



**8TH METRANS**

**International Urban Freight Conference**

October 16-18, 2019 | Hotel Maya, Long Beach, CA



# Characterization of Truck Traffic in Metro Manila

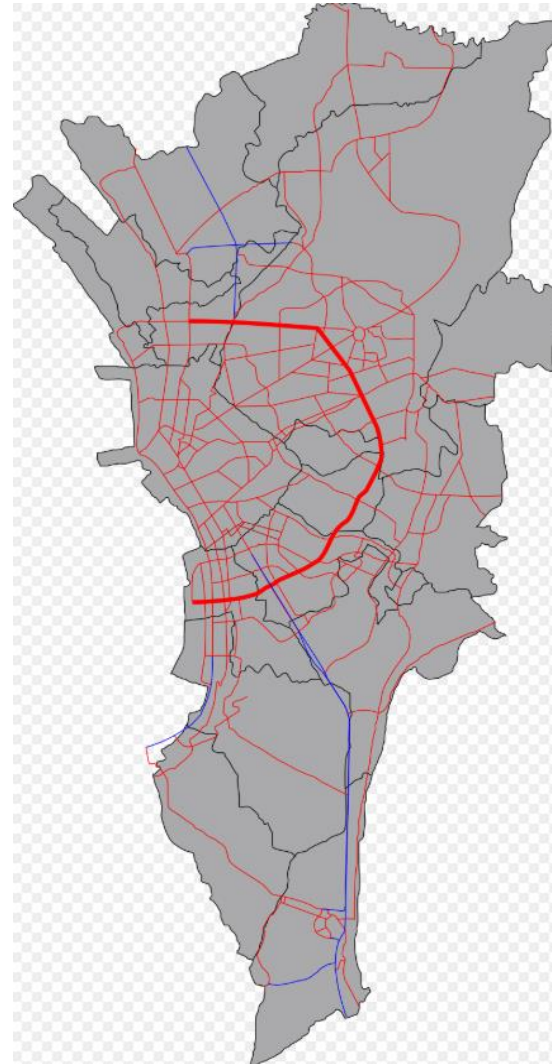
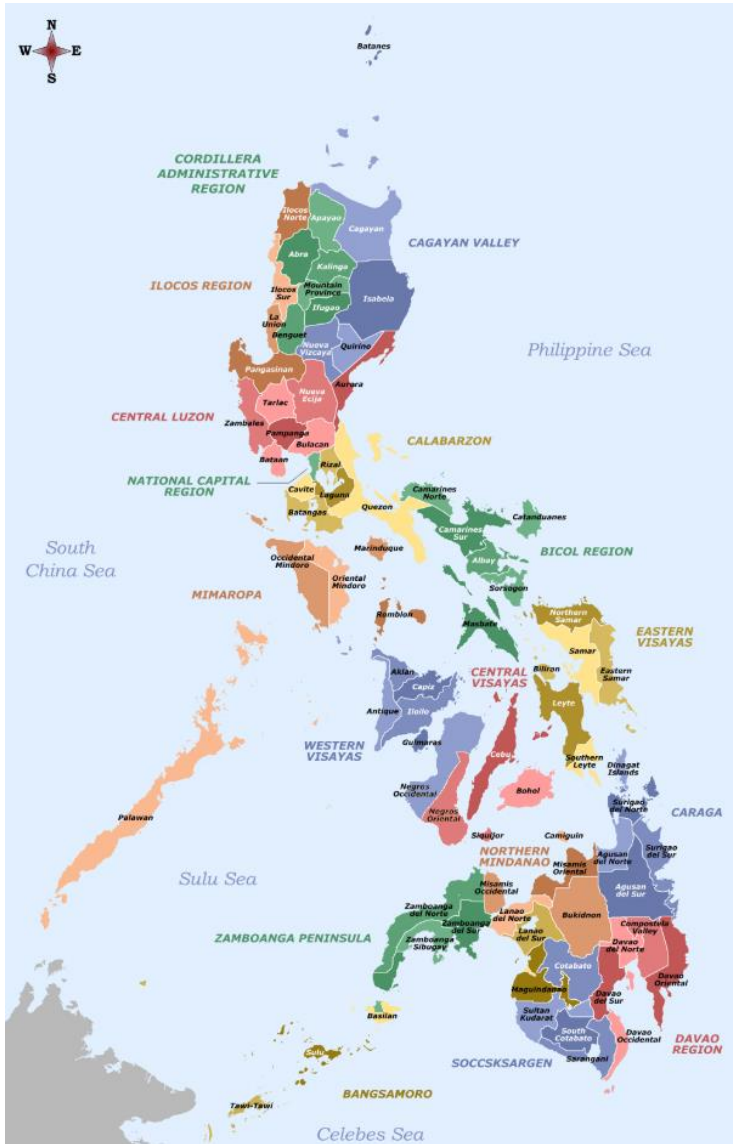
Riches BACERO

Alexis FILLONE

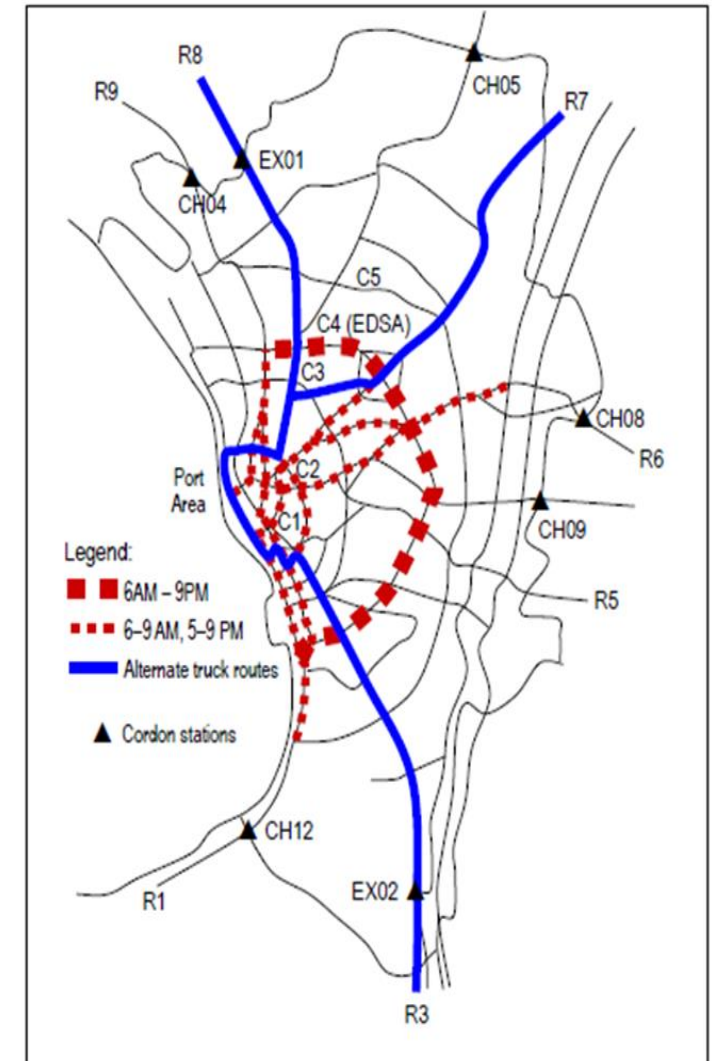
*Gokongwei College of Engineering, De La Salle University, Manila, Philippines*



