An Inventory and Assessment of National Urban Mobility in the Philippines

A Project of the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH in collaboration with the Philippine Department of Transportation (DOTr)

Contents

List Of Acronyms and Abbreviations

AADT	Annual average daily traffic
ADB	Asian Development Bank
ADEME	l'Agence de l'Environnement et de la Maitrise de l'Energie
AFD	French Development Agency
AIP	Annual investment plans
BCDA	Bases Conversion and Development Authority
BMUB	Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB)
BRT	Bus rapid transit
CC	Component city
CDP	Comprehensive Development Plan
CENRO	City Environment and Natural Resources Office
CEO	City Engineers' Office
CEREMA	Centre d'études et d'expertise sur les risques, l'environnement, la mobilité et l'aménagement
CH4	Methane
CLUP	Comprehensive Land Use Plan
CO2	Carbon dioxide
CODATU	Coopération pour le Développement et l'Amélioration des Transport Urbains et Périurbains
CPDO	City Planning and Development Office
CPSO	City Public Order and Safety Office
CPTS	Comprehensive Public Transport Strategy
CTTMO	City Transport And Traffic Management Office
DILG	Department of Interior and Local Government
DILG	Department of Interior and Local Government
DOTC	Department of Transportation and Communications
DOTr	Department of Transportation
DPWH	Department of Public Works and Highways
ECAP	Energy and Clear Air Project
GDP	Gross domestic product
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
HLURB	Housing and Land Use Regulatory Board
HPG	Highway Patrol Group
HUC	Highly urbanized city
I-ACT	Inter-agency Council for Traffic
ICC	Independent Component City
IRA	Internal Revenue Allotment
JBIC	Japan Bank for International Cooperation
JICA	Japan International Cooperation Agency
JUMSUT	JICA Update on Manila Study on Urban Transport
km	kilometer
LCP	League of Cities in the Philippines
LCV	Light commercial vehicles

LGU	Local government unit
LPTRP	Local Public Transport Route Planning
LRTA	Light Rail Transit Authority
LTFRB	Land Transportation Franchising and Regulatory Board
LTO	Land Transportation Office
LVC	Land value capture
MARINA	Maritime Industry Authority
MCDP	Metro Cebu Development Project
MCLUTS	Metro Cebu Land Use and Transport Study
MMDA	Metro Manila Development Authority
MMETROPLAN	Metro Manila Transport, Land Use and Development Planning Project
MMPTPSS	Mega Manila Public Transport Planning Support System
MMPTS	Mega Manila Public Transport Study
MMUTIP	Metro Manila Urban Transport Improvement Project
MMUTIS	Metro Manila Urban Transport Integration Study
MMUTSTRAP	Metro Manila Urban Transportation Strategy Planning Project
MRT3	Metro Rail Transit Line 3
MTPDP	Medium Term Philippine Development Plan
MUCEP	MMUTIS Update and Capacity Enhancement Project
MYC	MobiliseYourCity
N2O	Nitrous oxide
NCCAP	National Climate Change Action Plan
NEDA	National Economic and Development Authority
NESTS	National Environmentally Sustainable Transport Strategy
NGA	National government agency
NIP	National Implementation Plan for Environmental Improvement in the Transport Sector
NMT	Non-motorized transport
NRSAP	National Road Safety Action Plan
NTP	National Transport Policy
NTPP	National Transport Plan and Policy
NUDHF	National Urban Development and Housing Framework
NUMP	National Urban Mobility Policies or Programmes
OTC	Office of Transportation Cooperatives
OTCA	Overseas Technical Cooperation Agency
P2P	Point-to-point bus service
PDP	Philippine Development Plan
PKM	Passenger-kilometer
PKT	Passenger-kilometer traveled
PNP	Philippine National Police
PNR	Philippine National Railways
PPP	Public-private partnership
PSA	Philippine Statistics Authority
RMC	Route measured capacity

RTR	Rapid Transit Railway
RTRS	Road Transport Rationalisation Study
sq km	square kilometer
SUMP	Sustainable Urban Mobility Plan
TDM	Travel demand management
TRB	Toll Regulatory Board
UP-NCTS	University of the Philippines--National Center for Transportation Studies
UTDP	Urban Transport Development Plan
UTSMMA	Urban Transport Study in Manila Metropolitan Area
UV	Utility vehicles
VKM	Vehicle-kilometer traveled
WHO	World Health Organization

Executive Summary

Cities are important.

Cities in the Philippines are growing at an unprecedented pace. The World Bank estimates that by 20150 more than 65% of the Phillipine population will live in cities, up from 45% today. The Philippines currently has 145 cities, of which 33 are classified as 'Highly Urbanized Cities (HUCs)'. These cities also play a vital role supporting our economy, generating more than 70% of our national income.

Current transport challenges in cities

Transport forms an important part of the urban daily life, with the movement of people and of goods being essential to meet the social and economic needs of residents and of the economy. Transport is also an area which generates a number of undesirable impacts. These include congestion, which is estimated to cost the economy more than 3.5 billion pesos daily in lost productivity, time and unnecessary vehicle costs.

The transport sector is also a major polluter, contributing 76% to total particulate matter (PM10) emissions and exposing people to dangerous concentration levels. The Department of Environment and Natural Resources (DENR) announced in 2017 that it considers transport-related air pollution to be the biggest environmental health threat facing the country. Then, there are also the greenhouse gas emissions which contribute to global warming. The Second National Communications to the UNFCCC reported a total of 24 $MtCO_2e$ from the transport sector (37% of total GHG emissions), and based on motorization trends, the resulting GHG emitted by vehicles would grow by 2.2% per year.

In addition, there are road safety issues in transport along with their social and economic costs. Pedestrians are the third most affected by road safety issues, comprising 19% of total road traffic deaths (WHO 2014), while motorized 2- and 3-wheelers comprise 53% (Note: motorcycles are 16% of average daily traffic while cars and goods vehicles are 26% and 27% respectively).

Finally, making provision for the transport sector comes at a high cost in terms of city space allocated to it, with roads, skyways and parking all detracting from the cityscape as a place for people. Metro Manila's road density, for instance, has reached 1.67 km/km^2 in National roads and 6.01 km/km^2 in local roads (Note: Singapore, which is comparable in size to Metro Manila, has 5 km/km^2 of roads, but has more expansive road and rail public transport).

Observed trends

If left alone, transport challenges in Philippine cities will continue if not worsen in the future. The pressures of a growing urban population and rising incomes will increase the rates of motorisation. This pertains to the rapid increase in the number of vehicles on the road as well as longer distances that people travel due to expanding cities. Vehicle density is increasing much faster than roads are being built or than the public transport system expands or improves its quality. In Metro Manila alone, vehicle density has reached 1,895 vehicles per kilometre of road (Singapore with a comparable density to Metro Manila has 230 vehicles/km). Nationally, this has reached 281 vehicles per kilometre of road.

By nature, space within cities is limited, so the ability to increase road-space for these vehicles is restricted, and further roadbuilding as a solution to congestion has proved to be ineffective in cities around the world, as this just encourages even more traffic.

Action needed

To meet these mobility challenges which our urban areas face requires a clear vision of what a well-functioning and sustainable transport system looks like. Having clear objectives and comprehensive support mechanism, set at the national level will assist cities implementing climate-friendly and sustainable urban mobility measures. This is the rationale behind the '**National Sustainable Urban Mobility Program'**.

'A National Sustainable Urban Mobility Program is a strategic, action-oriented framework for urban mobility, developed by national governments, enacted to enhance the capability of cities to plan, finance and implement projects and measures designed to fulfil the mobility needs of people and businesses in cities and their surroundings in a sustainable manner'

The figure overleaf sets out the proposed framework for the National Sustainable Urban Mobility Program for the Philippines.

This identified the **vision** which is to move **towards people-first cities empowered by efficient, dignified, and sustainable mobility**

Three **objectives** underpin the vision, namely the **social, environmental and economic** objectives. Within these areas, specific **targets** are set to permit the measuring and monitoring of performance against the objectives.

To deliver effective urban mobility requires action across key **thematic areas/components**. These include Non-Motorized transport, Public Transport and Freight. Travel Demand Management and Transit Oriented Development are also important mechanisms within the planners 'toolkit' to improve mobility in cities.

NATIONAL SUSTAINABLE URBAN MOBILITY PROGRAM VISION AND STRATEGY

SUPPORTED BY: giz TRANSfer

ON BEHALF OF: Federal Ministry for the Environment, Nature Conservation and Nuclear Safety

Mobilise Your City

Vision: Towards people-first cities empowered by efficient, dignified, and sustainable mobility.

Objectives

SOCIAL

A people-first approach which ensures inclusive, comfortable, safe and dignified access to public services

ENVIRONMENTAL

An urban transport system which reduces its negative impacts on the environment and on public health, towards healthy cities

ECONOMIC

An efficient, affordable and economically sustainable transport which supports economic vitality for the individual and for the city

Targets

(ADJUSTED BY BASELINE STUDY)

	2025	2030
Reduce road fatalities	FROM BASELINE	FROM 2022
Increase mass transit accessibility (including to express buses)	XX	XX
Decrease time spent in public transport	45 MINS	30 MINS

	2025	2030
Decrease GHG emissions per passenger km	-10%	-15%
Reduce local air pollution	FROM BASELINE	FROM 2025
Increase cycling trips	+100%	+300%

	2025	2030
Reduce national fuel expenditure	FROM BASELINE	FROM 2022
Decrease average congestion (mins/km)	6	5
Decrease % of transport in income spent on transport	10%	8%

Themes & Components

NON-MOTORIZED TRANSPORT

- Walking
- Cycle

PUBLIC TRANSPORT

- New Jeeps
- Bus
- Rail

URBAN FREIGHT

- Light Goods Vehicle
- Heavy Goods Vehicle
- Non-Motorized Freight

TRAVEL DEMAND MANAGEMENT

- Information
- Pedestrian Zones
- Road User Charging

TRANSIT ORIENTED DEVELOPMENT

- Land Use Planning
- Land Value Capture
- Urban Regeneration

With regard to the practical delivery of the National Sustainable Urban Mobility Program, four key **implementation levers** can be identified:

- **Governance**: defining the relationship between national and local government and identifying the most appropriate agencies and institutions to lead the implementation.
- **Finance**: Establishing the most appropriate mechanisms for financing the schemes and interventions, and identifying funding streams.
- **Capacity Development**: Ensuring that skills and resources are present and nurtured within the implementing agencies.
- **Technology**: Developing technical advances and solutions which support the program objectives.

Following diagnostic analysis of the status quo, the following headline recommendations are made in relation to specific actions required to support the successful implementation of the NUMP. (More detail is provided in the report body).

Governance

- A commitment to the devolving of urban transport planning responsibilities to the local level over the longer term as capacity levels are built up, reflecting the fact that urban transport is first and foremost a local issue
- A focus on greater integration between transport and land use planning at the local level
- A greater emphasis and consideration of NMT within the local planning framework
- Enhanced collaboration between the agencies involved in the planning and delivery of urban mobility

Budgeting and Finance

- Developing of clearly defined urban transport funding linkages between national and local government
- Creation of objective specific funding 'pots' at the national level, for which LGUs can apply to deliver local schemes within the objective remit
- A reprioritisation and re-balancing of national expenditure from 'big ticket' infrastructure schemes towards NMT and road based public transport facilities and supporting activities

Capacity Development

- Capacity development at the national government level through greater collaboration between the DOTr, DILG and HLURB
- Build on and consolidate the capacity development at the local government level using the channels established as part of the LPTRP training program
- Consolidate and enhance capacity promoting partnerships, with academic institutions and NGOs

Technology

- Promotion of innovation in the development and adoption of clean vehicle technologies through the provision of enhanced incentives to support leapfrogging as part of the PUV modernization program

- Develop an Action Plan for the promotion of Ultra-Low Emissions Vehicles
- Support the development of a roadmap for Fuel Economy Standards through support and collaboration with the DOE
- Strengthen Enforcement of Vehicle Emission Standards for both Private and Public Vehicles
- Increase LGU Capacity for GIS Application on Urban Transport Management Systems
- Implement GPS Monitoring Systems for Local Public Transport as Recommended in the LPTRP

1. Introduction

1.1. Background of the Study

The Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH was commissioned by the BMUB with the implementation of the project TRANSfer III - Facilitating the development of ambitious transport mitigation actions. In the Philippines, the project has supported the Government in the preparation and implementation of the jeepney reform programme (PUV Modernisation). Furthermore, the TRANSfer projects support the Department of Transportation (DOTr) in the development of a National Urban Mobility Programme (NUMP) that will support sub-national levels in implementing sustainable, climate-friendly transport solutions on the local level. This collaboration is supported by the global MobiliseYourCity Initiative, in which the Philippine Government became a member in 2017.

MobiliseYourCity is a globally operating partnership launched by the Governments of France and Germany and supported by the European Commission. Procurement of implementation services under MobiliseYourCity is individually conducted with funds disbursed mainly by Agence Française de Développement (AFD) and Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) through GIZ TRANSfer. Further technical implementation partners of MYC are Coopération pour le Développement et l'Amélioration des Transport Urbains et Périurbains (CODATU), the Centre d'études et d'expertise sur les risques, l'environnement, la mobilité et l'aménagement (CEREMA) and l'Agence de l'Environnement et de la Maitrise de l'Energie (ADEME). MobiliseYourCity supports national and local governments in emerging and developing countries in planning of sustainable urban mobility. Through its activities, MobiliseYourCity contributes to reduce Greenhouse Gas (GHG) emissions in urban transport and to foster development of inclusive, liveable and economically efficient cities. Key tools promoted by MYC to accomplish that are the development of National Urban Mobility Policies or Programmes (NUMP) and city-level Sustainable Urban Mobility Plans (SUMP) including financing schemes for urban transport. Partner countries and partner cities of MobiliseYourCity have recognized the global challenges on urban transport and committed to tackle these through adoption of common principles of sustainable urban mobility in their national and local development planning. Partner countries and partner cities participate in the MobiliseYourCity Community of Practice and they can receive technical assistance as well as may take part in capacitybuilding activities.

The MobiliseYourCity activity line National Urban Mobility Policies or Programmes (NUMP) distinguishes between NUMPs and Advanced NUMPs–each to be developed under the guidance and leadership of a contracted consultancy. Both policies fulfil the basic principles of sustainable urban mobility planning. While the development of a NUMP takes about 18 months, that of an Advanced NUMP takes 24 or more months, since it entails a more detailed elaboration of policy aspects, such as monitoring and reporting, institutional framework, budgeting and finance, capacity development, and transport technologies.

1.2. Objectives and Scope

This study provides a comprehensive inventory of the key areas relevant to NUMP work for the Philippines. Where data is available, the study provides an overview and analysis on the state and trends in Philippine transport, especially highlighting urban transport.

The specific objective of the inventory and assessment are as follows:

- to build on the first diagnosis of the elements provided by the module 2 "Mobilise Days."
- provide recommendations for NUMP Visioning and Goal-setting to:
    - develop the national vision for urban mobility
    - define the objectives of the National Urban Mobility Policy and;
    - provide strategic framework direction on using the various levers of action available (governance, financing, capacity building, technological choices, etc.) in the Philippines.

The inventory comprises of the following:

- Urban mobility situation in the country, including state of urbanisation, transport volumes, transport supply, passenger mobility, urban freight, transport externalities, road safety, gender aspects, and data availability.
- Urban mobility planning process on the national and local (city) level
- Links between urban mobility and other sectoral policies
- National policy framework for urban mobility

A follow-up assessment is provided on the following:

- Governance and regulation
- Budgeting and Finance
- Technical capacities, skills, and available guidance
- Infrastructure and technology

Finally, based on the status-quo analysis and diagnostic assessment, recommendations are made on the actions required to support the NUMP development and on the structure of the program as it enters the strategic phase of development.

