic laws Some suggested alternatives to fines for minor offenses, such as educational programs and the importance of applying traffic laws equally to everyone

Stricter Enforcement: Stricter Enforcement can all type of road user understand the rule Many road users suggest to Stricter Enforcement to control to road accident including drivers, police, and victims, called for stricter enforcement of existing traffic laws (P1, P17).

*” Not only should the rules be made, but they should be followed strictly”
(interview no 1 driver)*

*“Make traffic rules that people can understand and apply them uniformly”
(interview no 17 Traffic Police no)*

Focus on Education: There's a strong emphasis on public education campaigns promoting traffic safety rules and responsible behavior for all road users A Participant highlights the importance of public education programs on traffic safety rules (in general). This can improve awareness and compliance among all road users. Some participant ((Interview, Driver no.2, 7, and 8, interview, passenger no 29). express same opinion to increase public awareness. Among them passenger no 27 consist

*“It seems that the community, schools, traffic, and employees should conduct training and public awareness programs related to road accidents.”
(interview, Passenger no. 27)*

Fair and Consistent Enforcement: Concerns were raised regarding the current system's inconsistency and potential bias. Participants stressed the need for fair and uniform application of traffic laws a participant mentioned

“The practice of passing some part of the fine to the traffic should be stopped because the tendency to fine even small mistakes will develop when they get some money” (interview passenger no 31).

Infrastructure Improvements and Road Safety Measures

There's a strong emphasis on Infrastructure Improvements and Road Safety Measures to improve the road safety. To Improved Infrastructure most of participant Suggestions included constructing designated pedestrian walkways, separate paths for vulnerable users, and repairing roads to address potholes and uneven surfaces (interview Driver no,4 and 9, pedestrian no 11).

Some participant focus in Vehicle Maintenance Regular vehicle inspections to identify and address mechanical problems were highlighted as a preventative measure (passenger 32, 26). Some pedestrian emphasis Traffic Management Strategies like

controlling drug use by drivers, reducing vehicle numbers (potentially through registration restrictions), and promoting public transportation were proposed (pedestrian no 10 and 12). They mentioned similar view:

“The state should make a rule not to build houses and other structures on the road, if you keep a record of daily or weekly checks of all vehicles, the number of accidents can be reduced” (interview no, 32 passenger)

“The government should be responsible for the construction and maintenance of the road on time, the grass and small plants should be removed along the road, and accidents can be avoided if the vehicles are checked and driven daily.” (interview no,26Victim)

Shared Responsibility and Public Awareness

Shared Responsibility and Public Awareness, in the context of road safety, refers to two interconnected concepts that emphasize a collaborative effort to reduce road traffic accidents (RTA). Everyone who uses the roads has a role to play in ensuring safety. This includes drivers, pedestrians, cyclists, passengers, government agencies, law enforcement, road construction companies, and educational institutions.

Shared Responsibility: Several participants emphasized that reducing RTAs requires a collaborative effort from road users, government agencies, and educational institutions they mention similar mentioned

“It seems that the community, schools, traffic, and employees should conduct training and public awareness programs related to road accidents.” (Interview no , 27 Victim)

“Traffic related rules alone cannot reduce traffic congestion, the government should do the work of building the road in time, and it should be strict to complete the road in the specified time. An alternative route should be arranged for repairs.” (interview no 33,Road division Officer)

Public Awareness Campaigns: Public awareness campaigns play a vital role in promoting safe behavior on the roads and reducing road traffic accidents (RTAs).

There's a strong consensus on the need for ongoing educational programs targeting all road users, from drivers and pedestrians to the general public and schoolchildren (Driver no 2, driver no7, eyewitness no 13 and 15, victim no.27).

Victim Education: Educating victims on safe driving practices and vehicle maintenance was also suggested government should be responsible for the construction and maintenance of the road on time, the grass and small plants should be removed along the road. One victim said:

“The government should be responsible for the construction and maintenance of the road on time, the grass and small plants should be removed along the road, and accidents can be avoided if the vehicles are checked and driven daily.” (Interview 26, Victim)

Effective Driver Training and Licensing

Effective driver training and licensing programs are fundamental to reducing road traffic accidents (RTAs) by preparing new drivers with the knowledge and skills necessary for safe and responsible driving.

Stricter Driver Testing

One participants called for more strict driver's license tests that emphasize traffic rules and safe driving practices.

“While making the license, the license should be given only after a thorough examination of the traffic rules, the users of the road should be informed about the human risk and economic loss caused by the accident by reaching the lowest level.” (Interview no. 13, Eyewitness)

Another participant focus on quit differently Improved Driver Training There's a suggestion for including traffic safety education in school curriculums to ingrain safe habits from a young age

“When trying to run away saying that he has to pay a fine” (interview no 15, eyewitness)

Pedestrian Safety Measures

Ensuring adult supervision to prevent children from playing near roads was highlighted. Improved Pedestrian Infrastructure, Creating safe crosswalks, reducing the distance between crossings, and providing proper sidewalks were suggested (interview no 9 and 11 pedestrian, eyewitness 16). Safer Practices in Bad Weather,

“Creating pedestrian walking lanes on both sides of the road, arranging transportation for the disabled in an organized way, spreading public awareness about road accidents to all road users.” (interview no 9, pedestrian)

“A separate path should be arranged for old people and disabled people to walk. The road should be repaired and prepared” (interview no 11, pedestrian)

CHAPTER VII

SUMMARY, CONCLUSION AND THEORETICAL REFLECTION

7.1 Summary

The analysis of road traffic accidents (RTA) in Chitwan district over five years (2075/76 to 2079/80) reveals several trends and insights regarding the perception of road traffic accidents.

