Integrating Statistics and Geospatial information II: The Case of MMDA

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Metropolitan Manila Development Authority

Philippine Data Festival

16 November 2018

Outline of Presentation

- Profile of Metro Manila
- Background on Metropolitan Manila Development Authority (MMDA)
- Application of Geospatial Analysis in Planning and Policy Formulation in:
  - Traffic Management
  - Flood Control and Management
  - Public Safety
- Metro Manila GIS Database Project
- Conclusions


METRO MANILA
PHILIPPINES

Metro Manila at a *Glance*

Composition 17 Local Government Units

Land Area 636 km²
(0.2% of the country's total land area of 300,000 km²)

2015 Population
15 Million (Day time)
12.8 Million (Census Population)
(12.75% of the country's total population of 100,981,437)

Male - 6,368,356

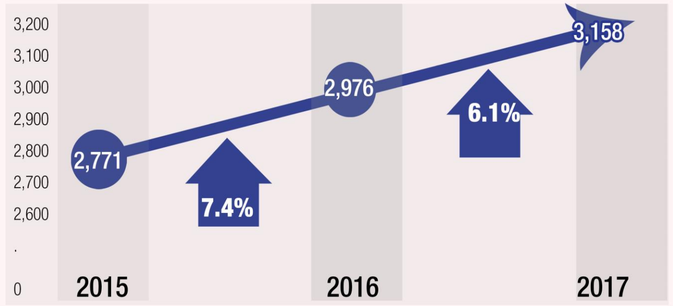
Female - 6,508,888

Population Density
20,785 persons per km²
(compared with the country's 337 persons per km²)

ECONOMIC PERFORMANCE

2015 -2017 Gross Regional Domestic Product (GRDP) At Constant 2000 Prices (in Billion Pesos)

GRDP is the aggregate of gross value added (GVA) of all resident producer units in the region

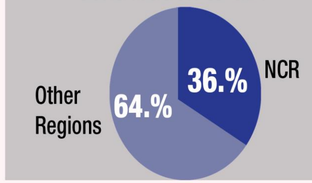


Per Capita GDP

= ₱ /

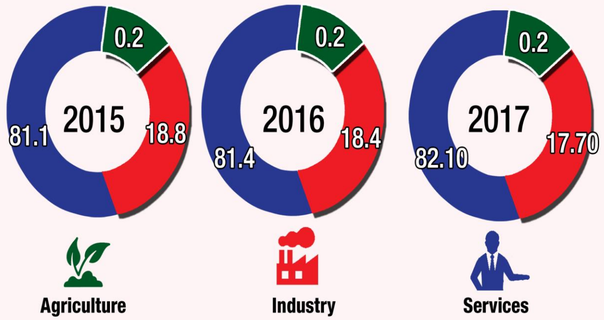
PhP 244,453.00

Contribution to GDP



GRDP by Industrial Origin

Percentage Distribution by Major Sector, 2015-2017



GRDP by Industrial Origin

Percent Distribution by Sub-Sector at Constant 2000 Prices, 2017

AGRICULTURE, HUNTING, FORESTRY AND FISHING – 0.2%

Agriculture and Forestry	Fishing
0.2%	0%

INDUSTRY SECTOR – 17.7%

Construction	Manufacturing	Electricity, Gas and Water Supply	Mining and Quarrying
2.3%	12.4%	2.9%	0%

SERVICE SECTOR – 82.1%

Public Administration and Defense	Trade and Repair	Real Estate, Renting and Business Activities
5.6%	29.5%	17.8%

Financial Intermediation	Transportation, Storage and Communication	Other Services
10.7%	5.7%	12.8%

LABOR AND EMPLOYMENT, 2017

Labor Force Participation Rate	Employment Rate	Unemployment Rate	Underemployment Rate
61.1	92.6	7.4	9.3

FAMILY INCOME AND EXPENDITURE, 2015

Poverty Incidence Among Families

*The proportion of families/individuals with per capita income less than the per capita **Poverty Threshold** to the total number of families/individuals*

4.5%

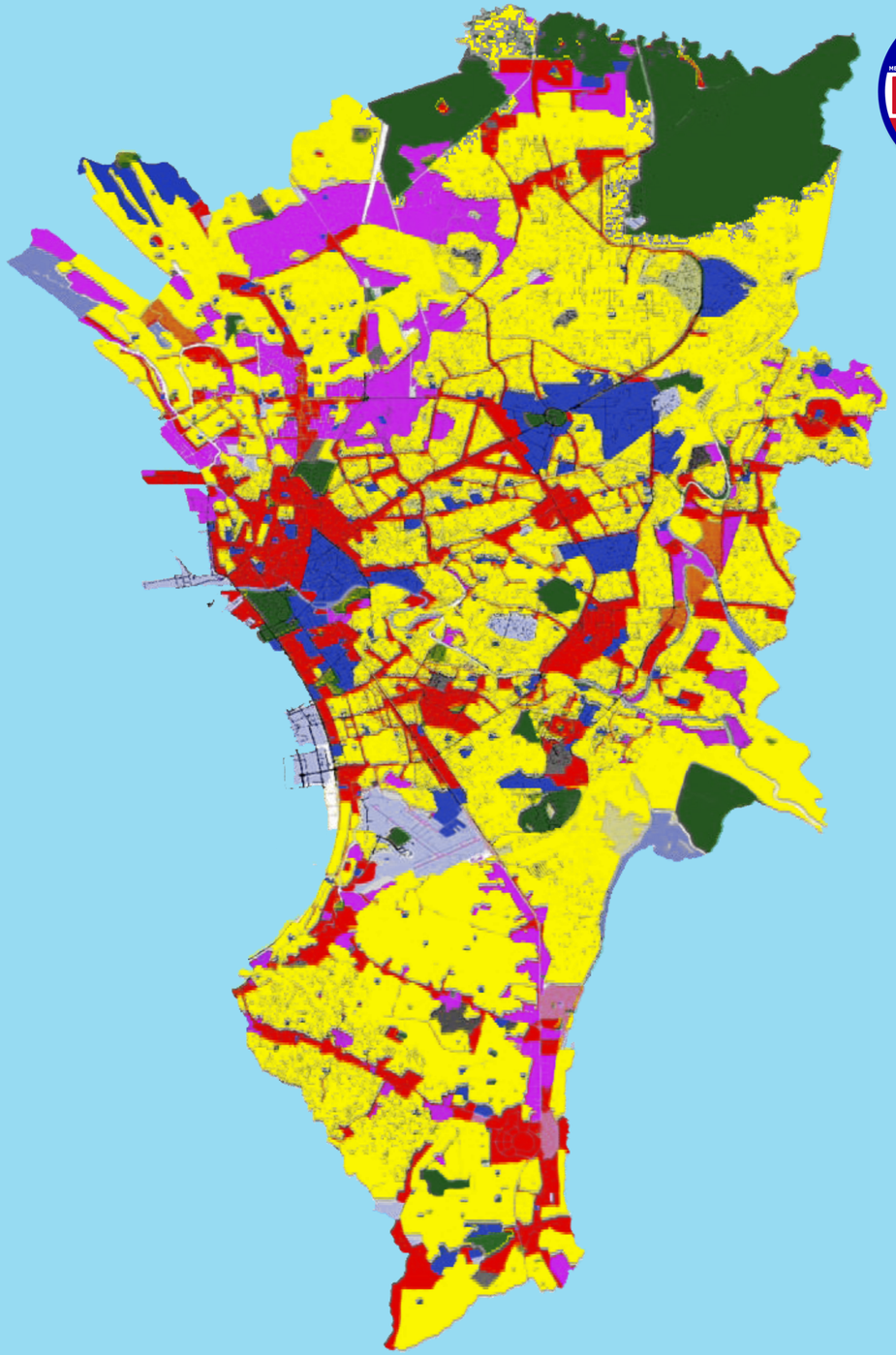
Subsistence Incidence Among Families

*The proportion of families/individuals with per capita income less than the per capita **Food Threshold** to the total number of families/individuals*