# INTRODUCTION



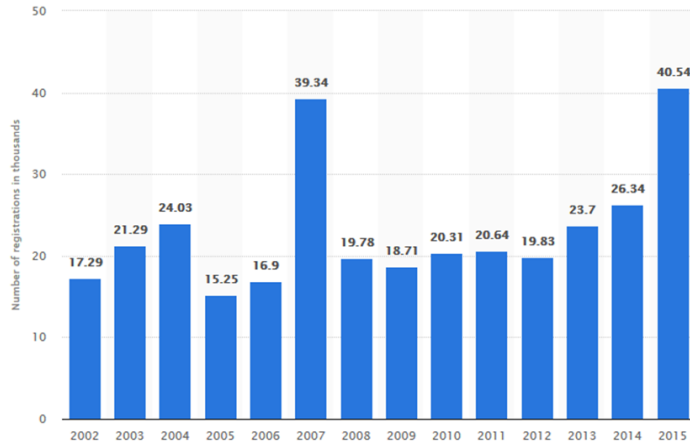
Road Network in Metro Manila



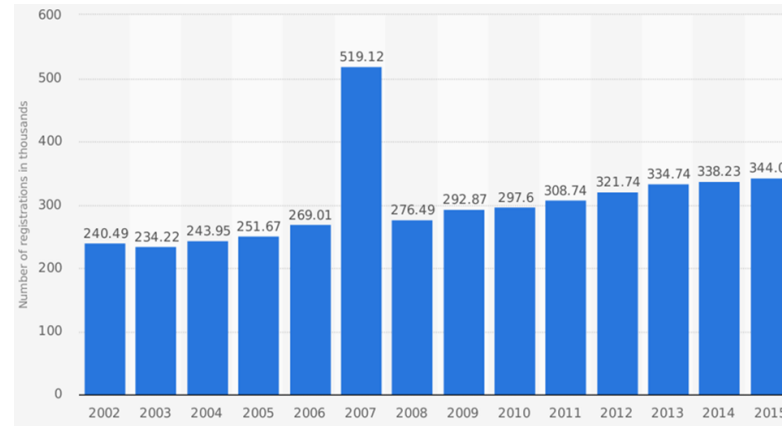
Truck Ban Routes and Alternative Routes  
(Castro et al., 2003)



# PROBLEM STATEMENT



Number of new truck registrations in the Philippines



Number of truck registration renewals in the Philippines



In Metro Manila, issues and concerns:

- increasing traffic of container and cargo trucks.
- traffic congestion in city's streets due to slow moving trucks
- port congestion and pollution from trucking operations.



# OBJECTIVES

- To characterize the existing truck routes and truck behavior that affect urban travel movement in Metro Manila for the enhancement of policies affecting the truck industry and goods movement as well as urban travel in general.

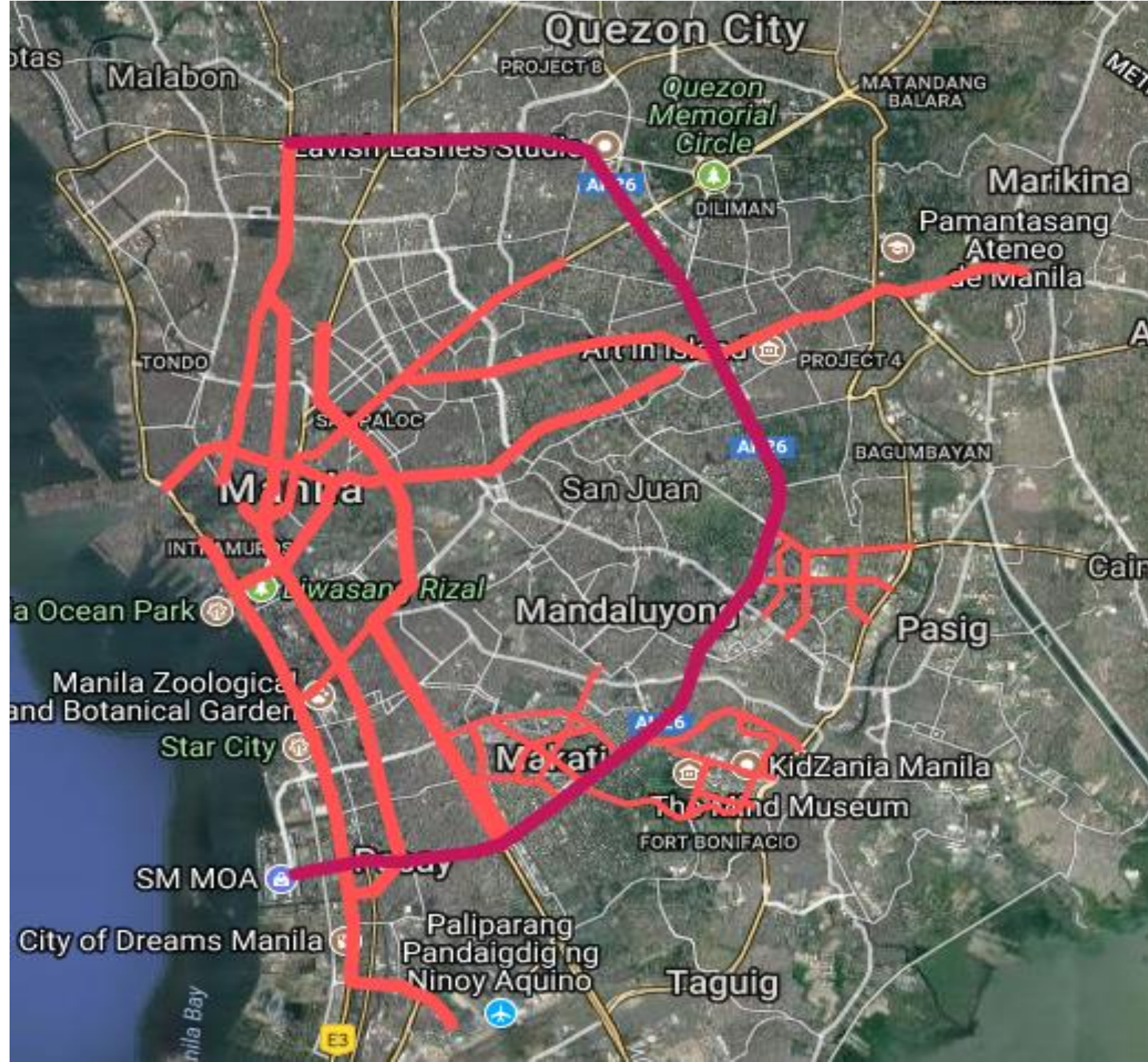
## SIGNIFICANCE OF THE STUDY

The study will provide information that will impart government agencies, trucking companies and other stakeholders concerning the current issues and problems of the truck movements and operations in the Metro Manila. This research is geared toward the enhancement policies for a better truck-oriented management in Metro Manila.



