Metro Manila Counts

Everyone matters, everyone counts.

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I. Acknowledgements

The organizers of the Metro Manila Counts would like to thank the 168 volunteers who contributed to this effort:

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This initiative would not have been possible without all of your collective effort.
Thank you for advocating for safer and more inclusive streets!

II. Summary

The Philippines have established conventions of data collection that capture movements of motorized vehicles on the road (i.e. number of trips generated, or number of motor vehicles according to different sizes and wheels). However, this has yet to be instituted for other modes of transport, particularly non-motorized transport (NMT). The lack of data on road use especially by active transport[1] has made it difficult for urban planners and decision-makers to design the appropriate transport infrastructure and program, justify investments and value the socio-economic benefits of active transport to cities and businesses.

The Metro Manila Counts! (MMC) Project is a citizen-led collaborative capacity-sharing effort by the Institute for Climate and Sustainable Cities, MNL Moves, The Climate Reality Project Philippines, 350.Org Pilipinas, and the Pinay Bike Commuter Community in partnership with the local government units (LGUs) of Marikina City, San Juan City, Pasig City, and Quezon City.

On June 8, 2021, 168 volunteers implemented the first Metro Manila Count; 132 volunteers were stationed in 32 locations in different parts of Quezon City, Marikina City, San Juan City and Pasig city and conducted a bike and pedestrian count. Volunteers counted during a two-hour peak count in the morning (6-8 am) and afternoon (4-6 pm) using adapted forms from the United States' National Bicycle and Pedestrian Documentation Project.

Results of the bike and pedestrian count revealed that during the four-hour window in 32 locations in 4 cities:

38,932
12,787
1,658

96.6%
3.1%

71.3%

127

- There were **38,932 cyclists**, **12,787 pedestrians** and **1,658 users of personal mobility devices (PMDs)** recorded;

- **Majority of the cyclists counted were men** and only **3.1% (1,145) are women**;

- **71.3% (26, 478)** of the cyclists **use helmets**;

- There were **127 unique movements** observed in the 32 locations in the four cities;

- **'Counter-flowing'** or going against the flow of motor-vehicle traffic is common among cyclists.

[1] *Active transport, or active mobility refers to non-motorized means of transport (NMT) of people and goods, which requires human physical activity.*

Likewise, data on the number of cyclists were equated to potential contribution, in terms of savings and amount of fossil fuel consumption reduced on a per-kilometer basis. Data suggests that:
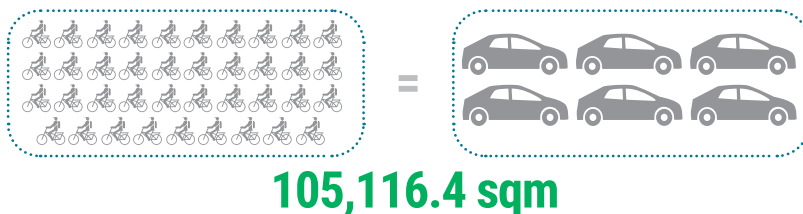
105,116.4 sqm

- The 38,932 cyclists in 32 locations on a stop, would have occupied an operational space equivalent to **105,116.4 sqm**. The same area of road will only occupy **6,257 people in cars**.

P87,597/km   P89,225/km
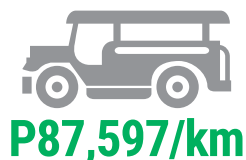
- If equated in savings in terms of minimum fare equivalent of a public transport jeepney ride, accumulated savings would be at least **P87,597 per kilometer;** If equated in savings in terms of gasoline fuel cost of a private car, accumulated savings would be at **P89, 225.06 per kilomete**r;

1,769.6 liters   4.2 metric tons
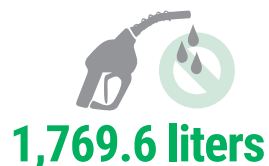
- If equated in terms of volume of gasoline reduced, some **1,769.6 Liters worth of Gasoline Fuel** were saved. This translates to an equivalent **4.2 metric tons of carbon dioxide avoided**.

The volunteers noted that the numbers remain undercounted, especially for pedestrians and PMD users. Among them:

i.   The count was conducted observing safe and healthy safeguards wherein volunteers signed up in stations nearest to their respective places of residence. There were a limited number of volunteers in locations with high traffic and pedestrian activity (i.e. intersections, locations near transit stops and commercial strips), on top of different data on transport modes to be recorded.

ii. Due to health measures observed, observation time was reduced by an hour in the morning and in the afternoon; from an ideal 3-hour window to 2- hour windows respectively.

iii. Inclement weather, especially in the afternoon, was identified as a potential factor for lower turn-out of cyclists in the afternoon.

This report details the methodology and results of that count effort, along with general observations of the volunteers. This report intends to provide a baseline for an annual volunteer count program, and to encourage local conversations about the importance of monitoring and baseline data gathering such as bicycle and pedestrian counts to inform planning and advocacies for more inclusive and sustainable transportation options for cities and communities.
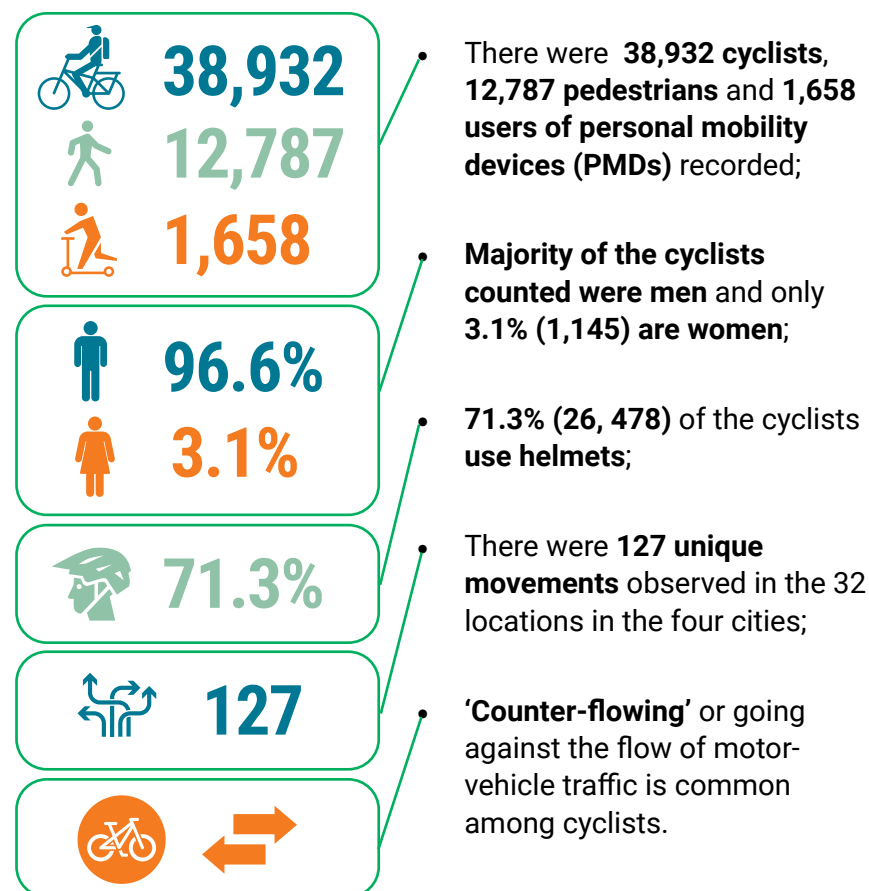
III. Background

The Philippines have established conventions of data collection that capture movements of motorized vehicles on the road i.e. number of trips generated, or number of motor vehicles according to different sizes and wheels. However, this has yet to be instituted for other modes of transport, especially non-motorized transport (NMT). The lack of consistent data on road use especially through active transport has made it difficult for urban planners and decision-makers to design the appropriate transport infrastructure and program, justify investments and value the socio-economic benefits of active transport to cities and businesses.

The observance of physical distancing as a public health safety measure, along with the travel restrictions on mass public transport during this COVID-19 pandemic, has created a momentum for for citizens who do not own motorized vehicles to resort to active transport[2] including cycling, walking and use of personal mobility devices (i.e. e-kick scooters, e-bikes, rollerblades). Likewise, there is a growing call to develop interconnected dedicated bicycle lane networks across the country to ensure safe passage for workers cycling to work. .

In recognition over this lack of data number of cyclists and pedestrians on the road, the convenors of the 2020 Mobility Awards, namely the Institute for Climate and Sustainable Cities (ICSC), MNL Moves, The Philippine Branch of The Climate Reality Project, 350.org Pilipinas and the Pinay Bike Commuter Community initiated the Metro Manila Counts! (MMC) Project.

The MMC is a citizen-led collaborative capacity-sharing effort that aims to mobilize volunteers to count people on bicycles, users of personal mobility devices (PMDs) and pedestrians to help planners, local government units, and active transport advocates put baseline figures of foot traffic on commonly used roads as we collectively advance more inclusive, safer and more connected roads for citizens. As a capacity-sharing effort, the MMC mobilized online citizen volunteers who were oriented on the bike and pedestrian counting. This pilot was implemented in partnership with Metro Manila city governments of Pasig, San Juan, Marikina and Quezon City.

This report details the methodology and results of that count effort, along with an analysis of major observations identified by the volunteers themselves. This information is intended to provide a baseline for an annual volunteer count program, and to encourage regional conversations about the importance of bicycle and pedestrian counts.

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[2]*Active transport, or active mobility refers to non-motorized means of transport (NMT) of people and goods, which requires human physical activity.*

IV. Count Methodology

The Metro Manila Count Project is a one-day event conducted by volunteer counters on standardized count sheets adapted from the US National Bicycle and Pedestrian Documentation Project[3]. We employed manual count to capture the numbers of cyclists, PMD-users and pedestrian traffic for the following reasons:

- Ideal counts would integrate technology but this requires resources. We recognize that some communities may not have the resources to purchase and install automated counters, making manual count programs the most economical option.

- Manual counts can quickly produce data in locations of interest (e.g., high crash locations, corridors that are under review for design changes).

- Manual counts can be combined with automated technology, such as mobile applications that replace clipboards with counting boards or screens.

- They have been used before deploying automated devices to study a given location's suitability for automated counters. They are also used after automated devices are installed to calibrate and confirm data collected through automated means.

- Manual counts allow for the opportunity to capture specific details and observations of the data such as gender, helmet use, and movement trends.

What did we count?

Through manual count, count volunteers recorded the data using a standardized count form *(See Annex 1)* and pen/pencil. The count form aimed at answering the following questions:

i. How many cyclists goes-to-work and cross city-borders and use our bike lanes?

ii. How many are women? How many are men?

iii. How many pedestrians including people with disabilities who are on wheelchairs are using the lanes?

iv. How many are using personal mobility devices to work?

v. How many are wearing helmets, how many are not?

vi. When is the busiest hour?

vii. Which routes are riders using?

[3]*Complete information on the project is available at bikepeddocumentation.org.*

What did we count?

a. Cyclists, Pedestrians, and Other Personal Mobility Device (PMD) Users

Cyclists	Pedestrians	Other PMD-Users
2-wheeled bicycle, 3-wheeler bicycle (three-users would count as three cyclists), recumbent bike users, Street vendors using bicycles/trisikad, hand cyclists, tandem bikes	People on walking on two legs, one leg, PWD's, assistive walker, people on wheelchairs, people walking with kariton, person not riding bicycle but walks	E-kick scooter users, skateboard users, roller skates users, e-bike users, unicycle users

b. Gender Distribution and Helmet-Use

Apart from counting the volume of cyclists and pedestrians, the count also disaggregated cyclists according to sex, and also recorded the helmet use of cyclists and other PMD-users.

c. Turning Movements
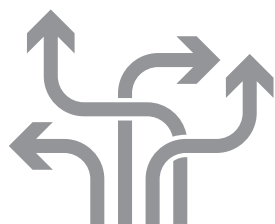
A total of 127 movements were counted in all selected intersections across the four cities during the count survey. The focus of this count is on screenline and intersection locations because these produce volumes data most suitable for the tracking of general use trends and travel behavior.

- *Screenline* **counts** - Screenline counts are done by establishing a visible or invisible line across a roadway or sidewalk and counting the number of cyclists and pedestrians who pass over that line. Often, screenline counts indicate direction of travel for bicyclists. They are used to identify trends in volume and factors influencing walking and biking

- **Intersection counts** - Intersection turning movement counts are done where two or more roadways and/or major commercial driveways meet. At minimum, these counts capture turning movement counts.

