Characteristics Of Pedicab Operation In Zamboanga City

Junievin RAMILLANO[a], Adrian BALANON[b], Deo Angelo Xenos CABUAL[c], Louisa May CASTRO[d], Jorizam ESCUADRO[e], Marjorie MADES[f], Jullian Gynne MAMAED[g]

[a,b,c,d,e,f,g] *Western Mindanao State University, Normal Rd., Baliwasan, Zamboanga City, Zamboanga del Sur, 7000, Philippines*
[a] *E-mail: junievin.ramillano@wmsu.edu.ph*
[b] *E- mail: qb202100114@wmsu.edu.ph*
[c] *E- mail: qb202100076@wmsu.edu.ph*
[d] *E- mail: qb202102006@wmsu.edu.ph*
[e] *E- mail: qb202100066@wmsu.edu.ph*
[f] *E- mail: qb202100363@wmsu.edu.ph*
[g] *E- mail: qb202100171@wmsu.edu.ph*

Abstract: Micromobility, the use of small, lightweight vehicles for short-distance trips like pedicabs, presents both opportunities and challenges in Zamboanga City. This study examines the operational characteristics of pedicabs, including the demographics of drivers and passengers, challenges faced by drivers, and the role pedicabs play in the urbanized areas. The study used descriptive statistics in the analysis. In the urban areas, 11 barangays were found to have existing high operations of pedicabs. Findings indicate that pedicabs are a significant source of income for drivers, with most being male, married, and having limited education. Passengers, typically students or working individuals, often use pedicabs for short-distance trips. Challenges such as competition from motorized vehicles, absence of fare matrix, inconsistent service quality were identified. The study highlights the need for regulatory improvements, fare standardization, and better support for drivers.

Keywords: Micromobility, Pedicab, Operations

1. INTRODUCTION

Active transportation, encompassing human-powered modes like cycling and walking, plays a crucial role in the transportation system, particularly in urban areas. Within this active transport category, informal public transport emerges as a vital component, bridging mobility gaps and providing affordable transportation options for many Filipinos (World Bank, 2015). Informal public transport, transportation services that operate outside of a regulated framework, typically lack fixed routes, fares, and licensing requirements compared to formal public transportation systems (World Bank, 2015). Individuals that are involved in the operation of informal public transport are creating innovative means of transportation tailored to their requirements, driven by limited financial resources and a preference for economical alternatives. (Hossain and Mazrin, 2023)

Micromobility, the use of small, lightweight vehicles for short-distance trips like pedicabs, presents both opportunities and challenges in Zamboanga City. According to the Institute for Transportation and Development Policy (2018), micromobility options include bicycles, e-scooters, and pedal-assisted bicycles. While pedicabs are human-powered and slightly larger than some micromobility options, they share similar characteristics in terms of offering a

sustainable, affordable, and space-efficient mode of transportation for short distances within urban areas.

Integrating pedicabs into a broader micromobility network, potentially through designated lanes or parking areas, could enhance their efficiency and accessibility, attracting new users and increasing driver income (ITDP, 2020). On the other hand, formalization efforts must be mindful of preserving the unique character of pedicabs and their role in informal employment. Striking a balance between regulation and flexibility will be crucial to ensure their continued relevance in the evolving urban transport landscape (Guillen, 2000).

Guillen (2000) stated that pedicab driving continues to provide a source of employment and livelihood, particularly for urban poor families. They serve as paratransit for short-distance travel. Cities like Zamboanga are where pedicabs serve as feeder mode to residential areas. According to Irene (2015), the majority of pedicab drivers are young adults who are married and have completed two to four years of college. They are primarily from urban areas and were generally primary school graduates. This highlights the enduring significance of pedicabs as a means of transportation and a source of income for many families.

Despite their prevalence and as a preferred mode of transport for short-distance trips in Zamboanga City, pedicab operations remain understudied. Though pedicabs mostly operate on urbanized areas, its operational characteristics still vary. However, the absence of this knowledge hampers this mode of transport to expose to better opportunities not only for the operators or drivers but also for the community. This lack of research hinders the city's ability to optimize urban mobility and address operational factors like traffic flow, safety, and regulatory framework. This study seeks to describe the pedicab operation in Zamboanga City. Through this, better regulatory policies can be made such as establishing permits, safety standards, and operational guidelines. This is also to shed light on their role in the local economies since they provide affordable transportation options and creates jobs for drivers and operators.

2. LITERATURE REVIEW

Many Asian cities face persistent mobility challenges across various transportation modes. Pedicab operations are impacted by infrastructure limitations and safety concerns, reflecting broader issues affecting active transportation options (Irene et al., 2015). However, despite these challenges, pedicabs play a vital role in the local economy, providing essential services and contributing to the livelihoods of marginalized drivers. This underscores the critical need for developing inclusive urban transportation solutions that cater to all segments of the population.

In Ermita, Manila, a study found out that while only a minority preferred pedicabs for short trips, the majority favored walking, emphasizing the importance of pedestrian-friendly environments and the enduring popularity of walking as a convenient transport choice (Fillone and Bibiano, 2018). Similarly, Sarsalejo and Preciados (2018) showed that pedicabs offer significant advantages due to their low investment and operating costs, resulting in high benefit-cost ratios and short pay-back periods compared to other modes of transport. Overall, both studies suggest that pedicabs represent a compelling option for urban transportation systems, offering economic benefits, affordability, and sustainability.

One case study by Irene (2015) examines non-motorized public transport in Catbalogan, Samar, focusing on pedicab driving and its economic opportunities. The study highlights that marginalized individuals often turn to pedicab driving as an accessible source of income. However, due to increasing competition from motorized pedicabs, many pedicab drivers feel compelled to switch to motorized vehicles for their convenience, leading to a decline in pedicab

operators and drivers despite their perceived importance for commuters due to their affordability and eco-friendliness.