1.3. Methodology

Rapid urbanization puts a strain on urban ecosystems, and increasing population pressed into a spatially-constrained urban area formed through mismanaged land use leads to reduced quality of life. In building a picture of urban mobility, this study summarizes mobility indicators into six components:

1. Mobility – Indicators that pertain to the characteristics of movement, including the travel demand, modal choice, and transport performance
2. Accessibility – refers to people's overall ability to reach services and activities, and therefore the time and money that people and businesses must devote to transportation. The quality of accessibility has tremendous direct and indirect impacts (Litman, 2014).
    - *Motor vehicle travel conditions*. Automobile travel speeds, affordability and safety.
    - Quality of other modes. Walking, cycling, public transit, telework, delivery services speeds, convenience, comfort, affordability and safety.

- Transport network connectivity. Density of paths and roadway connections, and therefore the directness of travel between destinations, plus the quality if connections between modes, such as the ease of walking and cycling to public transport stations.
- Land use proximity. Development density and mix, and therefore distances between activities.

3. Safety – Indicators of road safety including road traffic deaths and attributable causes
4. Economic – Economic indicators that determine travel demand including costs, but also economic impacts of transport such as jobs generated, land value
5. Energy – Indicators of transport energy intensity and efficiency
6. Environment and health – Transport environmental externalities such as air pollution and population exposure

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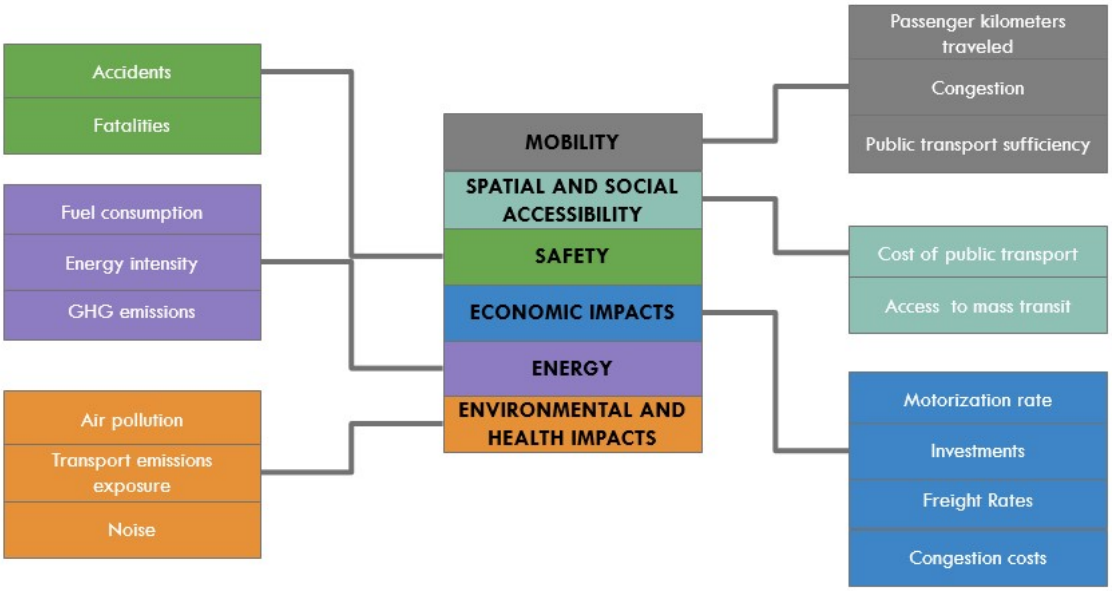


Figure 1. Overview of sustainable mobility indicators
Source: Authors' illustration

The MobiliseYourCity approach to monitoring and reporting proposes that participating cities track the development of transport related GHG emissions (CO_2, CH_4 and N_2O) at city-level rather than per-measure. The SUMPs form packages of measures that interact with each other and consequently have a bigger impact on emissions than the sum of single measures. MobiliseYourCity cities are therefore required to develop transport GHG emission inventories for their territory, i.e. direct emissions from mobile sources (tank-to-wheel)–cars, motorbikes, trucks, and buses–and indirect emissions from the use of electricity and potentially upstream emissions from fuels (well-to-tank). Accounting for upstream emissions from fuels is particularly relevant wherever measures in the territory affect the type of fuel that is consumed (Eichorst & Bongardt, 2017).

Emissions are estimated through four main parameters: (1) Activity, which pertains to the travel demand by mode of transport; (2) Structure, which pertains to the modal split and vehicle fuel split by trip purpose;

(3) Energy intensity, pertaining to the rate of energy consumption of each mode; and (4) Factor of Emissions, pertaining to the mode-specific emission rates. Each of the four parameters links directly to mobility indicators defined previously. The linkage between sustainable mobility and emissions is illustrated in Figure 2. In the succeeding section, mobility indicators are presented based on available data in the Philippines, hailing from both official data and published research.

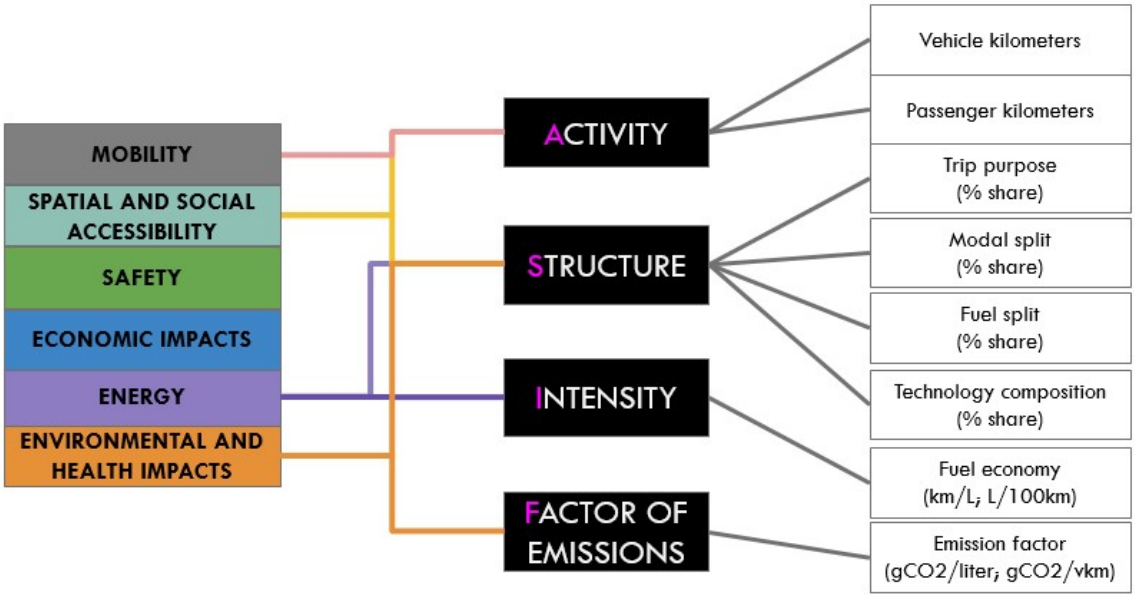


Figure 2. Mobility in the context of the ASIF framework
Source: Authors' illustration

2. Inventory and Assessment of Mobility Indicators

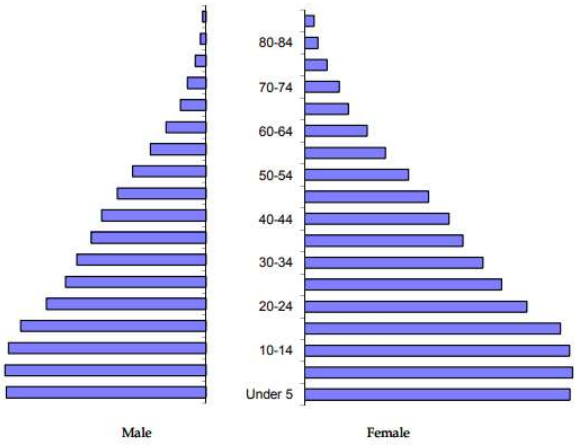
The aim of this chapter is to set the context within which the NUMP is being developed, describing the characteristics of the Philippines and how these relate to and influence the requirements of the NUMP. This chapter provides an overview of the sociodemographic and economic state of the Philippines, and the state of transport covering transport supply and demand as well as transport energy consumption and emissions.

2.1. Socio-demographic and economic accounts

The population of the Philippines had risen to 101 million persons as of 2015, averaging an annual growth of 1.84% for the 2000-2015 period (Philippine Statistics Authority, 2017). About half of the population are living in urban areas (Figure 3). The latest available age- and sex-disaggregated population data, the 2010 Census of Population and Housing,[1] also reveals that the country has a relatively young population, with 32% being under 15 years of age (

[1] Population censuses in the Philippines were conducted in 2000, 2010, and 2015.

) (Philippine Statistics Authority, 2017).



Planning for inclusive transport requires consideration of all population demographics, including age, gender, and income in planning for the future of mobility in cities.

There are also more females than males especially beyond the age group of 55 years old. It is estimated that there are 22.9 million households in the country.

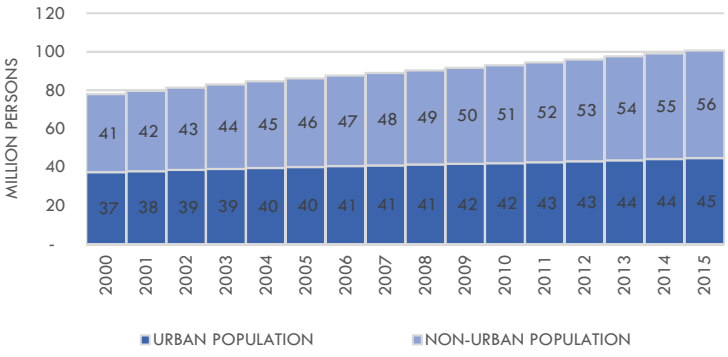


Figure 3. Philippine Population 2000-2015 (total, urban and non-urban)
Source: Philippine Statistics Authority

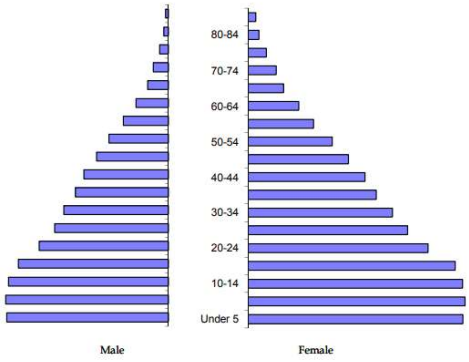


Figure 4. Population pyramid by Sex and Age Group (2010)
Source: Philippine Statistical Yearbook 2017

Based on Philippines' land area of approximately 300,000 sq km, the Philippines has a population density of 337 persons per square km. Metro Manila, which is comprised of 16 cities and 1 municipality, is by far the most densely populated region with 20,785 persons per sq km (Philippine Statistics Authority, 2017). The Philippines currently has three metropolitan centers:[2] Metro Manila or the National Capital Region, Metro Cebu, and Metro Davao. It is projected that, by 2025, Metro Cagayan de Oro will become the fourth metropolitan center (Philippine Statistics Authority, 2017).

As of 2017, there are 145 cities in the Philippines, 33 of which are considered highly-urbanized cities (HUC) (see Box 1). Four of these HUCs have a population of more than 1 million, namely, Quezon City, City of

[2] Based on population trends, service catchments, and economic activities.

Manila, Davao City and Caloocan City (Philippine Statistics Authority, 2017; National Economic and Development Authority, 2017).

The Philippine Statistics Authority (2018) estimated that, in 2017, gross domestic product (GDP) grew by 6.7%. Based on estimates by the National Economic Development Authority (NEDA), GDP in the Philippine has grown from 261.1 thousand to 745.3 thousand (in 2010 PPP USD). Despite economic growth and some increase in average household income, a large segment of the population still lives in poverty. With a poverty threshold of PHP 21,753 annual income, it was estimated that 16.5% of families fall below the poverty threshold while 11.5% of families in urban areas fall below poverty threshold based on the 2015 Census. The average household income in 2015 was estimated at PHP 267,000 (around USD 5,000). The Gini coefficient for income inequality as of 2015, 0.44, indicates a large income gap in the country and has not changed much since 2000 (0.45).

Box 1. Defining cities in the Philippines

Creation of cities is prescribed by the Local Government Code of the Philippines and governed by the Department of Interior and Local Government (DILG). The Internal Revenue Allotment (IRA), which is the share of revenues of a local government unit (LGU) from the national government, is determined by the LGU's income classification. In accordance with Section 386 of Republic Act No. 7160, "A *Barangay* may be created out of a contiguous territory which has a population of at least two thousand (2,000) inhabitants as certified by the National Statistics Office except in cities and municipalities within Metro Manila and other metropolitan political subdivisions or in highly urbanized cities where such territory shall have a certified population of at least five thousand (5,000) inhabitants." Such cluster of Barangays "may be converted into a component city if it has an average annual income, as certified by the Department of Finance, of at least Twenty million pesos (Php20,000,000.00) for the last two (2) consecutive years based on 1991 constant prices, and if it has either of the following requisites: (i) a contiguous territory of at least one hundred (100) square kilometers, as certified by the Lands Management Bureau; or, (ii) a population of not less than one hundred fifty thousand (150,000) inhabitants, as certified by the National Statistics Office."

A city may either be component or highly urbanized. The Internal Revenue Allotment (IRA), which is the share of revenues of an LGU from the national government, is determined by the LGU's income classification. The Philippines classifies its cities as follows in accordance with the Republic Act No. 7160 that is reflected in Philippine Standard Geographic Code:

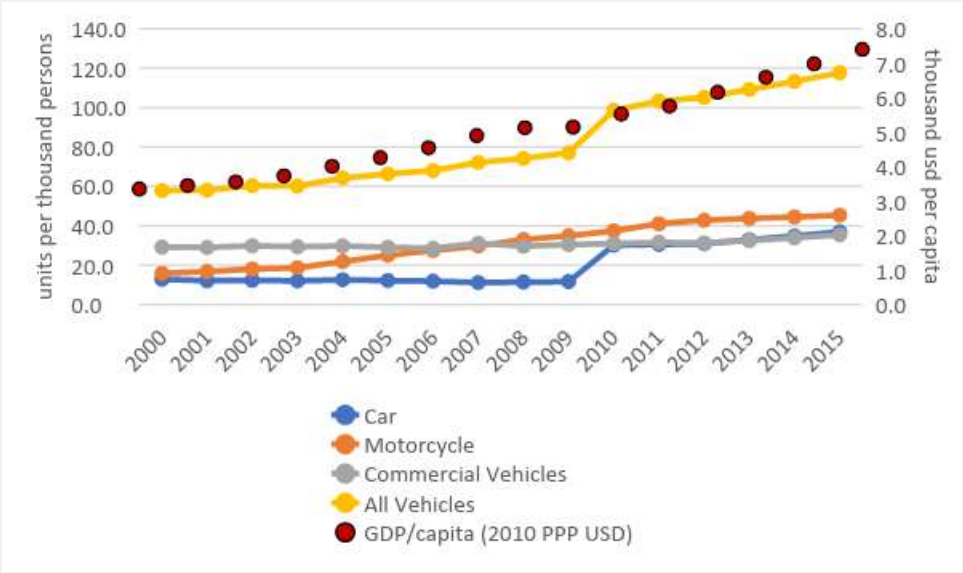
1. *Highly Urbanized Cities (HUC) – Cities with a minimum population of two hundred thousand (200,000) inhabitants, as certified by the National Statistics Office, and with the latest annual income of at least Fifty Million Pesos (PHP 50,000,000.00) based on 1991 constant prices, as certified by the city treasurer.*

2. *Component Cities (CC) – Cities which do not meet the requirements of an HC and an ICC shall be considered component cities of the province in which they are geographically located. If a component city is located within the boundaries of two (2) or more provinces, such city shall be considered a component of the province of which it used to be a municipality.*

3. *Independent Component Cities (ICC) – Component cities whose charters prohibit their voters from voting for provincial elective officials. Independent component cities shall be independent of the province.*

Despite this, the motorization rate has increased from 57.9 vehicles/1000 capita to 117.7 vehicles/1000 capita from 2000 to 2015 (**Fehler! Verweisquelle konnte nicht gefunden werden.**) based on analysis that

derived from registration data from the Land Transportation Office (LTO). The implications of rapid motorization links directly to congestion and poses strains in other aspects of mobility such as increase in fossil-based energy demand, GHG emissions, and worsening of air pollution. In the Philippines, it is estimated that 20% of disposable income is spent on transport (ALMEC Corporation, 2014).



