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Multi-method study on the determinants of driving behavior among drivers of organized transportation groups in Butuan City- Cabadbaran City route, Caraga region, Philippines

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Abstract: This study examined the complex interplay of personal, environmental, infrastructural, and institutional factors that influence the behavior of organized transport drivers on the Butuan City to Cabadbaran City route. It found that these drivers are generally a mature, experienced, and highly responsible group, often influenced by their strong family ties to exhibit cautious driving habits. They report excellent physical and psychological fitness, and while conscious of road conditions, they identify issues with infrastructure quality and the consistency of traffic enforcement. Despite overall satisfaction, many drivers expressed concerns about perceived unfairness and inconsistent regulations, as well as a notable tendency toward exaggerated safety concerns. Interestingly, while van drivers experienced more comfort and positive perceptions of their vehicles and roads compared to bus drivers, both groups displayed similarly low levels of negative driving behaviors and high levels of caution. This suggests that external elements, such as environmental conditions and the presence of traffic enforcers, are stronger determinants of their cautious driving styles than the type of vehicle they operate. Regression analysis further supported this, indicating that awareness of environmental hazards and the presence of enforcers significantly predict more cautious driving. Based on these insights, the study proposes a comprehensive, multifaceted approach to enhance road safety and efficiency. Key recommendations include standardized training for traffic enforcers, collaborative workshops between drivers and enforcers, harmonization of traffic laws, crucial road infrastructure improvements on high-risk routes, and the establishment of mental health support programs for drivers. These interventions aim to foster a more cooperative and safer road environment, addressing both driver behavior and broader operational challenges within the transport system.

Keywords: determinants, driver behavior, public utility vehicle, road safety, vehicular factors, policy intervention

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INTRODUCTION

Driving behavior has emerged as a critical field of study in transportation research, primarily due to its far-reaching implications for road safety, traffic flow efficiency, environmental sustainability, and public health. As roads become increasingly busy and the modes of transportation evolve, understanding driver behavior becomes crucial. It helps us make roads safer by reducing accidents, keeps traffic flowing smoothly, and allows us to design transportation systems that truly meet our needs.

Across the globe, extensive studies have documented that driver behavior is influenced by a complex web of interrelated factors, including psychological attributes, environmental conditions, vehicular features, cultural influences, and policy enforcement mechanisms (Evans, 2004; WHO, 2015). These factors not only determine how drivers interact with road infrastructure and traffic regulations but also shape the prevalence of road-related incidents, fuel efficiency, and environmental impact.

In light of these global patterns, the World Health Organization (WHO, 2023) has emphasized that human error, primarily behavioral, accounts for over 90% of road traffic accidents worldwide. As a result, behavioral research has become a vital component in developing targeted interventions designed to reduce collisions and promote safer, more sustainable transportation systems. With this in mind, transportation researchers have increasingly focused their attention on specific categories of risky or problematic driving behavior that compromise both safety and operational efficiency on the road.

When looking at different ways drivers behave, anxiety plays a big part. As many have observed, drivers often hesitate, react slowly, or experience trouble with coordination, especially in stressful or unfamiliar driving situations. On the other hand, some drivers might be overly cautious, braking more than necessary or signaling excessively. While they wanted to be safe, this can make traffic more confusing and less efficient for everyone else. Then, there is the more confrontational side: aggressive or hostile driving. This includes behaviors such as tailgating, sudden lane changes, or full-blown road rage. These actions often occur when drivers feel provoked or are in a rush. Unfortunately, they significantly increase the chances of an accident.

Accordingly, several empirical studies have sought to explain these behavioral tendencies and their underlying causes. For instance, Szumska and Jurecki (2020) linked aggressive driving not only to higher crash rates but also to increased. Similarly, Zhou et al. (2020) demonstrated that psychological states, such as fatigue and stress, often exacerbated by poor vehicle and environmental conditions, are leading predictors of risky driving behavior.

