

Origin-Destination Survey in the Time of COVID-19: The Case of Zamboanga City, Philippines

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Abstract: Conducting a recall Origin-Destination Survey within a large city in the time of a pandemic such as Covid-19 is unprecedented in the Philippines. With the threat of the virus, the success of the survey was dependent on how the methods were carefully strategized from hiring of surveyors, preparation of necessary materials, scheduling of orientation, conducting the actual survey, checking and retrieval of questionnaires, and finally, to the encoding of the raw data for interpretation and analysis. The survey was conducted by ensuring compliance to national and local directives related to Covid-19. While there were a few apprehensive residents to participate in the survey, it was still successful in identifying key issues regarding the transport system and supporting significant solutions such as rationalizing the Local Public Transport Route Plan while introducing a higher capacity vehicle, promoting a more active transport such as biking, and realizing the pedestrianization plan of the city.

Keywords: Origin-Destination (OD) Survey, Covid-19 Pandemic, Barangays

1. INTRODUCTION

Zamboanga City is the 6th largest city in the Philippines with a thriving economy and industry that makes it the only high-urbanized city in Region IX. With a population of 865,799 in 2015 and an average annual growth rate of 2.38% (PSA, 2016), it could reach a million population by 2022. It is an important economic hub in the Zamboanga Peninsula and the island provinces of Basilan, Sulu and Tawi-Tawi in southwestern Philippines. The total combined population within this region is more than 2.5 million people. Thus, travels within the city and between the contiguous economic centers have become more hectic.

A sustainable transportation system in Zamboanga City would ensure adherence to the highest standards of safety, security, economic efficiency and respect for the environment in all levels of transport management. While the contribution of high occupancy vehicles is a

way towards achieving a sustainable transport system by reducing dependency on private car travels, the growth of public utility jeepneys (PUJ) and/or buses, however, remain stagnant. For instance, the total number of registered motor vehicles in Zamboanga City in 2018 is 91,130 units. While the rate of car ownership remains high (17%), public transport growth rate on the other hand is low (-0.7%). There are 2,219 registered PUJ units and 6,587 tricycles; 95- 97% of all public transport trips end in the central business district. The transportation system in Zamboanga as well as in many other cities in the Philippines is in disarray. A large part of the road network is in poor condition and the intermodal integration is generally weak. The low mobility due to traffic congestion, the degraded air quality due to carbon emissions from the poor condition of fossil-fuel vehicles, the prevalence of overloading of trucks and PUJs, the inadequate enforcement of traffic regulations and poor sector governance, the fatalities and injuries brought about by chronic road accidents among others, all contribute to make the transport sector unsustainable.

Thus, a project called for the provision of consultancy services for the preparation of a Comprehensive Transport and Traffic Management Plan (2019-2033) and other supplementary plans to address the mobility needs of both people and goods within Zamboanga City based on the principle that the transportation system is safe, reliable, accessible, dependable, efficient, comfortable and environment-friendly. Initially, the project was scheduled to run for seven months, but the country imposed a nationwide lockdown on March 2020 which affected several activities to be conducted that month. One of which is the Origin-Destination (OD) Survey that would allow for the determination of the trip-making characteristics, which are essential in the formulation of transportation plans. With the constraints and situation concerning the pandemic, it was decided to push through with the conduct of the city-wide OD survey.

2. METHODOLOGY

2.1 Study Area

Zamboanga City being the economic and industrial center of the Zamboanga Peninsula region is classified as a first class highly urbanized city. It has a total land area of 1,414.70 square kilometers and has a population comprising 23.74% of the total population of the Zamboanga Peninsula region. These figures make Zamboanga City the third largest city by land area and sixth most populous city in the Philippines. Zamboanga City, although geographically separated, is grouped with the province of Zamboanga del Sur for statistical purposes but is governed independently from the province.

This highly urbanized city is politically subdivided into 98 barangays which are grouped into two congressional districts. District 1 on the west coast is composed of 38 barangays and District 2 with 60 barangays on the east coast. Of these 98 barangays, 58 are classified as urban and 40 are rural. The city's districts are linked by road networks in the urban core. The city has a total of 19 national roads – 1 primary, 6 secondary, and 12 tertiary roads. The transport activity data and energy demand survey covered all barangays of Zamboanga City.

2.2 Survey Instrument

The method used in the conduct of the Origin-Destination (OD) survey is a face-to-face interview using an established questionnaire. A household survey in transport surveys is the

usual method for data gathering on mobility. Aside from assessing the existing transport system and opportunities for transport developments in the study area, a household interview survey provides data on a household’s socio-economic information and its household member’s travel characteristics. This type of survey also gives information on the study area’s travel patterns and gathers the residents’ opinion regarding prevailing transport problems and their opinion on probable areas of improvement. Apart from the socio-economic information part of the questionnaire, the survey form includes two general parts: person trip survey and perception survey for energy demand.

The survey instrument was patterned after other surveys conducted in the Philippines including those conducted for MMUTIS (JICA, 1999) and Philippine cities such as Naga City Lipa City (Office of Transport Cooperatives, 2012) and the municipality of Dinalupihan (UPNCTSFI, 2020). In those cases, the implementations of the OD surveys were all under normal circumstances meaning there were no major concerns such as conflict or health issues that could affect the survey implementation. In this case, however, there were health protocols to be followed and a general apprehension from people to participate in the survey. As such, some adjustments had to be made and are explained in this paper.

Generally, in this type of survey, an estimate is made of all daily trips between and within a predefined set of zones which is usually based on existing demographic and political divisions – in this case, Zamboanga City’s barangays. As shown in Figure 1, each barangay is assigned with a specific barangay code for a more organized data encoding and processing. These codes corresponding to their specified barangay are listed in Table 1. Cities within 200-kilometer radius of Zamboanga City are also considered for trips coming to and from these places. And each city is also assigned with a specific city code.

