

PITFALLS OF TRAFFIC SAFETY ENFORCEMENT IN SRI LANKA

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Abstract: Road traffic accidents continue to be a critical safety issue in Sri Lanka, with human-related errors contributing significantly to injuries and fatalities. This study investigates the behavioural factors that lead to accidents by examining both driver and pedestrian mistakes from a male perspective. A mixed-methods design was adopted, combining field observations with a structured questionnaire administered to 90 male participants from the Ampara and Kalmunai regions. Observed behaviours were quantified using the Relative Importance Index (RII) and evaluated through a risk-impact analysis to determine the likelihood and severity of specific errors. The findings highlight several high-risk behaviours requiring urgent attention. Among male pedestrians, failing to yield outside crosswalks, distracted walking, and disregarding school-zone rules emerged as the most critical mistakes. Male driver-related risks included sudden braking, tailgating, late signalling, and overconfidence in driving skills. Pedestrians also frequently overlooked approaching vehicles while crossing or exited vehicles before they fully stopped. These behaviours collectively create substantial accident risks across urban and suburban settings. The study suggests targeted behavioural interventions, enhanced public awareness, and stricter enforcement of school-zone regulations to reduce preventable accidents and improve transportation safety.

Keywords: *Government; Safety; Traffic; Transportation; Sri Lanka.*

1. Introduction

Transportation means the movement of human beings, animals and goods from origin to destination by any mode of transport, including air, land, water, pipeline and cable. Sri Lanka's transportation networks, including road, rail, bus, trucking, and IWT, follow colonial economic paradigms (Kumarage, 2012). When it comes to transportation, safety plays a significant role at any time due to the involvement of humans. Transportation safety planning (TSP) has emerged as a leading subject in transportation research during the last decade. TSP requires a credible technique for forecasting the safety potential of alternative transportation planning systems (Dong, Huang, & Xu, 2012). As it is mentioned in the statistics of the World Health Organisation, with gathered information from 180 countries worldwide, the total number of road traffic deaths amounts to 1.25 million per year, with the highest road traffic fatality rates in low-income countries and between 20-50 million more people suffer non-fatal injuries, with many incurring a disability due to road accidents annually. (WHO, Global status report on road safety, 2015). Nearly half of those who die in road accidents are vulnerable road users: pedestrians, cyclists and motorcyclists (WHO, Top ten causes of death, Fact Sheet, 2015). It is a well-known fact that currently road traffic accidents are the 10th cause of leading cause of death in low-income countries, and it is anticipated to become the seventh leading cause of death by 2030. Furthermore, according to WHO data, the estimated number of road traffic deaths in 2013 was 3691, and the estimated road traffic death rate per 10000 population in the same year was 17.4.

This research specifically focuses on the male perspective of road user behaviour, examining how male drivers and pedestrians contribute to traffic accidents. By analysing the mistakes and compliance of male road users, this study aims to understand the behavioural factors leading to accidents and identify interventions to improve transportation safety. This focus provides an initial, in-depth understanding of one segment of road users, forming a foundation for future research that will include female perspectives and enable a comprehensive analysis of behavioural risks.

2. Literature Review

2.1. SAFETY

Safety is a very important factor to consider in any situation; on the other hand, until a dangerous situation or chances of trapping at risk arise, it remains hidden to the environment. (Oliver, 2021). So, it is true that no use in a situation where the safety does not stand a chance to prove its true meaning. Therefore, safety must take its place before something occurs. First of all, it is important to identify the basic keywords which are to be expressed in deeply through the later paragraphs. Risk is the assessment, expressed in terms of predicted probability and severity, of the consequences of a hazard, taking as

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reference the worst foreseeable situation (Flynn, 2021) while safety refers to the state in which the risk of harm to persons or property damage is reduced to, and maintained at or below, an acceptable level through a continuous process of hazard identification and risk management.

2.2. TRANSPORT SAFETY

Nowadays, humans seek to increase mobility to save some time for other activities (Zhang et al., 2017). When the mobility increases, then risky situations also arise to follow humans without knowing to their knowledge. As a result, the accidents that arise each and every day would be uncontrollable even though the government implements several control plans and programs continuously. As a revolution in transport, several modes and media are now available to choose from, so everyone can have several choices to travel from here to there. The transportation industry has developed so many techniques and facilities to this level; at the same time, this industry has always sought a way to control the risk it creates (Selishchev et al., 2025). Even though the government implements several safety precautions each time the need for new ideas and techniques to ensure safety in the transport industry increases heavily. It takes needed lot of practice to implement such safety controls, which would make the process a long-term journey (Borodavko et al., 2020). Zero accidents are considered in implementing the safety standards in every aspect (Zwetsloot et al., 2017), but on the other hand, the outcomes of such implementations give us the adverse effect, and it even gets worse yearly.