1.2%

METRO MANILA LAND USE PATTERN	
Institutional	6.90%
Industrial	7.62%
Commercial	12.22%
Open Space, Parks, and Roads	28.43%
Residential	44.83%

Source : 2006 METRO MANILA LAND USE FROM MMEIRS STUDY



Metropolitan Manila Development Authority

(Republic Act 7924)

MMDA shall perform planning, monitoring, coordinating, and implementing functions, and exercise regulatory and supervisory authority over delivery of metro-wide services

Metropolitan Manila is treated as a special development and administrative region subject to the direct supervision of the President

MANDATES


FLOOD CONTROL AND SEWERAGE MANAGEMENT
PUBLIC SAFETY
SOLID WASTE DISPOSAL AND MANAGEMENT
DEVELOPMENT PLANNING
URBAN RENEWAL, ZONING AND LAND-USE PLANNING
HOUSING AND SHELTER SERVISES
HEALTH AND SANITATION, URBAN PROTECTION AND POLLUTION CONTROL
TRANSPORT AND TRAFFIC MANAGEMENT
Geo Spatial Analysis of Data/Information for Planning and Policy Formulation

MMDA Command, Control and Communications Center (METROBASE)

HIGH DEFINITION CCTV CAMERAS

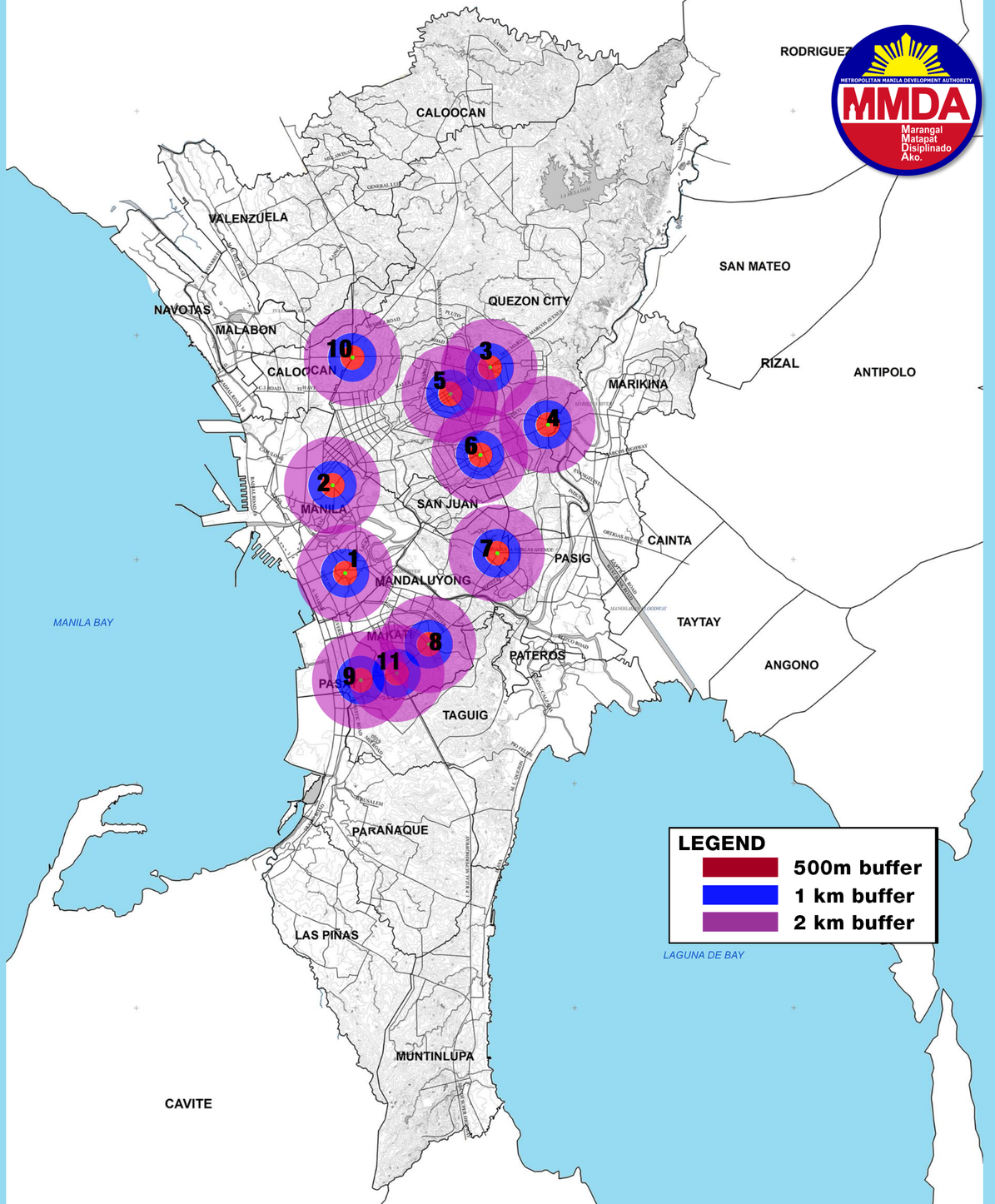
TRAFFIC SIGNALIZATION SYSTEM

400 CCTV CAMERAS LINKED TO THE METROBASE

423 UPGRADED TO DIGITAL PLATFORM-BASED SYSTEM OUT OF 441 ANALOG TRAFFIC SIGNAL SYSTEM BEING MONITORED AT THE METROBASE

Metro Manila Traffic Crisis Management Protocol

- Using geospatial analysis, eleven (11) Traffic Zones were identified:
  - critical areas in times of calamity
  - common areas for special events/occasions
  - areas prone to road users' conflicts
- Traffic Code depending on traffic impact from incident point:
  - RED - 500 meter radius
  - BLUE - 1 km meter radius
  - VIOLET - 2 km radius



PROJECT/POLICY TRAFFIC IMPACT EVALUATION USING VISUAL SIMULATION SOFTWARE (VISSIM):

A traffic pattern simulation tool which shows possible traffic impact of a project or a policy in terms of travel time, travel speed and level of service.

Simulation of proposed traffic signal on an intersection along Quezon Ave., Quezon City using VISSIM

COMPARATIVE ANALYSIS BASED ON SIMULATION

PROPOSED SCHEME

AM PEAK

TRAVEL TIME *(hh:mm:ss)*			
DIRECTION	**EXISTING**	**PROPOSED SCHEME**	**REMARKS**
Along Quezon Ave. From Wes Ave. To EDSA	03:46.6	03:38.0	4 % DECREASE
Along Quezon Ave. From EDSA to West Ave.	10:41.7	09:37.0	10 % DECREASE
AVERAGE	07:14.2	06:37.5	8 % DECREASE

TRAVEL SPEED *(kph)*					
DIRECTION	**EXISTING**	**LEVEL OF SERVICE**	**PROPOSED SCHEME**	**LEVEL OF SERVICE**	**REMARKS**
Along Quezon Ave. From Wes Ave. To EDSA	20.323	D	21.121	D	4 % INCREASE
Along Quezon Ave. From EDSA to West Ave.	7.172	F	7.977	F	11 % INCREASE
AVERAGE	13.747	E	14.549	E	6 % INCREASE

CAUSES OF TRAFFIC CONGESTION

METROPOLITAN MANILA DEVELOPMENT AUTHORITY
MMDA
Marangal Matapat Disiplinado Ako.