Note: All vehicles = all registered vehicles; Cars = registered passenger cars; commercial vehicles = bus, trucks excluding for hire motorcycles

Figure 5. GDP per capita and motorization rate from 2000 to 2015
Source: ADB Transport Data Bank

2.2. State of Passenger and Goods Transport

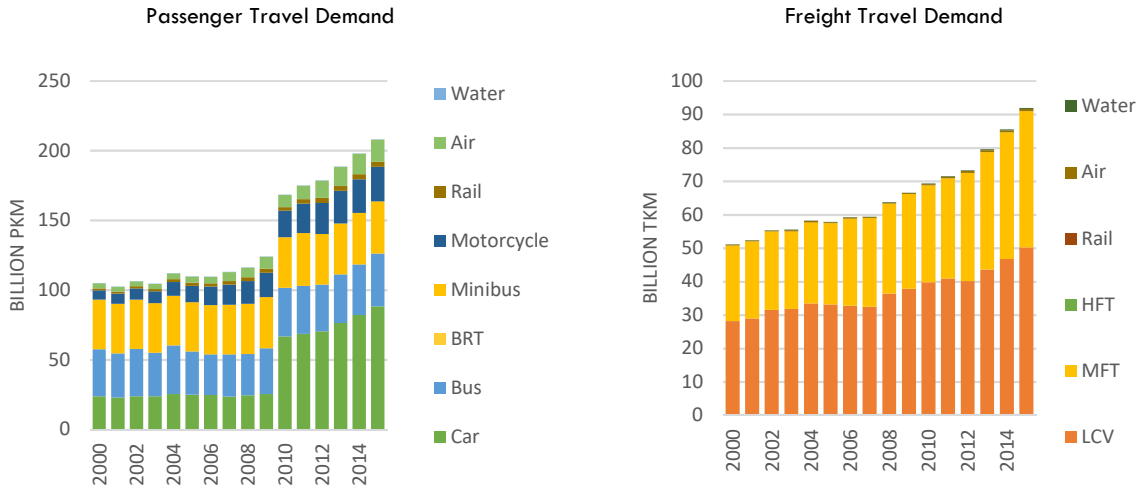
Based on vehicle stock data and through generalized assumptions on load factors and vehicle-km traveled per mode, the estimated travel demand for passenger and freight were estimated in the ADB Transport DataBank[3]. Results indicate that the estimated passenger travel demand increased by 4% per year from 2010 to 2015. Car travel on average comprised 31% of passenger travel demand and grew by 6.4% per year in the last 5 years, faster than the growth rate of total passenger-km. Freight travel demand on the other hand grew by 32% or 6.5% per year within the same period.

It is estimated that 42% of the total passenger kilometers traveled is made by private cars, which is one of the highest in Southeast Asia. Despite the high share of mileage, 69% of trips are still made by public transport, while a little over 20% of trips are made by walking. This highlights not only the importance of public transport in daily commute life but also the need to shift passenger kilometers from private car to mass transit modes.

[3] ## ADB Transport DataBank

Table 1. Transport Demand

	2000	2015
Passenger Travel		
Passenger-kilometers traveled (billion PKM)	126.6	234.9
Road Travel	121.6	215.4
Rail Travel	1.3	3.7
Freight Travel		
Ton-kilometers traveled (billion TKM)	51.2	91.9
Road Travel	50.8	91.0
Rail Travel	0	0



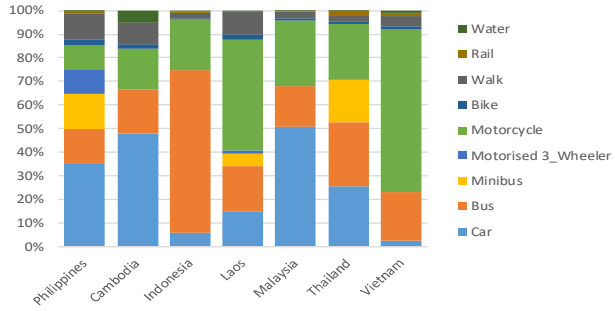
Cars = passenger cars; Bus = city and tourist buses; BRT = Bus Rapid Transit; LCV = Light Commercial Vehicles; MFT = Medium Freight Trucks; HFT = Heavy Freight Trucks
Note: Jeepneys are assumed as minibuses

Figure 6. National travel demand for passenger and freight from 2000 to 2015
Source: ADB Transport Data Bank

The modal split is derived from 2015 passenger- and ton-kilometer estimates (Figure 7).

[1] Passenger Mode Share (%PKM, 2015)

[2] Freight Mode Share (%TKM 2015)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Thailand
Vietnam
Water
Rail
Walk
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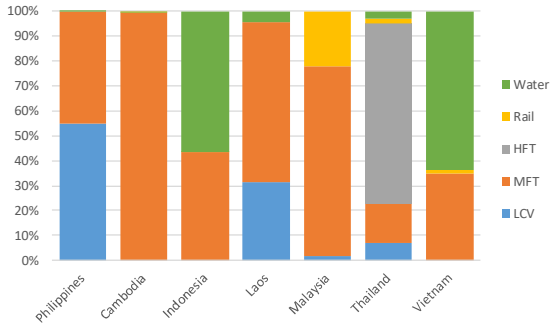
Minibus
Bus
Car


100%
90%
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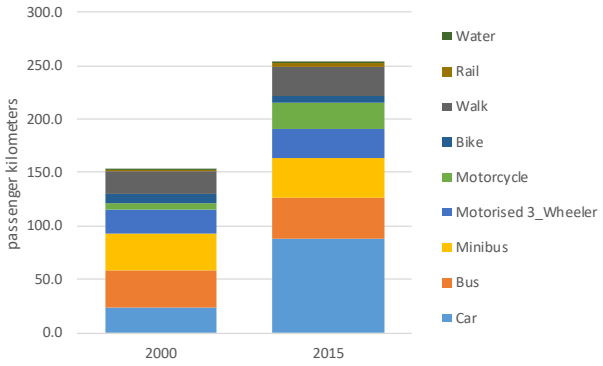
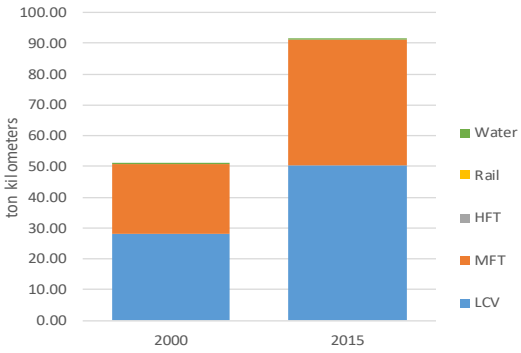
70%
60%
50%
40%
30%
20%
10%
0%
Philippines
Cambodia
Indonesia
Laos
Malaysia
Thailand
Vietnam
Water
Rail
HFT
MFT
LCV

[5] Passenger Kilometers Traveled by Mode (2000 and 2015)



[4] Ton Kilometers Traveled by Mode (2000 and 2015)



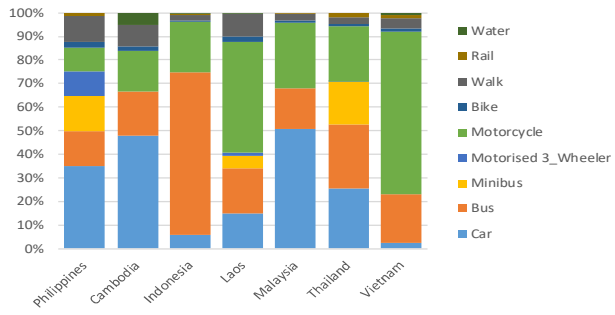
Cars = passenger cars; Bus = city and tourist buses; BRT = Bus Rapid Transit; LCV = Light Commercial Vehicles; MFT = Medium Freight Trucks; HFT = Heavy Freight Trucks.

Figure 7

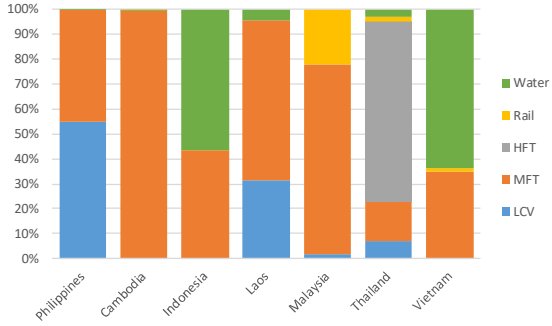
The chart indicates that, by 2015, 42% of the total passenger-km traveled across all modes (or 45% across land-based modes) were by private modes, specifically private cars and motorcycles. Meanwhile, nearly all domestic freight travel was made by road, with half made by light commercial vehicles (LCV) which include light trucks and minivans. When compared with neighboring Southeast Asian countries, the Philippines have mode shares similar to Thailand and Cambodia.

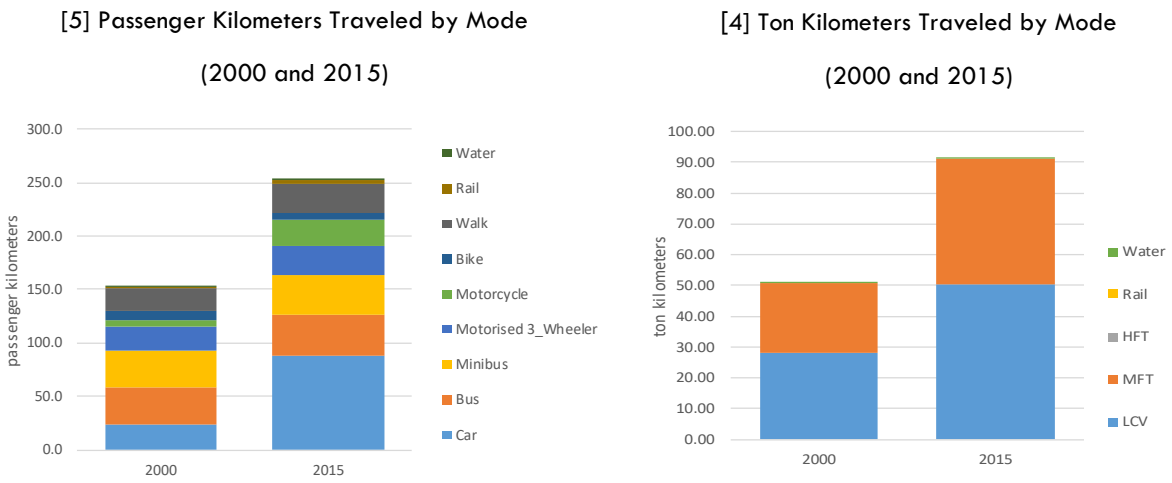
Between 2000 and 2015, estimates show a growth in passenger travel demand by 7.5 billion PKM per year, or about 1.72 times that of 2000. Chart 3 in Figure 7 shows that passenger travel demand has been driven by a growth in private car travel. On the other hand, Chart 4 of Figure 7 shows that freight travel demand also grew by about 1.78 times in the same years, or about 2.7 billion TKM increased per year.

[1] Passenger Mode Share (%PKM, 2015)



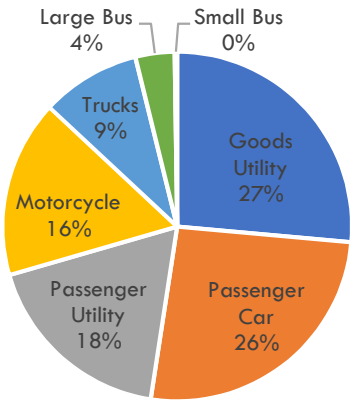
[2] Freight Mode Share (%TKM 2015)





Cars = passenger cars; Bus = city and tourist buses; BRT = Bus Rapid Transit; LCV = Light Commercial Vehicles; MFT = Medium Freight Trucks; HFT = Heavy Freight Trucks.
Figure 7. Passenger and freight mode shares in the Philippines vs Southeast Asia
Source: ADB Transport Data Bank

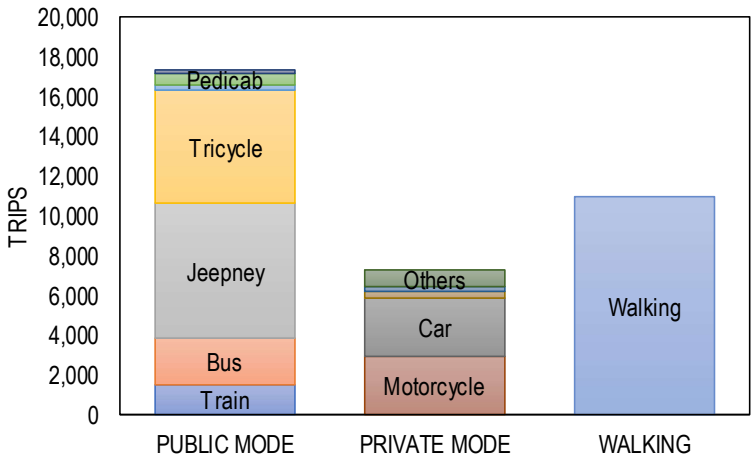
An analysis of annual average daily traffic (AADT) from the Department of Public Works and Highways (DPWH) and from transport surveys (Clean Air Asia, 2016) in Metro Manila's roads reveals that passenger cars and utility vehicles comprise 44% of traffic (in passenger car units) while trucks and goods vehicles comprise 36% of traffic. This implies that, while trucks and goods vehicles comprise a small portion of daily traffic, the traffic impact of these vehicles is significant compared to other vehicles in Metro Manila.



Note: Vehicle classifications are based on DPWH definitions
Figure 8. Traffic impact per mode in Metro Manila (2014)
Source: DPWH, Clean Air Asia

Although passenger-km mode shares were dominated by cars, the trip mode shares were still dominated by public transport at 69% (ALMEC Corporation, 2014). This means that people in the Philippines cover more distance by private modes, and yet make more trips by public transport presumably at shorter distances. This is an indicator of a disjunct between land use and transport in the mobility system. Moreover, the Metro Manila Urban Transportation Integration Study (MMUTIS) Update and

Enhancement Project (MUCEP) released in 2015 shows the dominance of walking trips in person-trip surveys.



Note: Based on person-trip surveys on residents, or "linked trips"
Figure 9. Mode shares based on linked trips
Source: MUCEP, 2015

2.2.1. Public Transport Infrastructure

Road public transport is dominated by buses, jeepneys and utility vehicle (UV) express in major roads, while smaller access roads are served by tricycles. Statistics show that for-hire motorcycles (tricycles) are nearly 71% of the road public transport fleet, while cars and utility vehicles (UV express and jeepneys) are about 25%. Buses are a mere 2.6% of the total road public transport fleet. Each of these modes bear a host of different issues such as safety, outdated and non-standard technology, and lack of inspection and maintenance.

Low frequency of high-capacity modes (bus) in major trasit corridors deters seamlessness of transit and increases competition for available public transport especially during peak hours, reducing quality of life for commuters. The disjunct between density and public transport service marginalizes sectors of the population heavily reliant on public transport.

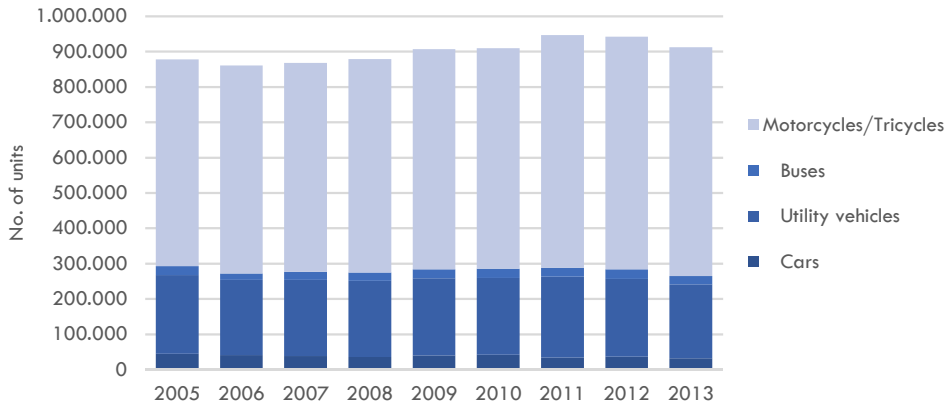


Figure 10. Number of registered public transport vehicles classified as "for hire" 2005-2013

Source: Philippine Statistics Authority

Observing the population density per *barangay* in Metro Manila side by side with public transport demand, trip intensity, and public transport frequency (Figure 11) shows that there are clear gaps in public transport service in many areas in Metro Manila. High-intensity trips are made at long-distances, and there is also a clear indication of trips coming from outside of Metro Manila.