2.1.1 Factors increasing transport safety

Transportation accidents are a serious public health hazard. According to recent statistics, approximately 1.24 million people die on the world's roads each year, with another 20 to 50 million people suffering non-fatal injuries. To reduce the hazards connected with road accidents for all users, employers of occupational drivers must be encouraged to improve their organisation's safety standards (Nævestad, Hesjevoll, & Phillips, 2018). The following Figure 1 outlines the key factors contributing to improved transport safety, offering insights that may be gained by adopting safety management strategies from more advanced and regulated transport sectors.

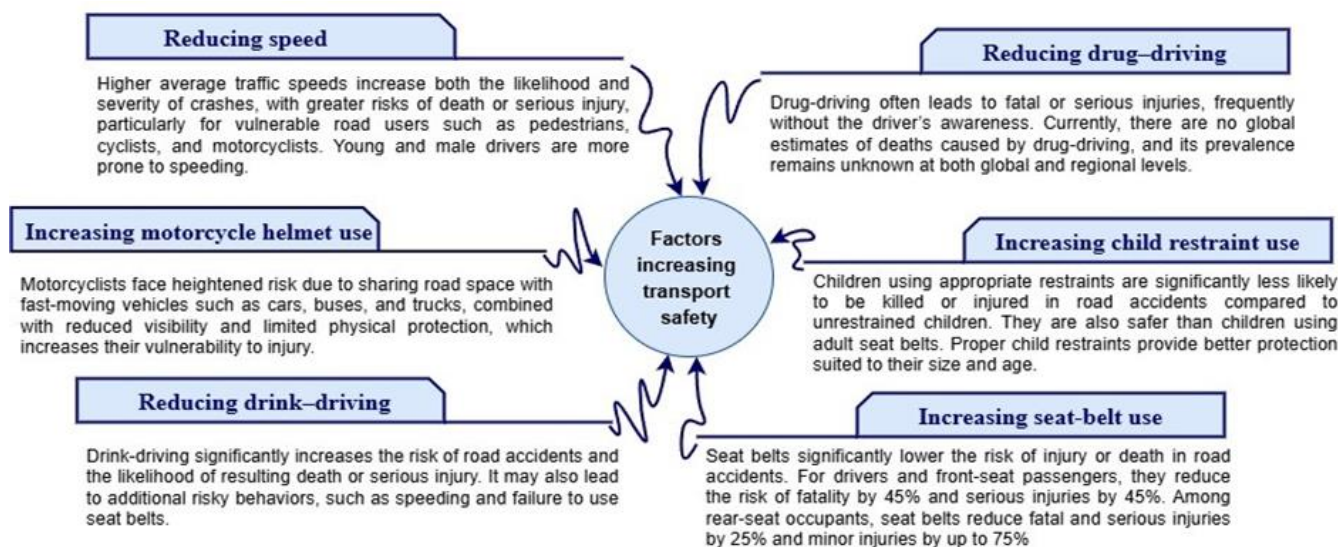


Figure 1: Factors increasing transport safety

Figure 1 highlights key factors that contribute to improving transportation safety: reducing speed, increasing motorcycle helmet use, reducing drunk and drugged driving, and encouraging the use of seat belts and child restraints. Each element focuses on specific dangers, such as accident severity, visibility, impaired driving, and inadequate protection, and stresses focused strategies to prevent fatalities and serious injuries, particularly among vulnerable road users.

2.3. ACCIDENT

Road traffic accidents have arisen as a significant public health concern that has to be addressed through a multidisciplinary approach. (Gopalakrishnan, 2012). An accident is an unplanned and unexpected incident that harms the individual concerned, resulting in both direct and indirect outcomes. Direct effects are quick and visible, such as physical injuries or property damage, but indirect repercussions, such as income loss and recuperation time, are less obvious and may appear later, but have a greater long-term impact. In Sri Lanka, there were 2498 fatal accidents reported by the Police in 2011. There is an increase from 1,963 in 2000. With the inauguration of the Decade of Road Safety in 2011, the RDA has decided that it has become necessary to emphasise proactive measures to improve the safety of road operations. The National Council for Road Safety, which reports to the Ministry of Transport and Highways, reported a minor but constant decrease in road accident-related deaths, injuries, and damages from 2019 to 2022, as shown in Figure 2 (Ginige, 2024).

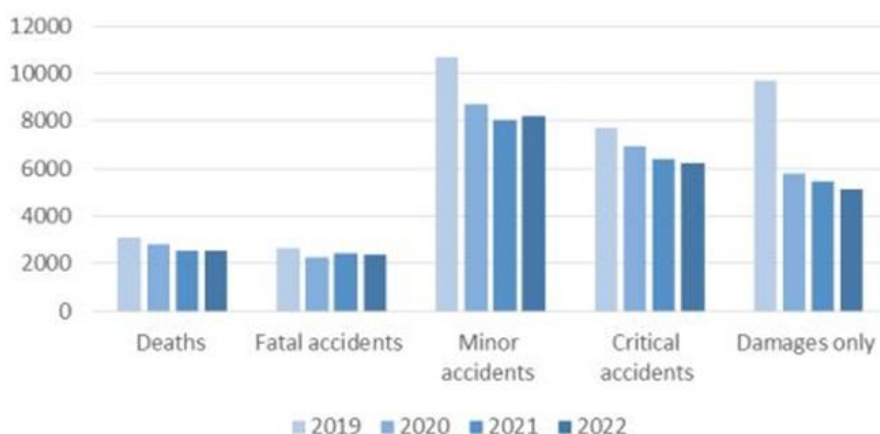


Figure 2: Road Accident Statistics from 2019 to 2022
(Source: National Council for Road Safety, Ministry of Transport & Highways)

