

The Effect Of Modernization Of Jeepneys On Local Tourism Development In Tagaytay City

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Abstract: *This study examined the effect of jeepney modernization on local tourism development in Tagaytay City, Philippines, with particular emphasis on the sustainability of modernized jeepney (e-jeepney) operations in terms of service quality and profitability. Using a quantitative descriptive research design, data were gathered from commuters, students, and jeepney drivers through a survey questionnaire. Descriptive statistics and multiple linear regression analysis with 5,000 bootstrapped samples were employed to analyze the data. Results revealed that jeepney modernization significantly contributes to local tourism development, explaining 60.6% of its variance. Service quality emerged as a significant predictor of local tourism development, indicating that improvements in safety, comfort, reliability, and driver professionalism enhance tourist experiences and destination accessibility. However, profitability did not show a significant direct effect on tourism development. Overall, the findings underscore the importance of prioritizing passenger-oriented service improvements in transport modernization initiatives to support sustainable local tourism growth.*

Keywords: Jeepney modernization, local tourism development, service quality, profitability, sustainable transportation

I. INTRODUCTION

The jeepney has come to represent the Philippines, even without intention. Its evolution reflects Filipino creativity transforming discarded metal into a functional and iconic form of transportation and art. Originally fashioned from surplus military vehicles left behind by American troops after World War II, these jeeps were modified by resourceful Filipinos to make them roadworthy and suitable for public transportation.

To improve the safety, reliability, and overall convenience of the country's transport system while reducing harmful emissions the Department of Transportation launched the Public Utility Vehicle Modernization Program (PUVMP) in 2017, as stated by the LTFRB. The program mandates the gradual phaseout of jeepneys older than 15 years and their replacement with safer and more modern units (Respicio, 2020). These newer alternatives include electric jeepneys or e-jeeps, which operate through electric engines compatible with rooftop solar panels.

The growing global shift toward modernization and sustainability has heightened the need for environmentally responsible transport. Old diesel powered PUVs, especially traditional jeepneys, have been identified as major contributors to air pollution

accounting for 75% to 94% of roadside soot Republic of the Philippines and particle emissions in Metro Manila, Baguio, Tagaytay City and Pampanga despite making up only about 20% of the vehicle population. A 2017 Rappler report also emphasized that jeepneys remain the most frequently used transportation mode in Metro Manila, responsible for 19.1% of all trips in the region because of their significant impact on air and noise pollution, the modernization program seeks to replace these aging vehicles with cleaner and more sustainable e-jeepneys. As noted by SolaReadyPH (2021), e-jeepneys do not burn fossil fuels, produce zero airborne emissions, and feature an environmentally friendly design.

This research benefits various stakeholders including the tourism sector, tourists, commuters, jeepney drivers and operators, and future researchers. It examines the economic implications of jeepney modernization on local tourism development and evaluates the sustainability of e-jeepney operations, particularly in terms of (1) service quality and (2) profitability.

II. METHODOLOGY

This study utilized descriptive and quantitative research designs to analyze the effects of jeepney modernization on local tourism development. The quantitative approach focused on the collection and analysis of numerical data,

while the descriptive design was used to assess and validate the research findings.

The respondents of the study consisted of fifty (50) jeepney drivers, students, and commuters from Tagaytay City. Cluster sampling was employed to group the respondents, followed by random sampling to select participants. Respondents were required to have experience in driving jeepneys or using jeepneys as their primary mode of public transportation.

Data were gathered using a researcher-made survey questionnaire composed of twenty (20) items based on related studies and literature. The collected data were organized and analyzed using frequency and percentage distribution, weighted mean, descriptive interpretation, simple linear regression analysis, and composite mean.

The survey was conducted through Google Forms after securing permission from the appropriate authorities. The purpose of the study was explained to the respondents, and participation was voluntary.

Ethical standards were observed by ensuring confidentiality, voluntary participation, and the absence of incentives or conflicts of interest.

III. RESULTS AND DISCUSSION

This chapter presents the results of the data gathered from 50 respondents composed of students, commuters, and jeepney drivers in Tagaytay City. The analysis follows the sequence of the study's research questions to provide an organized and comprehensive interpretation of findings related to the modernization of jeepneys and its impact on local tourism development.