To explain these behaviors more holistically, scholars have identified five key determinant dimensions that shape how drivers behave under various conditions. First, personal characteristics ranging from psychological readiness to educational attainment have been shown to influence a driver's ability to make sound decisions, as discussed by Asbridge et al. (2016). Second, environmental consciousness, including weather and road visibility, plays a significant role in triggering anxiety or caution, as evidenced by Yan et al. (2019). Third, vehicle characteristics, such as size, maintenance condition, and safety features, affect how drivers operate on the road, particularly in managing risk.

In addition, transportation infrastructure, including signage, lane markings, and traffic lights, guides driver navigation and behavior. Well-maintained roads reduce confusion and risky maneuvers, as highlighted by Litman (2020). Finally, the presence of enforcers provides both regulation and psychological deterrence; visible traffic authorities can promote discipline, while inconsistent enforcement may encourage violations.

Despite the presence of national laws in the Philippines intended to regulate driving conduct, such as Republic Act No. 4136 (Land Transportation and Traffic Code), Republic Act No. 8750 (Seatbelt Law), Republic Act No. 10913 (Anti-Distracted Driving Act), and Republic Act No. 10586 (Anti-Drunk and Drugged Driving Act) behavioral violations persist. Lu et al. (2022) reported over 12,000 annual road deaths in the country, many involving public utility drivers, with issues such as drunk driving and poor compliance continuing to plague both urban and rural areas.

However, these vital transportation laws and mandates would remain largely theoretical without the dedicated efforts of their implementers. In Butuan City to Cabadbaran City, and across the Philippines, key agencies and personnel collaborate to bring these regulations to life. The City Transportation and Traffic Management Department (CTTMD) plays a pivotal role in local traffic planning, regulation, and enforcement. Simultaneously, the Land Transportation Office (LTO) is responsible for vehicle registration, driver's licensing, and enforcing a wide array of land transportation laws. Furthermore, Traffic Enforcers are on the front lines, managing traffic flow, addressing violations, and responding to incidents. Complementing these efforts is the Philippine National Police (PNP) Highway Patrol Group, which focuses on enforcing traffic laws on national highways, combating highway crimes, and ensuring road security. Together, these entities pool their functions and duties to ensure the safety of both drivers and passengers on the road. They are the practical arm of the law, translating legal texts into tangible actions that directly impact the daily experience of commuters and the overall effectiveness of the transportation system.

Within this national context, the Caraga Region in Northeastern Mindanao represents a particularly under-researched area, especially regarding driver behavior in organized public transportation sectors specifically, the corridor between Butuan City and Cabadbaran City. A crucial aspect of their combined efforts, involving the mandates and implementers, is the direct oversight of Bachelor Express drivers and van drivers, particularly on routes connecting cities like Butuan City and Cabadbaran City. The approximate road distance between the two cities is 29 kilometers, with a typical travel time of around 30 minutes by bus or car (Rome2rio,2025). Notably, Bachelor Express buses, while primarily serving the Butuan City to Surigao City route, make an essential stop or drop-off in Cabadbaran City. This route sees a high volume of public transportation, with approximately 85 Bachelor Express buses operating daily, departing at roughly 15-minute intervals based on the interview conducted from Bachelor Express Butuan . The implementers, namely the City Transportation and Traffic Management Department (CTTMD), Land Transportation Office (LTO), Traffic Enforcers, and Highway Patrol Group (HPG), monitored this frequent flow, ensuring that drivers adhere to safety protocols and manage the high traffic density, thereby affecting both driver behavior and the efficient use of the transportation infrastructure to maintain predictable travel times. Butuan City, a highly urbanized city, and Cabadbaran City, a component city of Agusan del Norte province, face challenges in road infrastructure, enforcement, and other operational issues related to road management, including driver behavior.

Despite the diligent efforts of these implementers, potential gaps may exist in the consistent application of laws or the full compliance of these specific respondent drivers, especially given the rapid turnover of buses. It is in this context that the objectives of this study are set. The aim is to thoroughly investigate these observed or perceived discrepancies, ultimately contributing to a deeper understanding of the challenges faced by drivers and informing the development of more effective strategies for enhancing road safety and efficiency in travel.

