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Awareness on the Use of the Outer Lane for the Safety of Motorcycle Riders of Criminology Students

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ABSTRACT

This study investigates the awareness of criminology students at Nueva Ecija University of Science and Technology (NEUST) regarding the use of outer lanes to enhance motorcycle safety. Motorcycle-related accidents are a significant global concern, and proper lane usage is a critical factor in improving rider safety. Despite various advancements in road safety and regulations, the importance of outer lanes for motorcycles remains insufficiently emphasized. Using a quantitative research design, this study surveyed 100 criminology students who ride motorcycles, examining their understanding of traffic laws regarding outer-lane use. The results indicate a generally high awareness of the role of outer lanes in improving safety, with respondents particularly recognizing their importance for slow-moving vehicles. However, awareness regarding specific regulations, such as speed limits in the outer lane, was less pronounced. The findings suggest that further educational efforts, particularly on speed limits and specific traffic laws, are necessary to enhance motorcycle riders' overall safety awareness. The study recommends targeted campaigns and community outreach to address awareness gaps and improve compliance with safety regulations among motorcycle riders.

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Introduction

Motorcycle safety is a global concern, as motorcycle-related accidents remain one of the leading causes of fatalities on roads. A key strategy for reducing risks to motorcycle riders involves using designated lanes, particularly the outer lanes on highways. This practice minimizes exposure to faster-moving vehicles and can significantly improve rider safet. [1] Despite technological advancements and infrastructure improvements aimed at improving road safety, the use of outer lanes by motorcycles remains underemphasized in both global and local contexts. Raising awareness of this issue, especially among Criminology students, is crucial for instilling responsible road behavior, which can influence societal attitudes and impact future road safety policies. Globally, the World Health Organization (WHO) has emphasized the need for improved road safety infrastructure and motorcycle-specific road design. Their 2013 report highlighted that motorcycle riders in many countries are particularly vulnerable due to insufficient road safety measures and a lack of infrastructure tailored to their needs. The WHO advocates better road design, including separating motorcycle lanes from other vehicles, to reduce the risk of

[1] Michael Ferrarese and others, 'Stability of Measurements of Simulated Driving: A Comparison between a Static and a Dynamic Motorcycle Simulator with Different Degrees of Fidelity', *Transportation Research Part F: Traffic Psychology and Behaviour*, 117 (2026), 103468 <https://doi.org/https://doi.org/10.1016/j.trf.2025.103468>.

accidents. In some countries, this has led to policies requiring motorcycles to use specific lanes, with promising results in reducing accidents and fatalities.[2]

Internationally, the rising number of motorcycles has led to increased accidents, with countries like Australia reporting a doubling of registered motorcycles from 1996 to 2012. The surge in motorcycle numbers, combined with changes in road infrastructure and licensing rules, presents new challenges in mitigating road accidents. The lack of designated motorcycle lanes in many countries exacerbates the risks. In particular, motorcycles often share lanes with much larger vehicles, putting riders at a significant disadvantage in terms of visibility and maneuverability. Recent studies indicate that road infrastructure improvements, such as dedicated motorcycle lanes or clearer regulations regarding lane usage, can significantly reduce collision rates and improve rider safety. In addition to infrastructure, the advent of new vehicle technologies, such as automated vehicles, is reshaping the landscape of road safety. According to Colley et al. (2022), automated vehicles are expected to improve traffic flow and safety, but their introduction may also create challenges for vulnerable road users, particularly motorcycle riders. The potential for platooning, where vehicles move in close formation to reduce fuel consumption, could pose risks to motorcyclists who may perceive such behavior as unsafe. Automated systems must account for motorcycles' unique vulnerabilities and the need for clear lane separation to maintain safety.[3]

The introduction of roundabouts in urban road networks has been shown to reduce accidents by reducing traffic conflicts.[4] However, even in well-designed roundabouts with clear signage, collisions can still occur, especially at entrances and exits. Motorcycle riders are particularly vulnerable in these areas due to reduced visibility and difficulty maneuvering through tight spaces. To mitigate these risks, it is crucial to enforce lane discipline, particularly ensuring that motorcycles remain in the outer lanes, where they are less likely to be involved in high-speed conflicts with other vehicles. Lastly, policies aimed at controlling road behavior and safety are also evolving. In the Philippines, for example, the Department of the Interior and Local Government (DILG) issued a memorandum ordering Local Government Units (LGUs) to prohibit tricycles from using national highways, a response to the increasing number of accidents involving tricycles obstructing the inner lanes.[5] This policy aims to prevent accidents caused by slow-moving vehicles, with a particular focus on motorcycles and tricycles. Some LGUs have gone further by requiring motorcycles, particularly those with smaller engine capacities (sub-400cc), to use only the outermost lane on highways. This regulation underscores the importance of proper lane discipline for motorcyclist safety, reducing the likelihood of collisions with faster-moving vehicles.[6]

This study highlighted the urgent need to raise awareness of the importance of using outer lanes, particularly for motorcycle rider safety. Beyond merely following traffic regulations, the study emphasized that proper utilization of outer lanes was critical for safeguarding the safety and welfare of motorcycle riders. As road conditions evolved and vehicular technology advanced, ensuring that motorcycle riders used the outer lanes appropriately became even more crucial. The outer lanes often provided a safer space for motorcycles, reducing the risk of collisions with larger, faster-moving vehicles. By promoting better

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[2] Bharat Kumar Pathivada and others, 'Safety Performance Functions for Motorcycle Crashes at Interchange Ramp Segments', *Journal of Safety Research*, 93 (2025), 44–54 <https://doi.org/https://doi.org/10.1016/j.jsr.2025.02.004>.