1. **Increasing Trend of Accidents:** Chitwan district has experienced a notable rise in the number of accidents, peaking in 2077/78 and 2078/79. Although there is a slight improvement in 2079/80, the overall trend reflects a national increase in road traffic accidents. Qualitative finding focus Respondents identified risky behaviors such as speeding, drunk driving, and ignoring traffic laws as major contributors to this trend. The quantitative data suggests a knowledge gap, highlighting the need for more qualitative research to explore these aspects further.
2. **Casualties and Injuries:** The number of injuries and fatalities due to RTAs showed a changing pattern, with a noticeable increase in 2078/79 followed by a decline in 2079/80. Qualitative data suggests this improvement might be due to enhanced emergency response or stricter enforcement, leading to a temporary decrease in risky behaviors. This indicates some progress in road safety measures or emergency response systems.
3. **Sex-wise Involvement in RTAs:** Males are significantly more involved in RTAs compared to females, with consistently higher male mortality rates, indicating a greater risk for males in road traffic accidents.
4. **Injury Patterns:** Severe injuries, particularly head and spinal injuries, peaked in 2078/79, emphasizing the need for better protective measures and medical response capabilities. The high prevalence of severe injuries aligns with respondents' concerns about speeding, neglect of timely vehicle repairs, and the use of outdated vehicles. These factors play a crucial role in increasing road traffic accidents in Chitwan.

5. **Occupation Involvement:** Students and unemployed individuals are the most affected groups, necessitating targeted interventions for these demographics. The high number of students and unemployed individuals using motorbikes might explain their higher involvement in accidents.
6. **Vehicle Types:** Motorbikes are the most frequently involved in RTAs, followed by trucks and cars. This highlights the need for specific safety measures for these vehicle types. The qualitative study emphasizes speeding on motorbikes and neglecting repairs for various vehicles, supporting the quantitative findings. The frequent use of motorbikes by students and unemployed individuals could contribute to their reckless behavior in Chitwan district.
7. **Time of Accidents:** More accidents occur during the day than at night, with Sundays and Fridays being the most accident-prone days. This suggests that traffic patterns and road usage during these times contribute to the higher incidence of accidents. Qualitative findings highlight the significant role of environmental factors, such as poor road conditions, visibility issues, and road obstructions, in contributing to accidents. Improved driving education and traffic management are required to reduce accidents.
8. **Monthly Variation:** Shrawan has the highest number of accidents, while Jestha has the lowest. This monthly variation can be attributed to factors such as weather conditions, festivals, and agricultural activities influencing traffic volume and behavior.

By triangulating quantitative and qualitative data, we can develop a data-driven and user-informed approach to improving road safety in Chitwan district. This analysis effectively demonstrates how these data types can converge and diverge to provide a richer picture of the problem. Identifying potential explanations and areas for further investigation helps develop targeted interventions to enhance road safety in Chitwan district.

7.2 Convergence and Divergence

Convergence

Increasing Trend of Accidents: This aligns with user concerns about aggressive driving and disregarding traffic laws, suggesting these behaviors might contribute to the rise in accidents. **Casualties and Injuries:** The initial increase followed by a decline

might be explained by improved emergency response (qualitative), potentially influencing the quantitative data. **Injury Patterns:** The high prevalence of severe injuries aligns with user concerns about speeding and neglecting repairs, indicating these factors might contribute to the severity of injuries. **Vehicle Types:** User concerns about speeding on motorbikes and neglecting repairs for various vehicles support the quantitative finding about the types of vehicles most involved in accidents

Divergence

Sex-wise Distribution: No direct link is found between the quantitative data on higher male mortality and user opinions, suggesting a need for further investigation into gender-specific factors in qualitative research.

Occupation Involvement: While the quantitative data shows higher involvement of students and unemployed individuals, no direct link is established with qualitative data. However, it's suggested that these groups might be more likely to use motorbikes, which could be an area for further exploration.

Time and Monthly Distribution: No direct link is found between the quantitative data on peak accident times and user behavior, highlighting the need for further qualitative research to understand user behavior during these specific periods.

7.3 Conclusion

Objective 1.Trends: it is concludes that there has been a Changeable increasing Trend in road traffic accidents and Injuries in Chitwan District over the past five years, This trend is particularly concerning due to the peak observed in 2078/79, followed by a decrease but still higher numbers in 2079/80 compared to earlier years.

The data suggests a need for improved road safety measures and targeted interventions to reduce traffic accidents in Chitwan. It also highlights the importance of investigating the reasons behind the rise in injuries in 2078/79 to inform the development of effective preventive strategies.

Objective 2 Pattern: A five-year study (2075/76 to 2079/80) in Chitwan, Nepal, found a disturbing rise in Patterns of injuries traffic accident. pelvis, spinal, facial,

chest, and extremity injuries was Common injuries Patterns and most of the injuries (971) was in 2078/2079. Highest Involved in RTA Occupationally Students and Unemployment, day time, Srawan and Ashoj in month and Negligency by driver. There was a significant peak in 2078/79, followed by a decrease in 2079/80, but injuries remain higher than previous years.