Despite this general improvement, statistics from 2022 reveal that motorcyclists (820 deaths) and pedestrians (792 deaths) are still the most susceptible categories, followed by passengers (314 deaths), highlighting the need for focused safety measures for these road users. (Ginige, 2024). In addition, according to the Traffic Police Division, Sri Lanka has had persistently high road accident rates over the last five years, with several fatalities and reckless driving. In 2020, there were 23,704 accidents and 2,363 deaths, with a slight decrease in accidents in 2021 (22,847) but an increase in deaths to 2,557. While accidents decreased further in 2022 to 21,953, deaths remained high at 2,540. In 2023, there was a spike of 24,894 accidents, but deaths fell to 2,341. In 2024, accidents peaked at 25,299, with 2,521 deaths. From January to April 2025, there were 802 fatal accidents reported, resulting in 845 fatalities. These incidents are not primarily the fault of drivers; various other unintentional causes contribute to their occurrence. The impact of such elements is important and should not be underestimated. With good management and preventive actions, these dangers may be reduced, making roadways safer. Table 1 presents a full analysis of these significant elements.

Table 1: Factors impacting the road accident.

Factor	Detail
Engineering failures	Engineering failures of vehicles are unavoidable causes of accidents in some situations, but their impact can be greatly reduced through proper and regular maintenance. Issues like brake failure and tyre blowouts are common examples, and addressing them proactively can help ensure a much safer journey.
Poor infrastructure design and maintenance	Failure to follow minimum safety standards in infrastructure design, along with improper or poor maintenance systems, can significantly increase the risk of accidents. Ensuring well-planned designs and consistent upkeep is essential for creating a safer road environment.
Human errors	Human errors or mistakes, such as crossing a road without noticing an oncoming vehicle, can lead to accidents. Adhering to established safety standards and procedures is essential to prevent such incidents and ensure the safety of all road users.
Unavoidable nature	This type of accident is often unavoidable; however, advancements in technology can play a crucial role in significantly reducing its impact and enhancing overall road safety.

2.4. SAFETY MANAGEMENT

A country's road safety performance may be quantified using a variety of measures, including death or fatality rates in a particular year, as measured per million people or per million vehicle-kilometres travelled. It can also be assessed by observing changes over time, such as the percentage decrease or average annual change in accidents and fatalities over a decade. (Papadimitriou & Yannis, 2013). Safety management is considered managing activities and applying principles, framework, and processes to help and prevent accidents, injuries and to minimise other risks. Therefore, the safety management is a system which widely considers reducing the risk of accidents in any mode of transport.

2.4.1 Safety Management System

A safety management system is a systematic approach to safety management that includes developing clear organisational structures, defining accountability and responsibilities, and implementing complete policies and procedures to enable successful safety management. (ICAO, 2018). Figure 3 shows the Safety Management System Framework.

While establishing the rationale for the Safety Management System (SMS) framework, it becomes clear that effective safety performance can only be achieved through a combination of key elements: (1) proper implementation of safety regulations, (2) strong leadership, (3) comprehensive safety planning, (4) strict compliance with safety standards, (5) continuous performance measurement, (6) thorough risk assessment, (7) regular safety inspections, and (8) the promotion

of a strong (Khalid, Sagoo , & Benachir, 2021). Comparative studies show significant variation in how SMS frameworks are operationalised. For example, some researchers highlight the effectiveness of behaviour-based safety and safety climate assessments, whereas others emphasise the importance of organisational culture, leadership commitment, and worker engagement (Zhang et al., 2017).

