Study on the Operational Characteristics of Motorcycle Taxis in Metro Manila

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Abstract: During the 1990s, motorcycle taxis emerged as an alternative mode of transportation in the Philippines without appropriate policies to regulate their operation. As a result, growing worries over application, functioning, security, and even legal issues have gained prominence in conversations. To develop policy recommendations, this study was carried out to determine the features of usage and operation of traditional motorcycle taxis in Metro Manila. The data comprises variables, including basic information about the respondents, terminal characteristics, operational characteristics, fare, and route details, along with safety and legal concerns. The research identified at least eight informal taxi terminals. However, the authors focused only on four terminals: Guadalupe, Bicutan, Sucat, and Napindan as these are the locations with the highest number of interviewees. Regulation of the mode is thereby recommended to address safety concerns, among many other things.

Keywords: Motorcycle Taxis, Public Transport, Operating Characteristics

1. INTRODUCTION

The use of motorcycles as a mode of transportation is common in both urban and rural areas in the Philippines. Motorcycles are popular in urban areas because they can maneuver through traffic congestion, and they are widespread in rural areas since they can traverse some terrains that are not passable to three or four-wheeled vehicles. As of 2022, there are a total of 6,946,881 motorcycles in the Philippines and 1,532,763 of them are in Metro Manila (LTO, 2022).

Republic Act 4136 or the Land Transportation and Traffic Code classify motorcycles as private vehicles and states that they "*shall not be used for hire under any circumstance*". Still, their operations are seemingly tolerated, especially in areas with limited or no other available transportation modes.

There are two types of motorcycle taxis in the Philippines: conventional and non-conventional. Conventional motorcycle taxis are usually operated by the motorcycle owners themselves and they may or may not use a self-designated terminal. On the other hand, non-conventional motorcycle taxis are mobile app-based and act as another form of Transport Network Vehicle Service (TNVs). However, according to Department Order No. 2015-011, Transport Network Companies (TNCs) are only allowed to use sedans, Asian utility vehicles, sport utility vehicles, and vans. Some of the non-conventional motorcycle taxi services in the Philippines are Angkas and JoyRide among others.

The non-conventional motorcycle taxis have gone through a lot of issues pertaining to the legality of their operations. They have undergone suspension and resumption of service since their emergence. During their suspension by Land Transportation Franchise Regulatory Board (LTFRB), some of them have been used as courier service units like GrabBike. Then in 2019, the Department of Transportation (DOTr) did a pilot run of allowing motorcycle taxis to operate in Metro Manila and Cebu for six (6) months (June to December 2019), then an extension until March 2020. This time around, two other industry players - JoyRide and MoveIt were allowed to join. As of the latest, motorcycle taxis are on status quo as five (5) House Bills seeking to legalize their operations are in the Senate pending for deliberation.

Figure 1. Motorcycle taxis in Metro Manila (Conventional)

Figure 2. Motorcycle taxis in Metro Manila (Non-Conventional)

1.2 Literature Review

Guillen & Ishida (2003) traced the origins of motorcycle taxis in the Philippines back to "trisikads" or "pedicabs," evolving from bicycles with sidecars to tricycles in the late 1950s. In

1999, a new form emerged: motorcycle taxis or "habal-habal," initially serving areas lacking alternative transportation. This service started with regular motorcycles, evolving into variations like the "skylab" in rural areas, accommodating 4 to 6 passengers. Before their introduction in the Philippines, motorcycle taxis were already established in neighboring countries like Thailand, Vietnam, and Indonesia, with Thailand becoming the first to regulate them in 2005. "Habal-habal" arose in the Philippines as an alternative means of transportation in places where other modes of transit were unavailable owing to a lack of infrastructure.

1.3 Objectives

This study aimed to:

a. To determine the usage and operational characteristics of motorcycle taxis in Metro Manila;
b. To identify the service perception of users and nonusers regarding motorcycle taxis;
c. To provide recommendations on policies once the government decides to formalize this mode of transportation.

1.4 Significance of the Study

The results of this study will be helpful in the formulation of policies that will regulate motorcycle taxi operations. Also, given the limited number of studies on motorcycle taxis in the Philippines in an urban context, a study on their usage and operational characteristics will give a wider understanding of why passengers use and choose them over other available modes of transportation in the Metropolitan. On the same line, related aspects like the safety of the users and drivers' operational efficiency can be improved as well.

1.5 Framework

The conceptual framework for this research is shown in Figure 3. It focuses on the characteristics of motorcycle taxis including operations and service perceptions.

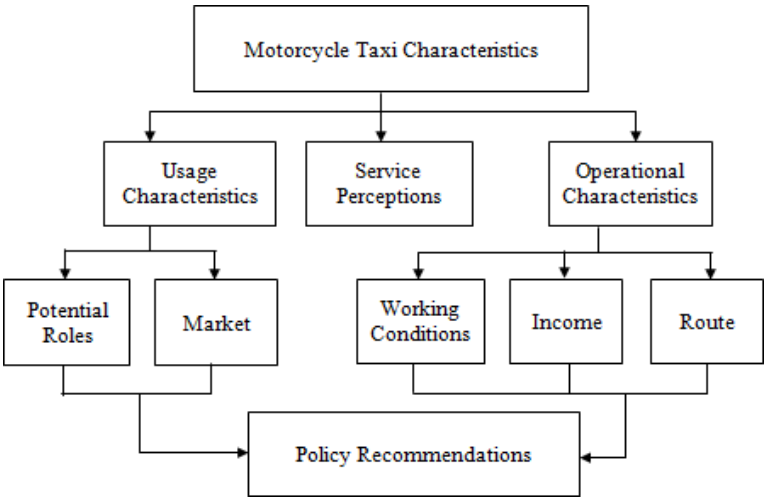

Figure 3. Conceptual Framework of the Study

Three sets of questionnaires were created with questions specifically for the characteristics of drivers, users, and non-users. These questions will determine the usage characteristics of users, the service perceptions of users and non-users, and the operational characteristics of the drivers. From these, the characteristics of motorcycle taxis were determined, and policies may be formulated.

2. DATA COLLECTION

2.1 Terminals

The terminals or areas where motorcycle taxis congregate were identified based on ocular inspection. The identified terminals were in Guadalupe, Sucat, Bicutan, Napindan, Balara, Gate 3 Bonifacio, Villamor, and Merville.