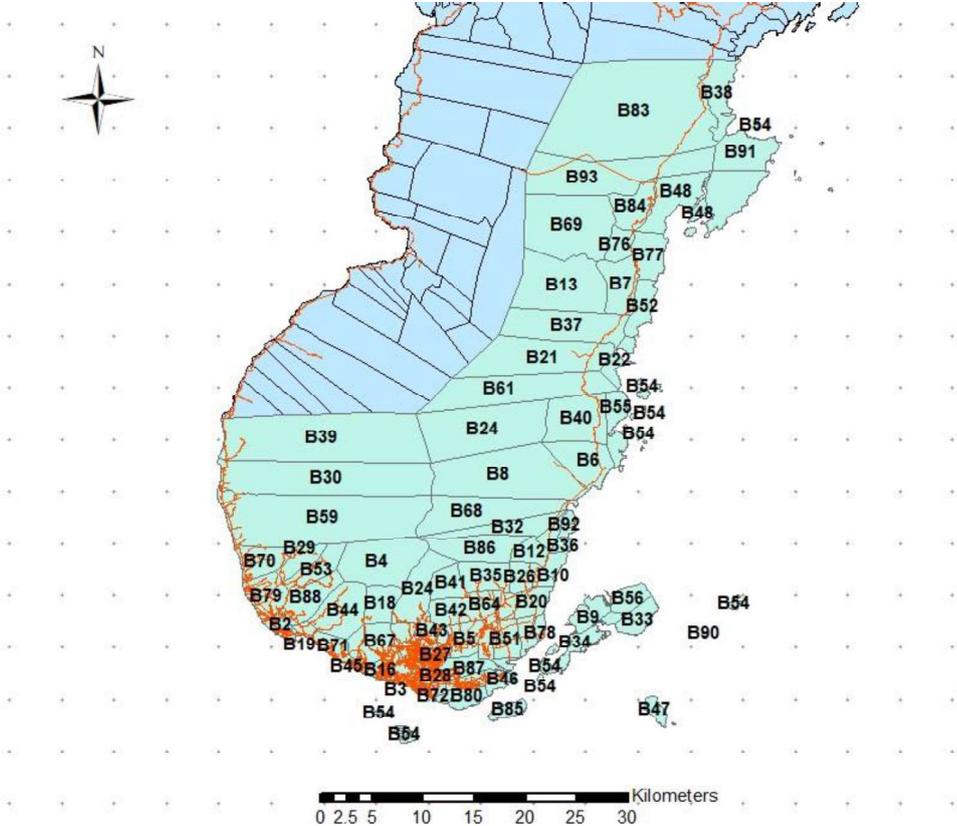


Figure 1. Zamboanga City Zone Map

Table 1. Barangay Codes Within Zamboanga City

Barangay Name	Code		Barangay Name	Code		Barangay Name	Code
Arena Blanco	B1		Landang Laum	B34		San Roque	B67
Ayala	B2		Lanzones	B35		Sangali	B68
Baliwasan	B3		Lapakan	B36		Sibulao	B69
Baluno	B4		Latuan	B37		Sinubong	B70
Boalan	B5		Licombo	B38		Sinunuc	B71
Bolong	B6		Limpapa	B39		Sta Catalina	B72
Buenavista	B7		Lubigan	B40		Sta. Barbara	B73
Bunguiao	B8		Lumayang	B41		Sta. Maria	B74
Busay	B9		Lumbangan	B42		Sto. Niño	B75
Cabaluay	B10		Lunzuran	B43		Tagasilay	B76
Cabatangan	B11		Maasin	B44		Taguiti	B77
Cacao	B12		Malagutay	B45		Talabaan	B78
Calabasa	B13		Mampang	B46		Talisayan	B79
Calarian	B14		Manalipa	B47		Talon-talon	B80
Camino Nuevo	B15		Mangusu	B48		Taluksangay	B81
Campo Islam	B16		Manicahan	B49		Tetuan	B82
Canelar	B17		Mariki	B50		Tictapul	B83
Capisan	B18		Mercedes	B51		Tigbalabag	B84
Cawit	B19		Muti	B52		Tigtapon	B85
Culianan	B20		Pamucutan	B53		Tolosa	B86
Curuan	B21		Pangapuyan	B54		Tugbungan	B87
Dita	B22		Panubigan	B55		Tulungatung	B88
Divisoria	B23		Pasilmanta	B56		Tumaga	B89
Dulian (UB)	B24		Pasobolong	B57		Tumalutab	B90
Dulian (UP)	B25		Pasonanca	B58		Tumitus	B91
Guisao	B26		Patalon	B59		Victoria	B92
Guiwan	B27		Putik	B60		Vitali	B93
Kasanyangan	B28		Quinipit	B61		Zambowood	B94
La Paz	B29		Recodo	B62		Zone I	B95
Labuan	B30		Rio Hondo	B63		Zone II	B96
Lamaong	B31		Salaan	B64		Zone III	B97
Lamisahan	B32		San Jose Cawa-Cawa	B65		Zone IV	B98
Landang Gua	B33		San Jose Gusu	B66			

Moreover, particularly for this OD interview survey, respondents were asked to recall a specific weekday before the COVID-19 pandemic. This is to make sure that gathered data for trip information from the survey are still representative of normal traffic conditions or traffic before the pandemic.

The questionnaire part for the trip information is presented in tabular form. Data fields to be answered are in rows and columns are added for subsequent trips made throughout the day. Aside from the trip's origin and destination, trip information questions include the time duration of the trip and travel characteristics such as trip purpose, mode of travel, and trip frequency. Response codes for trip purpose and travel mode are already provided in the survey for easier data encoding. For trips with transfer points, transfer point location and

mode of travel for each transfer are also included the survey form. Respondents who are public transport users are also required to specify their fare spent for each trip made.

3. SURVEY IMPLEMENTATION

3.1 Sampling

Summarized in Table 2 are the information about the survey sample size. Orientation and surveys were conducted from September 15 to October 2, 2020.

Table 2. Sample Size and Survey Schedule for Each Barangay

Barangay	Target Survey	Actual Surveyed	Schedule	
			Date of Orientation	Date of Survey
1) Zone I	50	50	September 15	September 16
2) Zone II	50	40		
3) Zone III	25	23		
4) Zone IV	25	26		
5) Sto. Niño	75	60		
6) Camino Nuevo	100	81		
7) Canelar	150	151		
8) San Jose Cawa-Cawa	75	36		
9) Mariki	25	25		
10) Sta. Barbara	75	77		
11) Rio Hondo	50	52		
12) Tetuan	400	404		
13) Tugbungan	300	272		
14) Sta Catalina	225	193		
15) Kasanyangan	200	161		
16) Campo Islam	200	204		
17) Baliwasan	350	351		
18) San Jose Gusu	300	200		
19) Talon-talon	450	460		
20) Mampang	450	441		
21) Arena Blanco	200	147		
22) Tigtabon	75	75		
23) Pangapuyan	25	20		
24) Calarian	375	324	September 17	September 18
25) Malagutay	100	115		
26) San Roque	375	376		
27) Sta. Maria	350	249		
28) Cabatangan	200	202		
29) Ayala	300	147	September 18	September 21
30) Talisayan	100	101		
31) Recodo	200	218		
32) Cawit	150	139		
33) Maasin	125	125		
34) La Paz	100	84	September 21	September 22
35) Tulungatung	150	148		
36) Pamucutan	100	65		
37) Baluno	50	50		
38) Limpapa	75	70		
39) Labuan	150	159		

Barangay	Target Survey	Actual Surveyed	Schedule			
			Date of Orientation	Date of Survey		
40) Patalon	125	129				
41) Sinubong	75	67				
42) Lunzuran	150	144	September 23	September 24		
43) Tumaga	450	440				
44) Lumayang	25	26				
45) Pasonanca	350	358				
46) Capisan	25	19				
47) Lumbangan	50	47				
48) Salaan	75	60				
49) Pasobolong	50	52				
50) Boalan	125	123				
51) Putik	300	224				
52) Divisoria	150	123				
53) Zambowood	150	104				
54) Mercedes	200	160	September 25	September 28		
55) Taluksangay	150	127				
56) Talabaan	75	53				
57) Dulian (UP)	25	27				
58) Cullanan	125	127				
59) Cabaluay	100	75				
60) Guisao	50	42				
61) Cacao	25	20				
62) Lanzones	50	38				
63) Sangali	300	306			September 28	September 29
64) Manicahan	150	151				
65) Victoria	50	40				
66) Lapakan	25	25				
67) Bunguiao	100	104				
68) Bolong	100	60				
69) Busay	50	54				
70) Pasmanta	50	52				
71) Landang Laum	75	80				
72) Landang Gua	50	54				
73) Manalipa	50	42				
74) Tumulutab	50	44				
75) Lamisahan	50	53				
76) Dulian (UB)	50	53				
77) Tolosa	50	54				
78) Panubigan	25	26	September 29	September 30		
79) Lubigan	50	52				
80) Quiniput	50	52				
81) Dita	50	46				
82) Curuan	125	128				
83) Buenavista	100	98				
84) Calabasa	50	51				
85) Muti	50	41				
86) Latuan	50	49				
87) Tagasilay	50	51	October 1	October 2		
88) Taguiti	25	20				
89) Sibulao	75	79				
90) Tigbalabag	25	24				
91) Mangusu	75	75				

Barangay	Target Survey	Actual Surveyed	Schedule	
			Date of Orientation	Date of Survey
92) Limaong	50	40		
93) Vitali	125	123		
94) Tumitus	50	42		
95) Tictapul	50	50		
96) Licomo	75	78		
97) Sinunuc	400	370		
98) Guiwan	300	217		
Total:	12,725	11,750		

For each barangay, the total population and the household population were considered. A sample size estimate of 1.5% of both the total population and household population were considered and the final sample size was set from whichever was higher rounded up with 20 to 100 respondents (depending on the total number of man-days) margin. A total of 11,750 respondents were surveyed out of the total 12,725 target total surveys.

