Improving Commuters' Tricycle Riding Experience In Angeles City, Pampanga, Philippines

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Keywords:
Design Thinking
Public Transport
Philippine Tricycles
Angeles City

Abstract: *The authors investigated the tricycle system in Angeles City, Pampanga, Philippines from the perspective of both commuters and drivers. They employed the Design Thinking approach and went through the various stages such as empathize, define, ideate, prototype, and test. The authors learned that commuters' primary concern were tricycles' efficiency, accessibility, safety, security, and value for money. Based on the research findings, they gave some recommendations to improve the tricycle system in the locality.*

Introduction

The Philippines has a decent number of public transportation modes that commuters are using in their day-to-day activities. Public transportation varies depending on the physical and socio-economic preferences of the provinces within the country. Among the traditional modes of public transportation, the Philippine tricycle has become the primary vehicle capable of traversing the tight and narrow roads more common in provincial and municipal settings.

Motorized passenger tricycles, or simply referred to as "tricycles" are built in a variety of styles although the basic concept is having a sidecar affixed to a motorcycle that can accommodate four to six passengers excluding the driver (Gumasing & Liao, 2021). Catering to a small group of people at a time, tricycles offer fast travel from one's place of residence to work, school, leisure, and others. For highly-urbanized areas like the Angeles City, Pampanga, tricycles are arguably the preferred mode due to narrower roads caused by heavy traffic, sprawled establishments, high population density, and bustling economic activities. Aside from convenience, the tricycles' popularity also stems from their affordability and availability, particularly in areas lacking robust public transport infrastructure (Nguyen, 2020; Olaaiya et al., 2024).

Research Problem

Given the stature of tricycles in the daily lives of Filipinos, they however pose several issues. For one, tricycles are inherently more prone to accidents than four-wheeled vehicles due to their three-wheeled design, leading to higher rates of transportation-related injuries. This instability necessitates stringent safety measures and enhanced training for drivers to improve road safety (Romero, 2015; Sy, 2017; Felongco, 2015).

In addition to safety concerns, the ergonomic design of tricycles often fails to consider passenger comfort, particularly regarding seat design and the ease of access and egress. Prioritizing ergonomic improvements is essential to enhance the overall commuter experience and ensure passenger well-being (Olaaiya et al., 2024). The economic impact on commuters also raises issues, particularly with the significant fare increases at night and when passengers travel alone, which can make tricycle use less affordable and accessible (Caoleng, 2024).

Furthermore, the prevalence of tricycles and pedicabs on national highways, along with the high incidence of related accidents, remains a major regulatory challenge. In 2022 alone, Metro Manila witnessed thousands of road accidents involving these vehicles, highlighting the urgent need for stricter regulations and improved enforcement to safeguard both operators and the public (Benavidez, 2023).

Research Objectives

Although there is a growing body of literature tackling issues in the current and whole tricycle transport system, there is a lack of research that involves Angeles City. Thus, this study aims to investigate the current tricycle situation in the City, determine the issues and challenges that commuters and drivers alike encounter, and come up with possible solutions that will create a more pleasant, sustainable, and commuter-friendly tricycle riding experience in Angeles City. Specifically, this study has the following objectives:

1. To identify the factors that affect a commuter's tricycle riding experience in Angeles City
2. To determine the issues that hurdle a commuter's tricycle riding experience
3. To examine the perspectives of both commuters and tricycle drivers
4. To develop modern and innovative solutions to improve the tricycle transport system in Angeles City

Investigating the commuters' tricycle riding experience would be a step towards transforming the overall tricycle system in Angeles City. More so, the study's findings would not only affect the said sector but also contribute to the country's call for a safer and efficient transport system.

Research Question

This study aims to answer the question: What policies might be adopted by local government agencies to improve tricycle riding experience for commuters in Angeles City, Pampanga, Philippines?