# STUDY AREA

## Truck Ban Routes





# DATA GATHERING PROCEDURE AND TOOLS

## Interview questionnaire

- 390 truck drivers were interviewed in North Harbor and South Harbor in Manila and in truck companies' depot in Cavite and Rizal.

## Transportation software (EMME4)

- to show the routes and behavior of trucks and simulate their movement using shortest path considering truck ban and mabuhay lanes traffic scheme.



## GPS data logger

- It was installed in the sample truck vehicle to track the behavior and movement of trucks and which routes they are using from their origin to their destination.



# TRUCK TRAFFIC

## Truck Traffic Volume

Circumferencial and Radial Road		2012		2013		2014		2015		2016		2017	
		Truck	Trailer	Truck	Trailer	Truck	Trailer	Truck	Trailer	Truck	Trailer	Truck	Trailer
C:1	Recto	702	250	939	347	816	382	769	16	703	13	584	3
C:2	Mendoza	5,253	1,237	5,093	1,000	4,374	398	4,007	506	3,462	265	5,102	731
	Pres. Quirino Ave.	7,788	2,556	6,729	2,204	7,130	2,398	6,421	3,070	7,075	2,358	5,958	981
C:3	Araneta Ave.	4,401	411	6,297	815	4,291	796	4,393	528	4,135	599	4,163	607
C:4	Edsa (Buendia Ave.)	5,023	43	4,491	4	4,417	1	5,451	8	5,556	2	8,830	2
C:5	Katipunan/C. P. Garcia	7,289	554	7,142	817	10,508	914	10,458	922	12,411	1,101	10,121	680
R:1	Roxas Blvd.	363	37	459	7	391	-	831	50	926	1,137	747	1,111
R:2	Taft Ave.	223	13	435	53	404	1	650	15	543	6	640	10
R:3	SSH	7,703	3,413	7,323	2,508	9,484	807	7,184	3,921	5,550	1,633	5,182	2,376
R:4	Shaw Blvd.	1,493	200	1,458	64	1,133	67	1,603	164	1,480	175	1,054	126
R:5	Ortigas Ave.	1,858	212	4,336	562	4,252	352	5,039	428	5,162	616	5,029	681
R:6	Magsaysay Blvd.	2,269	289	2,118	379	2,543	313	2,228	429	3,125	491	2,859	336
	Aurora Blvd.	4,124	326	4,255	386	2,290	27	2,168	30	2,358	37	3,674	712
R:7	Quezon Ave.	3,110	389	5,326	316	4,061	570	4,337	329	4,081	163	3,664	244
	Commonwealth Ave.	5,666	-	6,084	306	5,356	217	6,307	256	6,837	271	7,822	518
R:8	A. Bonifacio	9,509	2,495	10,038	2,784	9,230	3,939	6,736	2,867	6,554	3,221	9,278	3,915
R:9	Rizal Ave.	1,810	6	1,987	7	1,787	4	1,948	7	2,168	7	2,012	3
R:10	Del Pan			4,455	6,566	4,974	3,856			4,989	8,290	5,686	7,886
	Marcos Highway	7,030	749	7,237	475	6,524	533	6,394	548	5,431	439	5,684	412
	McArthur Highway	4,236	435	3,538	305	3,681	402	4,031	541	2,732	288	3,208	506
<b>Total</b>		<b>79,850</b>	<b>13,615</b>	<b>89,740</b>	<b>19,905</b>	<b>87,646</b>	<b>15,977</b>	<b>80,955</b>	<b>14,635</b>	<b>85,278</b>	<b>21,112</b>	<b>91,297</b>	<b>21,840</b>