3.2 Manpower and Other Requirements

The survey was intended to be city-wide so it was necessary to coordinate with the 98 barangay chairpersons to request for their assistance in hiring surveyors, preferably at least high school graduate barangay workers, to conduct the survey on random respondents from scattered households of each zone of the barangay. It was necessary that the surveyors were residing in the barangays they were assigned to survey to minimize rejection, especially during this pandemic. Residents are usually familiar with their barangay workers, particularly in the rural areas, so it was wise to employ them. Recommended surveyors under 21 years of age and above 60 were rejected by the team as the city prohibited them from leaving their homes. Finally, a total of 286 surveyors were employed.

Survey orientation usually took 2-3 hours depending on the number of surveyors per group. Larger groups consumed 3 hours as more surveyors raised more questions that needed discussion and it also took more time to check the outputs of the simulated survey towards the end of the orientation.

Pilot test runs were done for barangays Sinunuc and Guiwan. Orientations for the surveyors of these barangays were conducted at different time and venue because of their location. Survey materials were provided on the day of orientation. The questionnaire was explained thoroughly while giving them some tips and guidelines in administering the survey to minimize rejection. They were instructed to wear a face mask and a face shield at all time while conducting the survey. A survey simulation was conducted by the end of the orientation in which the surveyors were asked to select a partner to interview, and later be interviewed. This was done so that questions regarding the survey questionnaire will be raised while the survey facilitators are present. After the simulation, all filled-out questionnaires will be checked by the facilitators and explain further on certain items that may have confused the surveyors to ensure that they understood every part of the OD survey before conducting it the next day.

Initially, there was a team leader assigned for each barangay whose only duty was to check on the surveyors if they were actually conducting the survey, give an update and photo-document while the survey was on-going. Also, each surveyor was instructed to reach a quota of 20 respondents per day in barangay Sinunuc, while in barangay Guiwan, the surveyors were instructed to just finish the questionnaires provided (30 sets each per day). It was found that hiring a team leader with such duty was impractical because as it turned out,

all recommended surveyors by the barangay chairpersons were responsible enough in conducting the survey. Giving a quota was also found ineffective. Therefore, from these pilot tests, necessary adjustments to the survey implementation of the remaining 96 barangays were made. Each barangay had a team leader chosen by the surveyors of said barangay and giving an update and photo-documenting the on-going survey was just an additional duty. Instead of having a quota, the surveyors were then advised to just finish the sets of questionnaires provided for them if possible without telling them the actual total number of sets which was 30 per day per surveyor. Extra sets were provided as a contingency.

Aside from the surveyors, survey retriever and encoders were also included in the manpower. The survey retriever was responsible for collecting the filled-out interview questionnaires from surveyors who were done conducting the survey. He was also assigned to quickly check the content of the filled-out questionnaires to correct obvious errors committed by the surveyors on site, before giving their honoraria. On the other hand, a total of twelve (12) encoders were employed to encode the total 11,750 sets of the three-page filled-out questionnaires. Civil engineering college students were preferred to encode because in Zamboanga City, they have a prior knowledge of what an OD survey is as part of their Traffic and Highway Engineering subjects. This was to ensure that cleansing of the collected raw data will also be conducted while encoding to accelerate the limited time intended for data interpretation and analysis.

Excluding the two barangays surveyed for pilot test, the remaining 96 barangays were divided into 18 groups only for the purpose of orientation schedule and venue. Considering the printing of questionnaires and IDs of the surveyors, and the purchase and preparation of other materials by a four-man team on site, who were also assigned to orient the surveyors from all barangays, the groupings were made. They were based on the number of target respondents so that the facilitators will not be overwhelmed with providing all necessary materials for each group; by location which means adjacent barangays with reasonable number of respondents in total were grouped; and by the number of surveyors per barangay as the city was restricting mass gatherings, in which less than 20 people were allowed in a gathering or around 50% capacity of the venue, whichever is lower. Therefore, the number of barangays varies for each group.

Whenever possible, two to three groups of barangays were scheduled for survey orientation in a day (Day 0), survey checking (Day 1), and survey questionnaires retrieval and giving honoraria to the surveyors (last day).

During the orientation of the first eight groups, the facilitators explained each item of a blank questionnaire. But because the surveyors come from random ages (between 21 and 60) and from different walks of life, their comprehension of the questionnaire varied which was taking much of the orientation time. The facilitators needed to repeat discussing several items to ensure that they understood the survey. To solve this, a sample filled-out questionnaire was given to every surveyor of the remaining ten groups. This was used while explaining the survey, which also served as a reference for the surveyors while conducting the survey whenever they got confused about certain items. As a result, the comprehension regarding the survey questionnaire of the surveyors for these barangays were much better than first barangays oriented.

To ensure that they indeed understood the survey during the orientation, the facilitators went to every barangay to check on the surveyors when possible from 11am to 1pm on the first day of survey. This time range was selected so that errors committed by the surveyor will be corrected immediately and thus, will be avoided later in the afternoon and the next days of survey. However, for far-flung barangays such as those in group 18 (more than 60 kilometers from the city proper) and the island barangays, it was impractical to go and check the progress

of surveyors because of their location. Besides, the necessary respondents per barangay in this group were few so the team decided to omit checking on these groups on the first and only day of survey. This decision partly affected the results of the survey of these groups because some of the surveyors failed to correctly get the answers from the respondents on some of the items of the questionnaire.

In addition, the retrieval of all questionnaires after the survey is completed was also scheduled. Adjacent barangays whose surveys were projected to be completed on the same day were scheduled to be met by the survey retriever for checking and payment of honoraria. The survey questionnaire were retrieved as soon as possible so that the encoders team could start working with the data of the first groups of barangays that were done conducting the survey, while other barangays were still being oriented and conducting the survey to maximize the time available.

Orientation schedule for the surveyors in the morning was 8:00-10:00 or 10:00-12:00 for the first set of barangays and in the afternoon (1:00-3:00 or 3:00-5:00) for the second or third group of barangays. The conduct of survey was done in a usual work schedule (8:00 A.M.-12:00 NN, 1:00 P.M.-5:00 P.M.). The retrieval was dependent on the availability and accessibility of the barangay surveyors. Finally, survey runs were accomplished in two batches. 48 barangays were completed in the first half (September 15 to September 26) and the remaining 48 barangays were finished in the second batch (September 27 to October 2). Excluding Sundays, the whole survey duration run from September 15, 2020 to October 2, 2020.

On top of the usual expenses for a household interview survey – manpower salary, survey forms and materials cost, meal and transportation budgets, a separate budget for alcohol, face masks, and face shields were allotted for this survey to ensure that the surveyors would be following minimum safety protocols during the survey implementation. The surveyors needed to observe minimum health protocol so they were provided with face mask, face shield and handy alcohol each which costed around 6% of the total survey cost (P20,184.00 of P360,456.04).