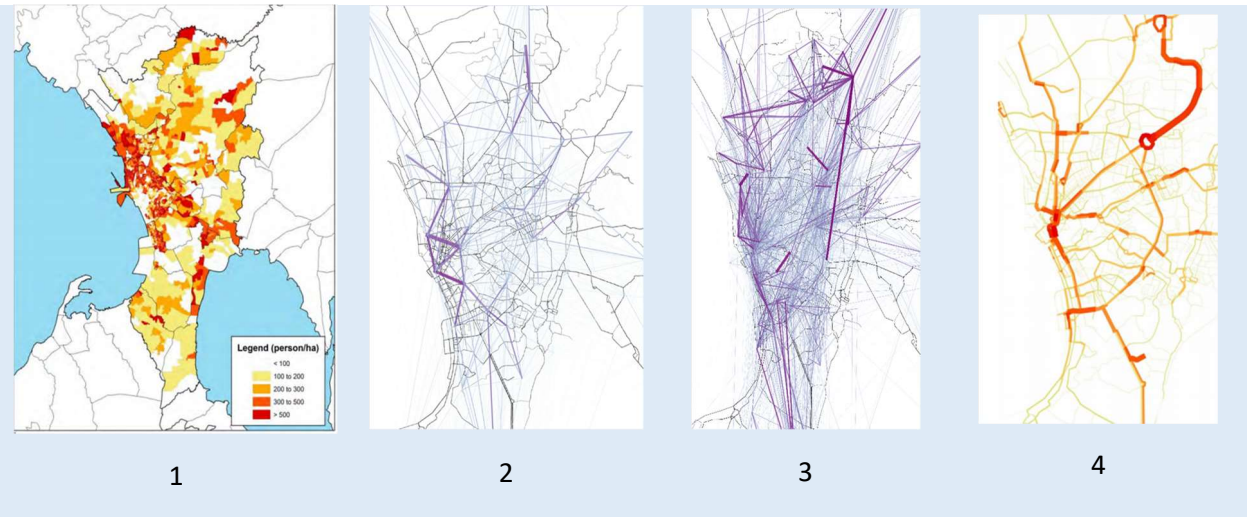


Figure 11. Metro Manila population density per barangay [1], public transport demand [2], public transport frequency [3], and trip intensity [4]
Sources: NEDA 2014, The World Bank and DOTr 2014

Urban rail is limited to the Philippine National Railways (PNR) and three lines of Metro Rail that plies Metro Manila. Line 1 runs from North of Manila to South of Manila and is supposedly connected to Line 3. MRT Line 3 runs from North to South of Metro Manila via EDSA, with currently 13 stations over 16.9 km. Line 2 links Manila's East and West, extending service until Antipolo City thus linking Metro Manila to Region 4. Currently, Line 4 is being constructed along Commonwealth Avenue.

Figure 12. MRT and LRT lines in Metro Manila
Source: Map c/o Wikepedia

Ideally, travel demand is matched by supply, including road infrastructure and public transport service. Meanwhile, road infrastructure and indices are presented in Table 2. As of 2017, the Philippines has a total of 32,868 km of national roads and 171,981 km of local roads. While both local and national roads increased by 12% or 1.7% per year between 2010 and 2017, the number of vehicles has increased at a much faster rate at 15% or 3% per year over just 5 years. For the case of Metro Manila, road density has reached 1.665 km/sq km for national roads and 6.01 km/sq km for local roads.

Metro Manila has very high road density (1.7 km/km^2) and intense vehicle density (1,895 vehicles/km), which is a result of high passenger car volume, causing severe congestion. Meanwhile, the rail system that should carry part of the ridership has reached overcapacity that not only affects the daily commute lives of people but also endangers commuters with the deterioration of the LRTs and MRTs. According to UBER, people spend 66 minutes in traffic in Metro Manila, which can reach 2.3 times during peak hours.

Table 2. Road infrastructure indicators

Region	km (2010)	km (2017)	Road Density Indices			
			km/km^2	km/000pax	No. of vehicles/km (2011)	No. of vehicles/km (2016)
Philippines (National Roads)	29,370	32,868 (12% inc)	0.095	0.348	243	281 (15% inc)
Metro Manila (National Roads)	1,032	1,162 (12% inc)	1.665	0.089	1,952	1,895 (2.8% dec)
Philippines (Local Roads)	171,981		0.57	1.8626	42	
Metro Manila (Local Roads)	3,723		6.01	0.3140	541	

Region III	14,512	0.66	1.4750	67
Region IV-A	9,222	0.55	0.7313	108

Source: JICA, NEDA, DPWH, LTO

2.2.2. Non-motorized Transport Infrastructure

Cities in Asia exhibit widely varying modal mixes. Non-motorized vehicles (e.g. bicycles, cycle-rickshaws, and carts) play a vital role in urban transport in much of Asia, accounting for 25 to 80% of vehicle trips in many Asian cities, more than anywhere else in the world. Unfortunately, this information has not been studied at such detail for the Philippines especially in urban areas. Several cities in the Philippines, however, have begun developing infrastructure in favor of non-motorized transport. For example, in Marikina City, a Marikina Bikeways Office has been created through an ordinance to plan and manage the construction and maintenance of the city's cycling network projects and to promote the city as a "Bike capital of the Philippines." This has resulted to the city having a network of designated cycling routes and a variety of public awareness campaigns and programs. The cities of Iloilo, Pasig, and Makati, for example, likewise have such improved infrastructure for cycling and walking.

2.2.3. Goods Transport Infrastructure

Based on the 2014 Annual Survey of Philippine Business and Industry (ASPBI), there are 1,108 establishments engaged in transportation and storage in the Philippines to date. 608 (54.9%) of these establishments are located in Metro Manila (ASPBI, 2014). Based on the freight assessment conducted by Clean Air Asia and the Department of Trade and Industry (GIZ, 2018)

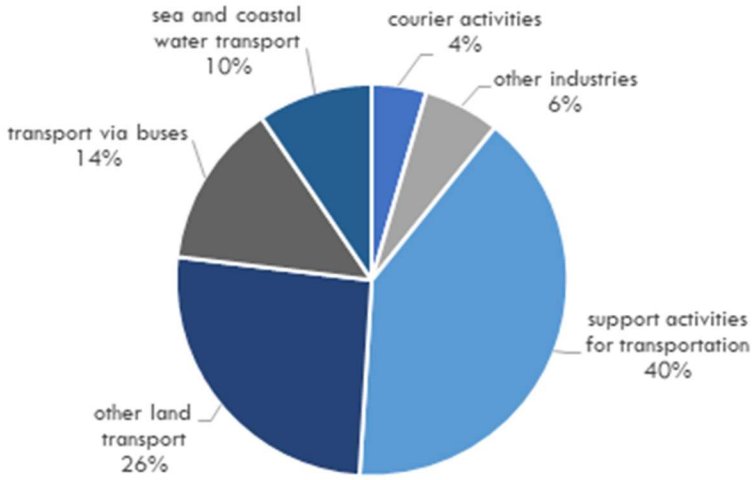


Figure 13. Percentage distribution of establishments by industry group
Source: ASPBI, 2014

The Logistics Performance Index (LPI) of the Philippines has been on the decline from 2010 to 2016, from 3.14 to 2.86. The drop seems to be driven most largely by drops in scores for customs, but with drops in infrastructure, international shipments, logistics competence, and tracing and tracking indexed across the whole sector. Meanwhile, although the timeliness index of the LPI indicate some improvement, the Philippines remain one of the lowest in timeliness scores based on the LPI mostly due to congestion (GIZ, 2018).

Freight transport is as important as passenger transport in the mobility system, affecting economic productivity. The biggest problems with the freight sector operations include overloading and empty miles. In terms of technology, fuel inefficiency has been found across the fleet, thus as was found in bottom-up estimates, trucks consume a huge portion of transport energy demand in the Philippines. The World Bank's LPI also indicate issues with customs handling.

In the freight assessment conducted by Clean Air Asia, two major problems were found concerning the freight sector. The first is fleet overloading, and from a 2010 study it was found that 16% of trucks are overloaded. Meanwhile in a study by Jun Castro, it was estimated that empty trips comprise about 80% of outbound trips and 56% of inbound trips.

Table 3 Vehicle types and fuel consumption
Source: Cueto, et al., 2015

Vehicle Type/Application	Gross weight range (lbs)	Empty weight range (lbs)	Typical Payload Capacity max (lbs)	Typical fuel economy range in 2007 (mpg)	Typical Fuel Consumed (gal / 1000 tonne-miles)
Large pick-ups, UV, multi-purpose, minibus, step van	8,501-10,000	5,000-6,300	3,700	10-15	38.5
UV, multi-purpose, minibus, step van	10,001-14,000	7,650-8,750	5,250	8-13	33.3
City delivery, parcel delivery, large walk-in, bucket, landscaping	14,001-16,000	7,650-8,750	7,250	7-12	23.8
City delivery, parcel delivery, large walk-in, bucket, landscaping	16,001-19,500	9,500-10,800	8,700	6-12	25.6
City delivery, school bus, large walk-in, bucket	19,501-26,000	11,500-14,500	11,500	5-12	20.4
City bus, furniture, refrigerated, refuse, fuel tanker, dump, tow, concrete, fire engine, tractor-trailer	26,001-33,000	11,500-14,500	18,500	4-8	18.2

2.3. Planned Transport Infrastructure

The current administration's "Build, Build, Build" [4] national infrastructure program comprises of 70 infrastructure projects spread across the Philippines with a total budget of PHP 1.649 trillion. Of the 70 projects, 21 are roads and bridges which will all be implemented by the Department of Public Works and Highways (DPWH). The Department of Transportation (DOTr) is the implementing agency for most of the projects on mass transit, seaports, airports, railways, while Bases Conversion and Development Authority (BCDA), a government-owned and controlled corporation, will implement the mass transit, railway, and airport projects, as well as new cities, that cover Bonifacio Global City and Clark.

> The total cost of the projects under the "Build, Build, Build" program of the government is about *1.7 trillion pesos*, with rail projects being allotted 57% of the budget and road projects being most in number. How is sustainable urban mobility integrated into the planning and design of these projects? Or are we looking at transport as mere infrastructure work without considering the impact on the peoples' lives?

There are 11 rail infrastructure projects which are mostly in Metro Manila and in Mindanao. These are Mega Manila Subway, Mindanao Railway (Tagum-Davao City-Digos Segment), Philippine National Railway (PNR) North 1 (North South Commuter Rail), PNR North 2, PNR South Commuter, PNR South Long Haul, unified common station, MRT-7, extensions of LRT-1 and LRT-2 and Subic-Clark Cargo Railway Project. When completed, the 581-km PNR South Long Haul and Subic-Clark Cargo Railway Project would accommodate freight, while provisions have been made for freight services in the planned 72-km PNR South Commuter. Rail infrastructure comprises 57% of the total budget.

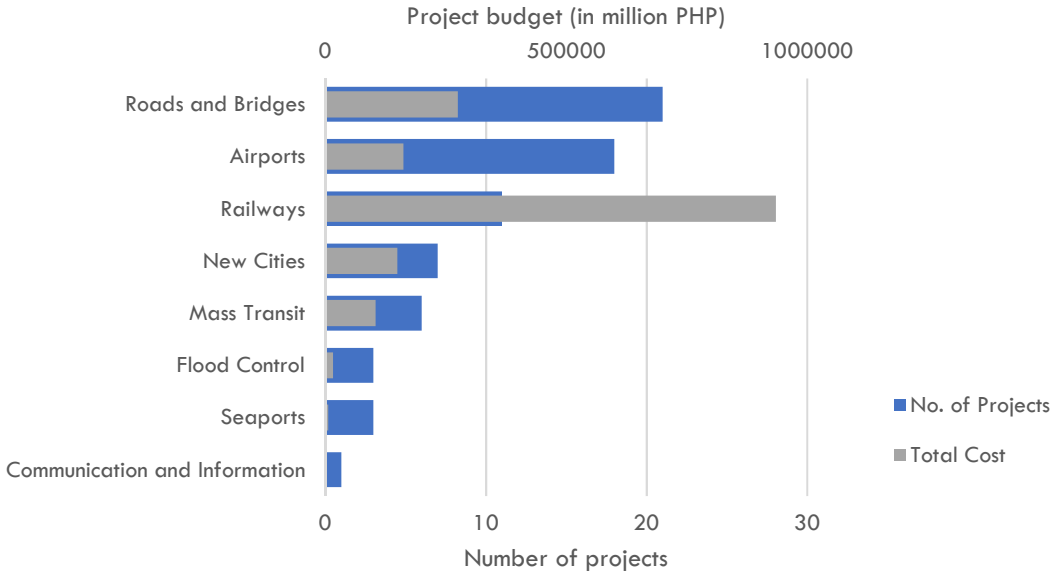


Figure 14. Analysis of projects under the "Build, Build, Build"

[4] The Build Build Build portal, http://build.gov.ph/, is administered and managed by the National Economic and Development Authority, the Department of Transportation, the Department of Public Works and Highways, and the Bases Conversion and Development Authority.

Source: DPWH

The PUV Modernization Program of the DOTr was launched targeting road-based public transport especially jeepneys and buses to address congestion by improving public transport service. Studies like *Mega Manila Dream Plan 2030* or the *Roadmap for Transport Infrastructure Development for Metro Manila and Its Surrounding Areas (Region III & IV-A)*"[5] (ALMEC Corporation, 2014) and the Road Transport Rationalisation Study (RTRS) (World Bank and DOTr, 2014) have looked at key issues on jeepneys and buses, while also acknowledging the gap that has been filled by UV Express which provide shared-taxi service. Gaps have also been filled by point-to-point bus service (P2P).

However, although studied, there have been few measures that tackle issues with tricycles. In the context of NUMP, work has to be done to ensure that tricycles are integrated into the system due to their role in the current spatial and economic landscape. Urban sprawl has caused massive residential developments now dependent on tricycles which provide door-to-door transport service. Moreover, many depend on tricycle as a form of livelihood.

2.4. Transport Impacts

2.4.1. Energy Intensity and Greenhouse Gas Emissions

A consequence of motorization is increasing energy demand from transport. An inspection of official energy balance from the country suggests that the transport sector energy demand grew by 15% between 2000 and 2015. Gasoline demand experienced a much higher increase of 25% compared to diesel at 12%.

Transport is the second largest energy consuming sector next to industry and emits considerable amounts of CO2 in the Philippines. The 2000 SNC reports that transport is 37% of the total GHG emissions.