Bongulto (2016) employed a descriptive survey and analytical method to investigate pedicab operations in Intramuros, Manila, focusing on non-motorized transportation (NMT), while Espina (2018) aimed to identify factors influencing the choice of pedicabs, understand customer preferences, and assess the economic viability of pedicab operations. Both studies found walking to be preferred for access and egress travel, scoring higher than pedicabs in safety, travel time, accessibility, and environment. Factors such as civil status, age, and income showed no significant trends, but sex notably influenced safety ratings. Distance, cost, and travel time were crucial factors influencing transportation choices, with walking preferred for shorter distances and pedicabs for longer distances. These findings underscore the importance of safety, travel time, accessibility, and cost considerations in individual transportation choices.

As noted by Alimo (2023), emerging trends in transportation, including the predicted dominance of micro-mobility options, necessitate smart solutions to address the challenges faced by informal transportation, particularly in developing cities. Research by Bongulto (2016) and Espina (2018) provided information on factors influencing pedicab use, customer preferences, and economic viability in the Philippines, offering insights into the socio-economic profiles of drivers, daily routines, challenges faced, and economic opportunities. However, there exists a gap in understanding specific characteristics of pedicab operations across different cities, including driver demographics, operation patterns, involvement in road incidents, and areas with high transportation demand.

3. METHODOLOGY

Descriptive statistics was used to comprehensively describe pedicab operations in Zamboanga City by examining various related characteristic. Surveys through interviews and traffic counts were employed. Simple frequency counts, percentages, pie charts, and bar graphs were used to present data collected.

The study is within Zamboanga City. A field observation and direct consultation to local authorities at the barangay level were done to determine areas with pedicab operations. It was found that a total of 11 barangays has high pedicab operations, as shown in Table 1 and the station locations are shown in Figure 1. In the data gathering, the survey approach employed convenience sampling to identify the first and following potential respondents, which are the pedicab drivers and users.

With the use of tally sheet, the volume and traffic count of the pedicabs was taken on May 13, 2024, from 7am-9am and 3pm-6pm. Surveyors were stationed mid-block of each station to gather the data. Pedicabs was manually counted or by means of digital counter, supported by record video footage for verification. Surveys were conducted last May 13, 2024, between 7am-12noon. The survey employed the Slovin's formula to determine the number of respondents in every selected station, of which a total of 63 respondents.

$$n = \frac{N}{1 + Ne^2} \tag{1}$$

$$n_o = \frac{PS}{N} \times n \tag{2}$$

where,

n = Sample size
N = Population size
e = Margin of error (5%)
n_o = Sample size per Station
PS = Population size per Station

Table 1. Identified barangays with pedicab operations, its population and sample size

Barangay	Station Number (Observation Station)	Population Size	Sample Size
Ayala	1	8	7
Recodo	2	15	13
Calarian	3	5	4
San Roque	4	5	4
San Jose Gusu	5	8	7
Sta. Maria	6	4	3
Tumaga	7	5	4
Guiwan	8	9	8
Sta. Barbara	9	9	8
Talon-Talon	10	2	2
Mampang	11	4	3

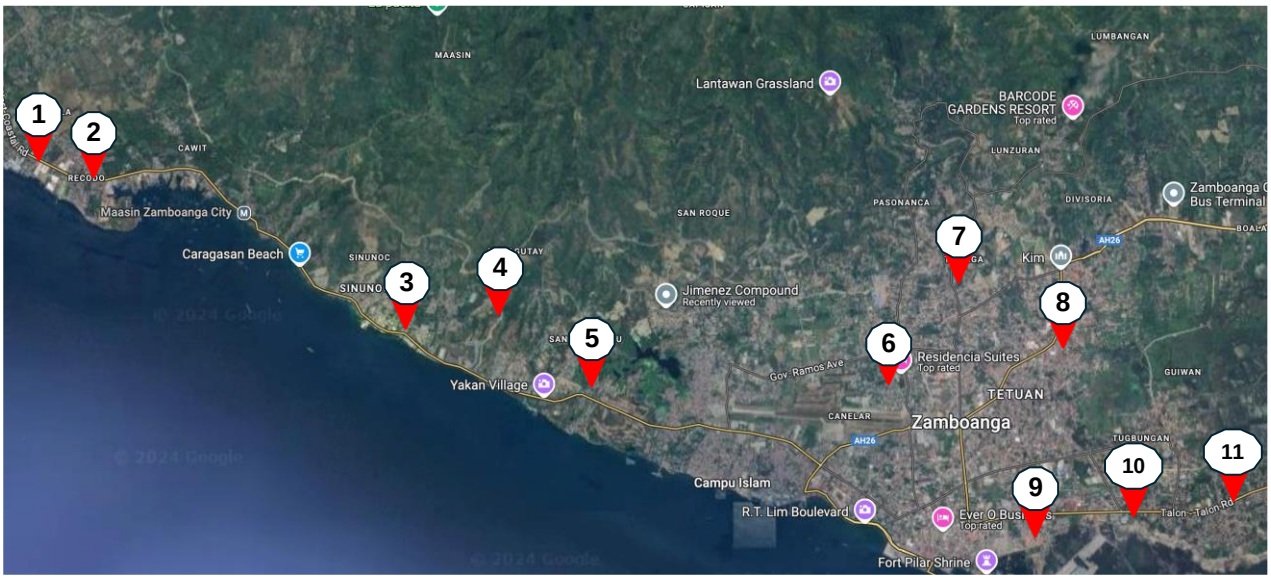


Figure 1. A map showing the locations of the stations of observations

The operational characteristics of pedicabs are determined using the following variables: (a) demographics of pedicab drivers and users, (b) operational characteristics in terms of how long they are operating, frequency of operation, acquisition of pedicab, cost of the acquisition and rent, earnings, manner of dispatch, affiliation to cooperatives, services offered, carrying capacity, pricing structure, challenges faced, and perception to safety.

4. RESULTS AND DISCUSSION

4.1 Demographics of Pedicab Drivers and Users

A survey was conducted among pedicab drivers to gather their demographics. The results revealed the following:

a. ***Age***: The mean age of pedicab drivers is 41 years old as shown In Figure 2 and their age range is 28 to 52 years old. Considering this mean age, the drivers are not at par to be considered as aging adults. The mean age of pedicab users is 25.44, meaning around 25 and 26, as shown in Figure 3. This means that typical users are students and young adults or working adults.