When did we do the count?

June 08, 2021 | 6AM-8AM and 4PM-6PM

This pilot project was conducted on Tuesday, June 08, 2021, within the peak hour periods of 6AM-8AM and 4PM-6PM in order to capture riders who cycle, walk, and use other modes of non-motorized transport or personal mobility devices who get to work. The assumption behind the peak hours selected is attributed to the traditional working hour variant of a Filipino worker scheduled from 9:00 AM to 5:00 PM, Monday through Friday.

On June 08, the overall weather during the morning count session (6AM-8AM) was fair. Prior to the afternoon count (4PM-6PM), heavy rainfall was observed across the four cities. Rain slowed down   around 4PM, allowing counters to safely proceed with the count.

Where did we count?

Marikina City, Quezon City, Pasig City, San Juan City (32 Count Locations)

There were 32 count sites across the four cities considering borders connecting exit and entry points across neighboring cities, historical count locations, areas with bike lanes and bike facilities, high collision areas, major streets near transit, and locations as recommended by respective LGUs. The count locations were also determined by the availability and number of volunteers per city. [See Figure 1]

Who did the count?

168 Volunteers

The count was conducted by 168 active volunteers who responded to the call for volunteers that we have circulated in our respective social media pages.

Volunteers were not only involved in the actual count. Some of the volunteers facilitated the orientation workshops, helped consolidate and organize the data, and generate maps and infographics. The recruitment of volunteers and the training for the count were all conducted online to minimize physical gathering as precaution against COVID-19 transmissions.

The volunteers are also being complemented by city traffic enforcers and deputized personnel by Marikina Bikeways Office, San Juan Traffic Parking Management Office (TPMO), Pasig Transport Office, and the Quezon City Green Transport Office under the Department of Public Order and Safety (GTO-DPOS) who have endorsed this undertaking.

Limitations

The count was implemented within the COVID-19 pandemic quarantine period as an operating context. Given such, we identified several limitations which affect the overall accuracy of particular data parameters. Among these limitation include:

i.   **Scope of Count Locations** - Ideally, bike counts are to be done in a variety of locations around an identified area, and that a random sample of all possible locations is chosen to provide a representative sample. However, manual counts depend on the availability and number of counters. Given the limited number of volunteers, the scope for the count locations was narrowed to 32 locations focusing on known high-volume bicycle and pedestrian traffic.

     This proved to be tedious for volunteers that were assigned in multiple-laned intersections that have high cycling and pedestrian traffic, and where the area coverage was expansive but had blind spots. Likewise, there were a limited number of volunteers that were assigned in these locations. This prompted the volunteers and the organizers to focus counting and observing the movements of cyclists, then PMD-users and pedestrians.

ii. **Count duration and frequency** - In this pilot count, the ability to mobilize more volunteers on the ground was limited mainly because the project is operating under a COVID-19 pandemic wherein physical distancing is the norm and that social gathering is highly discouraged. Given such, the observation period in the morning and afternoon were reduced by an hour; from a three-hour window to two-hour window respectively. As such, it is recognized that we were not able to adequately capture the 'peak hours' of foot traffic.

iii. **Weather Condition** - Inclement weather is known to heavily influence bicycle/non-motorized transport (NMT) ridership and pedestrian activity. It is presupposed that the unexpected heavy rainfall during the afternoon count has caused a lower turnout rate

iv. **Unanticipated disturbances** - Some counters have expressed that there have been instances in which they were being distracted by inquisitive public and officers who inquired about their activity during the two-hour window.

Count Location Sites

Site 1: Marikina - Infanta Highway (R6) In front of SM City Marikina
Site 2: Marikina - Infanta Highway (R6) cor Nicanor Roxas St
Site 3: Gen Ordoñez Avenue corner Katipunan Street
Site 4:Gen Ordoñez Avenue corner East Drive
Site 5: Bayan-Bayanan Avenue corner Gen Ordoñez Avenue
Site 6: A Bonifacio Avenue corner Riverbanks Avenue
Site 7: Commonwealth Avenue - PHILCOA Jollibee
Site 8: Commonwealth Avenue - Holy Spirit Drive
Site 9: Commonwealth Avenue - Batasan Road
Site 10: Commonwealth Avenue - Regalado Highway (going to QC Circle)
Site: 11 Congressional Avenue - EDSA / Roosevelt Avenue (Going to Monumento)
Site 12: Congressional Avenue - EDSA / Roosevelt Avenue (Going to E-Rodriguez)
Site 13: E Rodriguez Avenue - Tomas Morato Avenue (Going to Manila/ Welcome Rotonda)
Site 14: E Rodriguez Avenue - Tomas Morato Avenue (Going to Cubao/Aurora Blvd)
Site 15: Aurora Boulevard - EDSA
Site 16: Aurora Boulevard - C5 / Katipunan
Site 17: East Avenue - BIR Road (Going to EDSA)
Site 18: Quezon Avenue -West Avenue (Going to QC Circle)
Site 19: Quezon Avenue -West Avenue (Going to Manila)
Site 20: Ortigas Ave Intersection between Col. Bonny Serrano Ave, and Granada Street
Site 21: Ortigas Ave cor Wilson Street
Site 22: EDSA corner Annapolis St.
Site 23: Pinaglabanan St. corner N. Domingo and P. Guevarra
Site 24: N. Domingo St. corner Gregoria Araneta Ave
Site 25: Ortigas Ave - Meralco Intersection
Site 26: Shaw boulevard corner Meralco Ave
Site 27: Ortigas Ave cor C5 (Intersection)
Site 28: Eastbank Rd (Underneath jenny's bridge)
Site 29: Kaginhawaan Bridge
Site 30: C. Raymundo Ave corner F. Legaspi St.
Site 31: Pasig Boulevard
Site 32: Sandoval Ave corner Urbano Velasco
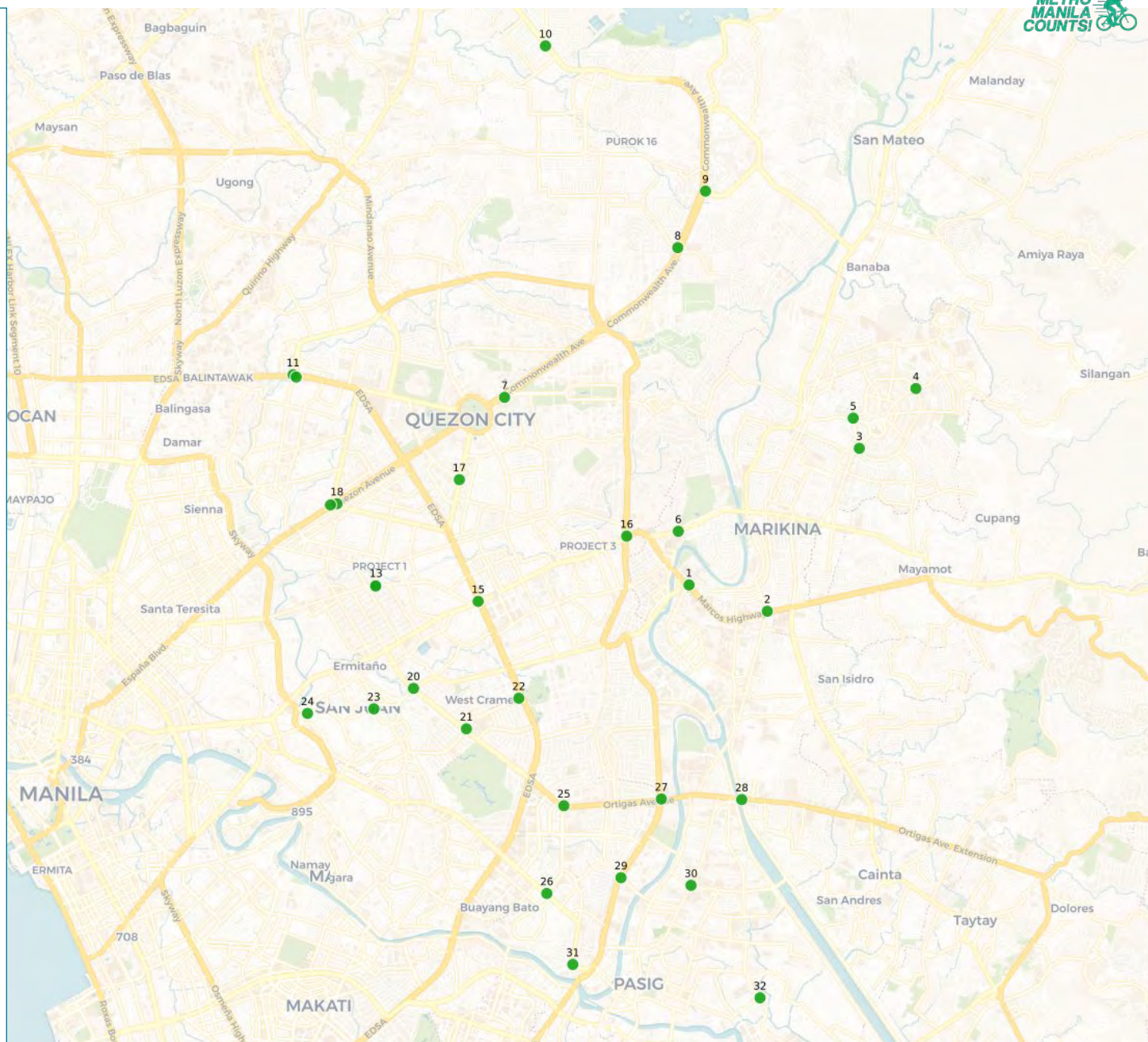
Figure 1: Map of 32 count locations in Marikina, Quezon, Pasig, and San Juan Cities

V. Count Results

Counted on June 08, 2021 from 6AM-8AM and 4PM-6PM) | Counted in 32 Locations in Marikina, Pasig, Quezon City, San Juan

Total Cyclists Counted:
38,932

Total Pedestrians Counted:
12,787

Total "Others" Counted:
1,658

Overall Cyclist Gender Distribution

3.1% FEMALE

.3% UNDETERMINED

96.6% MALE
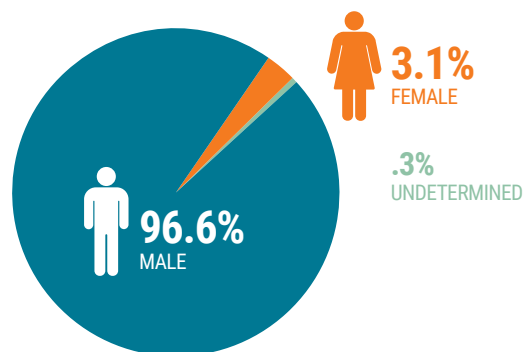
Cyclist Helmet User Distribution

28.7% NON-HELMET USERS

71.3% HELMET USERS

Bike Count: AM vs PM

20,953 6-8AM COUNT TOTAL

17,979 4-6PM COUNT TOTAL
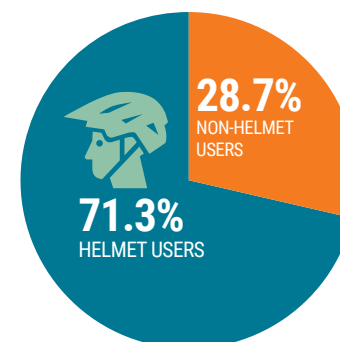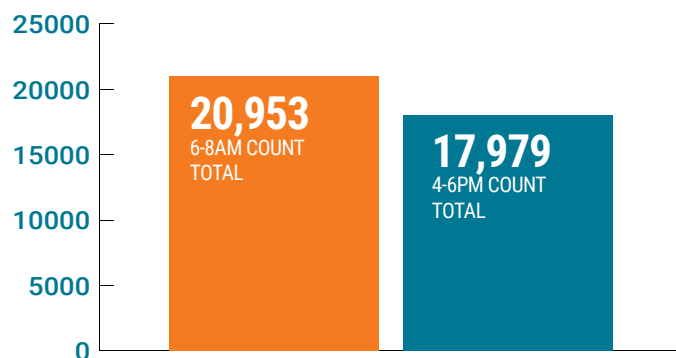
Cyclist Count & Gender Distribution per City

	MARIKINA	QUEZON CITY	PASIG	SAN JUAN
green	11	63	53	1
orange	231	237	493	184
blue	5,762	15,403	10,613	4,101
total	6,778	16,709	11,159	4,286