Table 4. Transport energy consumption and CO_2 emissions

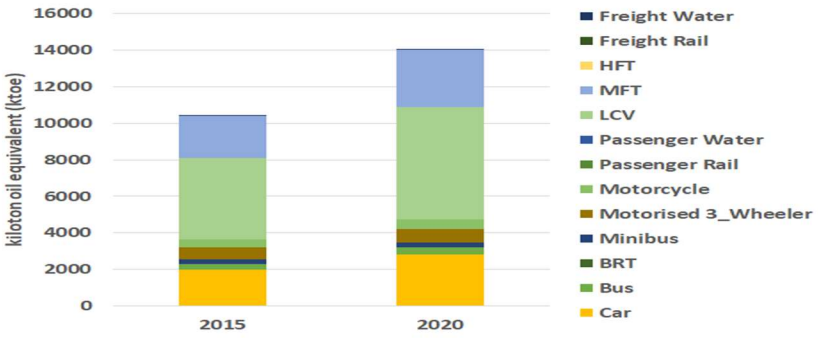
	2000	2015
Energy Consumption (ktoe)	7695	8822
Diesel	4323	4839
Gasoline	2575	3216
LPG	0	42
Fuel Oil	471	178
Natural Gas	0	0
Electricity	5	10
Jet Fuel	322	538
CO2 Emissions (million tons)	31.9	59.1
CO2 per capita (tons/capita)	0.41	0.59
Particulate Matter (tons)	40.3	24
Nitrogen Oxides emitted (tons)	145.8	156.5

Source: IEEJ Energy Balance Sheet for the Philippines, ADB Transport Data Bank

The bottom-up modeling of the ADB Transport Data Bank provides insights to major consuming modes through assumptions on fuel efficiency and fuel split. For the Philippines, it was seen that the top three largest consuming modes are private cars and freight trucks. Under the business-as-usual scenario, it is expected that transport energy demand would increase by 35%. Currently, steps are being made to

[5] Alternatively referred to as JICA Dream Plan or NEDA Dream Plan. The study was conducted by JICA in 2013-2014.

address fuel efficiency of light duty vehicles through vehicle labeling. However, there are other factors such as high travel demand and frequencies by motorized modes that also affect fuel consumption.



Note: Vehicle classifications are standardized for modeling purposes. Cars=private cars+ taxis; BRT = Bus Rapid Transit; LCV = Light Commercial Vehicles; MFT = Medium Freight Trucks; HFT = Medium Freight Trucks;
Jeepneys are counted as minibuses
Results are modeled bottom-up using the ADB Transport DataBank Model, meaning estimates are based on stock data with assumptions on fuel economy by vehicle type

Figure 15. Fuel consumption bottom-up estimates by mode for 2015 and 2020
Source: ADB Transport Data Bank

With the increase in fuel consumption, transport CO_2 emissions have also increased. The average growth rate of transport CO_2 per-capita was at 2.2% per year from 2008 to 2015, which was much faster than the average rate of 0.4% per year in preceding years. Addressing CO_2 emissions is a concern for the Philippines as a climate-vulnerable country.

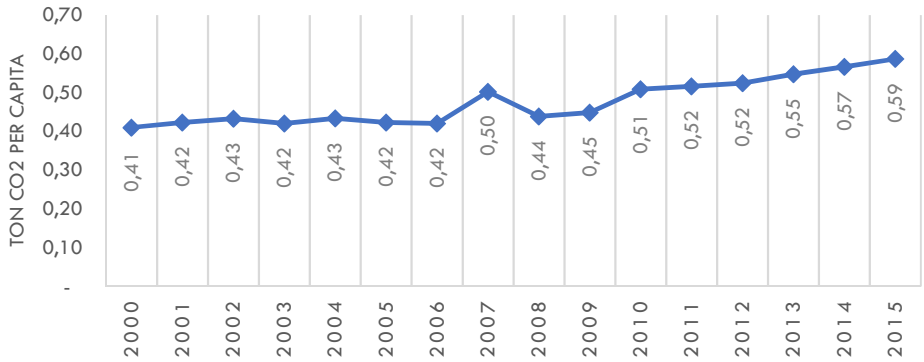


Figure 16. CO_2 per capita from 2000 to 2015
Source: ADB Transport Data Bank

2.4.2. Road Safety

From 2000 to 2008, the number of reported road fatalities averaged at 708 deaths in the Philippines. From 2009 to 2014, the average increased to 1253 reported road fatalities–a staggering 76% increase in average annual road fatalities. World Health Organization (WHO) reported that on average, 53% of road fatalities are riders of motorized 2- or 3- wheelers; 19% are pedestrians; and 25% are of passengers and drivers of 4-wheeled cars and light vehicles.

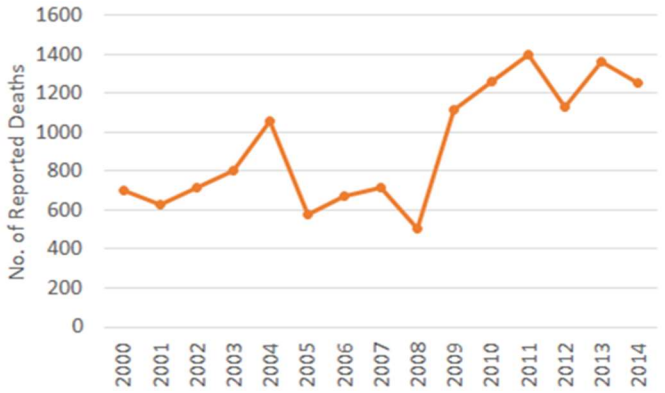


Figure 17. Total no. of reported road fatalities from 2000 to 2014

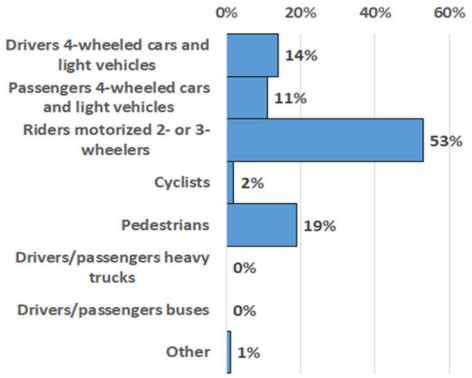


Figure 18. Road fatalities by affected groups (2014)

These statistics indicate that not only are roads unsafe, but also pedestrian facilities lack safeguards from accidents as well. In the context of urban mobility, safety must be improved for both road users and pedestrians.

2.4.3. Air Quality and Health Impacts

The combination of high motorized travel demand, inefficient fleet technology, and lack of inspection and maintenance results in highly emitting transport fleet. In the case of Metro Manila, the effects of rapid motorization and inefficient transport system are apparent. Based on 2012 data, it was estimated that 76% of particulate matter (PM_{10}) are from mobile sources (e.g. road vehicles). Because these areas tend to be near highly dense locations, the exposure to dangerous levels of pollution is high. It is estimated that 25% of Metro Manila's population are exposed to PM_{10} concentrations exceeding the National Ambient Air Quality Guideline Values (NAAQGV), and 79% are exposed to exceedances from WHO guideline values (Clean Air Asia, 2016).

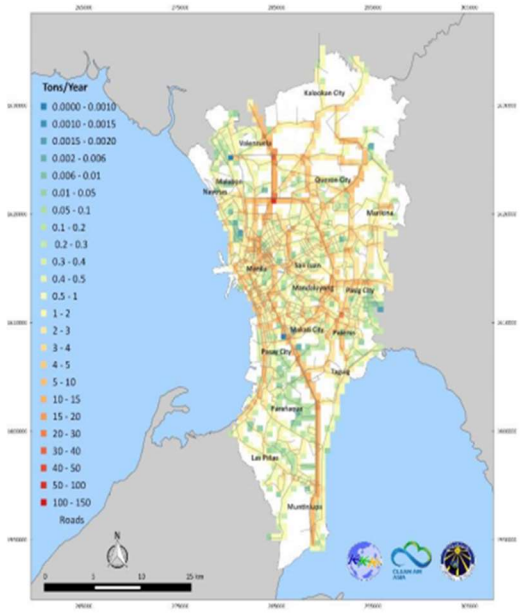


Figure 19. Annual mean PM emissions from mobile sources

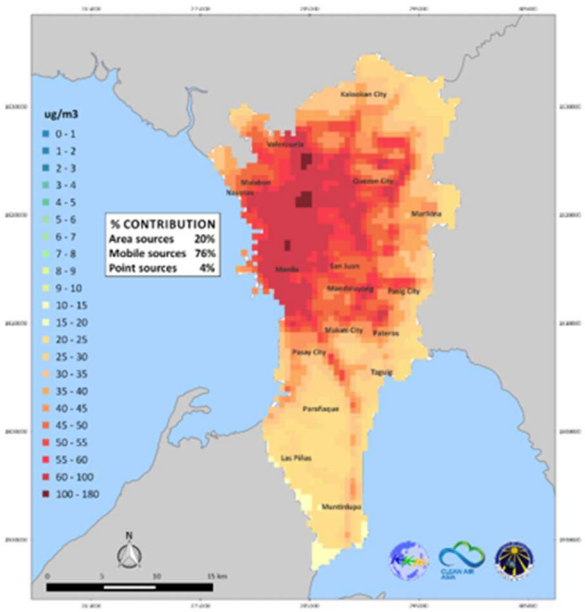


Figure 20. Annual mean PM concentrations from all sources

Source: Clean Air Asia 2016

3. Institutional Framework

As urban mobility is multi-dimensional, there are many institutions that are involved in urban mobility planning and implementation in the Philippines at the national and local levels. They are involved in different aspects of urban mobility as guided by their mandates. Table 5 shows these institutions and their focal urban mobility themes.

Table 5. Government Agencies involved in various aspects of Urban Mobility

Responsible Agency	Strategic Areas of Urban Mobility
Department of Transportation	Transport Policy and Regulation
Department of Public Works and Highways	Road Infrastructure
Department of Interior and Local Government	Local Government Oversight (cities and municipalities)
Local Government Units (LGUs)	Local land use planning and regulation, local public transport regulation, traffic management
Department of Environment and Natural Resources (emission standards) Climate Change Commission (GHG emissions)	Environment
Housing and Land Use Regulatory Board	Land Use
Metro Manila Development Authority	Capital City Transport Governance
Philippine National Police	Traffic Management
Department of Budget and Management	Budget
Light Rail Transit Authority Philippine National Railways MRT Corp (a government corporation attached to the DOTr)	Rail Mass Transit Systems

Department of Science and Technology	Transport Technologies and Industry Development
Department of Trade and Industry	Transport Technologies and Industry Development
National Economic Development Authority	Economy
Department of Energy	Energy
Philippine Statistics Authority	Data Consolidation, Monitoring, and Evaluation
Climate Change Commission	GHG, Environment

There are many agencies that are involved in various aspects of urban mobility and this implies that strong collaboration and linkages are needed to achieve the goals that are set for urban mobility. The main government agencies are the Department of Transportation (DOTr), the Local Government Units (LGUs), the Department of Interior and Local Government (DILG) which is tasked to oversee and guide LGUs, and the Department of Public Works and Highways (DPWH). The DOTr is the primary policy, planning, programming, coordinating, implementing and administrative entity of the executive branch of the government on the promotion, development and regulation of a dependable and coordinated network of transportation and communications systems, as well as in the fast, safe, efficient and reliable transportation[6]. The LGUs are mandated to plan and regulate the use of land within their territories and provide basic services to their constituents, subject to the guidelines of other government agencies. The DILG's task is to oversee and enable LGUs in the performance of their functions. The DPWH is mandated to undertake (a) the planning of infrastructure, such as national roads and bridges, flood control, water resources projects and other public works, and (b) the design, construction, and maintenance of national roads and bridges, and major flood control systems[7]. The DPWH's involvement in urban mobility is highlighted when their road infrastructure is located in urban areas.

There are many agencies that are involved in various aspects of urban mobility and this implies that strong collaboration and linkages are needed to achieve urban mobility goals.

The DOTr is the preeminent national government agency involved in transport policy and regulation. As such, the development of policies related to urban mobility for the country falls on its shoulders. This does not mean, however, that it is alone in the implementation of such a policy. As urban transport involves multiple disciplines, the DOTr has to collaborate with other agencies in the development and implementation of the appropriate transport policies aimed to achieve urban mobility in the country.

The DOTr's organizational structure has been evolving. The list below enumerates the offices and units within the department as of February 2018[8].

Table 6. DOTr Table of Organization

Secretary	**Head of Department**
Undersecretaries	Finance & Administration Legal Affairs & Procurement CAR & CARAGA Aviation & Airports

[6] http://dotr.gov.ph/18-transparency/166-dotc-mandate.html
[7] http://www.dpwh.gov.ph/dpwh/content/about-dpwh
[8] DOTr Performance Report (July 1, 2016 to July 1, 2017) and DOTr Organizational Chart (as of February 2018)

	Road & Infrastructure Railways Maritime Planning
Assistant Secretaries	Legal Affairs Procurement Administration Special Concerns Aviation Road Transport Planning & Policies Mobility Infra Implementation Commuter Affairs Railways MRT3 General Manager Maritime Project Development & PPP
Directors	Legal Service Procurement Service Investigation Security & Enforcement Staff Franchising Review Staff (FRS) Administrative Service Comptrollership Service (CS) Finance & Management Service (FMS) Planning Service Project Monitoring & Evaluation Service (PMES) Management Information Service
Sectoral Offices	Land Transportation Office Land Transportation Franchising & Regulatory Board
Attached Agencies & Corporations	Office of Transportation Cooperatives Toll Regulatory Board Light Rail Transit Authority Philippine National Railways Civil Aeronautics Board Philippine Aerospace Development Corporation Civil Aviation Authority of the Philippines Manila Cebu International Airport Authority Clark International Airport Authority Philippine Merchant Marine Academy Maritime Industry Authority Cebu Ports Authority Philippine Ports Authority Office for Transportation Security North Rail Philippine Coast Guard

The DOTr has 19 line agencies and attached agencies covering the planning, regulation, or operations of facilities and services that impact on urban mobility. Among these, the leading agencies related to urban mobility are the LTO (Land Transportation Office), LTFRB (Land Transportation Franchising and Regulatory Board), MRT3 (Metro Rail Transit (EDSA MRT3), LRTA (Light Transit Authority), OTC (Office of Transportation Cooperatives), PNR (Philippine National Railways), TRB (Toll Regulatory Board), and MARINA (Maritime Industry Authority). Within the DOTr itself, there are agencies that are involved in urban mobility. Hence, collaboration and coordination among these agencies is necessary.

> Within the DOTr itself, there are multiple agencies that are involved in urban mobility. Hence, collaboration and coordination among these agencies is necessary.

The DOTr's mandate is national in geographic purview, but in order to work with the LGUs, it needs to collaborate with the DILG which has direct supervision over these local entities. The DILG's functions include strengthening LGU's capability aimed towards the effective delivery of basic services to the citizenry. For instance, the major transport regulatory reform which pertains to the transfer of local public transport planning function from the DOTr to the local governments was institutionalized through a joint memorandum circular of the DILG and the DOTr (No. 001 Series of 2017) of the two executive departments.

