

The Efficiency of Jeepney Modernization on Sustainable Transportation in Metro Manila, Philippines: A Qualitative Study of Commuters, Drivers, and Operators

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Abstract

Original Research Article

This qualitative study investigates the efficiency of the Public Utility Vehicle Modernization Program (PUVMP) in Metro Manila, Philippines, through the lived experiences of three key stakeholder groups: commuters, drivers, and operators. Employing a phenomenological research design, this study explores how jeepney modernization impacts sustainable transportation from multiple perspectives. Data collection involves in-depth interviews with 30 participants (10 commuters, 10 drivers, 10 operators) selected through purposive sampling, complemented by focus group discussions and participant observations.

Thematic analysis guided by the Sustainable Livelihood Framework and Theory of Planned Behavior reveals complex dynamics between policy implementation and stakeholder experiences. Preliminary findings suggest that while modernization offers environmental benefits and improved safety features, significant challenges persist regarding affordability, accessibility, and livelihood sustainability. The study contributes to understanding transportation policy effectiveness through stakeholder-centered analysis, providing insights for policymakers to enhance program implementation. Results indicate the need for more inclusive approaches that balance environmental sustainability with social equity and economic viability for all stakeholders involved in the jeepney modernization process.

Keywords: jeepney modernization, sustainable transportation, qualitative research, stakeholder experiences, Metro Manila.

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Introduction

Public transportation systems serve as critical infrastructure for urban mobility, particularly in developing countries where they provide essential services to millions of daily commuters. In the Philippines, jeepneys have been an iconic mode of

public transportation for over seven decades, serving as the primary means of mobility for Filipino commuters, especially in Metro Manila. However, the aging fleet of traditional jeepneys has raised concerns about environmental sustainability, passenger safety, and operational efficiency.



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The Public Utility Vehicle Modernization Program (PUVMP), launched by the Land Transportation Franchising and Regulatory Board (LTFRB) in 2017, represents a comprehensive policy initiative aimed at transforming the public transportation landscape. This program mandates the replacement of traditional jeepneys with modern, environmentally friendly vehicles that comply with Euro-4 emission standards, incorporate safety features, and utilize cashless payment systems. The program's implementation has been extended multiple times, with the latest deadline set for July 31, 2024, reflecting the complex challenges inherent in large-scale transportation system transformation. The program was also required to meet stricter rules for safety and design, unlike the old jeepneys. Aside from the vehicles, the program also requires jeepney operators to form cooperatives or corporations. This makes it easier for the government to regulate routes, improve services, and ensure financial stability.

However, only groups or cooperatives are allowed to apply for new franchises and buy modern jeepneys. This has caused issues since many drivers and small operators cannot afford the expensive cost of new units, which range from Php 2 million to Php 2.5 million.

The program was supposed to be completed in 2020, but delays happened because of protests, logistical problems, and the COVID-19 pandemic.

In recent years, the Philippine government has been paying more attention to sustainable and climate-friendly transportation. The Public Utility Vehicle Modernization Program (PUVMP) is part of a bigger plan to reduce greenhouse gas emissions, make cities more livable, and align the country's goals with international agreements like the Paris Agreement and the United Nations Sustainable Development Goals (SDGs).

In the Philippines, sustainable transportation means reducing pollution from the transport sector which contributes a large share of energy-related carbon emissions — while also making travel more affordable, accessible, and efficient. Besides the PUVMP, the government has also pushed infrastructure under Build, Build, Build, such as

more rail transit systems, bike lanes, pedestrian walkways, and smart mobility solutions.

Other programs like the E-Jeepney and Green Transport Program promote electric vehicles (EVs) for public transport. These are supported by the Electric Vehicle Industry Development Act (EVIDA), passed in 2022, which gives incentives for EV development and adoption. Some local governments, especially in Metro Manila, have experimented with low-emission zones, car-free days, and intelligent transport systems to help manage traffic and encourage different modes of transport.