In response to these regional pressures, recent studies have highlighted systemic weaknesses. Reyes et al. (2023) noted that public utility drivers in Caraga experience fatigue, long working hours, and vehicle maintenance issues, all of which increase the likelihood of unsafe driving. Similarly, Macabodbod (2023) observed that rapid economic growth is intensifying the demand for transport services, placing further stress on enforcement and infrastructure. These compounding pressures create a volatile driving environment that requires both scholarly investigation and policy intervention.

Given the above realities, a significant research gap remains in localized, evidence-based studies that focus on the behavioral patterns of drivers within regional transport corridors. This absence of contextual data limits the ability of planners, enforcers, and policymakers to design targeted and responsive interventions.

To address this gap, the present study examines the determinants of driving behavior among organized transport groups operating along the Butuan City–Cabadbaran City route. Specifically, it examines how five key determinant dimensions Personal Characteristics, Environmental Consciousness, Vehicle Characteristics, Transportation Infrastructure, and Presence of Enforcers influence three critical behavioral categories: anxiety-based performance deficits, exaggerated safety/caution behaviors, and hostile/aggressive behaviors.

Through this localized and evidence-driven approach, the study aims to generate practical insights that can inform regional transportation policies, strengthen driver education programs, enhance traffic enforcement strategies, and guide infrastructure development, ultimately contributing to a safer and more efficient transportation system in the Caraga Region.

Problem Statement

This study explored the determinants of driving behavior among members of organized transportation groups operating along the Butuan City and Cabadbaran City route. It aimed to examine various personal, environmental, and systemic factors that may influence driver conduct. Specifically, the study assessed the drivers' profiles based on age, type of transport, and license validity. It further evaluated the extent to which multiple factors were evident among drivers, including personal characteristics, physical and psychological fitness, driver education, cultural sensitivity, educational attainment, environmental awareness, weather conditions, road environment, vehicle features, and the presence of transportation infrastructure such as road quality, signage, and traffic enforcement.

The study also analyzed the prevalence of different driving behaviors, such as anxiety-induced performance issues, overly cautious driving, and hostile or aggressive tendencies. It sought to understand drivers' perceptions of traffic enforcers and their passengers, and whether differences in behavior and influencing factors existed across different types of organized transport groups. Ultimately, the research aimed to identify which of these factors—individually or in combination—significantly determine driving behavior, with the goal of proposing appropriate policy interventions to promote safer and more responsible transportation practices.

Theoretical framework

This study was anchored in the Theory of Planned Behavior (TPB), developed by Ajzen (1991), which explains human behavior through three interconnected constructs: attitudes, subjective norms, and perceived behavioral control. The theory posits that a person's intention to engage in a specific behavior is influenced by their attitudes toward the behavior, the perceived social pressures or norms surrounding them, and their ability to control the behavior. These three elements ultimately drive individual behavior and have been extensively applied in transportation studies to explain driving patterns, including safe, aggressive, and risky behaviors. According to the Theory of Planned Behavior, drivers' decisions to engage in safe or risky driving behaviors are influenced by their evaluation of such actions, societal expectations, and their perceived ability to manage their driving under various conditions (Ajzen, 1991).

The TPB is highly relevant to driving behavior studies because it captures the dynamic interplay between personal, social, and situational factors. For instance, Lashkov and Kashevnik (2021)

demonstrated how perceived control over a vehicle, such as managing speed and maneuvers, affects aggressive driving tendencies. They showed that interventions targeting perceived behavioral control, such as real-time feedback on risky actions, can effectively reduce dangerous driving behaviors. Similarly, Piccardi et al. (2021) found that subjective norms, such as social and peer influences, can significantly drive risky behaviors, especially in settings where specific driving actions, like speeding or overtaking, are culturally normalized. These findings align with the TPB's core constructs and illustrate how the theory provides a robust framework for understanding and addressing diverse driving behaviors.