3.4. Issues Encountered

Some of the most common issues on site encountered by the surveyors while conducting the survey were:

- **Uncooperative residents** – due to the current pandemic situation, some residents were uncooperative and did not want to be interviewed either because of safety concerns or political issues. As a result, surveyors had a hard time accomplishing the expected number of samples.
- **Difficulty in meeting the required number of respondents** – this issue other than being caused by residents being uncooperative, was also caused by unanticipated issues such as storms and rainy weather which caused flood in some areas. Furthermore, particularly in rural barangays, households are situated far from each other. As a result, surveyors had a difficulty in meeting the required number of respondents expected of them.
- **Logistics concern** – this issue includes problems with the manpower provided by the barangay. Some surveyors had a hard time in fully understanding the survey forms. This resulted to the need of repeating the orientation process or in the case of barangay Divisoria, postponement of the survey and requesting for another set of surveyors all together. In addition, in some barangays where signal is scarce and location is an issue, it was hard for the survey team to check the surveyors on the first day of survey which

resulted to some confusing and incomplete survey results.

- **Social Amelioration Program related issues** – the Social Amelioration Program (SAP) of the national government grants a monthly cash subsidy to low-income families for two months, and provide marginalized sectors of society the means to afford basic needs during the pandemic. Some of the barangay residents did not want to participate in the survey because it was not SAP-related or because they were rejected in the final list of SAP beneficiaries.
- **No incentives for respondents** – some of the respondents complained that the surveyors were interviewing without giving something to them in exchange. Other residents did not want to be interviewed at all because it was not clear what was in it for them.
- **Insufficient rate for Island Barangay surveyors** – island barangays are located away from the city proper. Therefore, it was impractical for the surveyors to be paid only for one day (P400/surveyor per day) because accordingly, this P400 rate will only be spent for their fare in delivering the survey forms after conducting the survey. The team agreed to increase their rate from P400 to P1,000 per surveyor per day which should be enough to pay for their fare. On the other hand, the residents of these barangays were very much willing to participate in the survey because they believed it could help them in some way someday. As a result, the distributed forms were actually insufficient for these barangays.
- **“Car ownership” part was confusing for Bangka or boat owners** – the mode of travel of Island Barangay residents is usually *bangka* or boat. Therefore, in page 3 of the OD survey form, *bangka* was included in the options for the question “*Are you planning to own a vehicle for the next 5 years and what type?*” while the survey was on-going. Most residents also owned *bangka* so for the Car Ownership part of page 3, they were allowed to indicate *bangka* while leaving the space provided for the manufacturer and odometer reading blank.

4. ORIGIN-DESTINATION DATA OBTAINED

4.1 Data Processing

Survey data were gathered from a total of 11,750 respondents. As shown in Figure 2, of these total data, 4% were rejected due to issues on poor data collected. The remaining 96% which is equivalent to 11,232 survey data were processed for the data results discussed in the subsequent parts of this subsection.

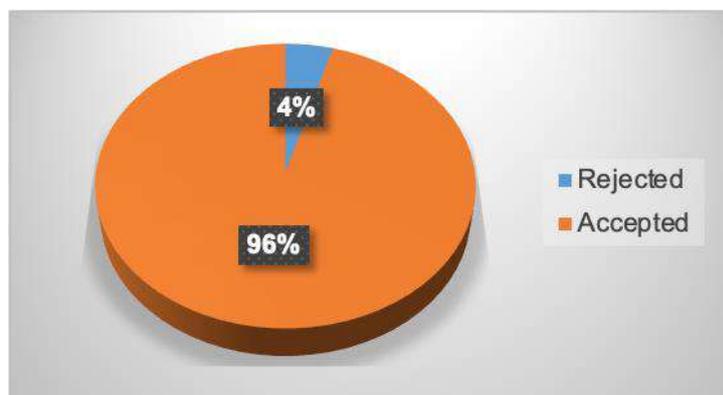


Figure 2. Total Number of Gathered Survey Data

4.2 Socio-economic Characteristics

Figure 3 shows the age distribution of the survey respondents. It shows that majority of the trip makers surveyed are of the age range 18-30 years old. This range is typical to the students in secondary and tertiary level and young adult workforce. This distribution also gives us an idea on the typical purpose of the trips made.

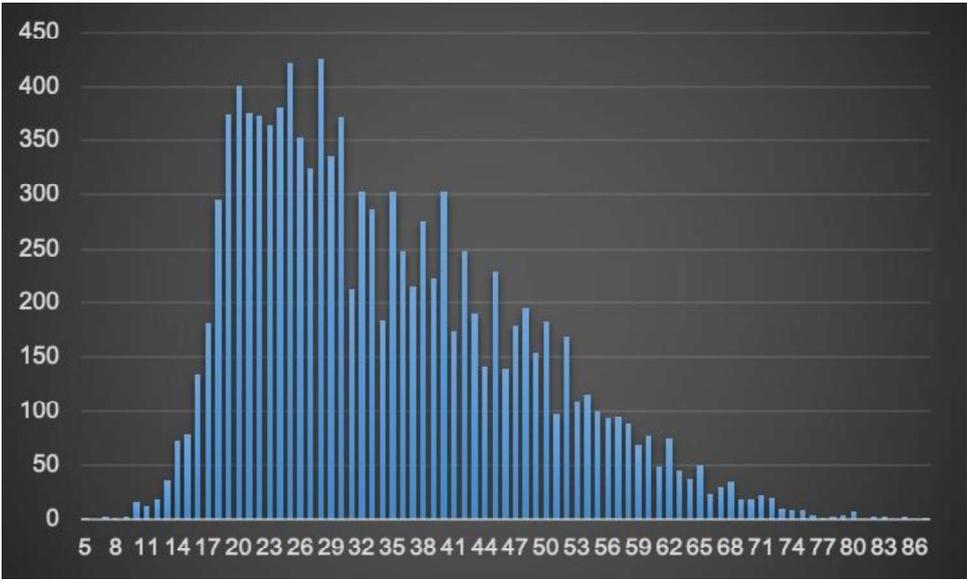


Figure 3. Age Distribution of the Trip Makers

As shown in Figure 4, majority of the 11,232 total survey respondents are female, which comprise 56% and 44% are male.

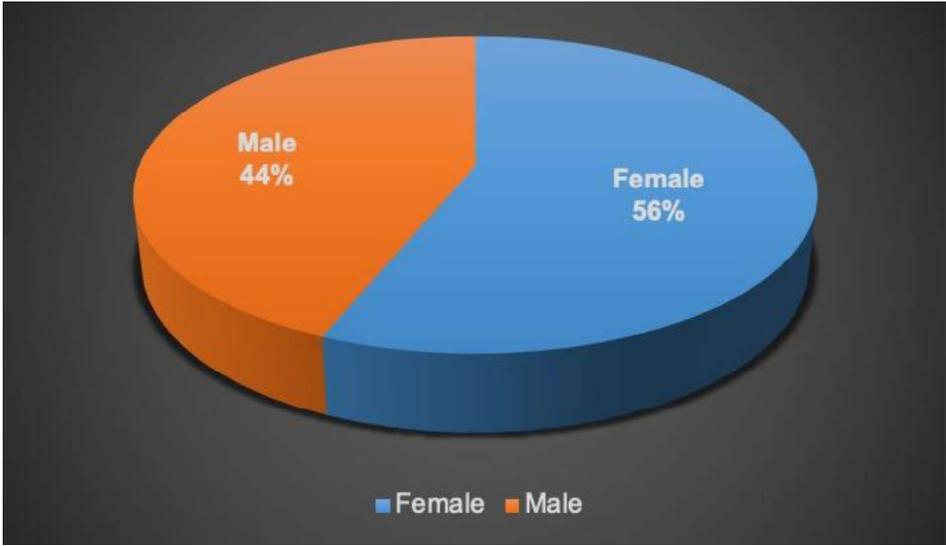


Figure 4. Distribution of the Trip Makers According to Sex

The distribution of the occupation of the trip makers is shown in Figure 5. As reflected in the age distribution in Figure 3, majority of the trip makers are students in high school and

college. Coming in close second are housewives and husbands trip makers. Shown in the graph are some of the identified occupations with service workers being the most number among these identified occupations, fifth overall. However, still a large portion of the respondents fall in other occupation categories, coming in third most number, while unemployed trip makers come fourth.