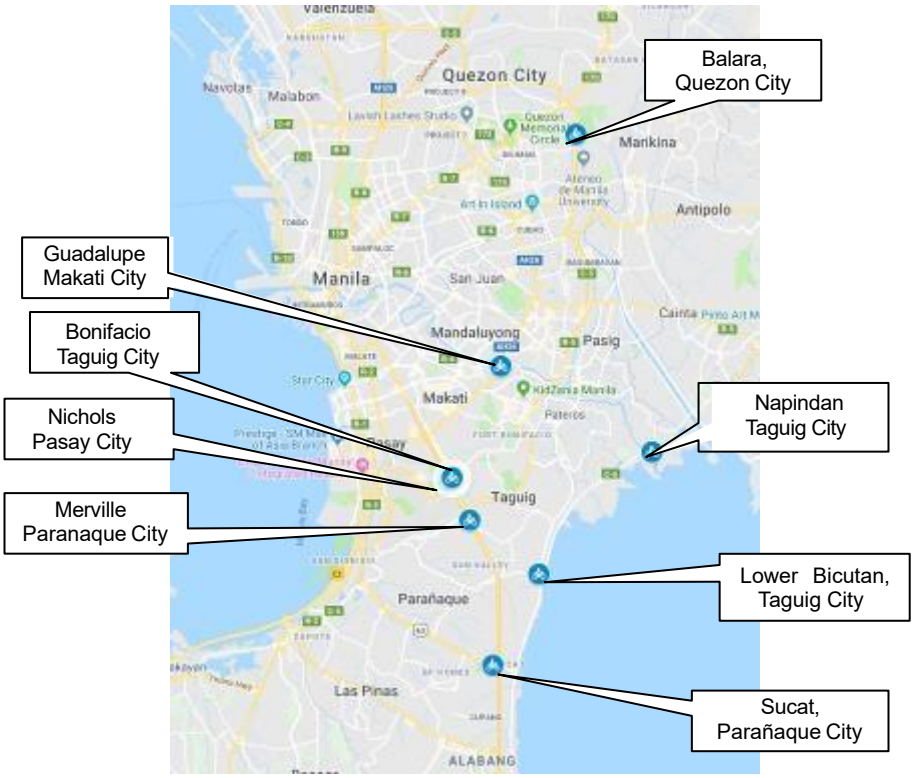

Figure 4. Locations of the Identified Terminals in Metro Manila

Surveys were conducted during pre-pandemic, in three terminals only - Guadalupe, Sucat, Bicutan and Napindan as these are the locations with the highest number of interviewers. Figure 5 shows the locations of the three study areas in Metro Manila.

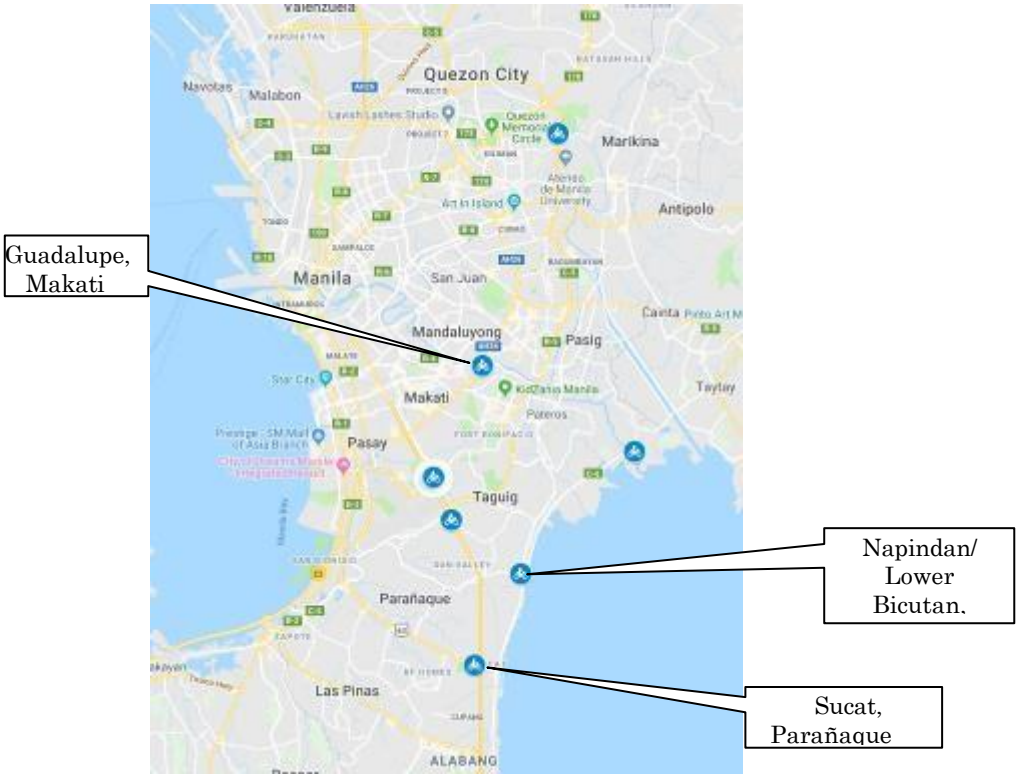

Figure 5. Study areas

2.2 Questionnaires

Three different questionnaires were created, one for the drivers of motorcycle taxis, one for the users, and one for non-users. For the drivers, the questionnaire consisted of questions about their basic information including license and motorcycle information, and if they have an operator, terminal characteristics, operational characteristics, fare and route characteristics, as well as safety and legal concerns.

For the users and non-users, both groups were asked about their basic information, including their salary per month and if they their own vehicles, and about their perceptions of motorcycle taxis services. Only the users were asked about their perceptions of motorcycle taxi drivers. The users were also asked about the characteristics of the fares, such as their usual fare, the routes and their safety concerns. Both groups, users and non-users, were asked about their knowledge of the legality of motorcycle taxi operations and the change in their commuting behavior if the services are to be regulated or legalized.

3. RESULTS AND DISCUSSION

3.1 Terminals and Profiles of the Respondents (Users, Non-Users and Drivers)

From the eight terminals surveyed, three (3) areas were selected for analysis due to number of respondents' reason. The said terminals are 1) Guadalupe in Mandaluyong City, 2) Sucat in

Paranaque City, and 3) Lower Bicutan/Napindan in Taguig City. The drivers that occupy the terminal in Napindan also use a terminal in Lower Bicutan, therefore these 2 terminals were considered as 1. Table 1 shows the distribution of the interviewed users, non-users, and drivers.

Table 1. Distribution of respondents per terminal

Terminal	User	Non-users	Driver
1. Guadalupe	15	58	27
2. Napindan/Lower Bicutan	60	13	26
3. Sucat	1	2	20
4. Balara	0	0	2
5. Bicutan	13	24	0
6. BGC Gate 3	1	0	1
7. Villamor	0	0	1
8. Merville	1	0	1
9. Online/UP*	5	24	0
TOTAL	**96**	**121**	**78**

The male and female users are comprised of 45.8% and 54.2% respectively. The non-users are of 44.6% (male) and 55.4% (female) composition. Drivers on the other hand are mostly males (96.2%). In terms of age, 46.9% of the users and 53.7% of the non-users are between 20 to 29 years old. Most of the drivers are within 30 to 39 age range.