Still, these initiatives face many challenges. The biggest problems are lack of funding, weak enforcement, and low public awareness. For the PUVMP, shifting to modern vehicles is slowed by financial constraints, limited capacity in institutions, and resistance from drivers and operators who will be affected. Even with these challenges, modernizing public utility vehicles remains a key step toward building a sustainable urban transport system. Whether it succeeds will depend greatly on how well the government works with stakeholders, supports them financially and technically, and ensures that low-income drivers and commuters are not left behind.

This study contributes by (a) refining conceptual understanding of jeepney modernization as a socio-technical transition through an interpretivist lens, (b) developing an empirically grounded thematic framework that integrates stakeholder perspectives with the Sustainable Livelihood Framework and Theory of Planned Behavior, and (c) offering actionable implications for policymakers, transport cooperatives, and local government units in designing more inclusive and equitable modernization policies in the Philippine public transport context.

Problem Statement

Despite the well-intentioned objectives of the PUVMP, its implementation has generated significant controversy and resistance from various stakeholder groups. Traditional jeepney drivers and operators express concerns about the financial

burden of acquiring new vehicles, potential loss of livelihood, and disruption of established route systems. Commuters report mixed experiences with modernized jeepneys, citing issues with accessibility, route coverage, and fare affordability. Meanwhile, policymakers emphasize the program's environmental benefits and long-term sustainability goals.

The gap between policy intentions and stakeholder experiences highlights the need for comprehensive research that examines the efficiency of jeepney modernization from multiple perspectives. Current literature predominantly focuses on policy analysis and environmental impact assessments, with limited attention to the lived experiences of those directly affected by the modernization process. This study addresses this gap by exploring how different stakeholder groups perceive, experience, and adapt to the changes brought about by jeepney modernization.

Research Objectives

Primary Objective:

To assess the efficiency of jeepney modernization on sustainable transportation in Metro Manila through the experiences and perspectives of commuters, drivers, and operators.

Secondary Objectives:

1. To explore commuter experiences with modernized jeepneys in terms of accessibility, affordability, comfort, and overall satisfaction
2. To examine the challenges and opportunities faced by drivers and operators in adapting to the modernization program
3. To identify factors that facilitate or hinder the successful implementation of jeepney modernization
4. To understand the implications of modernization for sustainable transportation and livelihood sustainability

5. To provide recommendations for improving the efficiency and inclusivity of the modernization program

Research Questions

1. How do commuters, drivers, and operators experience the jeepney modernization under the Public Utility Vehicle Modernization Program (PUVMP) in Metro Manila?
2. What factors enable or constrain the adoption and acceptance of jeepney modernization among the stakeholders?
3. How do participants make sense of the tension between the goal for efficiency and sustainability over the socio-economic results in the affordability, convenience, and livelihood over time?

Literature Review

Sustainable Transportation Systems

Sustainable transportation encompasses systems that meet mobility needs while minimizing environmental impact, promoting social equity, and ensuring economic viability (Banister, 2008). The concept has evolved from purely environmental considerations to include social and economic dimensions, reflecting the triple bottom line approach to sustainability. In developing countries, sustainable transportation faces unique challenges, including rapid urbanization, limited infrastructure investment, and the need to balance environmental goals with poverty alleviation (Poiani & Stead, 2015).

Research on sustainable transportation in Southeast Asia highlights the importance of context-specific solutions that consider local economic conditions, cultural practices, and institutional capacity (Barter, 2008). The transition from informal to formal public transportation systems requires careful attention to social impacts, particularly on low-income populations who depend on affordable mobility options (Cervero, 2000).

The Philippine Context of Jeepney Modernization

For nearly 80 years of operation on Philippine roads, there have been over 180,000 jeepneys serving nationwide, with around 75,000 operating in Metro Manila. Under the modernization program, these will be replaced by units equipped with features such as CCTV cameras, GPS trackers, and automated fare collection systems (Westerman, 2018).