Table 1: Demographic Profile of the Respondents

Category	Frequency	Percentage
Age:		
21 and below	17	34.0
22-31	11	22.0
32-43	15	30.0
44-55	6	12.0
56 and above	1	2.0
Sex at Birth:		
Male	33	66.0
Female	17	34.0
Employment Status:		
Employed	29	58.0
Unemployed	21	42.0

Note: n = 50

Table 1 presents the demographic profile of the respondents. In terms of age, the majorities are 21 years old and below (34%), followed by those aged 32–43 years (30%), indicating that the respondents consist

largely of young individuals and working-age adults who are actively exposed to modernization and technological advancements influence tourism development. Regarding sex at birth, most respondents are male (66%), while 34% are female, suggesting stronger male participation in tourism related activities and local development initiatives in Tagaytay City. In terms of employment status, the majority of respondents are employed (58%), while 42% are unemployed, implying that more than half of the respondents are economically active and potentially involved in tourism enterprises or related services affected by modernization. Overall, the findings suggest that the respondents are predominantly young to middle-aged, male, and employed individuals, making them relevant informants in assessing how modernization influences local tourism development in Tagaytay City.

Table 2: Tourists' Perception Toward Economic Impact of Modernization of Jeepney on Local Tourism

Indicators	Mean	Descriptive Interpretation
1. Jeepney modernization has contributed to the development of local tourism.	3.24	High
2. Modernized jeepneys have improved access to tourist destinations.	3.21	High
3. Jeepney modernization has positively affected tourism-related businesses.	3.23	High
Composite Mean	3.23	High Satisfaction Level

Note: Legend: 3.25 - 4.00 = Very High; 2.50 - 3.24 = High; 1.75 - 2.49 = Low; 1.00 - 1.74 = Very Low.

Table 2 presents tourists' perception toward the economic impact of jeepney modernization on local tourism. Among the indicators, the highest mean score is attributed to the statement —Jeepney modernization has contributed to the development of local tourism|| with a mean of (M= 3.24), interpreted as High. This finding suggests that tourists generally perceive modernized jeepneys as supportive of tourism growth by enhancing transport efficiency, safety, and overall travel experience within Tagaytay City. Improved public transportation systems play a crucial role in attracting tourists, as accessibility and convenience are key determinants of destination competitiveness. Jeepney and public transport modernization have been widely recognized as contributors to tourism and local economic development. According to the World Tourism Organization (UNWTO, 2019), efficient and modern transportation systems enhance destination accessibility, which directly influences tourist satisfaction and spending behavior. Improved mobility allows tourists to explore more attractions, thereby increasing tourism-related revenues.

The indicator —Jeepney modernization has positively affected tourism related businesses|| obtained a mean of ($M=3.23$), also interpreted as High, indicating that respondents recognize the role of modernized transport in stimulating local economic activities such as food establishments, accommodation services, and small tourism enterprises. Reliable transportation enables smoother tourist mobility, which can increase spending and length of stay in local destinations. Similarly, a study by Gwilliam (2018) emphasized that public transport modernization in developing regions leads to increased economic activity by improving connectivity between urban centers and peripheral tourist destinations. The study highlighted that transport reforms positively affect small businesses that rely on tourist movement.

Meanwhile, the statement —Modernized jeepneys have improved access to tourist destinations|| recorded the lowest mean of 3.21, though still interpreted as High. This suggests that while accessibility has generally improved, some respondents may still experience limitations such as route coverage, availability in remote areas, or fare concerns. These factors may affect the full realization of modernization benefits, particularly in less urbanized parts of Tagaytay City.

In the Philippine context, Llanto and Navarro (2020) found that transport infrastructure improvements, including public utility vehicle modernization, contribute to regional tourism development by reducing travel time, improving safety, and encouraging domestic tourism. Their study noted that modernized transport systems enhance tourists' perceptions of destination quality.