The application of TPB in this study highlighted its relevance in explaining the various levels of driving behavior, ranging from safe to aggressive, risky, and destructive. Drivers' attitudes, such as their perception of the benefits of aggressive actions (e.g., saving time by speeding), are likely to influence their behavioral decisions. Social expectations, especially those from passengers or peer drivers in the same transportation group, form another critical aspect. For instance, in Caraga's organized transport groups, cultural norms and social pressures may shape drivers' tendencies toward specific behaviors. Furthermore, perceived behavioral control, such as the ability to navigate poor road conditions or manage vehicle handling, can explain why some drivers are more prone to destructive or risky behaviors, as observed in Chen et al. (2023).

In this context, the TPB provided a lens to explore the intricate relationship between personal, social, and environmental factors and driving behaviors. The framework enables this study to delve deeper into understanding why some drivers adopt safe practices while others exhibit risky or destructive tendencies. It also offers a theoretical basis for examining the factors that influence these behaviors and how interventions can be designed to modify them. Yarlagadda and Pawar (2022) supported this notion by identifying significant heterogeneity in driver behavior, showing that individual attitudes and perceived control vary significantly among drivers based on situational factors and driving contexts. These insights underscore the relevance of the TPB in tailoring interventions for specific transportation groups.

In summary, this study leveraged the TPB to analyze the determinants of anxiety-based performance deficits, exaggerated safety/caution behavior, and hostile/aggressive behaviors. The theory connects personal attitudes, social influences, and perceived control to observable driving patterns, offering a comprehensive framework for understanding and addressing behavioral variations. Through this approach, the study builds on evidence from prior research by Ajzen (1991), Lashkov and Kashevnik (2021), Piccardi et al. (2021), Chen et al. (2023), and Yarlagadda and Pawar (2022), creating a structured foundation for analyzing behavioral drivers and proposing practical interventions.

The conceptual framework presented in the schematic diagram serves as a guide for understanding the interplay of various factors that influence driver behavior. It highlights the relationships between three major categories of independent variables —personal, environmental, and vehicular factors — and their impact on the dependent variable, which is the level of driving behavior. The framework categorizes driving behavior into four distinct levels: safe, aggressive, risky, and destructive. These levels represent observable behavioral patterns that result from the dynamic interaction between the independent variables and potential moderating factors, such as the presence of law enforcement, passenger influence, and road infrastructure.

Personal factors included psychological and physical conditions, cultural background, and educational attainment. These elements shape drivers' attitudes, cognitive processes, and decision-making abilities, directly influencing their likelihood of engaging in either safe or unsafe behaviors. Environmental factors such as weather, road conditions, and traffic density further

contribute by either enabling or constraining a driver's ability to navigate the road safely. For instance, poor road conditions may elevate the risk of aggressive or destructive driving behaviors. Vehicular factors encompass the characteristics and features of the vehicle, including safety mechanisms, size, and handling capacity, which influence the driver's interaction with the vehicle and its surroundings.

The framework suggested that these factors do not act in isolation but interact dynamically to produce specific behavioral outcomes. Safe driving behavior, for instance, may result from favorable personal, environmental, and vehicular conditions. In contrast, aggressive or risky behavior might emerge under less favorable circumstances, such as driver stress or challenging road environments. The inclusion another variable, such as the presence of law enforcement, adds complexity to the framework by acknowledging the potential for external factors to influence driver behavior.

This comprehensive review underscored that driver behavior is a complex interplay of psychological, environmental, vehicular, and regulatory factors. The insights gained, particularly from the regional context of Caraga and the specific dynamics of professional and organized transport groups in Butuan and Cabadbaran Cities, highlight the pressing need for tailored interventions.

Ultimately, by understanding these multifaceted determinants through the lens of frameworks such as the Theory of Planned Behavior, stakeholders can develop targeted strategies that not only enhance individual driver responsibility but also foster a collective commitment to road safety across the region. This integrated approach is crucial for mitigating risks and building a more secure and sustainable transportation future in the Philippines and beyond.

METHODOLOGY

Research design

This study employed a multi-method research design, integrating both quantitative and qualitative approaches to comprehensively examine the determinants of driving behavior among drivers of organized transportation groups operating along the Butuan City–Cabadbaran City route in the Caraga Region, Philippines. The choice of a multi-method design was grounded in the recognition that driving behavior is influenced by both measurable external factors and subjective human experience dimensions that cannot be fully captured by a single method alone. By combining the strengths of both quantitative and qualitative research, the study aimed to develop a more comprehensive understanding of driver behavior within the local context.