DAILY TRAFFIC COST IN NCR IS
PHP2.4 BILLION
AND WILL REACH UP TO
PHP6 BILLION (BY 2030)
IF NOTHING IS DONE TO REMEDY THE SITUATION.

METRO MANILA ROAD NETWORK

*SOURCE: DPWH ATLAS

LENGTH KILOMETER

	SHARES%	
PRIMARY ROAD	170.43 (14.70%) 2016	ROADS THAT CONNECT MAJOR CITIES WITH POPULATION OF LEAST 100,000
	170.36 (14.81%) 2015	
SECONDARY ROADS	392.05 (33.83%) 2016	OTHER ROADS WHICH COMPLEMENT WITH NATIONAL PRIMARY ROADS TO PROVIDE ACCESS TO MAIN POPULATION AND PRODUCTION CENTERS OF THE COUNTRY
	387.90 (33.37%) 2015	
TERTIARY ROADS	597.52 (51.47%) 2016	OTHER EXISTING ROADS UNDER DPWH WHICH PERFORM A LOCAL MAP.
	591.80 (51.46%) 2015	
TOTAL	1,159.01 (100%) 2016	
	1,150.07 (100%) 2015	

HIGH POPULATION DENSITY OF 20,785 PERSONS/SQUARE KILOMETER COMPARED WITH THE COUNTRY'S 337

RAPID GROWTH AND URBANIZATION

12.9 MILLION
(POPULATION - CENSUS 2015)
MORE THAN 15 MILLION (DAY TIME POPULATION - ESTIMATED 2015)


Presence of road-right-of way obstructions such as illegally parked vehicles and illegal vendors

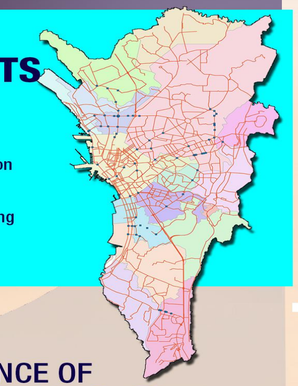
STALLED VEHICLES 2017
4,871

PROLIFERATION OF ILLEGAL PARKED VEHICLES 2017

TOWED UNATTENDED VEHICLES	5,913
ISSUED WITH VIOLATION TICKETS	24,367
TOTAL:	30,280
	2017

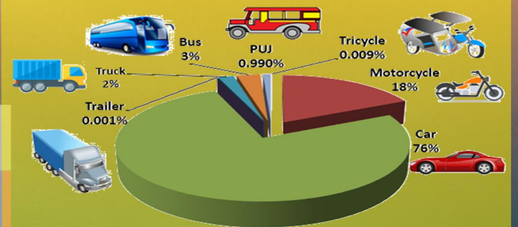
MAXIMUM CARRYING CAPACITY OF EDSA
6,000 VEHICLES PER HOUR PER DIRECTION
MAXIMUM CARRYING CAPACITY
6,800 VEHICLES PER HOUR PER DIRECTION
CURRENT SITUATION

77 TRAFFIC CHOKEPOINTS
either merging traffic, splitting traffic, u-turning/left-turning/ right turning vehicles or simply "no parking" provision forcing vehicles to momentarily park or go around the area while waiting especially in the case of school zone.



PRESENCE OF
15 MALLS
ALONG EDSA

MAJORITY **(90%)** OF THE VEHICLES IN EDSA ARE FROM PRIVATE INDIVIDUALS



WHAT COMPOSES EDSA TRAFFIC?

PRESENCE OF
46 OUT OF 85 PROVINCIAL
(EDSA-CUBAO–27 & EDSA-PASAY 19)
TERMINALS IN METRO MANILA

OCCURRENCE OF TRAFFIC ACCIDENTS

MOTORIST` UNDISCIPLINED DRIVING BEHAVIOR

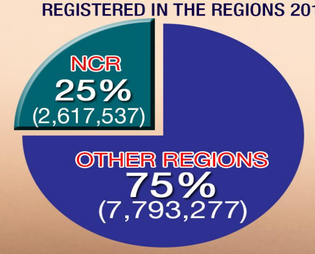
	2015	2016	2017
FATAL	1.42	1.11	1.16
NON-FATAL	46.86	43.38	42.48
DAMAGE TO PROPERTY	213.68	242.63	257.80
AVERAGE DAILY	262	299	301.44

PERCENTAGE OF ACCIDENT OCCURRENCE PER VEHICLE CATEGORY

VEHICLE CATEGORY	% OF ACCIDENT 2015	2016	2017
CAR	49%	51%	49%
MOTORCYCLE	11%	11%	13%
TAXI	5%	5%	4%
TRUCK	9%	10%	10%
PUJ	6%	5%	6%
BUS	4%	5%	5%
OTHERS	16%	13%	13%

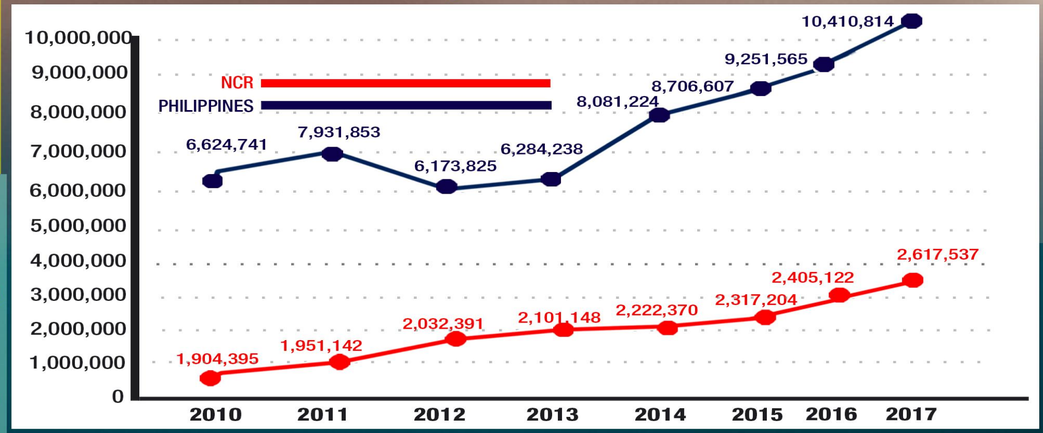
HIGH VOLUME OF VEHICLE REGISTRATION IN THE NCR

PERCENTAGE SHARE OF THE NUMBER OF MOTOR VEHICLES REGISTERED IN THE REGIONS 2017



PHILIPPINES
10,410,814 (TOTAL)
Of the total registration in the Philippines (10.4 Million), 25% (2.6 Million) are in NCR.