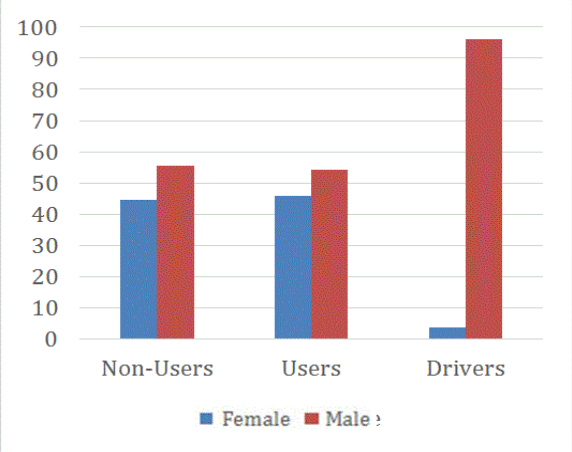

Figure 6. Users' Gender Distribution

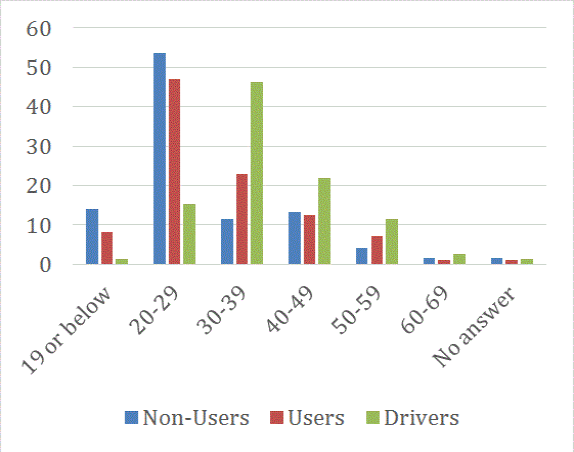

Figure 7. Users' Age Distribution

By employment status (Fig. 8), majority of the users (63.5%) are private company workers. Students shared 13.5 percent. Figure 9 shows the salary ranges of the users - Php 10,000 to Php 20,000 (31.3%), Php 20,001 to Php 30,000 (25%), and less than Php 10,000 (16.7%).

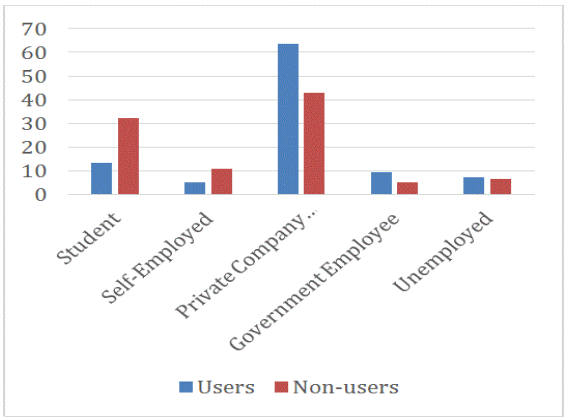

Figure 8. Employment Status of Users and Non-users

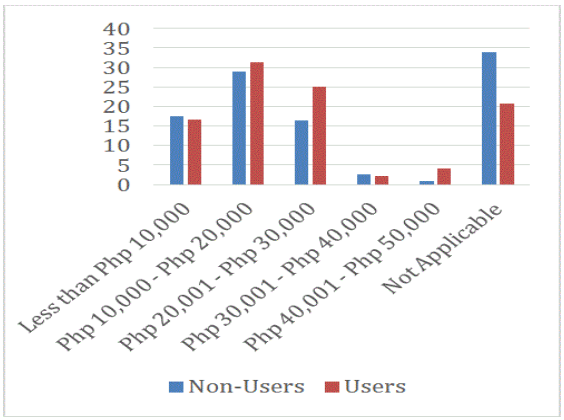

Figure 9. Monthly Income of Users and Non-users

3.2 Usage Characteristics

3.2.1 Guadalupe

In Guadalupe, majority of the users (86%) are private company employees (Fig. 10), largely call center agents. Seventy four percent (74%) of them (Fig. 11) earn more than Php 40,000 per month.

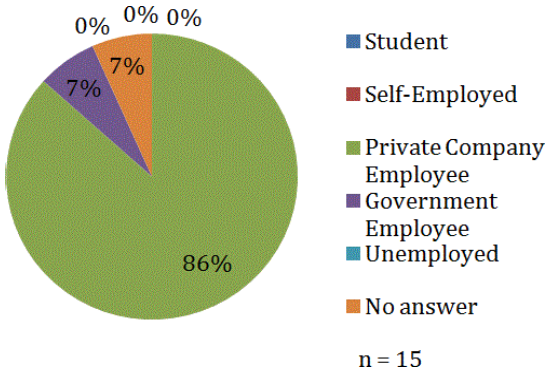

Figure 10. Employment Category of Users in Guadalupe

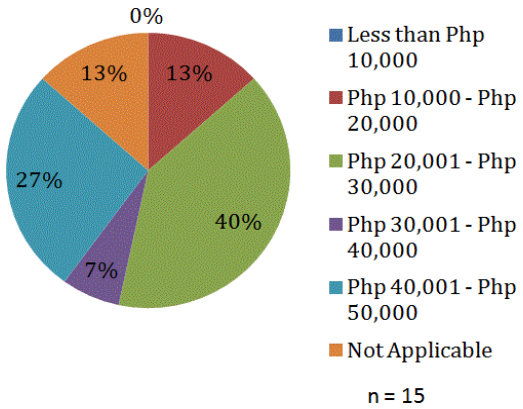

Figure 11. Distribution of the Salaries of Users in Guadalupe

In terms of frequency, 20% of the users interviewed in Guadalupe use motorcycle taxis every day, while 27% of them do once a week (Fig. 12).

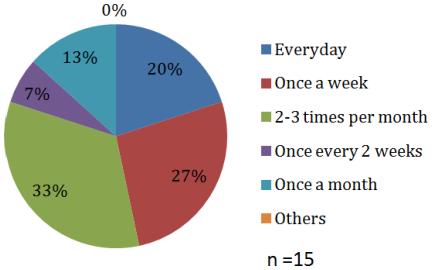

Figure 12. Distribution of Frequency of Use of the Users in Guadalupe

On trip purpose, more than 90% (Fig. 13) of the respondents in the area use the mode to go to their work places. Most of them (Fig. 14) spend from Php 50 to Php 100 as fare.