[3] Marcelo Werneck Barbosa, João Víctor de Oliveira Miranda and Leise Kelli de Oliveira, 'Identification of Antecedents of Risky Driving Behavior of Food Delivery Riders: An Analysis during the COVID −19 Pandemic in Brazil', *Case Studies on Transport Policy*, 20 (2025), 101403 <https://doi.org/https://doi.org/10.1016/j.cstp.2025.101403>.

[4] Duy Quy Nguyen-Phuoc and others, 'Questioning Penalties and Road Safety Policies: Are They Enough to Deter Risky Motorcyclist Behavior?', *Accident Analysis & Prevention*, 207 (2024), 107756 <https://doi.org/https://doi.org/10.1016/j.aap.2024.107756>.

[5] Emily A Greene-Colozzi and others, 'Social Network Analysis as a Tool for Understanding Mass Shooting Prevention: A Case Study of the Marjory Stoneman Douglas High School Shooting', *Journal of Criminal Justice*, 101 (2025), 102540 <https://doi.org/https://doi.org/10.1016/j.jcrimjus.2025.102540>.

[6] Momi Deb and others, 'Analyzing and Enhancing Motorized Two-Wheeler Overtaking Safety: A Comprehensive Study on Two-Way Two-Lane Urban Roads', *Traffic Injury Prevention*, 26.7 (2025), 856–65 <https://doi.org/https://doi.org/10.1080/15389588.2025.2461580>.

understanding and adherence to outer lane use, the study demonstrated that the safety of motorcycle riders could be significantly enhanced, adapting to the changing dynamics of modern roadways.[7]

Method

This study employed a quantitative research design to collect numerical data and analyze respondents' perceptions.[8] The approach used a descriptive research design to systematically gather and describe information from motorcycle-riding criminology students at Nueva Ecija University of Science and Technology. The study focused on understanding how the use of outer lanes helped reduce accidents and improve road safety in Barangay Sumacab Este, Cabanatuan City. The study specifically focused on raising awareness of the use of the outer lane to enhance motorcycle rider safety. It did not cover unrelated topics. The researchers aimed to promote adherence to traffic laws and reduce accidents by educating road users on the importance of outer lanes. The study was conducted at Nueva Ecija University of Science and Technology, with 100 criminology student motorcyclists selected through convenience sampling. The respondents were chosen based on availability, and the sample size was determined using Slovin's formula from a total population of 987 criminology students.[9]

Results and Discussion

Table 1 presents the level of awareness and understanding among motorcycle riders regarding the use of outer lanes for their safety. The table summarizes the responses of criminology students who ride motorcycles at Nueva Ecija University of Science and Technology (NEUST) and reflects their comprehension of various traffic regulations regarding the use of the outer lane. The weighted mean scores indicate the degree of awareness of each statement, with higher scores reflecting greater awareness. The table also ranks the statements by respondents' level of understanding.[10]

Table 1. Level of awareness and understanding among motorcycle riders regarding on the use of the outer lanes for their safety.

	Item Statement	Weighted Mean	Verbal Interpretation	Rank
1.	R.A. 4136, the Land Transportation and Traffic Code, was enacted to benefit users of motorcycles, tricycles, pedicabs, and e-bikes.	3.27	Highly Aware	7
2.	Slow-moving vehicles, such as motorcycles, tricycles, pedicabs, and e-bikes, should use the outer lane.	3.46	Highly Aware	1.5
3.	Improper use of the outer lane by motorbike riders, without a license, can lead to serious penalties, including fines or motorbike impoundment.S	3.44	Highly Aware	3
4.	The outer lane imposes a specific speed limit of 30 kph, and failure to adhere to this can result in penalties.	2.95	Aware	10
5.	In Cabanatuan City, the strict implementation of R.A. 4136 (Land Transportation and Traffic Code) aims to efficiently regulate the flow of vehicles. Non-compliance may lead to penalties.	3.15	Aware	9

[7] Duy Quy Nguyen-Phuoc and others, 'Driving the Shift to Electric Motorcycles: The Role of AI Trust and AI Benefits', *Transportation Research Part F: Traffic Psychology and Behaviour*, 118 (2026), 103484 <https://doi.org/https://doi.org/10.1016/j.trf.2025.103484>.

[8] Nattawat Rasri and others, 'Factors Influencing Wrong Way Driving Behavior of Motorcycle Riders in Thailand', *Transportation Research Interdisciplinary Perspectives*, 25 (2024), 101122 <https://doi.org/https://doi.org/10.1016/j.trip.2024.101122>.