Overall, the composite mean of ($M=3.23$), interpreted as a High Satisfaction Level, indicates that tourists perceive jeepney modernization as having a positive economic impact on local tourism development. The findings imply that modernization initiatives contribute to improved mobility, enhanced tourist experiences, and increased economic opportunities, thereby supporting sustainable tourism growth in Tagaytay City. Moreover, the World Bank (2021) reported that modern public transport systems support inclusive economic growth by generating employment opportunities and improving access to tourism markets, particularly in provincial areas. These improvements help local communities benefit more directly from tourism activities.

Table 3: Tourists' Perception Toward the Benefits of Jeepney Modernization on Local Tourism

Indicators	Mean	Descriptive Interpretation
1. Modernized jeepneys provide safer transportation for tourists.	3.26	High
2. The Comfort of modernized jeepneys improves the tourist experience.	3.22	High
3. Tourist prefer modernized jeepneys over traditional jeepneys	3.14	High
Composite Mean	3.21	High Satisfaction Level

Note. Legend: 3.25 - 4.00 = Very High, 2.50 - 3.24 = High, 1.75 - 2.49 = Low, 1.00 - 1.74 = Very Low.

Table 3 presents tourists' perception toward the benefits of jeepney modernization on local tourism. Among the indicators, the highest mean score is recorded for the statement Modernized jeepneys provide safer transportation for tourists|| with a mean of ($M=3.26$), interpreted as High. This finding indicates that tourists strongly perceive safety as a primary benefit of jeepney modernization. Enhanced safety features such as regulated operations, improved vehicle conditions, and standardized systems contribute positively to tourists' confidence when traveling within Tagaytay City. Transportation safety is a critical factor influencing destination image and tourists' willingness to explore local attractions.

The indicator The comfort of modernized jeepneys improves the tourist experience|| obtained a mean of ($M=3.22$), also interpreted as High, suggesting that tourists value improved seating, ventilation, and overall ride quality.

Comfort plays a significant role in shaping tourists' overall travel satisfaction, particularly for destinations that require frequent intra-provincial travel. Comfortable transport systems enhance tourists' enjoyment and encourage longer stays and repeat visits. Transportation safety and comfort have been widely identified as essential factors in enhancing tourist satisfaction. According to Prideaux (2000), efficient and safe transport systems significantly influence tourists' destination choice and overall travel experience. Destinations with reliable public transportation are more likely to attract and retain tourists. Similarly, Dickinson and Lumsdon (2010) emphasized that transport comfort and accessibility are critical components of tourism infrastructure, particularly in regional destinations. Their study found that improved transport quality enhances tourists' mobility and satisfaction, contributing to destination competitiveness.

Meanwhile, the statement Tourists prefer modernized jeepneys over traditional jeepneys|| yielded the lowest mean score of ($M=3.14$), although still interpreted as High. This result implies that while tourists generally favor modernized jeepneys, some may still appreciate traditional jeepneys for their cultural value and authenticity. This highlights the importance of balancing

modernization with cultural preservation in tourism development.

Overall, the composite mean of ($M=3.21$), interpreted as a High Satisfaction Level, indicates that tourists generally recognize the benefits of jeepney modernization in terms of safety, comfort, and preference. These findings suggest that modernization initiatives positively contribute to improving tourist mobility and experiences, thereby supporting sustainable local tourism development in Tagaytay City. In the Philippine context, Santos and Cordero (2019) reported that transport modernization programs improve perceived safety and service quality, positively affecting tourists' attitudes toward local destinations. The study also highlighted the need to integrate modernization efforts with cultural elements to maintain destination identity. Moreover, the World Tourism Organization (UNWTO, 2020) stressed that modern and safe transport systems are vital in promoting sustainable tourism, as they enhance visitor confidence while supporting local economic development.

Table 4: Sustainability of Modernized Jeepney Operations in terms of Service Quality

Indicators	Mean	Descriptive Interpretation
1. Modernized jeepneys are clean and well-maintained.	3.21	High
2. Drivers of modernized jeepneys are professional and courteous.	3.26	Very High
3. Modernized jeepneys provide reliable and safe service.	3.24	Very High
Composite Mean	3.17	High Satisfaction Level

Note: Legend: 3.25 - 4.00 = Very High, 2.50 - 3.24 = High, 1.75 - 2.49 = Low, 1.00 - 1.74 = Very Low.