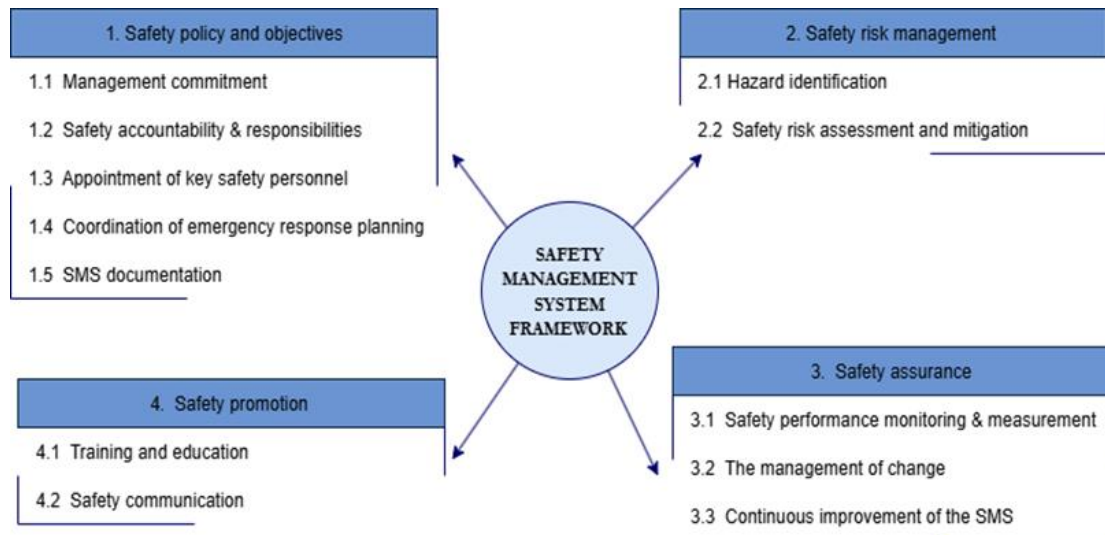


Figure 3: Safety Management System Framework for developing clear organisational structures (Source: (ICAO, 2018))

2.5. RISK MANAGEMENT

Project Risk Management is a systematic technique for detecting, assessing, and responding to project risks to maximise opportunities while minimising dangers. Its primary purpose is to increase the probability and effect of good occurrences while decreasing the possibility and impact of negative ones, hence raising the odds of project success. Effective risk management ensures that potential problems are addressed proactively, not reactively (Project Management Institute, 2017).

2.5.1 Risk Management processes

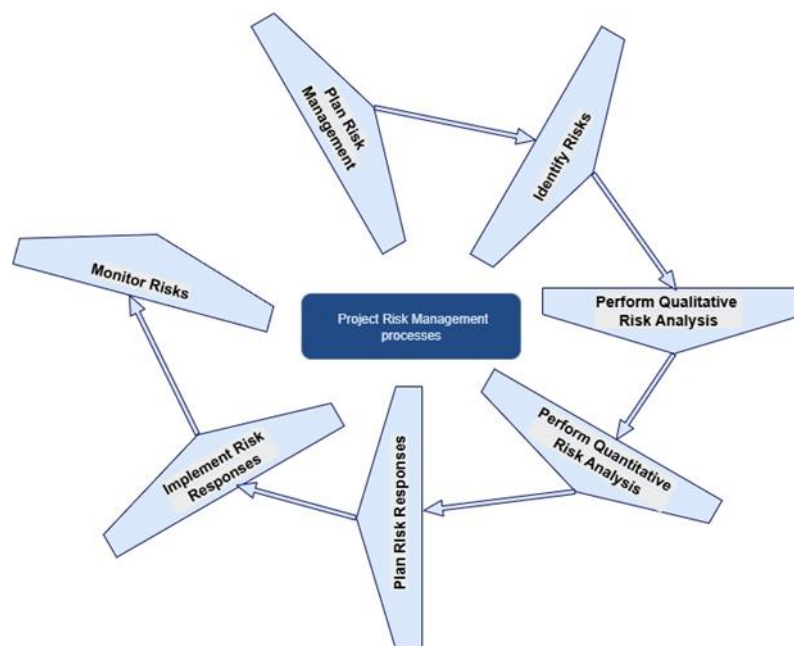


Figure 4: Project Risk Management processes (Source: (Project Management Institute, 2017))

As shown in Figure 4, the process is divided into seven key steps: planning how risk activities will be managed (Plan Risk Management), identifying specific risks and their sources (Identify Risks), assessing their likelihood and impact (Perform Qualitative Risk Analysis), and performing quantitative risk analysis. It also includes designing and choosing risk response strategies (Plan Risk Responses), putting those strategies into action (Implement Risk Responses), and regularly evaluating and analysing risks and response effectiveness (Monitor Risks). These techniques guarantee that risk management is incorporated throughout the project lifetime.

Risk identification is identifying all potential dangers associated with a scenario, then filtering those hazards to determine the real risks. These highlighted hazards may differ based on cultural norms, individual or group behaviour, industrial procedures, and regulatory compliance.

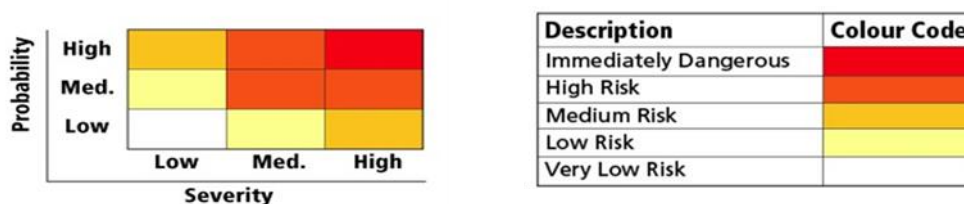


Figure 5: Risk analysis matrix

Risk assessment, on the other hand, is a two-step procedure that entails risk analysis and evaluation. After identifying the hazards, they are evaluated based on their potential severity and likelihood of occurrence. A risk analysis matrix, as shown in Figure 5, is often used to prioritise hazards based on their effect and probability, allowing for more informed risk management decisions. Following the first evaluation with the risk analysis matrix, the results are further reviewed by grading each discovered risk according to its severity and likelihood. This rating approach helps to prioritise risks, allowing project teams to focus on the most serious concerns first. This method of arranging hazards allows for more efficient resource allocation and the development of suitable response plans for successful risk reduction.