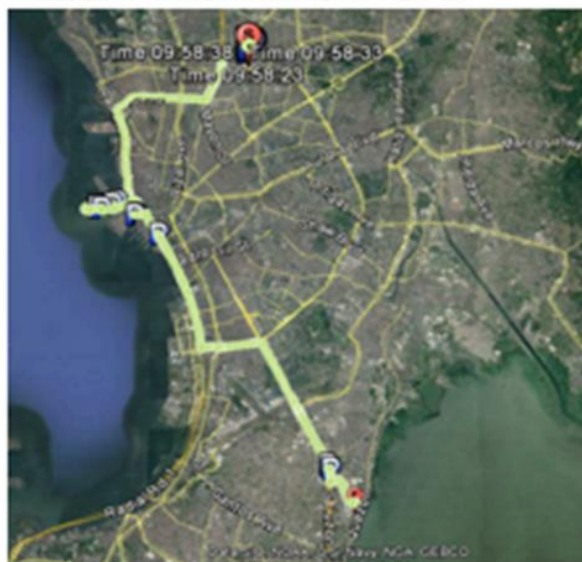


# TRUCK TRAFFIC



Queue of trucks along C5 after Restriction Time

## Truck Travel Log

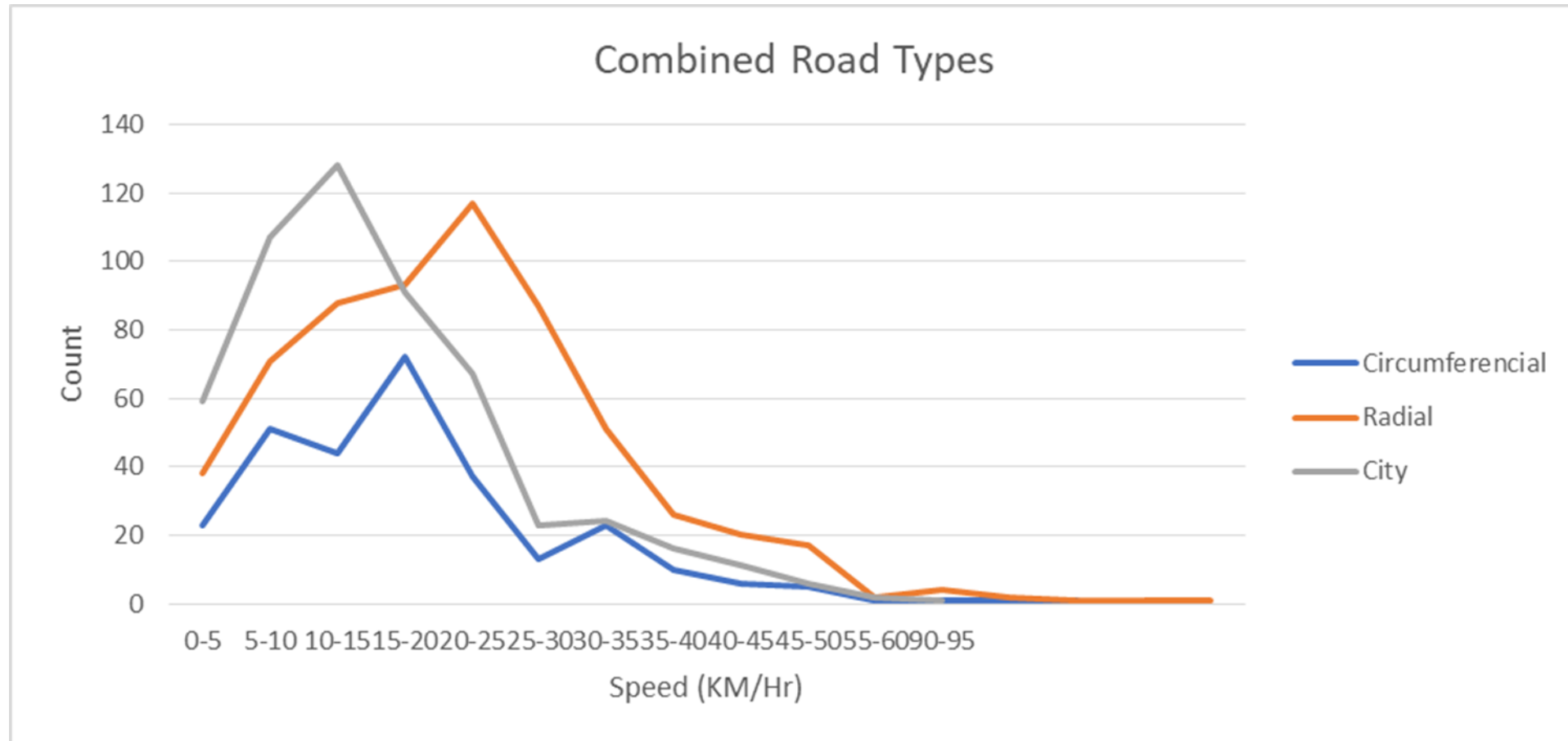


Start: 2018-05-19 9:58:23  
End: 2018-05-19 16:24:15  
Total travel time:  
**6 hours 25 minutes 52 seconds**  
Total running time:  
**2 hours 31 minutes 58 seconds**  
Total Stopping time:  
**3 hours 54 minutes 53 seconds**  
Distance: 45.38km  
Average speed: 12.2km/h  
Max speed: 69.0km/h





# Truck Travel Speed





# TRUCK POLICIES

## Truck Ban Restriction Time

Time Restriction	Morning	Afternoon/Evening
Ordinance No. 78-04	6:00 a.m. - 9:00 a.m.	4:00 p.m. - 8:00 p.m.
Ordinance No. 5 Series of 1994	6:00 a.m. - 9:00 a.m.	5:00 p.m. - 9:00 p.m.
MMDA Resolution No. 3, s. 2015 - present	6:00 a.m. - 10:00 a.m.	5:00 p.m. - 10:00 p.m.

## Maximum Allowable Gross Vehicle Weight

TRUCK CLASS	MAX. ALLOWABLE GVW (in kg)	TRUCK CLASS	MAX. ALLOWABLE GVW (in kg)
TRUCK WITH 2 AXLES (6 WHEELS)	18,000	TRUCK-TRAILER WITH 2 AXLES AT MOTOR VEHICLE & 3 AXLES AT TRAILER (18 WHEELS)	41,000
TRUCK WITH TANDEM REAR AXLE 3 AXLES (10 WHEELS)	33,300	TRUCK-TRAILER WITH 2 AXLES AT MOTOR VEHICLE & 2 AXLES AT TRAILER (14 WHEELS)	39,700
TRUCK WITH TANDEM REAR AXLE 4 AXLES (14 WHEELS)	35,600	TRUCK-TRAILER WITH 2 AXLES AT MOTOR VEHICLE & 3 AXLES AT TRAILER (18 WHEELS)	43,500
TRUCK SEMI-TRAILER WITH 3 AXLES (10 WHEELS)	34,000	TRUCK-TRAILER WITH 3 AXLES AT MOTOR VEHICLE & 3 AXLES AT TRAILER (22 WHEELS)	42,000
TRUCK SEMI-TRAILER WITH 4 AXLES (14 WHEELS)	40,600	TRUCK-TRAILER WITH 3 AXLES AT MOTOR VEHICLE & 2 AXLES AT TRAILER (18 WHEELS)	43,500
TRUCK SEMI-TRAILER WITH 4 AXLES (14 WHEELS)	39,700	TRUCK-TRAILER WITH 3 AXLES AT MOTOR VEHICLE & 3 AXLES AT TRAILER (22 WHEELS)	45,000
TRUCK SEMI-TRAILER WITH 5 AXLES (18 WHEELS)	41,500		

Republic City of Manila  
**SANGGUN**  
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 ORDINA  
 Seri  
**AN ORDINANCE IMPLEMENTING THE 0 AVENUE, CONGRESSIO STARTING FEBRUARY 1,**  
 Author by CODIC  
**WHEREAS**, the Metro N implementation of the uniform truck enacted MMDA Resolution No. 07-01  
**WHEREAS**, under MMDA Resolution No. 07-01, the Metro Manila from 6:00 AM to 10:00 Sundays and Holidays;  
**WHEREAS**, the City Governn the recurrent and perennial problem expansion and development within t  
**WHEREAS**, Section 16 of R "Local Government Code of 1991", p  
 Section 16. General We shall exercise the powers e implied therefrom, as well as incidental for its efficient a which are essential to the j Within their respective territ ment units shall ensure an preservation and enrichment safety, enhance the right ( encourage and support the reliant scientific and techno morals, enhance economic j full employment among the order, and preserve the con bitants."  
**WHEREAS**, the City Govern ease up the traffic congestion withi

## Anti-overloading Policy extended until December 2018

Friday, August 3, 2018



MMDA Pangasiwaan S. (Metropo)  
 WHEREAS, Sec. 3b ( in Metro Manila, which incl standards, programs and proje requirements, the use of thor persons and goods;  
 WHEREAS, the Met enacted MMC-STC Resolutor Policy Along C5 and Katipun Metro Manila;  
 WHEREAS, the Special T of the implementation of the or agreed to implement the polic Road-10 (R-10) of City of Mar  
 NOW, THEREFORE, by resolved, as it is hereby resol Metro Manila to be adopted sta

WHEREAS, the City Governn the recurrent and perennial problem expansion and development within t  
 WHEREAS, Section 16 of R "Local Government Code of 1991", p  
 Section 16. General We shall exercise the powers e implied therefrom, as well as incidental for its efficient a which are essential to the j Within their respective territ ment units shall ensure an preservation and enrichment safety, enhance the right ( encourage and support the reliant scientific and techno morals, enhance economic j full employment among the order, and preserve the con bitants."  
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Suspension of enforcement of the maximum allowable gross vehicle weight (GVW) for trucks and trailers with a total of 18 and 22 wheels has been extended by the Department of Public Works and Highways (DPWH) and Department of Transportation (DOTR).