Significance of the Study

Tricycles play an important role in local economies including Angeles City. Thus, the improvement of this mode of public transportation will imply a rippling effect on the economy. First, tricycles provide a source of income for Filipinos who reside in the rural and urban poor communities. The lack of educational attainment hindered many Filipinos in pursuing their dream jobs, thus operating a tricycle provides an easier way to generate cash for the needs of their family's survival. It also has lower capital investment and requires minimal training or educational qualifications and background.

Second, tricycles' continuous utilization to travel short distances connecting communities to public markets, schools, and workplaces triggers the start of the micro economy, boosting growth within the community.

Finally, tricycles operate usually near small retail shops, markets, and other service providing businesses. As such, they indirectly support the micro and small businesses by

helping in the smooth flow and increasing the customer mobility within the community. Furthermore, the building of sidecars and tricycle repairs give rise to small businesses.

Aside from the aforementioned economic benefits, addressing the issues involving tricycles would also have social implications. The introduction of safety attachments such as passenger restraints belts and side paddings, improved maintenance procedures, and conduct of mandatory driver safety training will drastically decrease the number of accidents and injuries on the roads. The increase of safety features of the tricycle would also increase the public confidence in its reliability thus increasing its ridership.

Another, the establishment of a strict rule implementation coupled with consistency on its imposition promotes a safer traffic environment, smoother traffic flow, and improves the service which can be used by the public thus increasing also the public trust of the people to the government.

Literature Review

Angeles City or officially known as “City of Angeles”, located in the northwestern portion of Pampanga, is a first-class highly urbanized and politically independent city (Lungsod ng Angeles, n.d.). As of the 2020 census, the City had a population of 462,928, reflecting a growth rate of 2.5 percent since 2015 (Philippine Statistics Authority, 2021). Known for its rich heritage sites, vibrant gastronomy tourism, and educational institutions, Angeles City serves as a melting pot of both residents and visitors.

In this context, tricycles serve as a vital mode of transportation within the City. They are particularly favored for short-distance travel due to their affordability and convenience. As of December 2022, there were approximately 1,527,187 registered tricycle drivers across the Philippines, with Region III (Central Luzon) accounting for about 283,330 or 18.5 percent of the total number of drivers (eFOI Portal). Meanwhile, Beltran et al. (2015) estimated that road density in Angeles City in 2013 is at 0.66 kilometer per 1,000 population which is notably lower than the standard urban road density of 2.4, complicating the commuting experience. Furthermore, the current state of tricycle transportation in Angeles City is marred with numerous challenges including traffic congestion, fragmented routes, inconsistent fare practices, and safety concerns.

A growing body of research has examined various aspects of commuter satisfaction regarding tricycle services in Angeles City. Rosal et al. (2024) explored the life narratives of Filipino tricycle drivers to understand their experiences before and during the COVID-19 pandemic. The study highlighted themes such as "Challenged Livelihood" and "The Need to be Contented," emphasizing how drivers navigated their professional lives amid economic uncertainty. The findings advocate for increased awareness among community commuters and governmental respect for the profession while suggesting intervention programs to support tricycle drivers.

Furthermore, environmental regulations have emerged as critical factors influencing tricycle operations. Research assessing environmental compliance among tricycle operators revealed that many drivers engage in self-evaluation concerning environmental protection but often lack comprehensive knowledge about applicable laws (Dela Cruz & Santos, 2023). This highlights the need for educational programs focusing on environmental awareness alongside traffic regulations to promote sustainable practices within the industry.

In addition to these environmental considerations, studies have highlighted compliance issues related to traffic regulations among tricycle drivers. A study conducted in San Jose, Occidental Mindoro found that while most drivers demonstrated high compliance with traffic rules and regulations, there was a noticeable decline in compliance as drivers aged or gained more experience (Vandamme et al., 2022). This suggests that targeted educational interventions may be necessary to maintain high compliance levels across all age groups.