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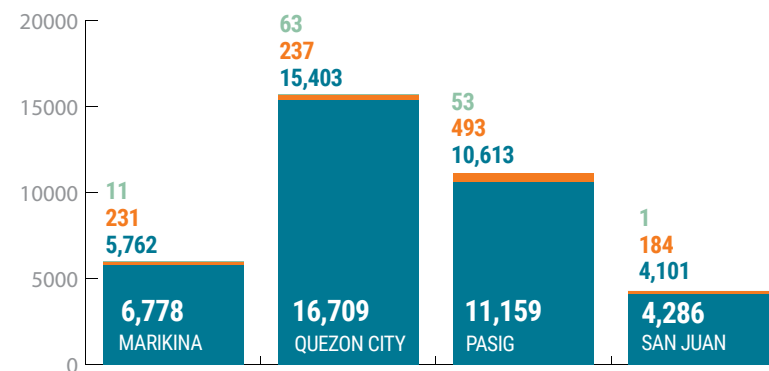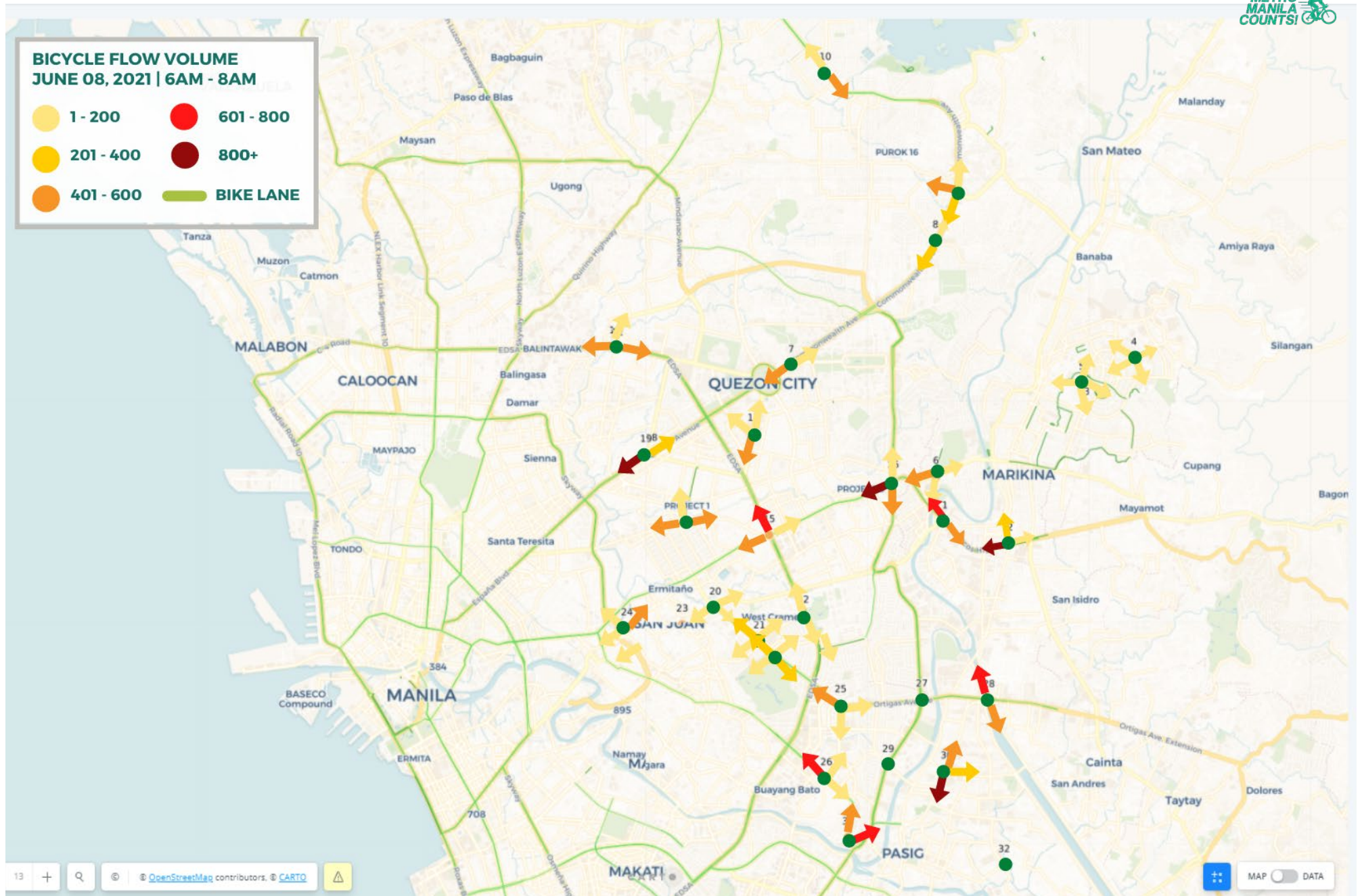
Figure 2: Bicycle Flow Volume for AM Bike Count
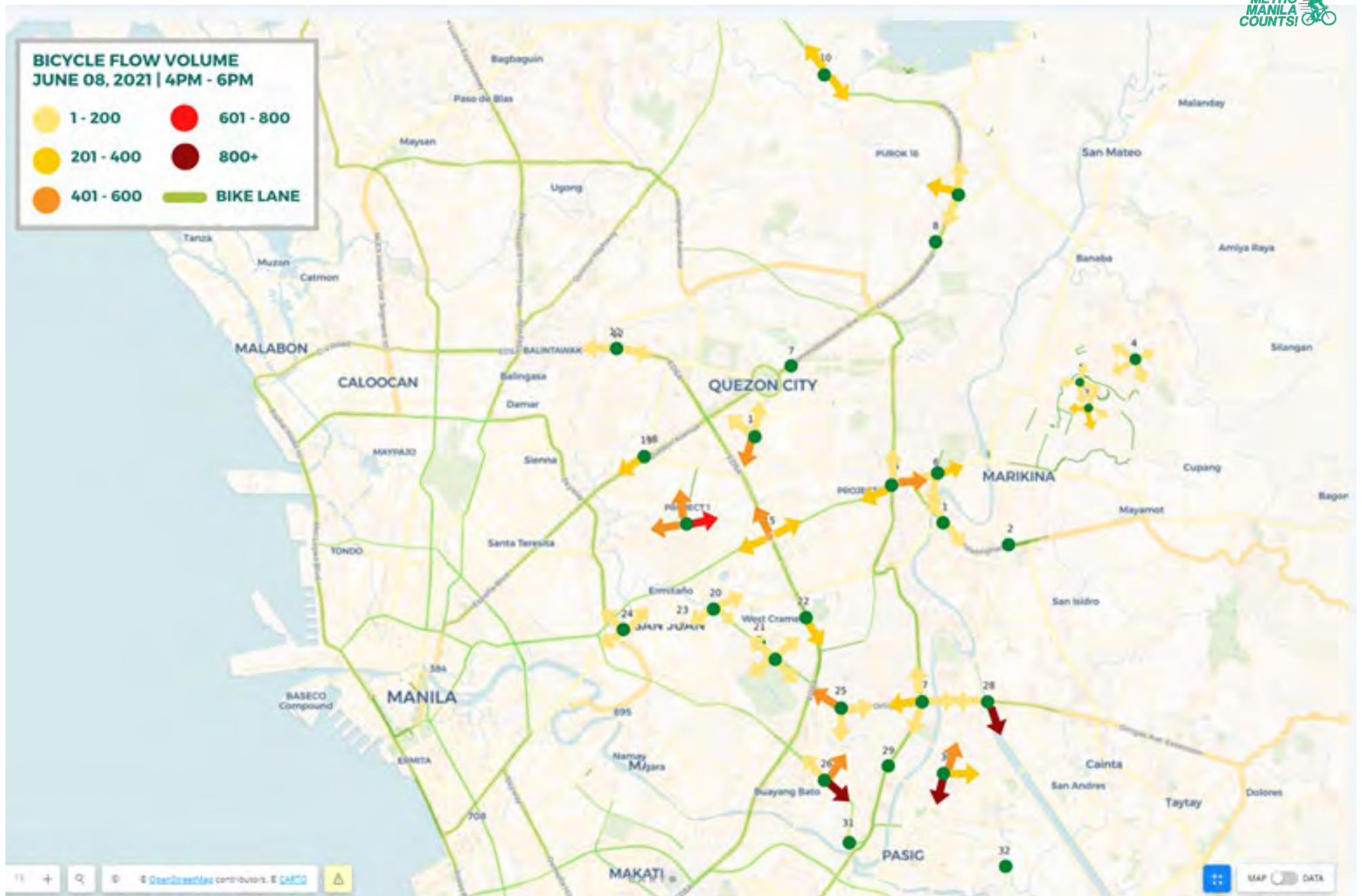
Figure 3: Bicycle Flow Volume for PM Bike Count

Marikina

Total Count Summary for both timeslots	
Total Cyclists	6,778
Total Pedestrians	2,763
Total Others	251

Pedestrians by Gender	
Total Male Pedestrians	1,086
Total Female Pedestrians	1,093
Undetermined Pedestrians	161
Total Pedestrians	*2,763*

Others by Gender	
Total Male Others	129
Total Female Others	54
Undetermined Others	0
Total Others	*183*

Others by Helmet Use	
Total Helmet Users	98
Total Non-helmet Users	85
Total Others	*183*
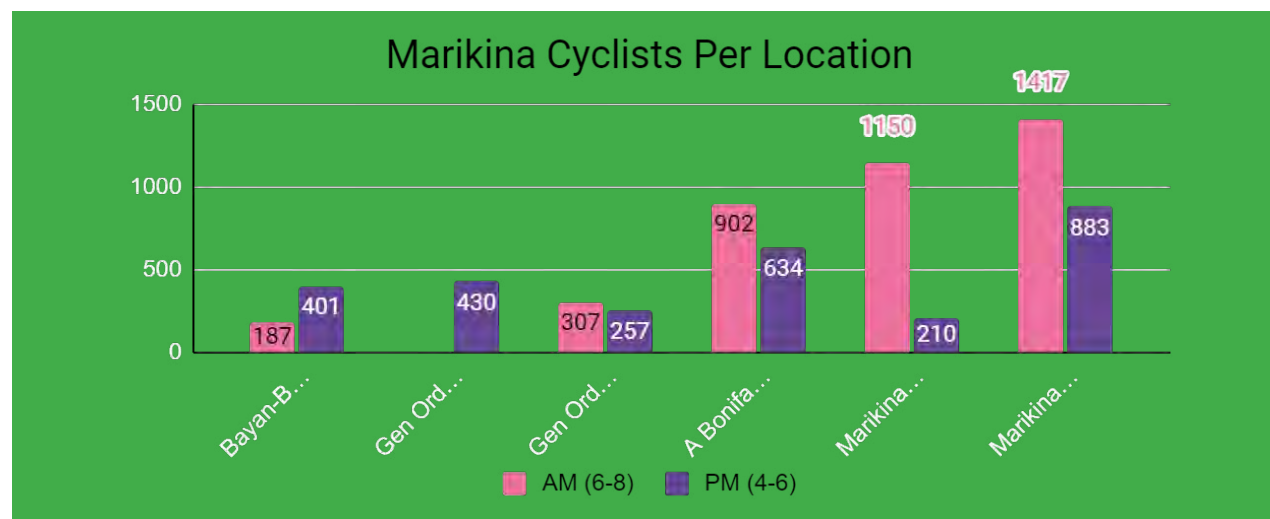
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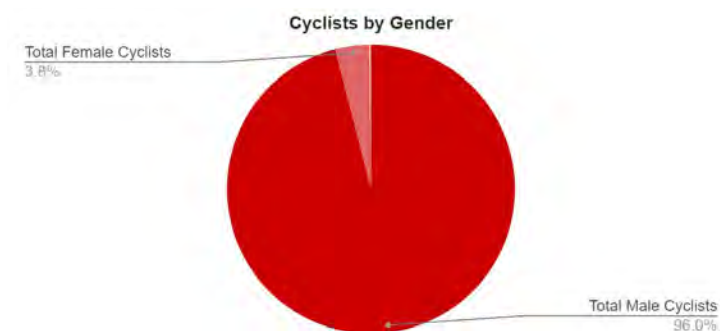
Figure 5:
Marikina Cyclists Gender Distribution