Although prior studies have examined behavioural factors, technological solutions, and SMS separately, there is limited integration of these elements within a unified framework that reflects real-world conditions. Evidence from low- and middle-income contexts, such as Sri Lanka, also remains scarce despite the disproportionately high burden of road accidents in these regions. Furthermore, pedestrian behaviour, youth risk patterns, and contextual influences on safety interventions remain underexplored, with few studies employing mixed-method or longitudinal approaches to understand these issues in depth. By combining qualitative insights with quantitative analysis, this study contributes to a more holistic understanding of road-user behaviours and risk factors. It provides contextual evidence that can inform targeted interventions, strengthen policy development, and enhance the effectiveness of safety management strategies aimed at reducing road accidents and improving public safety outcomes.

3. Research Methodology

This study employs a mixed-methods research design, integrating both qualitative and quantitative approaches to comprehensively examine road-user behaviour and its impact on transportation safety. The combination of these methods allows for a more holistic understanding, where qualitative insights inform the quantitative analysis and provide context to observed patterns. (Schoonenboom, 2023). The research aims to identify the key behavioural mistakes of drivers and pedestrians, evaluate their likelihood and severity, and determine their contribution to road accidents.

Qualitative methods were employed to observe real-world behaviours and uncover errors that may not be reported in surveys. Quantitative methods were subsequently applied to measure the relative significance of these behaviours using structured questionnaires. The study specifically focuses on traffic safety from a male perspective, serving as an initial phase of the broader research. The sample comprised 90 male participants representing various road-user categories, including pedestrians, private-personal drivers, private-family drivers, public transport users and drivers, and business owners.

3.1. DATA COLLECTION

The questionnaire is frequently regarded as the foundation of data gathering in a survey operation. Three essential criteria were highlighted during the design process: simplicity, clarity, and congruence with typical thought processes. The questions were specifically designed to be straightforward, intelligible, and properly organised to represent the respondents' mental processes. Some participants were able to answer on their own, while others required a more participatory, spoken approach. In such circumstances, explanatory remarks were added to the questions to improve clarity and efficacy of data collection. This participatory strategy proved to be quite effective in the field.

To evaluate the data, the Relative Importance Index (RII) approach was used, which computes the relative significance of each element based on weighted replies. The RII readings were then classified into three significance categories (Low, Medium, and High) based on prescribed ranges. Data was interpreted using RII, and the results were visually portrayed with charts and diagrams. The following equation (Equation 1) is used to determine the RII:

$$RII = \frac{\sum w}{A \times N} \quad \text{Equation (1)}$$

Where:

- $\sum w$ = Sum of the weights assigned to each factor by the respondents
- A = Highest possible weight (e.g., 3 or 4 depending on the scale used)
- N = Total number of respondents

4. Research Findings and Analysis

In this case, the risk and impact analysis approach was employed to assess the data collected from the questionnaire. The analysis relied heavily on the responses. The error identification was derived based on the observation of road users, and data was collected from randomly selected persons.

4.1. QUALITATIVE DATA ANALYSIS

The first phase in data collection was to observe road users and detect behavioural mistakes. The author, armed with prior knowledge from literature, was sent to a certain area to undertake this observation. After several hours of fieldwork, several faults were discovered only by human observation, offering a greater understanding of real-world behaviours. The results are summarised in Table 2.

Table 2: Mistakes of drivers and non-drivers

Road users	Mistakes
Driver	Sudden break
	Excessive high or low speed
	Forcing a vehicle to pull over
	Improper passing
	Tailgating
	Lack of cooperation with others
	Signalling a turn too late
	Forgetting to turn off the turn signal
	Driving while distracted
	Glaring or verbal abuse of one another
	Possessing superior driving skills
	Failure to follow school zone practices
	Sustained horn honking
	Ignoring the school zone on the weekend
	Pursuing another vehicle
	Speeding up while raining
Non-Driver	Not watching for the second vehicle while crossing the road.
	Walking with distractions
	Sudden cross at the pedestrian cross
	Lack of communication with children
	Pressuring or distracting drivers
	Getting down before a vehicle stops
	Not yielding the right-of-way to a vehicle while crossing outside a crosswalk.
	Running while raining when crossing the road

The survey highlighted some common errors made by both drivers and non-drivers. Drivers regularly participated in activities such as unexpected braking, incorrect passing, tailgating, excessive speeding, inattentive driving, and disregarding school zone laws. They also had poor communication skills, such as delayed or forgotten signals and hostile gestures. Non-drivers, on the other hand, were more likely to engage in risky crossing behaviours, be distracted when walking, fail to yield, and communicate poorly, particularly with youngsters. These practices all contribute to higher road safety concerns.