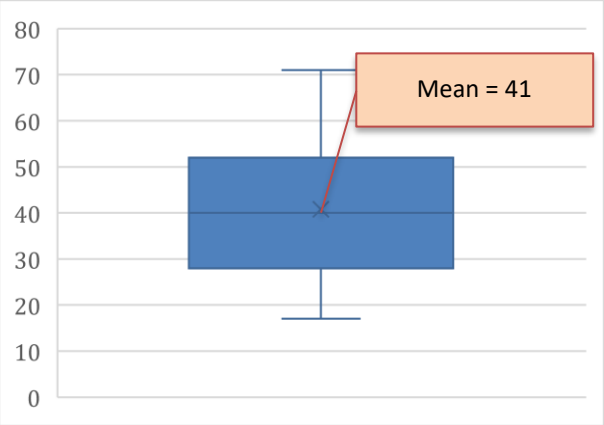


Figure 2. Age distribution for pedicab drivers.

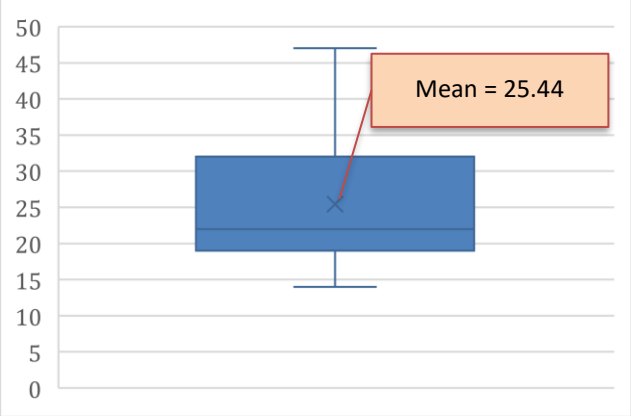


Figure 3. Age distribution for pedicab users.

b. ***Sex***: Most of the drivers are male, comprising 97% of the sample size, while 3% are female, as shown in Figure 4. Most of the users are female compared to female, as shown in Figure 5.

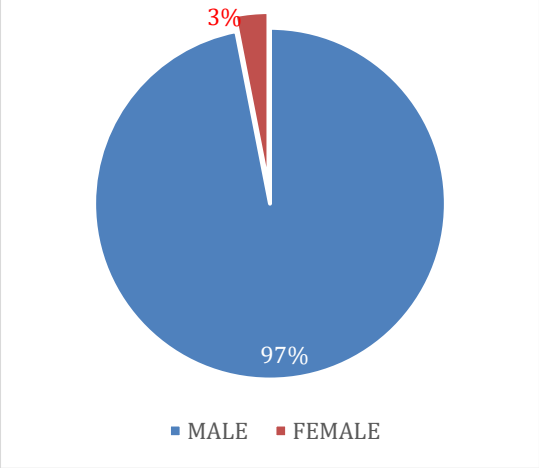


Figure 4. Age distribution for pedicab drivers.

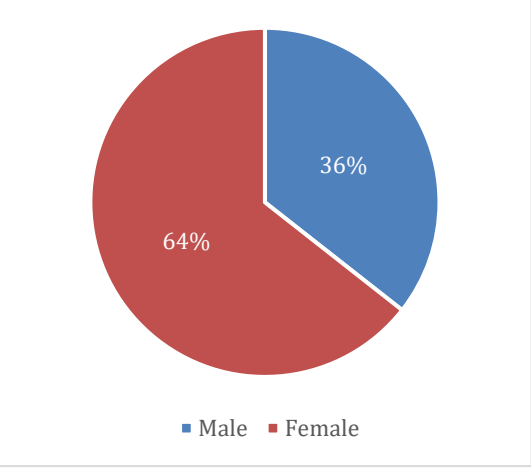


Figure 5. Age distribution for pedicab users.

c. ***Civil Status***: Most of the drivers are married (60%) followed by singles (25%,) as shown in Figure 6. Of users, 71% comprise married individuals then followed by singles (29%), as shown in Figure 7.

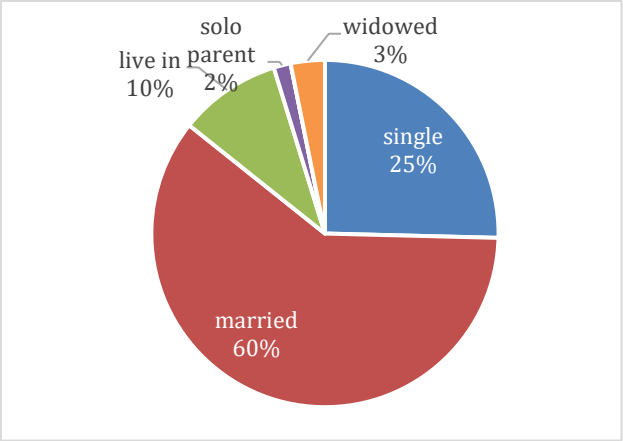


Figure 6. Civil Status for pedicab drivers.

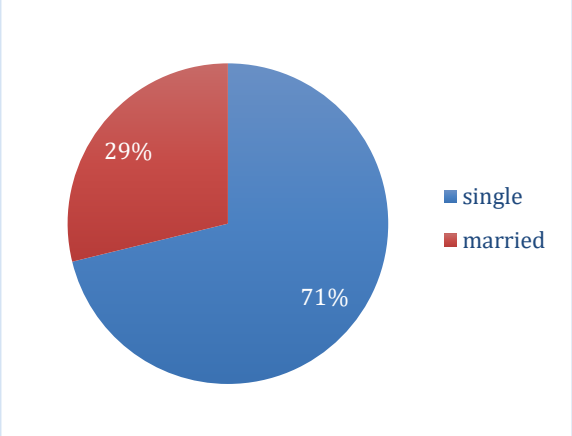


Figure 7. Civil Status for pedicab users.

d. ***Educational Attainment***: Most of the pedicab drivers have elementary and high school education as shown in Figure 8, of which 58% with elementary education and 32% with high school education. This means that since they do not have college degrees, employment opportunities are sought after the operation of pedicabs. On the other hand, users with a high school education (39%) are the highest, followed by those with a college education (37% in total), and with a bachelor's degree (18%) as shown in Figure 9. This means that a pedicab is a viable option for those who need short-distance trips from home to school and work.