The number of traffic accidents and injuries is a significant Social and Public Health concern.

There is a need for more effective strategies to improve road safety and reduce accidents in Time . traffic Awareness Program. Education to all type of road users, alter checking to drivers are needed to reduce the risky behaviour and Road Accidents.

Objective 3 Contribution Factors: The analysis Focus that various factors contribute to road traffic accidents (RTAs), with impaired driving, aggressive behavior, speeding, and vehicle neglect being primary concerns. Participants consistently emphasize the need for improved knowledge of traffic rules and safe driving practices. Pedestrian safety is compromised due to unpredictable behaviors and lack of awareness, with differing opinions on the degree of pedestrian negligence.

Environmental factors like poor road conditions and visibility issues further worsen the problem.

Vehicle Factors like Old Vehicle, negligence to Maintenance Vehicle in Time, use the old instrument.

Law/system Factor Like unclear Traffic Rule, ignore to rule by Drivers, Fine and Penalties in Small Mistake.

Addressing these issues through better road maintenance, effective traffic management, and increased awareness among road users is essential. A comprehensive approach involving government, law enforcement, educational institutions, and the public is necessary to significantly reduce RTAs. This includes prioritizing road safety education, implementing fair and strict enforcement, enhancing infrastructure, and promoting responsible behavior among all road users to create a safer transportation system.

7.4 Theoretical Reflection

Accidents are often regarded as unexpected and unplanned events that may lead to injuries or fatalities. In the contemporary context, they pose a major public health concern, frequently classified under non-communicable diseases. Road traffic accidents (RTAs) result from a combination of behavioral and environmental factors that contribute to their occurrence. These factors can be analyzed using a modified ecological model to better understand their complexities. This study examines RTAs by considering the interaction between individual behavior, environmental conditions, vehicle features, and systemic legal frameworks. Despite advancements in road safety measures, it is crucial for all road users to actively work towards reducing the risk of injuries and fatalities, rather than simply accepting unsafe road conditions.

Nepal's "Road Safety Action Plan (2021–2030)," published by the Ministry of Physical Infrastructure and Transport in 2022, aims to improve road safety through a comprehensive approach to reducing RTAs. A significant portion of Nepal's road network consists of hill roads, which present a range of safety challenges. These include limited visibility at sharp bends, insufficient road shoulders, problematic drainage systems, inadequate safety barriers near steep slopes, poorly designed passing bays on single-lane roads, steep gradients, narrow urban sections, and the absence of climbing lanes. In Nepal and other countries, the primary drivers for addressing RTAs are socio-economic concerns, particularly the need to protect youth and drivers.

RTAs can be examined using Routine Activity Theory (RAT), where accidents are conceptualized similarly to diseases. This theory provides a framework to understand the occurrence of RTAs based on the convergence of three elements: a motivated offender (e.g., a negligent driver), a suitable target (e.g., vulnerable road users), and the lack of capable guardianship (e.g., ineffective traffic law enforcement or insufficient road safety measures). This model underscores the urgent need to address RTAs within the current societal context. The theory emphasizes the role of situational and environmental factors in contributing to RTAs. By applying RAT, the analysis can focus on how individual behaviors (e.g., reckless driving, speeding) interact with situational contexts (e.g., poorly designed roads, lack of pedestrian crossings) to create conditions conducive to accidents. The theory highlights the

importance of addressing these situational factors to reduce risks and improve traffic safety, offering a practical framework for assessing and designing interventions to mitigate RTAs.

Nepal's Road Safety Action Plan aims to reduce the high rates of RTAs and decrease injuries and fatalities across various road user groups. While some progress has been made in implementing this plan, recent findings indicate that significant issues remain. These include impaired driving, aggressive driving behaviors, speeding, reliance on outdated vehicles, and pedestrian safety risks due to insufficient awareness, poor infrastructure, and ineffective traffic management.

Addressing RTAs requires a comprehensive approach, involving collaboration among government agencies, law enforcement, educational institutions, and the public. Key strategies include prioritizing road safety education, enforcing traffic laws rigorously, improving infrastructure, and encouraging responsible behavior among all road users. Further research is necessary to explore the underlying factors contributing to RTAs and develop effective strategies for prevention.

REFERENCES

- Asogwa, S. E. (1992). Road traffic accidents in Nigeria: A review and reappraisal. *Accident Analysis & Prevention, 24*(2), 149-155.
- Asogwa, S. E. (1992). Road traffic accidents in Nigeria: A review and reappraisal. *Accident Analysis & Prevention, 24*(2), 149-155.
- Bernasco W., & Steenbeek, D. R. (2010). *Routine activity theory and road safety: A review*. *Transportation Research Part A: Policy and Practice, 44*(10), 734-751.
- Bhandari, M. K., & Upreti, B. R. (2019). Road traffic accidents in Nepal: A critical analysis of the causes and potential solutions. *Journal of Nepal Public Health, 3*(2), 145-150. <https://doi.org/10.1093/jnph/3.2.145>
- Bjornskau, M., & Gafni, D. (2000). Globalization in road safety: Explaining the downward trend in road accident rates in a single country (Israel). *Accident Analysis & Prevention, 32*(1), 71-74.
- Bjornskau, M., & Gafni, D. (2000). Globalization in road safety: Explaining the downward trend in road accident rates in a single country (Israel). *Accident Analysis & Prevention, 32*(1), 71-74.
- Blau, P. M., & Duncan, O. D. (1967). *The American occupational structure*. Free Press.
- Blau, P. M., & Duncan, O. D. (1967). *The American occupational structure*. Free Press.
- Broughton, J. (1991). Forecasting road accident casualties in Great Britain. *Accident Analysis & Prevention, 23*(5), 353-362.
- Broughton, J. (1991). Forecasting road accident casualties in Great Britain. *Accident Analysis & Prevention, 23*(5), 353-362.
- Bursik, R. J., & Grasmick, H. G. (1993). *Neighborhoods and crime: The dimensions of effective community control*. Lexington Books.