The quantitative component of the study utilized a descriptive-correlational method to investigate the relationships between a set of independent variables and specific categories of driving behavior. The independent variables included: Personal characteristics (e.g., physical and psychological fitness, driver education, cultural sensitivity, and educational attainment), Environmental conditions (e.g., weather, roadside conditions), Vehicle-related factors (e.g., vehicle type, mechanical features), and Infrastructure elements (e.g., road condition, signage, traffic signals, and the presence of enforcers). These factors were correlated with three key behavioral patterns: Anxiety-based performance deficits, Exaggerated safety or caution behaviors, and hostile or aggressive driving tendencies.

Structured surveys were administered to drivers of public utility vehicles, including buses and vans. The data were analyzed using correlational statistics to assess the strength and significance of the relationships between these variables and observed driving behaviors.

Meanwhile, the qualitative component employed a phenomenological approach to explore the lived experiences, insights, and perceptions of both drivers and traffic enforcers regarding road safety enforcement, policy implementation, and day-to-day road conditions. This component focused on understanding how drivers interpret and respond to regulatory frameworks, as well as how enforcement practices influence their driving conduct. Semi-structured interviews and focus group discussions (FGDs) were conducted with purposefully selected participants, and the results were analyzed using thematic analysis to uncover recurring issues, narratives, and policy gaps.

The use of a multi-method approach was particularly justified by the complex, multifaceted nature of driving behavior, which involves a constant interplay between individual psychology, external road and environmental conditions, vehicle dynamics, and institutional factors such as enforcement and policy. The quantitative data offered objective measurements and helped identify patterns. At the same time, the qualitative findings added contextual depth behind the behaviors. This integration enhanced the validity and reliability of the study findings.

Additionally, this approach was informed by principles of naturalistic driving studies, which emphasize observing drivers in real-world contexts. Given the Caraga Region's unique geography, particularly in Butuan City and Cabadbaran City, its infrastructural and socio-economic characteristics, the mixed-methods design proved especially appropriate for gaining an authentic and comprehensive understanding of local driver behavior.

Ultimately, the multi-method design enabled this study to produce evidence-based, context-sensitive, and practical recommendations for improving road safety policies, driver education and training programs, and transportation infrastructure within the region, contributing meaningfully to the goal of reducing road accidents and enhancing commuter and pedestrian safety.

Locale of Study

This study was conducted in Butuan City and Cabadbaran City, both part of Agusan del Norte, located in the Caraga Region of the Philippines, with a focus on organized transportation groups, including buses and vans.

Respondents of the study

This study employed a convenience sampling method in selecting respondents. Respondents included drivers from organized transportation groups in Butuan City and Cabadbaran City, part of Agusan del Norte, Caraga, specifically those operating buses and utility vehicles (vans). Convenience sampling is appropriate due to the accessibility and availability of drivers during the data collection process.

The study included a representative sample of drivers from multiple transportation hubs and routes within Butuan City and Cabadbaran City.

A sample size of at least 10 drivers for each group is deemed sufficient for this study. According to Hair et al. (2010), a minimum sample size of 100 is often adequate for studies involving correlation and basic inferential statistics. This ensures meaningful data analysis while maintaining feasibility in a resource-limited setting. Overall, there are 150 respondents representing five transport groups operating in Caraga.

Data Gathering Instruments

his study employed a multi-methods approach to comprehensively investigate the determinants of driving behavior among drivers of organized transportation groups along the routes between Butuan City and Cabadbaran City in Caraga. It combined quantitative data from a structured

survey and standardized test with qualitative insights from open-ended questions and potential follow-up interviews.

Data Gathering Procedure

To collect data for this study, the researcher first obtained formal permission from the relevant transportation authorities and regulatory offices in Caraga, particularly in Butuan City and Cabadbaran City. Those agencies oversee organized transportation groups, including buses and vans, ensuring ethical compliance and access to target respondents. The researcher coordinated with transport organizations to facilitate participation and obtained informed consent from the drivers.