In a related study, Bawanan et al. (2020) explored customer satisfaction with tricycle services in Santiago City. This research emphasized safety and service quality as significant predictors of overall satisfaction among commuters. Utilizing structural equation modeling, the findings indicated that improvements in driver conduct and vehicle safety features could lead to higher levels of commuter satisfaction. This aligns with earlier work by Irene et al. (2015), which emphasized the importance of addressing passenger complaints regarding safety while maintaining affordability—a key factor that makes tricycles a popular choice among commuters.

Safety remains a predominant concern for passengers using tricycles. Research indicates that many commuters express dissatisfaction with safety measures currently in place during their rides. For instance, Rosal et al. (2024) highlighted that nearly half of respondents reported feeling unsafe due to driver behavior and the open design of tricycles. Addressing these safety concerns through improved training for drivers and better vehicle design is crucial for fostering a more secure commuting environment.

The integration of technology into transportation has also influenced commuter preferences significantly. The emergence of ride-hailing services like GrabTrike in Angeles City represents a shift towards more regulated options for passengers. With fare structures starting at PHP 25 for the first kilometer and an additional PHP 10 for subsequent kilometers, GrabTrike aims to provide reliable alternatives while enhancing safety through driver accountability (12Go, 2024). This development reflects an increasing recognition of the need for improved service standards within the tricycle industry.

Moreover, recent studies have explored sustainable alternatives such as electric tricycles (e-trikes). Research conducted in Bonifacio Global City indicated a high level of acceptability for e-trikes among commuters due to their reduced environmental impact and enhanced convenience (Marcelo, Parco, & Golpere, 2023). Transitioning to electric vehicles could significantly improve the riding experience by addressing noise pollution concerns while promoting sustainable urban mobility.

The organizational structure within which tricycle services operate is also crucial for understanding commuter experiences. The Tricycle Operators and Drivers' Associations (TODA) play an essential role in managing operations within Angeles City. These associations facilitate communication between drivers and local government authorities, allowing for better management of transportation services. For example, in 2015, various TODA groups petitioned the city council to open the issuance of franchises for tricycles operating within city limits (Pilapil, 2015). Such initiatives reflect ongoing efforts to enhance operational frameworks and address challenges faced by drivers.

Research Methods

Design Thinking method was applied in the study. To commence the first phase which is to empathize, the researchers conducted a field interview in Central Angeles City. The location was chosen because of its proximity to city landmarks such as the church, shopping malls, and schools, increasing chances to spot target participants.

Since the identification of participants was impromptu and voluntary, a less formal, semi-structured interview was the employed method in data collection. Although this method is known to offer the "best of both worlds", there is some risk where questions differ among participants that might challenge the identification of patterns, thereby lessening generalizability and validity of results (George, 2022).

Signed consent forms were secured prior to each interview to guarantee confidentiality. The researchers also offered to conduct the interviews in the language the participants are comfortable with (English, Filipino, Taglish, or Kapampangan, the local dialect), so they can freely express their ideas and insights.

There was a total of 14 interviewees wherein 9 were tricycle commuters and 5 were tricycle drivers. The interviewees' age ranged from 20 to 58 years old. Among the nine tricycle commuters, five were females while the other four were males. In terms of occupation, four were college students, three were workers, and two were vendors. All interviewed commuters have ridden tricycles in Angeles City. Meanwhile, the tricycle drivers were all males with driving experience ranging from 5 to 25 years. All interviewed tricycle drivers have routes traversing Angeles City.

Using a semi-structured interview, the interviewees were asked generally open-ended questions. They were asked about their personal experiences, interactions, struggles, and challenges when riding the tricycle. Ideas and suggestions for improvement of the tricycle were also solicited from the interviewees.

The interview audio recordings were transcribed, coded, and analyzed using the thematic method. Through the extracted codes, the researchers were able to identify patterns and draw main themes. After successfully identifying the themes, it was at the Define stage where the researchers were able to have an in-depth understanding of the research problem.