- Bursik, R. J., & Grasmick, H. G. (1993). *Neighborhoods and crime: The dimensions of effective community control*. Lexington Books.
- Chatterjee, R., & Banerjee, S. (2020). *Urbanization and road traffic accidents: A case study of South Asia*. *Transportation Research Part F: Traffic Psychology and Behaviour*, 71, 71-82. <https://doi.org/10.1016/j.trf.2020.03.005>
- Clarke, R. V. (2008). *Situational Crime Prevention: Successful Case Studies*. Harrow and Heston: Roxbourne Press.
- Coser, L. A. (1956). *The functions of social conflict*. Free Press.
- Coser, L. A. (1956). *The functions of social conflict*. Free Press.
- Council of Scientific Affairs. (1983). Automobile-related injury: Components, trends, and prevention. *JAMA*, 249(20), 3216-3222.
- Council of Scientific Affairs. (1983). Automobile-related injury: Components, trends, and prevention. *JAMA*, 249(20), 3216-3222.
- Cutter, S. L. (1993). *Living with risks: Geography of technological hazards*. Edward Arnold.
- Durkheim, E. (1982). *The rules of sociological method*. Free Press.
- Durkheim, E. (1982). *The rules of sociological method*. Free Press.
- Erick, P., Massami, et al. (2014). International journal of emerging technology and advanced engineering. *International Journal of Emerging Technology and Advanced Engineering*, 4(8), 2250-2459.
- Erick, P., Massami, et al. (2014). International journal of emerging technology and advanced engineering. *International Journal of Emerging Technology and Advanced Engineering*, 4(8), 2250-2459.
- Erjem, Y. (2007). A sociological inquiry into traffic systems and traffic accidents. *International Journal of Human Sciences*, 4(1). Retrieved from <https://www.insanbilimleri.com/en>

- Erjem, Y. (2007). A Sociological inquiry into traffic systems and traffic accidents. *International Journal of Human Sciences*, 4(1). Retrieved from <https://www.insanbilimleri.com/en>
- Felson, M., & Clarke, R. V. (1979). Opportunity makes the thief: Presenting the routine activity theory of crime. *Police Quarterly*, 6(4), 71-80.
- Gaårder, P. (2006). Segregated or mixed traffic: The safety impact of bicyclist and pedestrian facilities. *Transportation Research Record*, 1937(1), 89-97.
- Jessor, R. (1987). Risky driving and adolescent problem behavior: An extension of problem-behavior theory. *Alcohol Drugs Driving*, 3(3-4), 1-11.
- Getu, S. T., Washington, S., & King, M. J. Characteristics of police-reported road traffic crashes in Ethiopia over a six-year period.
- Getu, S. T., Washington, S., & King, M. J. Characteristics of police-reported road traffic crashes in Ethiopia over a six-year period.
- Government of Nepal: Ministry of Physical Planning & Transport Management. (2013). *Nepal road safety action plan (2011-2020)*. Retrieved from <file:///C:/Users/user/Downloads/Road%20Safety%20Action%20Plan%20English.pdf>
- Government of Nepal: Ministry of Physical Planning & Transport Management. (2013). *Nepal road safety action plan (2011-2020)*. Retrieved from <file:///C:/Users/user/Downloads/Road%20Safety%20Action%20Plan%20English.pdf>
- Graham, J. D. (1993). Injuries from traffic crashes: Meeting the challenge. *Annual Review of Public Health*, 14, 515-543.
- Graham, J. D. (1993). Injuries from traffic crashes: Meeting the challenge. *Annual Review of Public Health*, 14, 515-543.
- Gulzar, S., Yahya, F., & Zafar, R. (2012). Analysis of traffic accidents at the provincial level in Pakistan. *Social Science and Humanities*, 3.

- Gulzar, S., Yahya, F., & Zafar, R. (2012). Analysis of traffic accidents at the provincial level in Pakistan. *Social Science and Humanities*, 3.
- Hakims, S., Shefer, D., Hakkert, A. S., & Hocherman, I. (1991). A critical review of macro models for road accidents. *Accident Analysis & Prevention*, 23(5), 379-400.
- Hakims, S., Shefer, D., Hakkert, A. S., & Hocherman, I. (1991). A critical review of macro models for road accidents. *Accident Analysis & Prevention*, 23(5), 379-400.
- Huang, L., Adhikary, K. P., Choulagai, B. P., Wang, N., & Poudya, A. K. (2016). Road traffic accident and its characteristics in Kathmandu Valley. *Journal of Nepal Medical Association*, 55(203), 1-6.
- Huang, L., Adhikary, K. P., Choulagai, B. P., Wang, N., & Poudya, A. K. (2016). Road traffic accident and its characteristics in Kathmandu Valley. *Journal of Nepal Medical Association*, 55(203), 1-6.
- iPeden, m., Scurfield, R., sleet, D., Mohan, D., Hyder, A. A., Jarawan, E., & Mathers, C. (Eds.). (2004). World report on road traffic injury prevention. World Health Organization.
- Johnson, P., & Lee, S. (2017). Road traffic accidents and the impact of social inequality: An examination from a conflict theory perspective. *Critical Sociology*, 43(4-5), 555-570. Retrieved from <https://doi.org/10.1177/0896920516645940>
- Johnson, P., & Lee, S. (2017). Road traffic accidents and the impact of social inequality: An examination from a conflict theory perspective. *Critical Sociology*, 43(4-5), 555-570. Retrieved from <https://doi.org/10.1177/0896920516645940>
- Jørgensen, S. H., & Abane, A. M. (1999). A comparative study of urban traffic accidents in developing and developed countries: Empirical observations and problems from Trondheim (Norway) and Accra (Ghana). *Bulletin of Ghana Geographical Association*, 21, 113-128.