Figure 6:
Marikina Cyclists Helmet-Users Distribution

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Quezon City

Total Count Summary for both timeslots	
Total Cyclists	16,709
Total Pedestrians	5,575
Total Others Counted	490

Pedestrians by Gender	
Total Male Pedestrians	3,580
Total Female Pedestrians	1,994
Undetermined Pedestrians	1
Total Pedestrians	*5,575*

Others by Gender	
Total Male Others	319
Total Female Others	82
Undetermined Others	74
Total Others	*475*

Others by Helmet Use	
Total Helmet Users	393
Total Non-helmet Users	82
Total Others	*475*
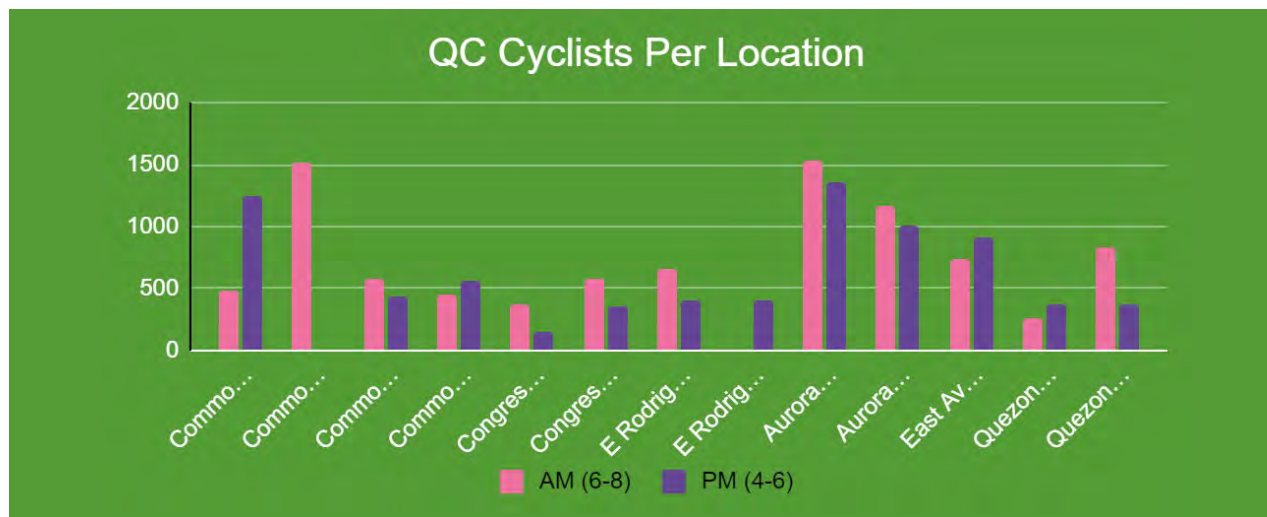
Figure 7: Quezon City Cyclists per Location
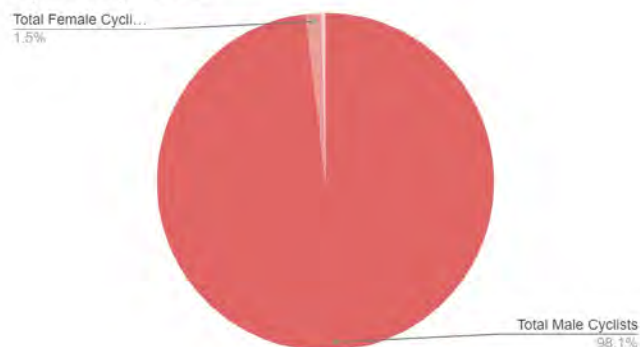
Figure 8:

Quezon City Cyclists Gender Distribution
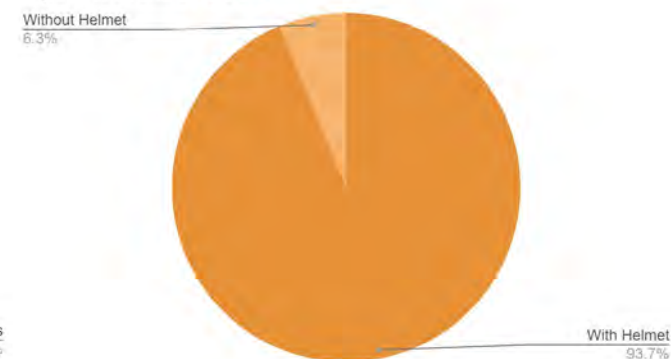
Figure 9:

Quezon City Cyclists Helmet-Users Distribution

Pasig City

Total Count Summary for both timeslots	
Total Cyclists	11,159
Total Pedestrians	2,370
Total Others Counted	559

Pedestrians by Gender	
Total Male Pedestrians	1,362
Total Female Pedestrians	1,016
Undetermined Pedestrians	12
Total Pedestrians	*2,390*

Others by Gender	
Total Male Others	321
Total Female Others	237
Undetermined Others	1
Total Others	*559*

Others by Helmet Use	
Total Helmet Users	318
Total Non-helmet Users	230
Total Others	*548*
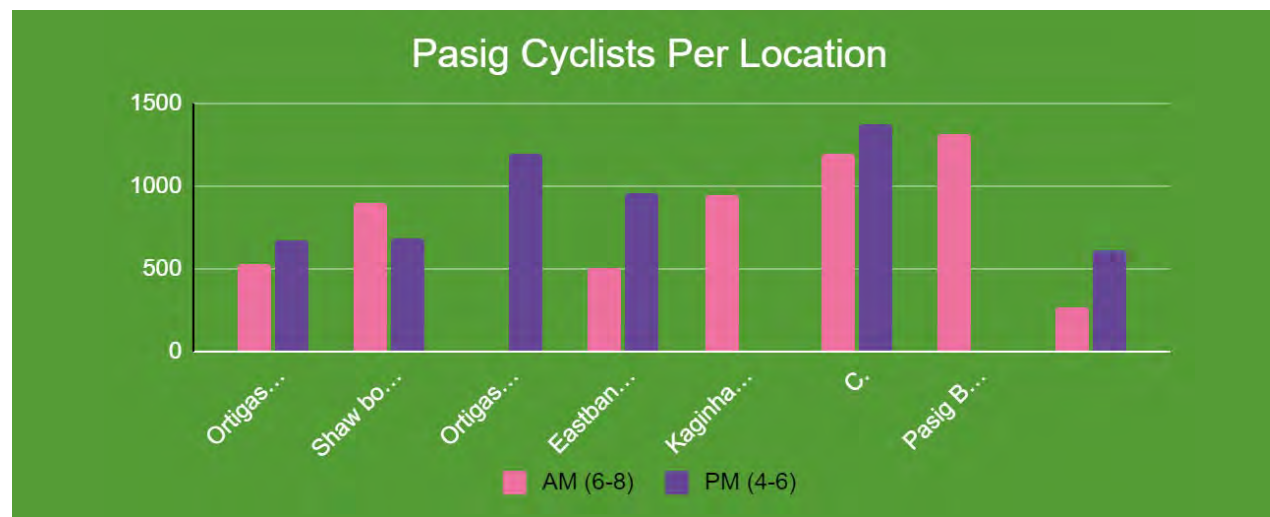
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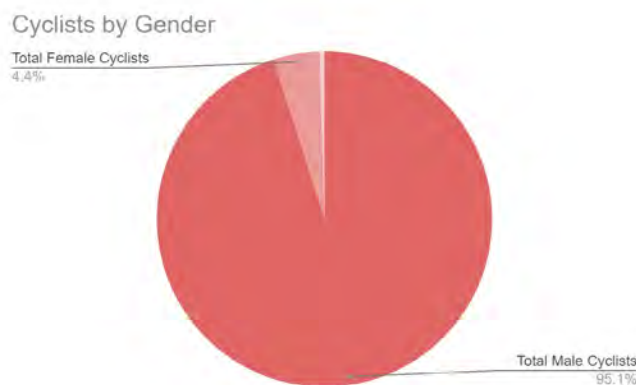
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Pasig City Cyclists Gender Distribution
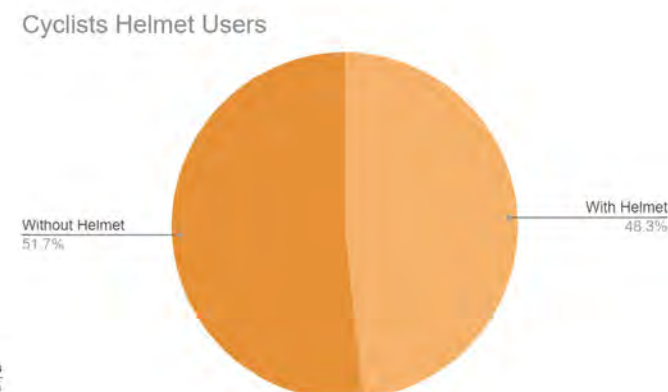
Figure 12:
Pasig City Cyclists Helmet-Users Distribution

San Juan City

Total Count Summary for both timeslots	
Total Cyclists	4286
Total Pedestrians	2059
Total Others Counted	358

Pedestrians by Gender	
Total Male Pedestrians	1249
Total Female Pedestrians	809
Undetermined Pedestrians	1
Total Pedestrians	*2059*

Others by Gender	
Total Male Others	218
Total Female Others	110
Undetermined Others	30
Total Others	*358*

Others by Helmet Use	
Total Helmet Users	259
Total Non-helmet Users	99
Total Others	*358*
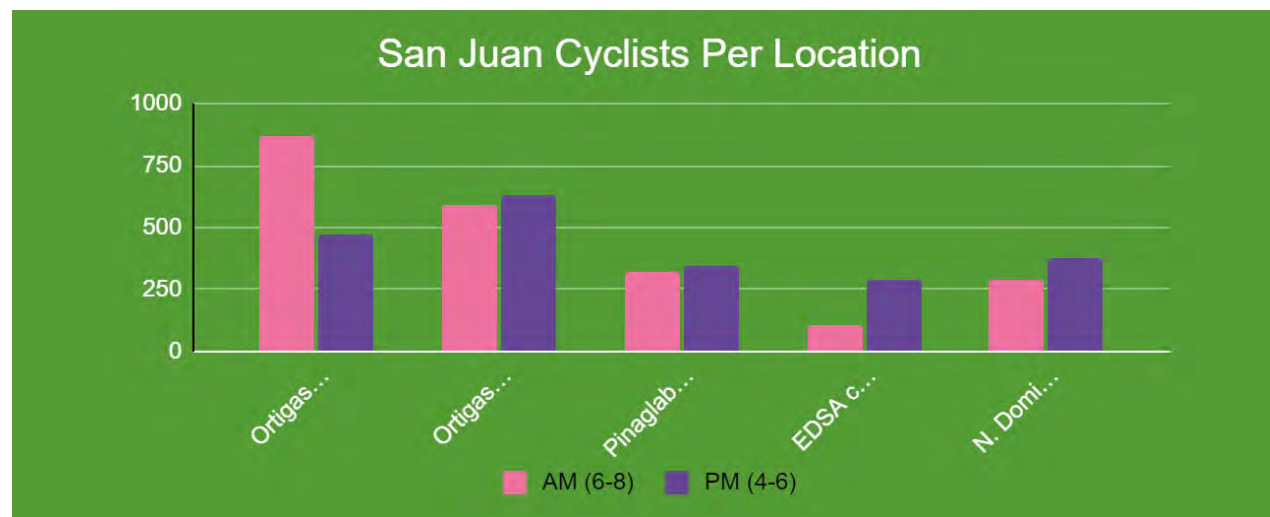
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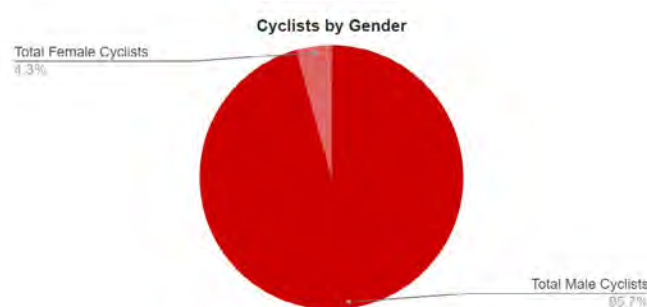
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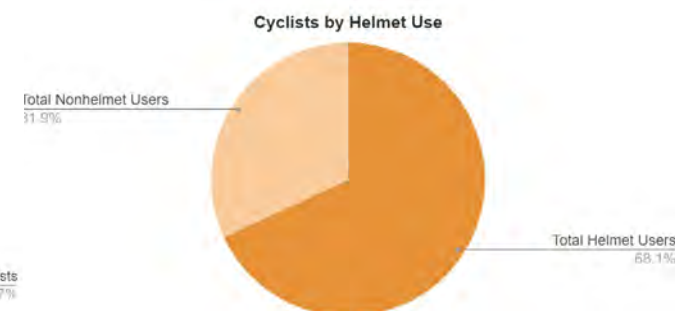
Figure 15:
San Juan City Cyclists Helmet-Users Distribution

VI. Key Observations

1. Cyclist Count Analysis

Gender

According to the National Economic and Development Authority (NEDA), bicycle imports increased by 112% to 2.1 million units in 2020 (Simeon, 2021). Albeit seeing more women on pedals as compared to pre-pandemic period, the count data suggests that there is still a large difference among male and female cyclists.