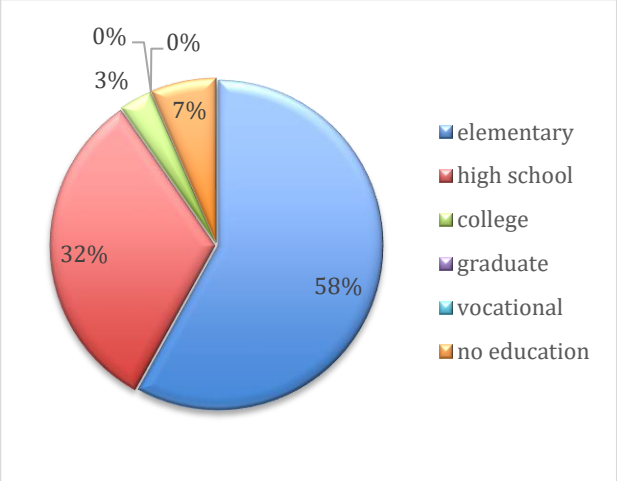


Figure 8. Civil Status for pedicab drivers.

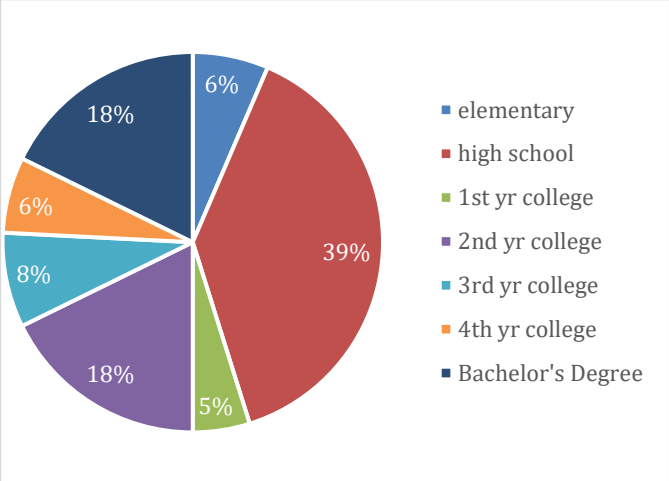


Figure 9. Civil Status for pedicab users.

4.2. Operational Characteristics of Pedicabs

The following results are the results based on the following variables: how long they are operating, frequency of operation, acquisition of pedicab, cost of the acquisition and rent,

earnings, manner of dispatch, affiliation to cooperatives, services offered, carrying capacity, pricing structure, challenges faced, and perception to safety.

a. Duration of operation as pedicab drivers. The average number of years of drivers operating pedicabs is 13.37 years, as shown in Figure 10. The long existence of the operations clearly depicts that pedicabs have been a vital part of the transportation system in urban areas. This also indicates that drivers have a deep understanding of the job that they are doing, familiarity with the routes, and have established relationships with regular customers. Operating pedicabs is not just a temporary job but rather a staple source of income, even when they are confronted with challenges like low wages or below the minimum wage. As shown in Figure 11, the average earnings of pedicab drivers are at Php316.29 while the minimum wage in Zamboanga is at Php381.

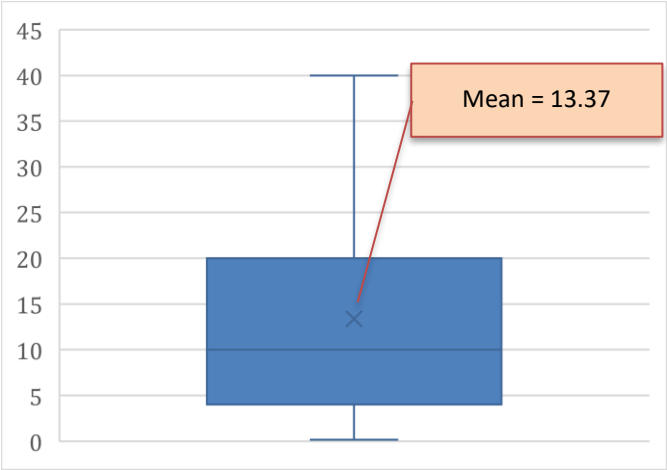


Figure 10. Distribution of number of years operating as pedicab drivers.

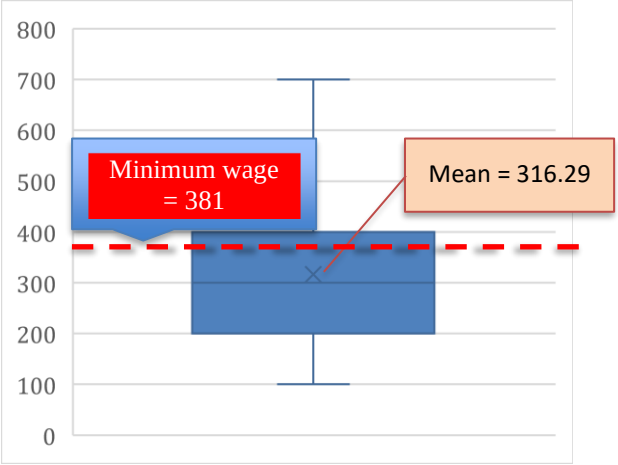
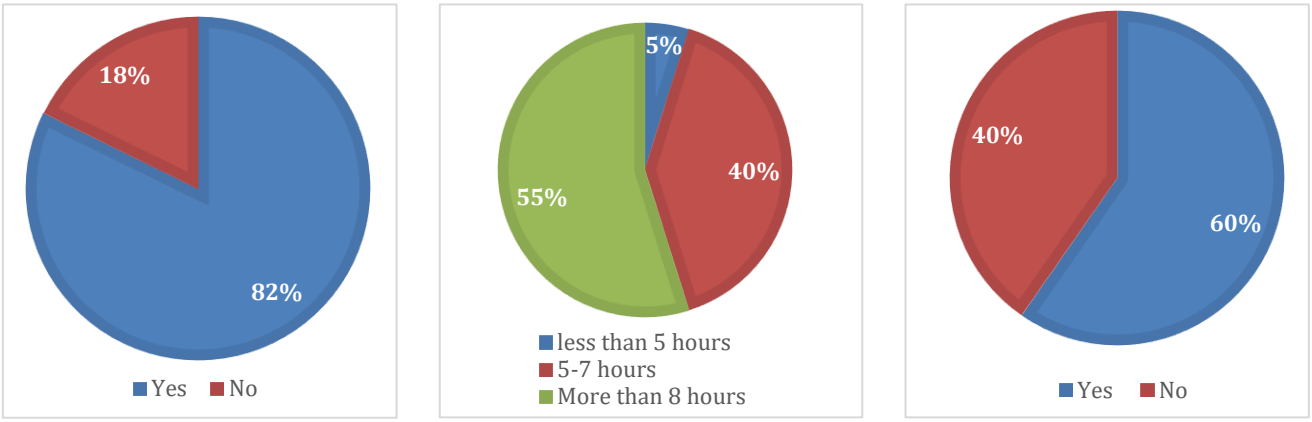