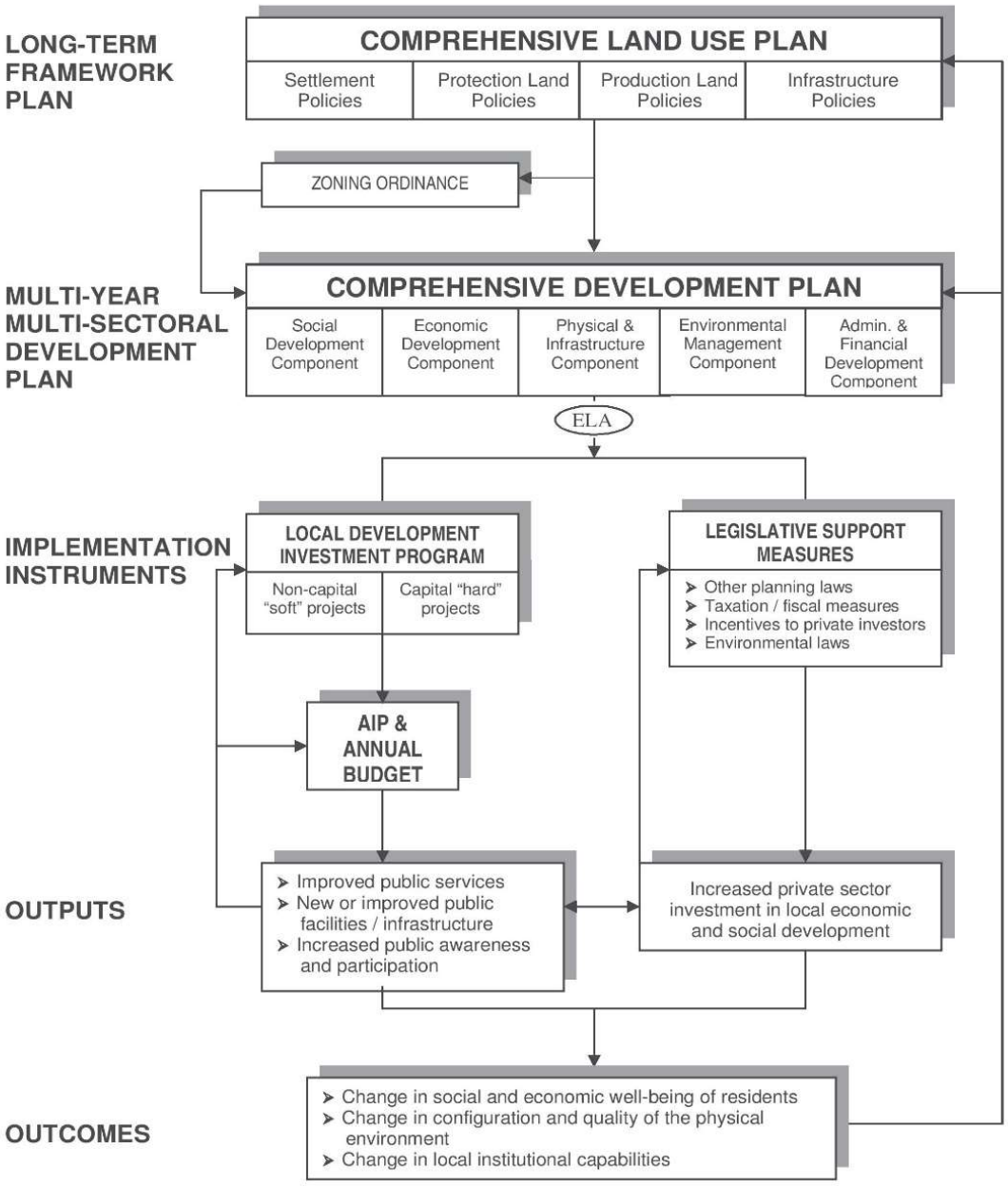
> The DOTr has to work with the DILG and the LGUs for actions that have to operationalized at the local level.

In the name of autonomy as institutionalized by the Local Government Code (Republic Act No. 7160), the LGUs are mandated to craft their own local plans as encapsulated in their Comprehensive Land Use Plans (CLUP) and Comprehensive Development Plans (CDP) employing a citizen-participatory approach in the crafting of such plans. The plans cover five development sectors–social, economic, environmental, infrastructure, and institutional sectors. The preparation of the CLUP and CDP is shaped by the guidelines issued by the Housing & Land Use Regulatory Board (HLURB). The HLURB therefore also plays a strategic role in mainstreaming and embedding the principles of sustainable urban mobility in their standards and guidelines to inform local plans. However, the current guidelines have yet to put stronger emphasis on sustainable urban mobility on top of the current emphasis on transport infrastructure. But a newly created opportunity is the National Urban Development and Housing Framework 2017-2022 (NUDHF) prepared by the UN-Habitat for the HLURB which counts, as among the strategies, the prioritization of urban transport modes in this order–pedestrians (or walking), bicycles, public transport, and private cars[9]. The UN-Habitat is assisting the HLURB in capacity development for LGUs in the area of planning sustainable transport and land use development. This is a clear opportunity for synergy and cooperation between DOTr and the UN-Habitat in development of the NUMP.

> LGUs are mandated to craft their own local land use and development plans. The preparation of these plans is shaped by the guidelines of the HLURB. The HLURB therefore plays a strategic role in mainstreaming and embedding principles of sustainable urban mobility. However, the current guidelines are still weak in the linkage between land use and transport planning.

[9] UN Habitat. National Urban Development and Housing Framework (2017-2022).

The chart below shows the framework for the preparation of comprehensive land use and development plans by local governments.



Serote, Ernesto. Rationalizing the Local Planning System (RPS)

Figure 21 Local Development Planning Framework

The DOTr is highly centralized in terms of its presence in different parts of the country. Other than its 19 line agencies and attached agencies which have regional and district offices (e.g. the LTFRB for franchising, the LTO for licensing of road-based vehicles), the core DOTr is centralized in Metro Manila.

The DPWH's mandate is the provision of national roads in the country. This road network establishes the connectivity or urban and rural areas all over the country, providing mobility for people to travel by land (or land and water) anywhere via the arterial road network. The department's mandate concerning urban mobility becomes highly relevant when the national road is located in urban territory as is common in many Philippine cities. There are times when objectives of speed of vehicles and people's mobility particularly that involving non-motorized transport are in conflict. Hence, it is important to balance the objectives of the different government agencies and harmonize potential conflicts.

Hence, it is important to balance the objectives of the different government agencies and harmonize potential conflicts.

It is clear that to develop sustainable urban mobility in local areas, the DOTr, DILG, LGUs, and other government agencies will be at the forefront, national government agencies (NGAs) working together with local government units (LGUs). The interaction and collaboration will therefore be both horizontal (inter-department) as well as vertical (NGAs-LGUs) linkages. The HLURB is also an important partner in ensuring that sustainable urban mobility principles are intrinsic in the plans of the local government since they are mandated to guide and approve the comprehensive land use plans of LGUs.

The interaction and collaboration among government agencies will be both horizontal and vertical.

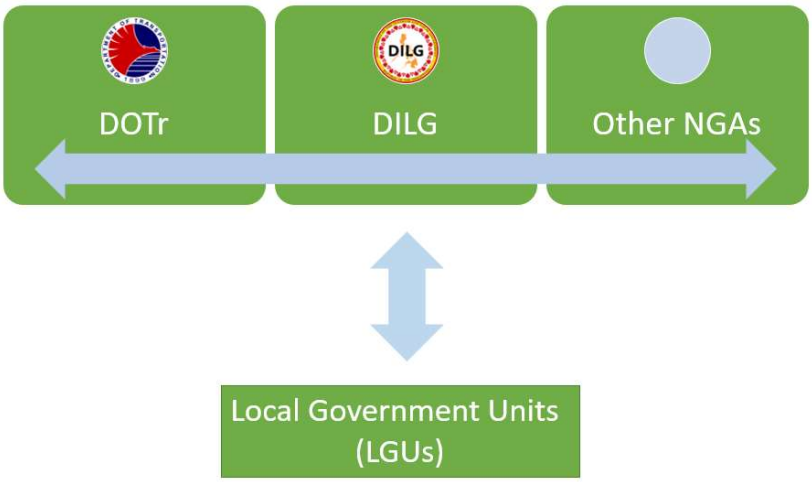


Figure 22. Linkages among national agencies and local government units

As transport is a multi-disciplinary and multi-sectoral issue, coordination and collaboration among relevant agencies is necessary. Such collaborations are undertaken at established or ad hoc levels. Inter-agency cooperation is mandated at the cabinet level (national), NEDA level (regional development councils, Inter-agency Infrastructure Committee, or NEDA Board for projects of certain scale), and at local level (provincial or city/municipal development councils). In Metro Manila, the Metro Manila Council composed of the 17 local chief executives and the Metro Manila Development Authority (MMDA) is where collaboration takes place. In addition, ad hoc alliances that are focused on specific issues such as traffic management in Mega Manila have been created. For instance, the Inter-agency Council for Traffic (I-ACT) was created in August 2016 to fortify the coordination and collaboration among transport-related agencies in Metro Manila in addressing the problem of traffic congestion. Headed by the DOTr, the members of I-ACT are the MMDA, Philippine National Police-Highway Patrol Group (PNP-HPG), LTFRB and

LTO and joined by Armed Forces of the Philippines (AFP), Metro Manila mayors who compose the Metro Manila Council, the Liga ng mga Barangay ng Pilipinas, and then Department of Interior and Local Government[10].

3.1. Transport Plans, Programs and Policies

This section presents the transport plans, program, and policies that have been developed over time, describing the major studies that were undertaken to develop and improve the transport network and services in Metro Manila, Cebu, and Davao – the primate cities of the country. The section also presents recent policies and frameworks that underscore the importance of sustainable mobility in Philippine cities.

3.1.1. Evolution of Transport Policies

Innumerable policies, programs, and plans have been crafted over time demonstrating the government's thrust to develop an efficient and effective urban transport system for the country's cities. These interventions have been undertaken by different government departments and agencies as guided by their mandates, supported by stakeholders from the private sector (business, operators), civil society, and international development agencies. They have also been shaped by the national government's commitments to international agreements on sustainable transport. The matrix below shows these major interventions. A more detailed list of interventions or inventory of transport policies is included in the appendix, describing the policy/plan, focus/orientation, responsible agency, implementation period, description, status, and identified gaps.[11]

Table 7 Policies, Strategies, & Plans on Urban Mobility

Period	Priorities, foci	Policy, strategy, plan (National)	Policy, strategy, plan (Local)
2016-present	EST, BRT, NMT, P2P buses, urban rail Infrastructure, urban expressways	NTP, NIP, PUV Modernization, NESTs, Greenways, TNVS, BBB	
2010-2016	EST, BRT, NMT, urban rail, P2P buses, urban expressways	NIP, PUV Modernization, TNVS, NCCAP, NESTs,	MUCEP, MMDA Green Print
2004-2010	EST, BRT, NMT, urban rail	NESTs, NIP	
1998-2004	MRT3 and LRT2 opening, Bikeways of Marikina		MMUTIS
1992-1998	BOT for mass transit, phase-out of dilapidated taxis	Early version of PPP, Bus liberalization/deregulation	
1986-1992	Import of city buses, creation of LTFRB		UTDP, 1990-2000.
Pre-1986	Road infrastructure, car priority, 1st urban rail in Metro Manila, PNR commuter rail		UTSMMA, 1973. MMETROPLAN, 1977. MMUTIP, 1981. MMUTSTRAP, 1983. JUMSUT I, 1984 and JUMSUT II, 1985.

[10] https://news.mb.com.ph/2017/09/06/i-act-revived-to-confront-traffic-crisis/
[11] Torayno. Inventory of Transport Policies in the Philippines, GIZ, 2017

Over the years, the focus of the government in providing people with mobility has evolved from one on road infrastructure development, mass transit development, public transport improvement, and NMT. While there were numerous studies and projects happening consecutively or simultaneously, the need to improve the existing public transport system and the importance of high-quality mass transit systems as well as NMT has become increasingly prominent in national government policies as well as local government actions. Marikina City with the assistance of the World Bank developed a master plan for 50 kms of bicycle facilities covering the whole city, strongly advocated by the local chief executive at that time (early 2000s). Aside from infrastructure development, the program also included soft components such as the creation of the Marikina Bikeways Office (MBO) and IEC activities (information, education, & communications) to promote bicycle use in the city.

Over the years, the focus of government in providing people with mobility has evolved from one on road infrastructure development, mass transit development, public transport improvement, and NMT.

3.1.2. Past Transport Studies and Plans in Metro Manila, Cebu, and Davao

Over the decades, the DOTr or its predecessors have commissioned numerous studies that impact on urban transport since the 1970s until the present, focusing on the primate cities of the country. These studies include the following[12].

Urban Transport Study in Manila Metropolitan Area (UTSMMA, 1973)

The first comprehensive urban transport master plan study for Metro Manila, this was undertaken by Japan's Overseas Technical Cooperation Agency (OTCA) which later became the Japan International Cooperation Agency (JICA). It proposed five (5) rail-based mass transit systems in addition to the upgrading of the Philippine National Railways (PNR), urgently recommending that the line that was to ply Quezon Avenue should be undertaken first. It also recommended that the railway be underground in areas inside EDSA, and elevated outside EDSA. The study envisioned the bus and jeepney services to function as feeder modes to the rail-based mass transit network in the metropolis. The following rail lines were recommended:

There is no dearth of transport studies that have been done in the country's major cities of Metro Manila, Cebu, and Davao.

[12] World Bank, Transport in Metro Manila – A Strategic Review. 2013

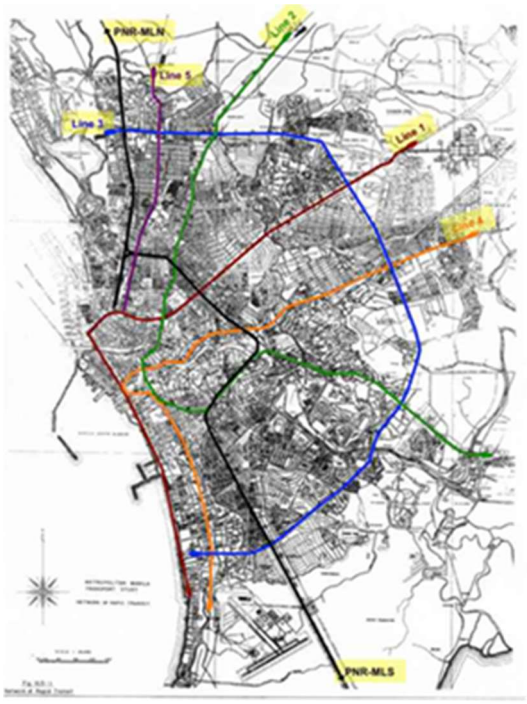


Figure 23. Proposed Rapid Transit Railway (RTR) Network
Source: UTSMMA 1973

Metro Manila Transport, Land Use and Development Planning Project (MMETROPLAN, 1977)

This was conducted form January 1976 to February 1977. It focused on the enhancement and management of the franchising of bus and jeepney services as well as cordon pricing, bus lanes, and an LRT system along Rizal Avenue. It contradicted the recommendations of the earlier UTSMMA on its RTR (Rapid Transit Railway), concluding that the earlier recommendations were not economically viable due to their high costs and expected low ridership. It recommended an LRT system on Rizal Avenue which would later become the LRT Line 1 as it is called today. It also recommended to have many small operators for buses and jeepneys.

Metro Manila Urban Transport Improvement Project (MMUTIP, 1981)

This was undertaken from July 1980 to August 1981. It focused on the improvement of the franchising system and in particular protection of franchise records as well as improvement in the efficiency in the granting of franchises. It also recommended additional bus and jeepney routes and proposed that additional buses were needed in major thoroughfares. It recommended jeepneys to be kept from major routes which were to be served by buses. It also recommended deregulation of jeepney services entry to non-bus routes. This study's focus was on the soft side of public transport operations such as management and franchising and not on the infrastructure aspects of the system.

Metro Manila Urban Transportation Strategy Planning Project (MMUTSTRAP, 1983)

Conducted from November 1982 to April 1983, this study contradicted the earlier recommendation of the MMETROPLAN's recommendations pushing for deregulation of entry of bus and jeepney operators. It recommended that profit is not the main objective of public transport services and public service should

take precedence over profit. The study recommended a prioritized list of public transport and road infrastructure projects for Metro Manila.

Metro Manila Transportation Planning Study I and II (JUMSUT I, 1984 and JUMSUT II, 1985)

These were also known as the JICA Update on Manila Study on Urban Transport (JUMSUT I & II, conducted from November 1982 to March 1984 and June 1984 to March 1985) which focused on the planning, traffic management, and public transport route restructuring for LRT 1 that would be plying Rizal Avenue and Taft Avenue. These studies recommended the restructuring of bus and jeepney routes so that they would not compete with but complement the LRT.

Metro Manila Urban Transport Development Plan (1990-2000) Project (UTDP)

This was undertaken from 1990 onwards to identify the needed transport interventions to improve urban transport in Metro Manila. It involved the various transport-related government agencies at that time. This consisted of a suite of studies the most notable of which is the study on identifying the suitable mass transit system on EDSA. The study recommended a bus–based system instead of a rail-based system. The bus system is now known as BRT and at that time was becoming a popular mass transit option in different parts of the world. Eventually, the government would opt for an LRT system for EDSA.

Metro Manila Urban Transport Integration Study (MMUTIS, 1996)

The MMUTIS was conducted from 1996 to 1999 is the most comprehensive urban transport master plan study conducted in Metro Manila. It involved the conduct of a comprehensive HIS (household interview survey) involving 40,000 households all over Metro Manila equivalent to 2.5% sampling rate. It developed a transport master plan for a 15-year planning horizon (until 2015) which consists of rail lines, road infrastructure, bus systems, integrated public transport terminals, etc. It also recommended travel demand management measures in addition to transport supply enhancement measures. It proposed more objective and informed planning and metropolitan governance models, underscoring the importance of land use planning integrated with transport planning. It pushed for financing transport infrastructure through private sector involvement, use of official development assistance (ODA), and integrated urban development. It also recommended the use of fiscal instruments to discourage car use and promote the use of public transport.