Out of the 38,932 cyclists counted, only 1,145 cyclists (3.1%) are women. This was consistently observed in all cities with male cyclists averaging more than 96.6% in the overall cyclist tally results.

Possible explanations for the gender disparity coincide with studies done in other countries where there is high car-culture. These include:

- **Observation time of the count may not have reflected women's activities -** Generally, women are less likely to cycle than men. According to data released by exercise app Strava, globally, men are 6.7% more likely than women to use bicycles on their way to work. If this was the case, the large gender disparity reflected in our data may be rooted in the possibility that the time slots chosen for data collection were more catered to cyclists going to-and-from work and not for other active transport purposes more aligned with women cyclists, who traditionally do reproductive and care work including errands for homemaking, visiting the public market, pharmacies or groceries or visiting peers.

Gender Distribution of Cyclists per City			
City	Male Cyclists	Female Cyclists	Undetermined
Marikina City	5,762	231	11
	96%	3.8%	0.1%
Quezon City	15,403	237	63
	98.1%	1.5%	0.4%
Pasig City	10,613	493	53
	95.1%	4.4%	0.5%
San Juan City	4,101	184	1
	95.7%	4.3%	0%
Averages	**96.6%**	**3.1%**	**0.3%**

Table 1: Gender Distribution of Cyclists per city

- **Location of observation points might not be women's preferred routes** - The stations designated for volunteer counters were mostly busy streets with high car-traffic which women, especially new cyclists, might generally avoid. Similarly, a study conducted by Deakin University researchers revealed that the majority (84.5%) of women cyclists in their population preferred and used off-road bicycle lanes while men often used on-road bike lanes. A study by the University of Minnesota shows that drivers were significantly more likely to encroach—i.e. to pass closer than three feet—on a female cyclist than on male cyclists, thus creating and confirming a major female cyclist concern about safety on the road.

- **Lack of confidence due to inadequate safe infrastructures for women cyclists** - Safety has been identified as an overarching concern for women in cycling, where 'cycling gender gap' persists in areas where there is a lack of bike infrastructure (Moore, 2019). The risks of being cornered into vulnerable situations or even fatal accidents are much higher when without bicycle lanes, barriers, greenways, and the like. Data by Strava in New York City suggests an increase of 40% - 50% in the number of trips made by women when the city has installed parking-protected lanes on two corridors of avenues on its streets.

  Additionally, women have more to fear as drivers or motorists are more likely to invade a female cyclist's space, which may be more due to patriarchal standards and chauvinist male culture.

Gender disparity and cycling behavior on secondary roads in Metro Manila should be further explored as a follow-up study. It is likely that the gender distribution will differ, due to the varying characteristics of secondary roads compared to primary roads or highways.

Helmet Use

Overall helmet use is relatively high among cyclists with 71.3% (26,478 cyclists) helmet-users out of the 38,932 total cyclists counted. Results also show that more cyclists wear helmets during the morning hours rather than in the afternoon. This is evident in all four cities.

Helmet use among the four cities exceeds more than 50% of the total cyclists counted except in Pasig city where only 48.3% of cyclists are helmet-users. Of the 28.7% (10,664 cyclists) not wearing helmets, Pasig City cyclists who are not helmet-users amount to 14.79% (5,759 cyclists) of that total. Meanwhile, only 2.5% (987 cyclists) are not wearing helmets in Quezon City where helmet use is compulsory for all cyclists.

Movement

Based on observation of turning movements in screen-line and intersections, the volunteers noted the following :

1. There is an increased volume of cyclists at intersections and screenline count locations that connect major streets.

2. There is a difference in cyclist movement during the morning and the afternoon. General movement of morning cyclists are heading westbound (to the direction of Manila-bound/ Makati bound) especially in boundary locations;

3. Cyclists counterflow in mostly major roads (Marikina-Infanta Highway, Commonwealth Avenue - PHILCOA Jollibee (Going to Fairview, Quezon City); E. Rodriguez Avenue, and Shaw Boulevard

4. Cyclists tend to use footbridges to cross along major roads.

Marikina

- Majority of the cyclists in Marikina, specifically along A. Bonifacio Avenue and Marikina-Infanta Highway, are heading towards Aurora Boulevard, Quezon City in the morning.

- Similarly in Marikina-Infanta Highway corner Nicanor Roxas St., counters observed that a few cyclists use the footbridge to cross the road.

- It is assumed that the cyclists using the footbridge are heading towards F. Mariano Avenue entering Pasig City. An interesting observation by counters was that the majority of the cyclists traversing Marikina-Infanta Highway were not using the bicycle lanes mostly because of the high foot traffic (pedestrians), hazards or obstructions, e.g., parked motor vehicles, manhole covers, potholes, and poor design. The bicycle lanes were also being used by motorists (motorcyclists) to counterflow.
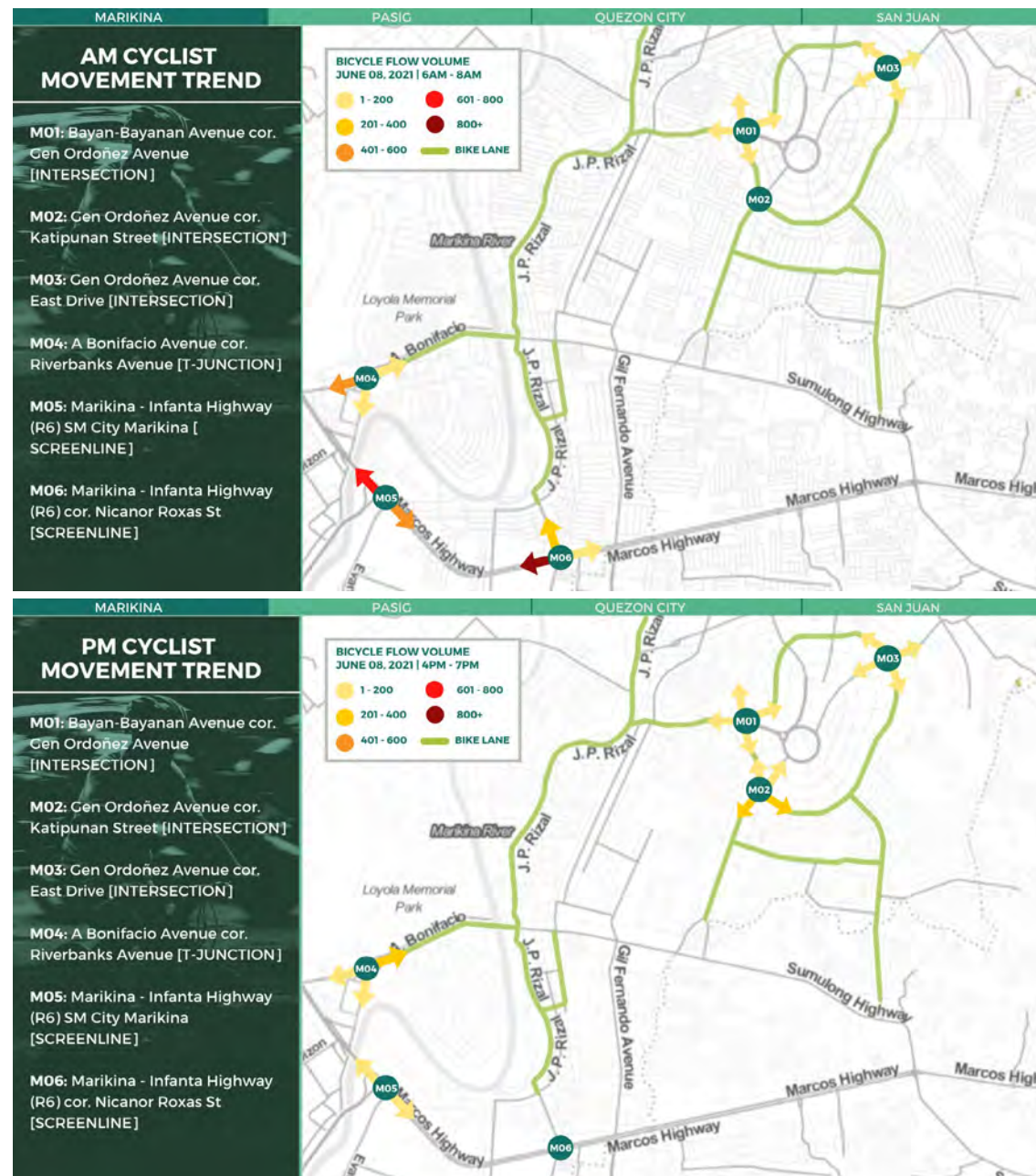
Figure 16: AM and PM Cyclist Movement trend in Marikina

Quezon City

- During the morning count, the majority of the cyclists were heading west (potentially Manila/Sampaloc area bound). Areas with highest counterflow volume in the morning are on Commonwealth Avenue - PHILCOA Jollibee.

- In the afternoon, movement of cyclists are generally heading eastbound towards entering Marikina City from Aurora Boulevard to A.Bonifacio St.

- We further observed that cyclists coming from the Balintawak area and Roosevelt Avenue heading towards EDSA use the pedestrian footbridge to cross.

- Cyclists tend to counterflow along: E Rodriguez Avenue - Tomas Morato Avenue.
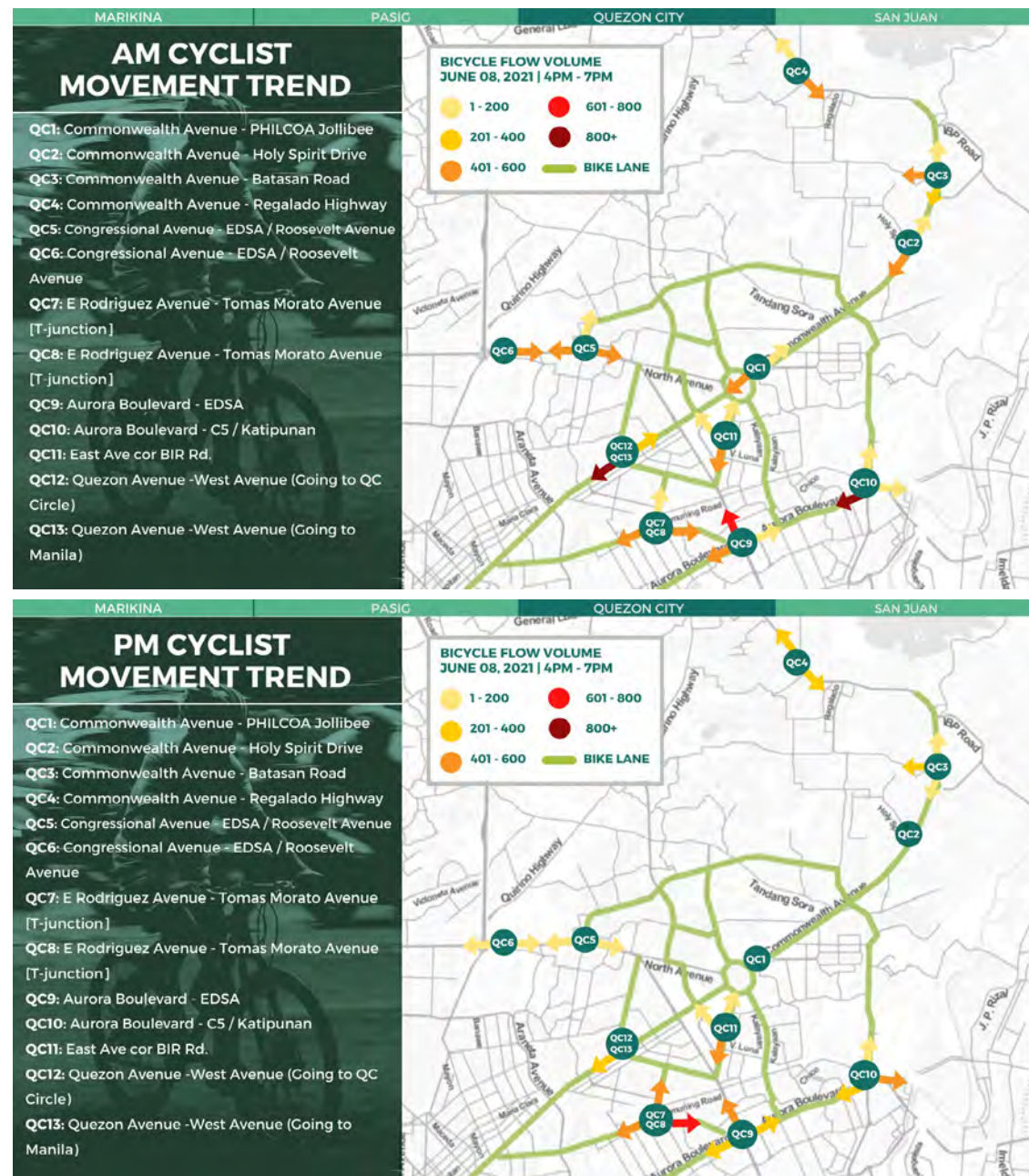
Figure 17: AM and PM Cyclist Movement trend in Quezon City

Pasig City

- There is a higher volume of cyclists in the morning, than in the afternoon. The movement trend observed is that cyclists are riding to exit premises of Pasig City.