In a joint advisory, the DPWH and DOTR moved its previous deadline to December 31, 2018, giving haulers and truckers another ample time to acquire additional transport equipment to conform with the latest GVW.

The suspension covers Code 12-2 and 12-3 which involves truck, semi-trailer with 3-axles at motor vehicle and 2 axles at trailer for a total of 18 wheels and truck semi-trailer with 3 axles at motor vehicle and 3-axles at trailer summing up 22 wheels.

Other truck/trailer codes are required to observe the current maximum allowable GVW under the anti-overloading policy.

"We are expecting full compliance from Codes 12-2 and 12-3 truck/trailer owners on upgrading their units to have maximum allowable GVW of 41,500 and 42,000 kilograms respectively before January 1, 2019," said



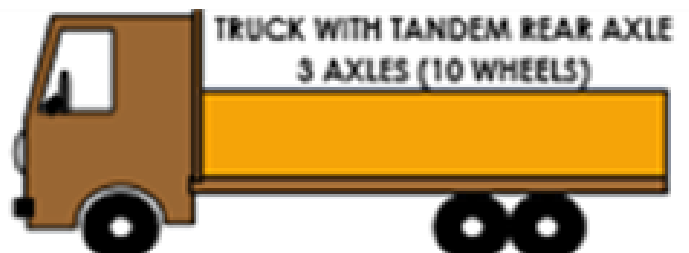
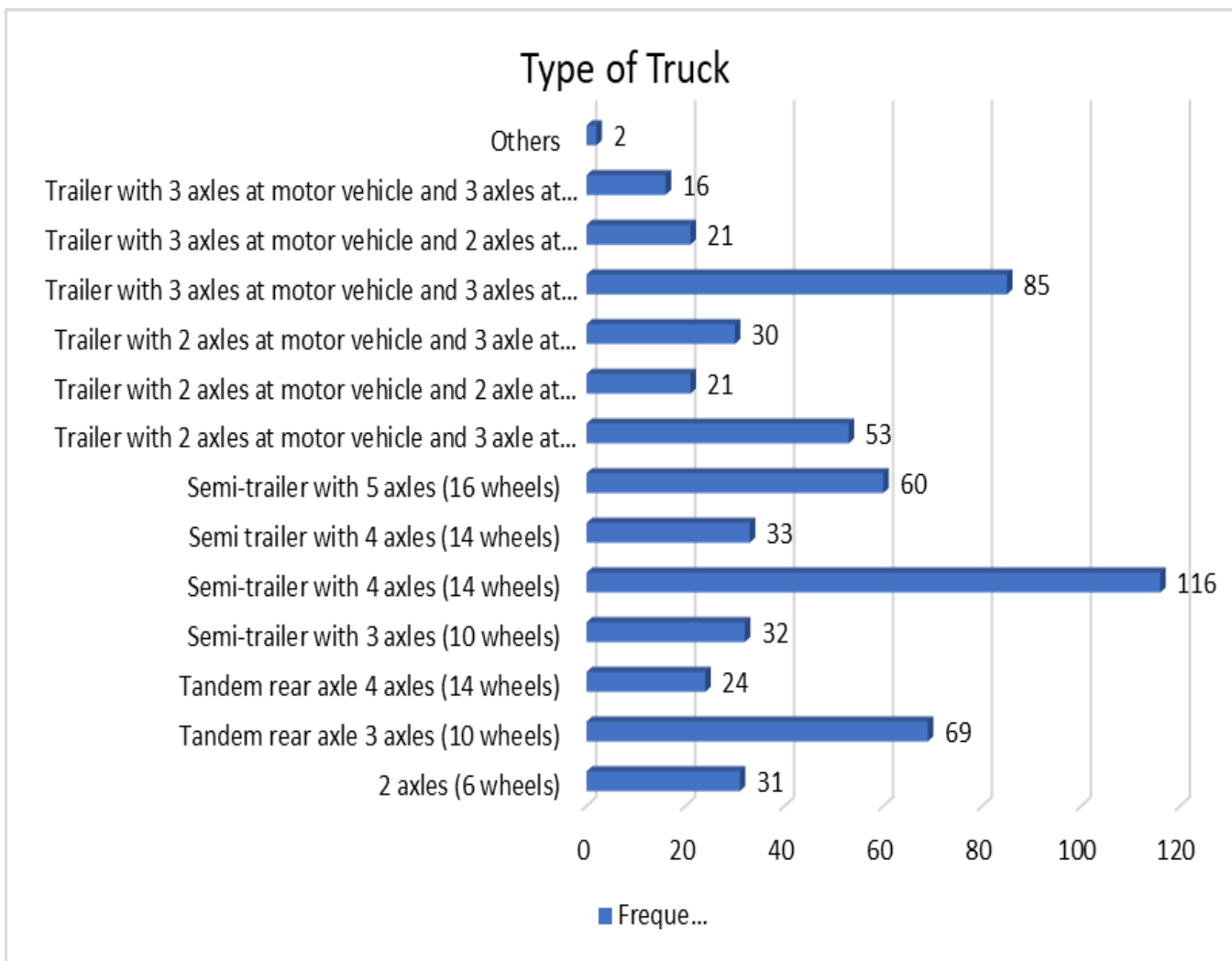
# Truck Driver's Survey

Age	Frequency	Percentage
20 and below	7	1.79
21-40	257	65.90
41-60	122	31.28
Above 60	4	1.03
<b>Total</b>	<b>390</b>	<b>100</b>
Civil Status		
Single	113	28.97
Married	254	65.13
(Widow/er/Separated)	16	4.10
No Answer	7	1.79
<b>Total</b>	<b>390</b>	<b>100</b>

Educational Attainment	Frequency	Percentage
Elementary Graduate	61	15.64
High School Graduate	271	69.49
College Undergraduate	13	3.33
College Graduate	11	2.82
Vocational (2-year College)	29	7.44
No Answer	5	1.28
<b>Total</b>	<b>390</b>	<b>100</b>
Years of Service		
No Answer	12	3.08
Less than a year	29	7.44
1-10	269	68.97
11-20	52	13.33
More than 20 years	28	7.18
<b>Total</b>	<b>390</b>	<b>100</b>