The cost of acquiring a modernized jeepney is approximately Php 2 to 2.5 million, compared to only about Php 500,000 for a traditional unit. This wide cost difference creates significant social and economic tensions, particularly in terms of affordability. For many drivers, the boundary system makes it difficult to earn sustainably, even with government-provided loan subsidies, especially for small-scale operators (Fillone et al., 2020).

From the commuters' perspective, responses are mixed. The base fare for traditional jeepneys is Php 13, while modernized units charge Php 15 due to added features. Although modernized jeepneys are more fuel-efficient, running 10 to 15 kilometers per liter compared to the traditional jeepney's 7 kilometers per liter, low-income commuters still express concerns. They argue that even a small fare increase accumulates into a significant daily expense (Pendre, 2024).

In terms of environmental impact, the Philippines' Nationally Determined Contribution (NDC) policies aim to achieve low-carbon growth by reducing emissions by 990 million metric tons of carbon dioxide. This aligns with the Philippine Clean Air Act of 1999 (RA 8749), which supports the modernization of jeepneys through Euro-4-compliant engines. These engines limit the emission of harmful gases, particularly Nitrogen Oxides (NOx), Carbon Monoxide (CO), Hydrocarbons (HC), and Particulate Matter (PM,) which contribute to ground-level ozone, acid rain, and serious health risks such as respiratory illnesses and cancer.

Public Transportation Modernization in Developing Countries

Public transportation modernization initiatives in developing countries often involve complex negotiations between efficiency goals, environmental objectives, and social equity concerns. Studies from Latin America, Africa, and Asia demonstrate that successful modernization requires stakeholder engagement, phased implementation, and attention to livelihood impacts (Hidalgo & Huizenga, 2013).

The Bus Rapid Transit (BRT) systems in Bogotá, Jakarta, and other cities provide valuable lessons for jeepney modernization in the Philippines. These experiences highlight the importance of addressing informal sector displacement, ensuring affordable fares, and maintaining service coverage to underserved areas (Cervero & Golub, 2007). Research emphasizes that modernization success depends not only on technological improvements but also on institutional capacity, stakeholder buy-in, and adaptive management approaches (Suzuki et al., 2013).

Stakeholder Experiences in Transportation Policy Implementation

The implementation of transportation policies significantly impacts various stakeholder groups, often in unintended ways. Research on transportation policy implementation emphasizes the importance of understanding stakeholder perspectives to identify implementation gaps and improve policy effectiveness (Marsden & Reardon, 2017).

Studies on jeepney modernization specifically have identified concerns among drivers and operators regarding financial capacity, route rationalization, and changes to traditional operating practices (Fillone et al., 2020). Commuter studies reveal mixed responses to modernization, with appreciation for improved comfort and safety balanced against concerns about fare increases and reduced route flexibility (Regidor et al., 2018). These findings underscore the need for comprehensive

stakeholder analysis in transportation policy evaluation.

Theoretical Framework

This study employs two complementary theoretical frameworks to understand the efficiency of jeepney modernization from stakeholder perspectives:

Sustainable Livelihood Framework (SLF)

The Sustainable Livelihood Framework, developed by the UK Department for International Development (DFID), provides a comprehensive approach to understanding how people construct their livelihoods within existing structures and processes. The framework examines five types of capital assets (human, social, natural, physical, and financial) and how these interact with vulnerability contexts, institutional structures, and livelihood strategies to produce outcomes.

In the context of jeepney modernization, the SLF helps analyze how policy changes affect the livelihood assets of drivers and operators, while also examining how commuters' access to transportation (as a form of physical capital) influences their livelihood opportunities. The framework's emphasis on vulnerability contexts is particularly relevant for understanding how economic shocks, policy changes, and technological transitions affect different stakeholder groups.

Theory of Planned Behavior (TPB)

Ajzen's Theory of Planned Behavior provides insights into stakeholder attitudes, subjective norms, and perceived behavioral control regarding jeepney modernization. The theory helps explain how stakeholders form intentions and make decisions about adopting or supporting modernization initiatives.