Figure 11. Earnings per day.

b. Frequency of operation. Figure 12 shows how frequently they operate in a week, day, or even in bad weather conditions. Most of the operations are done every day, ranging from 5 hours up to more than 8 hours per day, even in bad weather conditions.



(a) (b) (c)

Figure 12. The frequency of operations: (a) every day of the week, (b) number of hours operating per day, and (c) operating even on bad weather conditions.

c. ***Manner of acquisition of their pedicabs and cost.*** Figure 13 shows how they acquired their pedicabs. The options for this were: via loan, personal expense, rental, or others. It was found that the manner of acquisition is through rental and personal expense. On average, have their own pedicab, it would cost them P4963.64. It would also cost them P78.62 on average for rent. It was also found that only a small percentage (6%) of pedicab drivers are affiliated with cooperatives offering financial assistance, as shown in Figure 14. While cooperatives offer insurance and financial assistance, drivers did not opt to be members.

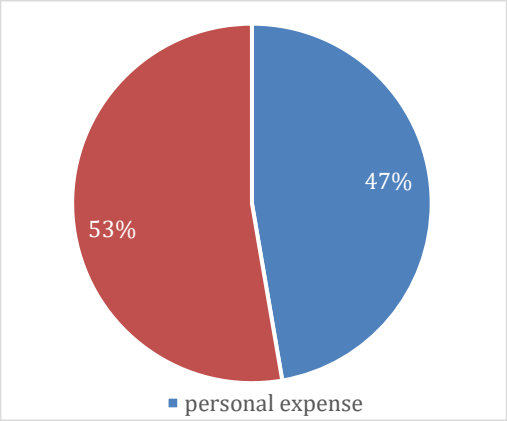


Figure 13. Manner of Acquisition of their pedicabs.

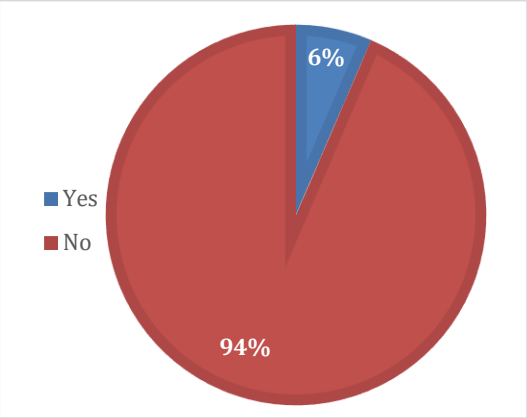


Figure 14. Cooperative affiliated or member.

d. ***Manner of dispatch and fare structure.*** Figure 15 shows the manner of dispatch in the operation of pedicabs. It is found that more than half (52%) wait for passengers at designated areas showing a structured approach to service. Yet, a significant portion (32%) do not have a proper dispatch which could lead to inefficiencies in passenger pick-ups, while 16% respond to hailed requests which highlights an ad-hoc element to the operation. The fare structure is shown in Figure 16. In the absence of a fare matrix, 74% of the operations are done through negotiated fares, while 19% are on fixed rates and 7% on metered fares based on distance. Since most of the drivers wait for passengers at a designated area and have been operating for a mean of more than a decade, the affordability of this mode of transport should be investigated.

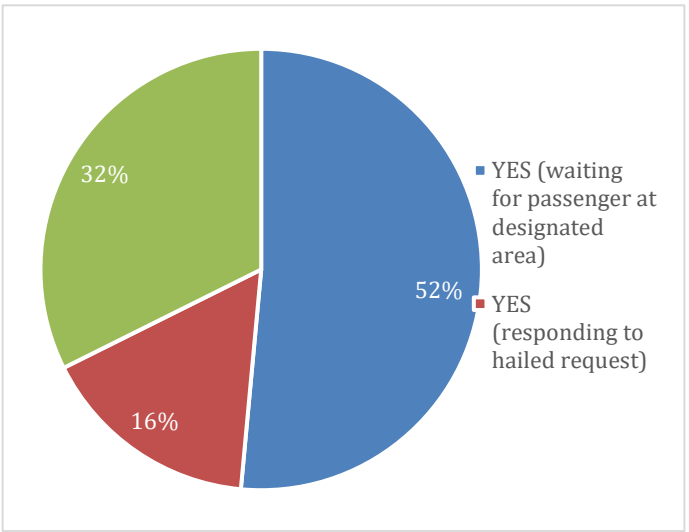


Figure 15. Manner of dispatch.