For the Ideate and Prototype stages, the researchers kept the interviewees' suggestions in mind that inspired and thus reflected in the recommendations to improve the tricycle system in Angeles City and the enhanced tricycle prototype. The researchers also sifted through related literature and current technologies in developing the recommendations and prototype.

Lastly, in the Test stage, the researchers conducted another field interview in the same location to gather feedback on the proposed recommendations and prototype. There were a total of four interviewees wherein two were commuters and the other two were tricycle drivers. The commuters were among the interviewees in the first round.

The feedback collected were noted and analyzed. The researchers improved the recommendations and prototype based on the response of the interviewees.

Results

This section provides the research findings as extracted and analyzed from the conducted interviews. Using the thematic method, the researchers were able to identify three main themes or factors that influence a commuter's tricycle riding experience in Angeles City. These are: 1) Tricycle efficiency and accessibility; 2) Commuters' concerns on safety and security; and 3) Commuters' value for money. Each theme will be discussed in further detail in succeeding paragraphs.

Tricycle efficiency and accessibility

Commuters in Angeles City highly value the efficiency and accessibility of tricycles, particularly when managed through TODA stations. Few interviewees expressed satisfaction with the minimal wait times. They noted the TODA's effective management in enhancing commuter convenience and reducing waiting times. However, challenges such as tricycle shortages during peak hours occasionally lead to competition among commuters.

The dynamic environment within Angeles City and the nearby residential-commercial zones had created connectivity and availability of a mode of transportation that could cater the needs of the community. The interviews revealed that availability is

not an issue in general but occasionally runs the risk of unavailability depending on the timeframe.

Tricycles are favored over jeeps and cars for their ability to navigate through traffic quickly and efficiently. The speed of tricycles is generally perceived as well-balanced, providing a safe and comfortable ride. One interviewee remarked on the adherence to speed limits which enhances the comfort level for commuters. Meanwhile, another interviewee appreciated the natural ventilation provided by the open design of the tricycles, adding to the overall comfort of the ride. The size and design of tricycles significantly impact the comfort and satisfaction of commuters. While some were satisfied with the current dimensions, others suggested modifications for increased comfort particularly a desire for larger, taller sidecars to accommodate different physical needs.

Commuters' concerns on safety and security

Most commuters preferred to ride inside the tricycle instead of behind the driver's seat because of perceived safety. Likewise, most drivers preferred the same for their passengers' safety. As most tricycles in rural and urban communities serve as a convenient and affordable means of travel, the commuters still expressed concerns about reckless driving as well as overspeeding. With a high value placed on safety, commuters take precautions in riding tricycles.

Commuters' value for money

The third factor that influences a commuter's tricycle riding experience is related to cost. The study used the phrase, 'value for money', to collectively describe the commuters' different concerns on cost. Glendinning (1988) stated that the concept of 'value for money' in everyday life is understood as someone not paying more for a good or service than what its quality or availability can account for.

Tricycles face fierce competition with other modes of public transportation, particularly jeepneys and GrabTrike. Cheaper fares is the defining factor that makes these alternative choices for transportation more appealing for commuters. Some interviewees

also felt that fares from the traditional tricycles were overpriced as compared with Grab car service. The interviews also revealed that commuters sometimes encounter unstandardized and varied fares when riding the tricycle. A surge in pricing is usually observed during peak hours and on fares in destinations which are beyond the limits of the published fare matrix. One student shared that there was an instance when the driver did not grant her student discount and that she experienced difficulty in getting a fare change which resulted in paying more than what is required. The varied fares also manifest when the tricycle gets stuck in traffic. Two tricycle drivers admitted that they sometimes charge additional fare because traffic costs them more gasoline fuel.