Aside from these master plan-type studies for Metro Manila, there were also thematic or focused studies that were undertaken, either transport system-specific or corridor specific. Among these are as follows:

Pre-Feasibility Study for a Bus Rapid Transit in the Greater Metro Manila Area

Funded by the USAID-ECAP (Energy and Clear Air Project) and undertaken in June 2006 to July 2007, this study identified and prioritized BRT corridors for Metro Manila, recognizing the advantages of BRT over rail-based mass transit systems in terms of lower cost, faster implementation times, flexibility, and possibility for incremental development, among other strengths. Potential BRT corridors were identified and prioritized using the following criteria – Passenger demand, availability of road space, traffic congestion, land use plan, potential for travel demand growth.

EDSA Bus Revalidation Survey

This study undertaken in 2005 assessed the bus services plying EDSA which is the major bus route in Metro Manila. It concluded that routes overlap resulting in an oversupply of buses serving the corridor. It recommended EDSA bus route restructuring to address the issue of oversupply and the conduct of a feasibility study for an EDSA BRT.

Mega Manila Public Transport Study (MMPTS)

A follow-up to the EDSA Bus Revalidation Study, this JICA study undertaken in November 2006 to April 2007 looked at the different issues that public transport in Mega Manila faces such as mismatch between supply and demand, need for route restructuring, etc. It also looked at the disconnect between the records of the LTFRB (franchising) and the LTO (vehicle registration), in effect recommending the integration of the databases of the two transport agencies.

Formulation of National Environmentally Sustainable Transport Strategies (NESTS, 2011)

This was undertaken by the UP National Center for Transportation Studies for the DOTC which identified transport strategies that aim to a) reduce the annual growth rate of fuel consumption and associated GHG emissions and b) mainstream environmentally sustainable transport systems that have low carbon intensity and promote environment-friendly transport modes. The strategies were grouped into 12 thematic areas: Public Health; Strengthening Roadside Air Quality Monitoring and Assessment; Traffic Noise Management; Vehicle Emission Control, Standards, and Inspection and Maintenance; Cleaner Fuels; Public Transport Planning and Travel Demand Management (TDM); Non-Motorized Transport (NMT); Environment and People Friendly Infrastructure Development; Social Equity and Gender Perspectives; Road Safety and Maintenance; Knowledge Base, Awareness and Public Participation; and Land-Use Planning.

The NESTS study would later inform studies and policies that emerged afterwards[13] –

- National Transport Plan and Policy (NTPP)
- Clean Technology Fund Investment Plan for the Philippines
- National Road Safety Action Plan (NRSAP)
- National Framework Strategy on Climate Change (2010)
- Medium Term Philippine Development Plan (MTPDP) for 2011-2016
- National Implementation Plan on Environment Improvement in the Transport Sector

Development of a Mega Manila Public Transport Planning Support System (MMPTPSS)

This DOTC-funded study undertaken by the University of the Philippines developed a dynamic model that can be used in determining the optimum number of public transport vehicles in a corridor that would a) serve passenger demand, b) within the volume capacity of the corridor, and c) with make for reasonable profitable operations. This is intended as an improvement over the use of the route measured capacity (RMC) which does not take into account overlapping routes, corridor capacity constraints, and network dynamics. The study also recommended the kind of mass transit system that is optimum for various

[13] UNCRD. Formulation of National Environmentally Sustainable Transport Strategies. 2011

ranges of passenger demand. The categories cover rail-based systems, BRTs, and conventional road-based public transport systems.

MMUTIS Update and Capacity Enhancement Project (MUCEP, 2014)

The MUCEP updated the person-trip database and the transport master plan developed by the MMUTIS. It also expanded the study area to include the provinces immediately at the outskirts of Metro Manila – Bulacan and Pampanga in the north, Rizal in the east, and Cavite, Laguna, and Batangas in the south. This MUCEP study area is now termed as Mega Manila. The so-called JICA Dream Plan consists of plans for road infrastructure, rail systems, bus rapid transit, and other transport infrastructure for Mega Manila.

Studies in Cebu and Davao

Transport studies have also been done in the two other primate cities of the country – Cebu and Davao.

In Cebu, the Metro Cebu Land Use and Transport Study (MCLUTS, 1978) was the first comprehensive land use and transport master plan preparation for what is called the Metro Cebu–an agglomeration of 7 cities and 6 municipalities which comprise the main urban center of Cebu Province. It was commissioned by the then-Ministry of Public Works, Transportation and Communication (MPWTC) with technical assistance from the Government of Australia. The study recommended 4 alternatives plans, namely: *Plan 1*: Concentrated, Without Reclamation; *Plan 2*: Concentrated, With Mainland Reclamation; *Plan 3*: Linear Dispersed, With Mainland Reclamation; and *Plan 4*: Mactan Expansion, With Mainland and Mactan Reclamation. The Metro Cebu Council adopted Plan 2, which recommended the development of radial-circumferential road network and new traffic signalization system.

The Metro Cebu Development Project (MCDP, 1989) was undertaken by the Japan Bank for International Cooperation (JBIC). It was the first comprehensive study for Cebu City and the rest of Metro Cebu.

The Cebu Public Transport Terminals Study was conducted in 2003 by the National Center for Transportation Studies of the University of the Philippines (UP-NCTS). The objectives of the study were a) to assess the suitability of proposed or existing sites/locations of inter-city public transport terminals; b) to determine the scale of the terminals such as number of berths or required floor/land area necessary to meet the demand, and; c) to review existing institutional and management structures of public transport terminals in Cebu City.

The Cebu Metropolitan Region Public Transport Strategic Plan (2009) commissioned by the then-DOTC identified mass transit options for Metro Cebu. The Cebu BRT Pre-feasibility Study (2010) and the Feasibility Study (2012) conducted by the World Bank for the DOTC have been the basis of the current Cebu BRT Project that will be the first BRT system in the country.

The Roadmap Study for Sustainable Urban Development in Metro Cebu (Metro Cebu Roadmap, JICA 2015) is Metro Cebu's blueprint for sustainable economic development. It has seven (7) sub-roadmaps including that for highway network and public transport development.

In Davao, the JICA Davao City Urban Transport Cum Land Use Study, 1983 was then the only comprehensive urban transport study undertaken for Davao City with extensive transport and land use surveys, travel demand modelling, and transport plan formulation and evaluation. The study recommended a diversion road linking Bunawah and Toril which eventually was implemented. The study also recommended the introduction of city buses to replace jeepneys for medium- to long-distance routes.

On public transport improvements, the master plan proposed the introduction of city buses to replace the jeepneys for medium- to long-distance routes and eventually, exclusive lanes for some bus routes.

The Davao City Transport and Traffic Management Plan was prepared by the UP-NCTS in 2000. The study proposed road and public transport interventions for the short, medium, and long terms.

The ADB supported the project "Promoting Sustainable Urban Transport in Asia (SUTRA)" which included Davao as one of its three case study cities. Completed in July 2011, this study recommended the urgent modernization of Davao's public transport system and operations. Included in the study is a pre-feasibility study of a BRT system for the city.

The Davao Sustainable Urban Transport Project (2013) aimed to develop a Comprehensive Public Transport Strategy (CPTS) which consists of transport operations and network structure, infrastructure provision and management, procurement, institutional and legislative framework, capacity development, and social impacts management.

The Davao High Priority Bus System Feasibility Study (2018) was conducted by the ADB to develop a high-quality bus-based public transport system that will eventually replace jeepneys on some arterial roads of the city. It is part of the Davao City Public Transport Modernization Project.

3.1.3. Recent Transport Policies

The National Transport Policy (NTP) was developed by the NEDA and the DOTr to articulate the government's vision for the country's national transport system along with its objectives and coverage.

The National Implementation Plan for Environmental Improvement in the Transport Sector (NIP) 2016-2020 aims to preserve the environment through sustainable passenger and goods movements propelled by clean energy. Some of the aforementioned NESTS study's provisions were used as input to the NIP. Together, the policies embodied in the NIP and the NESTS support the National Climate Change Action Plan (NCCAP) of the government.

The policies of the government have resulted in programs and projects that are aligned with the goals of urban mobility. Foremost of these interventions are the following:

The PUV Modernization Program is the DOTr's flagship program aimed to modernize the country's road-based public transport system through the following components:

1. Regulatory reform
2. LGU Local public transport planning with capacity building
3. Route rationalization
4. Fleet modernization
5. Industry consolidation
6. Financing
7. Vehicle useful life or scrappage program
8. Pilot implementation
9. Stakeholder support
10. Communications

The PUV Modernization Program is empowered by the Omnibus Franchising Guidelines which was issued by the DOTr in June 2017 to accomplish two things: to "shift the determination and provision of public

transportation services from the private sector to the public sector; this, in effect, would remove the longstanding exclusive reliance on the private sector in planning our local, regional, and national transportation systems" and to devolve the responsibility of public transport route planning from the national government, i.e. DOTr, to local governments[14]. The Local Public Transport Route Planning Manual (LPTRP) was developed to equip local governments in their new role of planning local transport.

The following are the salient points of the Omnibus Franchising Guidelines and the LPTRP:

- Part of the PUV Modernization Program, with local public transport planning assigned to local governments
- Local knowledge of local governments
- Focused on intra-city or intra-municipality trips
- Provincial LGUs to plan inter-city and inter-municipality trips
- DOTr to assist in inter-province and inter-region public transport planning
- DOTr to rationalize public transport planning for the Mega Manila (or MUCEP) area in the interim, with LGUs focusing on intra-trips
- Transfer public transport planning from private sector to public sector
- Change in institutional responsibilities

The "Build Build Build" is the overarching program of the national government to develop and implement infrastructure projects in the country including major transport infrastructure projects such as rail, bus rapid transit, intermodal bus terminals, and others.

The Greenways project aims to promote the use of NMT through the provision of high quality walking and bicycle facilities in Metro Manila and the highly urbanized cities (HUCs) of the country.

The National Urban Development and Housing Framework (NUDHF) 2017-2022 prepared by the UN-Habitat for the HLURB counts as among the strategies for Urban Planning and Design the integration of mobility and transport planning in land use planning. The NUDHF advocates the shift from car-oriented to people-oriented mobility. A new hierarchy of transportation and mobility is introduced, prioritizing pedestrians first, then non-motorized vehicles such as bicycles, followed by public transport, commercial vehicles, taxis, and single occupancy vehicles[15].

The UN-Habitat is assisting the HLURB in capacity development for local government units in the area of planning sustainable transport and land use development. The DOTr collaborating with the HLURB can serve as a very good opportunity for the mainstreaming of sustainable urban mobility in local areas.

The NUDHF recommends the integration of mobility and transport planning in land use planning. The NUDHF advocates the shift from car-oriented to people-oriented mobility. The DOTr collaborating with the HLURB can serve as a very good opportunity for mainstreaming sustainable urban mobility in local areas. A potential area of collaboration is capacity development for local government in the area of sustainable transport planning and land use development.

[14] DOTr, Omnibus Franchising Guidelines, June 2017

[15] UN Habitat. The National Urban Development and Housing Framework (NUDHF 2017-2022)

3.2. National Strategy for Urban Mobility

3.2.1. National Vision for Urban Mobility

While there is no single vision statement for urban mobility for the country, the following policies and legal instruments can be used as guide for the formation of a definitive urban mobility vision statement for the country. Foremost of these policies are:

- Ambisyon Natin 2040 or the country's development vision which incorporates freedom of movement (or mobility) in the national vision
- Philippine Development Plan (2017-2022) which includes transport strategies relating to efficiency improvement actions, road infrastructure improvements through engineering, education, and enforcement
- National Transport Policy which shows the attributes and descriptors of the transport system that is envisaged for the country
- National Urban Development and Housing Framework which is intended to guide the preparation of land use plans that adhere to the prioritization of transport modes in the following order – pedestrians, bicycles, public transport, and private vehicles

> The national vision for urban mobility can be shaped by the Ambisyon Nation 2040, the PDP, the NTP, and the NUDHF. These policy statements contain the elements and descriptors that can be used for articulating the national vision for urban mobility.

3.2.2. National Vision of the Country

The over-all National Vision of the Country for the year 2040 has been developed and is aptly branded as Ambisyon Nation 2040. The theme of mobility is embedded in the vision as the "freedom to go where we desire". It says:

In 2040, we will all enjoy a stable and comfortable lifestyle, secure in the knowledge that we have enough for our daily needs and unexpected expenses, that we can plan and prepare for our own and our children's future. Our family lives together in a place of our own, and we have the freedom to go where we desire, protected and enabled by a clean, efficient, and fair government.

"Good Transport" is one of the attributes of the kind of life that is envisioned for Filipinos.

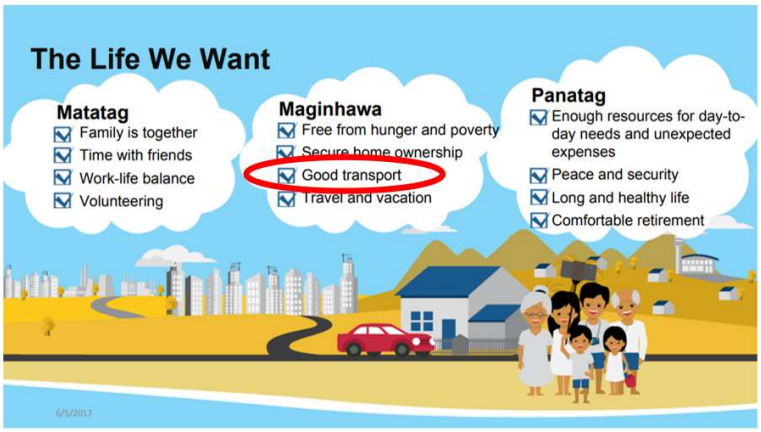


Figure 24 Overview of the Philippine Development Plan 2017-2022

3.2.3. Transport as Part of the Philippine Development Plan 2017-2022

The Philippine Development Plan (PDP) 2017-2022 is the lead document that determines the Government's strategic areas. The plan has three (3) pillars: enhancing the social fabric; inequality reducing transformation; and increasing growth potential. Within the plan, certain strategies have been identified, including transport strategies to be pursued within the plan's timeframe.

The PDP 2017-2022 also includes success indicators which are regularly reported to the NEDA. NEDA tracks indicators of the PDP through success matrices, with some indicators for transport that are relevant to national urban mobility.

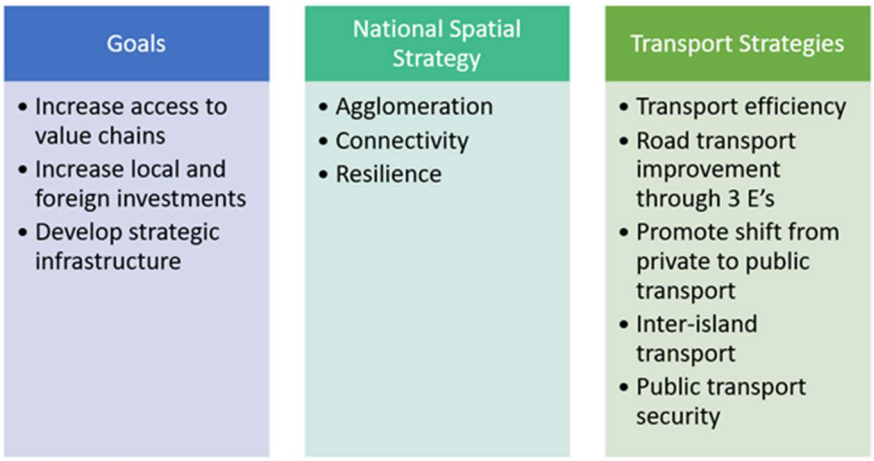


Figure 25. Framework of Philippine Development Plan 2017-2022

Transport Strategies are included in the PDP that are intended to achieve the goals and national spatial strategies that are embodied in the plan. These strategies include:

- Enhance efficiency of the transport sector through providing adequate, accessible, reliable, and safe access for people and goods.
- Improve road-based transport to address traffic congestion through "engineering, enforcement, and education," and upgrade road network to the highest quality standards.
- Encourage shift from private to public transport, especially on mass transport.
- Improve operational efficiency of airports and address constraints to optimal capacity utilization.
- Improve port facilities to ensure that inter-island shipping, including a stronger RORO network, will remain a viable option for transporting people and cargo
- Improve safety and security of public transport system by adopting a universal security structure.