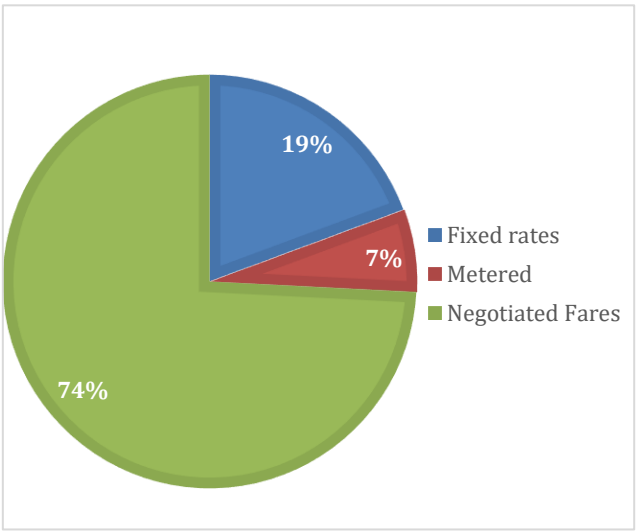


Figure 16. Pricing structure.

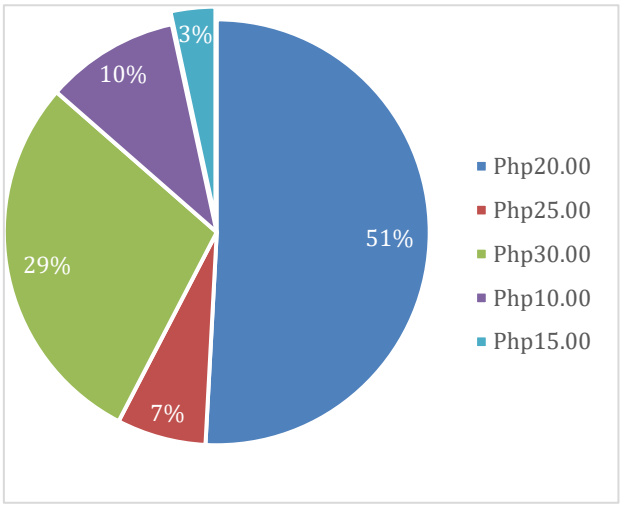


Figure 17. Fares paid by users

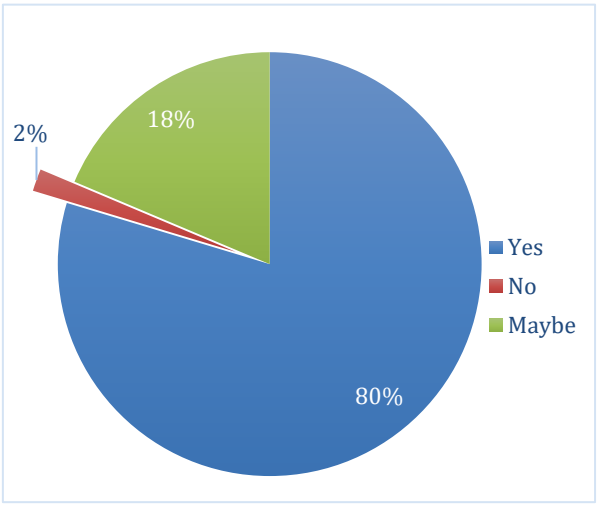


Figure 18. Fares are reasonable for the services provided.

It was found that most of the users are paying Php20.00-P30.00 for their fares with the absence of fare matrix, as shown in Figure 17, this suggests inconsistencies in pricing, though most of the users say that this is a reasonable amount, as shown in Figure 18; this system creates potential fare discrepancies and misunderstandings. There is a need to investigate the affordability to both drivers and users to determine if the services offered by the drivers are adequately compensated, especially that most have been operating for more than a decade already. Formalizing the fare structure system could enhance fairness and transparency, to ensure that drivers are adequately compensated while keeping this mode affordable to the users.

e. Services offered. Figure 19 shows if pedicab operators also transport goods other than people. About 94% of the pedicab operations mainly transport people, with a mean carrying capacity of around 2-3 persons per trip, as shown in Figure 20. It is important to note that pedicab operations in the scope of this study are human-propelled pedicabs. With the mean carrying capacity of 2.5 and the mean age of drivers at 41 years old, there

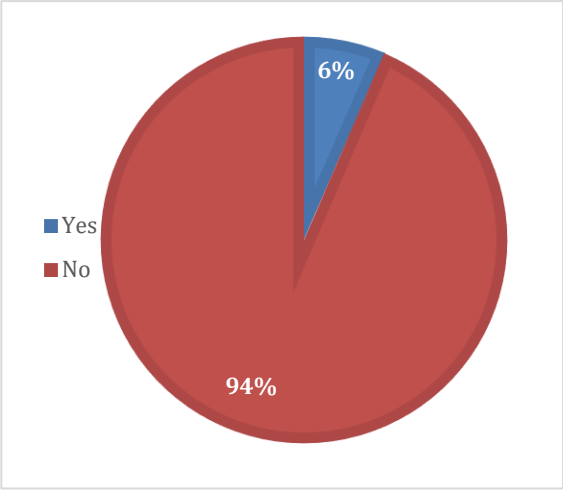


Figure 19. Do they also transport goods

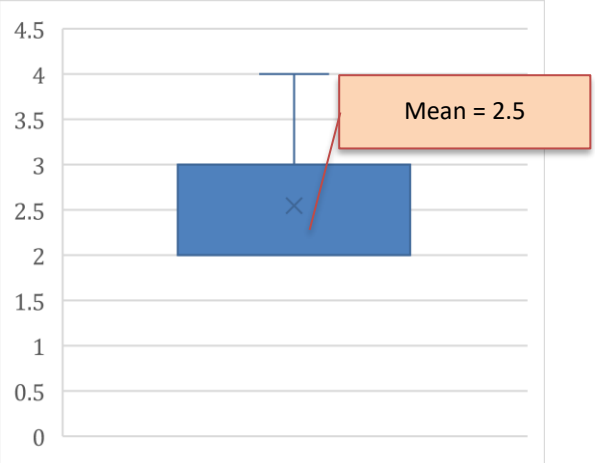


Figure 20. How many passengers do they carry

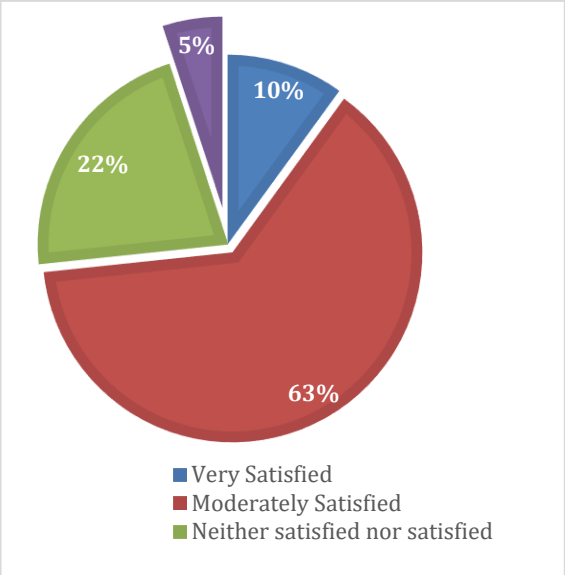


Figure 21. Overall satisfaction of pedicab users.