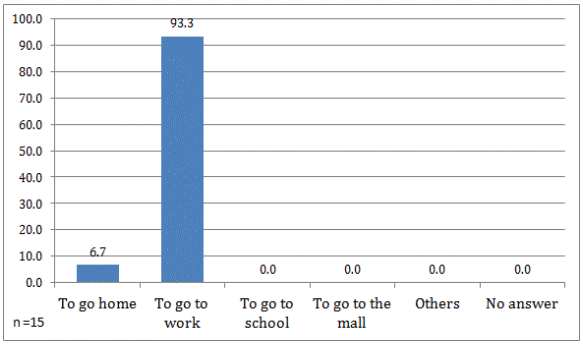

Figure 13. Trip Purpose of Users in Guadalupe

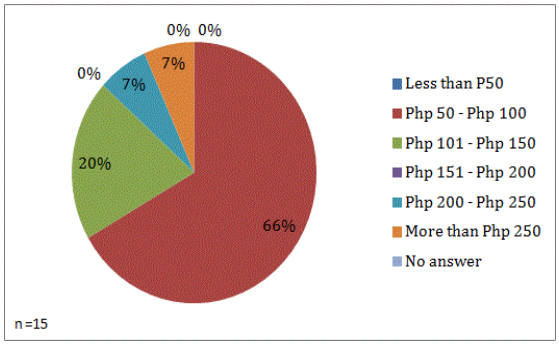

Figure 14. Usual Amount of the Fares of Passengers in Guadalupe

3.2.2 Sucat

Only 1 user was interviewed in Sucat due to time constraints. She works in a private company, with monthly salary that is between Php10,000 – Php20,000.

3.2.3 Napindan

Most (66%) of the users in Napindan are private company employees (Fig. 15). Thirty five percent (35%) of them earn Php 10,000 - Php 20,000 (Fig. 16).

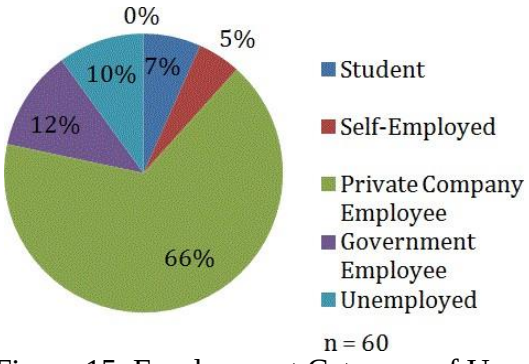

Figure 15. Employment Category of Users in Napindan

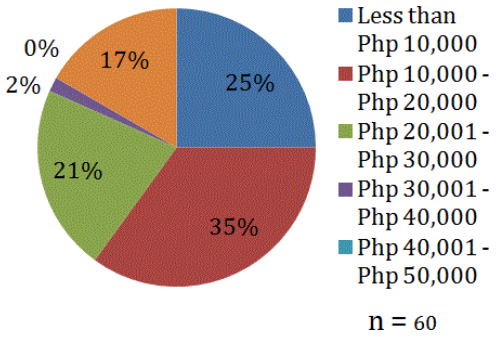

Figure 16. Distribution of the Salaries of the Users in Napindan

On frequency of use, 53% of the users in Napindan use the service daily (Fig. 17). Those who use the mode once a week are about 10% in share.

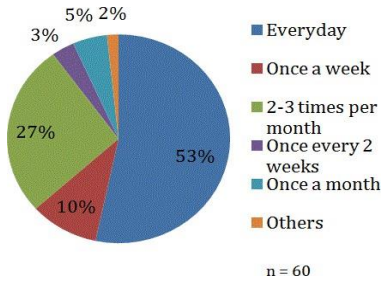

Figure 17. Distribution of Frequency of Use of the Users in Napindan

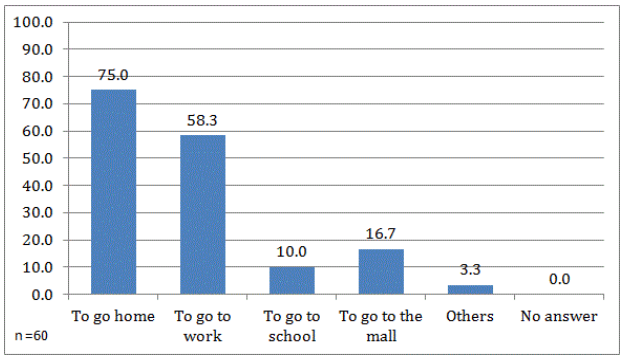

Figure 18. Purpose of Trips of the Users in Napindan

In this terminal, most of the users surveyed use the mode to go home (Fig. 18). Almost 50% of them indicated that they spend less than Php 50 (Fig. 19) for a single trip.

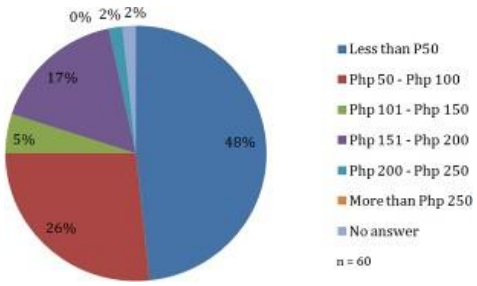

Figure 19. Usual Amount of the Fares of the Passengers

3.3 Terminal Characteristics

Some congregations of the motorcycle taxis have organizations that keep track of the drivers using their self – designated terminal. These organizations may allow or not allow drivers from using the terminal therefore they may collect some fees.

3.3.1 Guadalupe

The drivers were asked to determine how many of them use the terminal. Most of them (56%) agreed that there are at least 31 to 40 of them using Guadalupe terminal. Some said, there are about 41-50 (18%) drivers using the said terminal.

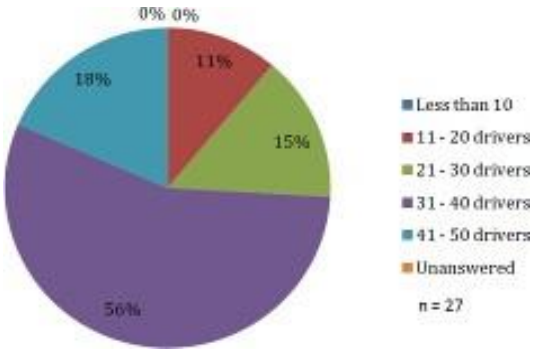

Figure 20. Number of Drivers Using Terminal in Guadalupe

The drivers' answers regarding the nature of payment to their "organization" are also varied (Fig. 21 and 22). Apparently, there are fees to be paid in using the terminal, as well as in joining the drivers' informal organization.