Many of the commuters agree that short trips of tricycles within barangay areas have reasonable fares. However, there are commuters specially on sectors of younger and older generations who have pointed out the inconsistencies specially during rush or peak hours and when fewer transport options are available due to unforeseen timeframes. The inconsistencies on fare matrix usually expose the commuter populace to overcharging creating an environment of frustration and distrust.

Given the challenges with fares, interviewees expressed strong desire for transparency. They wanted fares to be standardized, consistent, and non-discriminatory. For one interviewee, public announcements can be done to inform commuters of the correct fares and increase awareness of their rights. Another interviewee thought of a simple display of the fare matrix in conspicuous places. The corresponding discounts for students and senior citizens will also be included in the display.

Commuters naturally place high regard on the value for money. It is an unequivocal factor that sometimes can make or break the appeal of a service. The study revealed that the availability of cheaper alternatives affects the patronage of tricycle riding. Meanwhile, issues on fares arising from its being unstandardized and varied can potentially negate the positive aspects of the tricycle riding experience.

Discussion

This work aimed to answer the research question: What policies might be adopted by local government agencies to improve tricycle riding experience for commuters in

Angeles City, Pampanga, Philippines? Based on the findings of this study, the following policies are recommended, to wit:

Establish an integrated smart transportation systems

To limit erratic driving antics, enhance transport reliability and safety, and promote efficient traffic management, the existing tricycle system will be integrated with smart transportation systems. Also known as intelligent transportation systems, this pertains to the use of several technologies such as vehicle navigation, traffic signal control systems, and speed cameras that will collect, transmit, process, and display information across the transport network (NEC, 2022). The systems will help minimize traffic problems and achieve efficiency by providing real-time and up-to-date information to passengers and fellow tricycle drivers.

The following are the recommended smart transportation system features:

a) Global Positioning System (GPS) tracker - Existing tricycles will be fitted with GPS trackers for location monitoring. This will help in providing real-time information on the tricycles deployed which can be used to estimate the waiting time for passengers.

b) Speed limiter - This device will be installed in tricycles for speed monitoring and control to ensure that the tricycle is running at safe speed. The devices are then connected to the integrated tricycle transport system as control devices for drivers who are beyond the published speed limits under government transport policies.

c) Route optimization systems - The use of digital maps such as Google Maps or Waze for tricycle drivers is recommended to avoid traffic bottlenecks.

d) Digital fare meter - This device will help increase transparency and ensure fairness in charging fares.

e) Television (TV) display of real-time information on tricycles - TODA stations will be installed with a TV device that will flash information on deployed tricycle locations (showing estimated waiting time if there are no more reserved tricycles at the station), fare matrix, and Quick Response (QR) code for community feedback.

f) Mobile Ready Tricycle Transport System - The integrated tricycle transport system will be a mobile ready system to cater to the evolving needs of commuters. Integration of

the system can be done through a mobile application to create an efficient and always on the go function. Aside from mobile applications, the aged group can be provided with Near-Field Communication or NFC tags/stickers or microchip enabled dongles as an alternative for mobile applications.

On a more advanced and broader scale, tricycles can also be equipped with sensors for engine parameters monitoring to create data on fuel consumption and its effect on environmental air quality. Data extracted on this effort can be used on future urban planning and creation of environmental sensitive policies.

Pushing this type of solution will benefit not only the commuters but will also address the security concerns of tricycle drivers and operators. Upon implementation of the smart transport system, it will create a safer, reliable, and efficient traffic system starting with the traditional tricycle and hopefully will eventually be also integrated to the other modes of transportation in the City. Integrating a smart traffic system will create a future where traffic is not a headache but a symbol of economic development.

Formulate a Tricycle Services Communication Plan

The crafting of a communication plan to more effectively disseminate important information related to tricycle services will address the issues of overcharging and having unstandardized, varying fares. This action would be beneficial in bolstering confidence in availing tricycle services. Said plan will outline various advocacy campaigns such as city hall sessions and roadshows to inform the general public on commuter rights and updated fare matrix. Aside from the digital display at TODA stations, the fare matrix will also be mandated to be displayed conspicuously inside the tricycle.