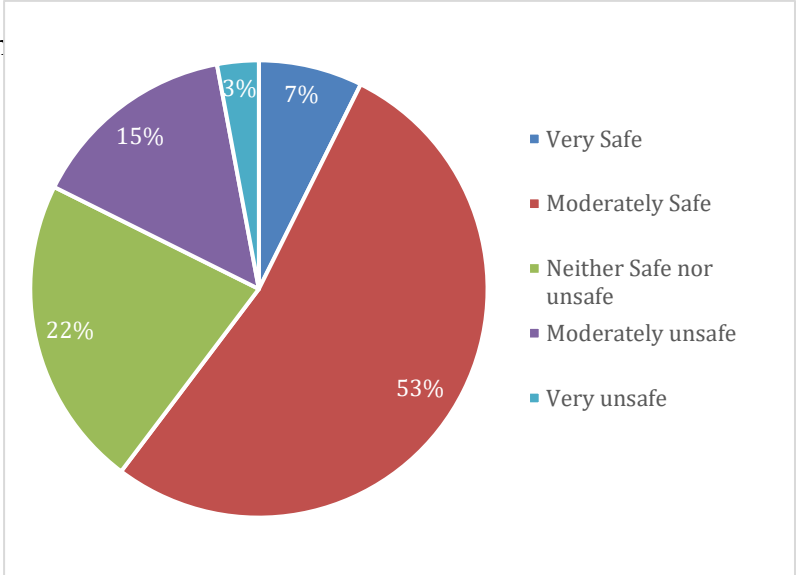


Figure 22. Perception of users riding a pedicab.

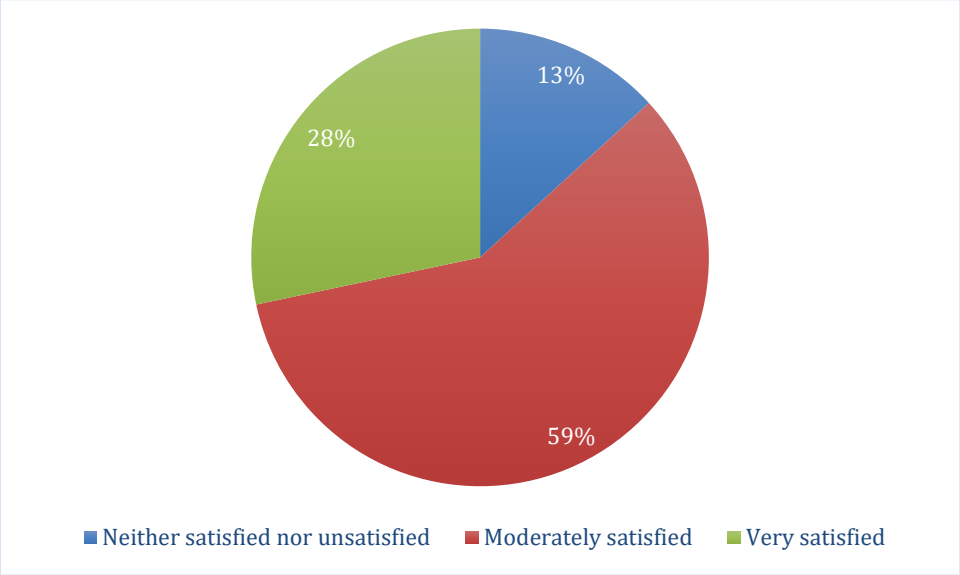


Figure 23. Professionalism and behavior of pedicab drivers

While 63% of users are moderately satisfied, as shown in Figure 21, and 28% very satisfied with the professionalism and behavior of drivers as shown in Figure 23, the remaining 13% are either indifferent or dissatisfied. This gap could be attributed to inconsistent service quality, possibly due to the informal nature of pedicab operations. Introducing a more structured system—such as a certification or training program for drivers—could enhance professionalism. Drivers who receive proper training in customer service and traffic regulations may create a better overall experience for passengers, leading to higher satisfaction rates. Moreover, the perception of safety among users shows room for improvement. As shown in Figure 22, with only 53% of users feeling "moderately safe" and 15% reporting feeling "moderately unsafe," there is a clear need for measures that enhance safety perceptions. Initiatives such as driver training on road safety, routine vehicle maintenance checks, and infrastructure

improvements (such as designated pedicab lanes) could help improve user confidence in the safety of pedicabs.

f. ***Challenges faced by pedicab drivers.*** Figure 24 shows the challenges faced by pedicab drivers, among which, competition with other modes (41%) is the main challenge, followed by weather conditions (26%), traffic concerns (25%), and the least is safety concerns (8%). While pedicabs offer short-distance trips, competition with other modes of transport such as motorized vehicles, is the biggest challenge faced by pedicab drivers, for instance, the existing operations of tricycles around these urbanized areas; this is also because tricycles are also free to operate on areas where pedicabs are operating. The need to have jurisdiction over the operating area must be taken into consideration. With safety as the least challenge faced while operating a pedicab, 69% of the drivers felt that it is moderately safe to drive a pedicab as shown in Figure 25. This is an advantage for them since they are just operating mostly in the neighborhoods of residential communities.