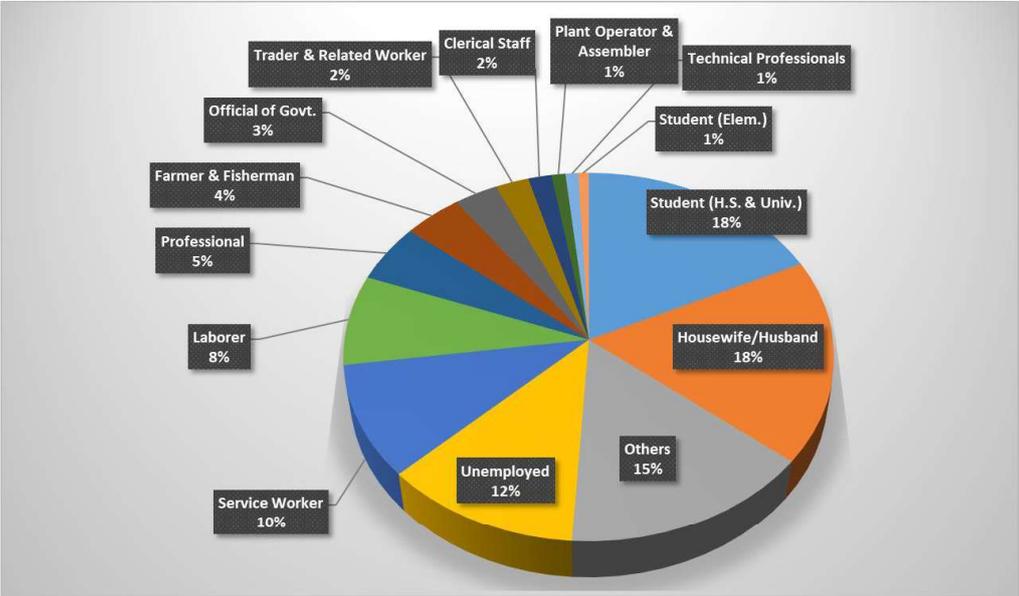


Figure 5. Occupation of the Trip Makers

Figure 6 shows the income of the trip makers in Philippine pesos (PhP). As shown in the graph, income of majority of the trip makers falls under below PhP 10,000 or no income bracket which is consistent with distribution of the trip makers' occupation in Figure 5. The 'no income' bracket is attributed to the students, housewives/husbands, and unemployed respondents.

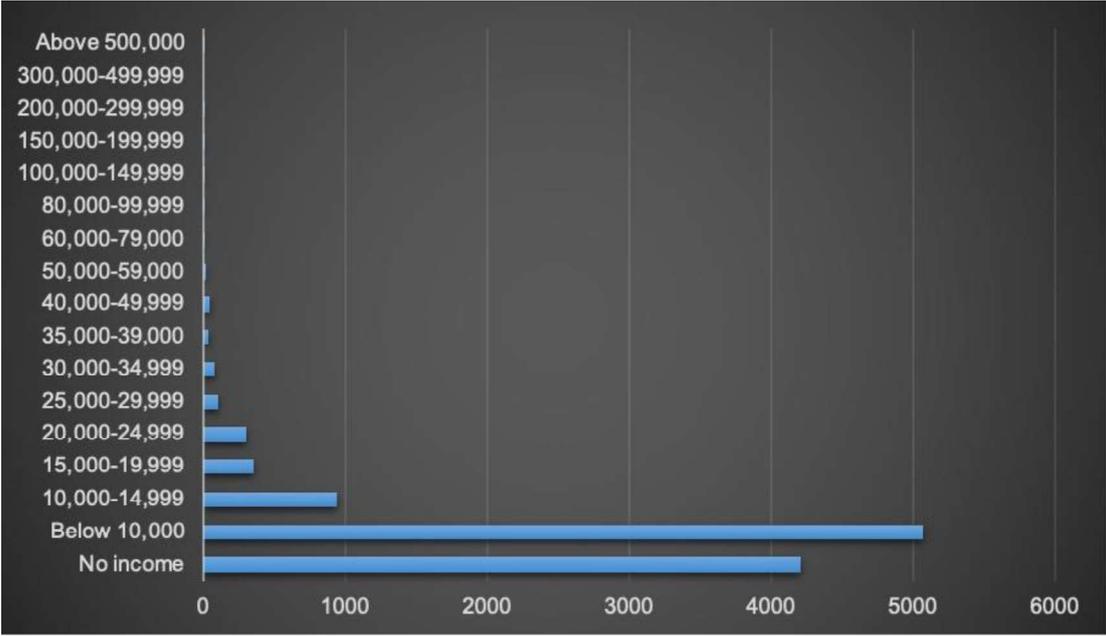


Figure 6. Income of the Trip Makers

4.3 Trip Characteristics

Figure 7 shows the percentage distribution of the purpose of the trips made. The big three purposes are trips to home, to work, and to school which comprise 45%, 23%, and 12% of the total trips made, respectively.

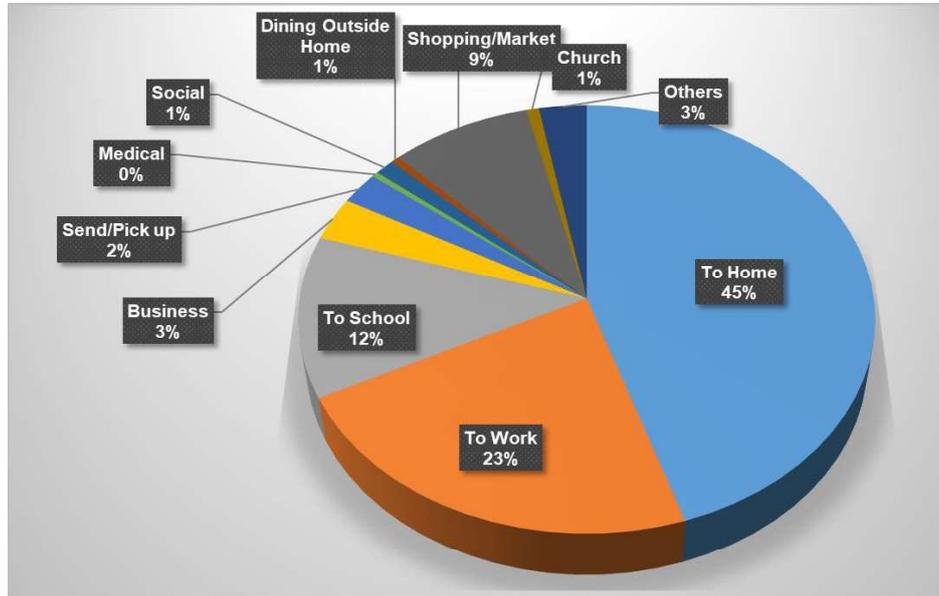


Figure 7. Trip Purpose

Mode share of the total trips made is shown in Figure 8. Public utility jeepneys are the most common mode of transportation used amounting to 27% of the total trips. 22% of the survey respondents drive their own motorcycle while 12% ride as passengers. Walking as a mode of transport also shares a significant chunk amounting to 14%. Tricycles and UV Express are used in almost the same amount, 6% and 5%, respectively. The remaining percentage of mode share are distributed to pedicabs, bicycles, private cars, and water transport.