For commuters, TPB helps understand factors influencing their choice to use modernized versus traditional jeepneys. For drivers and operators, the theory illuminates decision-making processes regarding participation in modernization programs. The integration of attitude, subjective norms, and perceived behavioral control provides a

comprehensive framework for understanding stakeholder responses to policy implementation.

These theoretical frameworks complement each other by providing both structural (SLF) and individual-level (TPB) perspectives on stakeholder experiences with jeepney modernization.

Methodology

Research Design

The paper adopted an interpretivist, qualitative, descriptive design to generate a rich, practice-near account of participants' experiences of jeepney modernization and its socio-economic impact in Metro Manila, Philippines. This design is appropriate for how/why questions that prioritize participants' meanings. The research questions, purposive sampling, semi-structured interviewing, and reflexive thematic analysis were selected and aligned to this stance to ensure methodological coherence (Dipon et al., 2024).

Theoretical Framework Application

Implications of the Sustainable Livelihood Framework to Drivers and Operators

Financial Capital: Many drivers and operators are experiencing financial difficulties. A modern jeepney costs around Php 2 to Php 2.5 million, an amount that most of them cannot afford. They often lack sufficient savings or access to low-interest loans. As a result, many fear losing their primary source of income if they are unable to participate in the program.

Social Capital: Some drivers are members of cooperatives or organizations that provide information, support, and financing. These connections make it easier for them to participate in the modernization program. However, many drivers remain unaffiliated with such groups, leaving them isolated and uncertain about their options.

Physical Capital: Traditional jeepneys are often old, worn out, and prone to frequent breakdowns. In contrast, modern jeepneys are safer, more comfortable, and more reliable. Drivers who already

operate modern units report better working conditions. Still, many drivers cannot afford the upgrade and are left to continue using outdated vehicles.

Human Capital: Not all drivers and operators fully understand how the modernization program works. Some also lack familiarity with digital tools and government requirements. As a result, they face difficulties in joining the program or applying for available support. This lack of knowledge prevents them from accessing new opportunities.

Application of the Sustainable Livelihood Framework to Commuters' Perspectives

Physical Capital: Modern jeepneys provide commuters with a better travel experience, offering air-conditioning, more space, and enhanced safety features. However, many commuters still do not have access to them. In some areas, modern units are not yet available, while in others, routes have been changed or removed, making travel more difficult.

Financial Capital: Modern jeepneys generally have higher fares than traditional ones. For many low-income commuters, this makes it challenging to use them regularly. Although modern units offer a more comfortable ride, most commuters still prefer traditional jeepneys because they are cheaper and more accessible.

Implications of the Sustainable Livelihood Framework to the Environment

Environmental Impact: One of the main goals of the jeepney modernization program is environmental sustainability. The new vehicles comply with Euro-4 standards or use electric engines, which emit fewer harmful pollutants. This can contribute to cleaner air in urban areas and improved public health. However, these environmental benefits can only be fully realized if the program is implemented nationwide and properly enforced.

Implications of the Theory of Planned Behavior for Drivers and Operators

Attitude Aspect: Most drivers and operators feel worried about the jeepney modernization program. They are afraid of losing their jobs or routes. Many

also worry about not being able to afford the new jeepneys, which cost around Php 2 to 2.5 million each. Another concern is whether their income will still be enough in the future. However, some drivers and operators see benefits. They believe modernization can lead to better working conditions, with fewer breakdowns and newer vehicles. Others view being part of official cooperatives as a way to make their jobs more secure.

Subjective Norms: Government agencies and cooperatives are strongly encouraging drivers to join the program. Among their fellow drivers, opinions are divided. Many still resist the change and refuse to participate, while some early adopters see it as a good opportunity. Even though the media and leaders promote the program as beneficial, many drivers still feel excluded from the decision-making process.

Perceived Behavioral Control: Many drivers and operators feel powerless to join the program. They cannot afford the new jeepneys and often do not understand the rules or the application process. Some lack support or do not know how to become part of a cooperative. Those who are already in cooperatives feel somewhat more confident about joining, but they still face significant challenges.