- Joshi, S. K., & Shrestha, S. (2009). Road traffic accidents in Kathmandu Valley. *Journal of Nepal Medical Association*, 48(176), 301-306.
- Joshi, S. K., & Shrestha, S. (2009). Road traffic accidents in Kathmandu Valley. *Journal of Nepal Medical Association*, 48(176), 301-306.
- Karkee, R., & Lee, A. H. (2016). Epidemiology of road traffic injuries in Nepal, 2001–2013: Systematic review and secondary data analysis. *Journal of Biomedicine and Global Health Research*, 6(4).
- Karkee, R., & Lee, A. H. (2016). Epidemiology of road traffic injuries in Nepal, 2001–2013: Systematic review and secondary data analysis. *Journal of Biomedicine and Global Health Research*, 6(4).
- Komba, D. D. (2006). *Risk factors and road traffic accidents in Tanzania: A case study of Kibaha District*. Norwegian University of Science and Technology (NTNU).
- Komba, D. D. (2006). Risk factors and road traffic accidents in Tanzania: A case study of Kibaha District. Norwegian University of Science and Technology (NTNU).
- Krug, E. (2002). How can road safety be improved? The BMJ asked four experts for their views. *British Medical Journal*, 324, 1116. Retrieved from <http://bmjjournal.com/cgi/content/full/324/7346/1116>
- Kumar, P., & Srinivasan, K. (2013). A study on the demographic characteristics of road traffic accident victims at District Hospital, Karimnagar. *International Journal of Research & Development of Health*, 1, 136-140. Retrieved from <http://www.ijrdh.com/files/RTA%20article%206.pdf>
- Kumar, P., & Srinivasan, K. (2013). A study on the demographic characteristics of road traffic accident victims at District Hospital, Karimnagar. *International Journal of Research & Development of Health*, 1, 136-140. Retrieved from <http://www.ijrdh.com/files/RTA%20article%206.pdf>

- Leeming, J. J. (1969). *Road accidents: Prevent or punish? Definitions, facts and figures*. London: Cassell. Chapter 3:17-41.
- Leeming, J. J. (1969). Road accidents: Prevent or punish? Definitions, facts and figures. London: Cassell. Chapter 3:17-41.
- Leon, S. R. (1996). Reducing death on the road: The effects of minimum safety standards, unpublicized crash tests, seat belts, and alcohol. *American Journal of Public Health, 86*(1), 31-33.
- Leon, S. R. (1996). Reducing death on the road: The effects of minimum safety standards, unpublicized crash tests, seat belts, and alcohol. *American Journal of Public Health, 86*(1), 31-33.
- Limb, N., & Dwyer, C. (2001). *Qualitative methodologies for geographers: Issues and debate*. Oxford University Press.
- Limb, N., & Dwyer, C. (2001). *Qualitative methodologies for geographers: Issues and debate*. Oxford University Press.
- Majumder, B., Karmakar, R., Bose, T., Dasgupta, S., & Basu, R. (1996). Some host factors and seasonal variations in fatal road traffic accidents occurring in Eastern Suburban Calcutta. *Indian Journal of Public Health, 40*(2), 46-49.
- Majumder, B., Karmakar, R., Bose, T., Dasgupta, S., & Basu, R. (1996). Some host factors and seasonal variations in fatal road traffic accidents occurring in Eastern Suburban Calcutta. *Indian Journal of Public Health, 40*(2), 46-49.
- Marx, K., & Engels, F. (1848). *The communist manifesto*. Penguin Classics.
- Marx, K., & Engels, F. (1848). *The communist manifesto*. Penguin Classics.
- Massie, D. C., Campbell, K. L., & Williams, A. F. (1995). Traffic accident involvement rates by driver's age and gender. *Accident Analysis & Prevention, 27*(1), 73-87.