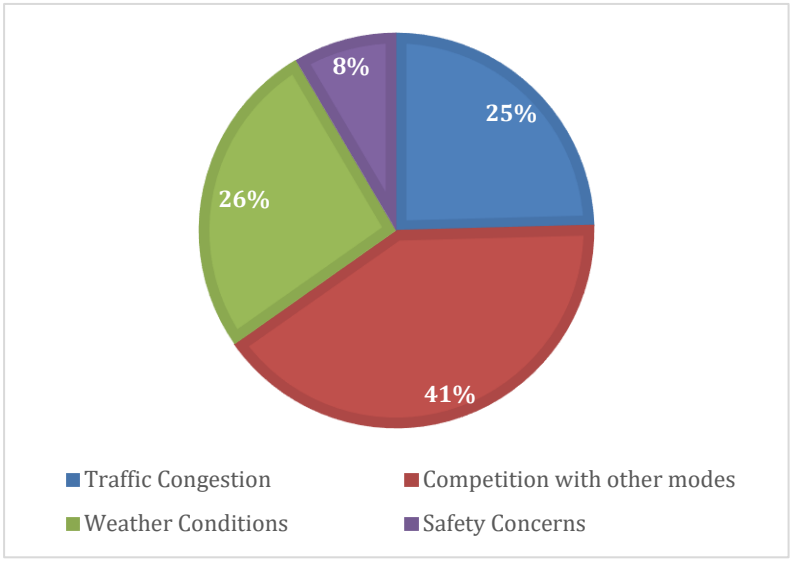


Figure 24. Challenges faced by pedicab drivers.

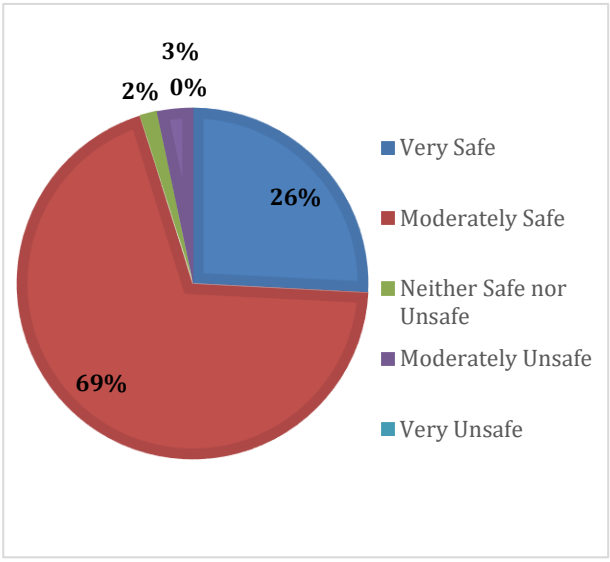


Figure 25. Perception to driving a pedicab.

5. CONCLUSION

Several findings were highlighted in describing the operational characteristics of pedicabs in urbanized areas of Zamboanga City. The mean age of pedicab drivers is 41 years, mostly middle-aged individuals, have been operating pedicabs for an average of 13.37 years. Most drivers are male, with a significant portion of not having a college degree. This indicates that operating a pedicab serves as a long-term source of income, particularly for those with limited educational backgrounds. Despite working for more than 5-8 hours even during bad weather conditions, below the minimum wage in Zamboanga City. They are even faced with challenges including competition from motorized vehicles, poor weather conditions, and traffic concerns. The mean age of pedicab users is 25.44 years, dominated by female users having at least a high school education, indicating that the typical user consists of students, young adults, and working individuals. This suggests that pedicabs serve as an accessible transportation option for individuals who need affordable short-distance travel, such as trips from home to school or work. Pedicab operations, in this study, are human-propelled and typically carry 2-3 passengers

per trip. Drivers either own or rent their pedicabs, with a significant portion relying on rental options. The fare structure is mostly negotiated, which adds uncertainty to earnings but allows flexibility based on demand. Although safety is not perceived as a major concern, competition with motorized vehicles such as tricycles is a significant challenge. reveals notable gaps in user satisfaction and safety perceptions that need attention. While 63% of users are moderately satisfied with their pedicab experience, 13% express dissatisfaction or indifference, which can be linked to inconsistent service quality inherent in informal operations. Introducing a certification or training program for drivers could enhance professionalism and ensure better service consistency. This would likely raise user satisfaction, especially if training focuses on customer service and adherence to traffic regulations. Furthermore, user perceptions of safety highlight an area for improvement, with only 53% feeling moderately safe and 15% feeling moderately unsafe. Addressing these concerns through initiatives like driver safety training, regular vehicle maintenance, and the development of dedicated pedicab lanes could significantly boost user confidence and overall satisfaction. By formalizing certain aspects of pedicab operations, the city can strike a balance between maintaining the accessibility of this transportation mode while ensuring its reliability and safety.

Since this study only focused on human-propelled pedicabs and with the existing of e-bikes and e-trikes, a comparison in terms of efficiency and economic viability is good for further studies. Future research should also investigate how operating a pedicab impacts a household's financial stability, educational opportunities for children, and access to healthcare. A study on how existing regulations and policies that are applied among motorized vehicles such as tricycles and public transport can support the viability of pedicab operations for it to be integrated into urban transportation systems. Since most drivers are male and most passengers are female, future studies could investigate the gender dynamics of pedicab operations. This could amplify more inclusivity of both genders. Investigation on effectiveness of pedicab cooperatives could be done to assess whether cooperatives are a viable way to improve earnings and provide financial stability, this could explore what hinders them from joining cooperatives and suggest way to make membership more appealing. Future research could analyze the relationship between service consistency and user satisfaction. This could involve deeper qualitative studies exploring passenger expectations and the specific factors that lead to dissatisfaction.

While pedicabs in Zamboanga City play a crucial role in short-distance urban transportation, there are clear areas for improvement in terms of service quality, safety, and operational structure. Findings show that while most users are moderately satisfied with both the service and professionalism of drivers, gaps in safety perception and service consistency remain. Addressing these through structured driver training, enhanced safety measures, and potential formalization of operations could significantly improve user satisfaction and the overall viability of pedicabs as a sustainable mode of transport.

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