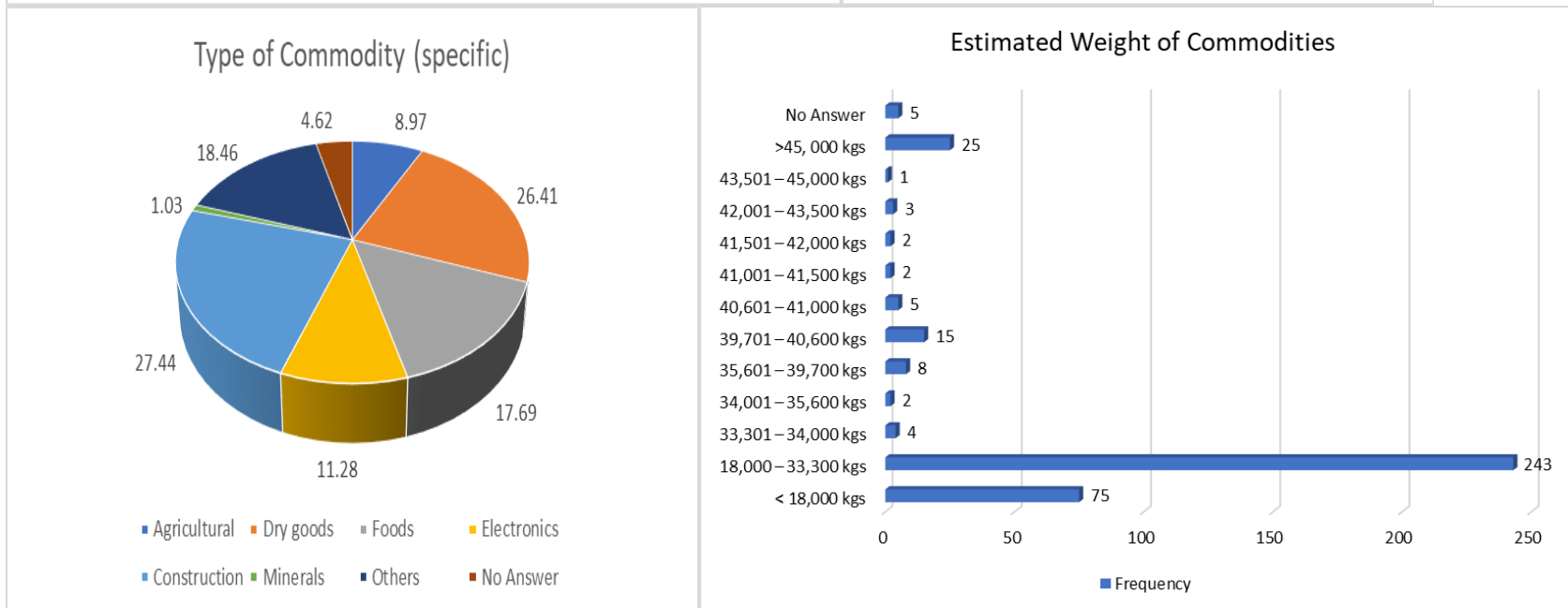
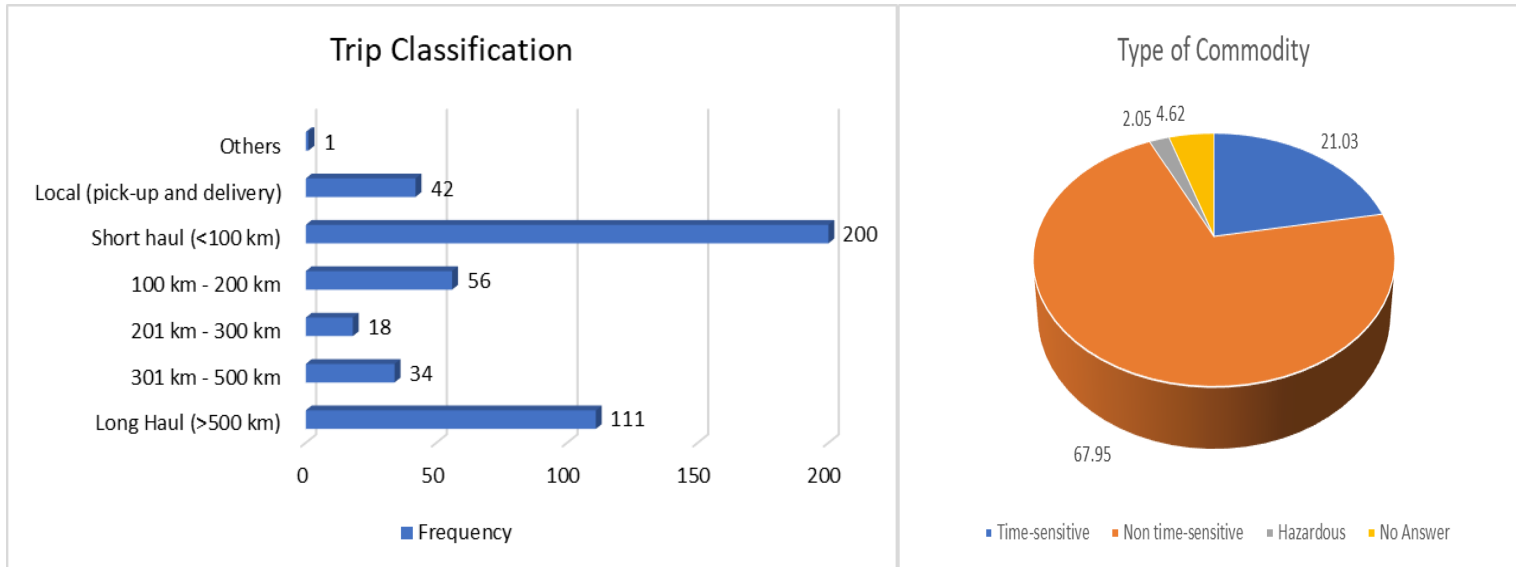


# Truck Driver's Survey





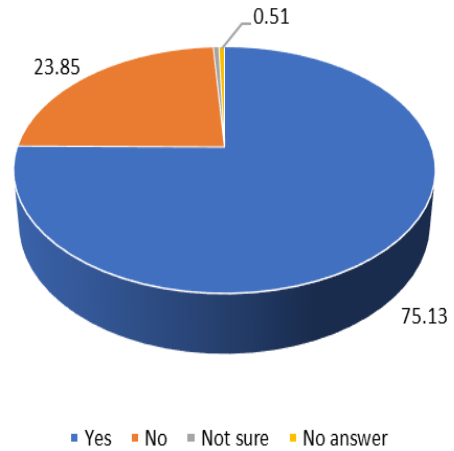
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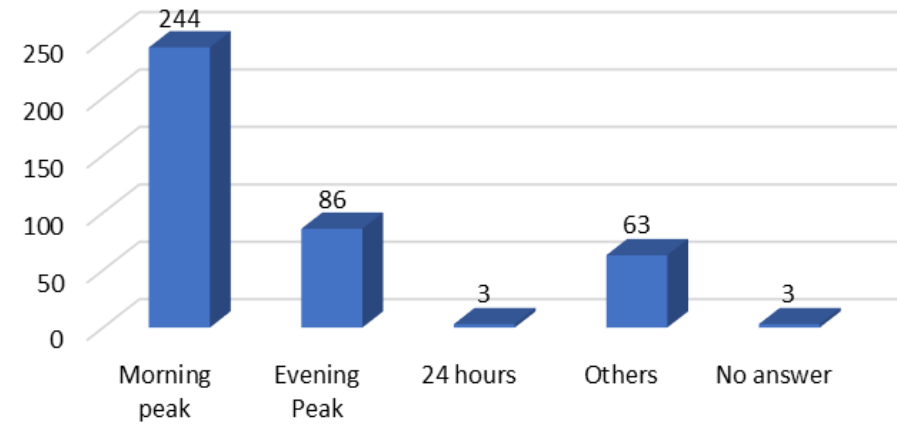