4.2. QUANTITATIVE DATA ANALYSIS

The analysis of survey data is a significant component of the research. In this study, participants were asked to score numerous mistakes based on their own conduct or previous experiences. This method enabled the collection of subjective yet useful insights that reflected individual perspectives and patterns of behaviour.

4.2.1 Mistakes of Responding Drivers with Respect to Low, Medium and High Levels

The bar chart in Figure 6 illustrates the likelihood and impact of various driver-related road mistakes. Some behaviours, such as signalling a turn too late, forgetting to turn off the signal, and pursuing another vehicle, show a high likelihood of occurrence but relatively lower impact, indicating that while these actions are common, they may not always lead to severe consequences. On the other hand, actions like ignoring school zones on weekends, tailgating, failing to follow school zone

practices, and possessing superior driving skills (which may reflect overconfidence) demonstrate high impact despite a more moderate likelihood, suggesting these behaviours could lead to serious incidents when they do occur.

Certain mistakes—such as sudden braking, tailgating, verbal abuse, and pursuing another vehicle exhibit both high likelihood and high impact, making them particularly concerning for road safety. Meanwhile, some errors like driving while distracted, glaring or verbal abuse, and speeding up while raining score lower in both likelihood and impact. Overall, the chart offers a clear view of which risky driving behaviours are both common and dangerous, helping prioritise areas for intervention and awareness.