Application of the Theory of Planned Behavior to Commuters' Perspectives

Attitude Aspect: Many commuters appreciate the modern jeepneys because they are cleaner, cooler, and safer compared to traditional ones. They also recognize that modern units help reduce air pollution. Despite this, some commuters have concerns. They point out that fares are higher than those of regular jeepneys. Others complain that some routes are no longer available, forcing them to walk farther to reach their destinations. Many are also confused about the use of cashless payments or new apps. While a large number think modern jeepneys are good, they still prefer the cheaper, traditional ones.

Subjective Norms: In urban areas, more people accept and even expect modern jeepneys as part of everyday transportation. The media and government continue to promote them as modern and better

alternatives. However, in poorer areas, people tend to support traditional jeepneys and express concern about the drivers who may lose their jobs because of the modernization program.

Perceived Behavioral Control: Commuters generally feel they have some level of choice when both modern and traditional jeepneys are available. However, in many areas, there are still not enough modern units to meet demand, limiting their options.

Research Setting

The study is conducted in Metro Manila, Philippines, specifically focusing on major jeepney routes in Manila, Quezon City, and Makati. These areas were selected because they represent diverse socio-economic contexts and have experienced varying degrees of modernization implementation. The research sites include:

1. Traditional jeepney routes that have not yet undergone modernization
2. Routes with mixed traditional and modernized jeepneys
3. Fully modernized routes under the PUVMP

This selection allows for comparative analysis of stakeholder experiences across different stages of modernization implementation.

Participants and Sampling

The study used purposive sampling to commuters (n=10), drivers (n=10), and operators (n=10) from major jeepney routes in Metro Manila, Philippines who met the criteria for the commuters who ride jeepney regularly and has experiences with traditional and modernized units, drivers who has driving experience in the involvement of modernized jeepneys for at least 6 months and operators who owns or manage modernized jeepney and its operations for at least 6 months (Dipon et al., 2023). On another note, participants who do not meet the criteria are not included, specifically those who lack direct experience in the modernized implementation and those who have the right to refuse the interview in accordance with ethical considerations. Recruitment occurred via on-site approaches in the terminal station with a referral from the transport associations. Sample adequacy was guided by the information power framework, with data collection continuing until no substantively new insights emerged and theme boundaries stabilized. Participant characteristics are summarized in Table 1.

Table 1. Participants' Characteristics

Role	Number of Participants	Gender	Age Bracket in Years	Tenure in Role
Commuters	10		18 to 24 years old (7 participants)	4 years of commuting (2 participants)
			25 to 31 years old (1 participant)	6 years of commuting (4 participants)

		3 Males 7 Females	32 years old and above (2 participants)	8 years of commuting and above (4 participants)
Drivers	10	10 Males	25 to 31 years old (1 participant)	1 - 2 years of driving a modernized jeepney (3 participants)
			32 years old and above (9 participants)	2 years and above driving a modernized jeepney (7 participants)
Operators	10	10 Males	32 years old and above (10 participants)	1 - 2 years of driving a modernized jeepney (4 participants)
				2 years and above driving a modernized jeepney (6 participants)
TOTAL	30	30		

Data Collection Method

Data collection employs multiple methods to ensure a comprehensive understanding:

In-depth Semi-structured Interviews

Individual interviews lasting 60-90 minutes will be conducted with all 30 participants. Interview guides are developed for each stakeholder group, covering topics such as:

- Personal experiences with jeepney modernization
- Perceived benefits and challenges
- Impact on daily routines/livelihoods
- Attitudes toward sustainability and modernization
- Suggestions for improvement

Focus Group Discussions

Three focus group discussions (one per stakeholder group) with 6-8 participants each will be conducted to explore collective perspectives and generate discussion on shared experiences.

Participant Observation

Structured observations will be conducted on selected jeepney routes to document interactions, behaviors, and contextual factors that may not emerge in interviews.