- Cyclists along Shaw Boulevard coming from EDSA were observed to position themselves ahead of motorists at the T-junction or use the road island while waiting for the green light turning left to Meralco Avenue.

- Counters also observed that there was a high volume of cyclists who counterflow in Shaw Boulevard corner Meralco Ave.

- Notably, there was a high volume of cyclists and PMD-users going to F. Legaspi St. (no bike lanes) from C. Raymundo during the afternoon count.
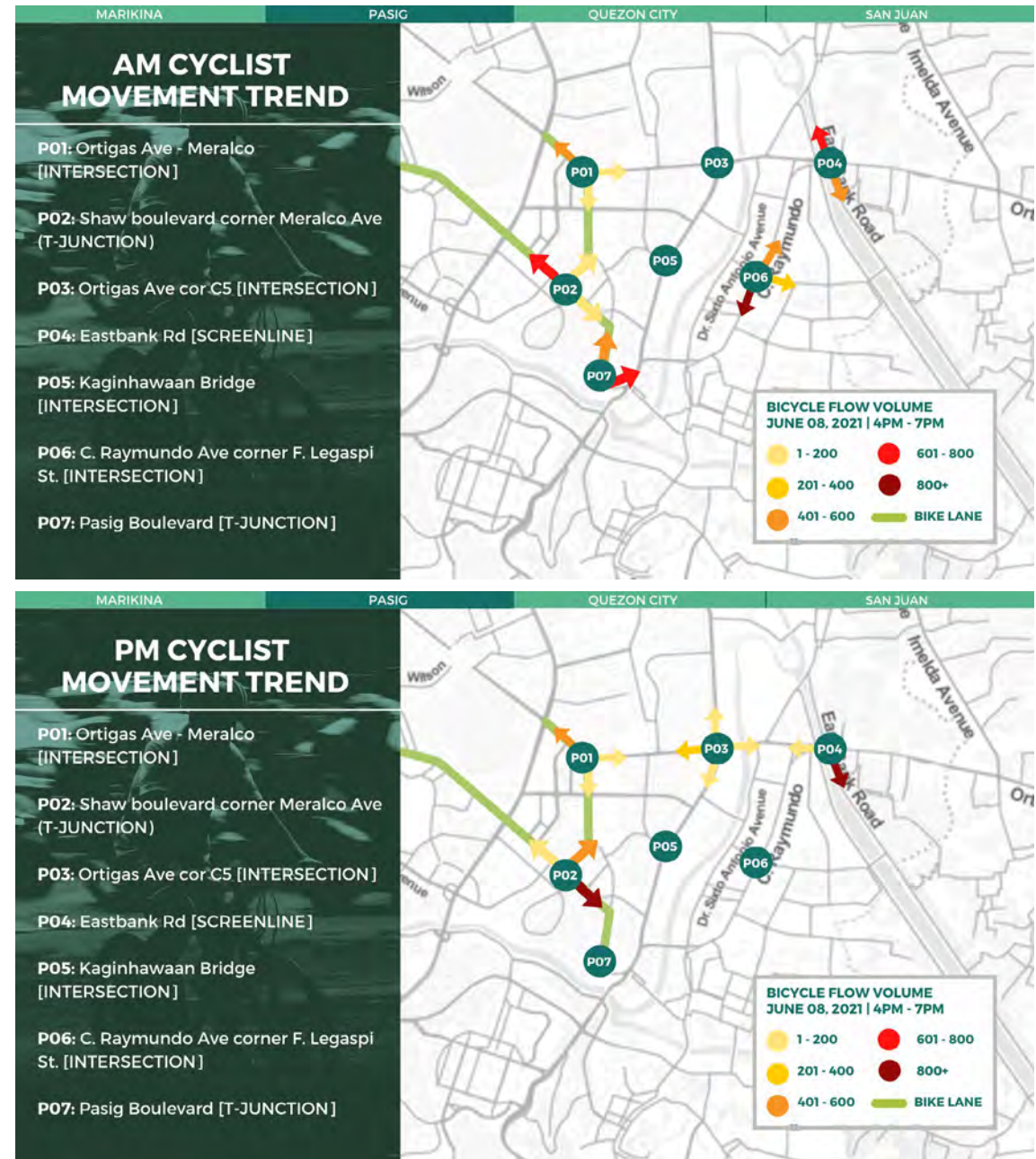
Figure 18: AM and PM Cyclist Movement trend in Pasig City

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San Juan City

- San Juan had only five locations counted. This could be related to the overall population of the city (126,347 residents, 2020 consensus with a land area of 7.77 km²). Based on the results, there's not much of a difference in the movement between the morning and afternoon count.

- However, as observed during the morning count, cyclists usually counterflow along Ortigas Ave specifically in the intersection between Col. Bonny Serrano Ave, and Granada St. and in Ortigas Ave corner Wilson St.
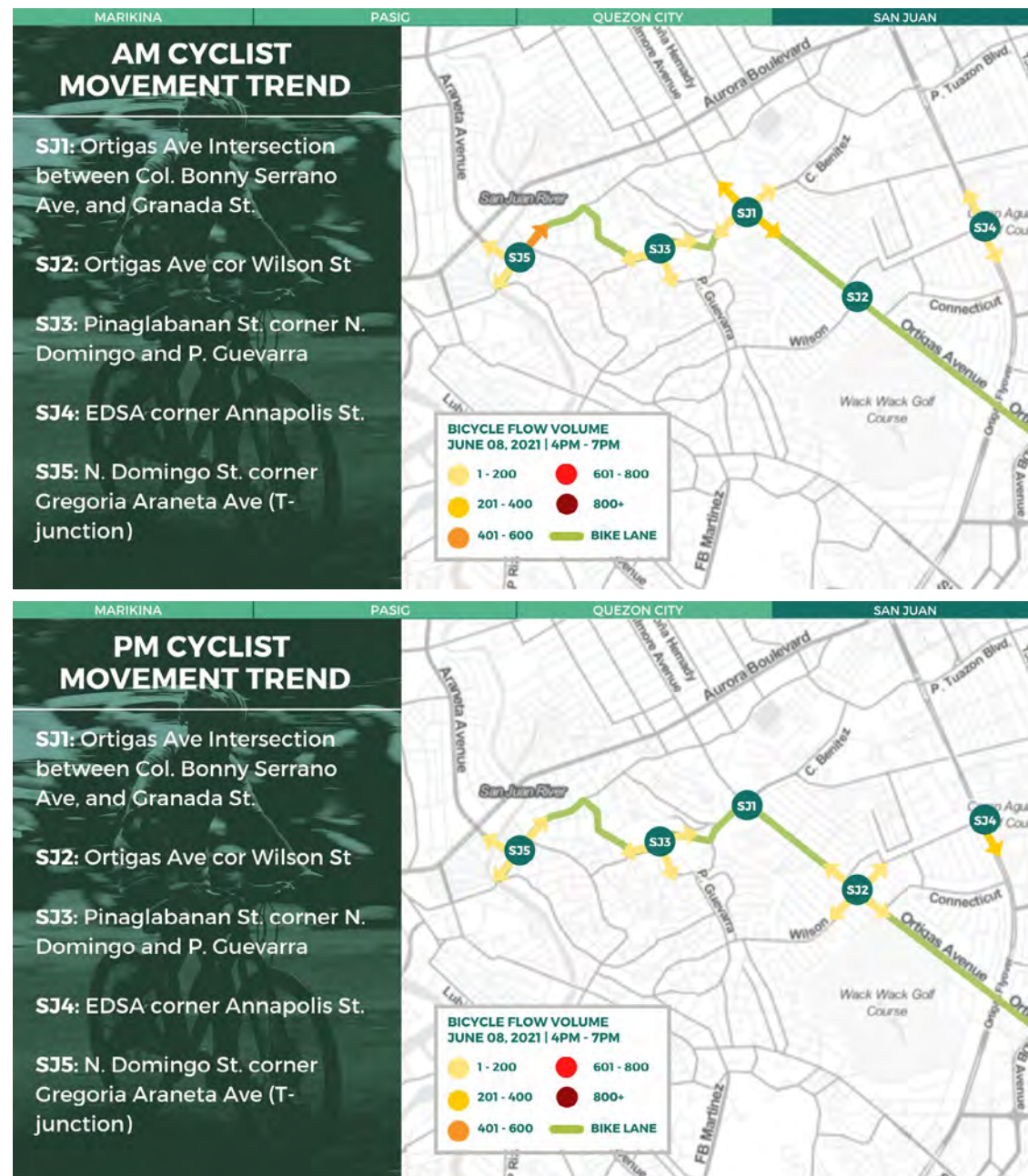
Figure 19: AM and PM Cyclist Movement trend in San Juan City

Valuing potential contribution of cyclists on the road

Making sense and equating the number of cyclists on the road to their contribution in:

a. Helping reduce road congestion;

b. Generating cumulative savings that can help recover local economies, and;

c. How they can practically reduce fossil fuel consumption on our roads is part of the Metro Manila Count's initiative.

As such, we used the number of cyclists counted to illustrate the benefits of active transport:

1. Road Space Savings

The total space occupied by 38,932 cyclists in 32 locations using operational road dimensions is **105,116.4 sqm**.

If we translate the number of persons driving a car for that amount of area, only 6,256 cars would be able to fit that amount of space. In other words, **only 6,256 people in cars are being mobilized** (assuming that 1 car is equivalent to 1 passenger).

In practical terms, more people are 'moved', and 'less space' is used in travelling by bicycles than by cars during peak hours in the morning and afternoon of a single day.

Operational space occupied by Bicycle: Bicycle (L x W): 72cm x 30 cm = **2.7sqm**

Equivalent operational space needed if 38, 932 people on bicycles used private cars instead: **654,057.6 sqm.**
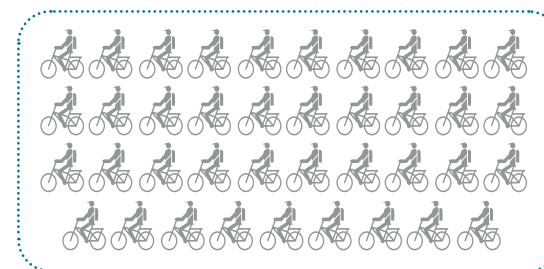
= **105,116.4 sqm**
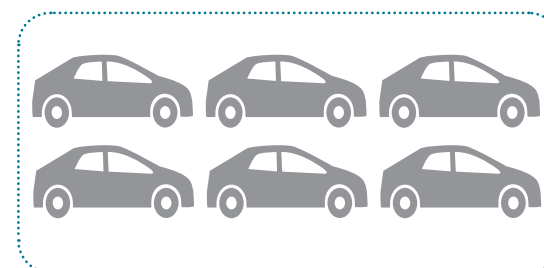
Assumptions:

- The operational space occupied by a bicycle on the road based on American Association of State Highways and Transportation Officials (AASHTO) has an average width of 1.5 meters x 1.8 meters in length. Using these dimensions, the total road space occupied per bicycle would be 2.7sqm.