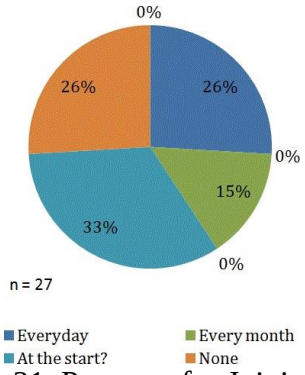

Figure 21. Payment for Joining the Organization in Guadalupe

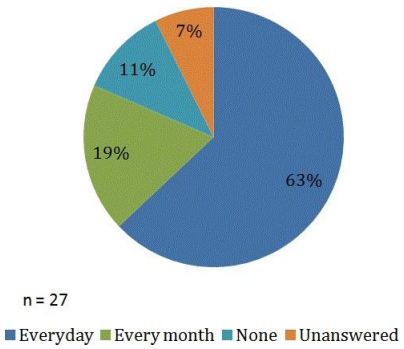

Figure 22. Payment for Using the Terminal in Guadalupe

3.3.2 Sucat

Sucat is similar to Guadalupe terminal regarding the drivers' knowledge of their probable number; most of them answered 21 to 30 (Fig. 23). No cost indicated when it comes to joining (No Cost = 95%) the organization and using the terminal (No Cost = 80%) in Sucat (Fig. 24 and 25).

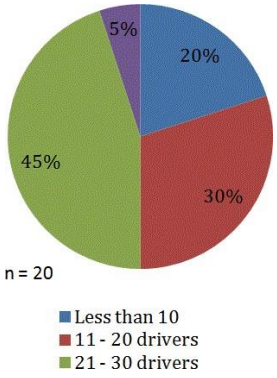

Figure 23. Number of Drivers Using Terminal in Sucat

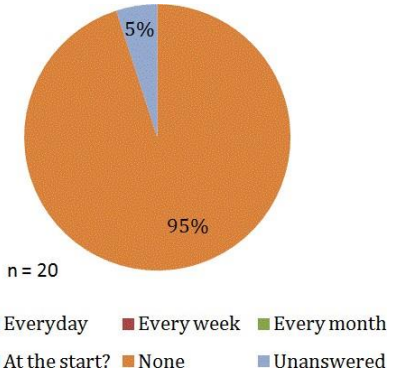

Figure 24. Payment for Joining the Organization in Sucat

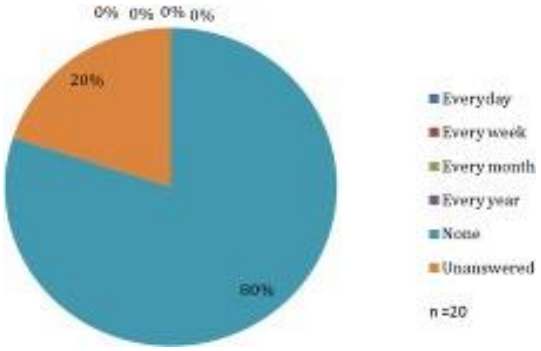

Figure 25. Payment for Using the Terminal in Sucat

3.3.3 Napindan

The survey turnout in Napindan was poor as only one out of 26 drivers responded to the number of drivers (11 to 20) question item. In Napindan, a one-time fee is required to join the organization, while using the terminal fee (PhP 20) is on a daily basis (Fig. 26 and 27).

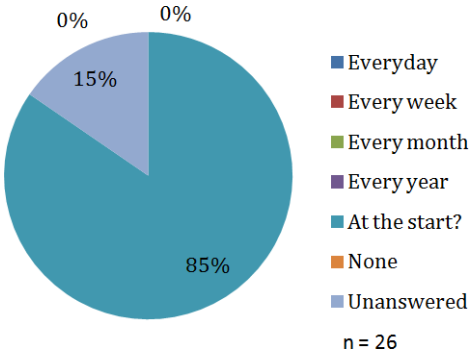

Figure 26. Payment for Joining the Organization in Napindan

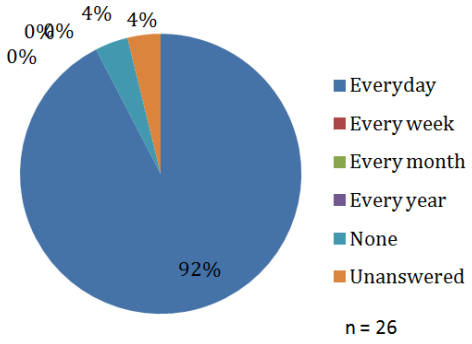

Figure 27. Payment for Using the Terminal in Napindan

3.4 Operational Characteristics

3.4.1 Income

The Net income is computed using the daily income of the drivers, the number of days per week they spent, as well as their daily gas expenditures, and monthly maintenance expenditures. Table 2 shows the daily income distribution of the drivers in Guadalupe, Sucat and Napindan, in terms of maximum range and share.

Table 2. Daily income of drivers per terminal

Terminal	Daily Income of Drivers	
	Maximum Range	Share (%)
Guadalupe (n=27)	Php 1501 – 2000	52%
Sucat (n=20)	Php 0 - 500	70%
Napindan (n=26)	Php 0 - 500	50%

Slightly more than half of the drivers in Guadalupe earn between Php 1501 and Php 2000, while those in Sucat (70%) and Napindan (50%) are within the range Php 0 - 500. On daily gas expenditures and monthly maintenance cost (Fig. 28 and 29), most drivers indicated that they do spend between Php 101 and Php 200. Their maintenance cost is less than Php 1,000 per month.

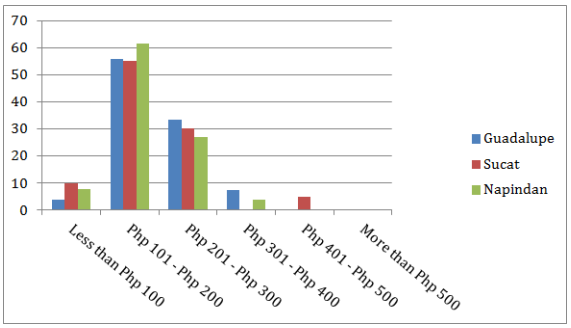

Figure 28. Daily Gas Expenses of the Drivers in the Studied Terminals

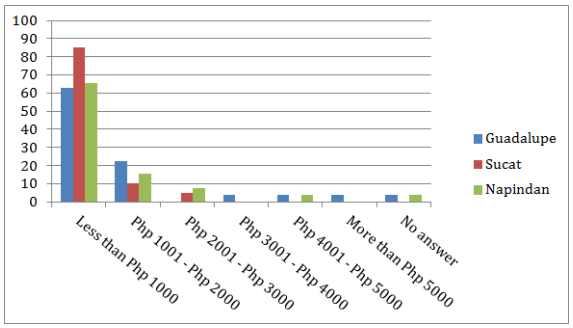

Figure 29. Monthly Maintenance Expenses of the Drivers in the Studied Terminals

The drivers' monthly gross income is computed by multiplying their daily earnings by the number of days per week they worked then by 4, assuming that a month is consists of 4 weeks.