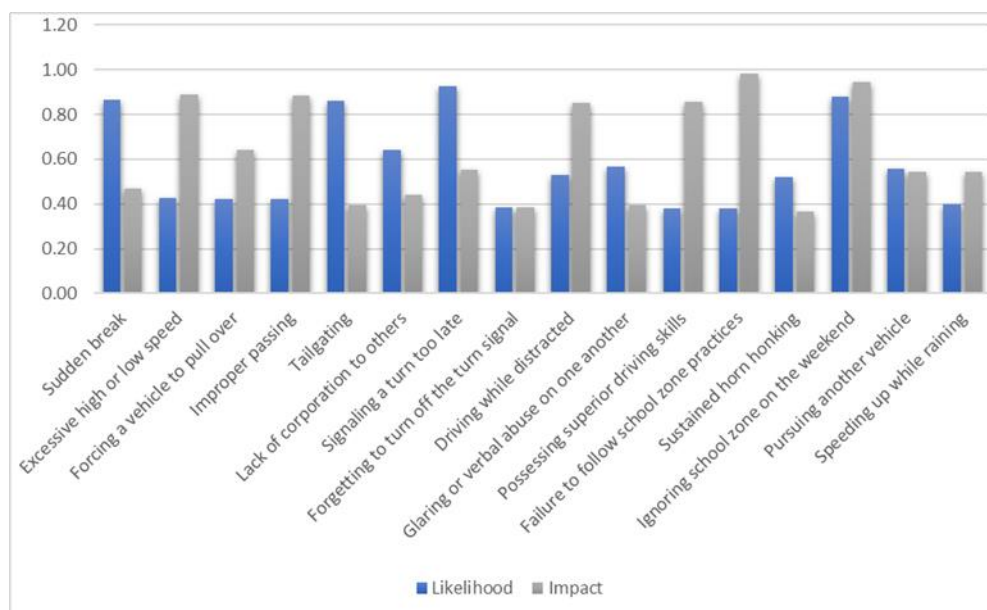


Figure 6: Mistakes of responded drivers

4.2.2 Mistakes of non-drivers in response to low, medium and high levels

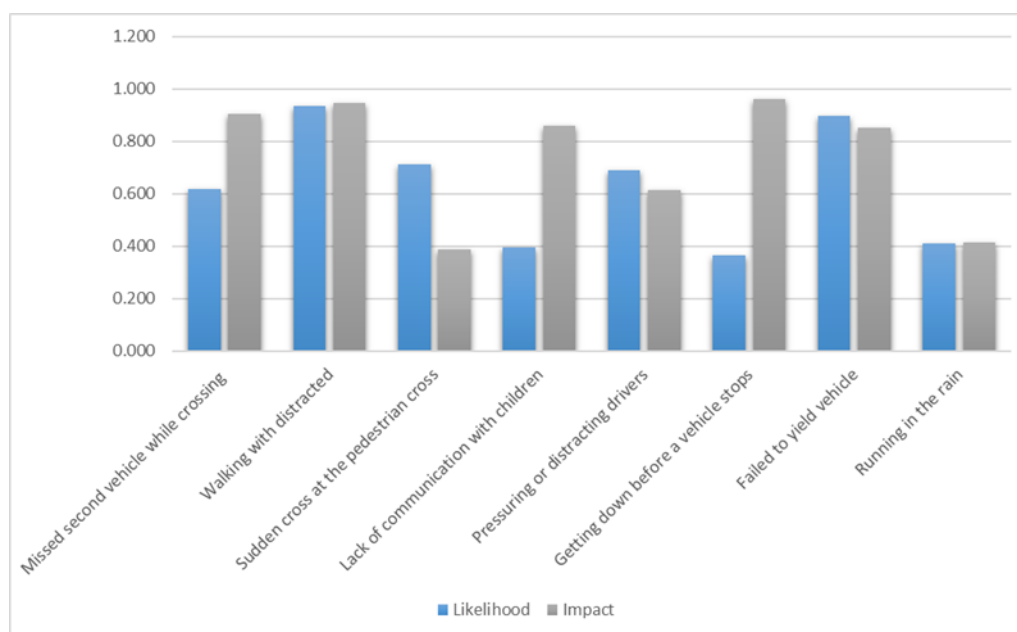


Figure 7: Mistakes of responded non-drivers

The bar chart in Figure 7 depicts the probability and severity of numerous non-driver (pedestrian) mistakes in road use. Walking while inattentive and unexpected crossings in pedestrian zones have a high likelihood and effect, showing that they are common and dangerous. Similarly, neglecting to yield to cars and pressing or distracting drivers have a significant

influence, but less frequently. These activities represent significant risks to pedestrian safety and necessitate specialised awareness campaigns.

On the other side, mistakes such as jogging in the rain, getting down before a car stops, and failing to communicate with youngsters have a lower chance and moderate to low effect, implying that they are less common or less harmful. Overall, the figure shows that pedestrian distraction and unexpected movements are among the most harmful behaviours, both in terms of frequency and severity, underlining the need for better pedestrian education and behaviour monitoring.

4.2.3 Mistakes of the driver as ranked according to risk and impact analysis

The below Table 3, categorises numerous road user mistakes based on their frequency and severity, assisting in risk prioritisation. Some habits, such as disregarding school zones on weekends, are both extremely likely and severe, signalling immediate worry. Others, such as tailgating and indicating a turn too late, are quite likely but range in severity.

Several mistakes, such as driving at extreme speeds, while distracted, and with better driving abilities (often reflecting overconfidence), have a high severity but a low or medium likelihood. In contrast, actions such as staring or verbal abuse, as well as sustained horn honking, have a medium chance with a low severity, indicating that they are prevalent but less threatening. This matrix promotes focused interventions by emphasising which acts represent the highest risk in terms of frequency and possible harm.

Table 3 Mistakes of the driver as ranked according to risk and impact analysis

Mistakes	Likelihood	Severity
Sudden break	High	Low
Excessive high or low speed	Low	High
Forcing a vehicle to pull over	Low	Med.
Improper passing	Low	High
Tailgating	High	Low
Lack of cooperation with others	Med.	Low
Signalling a turn too late	High	Med.
Failing to turn off the turn signal	Low	Low
Driving while distracted	Med.	High
Glaring or verbal abuse of one another	Med.	Low
Possessing superior driving skills	Low	High
Failure to follow school zone practices	Low	High
Sustained horn honking	Med.	Low
Ignoring the school zone on the weekend	High	High
Pursuing another vehicle	Med.	Med.
Speeding up while raining	Low	Med.

4.2.4 Mistakes of non-driver as ranked according to risk and impact analysis

The below Table 4 ranks various pedestrian blunders according to their probability and severity. Walking while inattentive and failing to yield to automobiles are examples of high-risk activities since they are both likely and severe. Missing a second car when crossing, failing to communicate with children, and getting down before a vehicle stops are all deemed high severity, even if their chance ranges from medium to low. Pressuring or distracted drivers have a medium chance and medium severity, but a sudden cross at a pedestrian crossing has a medium likelihood but low severity. Finally, jogging in the rain is classified as a low-probability, low-severity mistake.

Table 4: Mistakes of non-drivers as ranked according to risk and impact analysis

Mistakes	Likelihood	Severity
Missed the second vehicle while crossing	Med.	High
Walking with distractions	High	High
Sudden cross at the pedestrian cross	Med.	Low
Lack of communication with children	Low	High
Pressuring or distracting drivers	Med.	Med.
Getting down before a vehicle stops	Low	High
Failed to yield vehicle	High	High
Running in the rain	Low	Low

5. Discussion

The study identified three road-user errors as immediately risky due to their high risk levels: failing to yield while crossing outside crosswalks, walking while distracted, and ignoring school zones on weekends. Other observed hazards were distributed across high, medium, and low-risk categories, with low-risk behaviours remaining limited. Several errors, including abrupt crossing in pedestrian zones, late turn signalling, overconfidence in driving, tailgating, and sudden braking, were observed more than ten times. Notably, younger drivers committed most of these errors, suggesting a possible age-related trend in unsafe driving behaviour, which aligns with findings from Gopalakrishnan (2012) and Nævestad et al. (2018), who noted that younger drivers often exhibit higher-risk behaviours.