After securing authorization, the quantitative data collection will commence with the distribution of structured survey questionnaires to selected bus and van drivers. These surveys will be administered through their respective transport groups, accompanied by a brief explanation of the study's purpose and clear instructions to ensure accurate responses. Subsequently, the researcher distributed the survey questionnaires to the participating drivers at designated terminals and meeting points, ensuring a convenient and accessible process. For the qualitative phase, the researcher scheduled and conducted semi-structured interviews with selected bus and van drivers in Butuan City and Cabadbaran City, as well as with traffic enforcers, at mutually agreed-upon times and locations.

The completed surveys were then compiled for statistical analysis, allowing the study to examine relationships between various influencing factors and driving behaviors.

For the qualitative data collection, the researcher conducted semi-structured interviews with selected bus and van drivers from Butuan and Cabadbaran, as well as traffic enforcers assigned to these areas. The interviews explored drivers' experiences with road safety, law enforcement, and regulatory policies. The researcher also facilitated focus group discussions (FGDs) among drivers and enforcers to capture diverse perspectives on traffic management challenges and the effectiveness of enforcement. These discussions provided deeper insights into behavioral motivations and systemic issues that may not have been apparent in the quantitative data.

All qualitative interviews were recorded, transcribed, and analyzed using thematic analysis to identify key themes and patterns. By integrating both quantitative and qualitative data, the study ensured a comprehensive understanding of the determinants of driving behavior in organized transport groups in Butuan and Cabadbaran. Confidentiality and voluntary participation were strictly observed throughout the data collection process, ensuring that respondents felt safe and respected in sharing their experiences.

Data Analysis Procedure

To analyze the collected data and effectively address the statement of the Problem (SOP), this study employed both descriptive and inferential statistical techniques, along with thematic analysis for qualitative data. These methods ensured a comprehensive understanding of the relationships between influencing factors and driving behavior among bus and van drivers in Butuan City and Cabadbaran City.

DISCUSSION OF FINDINGS

Profile of the Respondents

The driver demographic primarily consists of a mature and experienced workforce, with a mean age of 45 and the majority falling between 35 and 50 years old. This group is composed mainly of bus drivers (two-thirds) and van operators (one-third), all of whom hold 10-year valid driver's licenses, indicating strong legal compliance and clean driving histories. A notable 95% of these drivers are married, suggesting that family responsibilities significantly influence their cautious and safety-conscious driving behaviors, making them ideal subjects for studying organized transport operations due to their extensive road experience and adherence to formal systems.

Drivers reported very high levels of physical and psychological fitness, demonstrating confidence in their ability to manage stress, make quick decisions, and endure long periods of driving. Educational attainment and cultural sensitivity were also rated very highly, pointing to strong alignment with community norms and legal expectations. In contrast, environmental consciousness, including road conditions and weather effects, was rated as "high" but not "very high," signaling concern over external driving conditions. Car characteristics, infrastructure quality, and the presence of enforcers were also rated as "high," indicating that while these elements are influential, they are areas where challenges still exist, particularly in terms of road maintenance, signage clarity, and consistent enforcement.

Organized transport drivers on the Butuan City – Cabadbaran City route generally self-report a low occurrence of negative driving behaviors, with anxiety-based performance deficits and hostile/aggressive behaviors being rare. Notably, they frequently report exhibiting exaggerated safety and caution, suggesting a strong inclination towards prioritizing safety, potentially to an excessive degree in some instances, while the overall average for negative driving behaviors remains low.