NUMBER OF VEHICLE REGISTRATION PHILIPPINES AND NCR, 2010 – 2017



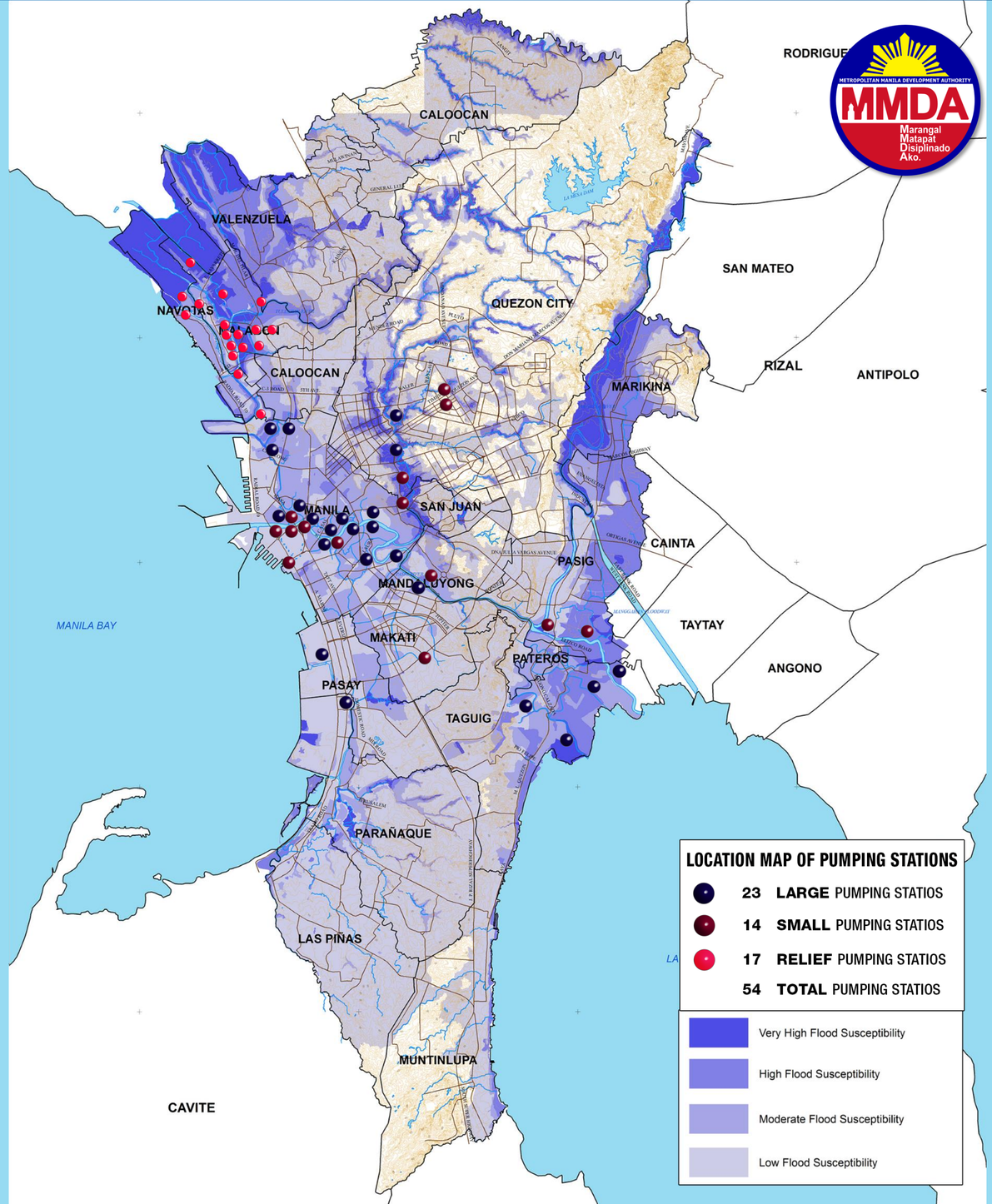
DRONES

- Aerial monitoring during national events, traffic gridlock, flood situations and emergency response
- Assess the damage caused by disasters such as flood and other calamities
- Monitor waterways that needs to be dredged, de-silted or de-clogged during the “Estero Blitz” Program
- Map-out areas to a large extent

Note: Currently, MMDA has four (4) drones.

PUMPING STATION

Flood facilities that facilitate the draining of flood waters when the water elevation at Manila Bay or Pasig River is high due to high tide and/or excessive rains.



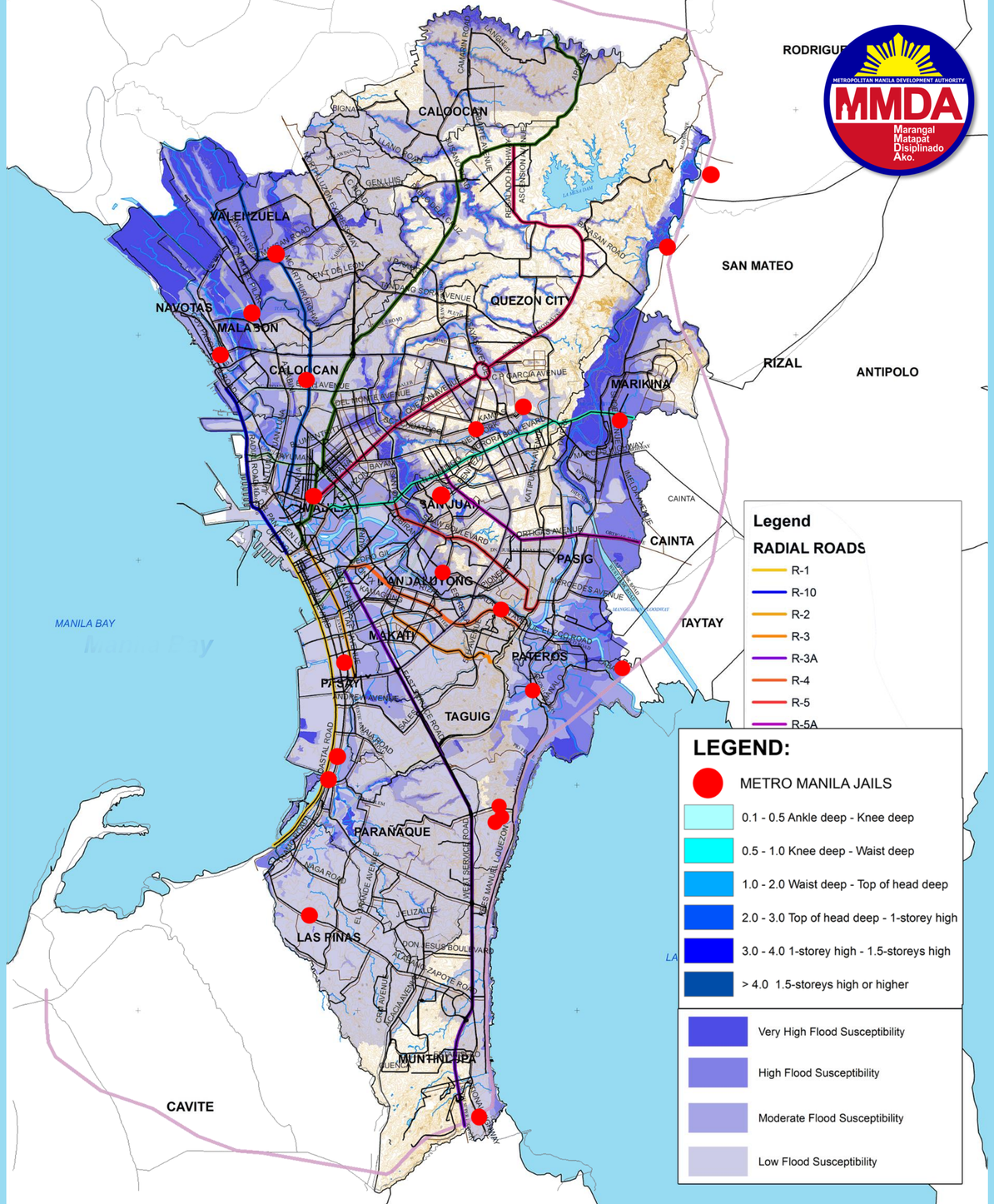
HAZARD MAPS

- GROUND SHAKING
- LIQUEFACTION
- STORM SURGE
- TSUNAMI
- RAIN-INDUCED LANDSLIDE
- FLOOD

OVERLAY OF HAZARD MAPS TO IDENTIFY VULNERABILITY AND POTENTIAL DAMAGE

- Road Network
- Critical Support Facilities

- Basis for the preparation of Operational Plans (OPLAN)
- Aids/guides decision making on the appropriate intervention in terms of identifying the required resources and their locations in the most strategic and less vulnerable sites.