The study used a three-stage methodology: identifying errors through observation, expert advice, and literature review; gathering data via questionnaires; and evaluating findings using risk–impact assessments. High-frequency behaviours such as using mobile phones while walking, eating, drinking, and group conversations among pedestrians were identified as immediate risks. Literature supports these findings; for instance, Flynn (2021) emphasised that distraction significantly increases accident likelihood. Pedestrian urgency and mood also influenced crossing outside crosswalks, echoing prior research highlighting behavioural factors in transport safety (Selishchev et al., 2025; Zhang et al., 2017).

Driver-related high-risk behaviours included late signalling, distracted driving, tailgating, and failure to check for other vehicles while crossing. Although some errors occurred only once in this study, they are likely to happen frequently in real-world settings, reinforcing the need for continuous awareness and preventive measures (Borodavko et al., 2020; Zwetsloot et al., 2017). Overall, these observations demonstrate that seemingly minor behaviours can have substantial consequences on road safety, emphasising the importance of behavioural interventions, education, and policy measures.

6. Conclusion and Recommendations

This study highlighted critical behavioural errors among male road users that significantly contribute to traffic safety risks in Sri Lanka. The most hazardous behaviours included failing to yield outside crosswalks, distracted walking, and ignoring school zones on weekends. Other high-risk driver behaviours, such as late signalling, tailgating, and overconfidence, were also identified. Younger drivers were more prone to unsafe practices, emphasising the need for targeted interventions. These findings underline the necessity of focusing on human behavioural factors to reduce accidents and improve overall transportation safety. Following the completion of this research, numerous prospective areas for further investigation were discovered. One important area of focus is the development of novel techniques to improve pedestrian and driver safety and minimise road accidents. Another critical area is the implementation and enforcement of rules and regulations expressly designed to reduce frequent road user mistakes. Finally, the study suggests developing and implementing effective countermeasures to reduce the frequency and severity of road user risks, thereby contributing to long-term road safety improvements.

7. References

- Borodavko, L., Rusakova, O., Golovan, S., & Semenova, E. (2020). Financial risk management of the transport industry. IOP Conference Series: Materials Science and Engineering, 753(5), 052052. <https://doi.org/10.1088/1757-899X/753/5/052052>
- Dong, N., Huang, H., & Xu, P. (2012). Transportation safety planning: A spatial analysis approach. Transportation Research Board Annual Meeting 2013.
- Flynn, A. M. (2021). Hazard risk assessment. In *Introduction to Environmental Management* (pp. 339–349). CRC Press. <https://doi.org/10.1201/9781003171126-44>
- Ginige, S. (2024). Weekly epidemiological report. Epidemiology Unit, Ministry of Health, Sri Lanka.
- Gopalakrishnan, S. (2012). A public health perspective on road traffic accidents. *Journal of Family Medicine and Primary Care*. <https://doi.org/10.4103/2249-4863.104987>
- ICAO. (2018). Safety management manual. International Civil Aviation Organisation.
- Khalid, U., Sagoo, A., & Benachir, M. (2021). Safety Management System (SMS) framework development – Mitigating the critical safety factors affecting health and safety performance in construction projects. *Safety Science*.
- Kumarage, A. S. (2012). Sri Lanka transport sector policy note. World Bank.
- Nævestad, T.-O., Hesjevoll, I. S., & Phillips, R. O. (2018). How can we improve safety culture in transport organisations? A review of interventions, effects and influencing factors. *Transportation Research Part F: Traffic Psychology and Behaviour*, 28–46.

Oliver, A. (2021, October 7). Bridge failure and public perception of safety: Managing situations the public sees as dangerous. Footbridge 2022, Madrid: Creating experience. <https://doi.org/10.24904/footbridge2022.213>

Papadimitriou, E., & Yannis, G. (2013). Is road safety management linked to road safety performance? *Accident Analysis & Prevention*, 593–603.

Project Management Institute. (2017). A guide to the project management body of knowledge (PMBOK guide). Project Management Institute.

Schoonenboom, J. (2023). The fundamental difference between qualitative and quantitative data in mixed methods research. *Forum: Qualitative Social Research*.

Selishchev, S. V., Tryukhan, O. M., & Ukrainskyi, Y. O. (2025). Risk management in transport and logistics enterprises. *Business Inform*, 2(565), 337–342. <https://doi.org/10.32983/2222-4459-2025-2-337-342>

WHO. (2015). Global status report on road safety. World Health Organisation.

WHO. (2015). Top ten causes of death: Fact sheet. World Health Organisation.

Zhang, J., Fiers, P., Witte, K., Jackson, R., Poggensee, K., Atkeson, C., & Collins, S. (2017). Human-in-the-loop optimisation of exoskeleton assistance during walking. *Science*, 356, 1280–1284. <https://doi.org/10.1126/science.aal5054>

Zwetsloot, G. I. J. M., Kines, P., Ruotsala, R., Drupsteen, L., Merivirta, M.-L., & Bezemer, R. A. (2017). The importance of commitment, communication, culture and learning for the implementation of the Zero Accident Vision in 27 companies in Europe. *Safety Science*, 96, 22–32. <https://doi.org/10.1016/j.ssci.2017.03.001>