- Massie, D. C., Campbell, K. L., & Williams, A. F. (1995). Traffic accident involvement rates by driver's age and gender. *Accident Analysis & Prevention*, 27(1), 73-87.
- Mayer, J. D. (1996). The political ecology of disease as one new focus for medical geography. *Progress in Human Geography*, 20(4), 441-456.
- Mayer, J. D. (1996). The political ecology of disease as one new focus for medical geography. *Progress in Human Geography*, 20(4), 441-456.
- Moen, B. E., & Rundmo, T. (2005). Worrying about transport risks. In: Rundmo, T. & Moen, B. E. (Eds.), *Risk judgement and safety in transport*. Rotunde Publication Number 87, Trondheim.
- Moen, B. E., & Rundmo, T. (2005). Worrying about transport risks. In: Rundmo, T. & Moen, B. E. (Eds.), *Risk judgement and safety in transport*. Rotunde Publication Number 87, Trondheim.
- Muhlrad, N., & Lassarre, S. (2005). *Systems approach to injury control*. New Delhi: Macmillan India Ltd.
- Odero, W. (1995). Road traffic accidents in Kenya: An epidemiological appraisal. *East African Medical Journal*, 72(5), 295-305.
- Odero, W. (1995). Road traffic accidents in Kenya: An epidemiological appraisal. *East African Medical Journal*, 72(5), 295-305.
- Pandey, S. (2013). Nepal's highways of death. *Nepali Times*. Retrieved from <http://nepalitimes.com/article/nation/nation-nepal-highways,62>
- Pandey, S. (2013). Nepal's highways of death. *Nepali Times*. Retrieved from <http://nepalitimes.com/article/nation/nation-nepal-highways,62>
- Peden, M. (2008). *World report on child injury prevention*. Geneva: World Health Organization.
- Peden, M. (2008). *World report on child injury prevention*. Geneva: World Health Organization.

- Peden, M., Scurfield, R., Sleet, D., Mohan, D., Hyder, A. A., & Jarawan, E. (Eds.) (2004). *World report on road traffic injury prevention*. Geneva: World Health Organization. Retrieved from http://www.who.int/world-health-day/2004/info-materials/world-report/en/summary_en_rev.pdf
- Peden, M., Scurfield, R., Sleet, D., Mohan, D., Hyder, A. A., & Jarawan, E. (Eds.) (2004). *World report on road traffic injury prevention*. Geneva: World Health Organization. Retrieved from http://www.who.int/world-health-day/2004/info-materials/world-report/en/summary_en_rev.pdf
- Rai, S. K., & Bhatta, L. D.** (2020). Road traffic accidents in Pokhara Metropolitan City: Trends and contributing factors. *Journal of Nepal Health Research Council*, 18(1), 29-35. <https://doi.org/10.33314/jnhrc.v18i1.2867>
- Rengert, G. (2000). Routine activity theory, social ecology, and place-based criminology: New directions for theory and research. *Criminology*, 38(3), 969-1010.
- Rivara, F. P., & Barber, M. (1985). Demographic analysis of childhood pedestrian injuries. *Pediatrics*, 76(3), 375-381.
- Rivara, F. P., & Barber, M. (1985). Demographic analysis of childhood pedestrian injuries. *Pediatrics*, 76(3), 375-381.
- Rundmo, T., & Iversen, H. (2004). Risk perception and driving behavior among adolescents in two Norwegian countries before and after traffic safety campaign. *Science*, 42(1), 1-21.
- Rundmo, T., & Iversen, H. (2004). Risk perception and driving behavior among adolescents in two Norwegian countries before and after traffic safety campaign. *Science*, 42(1), 1-21.
- Rune, E. (2002). Human ecology: A new social science. *Teachers College Record*, 39, 488-493.
- Rune, E. (2002). Human ecology: A new social science. *Teachers College Record*, 39, 488-493.

- Rutter, J., & Quine, P. (2014). Routine activity theory and road traffic safety: A meta-analytical review. *Accident Analysis & Prevention*, 72, 271-282.
- Sampson, R. J., & Groves, W. B. (1989). Community organization and criminal behavior: Empirical tests of social disorganization theory. *American Journal of Sociology*, 94(4), 774-802.
- Sampson, R. J., & Groves, W. B. (1989). Community organization and criminal behavior: Empirical tests of social disorganization theory. *American Journal of Sociology*, 94(4), 774-802.
- Sharma, K. K. (2011). Status paper on road safety in Nepal. *Expert Group Meeting on Progress on Road Safety Improvement in Asia and Pacific*. Bangkok: UNESCAP.
- Sharma, K. K. (2011). Status paper on road safety in Nepal. *Expert Group Meeting on Progress on Road Safety Improvement in Asia and Pacific*. Bangkok: UNESCAP.
- Shaw, C. R., & McKay, H. D. (1942). *Juvenile delinquency and urban areas*. University of Chicago Press.
- Shaw, C. R., & McKay, H. D. (1942). *Juvenile delinquency and urban areas*. University of Chicago Press.
- Simons-Morton, B. G., Lerner, N., & Singer, J. (2005). The observed Influence of teenage Traveler on the risky driving behavior of teenage drivers. *Accident Analysis & Prevention*, 37(6), 973-982.
- Sjoberg, L., & Biel, A. (1983). Mood and belief-value correlations. *Acta Psychologica*, 53, 253-270.
- Slovic, P. (1987). Perception of risk. *Science*, 236, 280-285.
- Subedi, R. (2016). Emergency response in road traffic accidents: A study in Nepal. *Nepalese Journal of Health Sciences*, 10(2), 67-74.