Table 3. Daily Income Sample of the Driver

Daily income	Number of days per week
Php 550	4 days

For the expenses, the daily gas cost and monthly maintenance incurred by the drivers are expressed in range - minimum, average, and maximum (Table 4).

Table 4. Daily Gas Expenditure Sample of the Driver

Expenditures	Sample Cost (Php)	Min (Php)	Ave Php	Max Php
Daily Gas Expenditures	201 – 300	200	250	300
Monthly Maintenance Costs	Less than 1000	0	500	1000

The gas expenditures are also multiplied by the number of days per week worked and the number of weeks per month, 4, to convert it to monthly, hence:

Monthly Gas expenditures, min = 200*4*4 = PhP 3,200

After the income and expenses are converted to a monthly rate, the net income per month can now be computed.

Net Income = Gross Income – Gas Expenses – Maintenance expenses (2)
Monthly Net Income, min = 8,800 – 3,200 – 0 = PhP 5,600
Monthly Net Income, ave = 8,800 – 4,000 – 500 = PhP 4,300
Monthly Net Income, max = 8,800 – 4,800 – 1000 = PhP 3,000

After computing the net monthly income of the drivers, the distribution of the average income using average expenses is shown below in Figure 30.

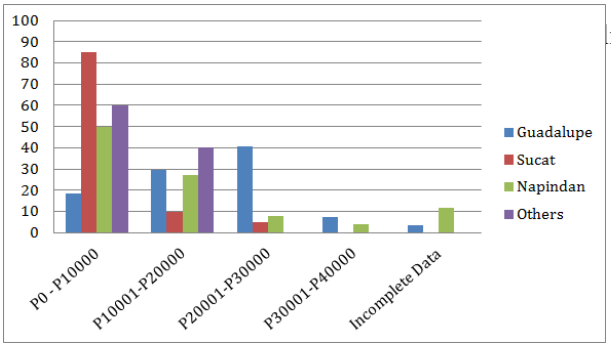

Figure 30. Net Income Distribution of the Drivers Using Average Expenses

The average income using the expenses expressed in range is tabulated in Table 5. The drivers in Guadalupe have the higher monthly net income than the drivers in the other two terminals. The comparison goes the same using minimum, average, and minimum expenses range.

Table 5. Average Income the Drivers Using Minimum, Average, and Maximum Expenses

Expenses	Income		
	Guadalupe	Sucat	Napindan
Minimum expenses	Php 19,200.00	Php 7,550.00	Php 14,120.00
Average expenses	Php 17,630.77	Php 6,070.00	Php 12,280.00
Maximum Expenses	Php 16,061.54	Php 4,590.00	Php 10,440.00

3.4.2 Operation

Figure 31 shows that most of the drivers work from 3-6 (29%) and 6-12 hours (31%). Most (51.9%) of the drivers in Guadalupe get 9 to 12 trips per day. Napindan, although with smaller number of drivers, responded that they get more than 15 trips per day. Drivers in Sucat get only 7 – 9 trips per day (Fig. 32).

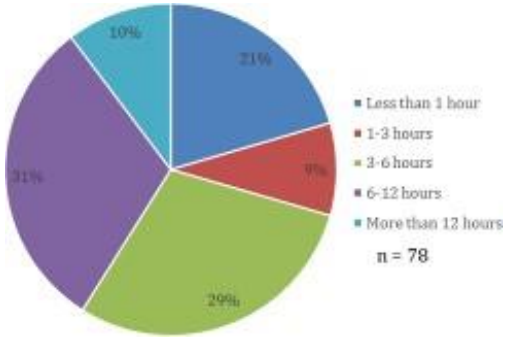

Figure 31. Distribution of Operating Hours per Day of the Drivers

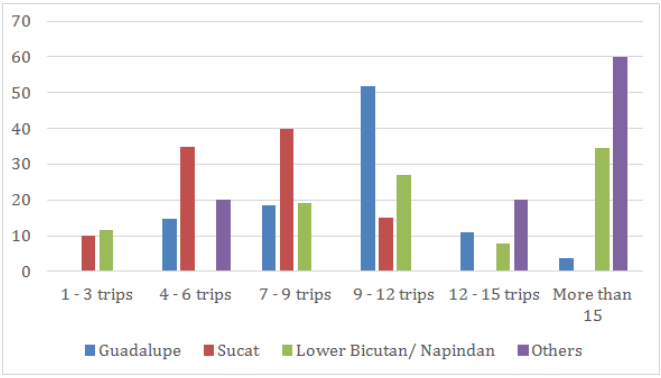

Figure 32. Number of Trips per Day of the Drivers per Terminal

3.5 Fare and Route Characteristics / Other Modes Available

3.5.1 Lowest Fare

Majority of drivers in all three terminals set the fare below Php 50, while it is from Php 50 to Php 100 in Guadalupe (Fig. 33).

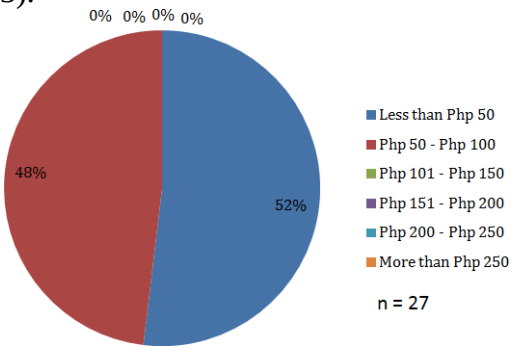

Figure 33. Lowest Fare in Guadalupe and Those in Other Terminals

3.5.2 Other Modes of Transportation Present in the Area

The drivers were asked about the presence of other modes of transportation in their usual routes. They revealed that their motorcycle taxis compete with the other public transport modes of transportation in their areas of operation or at least, along the routes they usually traverse. Jeepneys, buses, train and FX/UV Express are among the said competition modes.

3.6 User and Non-User Service Perceptions

The service perceptions of users and non-users regarding motorcycle taxis were asked to better understand their choice, expressed in terms of how they agree and disagree (1 to 5 with 1 being "Strongly Disagree" and 5 being "Strongly Agree") on the ten (10) characteristics of the mode as shown in Table 6 and Table 7. The cells in dark blue highlight show the characteristics of motorcycle taxis with the highest percent choice depending on their ratings. The users indicated that they strongly agree on the characteristics "Short waiting time", "Accessible", "Faster travel time", and "9. Point to point" (Table 6).