- The operational space occupied by a private car on the road based on National Association of City Transport Officials (NACTO) has an average width 2.8 meters x 6 meters length with a buffer. These dimensions will yield a total road space of 16.8 sqm per car.

2. Estimated Money Savings

On a per kilometer basis, the 38,932 people on bicycles would have an accumulated **P87,597** worth of savings from public jeepney fare (based on PUJ ordinary minimum fare distance: P9 per 4 km or P2.25 per km).

The potential accumulated savings if equated to private cars would be higher with a conservative amount of **P89,225.06** of savings per kilometer from gasoline cost of private cars aside from the costs of car unit, maintenance and repair, and parking costs.

In practical terms, translating this to potential savings that could have been spent for basic needs like food staple: **P87,597** would be able to buy an equivalent **2,136.51** kgs of rice that can sustain the monthly rice needs of **219** Filipinos.

Assumptions :

- Using Philippine Statistics Authority (2021) data on rice consumption, Filipinos consume an average of 9.765 kg of rice per month, which is worth PhP 400; Average retail price of well-milled rice is PHP 41.04.

- The fuel consumption rating of a Toyota Vios model is 22 liters per kilometer.

On a per kilometer basis, the 38,932 people on bicycles would have accumulated these savings worth:

P87,597/km
from jeepney fare

P89,225/km
from Gasoline fuel
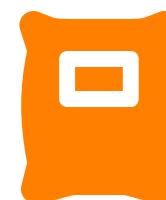
equivalent to
2,136.51 kgs
of rice

enough to feed
219 Filipinos
for a month

3. Estimated Fossil Fuel displaced

Using the Greenhouse Gas Equivalencies Calculator of the United States Environmental Protection Agency (US EPA, March 2021), the 38,932 people who chose to cycle rather than drive a car were able to displace an estimated **1,769.6 liters worth of gasoline fuel**. This translates to an equivalent **4.2 metric tons of carbon dioxide avoided**. The 1,769.6 liters worth of gasoline fuel displaced can only fuel 42 full-tanked vehicles.

Assumptions:

- A toyota vios has an fuel efficiency rating of 22 km/liter;

- Average retail price of gasoline fuel Php 50.42/liter;

- An average car, based on the specifications of Toyota Vios Sedan would have a full tank of 42 liters.

The 38,932 people who chose to cycle rather than drive a car were able to displace an estimated:

1,769.6 liters
worth of gasoline fuel

= 4.2 metric tons
of CO_2 avoided

2. Pedestrian Count Analysis

Across the four cities, there were 12,787 pedestrians recorded by the volunteers. A significant number (39.7%) are female.

Gender data for the pedestrian count shows a closer gender distribution between male (58.9%) and female pedestrians as compared to the gender distribution of cyclists.

Lower gender disparity may be related to decreased risk perception among women on walking and public transportation.

The volunteers noted that the pedestrians were undercounted. There was a difficulty in getting pedestrian data due to high volume and activity levels of pedestrians, and limited number of volunteers. Monitoring pedestrians from all directions while recording the gender attribute per pedestrian was also hard because of the limitations of the count form that were used.

However, it should be cautioned that the pedestrian count alone is rarely a sufficient basis for analyzing pedestrian behavior and addressing related problems concerning safety. Since pedestrian count data is quantitative in nature, more discrete, qualitative information on the length and purpose of pedestrian trips as well as the generation of pedestrian traffic must be supplied by other research techniques in order to generate a more comprehensive analysis.

Overall Pedestrian Gender Distribution

1.4%
UNDETERMINED

58.9%
7,277
MALE

39.7%
4,921
FEMALE
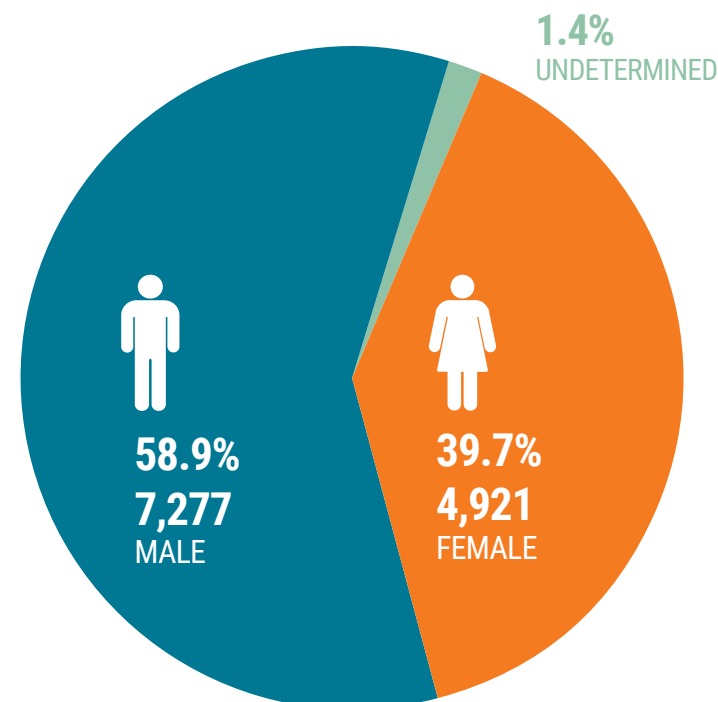
3. Other PMD-User Count Analysis

There were a total of 1,658 PMD users counted in the 32 locations in four cities; 62.7% and 30.7% of these were male and female respectively.

As for the distribution for helmet users, 68.5% were observed to be using helmet or other safety headgears while the remaining were seen without it.

Additionally, the mobility devices frequently used by the PMD-users monitored were e-scooters and skateboards.

Similar to the observations on pedestrians, the number of PMD users were observed to be undercounted, mainly because of limitations in the number of volunteers stationed in count locations.

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VII. Recommendations

The volunteers held an online debriefing session to provide feedback and initial observations on the Bike Count. The following were the general recommendations to further improve the Count Methodology:

i. To address the limitations on the number of volunteers - Rather than a simultaneous count in all cities, counts can be done per city on a common day on different working weeks ;

ii. Make the Count Regular - Bike and Pedestrian Count to be replicated in another season, or in a quarter basis to determine patterns and trends;

iii. Expand the scope to capture movement routes and potential gender-related factors - Consider doing counts on secondary roads to also capture potential cycling routes and explore and validate assumption on gender differences;

iv. Longer observation period needed - Workers especially those engaged in construction sector reports to work as early as 7 in the morning, and starts their commute as early as 4 in the morning; Likewise, women may have different commute time than men;

v. Assign dedicated volunteers to do separate counts for pedestrians, and PMD users and to monitor their movements respectively;

vi. Count Forms needs to be modified (Annex 1, Annex 2) to allocate more spaces for writing and separate data fields for other modes of non-motorised transport;

vii. Do simulation videos and actual count simulations during trainings;

viii. Invest visibility and safety gears for counters;

ix. Consider other data Sources to complement the Count - Other potential data sources such as Strava, personal smartphone health apps, bicycle share programs, and public security cameras are beyond the scope of this study but could be considered in the future as part of expanded non-motorized counting efforts;

x. Counts should be supplemented with other researches on non-motorized transport, including but not limited to: surveys on distance and route of travels, perceptions on pedestrian and cycling infrastructures, movements behavior (especially on specific factors on counter-flowing).

VIII. References

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IX. Annex

Annex 1: Count Forms

Table Count Form
Designed to capture gender distribution, helmet-use, and peak hours

Metro Manila Counts! Bike-per Count Form

LOCATION:	DATE:	TIME: ☐ 06:00am - 08:00am
WEATHER:	NAME:	☐ 04:00pm - 06:00pm
NOTES:		

	BICYCLE						PEDESTRIAN			OTHERS (EKS, skateboards, rollerskates, wheelchair, etc.)					
	MALE		FEMALE		NOT DETERMINED		MALE	FEMALE	NOT DETER-MINED	MALE		FEMALE		NOT DETERMINED	
	With Helmet	No Helmet	With Helmet	No Helmet	With Helmet	No Helmet				With Helmet	No Helmet	With Helmet	No Helmet	With Helmet	No Helmet
00:00-00:15															
00:15-00:30															
00:30-00:45															
00:45-01:00															
01:00-01:15															
01:15-01:30															
01:30-01:45															
01:45-02:00															

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Diagram Count Form
Designed to capture movement trends

Annex 2: Sample Filled Count Form

Metro Manila Counts! Bike-per Count Form

LOCATION: COMM. AVE - REGALADO HIGHWAY DATE: JUNE 08, 2021 (TUESDAY) TIME: ☑ 06:00 - 08:00am ☐ 04:00 - 06:00pm
WEATHER: CLOUDY / OVERCAST NAME: LAUREN VILLARAMA

Metro Manila Counts! Bike-per Count Form

LOCATION: 3623 EAST BANK ROAD, PASIG CITY DATE: JUNE 8, 2021 TIME: ☑ 06:00am - 08:00am ☐ 04:00pm - 06:00pm
WEATHER: 32°. NAME: ROBERT PATRICK CAMACHO
NOTES: MAJORITY OF CYCLIST IN BETWEEN 6am-8am ARE MALE

| | BICYCLE | | | | | | PEDESTRIAN | | | OTHERS (EKS. skateboards, rollerskates, wheelchair, etc.) | | | | | |
| | MALE | | FEMALE | | NOT DETERMINED | | | | | MALE | | FEMALE | | NOT DETERMINED | |
	With Helmet	No Helmet	With Helmet	No Helmet	With Helmet	No Helmet	MALE	FEMALE	NOT DETER-MINED	With Helmet	No Helmet	With Helmet	No Helmet	With Helmet	No Helmet
00:00-00:15	13	27	2	1											
00:15-00:30	29	34	3	2											
00:30-00:45	25	37	5	3											
00:45-01:00	19	28	2												
01:00-01:15	18	35	1	2											
01:15-01:30	33	40	5	7											
01:30-01:45	37	28	6	4											
01:45-02:00	30	19	3	2											
	220	253	27	21											

Annex 3: Raw Data

Raw Bike Count Data										
Location	Count time	City	Total No of Volunteers (AM & PM)	Total No. Of Cyclists	Male	Female	Und	Helmet Users	Non-Helmet Users	Ave. count per 15 mins for cyclists
Marikina - Infanta Highway (R6) In front of SM City Marikina	6-8 am, 4-6pm	Marikina	7	1150	1102	48	0	869	281	169
Marikina - Infanta Highway (R6) cor Nicanor Roxas St	6-8 am, 4-6 pm	Marikina	2	2300	2206	85	9	1145	1155	287
Gen Ordoñez Avenue corner Katipunan Street	4-6 pm	Marikina	2	430	420	10	0	115	315	53
Gen Ordoñez Avenue corner East Drive	6-8 am, 4-6pm	Marikina	4	564	Table Count Form not filled due to limited number of volunteers					70
Bayan-Bayanan Avenue corner Gen Ordoñez Avenue	6-8 am, 4-6 pm	Marikina	2	588	538	50	0	248	340	73
A Bonifacio Avenue corner Riverbanks Avenue	6-8 am, 4-6 pm	Marikina	3	1536	1496	38	2	1077	459	191
Commonwealth Avenue - PHILCOA Jollibee (Going to Fairview)	6-8 am, 4-6 pm	Quezon	10	1718	1687	31	0	1691	27	214
Commonwealth Avenue - Holy Spirit Drive (Going to QC Circle)	6-8 am	Quezon	1	1522	1500	21	1	1511	11	190
Commonwealth Avenue - Batasan Road (Side of COA - Going to Fairview)	6-8 am, 4-6 pm	Quezon	6	1017	1000	17	0	965	52	127
Commonwealth Avenue - Regalado Highway (going to QC Circle)	6-8 am, 4-6 pm	Quezon	4	1020	1009	11	0	915	105	127
Congressional Avenue - EDSA / Roosevelt Avenue (Going to Monumento)	6-8 am, 4-6 pm	Quezon	4	518	498	20	0	477	41	64
Congressional Avenue - EDSA / Roosevelt Avenue (Going to E-Rodriguez)	6-8 am, 4-6 pm	Quezon	2	924	909	15	0	808	116	114
E Rodriguez Avenue - Tomas Morato Avenue (Going to Manila City Hall/ Welcome Rotonda)	6-8 am, 4-6 pm	Quezon	5	1053	1023	25	5	915	138	131
E Rodriguez Avenue - Tomas Morato Avenue (Going to Cubao/Aurora Blvd)	4-6 pm	Quezon	1	399	399	0	0	399	0	49