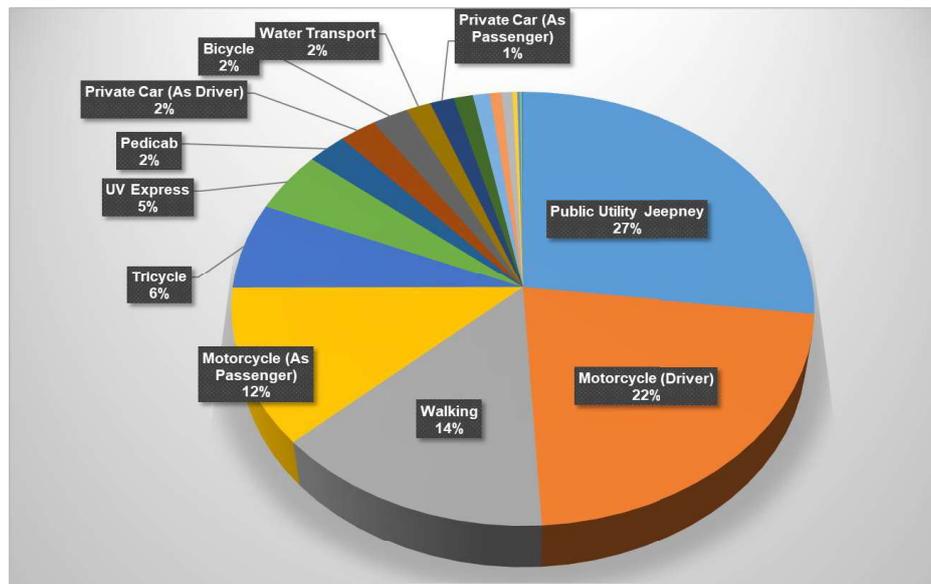


Figure 8. Mode Share

Figure 9 shows the amount of money public transport users allot for fare expenses and private transport users allot for fuel expenses on daily basis. The graph shows that more than half of the respondents' budget fall under the range below Php 50. This result is reflective of the public transport users' fare budget as they comprise majority of the mode share as shown in Figure 8.

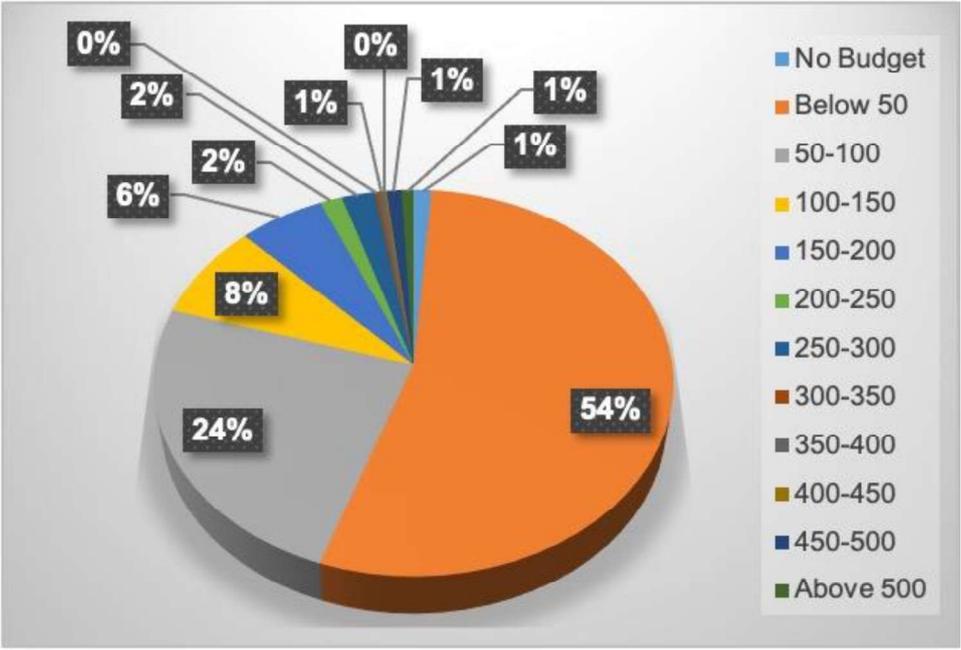


Figure 9. Transportation Budget Pie Chart

4.4 Other Data Derived from the Surveys

The survey included many other questions to establish other information needed for transportation planning. Among these are questions designed to get data on walking, cycling, car ownership and perceptions or opinions about transportation issues such as traffic congestion. Figure 11 shows the maximum distance people are willing to walk.

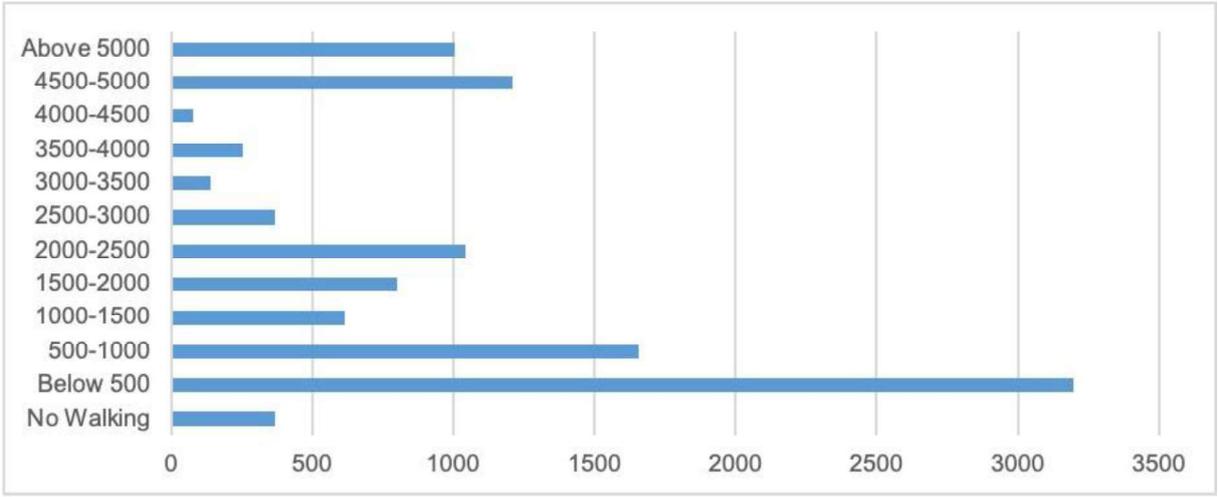


Figure 10. Maximum Walking Distance (in meters)

Figure 11 shows the respondents' perception on causes of traffic. Top three identified causes are increase in number of trucks, increase in number of private cars, and insufficient road network.