Table 6. Users' Perception of the Characteristics of Motorcycle Taxis

Characteristics	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	No Answer
1. Cheap	3.1	13.5	74.0	8.3	1.0	0.0
2. Safe	1.0	26.0	67.7	4.2	1.0	0.0
3. Short waiting time	50.0	41.7	7.3	0.0	0.0	1.0
4. Accessible	49.0	39.6	5.2	5.2	0.0	1.0
5. Better than other alternative	18.8	27.1	49.0	2.1	1.0	2.1
6. Variable fare	1.0	7.3	58.3	30.2	1.0	2.1
7. Faster travel time	49.0	40.6	9.4	0.0	0.0	1.0
8. Environment friendly	1.0	6.3	72.9	17.7	0.0	2.1
9. Point to point	51.0	33.3	13.5	1.0	0.0	1.0
10. Comfortable	5.2	24.0	68.8	1.0	1.0	0.0

The perceptions of the non-users are obviously different from the users of motorcycle taxis. They are mostly on neutral grounds when it comes to "Cheap", "Safe", "Short waiting time", "Accessible", "Better than other alternative", and "Variable fare". They do agree on “Environment friendly”, while disagree on the item "Faster travel time" (Table 7).

Table 7. Non-Users’ perception of the Characteristics of Motorcycle Taxis

Characteristics	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	No Answer
1. Cheap	1.7	31.4	49.6	10.7	4.1	2.5
2. Safe	4.1	43.0	43.0	5.8	3.3	0.8
3. Short waiting time	0.8	5.0	38.0	35.5	18.2	2.5
4. Accessible	1.7	14.9	38.0	23.1	15.7	6.6
5.Better than other alternative	0.0	15.7	48.8	19.8	11.6	4.1
6. Variable fare	3.3	33.9	38.8	17.4	1.7	5.0
7. Faster travel time	0.0	3.3	31.4	32.2	28.1	5.0
8. Environment friendly	2.5	46.3	39.7	8.3	0.8	2.5
9. Point to point	0.0	9.1	33.1	26.4	28.9	2.5
10. Comfortable	0.8	40.5	45.5	8.3	0.8	4.1

The users were also asked to rate from 1 to 5 (with 1 being “Strongly Disagree” and 5 being “Strongly Agree”) the taxi drivers based on seven (7) characteristics as listed in Table 8. The users "Agree" on "Respectful", "Follows traffic rules", and "Passes through narrow roads", while they are somewhat "Neutral" on "Drives properly", "Drives fast", "Gives reasonable fare", and "Flexible".

Table 8. Users’ Perception of the Behaviours of Motorcycle Taxi Drivers

Characteristic	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	No answer
1. Respectful	15.6	42.7	41.7	0	0	0
2. Follows traffic rules	12.5	43.8	41.7	2.1	0	0
3. Drives properly	12.5	34.4	47.9	0	1	4.2
4. Passes thru narrow roads	3.1	41.7	40.6	12.5	2.1	0
5. Drives fast	4.2	28.1	63.5	3.1	1	0
6. Gives reasonable fare	2.1	10.4	81.3	4.2	0	2.1
7. Flexible	4.2	21.9	66.7	5.2	1	1

3.7 Safety Concerns

3.7.1 Accident and Hospitalization

One of the major factors being considered on the regulation of motorcycle taxis is the users and passengers' safety. The same reason is indicated by the non-users why they opt not to use motorcycle taxis (Fig. 34).

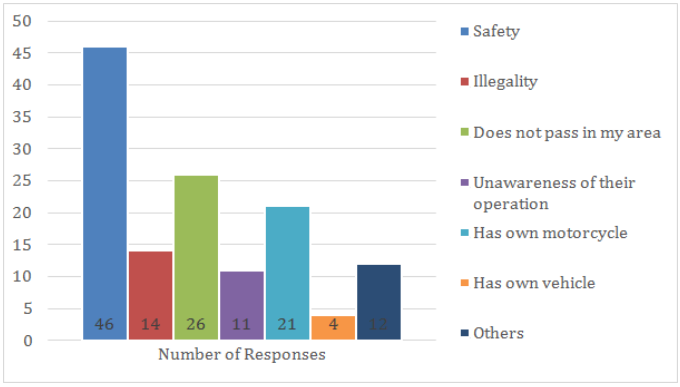

Figure 34. Non-users Reasons for Not Using Motorcycle Taxi

Of the interviewed users and drivers, 6 out of 96 (6.3%) users and 14 out of 78 (17.9%) drivers said that they have been on an accident. Crucially, most of the accidents that occurred resulted in the hospitalization of the passengers. Although the drivers said they contributed to the users' hospital expenses, there is no guarantee that the same will happen in the future accidents as there is no law that will compel them to.

3.7.2 Available Safety Paraphernalia

Furthermore, the users were asked about the safety paraphernalia of motorcycle taxis, which includes basic safety gears and items for weather protection. Figure 35 shows that plate number (90%), passenger handle (91%), foot rest (94%), raincoat (65%), face mask (3%), and helmet (91%) are always available.

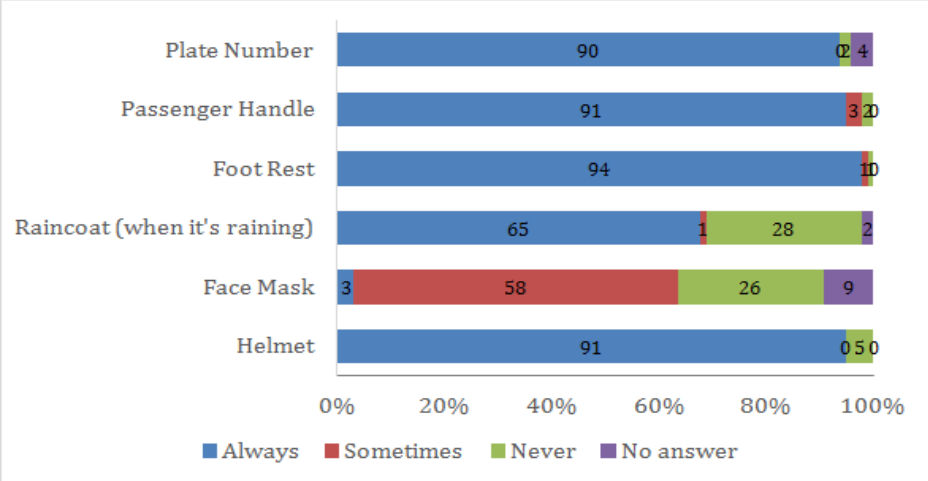

Figure 35. Availability of Safety Paraphernalia for Passengers

3.7.3 Traffic Violations of Drivers

Fifty percent (50%) or 39 out of 78 of the drivers have been arrested or fined by the police because of the reasons illustrated in Figure 36. Notably, 38.4% of them were arrested or fined for being "motorcycle taxis" and not by disobeying any traffic rules.