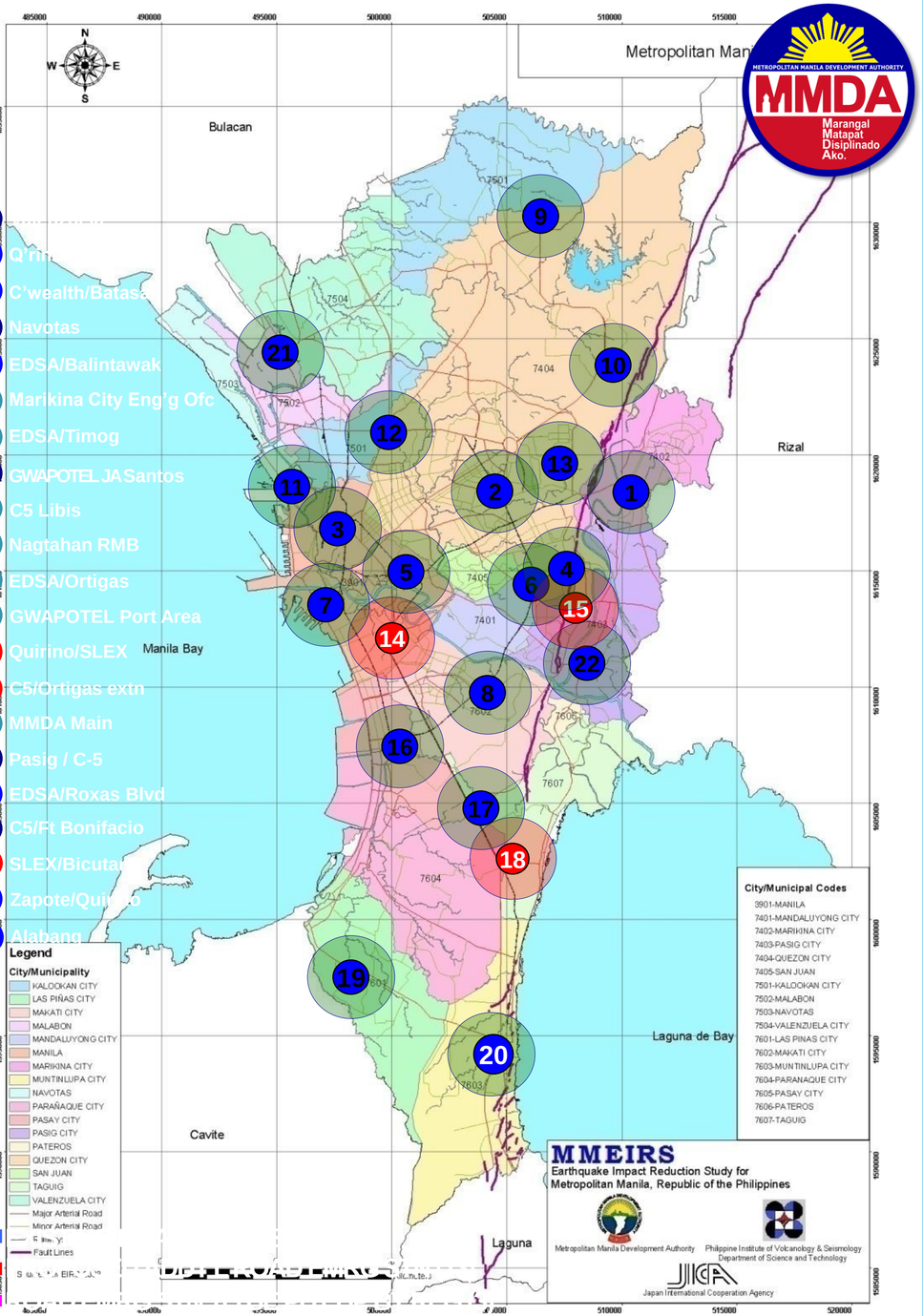


DRETFSUs

The disaster response equipment and tools field storage units or DRETFSUS are deployed near the high risk areas to make them accessible to communities.

CONTENTS:

- Hand Tools
- Digging Tools
- Lifting Tools
- Cutting Tools
- Lighting Tools
- Shelter Material



METRO MANILA GIS DATABASE PROJECT

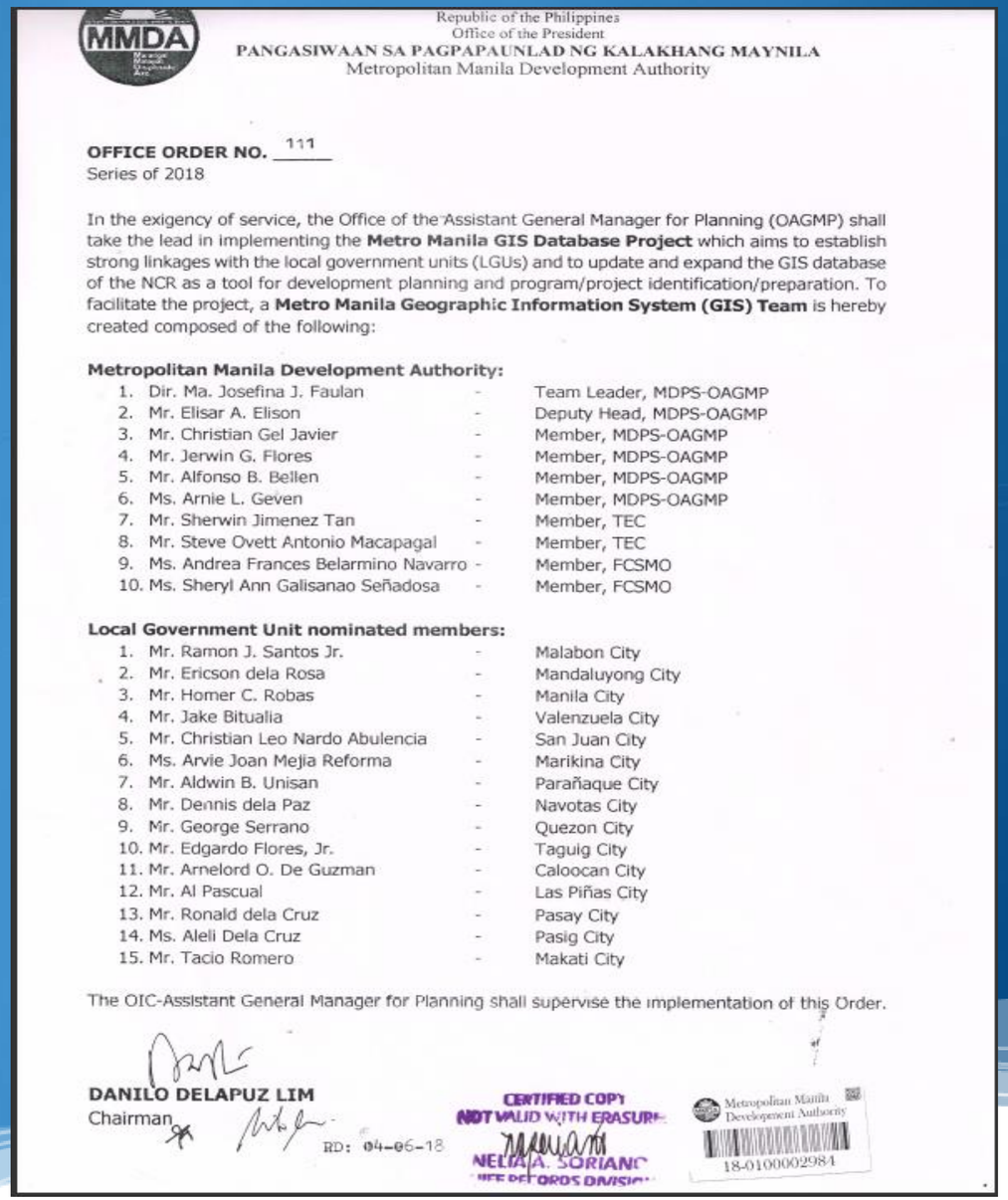
Objectives:

- To update and expand the existing GIS database of Metro Manila to improve development planning and program/project identification/ preparation;
- To establish strong linkages between MMDA, local government units (LGUs), and relevant regional line agencies to further develop and promote coordination in various development works in Metro Manila for database expansion;
- To capacitate the Metro Manila GIS Team and other representatives thru training seminars which are relevant to GIS; and
- To establish a protocol on data sharing of GIS common datasets among the stakeholders

Major Activities

- **Metro Manila Geographic Information System (GIS) Team**

MMDA led the organization of Metro Manila GIS Team through an Office Order signed by Chairman Danilo Delapuz Lim composed of representatives from Metro Manila LGUs nominated each by the LGUs themsevesand MMDA technical staff coming from Traffic Engineering Center, Flood Control, and Planning Office



Republic of the Philippines
Office of the President
PANGASIWAAN SA PAGPAPAUNLAD NG KALAKHANG MAYNILA
Metropolitan Manila Development Authority

OFFICE ORDER NO. 111
Series of 2018

In the exigency of service, the Office of the Assistant General Manager for Planning (OAGMP) shall take the lead in implementing the **Metro Manila GIS Database Project** which aims to establish strong linkages with the local government units (LGUs) and to update and expand the GIS database of the NCR as a tool for development planning and program/project identification/preparation. To facilitate the project, a **Metro Manila Geographic Information System (GIS) Team** is hereby created composed of the following:

Metropolitan Manila Development Authority:

1. Dir. Ma. Josefina J. Faulan	-	Team Leader, MDPS-OAGMP
2. Mr. Elisar A. Elison	-	Deputy Head, MDPS-OAGMP
3. Mr. Christian Gel Javier	-	Member, MDPS-OAGMP
4. Mr. Jerwin G. Flores	-	Member, MDPS-OAGMP
5. Mr. Alfonso B. Bellen	-	Member, MDPS-OAGMP
6. Ms. Arnie L. Geven	-	Member, MDPS-OAGMP
7. Mr. Sherwin Jimenez Tan	-	Member, TEC
8. Mr. Steve Ovett Antonio Macapagal	-	Member, TEC
9. Ms. Andrea Frances Belarmino Navarro	-	Member, FCSMO
10. Ms. Sheryl Ann Galisanao Señadosa	-	Member, FCSMO

Local Government Unit nominated members:

1. Mr. Ramon J. Santos Jr.	-	Malabon City
2. Mr. Ericson dela Rosa	-	Mandaluyong City
3. Mr. Homer C. Robas	-	Manila City
4. Mr. Jake Bitualia	-	Valenzuela City
5. Mr. Christian Leo Nardo Abulencia	-	San Juan City
6. Ms. Arvie Joan Mejia Reforma	-	Marikina City
7. Mr. Aldwin B. Unisan	-	Parañaque City
8. Mr. Dennis dela Paz	-	Navotas City
9. Mr. George Serrano	-	Quezon City
10. Mr. Edgardo Flores, Jr.	-	Taguig City
11. Mr. Arnelord O. De Guzman	-	Caloocan City
12. Mr. Al Pascual	-	Las Piñas City
13. Mr. Ronald dela Cruz	-	Pasay City
14. Ms. Aleli Dela Cruz	-	Pasig City
15. Mr. Tacio Romero	-	Makati City

The OIC-Assistant General Manager for Planning shall supervise the implementation of this Order.

DANILO DELAPUZ LIM
Chairman

RD: 04-06-18

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NELIA A. SORIANO
RECORDS DIVISION

Metropolitan Manila Development Authority
18-0100002984

Major Activities

- **Updated GIS software**

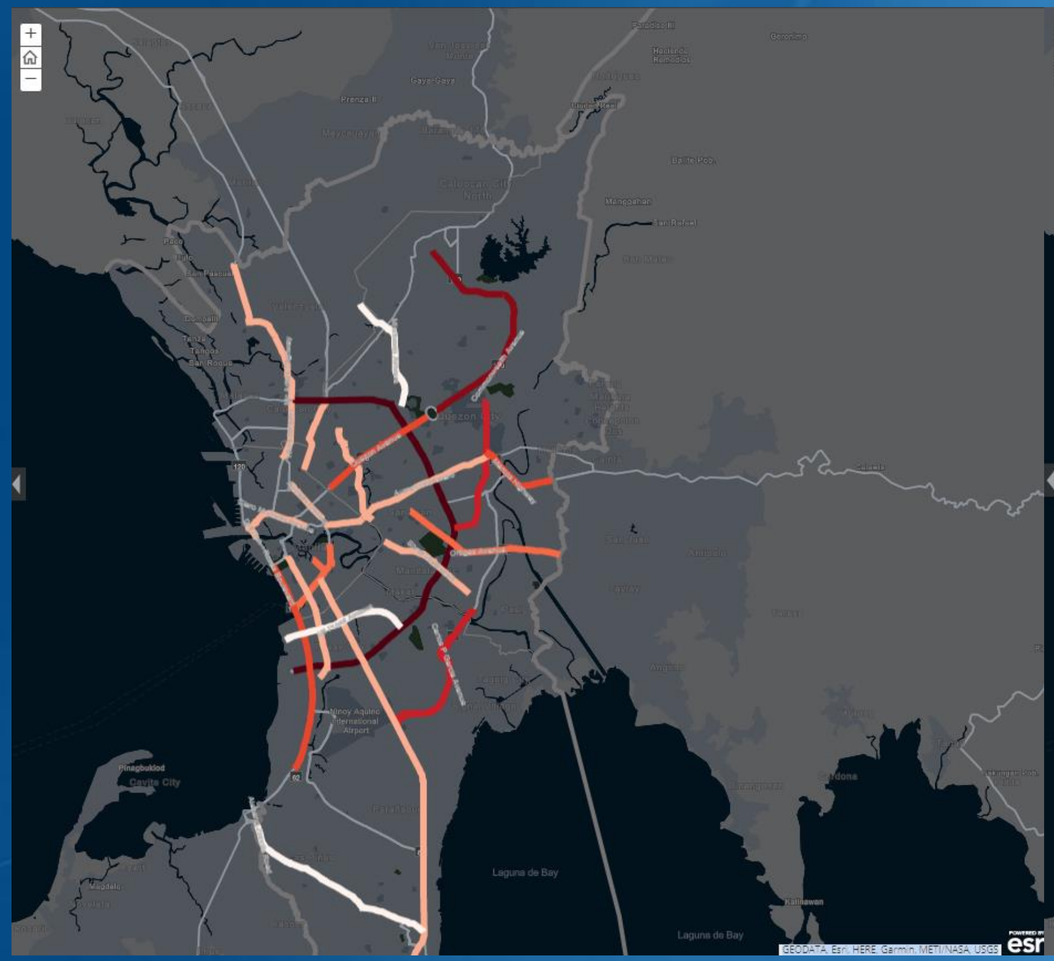
  MMDA purchased the latest GIS software (ArcGIS 10.5 with perpetual license) from Geodata Systems Technology, Inc. last July 30, 2018