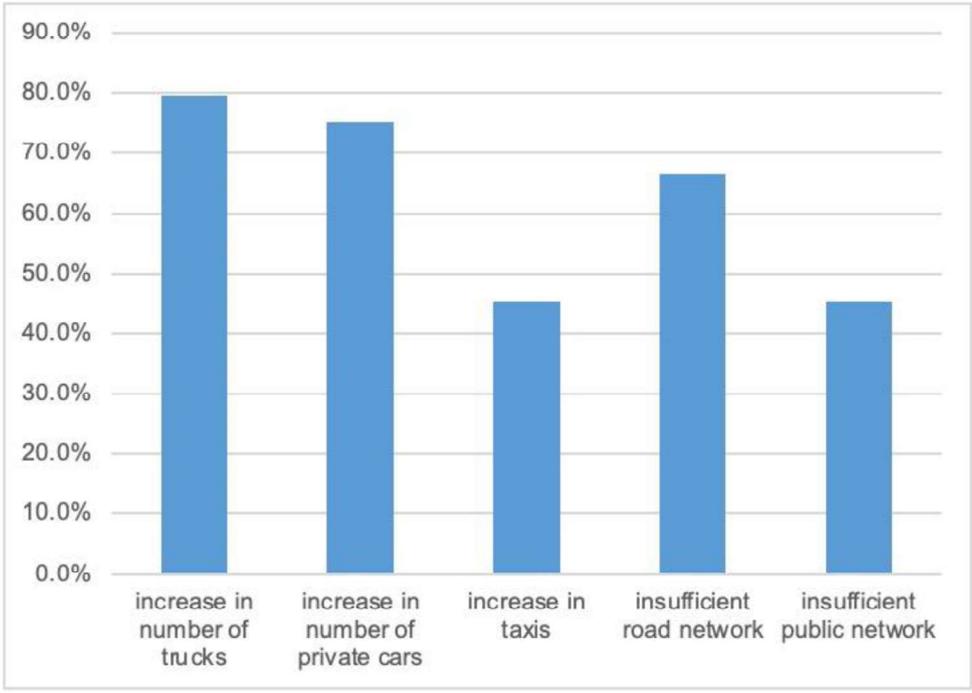


Figure 11. Perception on Causes of Traffic

Information on cycling in Zamboanga City are shown in Figures 12 to 14. Only 14% of the surveyed population owns a bicycle. 37% of them use bike for recreational purposes, 30% for commute, and 33% for both. In addition, majority of these regular bike users use their bikes only once or twice a week.

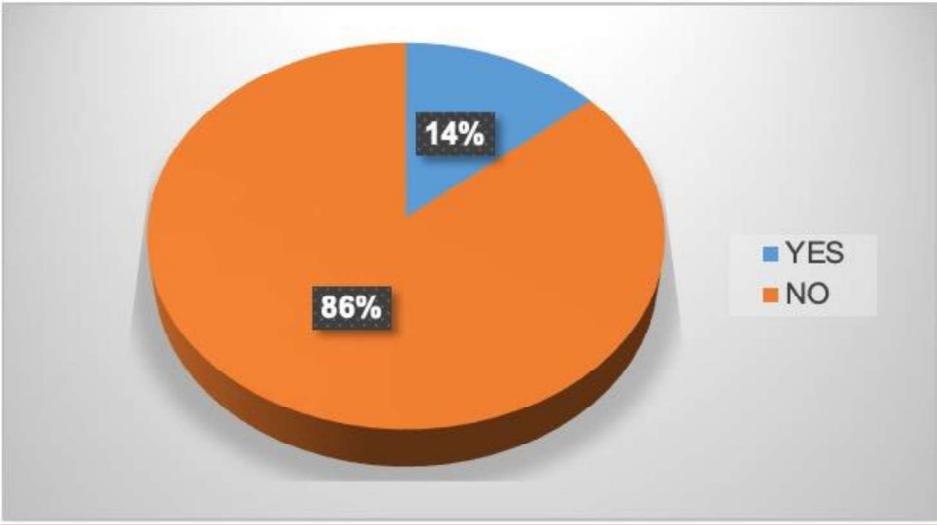


Figure 12. Bicycle Ownership

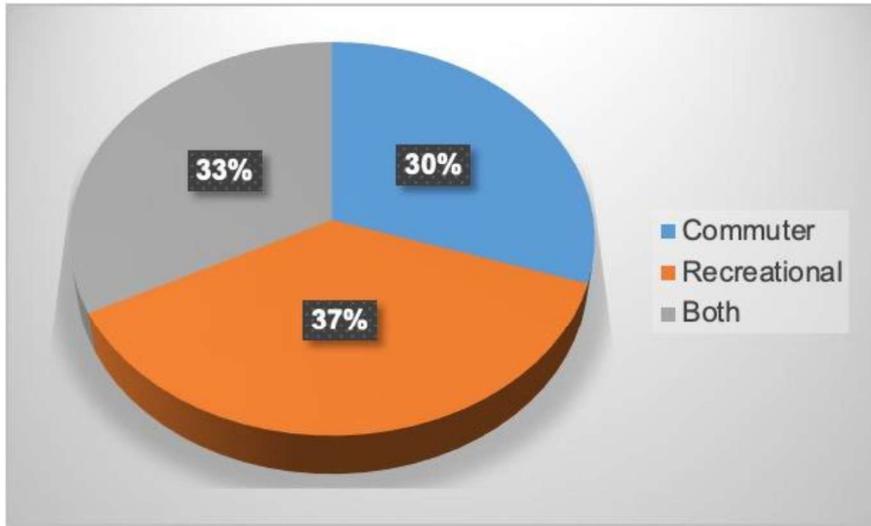


Figure 13. Type of Cyclist

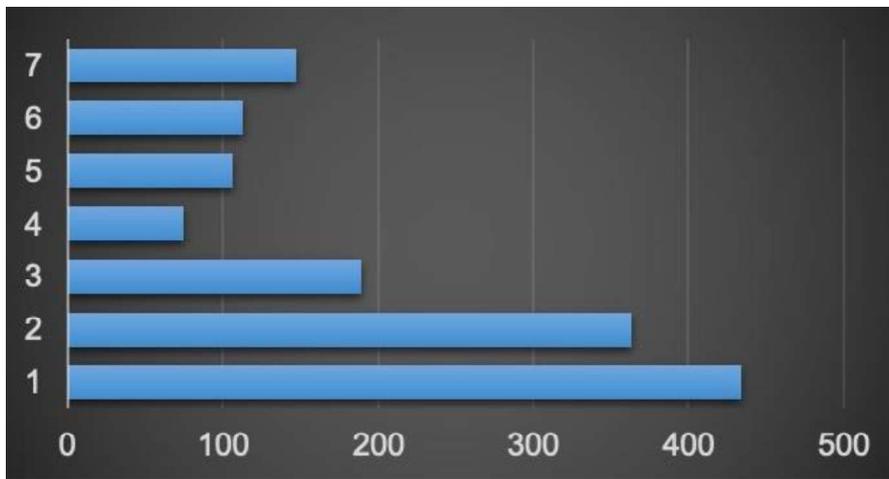


Figure 14. Regular Biker Weekly Usage

Further, if bike lanes will be implemented, 55% of the respondents are willing to shift to bicycles as their mode of transport in one of their trips as shown in Figure 15.

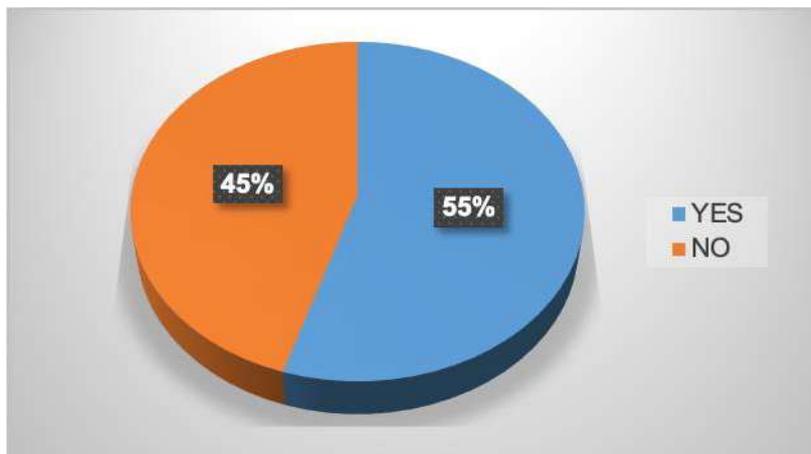


Figure 15. Willingness to Shift to Bicycles as a Mode of Transport

During orientation, it was emphasized that the question “If there will be bike lanes, are you willing to shift to bicycle in one of your trips?” should be answered by all respondents, regardless of bike ownership.

Figures 16 to 17 show information on car ownership of the surveyed population. As shown in Figure 16, 31% of the respondents own a vehicle – 30% of them own one vehicle and 1% own two vehicles. The average year model of these vehicles ranges from 2015-2020 with 2018 being the most common. Moreover, 89% of these vehicles run on gasoline while 11% run on diesel.