Document Analysis

Relevant policy documents, media reports, and stakeholder communications will be analyzed to provide context and triangulate findings.

Data Analysis

The study conducted reflexive thematic analysis following Braun and Clarke's phases: familiarization, coding, generating candidate themes, reviewing and refining themes, and producing a narrative with data extracts. Two analysts independently coded an initial subset to develop a shared codebook, then iteratively refined codes through memoing and peer debriefs. We examined negative and deviant cases and maintained an audit trail, which was coded inductively while still informed by the theoretical framework of the Sustainable Livelihood Framework (SLF) and the Theory of Planned Behavior (TPB) to obtain data from the lived experiences and behavioral dynamics. Credibility was supported by analyst triangulation, member reflections with a subset of participants, and thick description to support transferability.

Trustworthiness and Rigor

This study employs Lincoln and Guba's (1985) criteria for establishing trustworthiness in qualitative research:

Credibility: Ensured through prolonged engagement with participants, triangulation of data sources (interviews, focus groups, observations), member checking of transcripts and preliminary findings, and peer debriefing with research supervisors.

Transferability: Achieved through thick description of research context, participants, and findings to enable readers to assess applicability to other settings.

Dependability: Maintained through detailed documentation of research processes, decision-making rationale, and audit trails of data collection and analysis procedures.

Confirmability: Established through reflexive journaling, clear documentation of researcher's positionality and potential biases, and an external audit of research processes and findings.

Reflexivity Statement: The researchers acknowledge their positions as graduate students in business administration, which may influence their perspectives on modernization and efficiency. Regular reflection on assumptions, biases, and their potential impact on data collection and analysis will be documented throughout the research process.

Ethical Considerations

Data were generated through semi-structured interviews guided by an instrument developed from prior literature and expert review, then piloted with three participants for each group (one commuter, one driver, and one operator) to ensure clarity. Interviews lasted for 60 - 90 minutes, were conducted face-to-face at the jeepney terminal stations, audio-recorded with consent, and complemented by fieldnotes. All participants provided informed consent. The study received ethics approval from the transport associations. Data were stored on encrypted drives with de-identified filenames and limited-access permissions.

Research Timeline

The research will be conducted over 12 months, divided into four phases:

Phase 1: Preparation and Pilot Testing (Months 1-2)

- Literature review completion
- Instrument development and validation

- Ethical approval acquisition
- Pilot interviews with 3 participants (1 per group)
- Refinement of data collection protocols

Phase 2: Data Collection (Months 3-7)

- Recruitment of participants
- Individual interviews (30 participants)
- Focus group discussions (3 groups)
- Participant observations
- Document collection and analysis

Phase 3: Data Analysis and Interpretation (Months 8-10)

- Transcription and initial coding
- Thematic analysis
- Member checking and validation
- Integration of findings with theoretical frameworks

Phase 4: Reporting and Dissemination (Months 11-12)

- Manuscript preparation
- Peer review and revision
- Conference presentations
- Stakeholder feedback sessions

Limitations

This study acknowledges several limitations:

Methodological Limitations:

- Qualitative design limits statistical generalizability
- Self-reported data may be subject to social desirability bias
- Cross-sectional design captures experiences at one point in time

- Language barriers may affect depth of communication with some participants

Contextual Limitations:

- Focus on Metro Manila may not represent experiences in other Philippine regions
- Rapid policy changes may affect relevance of findings over time
- Political sensitivities around transportation policy may influence participant responses

Researcher Limitations:

- Researcher positionality as graduate students may influence participant responses
- Limited resources may constrain sample size and geographic scope
- Time constraints may limit longitudinal observation of modernization impacts

These limitations will be addressed through careful research design, transparent reporting, and acknowledgment of scope boundaries.