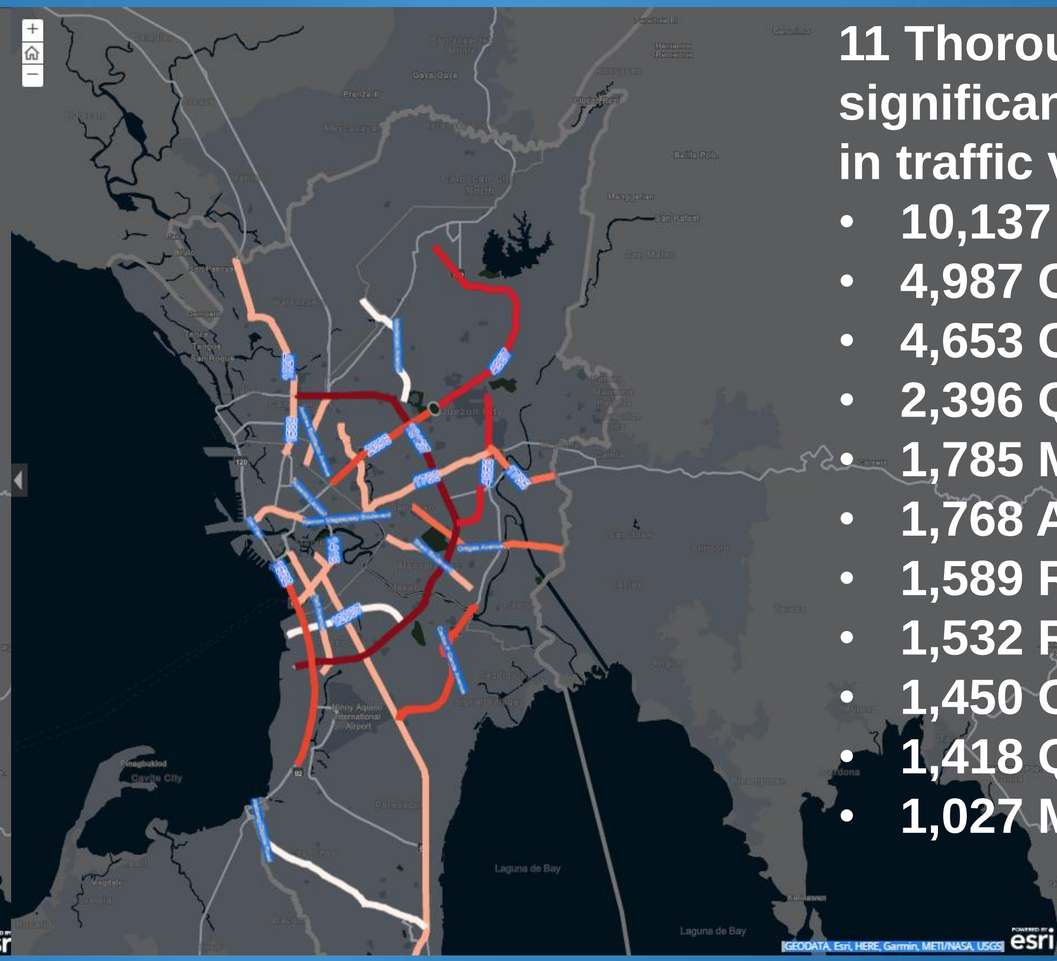
- **Upgrading of GIS Work Station -** *ongoing*:
  - 6 units Desktop, 1 unit plotter, and 3 printers *(programmed purchase from the project)*
  - 3 units Desktop, 1 unit LED TV (for map viewing and presentation), and DSL connection solicited from Globe Telecom
  - Solicited support from Globe Telecom for:
    - ✓ Dedicated bandwidth internet speed
    - ✓ Two (2) units of Desktop
    - ✓ One (1) unit LED TV for map viewing and presentation

❑ Capacity Building

The MMDA, in partnership with the Geodata Systems Technology Inc., conducted two (2) training batches: i) March 13 & 14: A Hands-On Basic Training on GIS Operation and ii) March 16, 2018: Building and Managing Metro Manila GIS Database

STUDY THE IMPLEMENTATION OF FLEXIBLE WORKING HOURS FOR GOVERNMENT WORKERS IN METRO MANILA USING GIS





11 Thoroughfares with significant decrease in traffic volume

- 10,137 EDSA
- 4,987 Commonwealth
- 4,653 C5 Katipunan
- 2,396 Quezon Ave.
- 1,785 Marcos HW
- 1,768 Aurora Blvd
- 1,589 Rizal Ave
- 1,532 Roxas Blvd
- 1,450 Gil Puyat (Buendia)
- 1,418 Quirino Ave.
- 1,027 McArthur

WITHOUT 4-DAY WORK WEEK AND FLEXI TIME

WITH 4-DAY WORK WEEK AND FLEXI TIME

Metro Manila Development Authority

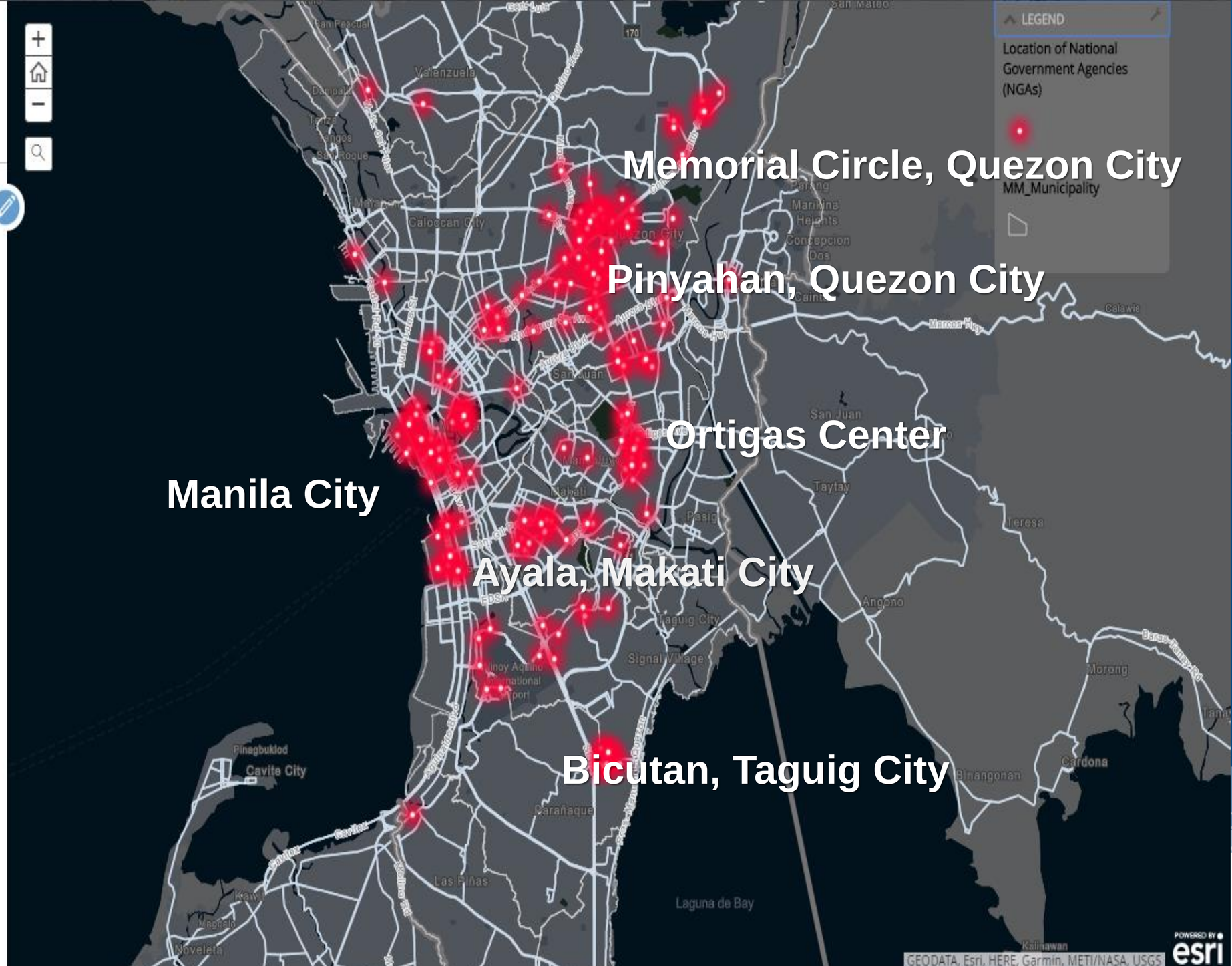
Presidential Directive:
MMDA to Study the Implementation of a Flexible Working Hours Policy for