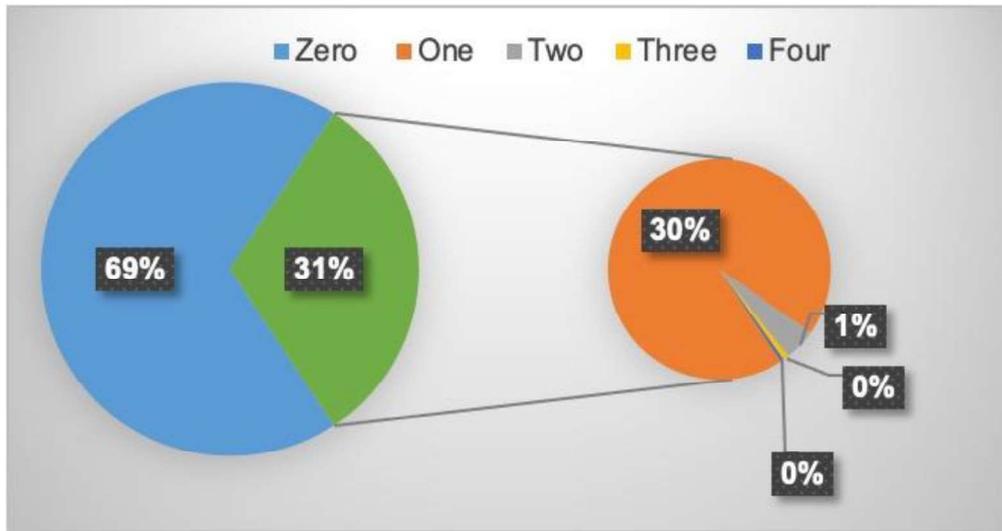


Figure 16. Vehicle Ownership

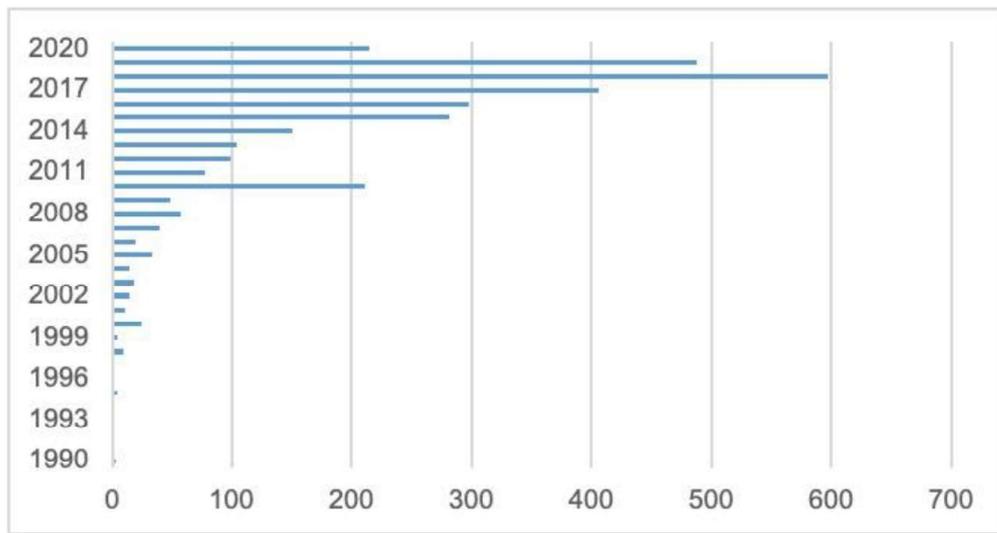


Figure 17. Vehicle Year Model

4.5 Desire lines for Zamboanga City

The following Figures 18 and 19 show the outcomes of the recall O-D surveys. Figure 18 shows the desire lines for public transport trips while Figure 19 shows trips using private transportation. The data were used in analyzing transport demand for the city in relation to various proposals including rationalization of public transportation routes, pedestrianization,

intersection improvements and the introduction of bike lanes along major roads.



Figure 18. Desire lines map for public transport trips in Zamboanga City



Figure 19. Desire lines map for private transport trips in Zamboanga City

5. CONCLUSION

Some activities needed for the preparation of Comprehensive Transport and Traffic Management Plan (2019-2033) and other supplementary plans to address the mobility needs of both people and goods within Zamboanga City were affected by the lingering pandemic. The brief timeframe of the project led to the conduct of some surveys including OD survey during the pandemic.

Conducting a recall Origin-Destination Survey within a large city in the time of a pandemic such as Covid-19 is unprecedented in the Philippines. With the threat of the virus, the success of the survey was immensely dependent on how the methods were carefully strategized from hiring of surveyors, identification and preparation of necessary materials, scheduling of orientation, conducting the actual survey, checking and retrieval of questionnaires, and finally, to the encoding of the raw data for interpretation and analysis. National and local directives relevant to Covid-19 pandemic such as restricting ages under 21 and above 60 to go out of their homes, and the prohibition of mass gatherings, challenged the hiring of surveyors and the conduct of orientation, respectively. The barangay chairpersons were coordinated to assist in hiring surveyors who were residing and will be assigned to survey in their respective barangay. Recommended surveyors were preferably barangay workers within the allowed age bracket to go out, so that the respondents would feel at ease because the surveyors were familiar to them. On the other hand, each surveyor was provided with alcohol, face mask and face shield aside from other survey materials to ensure that they were observing minimum safety protocols while conducting the survey.

The orientation for the surveyors was the most critical part in obtaining a high-quality result because it will determine whether or not the surveyors fully understood the questions they needed to ask the respondents. Poor comprehension of the questionnaire yields poor quality of gathered data, which will ultimately fail the survey. Thus, providing a good example of a filled-out questionnaire, explaining it thoroughly, and simulating the conduct of survey by the end of the orientation were strategies used to improve the surveyors' comprehension of the questionnaire.

Checking on the surveyor's progress around noon time of the first day of the survey was also vital to ensure that they were not conducting the survey incorrectly. This saved the surveyors from repeating mistakes in the afternoon and the rest of the days of survey.

During the conduct of survey, some of the problems encountered by the surveyors in different barangays were as follow: uncooperative residents, difficulty in meeting the required number of respondents, logistics concerns, Social Amelioration Program related issues, and complaints because no incentives were given to the respondents. Fortunately, the surveyors were already informed during the orientation that some residents would be apprehensive to participate in the survey for several reasons which may or may not be related to the pandemic. They were told not to insist on interviewing these types of residents and just proceed to another respondent so as not to waste time. On the other hand, special problems involving the island barangays were as follow: insufficient rate for Island Barangay surveyors and "Car ownership" part was confusing for boat owners. The rates were increased sufficiently and the *bangka* was allowed to be an answer in the "car ownership" part, considering that this was the most common mode of transport in the islands.

A survey retriever who was tasked to quickly scan the filled-out questionnaires submitted by the surveyors and spot obvious errors prior to giving their honoraria was also significant so that blank items and confusing answers were clarified in front of the surveyors

who conducted the interview.

Encoding of the raw data was preferably done by people who had previous knowledge of OD survey so that data cleansing would be conducted at the same time. Encoding started as soon as there were surveyors who completed the survey. It was done simultaneously, while other barangays were still conducting the survey to maximize the time resources.

The conduct of surveys during times of pandemic is challenging and a daunting task which necessitates careful planning, management, and execution. While the survey methods are already institutionalized in the transport science practice, modifications and adjustments are conceived and employed to the changing and challenging times, in this case, the lingering pandemic, in order to ensure that transport planning will continue as it faces the future with a new normal. This paper made a case out of the situation we have at this point.

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