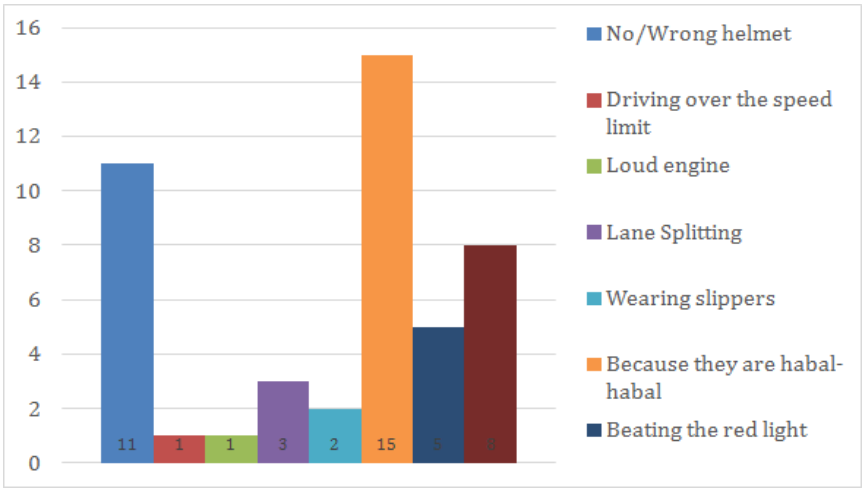

Figure 36 Reasons Why the Drivers Were Arrested/Fined by the Police

3.8 Legal Issues

On legality, 90.6% of the users and 71.9% of the non-users are aware that motorcycle taxis are illegal, as shown in Figures 37a and 37b. Interestingly, the users are well aware that the service is illegal, yet they still use it.

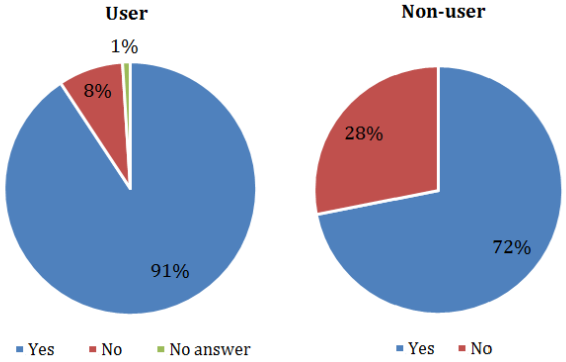

Figure 37a and 37b Awareness of the Legality of Motorcycle Taxis

When non-users asked if they will consider using motorcycle taxis in the future, about 70% of them said they would if the operation will be regulated, while 76% expressed the same if Grab will offer similar service (Fig. 3.8a and 3.8b).

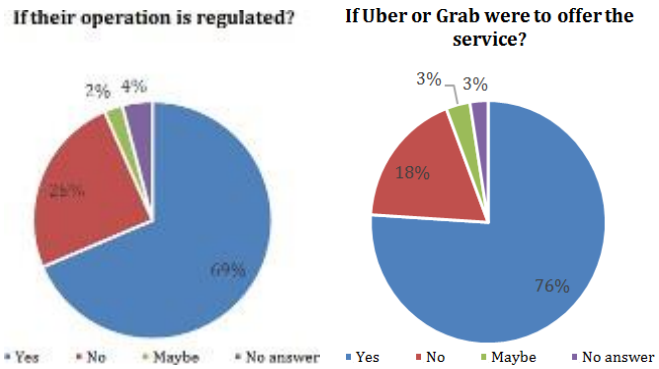

Figure 38a and 3.8b. Possible Non-users Who Will Consider Using Motorcycle Taxis

4. CONCLUSION

Motorcycle Taxis have proliferated in Metro Manila. There are already 11 identified terminals in Mandaluyong city, Pasay city, Taguig city, and Paranaque city. Although their operations have grown, there are still insufficient studies regarding motorcycle taxis. Usage and operational characteristics were determined in this study, as well as the perceptions of both users and non-users. Because of their illegality, drivers are hesitant to be interviewed, and consequently to be studied. Plans to deploy surveyors on some terminals were scrapped because of the rudeness of the drivers, so new terminals were searched. It was also hard to interview passengers on site because they are always in a hurry. Due to this, only 96 users were interviewed.

Based on the sites in Guadalupe and Napindan, there is a demand for motorcycle taxis and they mostly served the area adjacent to them, be it a business area or residential area. Also, people can make a living from operating as motorcycle taxis with some earning higher than the NCR non-agricultural minimum wage. Based on the findings of this study, the legalization and regulation of motorcycle taxis may be recommended.

5. RECOMMENDATIONS

5.1 Recommended Policies

Countries like Vietnam and Thailand have regulated motorcycle taxis (Guillen, 2003). Some policies which were implemented in Thailand include setting the fare to 25 Baht for the first 2 kilometers and 5 Baht/km for the next 5 kilometers, providing specific license plates for motorcycle taxis and assigning colored jackets/vests to drivers as shown in Figure 39.

Figure 39. Motorcycle Taxi Drivers in Thailand

Handles and helmets should also be provided for the passengers. The motorcycle taxi drivers in Thailand are also required to register every 3 years and by not doing so, their license could be cancelled. Some recommended policies for the regulation of motorcycle taxi operations in Metro Manila include:

- Assigning formal terminals

- Identifying the boundary and route of a terminal
- Providing fare matrix
- Limiting the number of passengers to one
- Providing insurance for passengers in case of crashes
- Requiring the drivers to provide safety paraphernalia (at least a helmet and/or raincoat when raining) for every passenger
- Providing an identifier to distinguish motorcycle taxis from private motorcycles i.e., color-coded jackets or helmets

These policies may be introduced by the national government through the Department of Transportation (DOTr) and Land Transportation Franchising and Regulatory Board (LTFRB) while being recognized by the local government units.

5.2 Further Studies

There are other terminals that were identified in this research that were not properly studied. Those terminals are in Bicutan, Merville, Villamor, Bonifacio, Sta. Lucia and White Plains. Future researches may also focus on a single terminal to study and determine the origin-destination of trips, the routes taken by the drivers and the corresponding fare. Studies on single terminals or areas can be consolidated to further validate operational characteristics and provide basis for proper regulation in order to ensure safety and establish suitable fare structures. Future research can also be made to explore the informal non-conventional motorcycle taxis that use Facebook groups instead of applications.

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