[9] Muhammad Junaid and others, 'Understanding Motorcycle Crash Severity in Pakistan: Insights from Machine Learning and Interaction Effects', *KSCE Journal of Civil Engineering*, 2026, 100569 <https://doi.org/https://doi.org/10.1016/j.kscej.2026.100569>.

[10] Pei-Fen Kuo and others, 'Exploring the Spatial Relationship of E-Bike and Motorcycle Crashes: Implications for Risk Reduction', *Journal of Safety Research*, 88 (2024), 199–216 <https://doi.org/https://doi.org/10.1016/j.jsr.2023.11.007>.

6.	Utilizing the outer lane not only eases traffic congestion but also promotes a more efficient and organized vehicular flow, contributing to smoother transportation dynamics.	3.25	Aware	8
7.	Using the outer lane for overtaking is expressly forbidden, emphasizing the importance of adhering to this rule to maintain traffic order.	3.32	Highly Aware	5.5
8.	Navigating the outer lane amidst slow-moving vehicles elevates the risk of injury, emphasizing the need for cautious driving to ensure safety on the road.	3.38	Highly Aware	4
9.	The proper use of outer lanes is crucial for safe and organized traffic flow, contributing to a well-regulated road system.	3.32	Highly Aware	5.5
10.	The designation of the outer lane as a safety zone for motorcycles on highways is predicated upon the fundamental objective of augmenting overall road safety.	3.46	Highly Aware	1.5
	Average Weighted Mean	**3.3**	**Aware**	

The results highlight the level of awareness and understanding among motorcycle riders regarding the use of outer lanes for their safety. The results show that the criminology student motorcycle riders at NEUST exhibit a general awareness of the importance of using outer lanes.[11] Notably, two statements stood out with the highest mean score of 3.46, classified as highly aware: "Slow-moving vehicles, such as motorcycles, tricycles, pedicabs, and e-bikes, should use the outer lane," and "The designation of the outer lane as a safety zone for motorcycles on highways is designed to enhance overall road safety." This indicates that respondents have a strong understanding of the purpose and importance of outer lanes in ensuring motorcycle rider safety. On the other hand, the statement "The outer lane imposes a specific speed limit of 30 kph, and failure to adhere to this can result in penalties" received the lowest mean of 2.95, categorized as aware, indicating that while respondents understand this rule, their awareness is less pronounced compared to other aspects of outer lane usage. In support of these findings, Gito Sugiyanto and Siti Malkhamah (2018) emphasize that speeding is a major issue in developing countries, particularly in areas like school zones, where lower speeds are critical for safety.[12] Their research shows that many motorcycle riders exceed safe speed limits, contributing to accidents and increased risks.[13]

Conclusion

In conclusion, the research reveals that NEUST criminology student motorcycle riders generally possess a solid understanding of the importance of using outer lanes for motorcycle safety. The high mean scores for statements about using outer lanes as a safety zone and the role of slow-moving vehicles in using them reflect a strong awareness of their safety benefits. However, the relatively lower mean score regarding the speed limit on outer lanes suggests that while respondents are aware of this regulation, their understanding is not as thorough. Overall, the study indicates that while there is a solid foundation of awareness about outer lane usage, further education on specific traffic rules, such as speed limits, could enhance safety awareness among motorcycle riders.

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[11] Jirachot Noothep and others, 'Safety Effectiveness of Inclusive Motorcycle Lane: A Case Study in Hat Yai City, Thailand', *Transportation Research Interdisciplinary Perspectives*, 33 (2025), 101608 <https://doi.org/https://doi.org/10.1016/j.trip.2025.101608>.

[12] Gito Sugiyanto and Siti Malkhamah, 'Determining the Maximum Speed Limit in Urban Road to Increase Traffic Safety', *Jurnal Teknologi*, 80 (2018) <https://doi.org/https://doi.org/10.11113/jt.v80.10489>.

[13] Nhat Xuan Mai and others, 'Traffic Crash Risk among On-Demand Food Delivery Riders in Danang City, Vietnam: Key Contributing Factors', *Travel Behaviour and Society*, 40 (2025), 100995 <https://doi.org/https://doi.org/10.1016/j.tbs.2025.100995>.

Author Contributions Statement

MMDC supervised the overall research project. JAC and JCJ contributed to the research design and development of the data collection instrument. ZH and VTS conducted data gathering and performed the statistical analysis. HT assisted in data processing and literature review. All authors participated in the interpretation of results, drafting, reviewing, and revising the manuscript, and approved the final version for submission. All authors agree to be accountable for the integrity and accuracy of the work.

AI Usage Statement

The authors declare that the use of Artificial Intelligence (AI) tools in this work was strictly limited to supportive functions. The authors used AI only for language editing, grammar checking, and improving clarity and readability. AI was not used to generate core ideas, conduct substantive analysis, interpret data, or draw scholarly conclusions. The authors retain full responsibility for the originality, accuracy, and academic integrity of the content, and AI tools are not credited as authors or contributors, in accordance with ethical standards in academic publishing.

Conflict of Interest

The authors declare that there is no conflict of interest regarding the publication of this article.

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