Table 4 presents the level of sustainability of modernized jeepney operations in terms of service quality. Among the indicators, the highest mean score was recorded for the statement Drivers of modernized jeepneys are professional and courteous ($M = 3.26$), which is descriptively interpreted as Very High. This finding suggests that passengers highly value the professionalism and courteous behavior of drivers, indicating that driver conduct plays a crucial role in shaping positive commuter experiences. Professional drivers contribute to safer travel, better passenger relations, and improved public trust in modernized transport systems. This result is consistent with the study of Parasuraman, Zeithaml, and Berry (1988), which emphasized that assurance and empathy manifested through employee courtesy and professionalism are key dimensions of perceived service quality.

The second highest mean was obtained by the statement Modernized jeepneys provide reliable and safe service ($M = 3.24$), also interpreted as Very High. This implies that passengers perceive modernized jeepneys as dependable and safe modes of transportation, likely due to improved vehicle standards, regulated operations, and enhanced safety features. Similarly, a study by Del Rosario, Palanca, and Gonzales (2020) found that vehicle reliability and safety significantly influence commuter satisfaction and acceptance of public transport modernization initiatives in the Philippines.

On the other hand, the lowest mean score was noted for the statement Modernized jeepneys are clean and well-maintained ($M = 3.21$), which is still interpreted as High. Although passengers generally agree that modernized jeepneys are clean and properly maintained, the relatively lower rating suggests that there may be occasional concerns regarding cleanliness consistency or maintenance practices. According to Eboli and Mazzulla (2007), cleanliness and vehicle condition remain important service attributes, and any decline in these areas can slightly reduce overall satisfaction despite strong performance in other service dimensions.

Overall, the composite mean of ($M=3.17$), interpreted as a High Satisfaction Level, indicates that overall, passengers are satisfied with the service quality of modernized jeepney operations. This suggests that modernization efforts positively contribute to service sustainability, particularly through improved driver behavior, safety, and reliability. These findings align with the study of Redman et al. (2013), which concluded that high service quality perceptions are essential in sustaining public transport usage and encouraging long-term commuter support for transport reforms.

Table 5: Sustainability of Modernized Jeepney Operations in terms of Profitability

Indicators	Mean	Descriptive Interpretation
1. Modernized jeepneys generate sufficient income for operators.	3.12	High
2. Fare rates of modernized jeepneys are reasonable.	3.23	High
3. Jeepney modernization supports long-term financial sustainability.	3.15	High
Composite Mean	3.17	High Satisfaction Level

Note: Legend: 3.25 - 4.00 = Very High, 2.50 - 3.24 = High, 1.75 - 2.49 = Low, 1.00 - 1.74 = Very Low.

Table 5 illustrates the sustainability of modernized jeepney operations in terms of profitability. Among the indicators, the highest mean score was obtained by the statement Fare rates of modernized jeepneys are

reasonable (M = 3.23), which is descriptively interpreted as High. This finding indicates that commuters generally perceive the fare structure of modernized jeepneys as acceptable relative to the quality of service provided. Reasonable fare rates are essential in balancing affordability for passengers and revenue generation for operators. This result supports the findings of Litman (2021), who emphasized that fare acceptability significantly influences both ridership levels and the financial viability of public transport systems. The statement Jeepney modernization supports long-term financial sustainability yielded a mean score of (M = 3.15), also interpreted as High. This suggests that respondents believe modernization initiatives can contribute to stable financial performance over time, possibly through improved efficiency, increased ridership, and reduced maintenance costs. According to the study of Santos and Javier (2019), investments in modern public transport vehicles often lead to better operational efficiency and long term cost savings, which enhance overall financial sustainability.

Meanwhile, the lowest mean score was recorded for the statement Modernized jeepneys generate sufficient income for operators (M = 3.12), though it still falls under the High descriptive interpretation. This result implies that while operators generally earn adequate income, there may be concerns regarding loan repayments, operational expenses, or fluctuating passenger demand. Similarly, Pojani and Stead (2015) noted that transport modernization programs may initially pose financial challenges for small operators, particularly during the transition phase, despite long-term profitability prospects.