Location of National Government Agencies (NGAs) in Metro Manila

MMDA initially mapped-out 215 National Government Agencies (NGA) spread all over Metro Manila.

The map shows only the location of main/central offices and does not include their satellite offices.

ADD SECTION ORGANIZE



Metro Manila Development Authority

Presidential Directive:
MMDA to Study the Implementation of a Flexible Working Hours Policy for

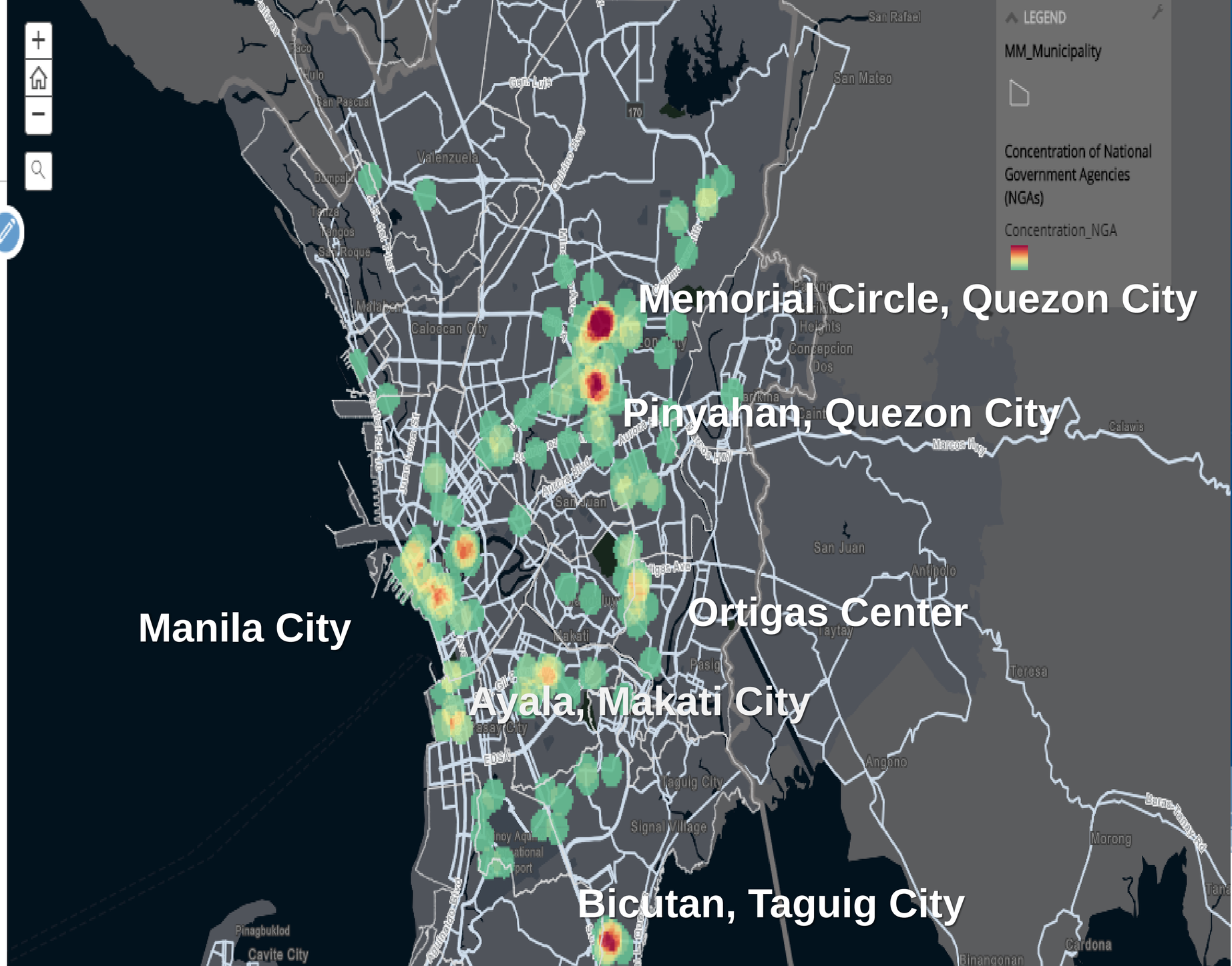
Concentration of National Government Agencies (NGAs) in Metro Manila

Looking at the map, the
Red areas signify a high concentration of NGAs.
Orange areas signify a medium concentration of NGAs.
Yellow areas signify a low concentration of NGAs.
Green areas signify a normal concentration of NGAs.

National Government Agencies (NGAs) are concentrated mostly at the heart of Metro Manila particularly in the areas of Quezon City along Memorial Circle (QCMC), Pinyahan, and Batasan; Pasig City along Ortigas Center; along Manila City, Makati City in Ayala and Taguig City mainly along Bicutan.

Actually, government agencies with the most number of personnel are found in the offices of :

Department of Education (DepEd), Supreme Court of the Philippines (SC), Bureau of Fire Protection (BFP), Philippine National Police (PNP), Bureau of Internal Revenue (BIR), Commission on Audit (COA), Metropolitan Manila Development Authority (MMDA), Department of Public



CONCLUSIONS

- ✓ DATA STATISTICS aids analysis to empower development planners to make informed policy decisions, formulate development plans and identify/prioritize targeted interventions that will produce greater impacts for the people and their community.

- ✓ Applying and integrating geo-spatial analysis will put a “face” on the numbers.

- ✓ Combining statistics and geo-spatial analysis will create an enabling **environment that will provide visuals to establish an open and inter-operable platforms for source and targeted information.**

METROPOLITAN MANILA DEVELOPMENT AUTHORITY

MMDA

Marangal
Matapat
Disiplinado
Ako.

Thank You

Integrating Statistics and Geospatial information II: The Case of MMDA

SOCIAL MEDIA FOR PUBLIC INTERACTION AND ONLINE PLATFORMS TO PROMOTE PUBLIC INFORMATION DISSEMINATION

- Facebook and Twitter
- Metro Manila Traffic Navigator + WAZE
- Road Accident Alert Application
- Pasig Ferry Applications
- Friendtrip Applications
- www.mayhuli.com (traffic apprehension check)