- Subedi, S. (2016). *Pattern of road traffic accident in teaching hospital, Chitwan*.
- Subedi, S. (2016). Pattern of road traffic accident in teaching hospital, Chitwan.
- Thapa, A. (2014). *Reckless driving and road safety in Nepal*. Journal of Nepal Transport Studies, 4(3), 56-72.
- Thapa, A. J. (2013). *Road safety status of Nepal 2013*. Retrieved from http://www.unece.org/fileadmin/DAM/trans/doc/2017/wp1/newdelhi/New_Delhi_dec_2017_Nepal.pdf
- Thapa, A. J. (2013). Road safety status of Nepal 2013. Retrieved from http://www.unece.org/fileadmin/DAM/trans/doc/2017/wp1/newdelhi/New_Delhi_dec_2017_Nepal.pdf
- Thomson, R. S., Rivara, F. P., & Thomson, D. C. (1989). A case-control study of the effectiveness of safety helmets. *New England Journal of Medicine*, 320, 1361-1366.
- Tripop, R. M., & Wilde, G. J. S. (Eds.). (1994). *Challenges for accident prevention – The issue of risk compensation behaviour*. Amsterdam.
- Violant, J. M., & Marshall, J. R. (1996). Cellular phones and traffic accidents: An epidemiological approach. *Accident Analysis & Prevention*, 28(2), 265-275.
- Williams, A. F. (2003). Teenage drivers: Patterns of risk. *Journal of Safety Research*, 34(1), 5-15.
- Wikipedia. (n.d.). Chitwan District. In *Wikipedia*. Retrieved from https://en.wikipedia.org/wiki/Chitwan_District
- Wikipedia. (n.d.). Road traffic accident. In *Wikipedia*. Retrieved from https://en.wikipedia.org/wiki/Road_traffic_accident
- World Health Organization. (1984). *Road traffic accidents in developing countries*. Technical Report Series No. 73. Geneva, WHO.

World Health Organization. (2009). *Global status report on road safety: Time for action*. Geneva: World Health Organization.

World Health Organization. (2013). *World report on road traffic injury prevention*. Geneva: World Health Organization.

World Health Organization. (2015). *World report on road traffic injury prevention*. Geneva: WHO Press.

World Health Organization. (2023). *Global status report on road safety 2023*. Retrieved from <https://www.who.int/publications/i/item/9789241565684>

Wortley, R. (2004). *Situational Crime Prevention for Road Safety: Theory and Practice*. Cullompton, Devon: Willan Publishing.

APPENDIX-II: QUESTION WITH PASSENGER

1. Age:
2. Sex:
3. Ethnicity:
4. Experience of road travelling on the vehicles:
5. There is a saying that drivers are also responsible for the causation of RTA. In your opinion what are the behavioural related factors which contribute for RTA?
6. There is a saying that pedestrian are also responsible for the causation of RTA. In your opinion, what are the pedestrian related behavioural factors which contribute for RTA?
7. There is a saying that passengers are also responsible for the causation of RTA. In your opinion, what are the passenger related behavioural factors which contribute for RTA?
8. There is a saying that vehicles are also responsible for the causation of RTA. In your opinion, what are the vehicles related factors which contribute for RTA?
9. There is a saying that physical structure of road and environment is the cause of road Traffic accidents. In your opinion what are the physical structure of road and environment related factors which contribute for RTA?
10. There is a saying that rules and regulations are the cause of road Traffic accidents. In your opinion what are the rules and regulations related factors which contribute for RTA?
11. What are your recommendations/opinions to reduce traffic accidents in Chitwan District?

APPENDIX-II: QUESTION ACCIDENT VICTIMS

1. Age.....
2. Sex.....
3. Occupation.....
4. Ethnicity.....
5. There is a saying that drivers are also responsible for the causation of RTA. In your opinion what are the behavioural related factors which contribute for RTA?
6. There is a saying that pedestrian are also responsible for the causation of RTA. In your opinion, what are the pedestrian related behavioural factors which contribute for RTA?
7. There is a saying that passengers are also responsible for the causation of RTA. In your opinion, what are the passenger related behavioural factors which contribute for RTA?
8. There is a saying that vehicles are also responsible for the causation of RTA. In your opinion, what are the vehicles related factors which contribute for RTA?
9. There is a saying that physical structure of road and environment is the causation of road Traffic accidents. In your opinion what are the physical structure of road and environment related factors which contribute for RTA?
10. There is a saying that rules and regulations are the causation of road Traffic accidents. In your opinion what are the rules and regulations related factors which contribute for RTA?
11. What are your recommendations/opinions to reduce traffic accidents in Chitwan District?

APPENDIX-IV: QUESTION WITH TRAFFIC POLICE

Personal particulars

Date-----

- .1. Age.....
2. Sex-----
3. Rank-----
4. Working experience-----
5. There is a saying that drivers are also responsible for the causation of RTA. In your opinion what are the behavioralrelated factors which contribute for RTA?
6. There is a saying that pedestrian are also responsible for the causation of RTA. In your opinion, what are the pedestrian related behavioural factors which contribute for RTA?
7. There is a saying that passengers are also responsible for the causation of RTA. In your opinion, what are the passenger related behavioural factors which contribute for RTA?
8. There is a saying that vehicles are also responsible for the causation of RTA. In your opinion, what are the vehicles related factors which contribute for RTA?
9. There is a saying that physical structure of road and environment is the causation of road Traffic accidents. In your opinion what are the physical structure of road and environment related factors which contribute for RTA?
10. There is a saying that rules and regulations are the causation of road Traffic accidents. In your opinion what are the rules and regulations related factors which contribute for RTA?
11. What are your recommendations/opinions to reduce traffic accidents in Chitwan District.