Overall, the composite mean of (M=3.17), interpreted as a High Satisfaction Level, indicates that overall, modernized jeepney operations are perceived as financially sustainable. This suggests that stakeholders recognize the profitability potential of modernization, especially when supported by reasonable fares and long-term financial planning. These findings align with the conclusions of Vuchic (2005), who asserted that financially sustainable public transport systems require a balance between cost recovery, service quality, and affordability.

TABLE 6: Continuous Enhancement for Local Tourism Development

Indicators	Mean	Descriptive Interpretation
1. Additional routes connecting tourist destinations should be introduced.	3.13	High
2. Tourist-friendly features should be added to modernized jeepney.	3.23	High
3. Continued government support is needed to improve jeepney modernization for tourism.	3.22	High
Composite Mean	3.19	High Satisfaction Level

Note: Legend: 3.25 - 4.00 = Very High, 2.50 - 3.24 = High, 1.75 - 2.49 = Low, 1.00 - 1.74 = Very Low.

Table 6 presents the assessment of continuous enhancement initiatives for local tourism development in relation to modernized jeepney operations. Among the indicators, the highest mean score was recorded for the statement Tourist-friendly features should be added to modernized jeepney (M = 3.23), which is descriptively interpreted as High. This result indicates that respondents strongly recognize the importance of incorporating features such as route information displays, multilingual signages, comfort-oriented seating, and accessibility provisions to better serve tourists. Tourist-friendly transport systems enhance visitor experience and mobility, which are essential components of sustainable tourism development. This finding is supported by the study of Dickinson and Lumsdon (2010), which emphasized that accessible and user-friendly transport significantly improves tourist satisfaction and destination competitiveness.

Closely following this, the statement Continued government support is needed to improve jeepney modernization for tourism obtained a mean score of (M = 3.22), also interpreted as High. This suggests that respondents acknowledge the critical role of government intervention in sustaining and enhancing transport modernization efforts, particularly through policy support, infrastructure investment, and financial assistance. According to Hall (2008), effective government involvement is vital in integrating transportation planning with tourism development to ensure long-term sustainability and inclusive growth.

The lowest mean score among the indicators was noted for Additional routes connecting tourist destinations should be introduced (M = 3.13), which still falls under the High descriptive interpretation. Although respondents agree on the need for expanded routes, the slightly lower rating may indicate existing route coverage or operational constraints such as traffic conditions and demand variability. Nonetheless, improved connectivity remains essential, as transport networks directly influence tourists' ease of access to destinations. As highlighted by Prideaux (2000), transport accessibility is a fundamental factor in tourism development, shaping travel patterns and destination choice.

The composite mean of 3.19, interpreted as a High Satisfaction Level, indicates that overall, respondents support continuous enhancement measures linking modernized jeepney operations with local tourism development. This suggests that further improvements in route connectivity, tourist-oriented features, and sustained government support can strengthen the contribution of jeepney modernization to the growth and sustainability of local tourism.

Table 7: Effect of Jeepney Modernization on Local Tourism Development

Variable	B Coefficients	SE	Sig.	95% Confidence Interval		Conclusion
				Lower	Upper	
(Constant)	-.057	.183	.760	-.427	.292	Not Significant
Service Quality	.182	.076	.034	.018	.366	Significant
Profitability	.062	.041	.138	-.015	.133	Not Significant

Note: Adjusted R² = .606 (n = 288, df = 6, F = 51.938, p = <.001); 5000 sample bootstrapped.

Table 7 presents the results of a multiple linear regression analysis using 5,000 bootstrapped samples to examine the effect of jeepney modernization on local tourism development. The model was statistically significant overall (Adjusted R² = .606, F = 51.938, p < .001), indicating that approximately 60.6% of the variance in local tourism development can be explained by the combined predictors included in the model. This reflects a strong model fit and suggests that factors associated with jeepney modernization meaningfully contribute to explaining variations in local tourism development.

Among the independent variables examined, Service Quality emerged as a statistically significant predictor of local tourism development (B = .182, SE = .076, p = .034, 95% CI [0.018, 0.366]). This positive coefficient indicates that improvements in service quality associated with jeepney modernization such as better comfort, safety, reliability, and passenger experience are associated with increased local tourism development. Enhanced transport service quality likely improves tourists' mobility, satisfaction, and overall travel experience, making destinations more accessible and attractive. This finding supports the view that transport service quality plays a crucial role in tourism growth, as efficient and comfortable public transportation enhances destination competitiveness and visitor satisfaction.