# Truck Driver's Survey

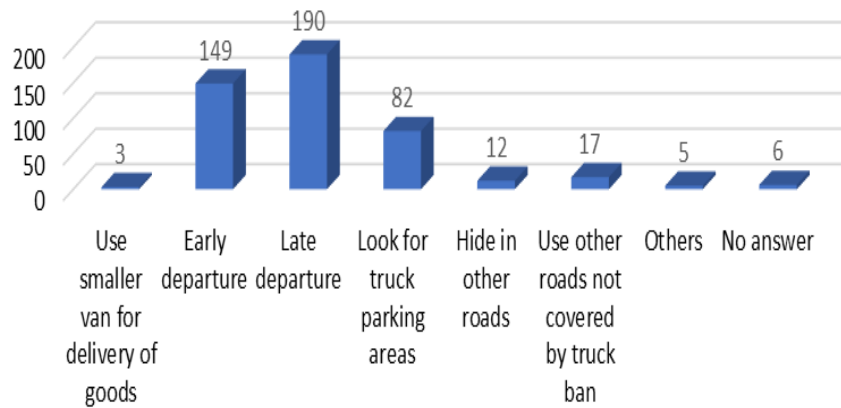
Separating Trucks from Other Traffic



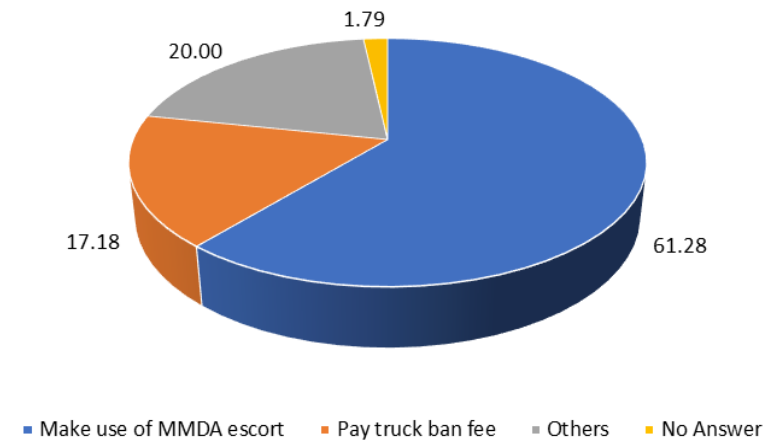
Time of the Day for Truck Ban



Strategies to avoid Truck Ban



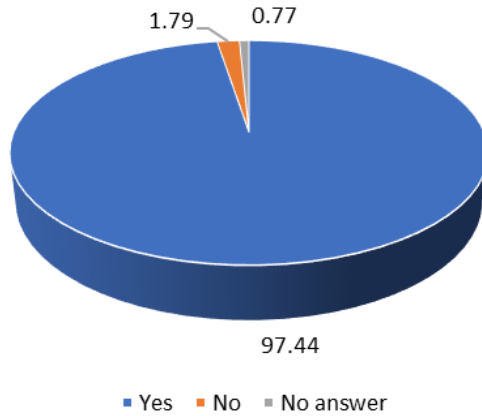
Strategies during Truck Ban Times



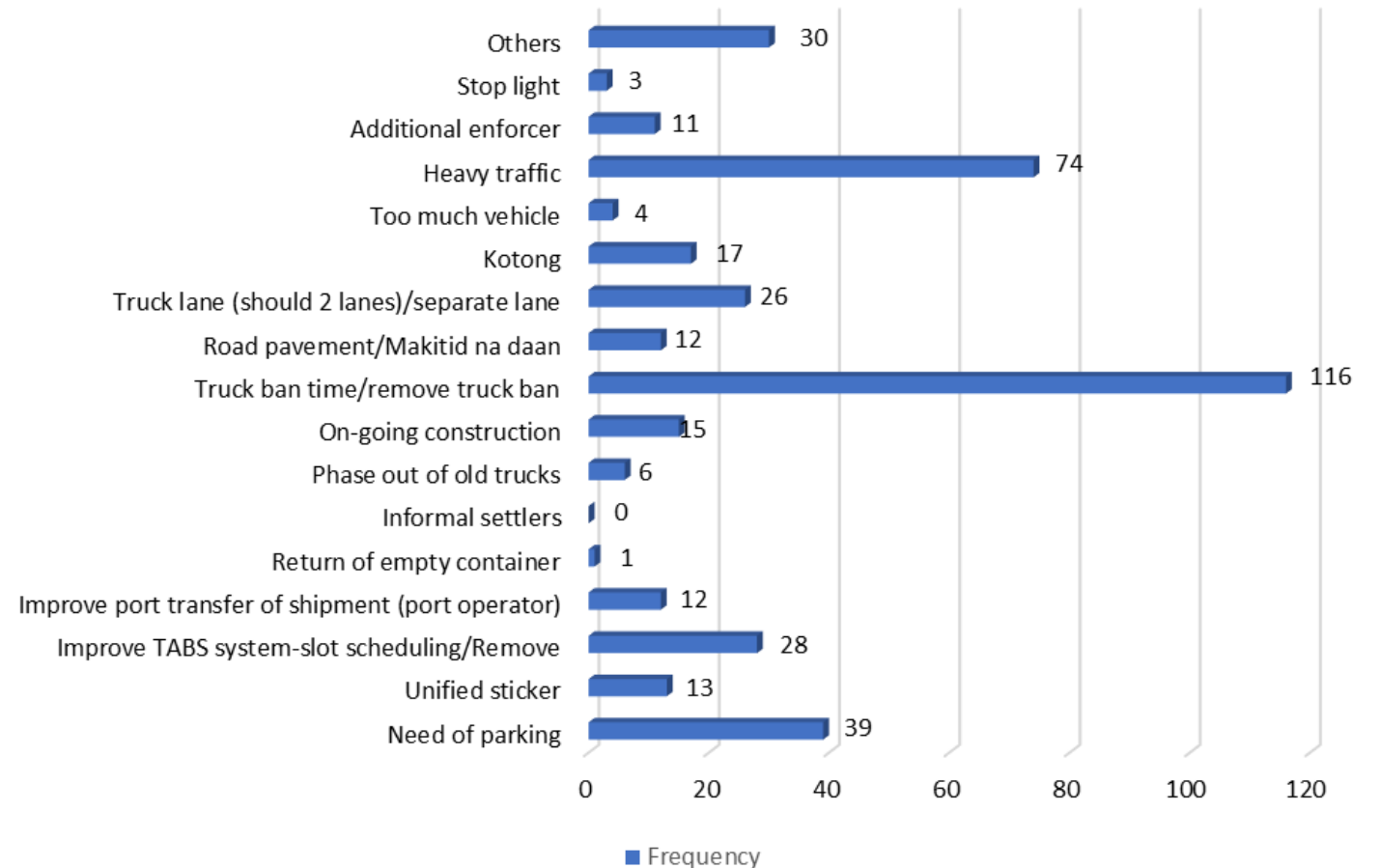


# Truck Driver's Survey

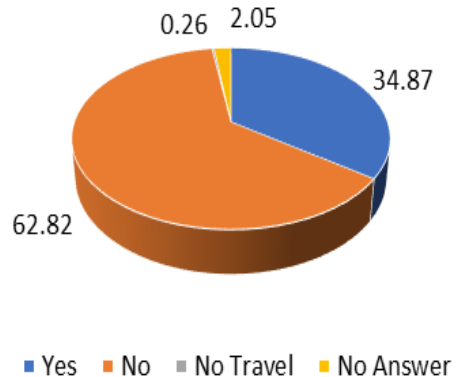
Pre-defined Route



Problems and Issues Regarding Truck Operation in Metro Manila

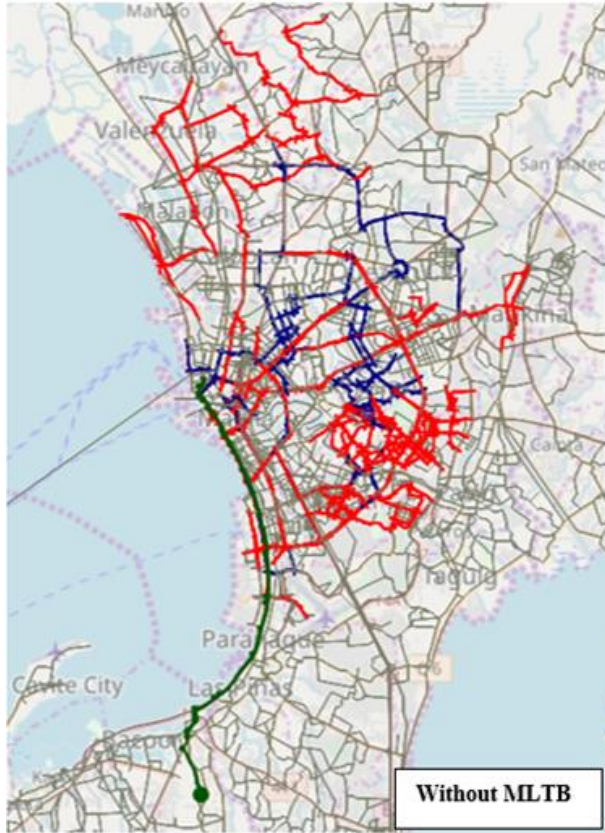


Changing Route Midway



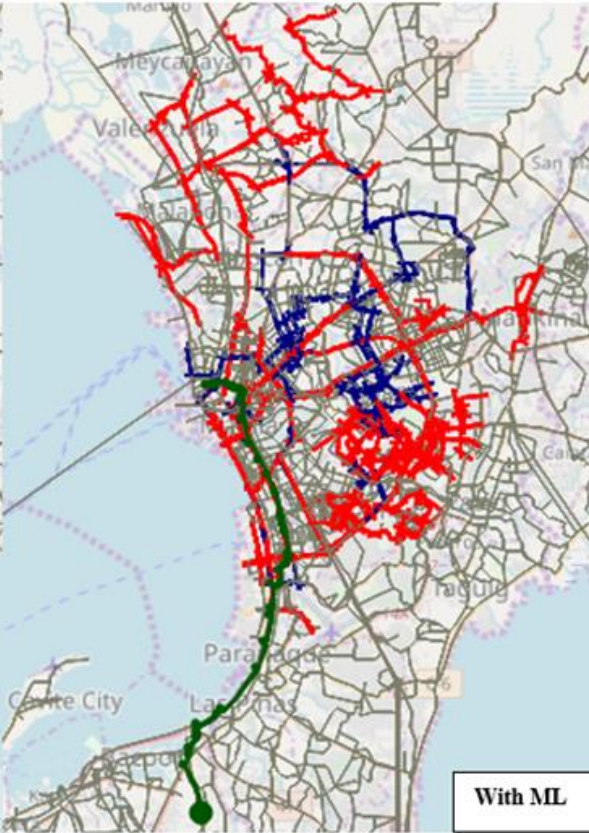


# SIMULATION USING SHORTEST PATH



Without MLTB

TSP without MLTB



With ML

with ML from zone 6661



With TB

TSP with TB



With MLTB

with MLTB from zone 6661





# SIMULATION USING SHORTEST PATH

Shortest Path distance from Zone i to the port area of Manila (km)

Zone	Without MLTB	With ML	With TB	With MLTB
6661 (Bacoor, Cavite)	21.44	23.08	33.66	37.03
288 (Cavite City)	34.15	35.80	46.99	50.36
6662 (Guiguinto Bulacan)	32.50	32.57	33.73	36.54
326 (San Jose Del Monte)	34.90	37.22	35.03	43.42
352 (Rodriguez, Rizal)	32.38	32.35	34.69	45.22
349 (Antipolo)	27.97	29.05	33.59	40.81
298 (Binan, Laguna)	36.00	36.17	40.59	45.20
342 (Santa Rosa, Laguna)	39.99	40.16	45.55	49.19



# CONCLUSION

- There is a significant increase of truck volume observed in circumferential and radial road in Metro Manila. Congestion in the truck routes were evident based on the long queue of trucks observed and based on the travel time and delay from data logger.
- Truck ban time are not synchronized across cities.
- Most of the truck current trips are less than 100 km. The average travel time from origin to destination is 4-5 hours with an average speed of 15-20 kph. Most of the truck drivers perceived that mixed traffic post safety hazard and they want to have a separate lane for trucks. They have pre-defined route before they travel and mostly, they do not change route even there were traffic problems along the route. The top 3 problem and issues they raised and need to be improved regarding truck operation in Metro Manila are truck ban/or removal of truck ban, heavy traffic, and need of parking.
- Based on simulation results, using shortest path method, travel distance of trucks will be longer if mabuhay lanes, truck ban, and both mabuhay lanes and truck ban were considered or applied as traffic scheme.



# RECOMMENDATION

Based on the findings of the study,

- it is recommended that the concerned government agency should look into and review the truck ban regulation and one truck lane policy with respect to the effectiveness of these regulations and their impact to truck industry.
- it is recommended to study the impact of congestion and pollution from trucking operation to the transportation system and general public.



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# Acknowledgement



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Technology (ERDT)**

**Department of Science and Technology (DOST)**



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**THANK YOU FOR YOUR ATTENTION!**