APPENDIX-V: QUESTION WITH PEDESTRIANS

1. Age
2. Sex
3. Ethnicity
4. How long have you been walking around Bharatpur city?years
5. There is a saying that drivers are also responsible for the causation of RTA. In your opinion what are the behavioural factors which contribute for RTA?
6. There is a saying that pedestrian are also responsible for the causation of RTA. In your opinion, what are the pedestrian related behavioural factors which contribute for RTA?
7. There is a saying that passengers are also responsible for the causation of RTA. In your opinion, what are the pedestrian related behavioural factors which contribute for RTA?
8. There is a saying that vehicles are also responsible for the causation of RTA. In your opinion, what are the vehicles related factors which contribute for RTA?
9. There is a saying that physical structure of road and environment is the causation of road Traffic accidents. In your opinion what are the physical structure of road and environment related factors which contribute for RTA?
10. There is a saying that rules and regulations are the causation of road Traffic accidents. In your opinion what are the rules and regulations related factors which contribute for RTA?
11. What are your recommendations/opinions to reduce traffic accidents in Chitwan District?

APPENDIX-VI: QUESTION WITHEYE WITNESS

1. Age
2. Sex
2. Occupation
3. Ethnicity
4. How many road accident Did you see?
5. There is a saying that drivers are also responsible for the causation of RTA. In your opinion what are the behavioural factors which contribute for RTA?
6. There is a saying that pedestrian are also responsible for the causation of RTA. In your opinion, what are the pedestrian related behavioural factors which contribute for RTA?
7. There is a saying that passengers are also responsible for the causation of RTA. In your opinion, what are the pedestrian related behavioural factors which contribute for RTA?
8. There is a saying that vehicles are also responsible for the causation of RTA. In your opinion, what are the vehicles related factors which contribute for RTA?
9. There is a saying that physical structure of road and environment is the causation of road Traffic accidents. In your opinion what are the physical structure of road and environment related factors which contribute for RTA?
10. There is a saying that rules and regulations are the causation of road Traffic accidents. In your opinion what are the rules and regulations related factors which contribute for RTA?
11. What are your recommendations/opinions to reduce traffic accidents in Chitwan District

APPENDIX-VII: QUESTION WITH ROAD DIVISION OFFICE

1. Age.....
2. Rank..... Date-----
3. Ethnicity
4. Working experience-----
5. There is a saying that drivers are also responsible for the causation of RTA. In your opinion what are the driver related behavioural factors which contribute for RTA?
6. There is a saying that pedestrian are also responsible for the causation of RTA. In your opinion, what are the pedestrian related behavioural factors which contribute for RTA?
7. There is a saying that passengers are also responsible for the causation of RTA. In your opinion, what is the passenger related behavioural factors which contribute for RTA?
8. There is a saying that vehicles are also responsible for the causation of RTA. In your opinion, what are the vehicles related factors which contribute for RTA?
9. There is a saying that physical structure of road and environment is the causation of road Traffic accidents. In your opinion what are the physical structure of road and environment related factors which contribute for RTA?
10. There is a saying that rules and regulations are the causation of road Traffic accidents. In your opinion what are the rules and regulations related factors which contribute for RTA?
11. What are your recommendations/opinions to reduce traffic accidents in Chitwan District?

APPENDIX-VIII: QUESTION WITH DRIVER

1. Age
2. Sex
3. Ethnicity
4. Job Experience
5. There is a saying that drivers are also responsible for the causation of RTA. In your opinion what are the behavioural related factors which contribute for RTA?
6. There is a saying that pedestrian are also responsible for the causation of RTA. In your opinion, what are the pedestrian related behavioural factors which contribute for RTA?
7. There is a saying that passengers are also responsible for the causation of RTA. In your opinion, what are the passengers related behavioural factors which contribute for RTA?
8. There is a saying that vehicles are also responsible for the causation of RTA. In your opinion, what are the vehicles related factors which contribute for RTA?
9. There is a saying that physical structure of road and environment is the causation of road Traffic accidents. In your opinion what are the physical structure of road and environment related factors which contribute for RTA?
10. There is a saying that rules and regulations are the causation of road Traffic accidents. In your opinion what are the rules and regulations related factors which contribute for RTA?
11. What are your recommendations/opinions to reduce traffic accidents in Chitwan District?

APPENDIX-IX: QUESTION WITH LOCAL GOVERNMENT

Personal particulars

1. Sex-----
2. Rank-----
3. Ethnicity
4. Working experience----
5. There is a saying that drivers are also responsible for the causation of RTA. In your opinion what are the behavioral related factors which contribute for RTA?
6. There is a saying that pedestrian are also responsible for the causation of RTA. In your opinion, what are the pedestrian related behavioral factors which contribute for RTA?
7. There is a saying that passengers are also responsible for the causation of RTA. In your opinion, what are the passengers related behavioral factors which contribute for RTA?
8. There is a saying that vehicles are also responsible for the causation of RTA. In your opinion, what are the vehicles related factors which contribute for RTA?
9. There is a saying that physical structure of road and environment is the causation of road Traffic accidents. In your opinion what are the physical structure of road and environment related factors which contribute for RTA?
10. There is a saying that rules and regulations are the causation of road Traffic accidents. In your opinion what are the rules and regulations related factors which contribute for RTA?
11. What are your recommendations/opinions to reduce traffic accidents in Chitwan District?

APPENDIX-X: GLIMPSES DURING DATA COLLECTION





Some Photoes of Road Accident in Chitwan District in Different Time