Location	Count time	City	No of Volunteers Present	Total No. Of Pedestrians (AM & PM)	Male	Female	Undetermined	Ave. count per 15 min pedestrians
Aurora Boulevard - EDSA	6-8 am, 4-6 pm	Quezon	10	2880	2798	34	48	2644	236	359
Aurora Boulevard - C5 / Katipunan	6-8 am, 4-6 pm	Quezon	4	2181	1156	12	7	1021	154	271
East Avenue - BIR Road (Going to EDSA)5	6-8 am, 4-6 pm	Quezon	5	1652	1609	43	0	1595	57	206
Quezon Avenue -West Avenue (Going to QC Circle)	6-8 am, 4-6 pm	Quezon	3	627	625	1	1	605	22	77
Quezon Avenue -West Avenue (Going to Manila)	6-8 am, 4-6 pm	Quezon	3	1198	1190	7	1	1170	28	149
Ortigas Ave Intersection between Col. Bonny Serrano Ave, and Granada Street	6-8 am, 4-6 pm	San Juan	6	1341	1287	53	1	917	424	167
Ortigas Ave cor Wilson Street	6-8 am, 4-6 pm	San Juan	4	1222	1174	48	0	806	416	152
EDSA corner Annapolis St.	6-8 am, 4-6 pm	San Juan	1	391	380	11	0	333	58	48
Pinaglabanan St. corner N. Domingo and P. Guevarra	6-8 am, 4-6 pm	San Juan	2	666	627	39	0	424	242	82
N. Domingo St. corner Gregoria Araneta Ave	6-8 am, 4-6 pm	San Juan	2	666	633	33	0	438	228	82
Ortigas Ave - Meralco Intersection	6-8 am, 4-6 pm	Pasig	5	1205	1166	38	1	738	467	150
Shaw boulevard corner Meralco Ave	6-8 am, 4-6 pm	Pasig	5	1579	1541	36	2	779	800	197
Ortigas Ave cor C5 (Intersection)	4-6 pm	Pasig	3	1196	1162	33	1	698	498	149
Eastbank Rd (Underneath jenny's bridge)	6-8 am	Pasig	7	1468	1376	92	0	620	838	182
Kaginhawaan Bridge	6-8 am, 4-6 pm	Pasig	6	949	765	139	45	623	326	118
C. Raymundo Ave corner F. Legaspi St.	6-8 am, 4-6 pm	Pasig	7	2568	2466	102	0	908	1660	321
Pasig Boulevard	6-8 am	Pasig	2	1313	1298	15	0	623	690	164
Sandoval Ave corner Urbano Velasco	6-8 am, 4-6 pm	Pasig	2	881	839	38	4	401	480	109

Raw Pedestrian Count Data								
Location	Count time	City	No of Volunteers Present	Total No. Of Pedestrians (AM & PM)	Male	Female	Undetermined	Ave. count per 15 min pedestrians
Marikina - Infanta Highway (R6) In front of SM City Marikina	6-8 am, 4-6pm	Marikina	7	145	63	82	0	18
Marikina - Infanta Highway (R6) cor Nicanor Roxas St	6-8 am, 4-6 pm	Marikina	2	844	471	369	4	105
Gen Ordoñez Avenue corner Katipunan Street	4-6 pm	Marikina	2	344	156	188	0	43

Location	Time	City	Volunteers	Total	Col A	Col B	Col C	Last
Gen Ordoñez Avenue corner East Drive	6-8 am, 4-6pm	Marikina	4	423	Table Count Form not filled due to limited number of volunteers			52
Bayan-Bayanan Avenue corner Gen Ordoñez Avenue	6-8 am, 4-6 pm	Marikina	2	470	237	233	0	57
A Bonifacio Avenue corner Riverbanks Avenue	6-8 am, 4-6 pm	Marikina	3	537	159	221	157	66
Commonwealth Avenue - PHILCOA Jollibee (Going to Fairview)	6-8 am, 4-6 pm	Quezon	10	166	104	62	0	20
Commonwealth Avenue - Holy Spirit Drive (Going to QC Circle)	6-8 am	Quezon	1	110	107	3	0	13
Commonwealth Avenue - Batasan Road (Side of COA - Going to Fairview)	6-8 am, 4-6 pm	Quezon	6	1455	958	497	0	181
Commonwealth Avenue - Regalado Highway (going to QC Circle)	6-8 am, 4-6 pm	Quezon	4	20	16	4	0	2
Congressional Avenue - EDSA / Roosevelt Avenue (Going to Monumento)	6-8 am, 4-6 pm	Quezon	4	343	310	33	0	42
Congressional Avenue - EDSA / Roosevelt Avenue (Going to E-Rodriguez)	6-8 am, 4-6 pm	Quezon	2	774	353	420	1	96
E Rodriguez Avenue - Tomas Morato Avenue (Going to Manila City Hall/ Welcome Rotonda)	6-8 am, 4-6 pm	Quezon	5	214	115	99	0	26
E Rodriguez Avenue - Tomas Morato Avenue (Going to Cubao/Aurora Blvd)	4-6 pm	Quezon	1	7	5	2	0	
Aurora Boulevard - EDSA	6-8 am, 4-6 pm	Quezon	10	1706	1097	609	0	212
Aurora Boulevard - C5 / Katipunan	6-8 am, 4-6 pm	Quezon	4	25	12	13	0	3
East Avenue - BIR Road (Going to EDSA)	6-8 am, 4-6 pm	Quezon	5	383	272	111	0	47
Quezon Avenue -West Avenue (Going to QC Circle)	6-8 am, 4-6 pm	Quezon	3	233	149	84	0	28
Quezon Avenue -West Avenue (Going to Manila)	6-8 am, 4-6 pm	Quezon	3	139	82	57	0	16
Ortigas Ave Intersection between Col. Bonny Serrano Ave, and Granada Street	6-8 am, 4-6 pm	San Juan	6	631	465	166	0	78
Ortigas Ave cor Wilson Street	6-8 am, 4-6 pm	San Juan	4	488	252	236	0	60
EDSA corner Annapolis St.	6-8 am, 4-6 pm	San Juan	1	233	122	110	1	29
Pinaglabanan St. corner N. Domingo and P. Guevarra	6-8 am, 4-6 pm	San Juan	2	478	295	183	0	59
N. Domingo St. corner Gregoria Araneta Ave	6-8 am, 4-6 pm	San Juan	2	229	115	114	0	28
Ortigas Ave - Meralco Intersection	6-8 am, 4-6 pm	Pasig	5	413	241	172	0	50

Location	Count time	City						
Shaw boulevard corner Meralco Ave	6-8 am, 4-6 pm	Pasig	5	437	291	146	0	53
Ortigas Ave cor C5 (Intersection)	4-6 pm	Pasig	3	98	49	49	0	12
Eastbank Rd (Underneath jenny's bridge)	6-8 am	Pasig	7	155	101	54	0	18
Kaginhawaan Bridge	6-8 am, 4-6 pm	Pasig	6	322	168	142	12	40
C. Raymundo Ave corner F. Legaspi St.	6-8 am, 4-6 pm	Pasig	7	166	80	86	0	19
Pasig Boulevard	6-8 am	Pasig	2	779	419	360	0	97
Sandoval Ave corner Urbano Velasco	6-8 am, 4-6 pm	Pasig	2	20	13	7	0	2

Raw "Others" Count Data										
Location	Count time	City	No of Volunteers Present	Total Other's Count (AM & PM)	Male	Female	Undetermined	Helmet-users	Non-Helmet users	Ave. count per 15 min others
Marikina - Infanta Highway (R6) In front of SM City Marikina	6-8 am, 4-6pm	Marikina	7	28	10	0	0	8	2	3
Marikina - Infanta Highway (R6) cor Nicanor Roxas St	6-8 am, 4-6 pm	Marikina	2	80	65	15	0	39	41	10
Gen Ordoñez Avenue corner Katipunan Street	4-6 pm	Marikina	2	15	9	6	0	4	11	1
Gen Ordoñez Avenue corner East Drive	6-8 am, 4-6pm	Marikina	4	50	Table Count Form not filled due to limited number of volunteers					6
Bayan-Bayanan Avenue corner Gen Ordoñez Avenue	6-8 am, 4-6 pm	Marikina	2	31	20	11	0	9	22	3
A Bonifacio Avenue corner Riverbanks Avenue	6-8 am, 4-6 pm	Marikina	3	47	25	22	0	38	9	5
Commonwealth Avenue - PHILCOA Jollibee (Going to Fairview)	6-8 am, 4-6 pm	Quezon	10	39	31	8	0	28	11	4
Commonwealth Avenue - Holy Spirit Drive (Going to QC Circle)	6-8 am	Quezon	1	37	26	11	0	37	0	4
Commonwealth Avenue - Batasan Road (Side of COA - Going to Fairview)	6-8 am, 4-6 pm	Quezon	6	36	35	1	0	26	10	3
Commonwealth Avenue - Regalado Highway (going to QC Circle)	6-8 am, 4-6 pm	Quezon	4	12	12	0	0	7	5	
Congressional Avenue - EDSA / Roosevelt Avenue (Going to Monumento)	6-8 am, 4-6 pm	Quezon	4	6	6	0	0	0	6	
Congressional Avenue - EDSA / Roosevelt Avenue (Going to E-Rodriguez)	6-8 am, 4-6 pm	Quezon	2	15	14	1	0	14	1	

Location	Time	City								
E Rodriguez Avenue - Tomas Morato Avenue (Going to Manila City Hall/ Welcome Rotonda)	6-8 am, 4-6 pm	Quezon	5	60	36	21	3	46	14	7
E Rodriguez Avenue - Tomas Morato Avenue (Going to Cubao/Aurora Blvd)	4-6 pm	Quezon	1	68	0	0	68	68	0	8
Aurora Boulevard - EDSA	6-8 am, 4-6 pm	Quezon	10	85	68	17	0	68	17	10
Aurora Boulevard - C5 / Katipunan	6-8 am, 4-6 pm	Quezon	4	32	12	5	0	13	4	2
East Avenue - BIR Road (Going to EDSA)	6-8 am, 4-6 pm	Quezon	5	58	46	10	2	47	11	6
Quezon Avenue -West Avenue (Going to QC Circle)	6-8 am, 4-6 pm	Quezon	3	8	7	1	0	8	0	1
Quezon Avenue -West Avenue (Going to Manila)	6-8 am, 4-6 pm	Quezon	3	34	26	7	1	31	3	4
Ortigas Ave Intersection between Col. Bonny Serrano Ave, and Granada Street	6-8 am, 4-6 pm	San Juan	6	156	90	37	29	116	40	19
Ortigas Ave cor Wilson Street	6-8 am, 4-6 pm	San Juan	4	81	59	21	1	66	15	9
EDSA corner Annapolis St.	6-8 am, 4-6 pm	San Juan	1	11	8	3	0	11	0	
Pinaglabanan St. corner N. Domingo and P. Guevarra	6-8 am, 4-6 pm	San Juan	2	53	27	26	0	37	16	6
N. Domingo St. corner Gregoria Araneta Ave	6-8 am, 4-6 pm	San Juan	2	57	34	23	0	29	28	7
Ortigas Ave - Meralco Intersection	6-8 am, 4-6 pm	Pasig	5	74	47	27	0	60	14	8
Shaw boulevard corner Meralco Ave	6-8 am, 4-6 pm	Pasig	5	32	22	10	0	20	12	3
Ortigas Ave cor C5 (Intersection)	4-6 pm	Pasig	3	22	16	6	0	20	2	2
Eastbank Rd (Underneath jenny's bridge)	6-8 am	Pasig	7	64	36	28	0	31	33	8
Kaginhawaan Bridge	6-8 am, 4-6 pm	Pasig	6	66	34	32	0	42	24	8
C. Raymundo Ave corner F. Legaspi St.	6-8 am, 4-6 pm	Pasig	7	130	72	57	1	69	61	15
Pasig Boulevard	6-8 am	Pasig	2	153	79	74	0	76	77	19
Sandoval Ave corner Urbano Velasco	6-8 am, 4-6 pm	Pasig	2	18	15	3	0	11	7	2