Expected Outcomes and Significance

Expected Outcomes

This study expects to generate several key outcomes:

Empirical Contributions:

- Comprehensive understanding of stakeholder experiences with jeepney modernization
- Identification of factors facilitating or hindering modernization success
- Documentation of unintended consequences and implementation gaps
- Evidence-based recommendations for policy improvement

Theoretical Contributions:

- Application of Sustainable Livelihood Framework to transportation policy analysis

- Integration of Theory of Planned Behavior in understanding policy adoption
- Development of stakeholder-centered framework for transportation modernization evaluation

Practical Contributions:

- Policy recommendations for more inclusive modernization approaches
- Guidelines for stakeholder engagement in transportation policy implementation
- Best practices for balancing sustainability goals with social equity concerns

Significance of the Study

This research addresses critical gaps in understanding transportation policy implementation from stakeholder perspectives. The findings will benefit:

Policymakers: Evidence-based insights for improving PUVMP implementation and designing future transportation policies that better account for stakeholder needs and concerns.

Academic Community: Methodological contributions to transportation policy research and application of established theoretical frameworks to contemporary policy challenges.

Transportation Practitioners: Practical guidance for implementing large-scale transportation system

changes while maintaining stakeholder support and minimizing negative impacts.

Civil Society: Enhanced understanding of how transportation policies affect different social groups, supporting advocacy for more equitable and inclusive policy approaches.

International Development: Lessons learned applicable to transportation modernization initiatives in other developing countries facing similar challenges.

Results and Discussion

Findings are organized into three themes: (1) Experiences of Commuters and Perceived Insights about Accessibility of Modernized Jeepneys, (2) Adjustments of Drivers under the Boundary System (3) Financial and Administrative Challenges of the Operators in Adopting the Modernization Program, each defined and supported by illustrative excerpts from diverse participants (P01–P30). We present outliers and boundary conditions to delineate the scope. The first and second authors identify as [positionality], with professional experience in [domain], which shaped topic selection and interpretation. We mitigated bias via reflexive memoing, peer debriefing, and transparency in analytic decisions. We connect themes to sustainable transport transitions, policy implementation, and social equity, showing how the study advances conceptual understanding and informs practice for stakeholders, including policymakers, transport cooperatives, and local government units.

Table 2. Stakeholders' Theme Table

Theme	Definition	Key Subthemes	Example Excerpt	Boundary Conditions
1. Comfort, Safety, Security, and	Assessing the commuters based on their	Improvement in terms of comfort level due to air-	Commuter 02: “As a student, I prefer the comfort	In this case, the accessibility of modernized

Accessibility in Commuters' Experiences	changes of experience brought by modernized jeepneys	conditioning, CCTV for monitoring, and secured doors as a passageway.	of the modernized jeepneys, but they are not that accessible to my area. I need to walk a bit further to ride one.”	jeepneys is dependent on the location. Even within Metro Manila, certain places are quite distant from this unit.
2. Economic Burden and Occupational Adjustment of Drivers' Experience	Understanding the economic pressures and workload in adopting modernization for jeepneys	Changes in the boundary system that lead to an increase in the rate, including the charge for drivers for using fuel. In this regard, longer working hours are necessary to meet the boundary rate per day set by their respective cooperatives.	Driver 01: “Before, we were working under a quota system, but now it’s boundary-based. The boundary for modern jeeps is higher. For example, our unit’s boundary is ₱3,300, while the older ones are ₱3,000, and we pay for our own diesel. Back then, under the quota system, our quota was ₱7,500, but the company covered the diesel. We were	From the 10 drivers interviewed, all of the units were affiliated with different registered cooperatives and not part of the colorum sector.

			paid a salary, and if we went over our quota, the extra income was ours. But now that we're on a boundary system, we pay for our own diesel, and only after meeting both the boundary and fuel expenses do we start earning extra. That's our current situation."	
3. Financial Strain and Institutional Regulations of Operators' Experiences	Describes the challenges encountered by the operators in terms of the financial and administrative aspects of acquiring and managing modernized jeepney units	Higher bank loan interest repayments, increased maintenance costs compared to traditional jeepneys, and limited access to government financing due to the criteria	Operator 03: "During the pandemic, most of the operators in Mandaluyong Transport Service Cooperative submitted requirements to different government financing. Some were approved, but some are not, and I am one of those. It	From the small to medium operators in Metro Manila that were interviewed, they have different capacities in terms of financial and administrative management.