Interactions with traffic enforcers were generally described as routine and manageable. Still, several drivers voiced concerns about perceived unfairness and inconsistent rule enforcement. Some enforcers were seen as helpful during traffic, while others were perceived as overly strict or focused on minor infractions. These inconsistencies often led to passenger frustration, particularly when checkpoint stops resulted in delays. Despite these issues, most drivers emphasized the importance of following rules and maintaining respectful conduct. There was also a clear desire for uninterrupted travel, with many drivers prioritizing efficient passenger service over confrontation. Drivers emphasized the importance of clearer traffic regulations, standardized and empathetic enforcement practices, and improved communication. They valued enforcers who demonstrate fairness, respect, empathy, competence, and moral integrity, advocating for a shift towards cooperation and collaboration through joint training initiatives. Ultimately, the findings underscore the necessity for holistic capacity-building programs for enforcers alongside strategies that promote mutual understanding and a more cooperative road environment in Butuan City - Cabadbaran City.

A significant difference emerged between bus and van drivers in three key areas: physical fitness, vehicle classification, and perception of road quality. Van drivers reported higher physical comfort, likely due to operating smaller vehicles with less physical demand. They also rated their vehicle classification and road quality more positively, possibly because vans are more agile and adaptable to poor road conditions. However, no significant differences were found in other indicators such as psychological fitness, enforcement perception, or infrastructure features, indicating that most factors are experienced similarly by both groups.

When grouped by transport type, there were no significant differences in driver behavior between bus and van drivers. Both groups exhibited low levels of anxiety and aggression, and both

demonstrated similarly high levels of exaggerated caution. These results suggest that behavioral traits are not vehicle-type dependent but rather more influenced by shared environmental pressures, policies, and enforcement interactions. This uniformity supports the need for standardized training and behavior programs that apply across all vehicle types.

Regression analysis revealed that two key variables—environmental consciousness and the presence of traffic enforcers — significantly predicted variations in driver behavior. Specifically, increased awareness of environmental hazards and the presence of enforcers correlated with more cautious or defensive driving styles. This suggests that external stressors, such as unpredictable road conditions or fear of penalties, influence driver behavior more than internal traits like education or experience. The model explained 34.05% of the behavioral variation, supporting targeted interventions in environmental safety and enforcement dynamics.

Based on the findings, five major policy interventions were proposed. First, standardized training for enforcers would ensure consistent, respectful, and legally sound enforcement practices. Second, collaborative driver-enforcer workshops would build mutual understanding and reduce field conflict. Third, harmonizing traffic laws would address confusion over unclear or inconsistent regulations. Fourth, road infrastructure improvements, especially on high-risk routes, would enhance safety and reduce exaggerated caution behavior. Finally, mental health support programs for drivers would help mitigate occupational stress and improve long-term behavioral stability. These interventions reflect a comprehensive, systemic response to the behavioral and operational challenges identified throughout the study

CONCLUSION

Based on the findings, the study concluded that the majority of organized transport drivers in Butuan City and Cabadbaran City are middle-aged, married, and professionally licensed with extensive driving experience. This demographic reflects a stable and mature workforce well-positioned within the public transportation system. The drivers demonstrated high levels of preparedness in terms of physical and psychological fitness, cultural sensitivity, and educational background. However, their operational performance is moderately affected by external factors, such as inconsistent traffic enforcement, inadequate infrastructure, and challenging environmental conditions.

Behaviorally, the drivers exhibited low levels of anxiety-induced deficits and aggression, though many displayed overly cautious driving tendencies—likely a response to inconsistent enforcement visibility and unpredictable road environments. The study emphasized the need for improved traffic enforcement practices that are respectful, clearly communicated, and empathetic, alongside better legal clarity and infrastructure support. Particularly, issues at the Butuan terminal highlight the importance of addressing systemic problems to improve transportation quality and safety.

Differences in perception were found between bus and van drivers regarding physical fitness, road quality, and vehicle classification, indicating that tailored interventions should address the distinct challenges of each transport type. However, driver behavior remained largely consistent across vehicle types, suggesting that external factors such as enforcement pressure and environmental awareness are more influential than vehicle-specific characteristics.

The study identified traffic enforcer presence and environmental consciousness as significant external factors shaping driver behavior. A multifaceted policy response was proposed, including standardized enforcement procedures, joint training programs for drivers and enforcers, clearer

legal frameworks, infrastructure upgrades, and driver wellness support. These measures are deemed essential to foster safer roads, enhance the professionalism of transport groups, and create a more equitable and efficient public transportation system.

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