Further to this, the plan can also include establishing a community feedback mechanism through a physical desk, hotline, and/or QR code to attend passengers' sentiments and complaints regarding tricycle services.

Establish a Tricycle Maintenance Program

Another recommendation is to set up service stations at key points in the city for regular maintenance and quick repairs during operations. This will help maintain the

tricycles in optimal condition, reducing delays due to mechanical failures and enhancing overall service reliability. The tricycle maintenance program can be a collaborative effort from the local government and motorcycle industries within Angeles City to help maintain and create a solution to the transport problem posed by the old system of tricycle transportation.

Furthermore, this program can include subsidies or low-interest programs for drivers to upgrade or perform major maintenance activities on their tricycles. A maintenance certification program can also be provided to the drivers from government institutions for them to open another source of income for the drivers while maintaining a good performance of the tricycle system within the City.

Prioritize public transport efficiency, safety, and security

Pass local ordinances focusing on route optimization, creation of firm safety standards and a sustainable income for tricycle drivers. Under route optimization, a detailed map and route study should be conducted or created in a way that overlapping with other transport utility vehicles be minimized or eradicated to create a smoother traffic movement. Strict safety standards should also be set covering the responsibilities of operators and drivers specially on the strict adherence to vehicular maintenance and mandatory safety seminars and training. Lastly, a sustainable income matrix should be formulated to eradicate the culture or mindset of “fast driving is equal to more passengers” which is very rampant within the tricycle and jeepney community all over the country.

Provide continuous capacity-building activities for tricycle drivers/operators

Tricycle drivers are recommended to be provided with continuous seminars, training, and workshops. These activities will cover a wide range of topics, including safety and traffic rules and regulations, first-aid and emergency response training, and practical workshops on basic maintenance of motorcycles. This comprehensive program will ensure that the tricycle drivers remain competent and responsible for the safety of their passengers.

Conclusion

Tricycles are among the most popular modes of public transportation in the Philippines. For highly-urbanized areas like the Angeles City, Pampanga, tricycles are arguably the preferred mode due to narrower roads caused by heavy traffic, sprawled establishments, high population density, and bustling economic activities. Aside from convenience, the tricycles' popularity also stems from their affordability and availability. However, the tricycle transport system in Angeles City is far from perfect.

By applying Design Thinking, the study brought commuters' daily struggles into light. The study investigated the perspectives and experiences of both commuters and drivers that opened a comprehensive view of the tricycle transport system's current state. With ideas and insights from both groups pinpointing the problems and pressing needs of the current tricycle transport system, they also guided the study's recommendations. One of the key proposals is the creation of an integrated smart transport system - a visionary approach that can be started at Angeles City that links all modes of transportation under one unified government transport system. The system would harness the technology in streamlining transportation operations, improving service quality, and ensuring affordability and accessibility. Starting on a smaller scale in a city like Angeles City and initially integrating it on the tricycle transport system, the concept could eventually be adopted in other locations to finally address the enormous and daunting traffic congestion problems in highly urbanized cities in the Philippines.

The study hopes to spark further research focused on improving public transportation starting with the traditional tricycle and hopefully with the other modes of transportation in the country as well. To mention a few, there could be studies like addressing the long-standing problems in transport inefficiencies, safety issues, and balanced ratio of fare to income matrix in the transportation sector. Giving focus on these issues would create a more sustainable, inclusive, and commuter-friendly transport system.

This study serves as an important step toward addressing the challenges of urban mobility and public transportation. By shedding light on the difficulties faced by both

commuters and drivers within the tricycle transport system, the study identified critical issues and proposed practical solutions that can lead to significant improvements. The insights gained from this research emphasize the need for a collaborative approach to transportation reform—one that prioritizes safety, accessibility, and sustainability for all involved.

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