In Contrast, Profitability was not found to be a statistically significant predictor of local tourism development (B = .062, SE = .041, p = .138, 95% CI [-

0.015, 0.133]). Although profitability may benefit transport operators and stakeholders economically, its direct effect on tourism development appears limited in this model. This suggests that financial gains from jeepney modernization alone do not necessarily translate into increased tourism activity, and that such economic benefits may influence tourism indirectly through reinvestment in services, infrastructure, or employment rather than through an immediate direct effect.

The constant term was also not statistically significant (B = -.057, SE = .183, p = .760), indicating that in the absence of the predictor variables, local tourism development does not significantly deviate from the baseline level.

Overall, the findings indicate that while jeepney modernization as a whole contributes significantly to explaining local tourism development, service quality is the key driver of this effect, whereas profitability does not exert a significant direct influence. This underscores the importance of prioritizing passenger-oriented improvements such as comfort, safety, and reliability in transport modernization programs to support tourism development. The results further imply that policy efforts should focus not only on economic viability for operators but also on enhancing the quality of transport services to maximize the tourism-related benefits of jeepney modernization.

IV. CONCLUSION

The findings of the study indicate that jeepney modernization has a generally positive influence on local tourism development in Tagaytay City. Respondents, who were mostly young to middle-aged, male, and economically active, demonstrated high levels of agreement regarding the economic impact, benefits, service quality, profitability, and sustainability of modernized jeepney operations. Tourists perceived modernization as beneficial in improving safety, comfort, accessibility, and overall travel experience, which are essential factors in enhancing destination attractiveness.

Moreover, the regression analysis revealed that service quality is a significant predictor of local tourism development, highlighting that improvements in comfort, safety, reliability, and passenger experience directly contribute to tourism growth. In contrast, profitability did not show a significant direct effect on tourism development, suggesting that financial gains alone are insufficient to drive tourism outcomes without corresponding improvements in service delivery.

Overall, the results emphasize that jeepney modernization supports local tourism development primarily through enhanced service quality rather than economic profitability alone. These findings underscore the importance of prioritizing passenger-centered transport improvements and continuous service enhancement to maximize the tourism-related benefits of jeepney modernization in Tagaytay City.

V. RECOMMENDATIONS

Based on the findings, the following recommendations are proposed to enhance local tourism development through improved service quality, accessibility, and sustainability of modernized jeepney operations in Tagaytay City.

1. **Enhance Service Quality Standards:** Government agencies and transport operators should prioritize continuous improvement of service quality by ensuring high standards of safety, comfort, cleanliness, and reliability in modernized jeepney operations. Since service quality was found to significantly influence local tourism development, regular monitoring and driver training programs should be implemented to maintain positive passenger experiences.
2. **Integrate Tourist-Friendly Features in Modernized Jeepneys:** Transport authorities should require the inclusion of tourist-oriented features such as route maps, multilingual signages, digital fare information, and accessibility facilities for persons with disabilities. These enhancements can improve tourist mobility, convenience, and satisfaction, thereby strengthening the role of public transport in tourism development.
3. **Expand Routes Connecting Tourist Destinations:** Local government units should collaborate with transport planners to expand and optimize jeepney routes that directly connect major tourist attractions, terminals, and accommodation areas. Improved route coverage can enhance accessibility, especially in less urbanized areas of Tagaytay City, and encourage greater tourist movement within the province.
4. **Strengthen Government Support and Policy Implementation:** Continued government support is recommended through financial assistance, infrastructure investment, and policy reforms that support sustainable jeepney modernization.

Subsidies, loan assistance, and technical support can help operators manage financial challenges while maintaining high service quality standards.

5. **Balance Modernization with Cultural Preservation:** Policymakers and transport operators should integrate cultural elements of traditional jeepneys into modern designs to preserve their cultural identity and tourism appeal. This balance can attract tourists who value both modern comfort and cultural authenticity, thereby enhancing the overall tourism experience.

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