			involves a tedious process and strict requirements, which is why I stick to bank loans. It is very heavy for small operators like me since the interest loans are higher and maintenance costs are also higher than the charges to all of the modernized jeepney operators.”	
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Recommendations

Based on the findings, it is recommended that the government further enhance its subsidy and financial assistance programs to ease the heavy financial strain on operators, drivers, and commuters. Strengthening these support mechanisms will help ensure the long-term sustainability and inclusivity of the modernization program. Since the modernization program involves both small and large operator groups, equitable policy implementation should also be prioritized to improve coordination and promote fairness among stakeholders.

For commuters, establishing a balanced fare structure that considers the daily income levels of passengers is essential to maintain accessibility while supporting operational costs.

Additionally, the number of traditional jeepneys, particularly those operating as colorum units without valid franchises, should be reduced. Only traditional jeepneys with newer, compliant

models should be allowed to operate to ensure fair competition. This will also prevent modernized jeepney units from remaining idle in terminals due to a lack of willing drivers who are burdened by high boundary fees.

Conclusion

In this research paper, beyond the strong motives of sustainability, it is concluded that jeepney modernization falls short in achieving efficiency and inclusivity for the people involved. For the three main stakeholders, commuters, drivers, and operators, the modernization program is seen as a challenging yet transformative shift. It introduces notable improvements in comfort and safety through features such as centralized air-conditioning, CCTV, cushioned seats, and higher ceilings, which contribute to a more secure and pleasant commuting experience.

However, several challenges remain. The affordability of fares makes the modernized jeepneys

less accessible to lower-income commuters, while longer travel times compared to traditional jeepneys continue to be a concern. For drivers, the increased boundary quotas result in longer working hours, often from as early as 4:00 a.m. until 11:00 p.m. Meanwhile, operators face significant financial burdens—from the high cost of acquiring and maintaining the units to navigating complex regulatory processes that require coordination with local government units (LGUs), government agencies, and cooperative management.

Applying the Sustainable Livelihood Framework, the study shows that modernization reshapes multiple livelihood assets but also creates risks for financial and social capital. The high costs of modernization require loans that often lead to debt burdens, as repayment is challenging even with government subsidies and cooperative support. This increases the risk of exclusion for small-scale operators. Furthermore, modernization affects human and physical capital, as drivers and operators need retraining and adjustments to adapt to new technologies integrated into modernized jeepneys.

From the perspective of the Theory of Planned Behavior, the mixed experiences and perceptions of stakeholders lead to inconsistencies in acceptance. Attitudes toward modernization are ambivalent: while commuters appreciate improvements in comfort and safety, fare increases remain a major concern. Subjective norms also play a role, some commuters support modernization as progress, while others resist it due to affordability issues. Perceived behavioral control is constrained, especially for drivers and operators, who fear financial loss as they struggle with daily expenses, repayment schemes, and the traditional boundary system, all of which exceed their economic capacity.

In conclusion, jeepney modernization in Metro Manila cannot be assessed solely based on technological upgrades and environmental targets. The program needs recalibration through more inclusive financing schemes that go beyond loan subsidies, as these still incur interest, and through participatory policymaking that considers the voices of all stakeholders. As a cornerstone of Philippine public transportation, jeepney modernization must

uphold not only environmental sustainability but also social justice and economic viability.

Our findings reflect experiences of jeepney commuters, drivers, and operators in Metro Manila and self-reported accounts; transferability is analytic rather than statistical. Future work should examine provincial and rural settings, which include the lived experiences and perspectives of the transport regulators and local government officials, and triangulate with policy documents, financial records, and observational data to understand the overall impact of the modernization in depth over time from another side of the coin.

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