Many of the above strategies are directly relevant to urban mobility, and four out of the six strategies presented here pertain to urban mobility.

3.2.4. National Transport Policy

The National Transport Policy (NTP) passed in mid-2017 articulates the kind of national transport system that is desired for the country. The vision, objectives, and coverage of the NTP are shown below. It is clear that sustainable urban mobility is covered by the policy.

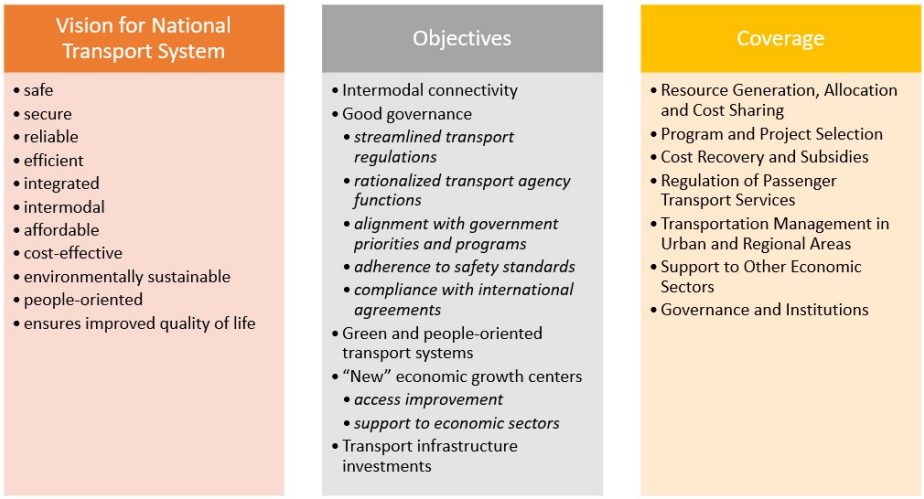


Figure 26. Framework of National Transport Policy

3.2.5. National Urban Development and Housing Framework

As described earlier, this framework passed in 2017 recommends that the planning for local areas would involve the integration of land use and mobility and transport planning. In addition, the framework recommends that prioritization be given to the various transport modes serving cities as follows: pedestrians, bicycles, public transport, commercial vehicles, taxis, and single occupancy vehicles. The aforementioned policies aim to achieve the following overarching goals of transport:

Table 8 Environmental, Economic, and Social Concerns of Urban Mobility

Overarching goals	Focal areas of action
Environmental concerns	GHG emission reduction, air quality improvement, road safety improvement
Economic concerns	Access to opportunities, traffic congestion reduction
Social concerns	Health impacts reduction, social equity, social inclusion

Environmental concerns

Environmental concerns warrant actions that will address global pollution (GHG emission), local pollution (air quality improvement), and road safety improvement. Among these concerns, the latter two are more perceptible in local areas because of their more direct effect on people. The challenge on the government, both national and local, is to underscore the importance of actions that address both global and local areas.

Economic concerns

Transport is a means to physically access employment locations and economic opportunities. Traffic congestion implies lost man-hours and reduced productivity. Addressing traffic congestion, therefore will translate to economic benefits. Reducing travel times through more efficient transport or shorter travel distances through good residential-employment locations mix will make cities more efficient and productive.

Social concerns

Transport should prioritize people's health. Air pollution, road crashes, and stress from travel are among the direct threats to people's health and should therefore be addressed. Transport should be made accessible and available to all regardless of socio-economic standing, gender, age, and physical status.

3.3. Stakeholder Analysis on Urban Mobility

Aside from the government sector, urban mobility involves numerous stakeholders coming from the private sector and civil society or non-government organizations. The following table shows the various stakeholders from these sectors. These stakeholders have national, regional, or local purview.

The mandates and responsibilities of national, regional and local government agencies have been described earlier.

> Urban mobility involves numerous stakeholders – from government, private sector, business, NGOs, commuter groups, and others.

Table 9. Stakeholders of Urban Mobility

Scope of Influence/Sector	Government	Private Sector	NGOs
National	DOTr, LTFRB, LTO, OTC, HLURB, DILG, DPWH, NEDA, DOST, DENR, DOE, DTI, PNP, CCC, LRTA	Vehicle manufacturers, Passenger transport drivers and operators, Passengers, Freight forwarders, Property developers, Employers, Businesses, Private car users	Commuter groups, NMT advocacy groups, Motorcycle riders groups, Car user groups, Media, Academia, Other interest groups
Regional	MMDA, NEDA, LTFRB, LTO, DPWH, DENR		
Local	LGUs, LTO, PNP-HPG		

3.3.1. Local Government Units

In addition to the mandate of LGUs to craft and implement its land use plans, it is also responsible for delivering basic services to its constituents, among which are planning, infrastructure provision, and traffic management. These are responsibilities where the concepts and practice of sustainable urban mobility can be operationalized. LGUs will just need the capacity to plan and implement urban mobility actions through the needed know-how, manpower, and resources.

> A typical LGU is generally a microcosm of the national government structure in delivering transport-related services.

A typical LGU is generally a microcosm of the national government structure in delivering transport-related services. As the executive branch of the government has the DOTr and the DPWH responsible for the soft and hard aspects of transport, respectively, the LGU has the planning office (usually the City Planning and Development Office or CPDO) and the City Engineer's Office (CEO) as the entities responsible for transport planning and infrastructure provision/maintenance, respectively. There is usually a separate office focused on traffic management.

The case of Makati City (Pop. 582,602 in 2015), for instance, shows these planning/management and infrastructure departments. The planning office is called the Urban Development Department and the

infrastructure office is the Engineering & Public Works Department. Then there is a traffic management office within the Public Safety Department. [16] The following shows the Organizational Chart of Makati City.

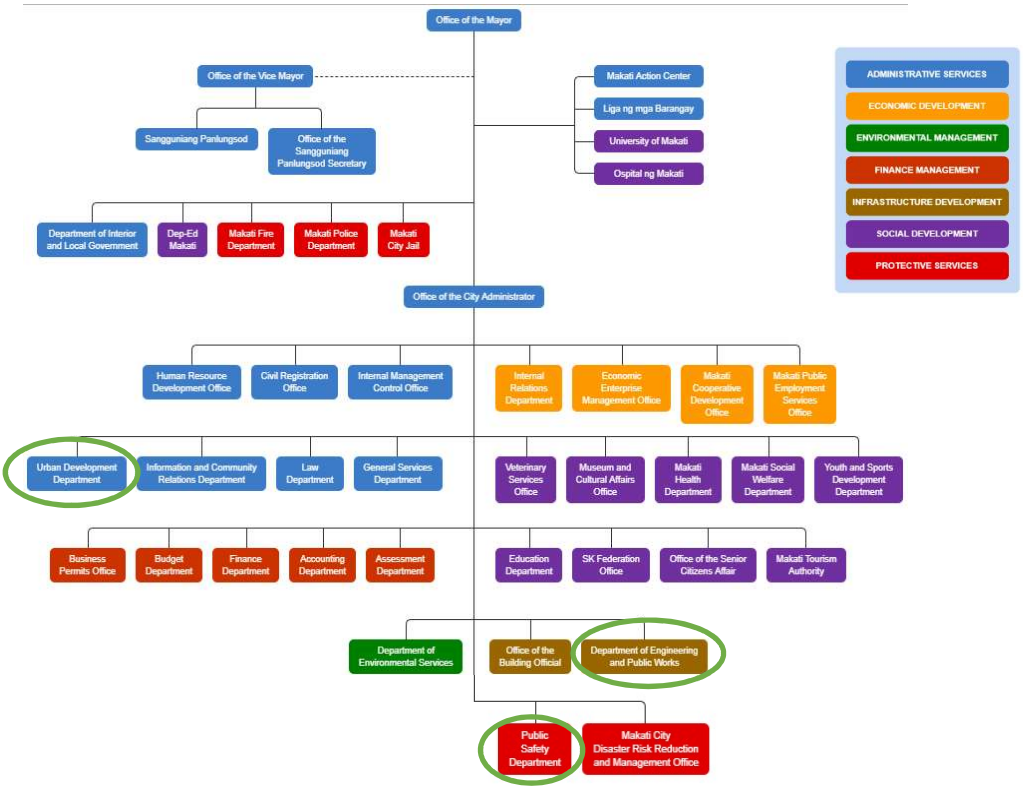


Figure 27. Makati City Organizational Chart

Under the Urban Development Department are the following divisions: Urban Planning Division, Monitoring and Evaluation Division, and Management Information Services Division. The Department has a total of 75 people consisting of the head and his assistant (2), 23 in the Urban Planning Division, 16 in the Monitoring and Evaluation Division, and 26 in the Management Information Services Division. Transport planning is subsumed under the Urban Planning Division.

Under the Engineering and Public Works Department are the Project Development Division, Equipment Division, District 1 Operations Division, and District 2 Operations Division. There is a total of 306 people in the department consisting of 3 people in the City Engineer's Office (1 head and 2 assistants), 26 administrative staff, 62 in the Project Development Division, 45 in the Equipment Division, 85 in the District 1 Operations Division, and also 85 in District 2 Operations Division.

Under the Public Safety Department are Security Services Division, Traffic Aide Division, and Special Services Division. There is a total of 1,000 people in the department consisting of 2 in the office of the department head, 47 administrative staff, 350 in the Security Services Division, 450 in the Traffic Aide Division, and 150 in the Special Services Division. Traffic management is undertaken by the Traffic Aide Division.

[16] http://www.makati.gov.ph/portal/organizational_chart/

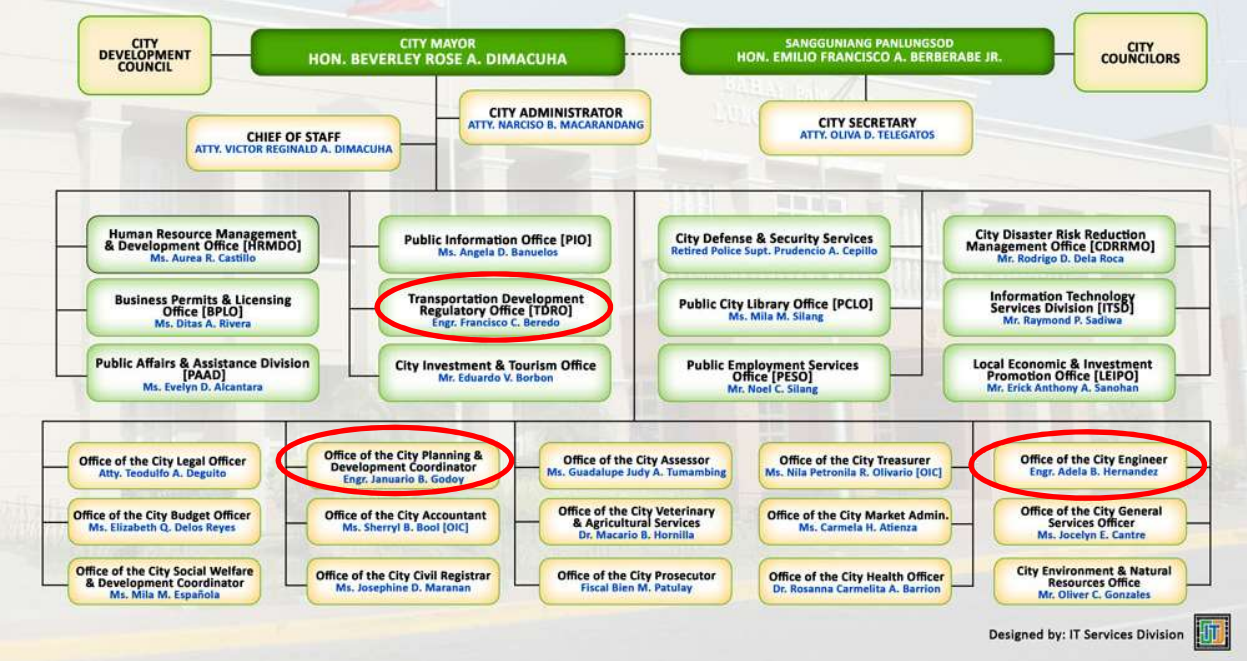
Navotas City (Pop. 249,463 in 2015) also in Metro Manila has its Traffic and Parking Management Office (TPMO) which is tasked with transport planning and traffic management. The team is comprised of 8 staff. The City Engineer's Office (CEO), meanwhile, is tasked with infrastructure provision, repair, and maintenance. It has 20 people in its team.

The TPMO is composed of the following divisions[17]:

- Traffic Engineering Division which is responsible for identification of traffic management schemes
- Transportation Planning Division which is responsible for regulation and oversight of public transport services (along with the Franchising & Permits Processing Unit or FPPU) and formulation of programs that will promote and advocate walking, public transport use, and high occupancy vehicle use
- Traffic Enforcement Division which is responsible for traffic management, traffic education, and road safety programs
- Facilities Management Division which is responsible for the operations and maintenance of terminals, parking facilities, bicycle facilities, administration of pedestrian districts and pedestrianized streets
- Support Services Division which is responsible for providing administrative and logistics support to the TMPO, management information services including collection of road crash data, inventory of roads and traffic control devices

Other cities have a similar organizational structure, slightly different in form but similar in substance. The following figure shows the organizational chart of the Batangas City government (Pop. 329,874 in 2015). The city government has the Office of the City Planning & Development Coordinator which undertakes the socio-economic planning including transport planning for the city, the Office of the City Engineer which is responsible for infrastructure provision, repair, and maintenance, and the Transportation Development & Regulatory Office which is responsible for local public transport regulation and traffic management.

[17] Traffic Management Code of Navotas City, Metro Manila, Ordinance No. 2004-13



Source: http://www.batangascity.gov.ph/web/about-the-city/city-government/organizational-chart

Figure 28. Batangas City Organizational Chart[18]

Clean Air Asia conducted an ad hoc survey in 2017 with the objective of assessing local government capacity, understanding, and existing activities. The survey was conducted in support of the capacity building activities to be led by the DOTR in the implementation of the PUV Modernization Program especially the roll-out of the LPTRP. The survey also intended to understand what problems and challenges the local governments perceive with respect to transport. The design of the survey was with due consultation from the PUV Modernization Capacity Building Working Group and considered information that the group wanted. The survey was sent out through the League of Cities in the Philippines (LCP) and was sent to all 145 cities. 60 responses were received, of which 17 were from HUCs, 39 from CCs, and 4 came from ICCs. The scope of assessment covered the following: perceived local challenges, existing data collection and monitoring, and government capacity including its mandates, plans and programs, financial allotment, and local partnerships. The survey did not intend to take samples but rather to identify priority areas of capacity building. As a pilot survey, there were initial insights gained from the respondents from LGUs on opportunities for urban mobility planning at the local government level.

The rapid assessment revealed that the top three transport issues among the 60 responding cities are: congestion, road accidents, and air pollution. On the other hand, public transport supply and management of operators are the concern for a small portion of the respondents. It also provided a better understanding of the structure in LGUs:

- Traffic and transport are led by the City Transport and Traffic Management Office (CTTMO) for most respondents. The office also handles public transport, traffic enforcement, traffic safety, and transport planning. However, for many cities, this function is handled by either the City Planning and Development Office (CPDO) or the City Engineers' Office (CEO).

[18] http://www.batangascity.gov.ph/web/about-the-city/city-government/organizational-chart

- Urban planning, which is comprised of land use and development planning, is heralded by the City Planning and Development Office (CPDO). The CPDO follows the HLURB Guidelines for Comprehensive Land Use Planning which was found to have very limited provisions for transport planning.
- Infrastructure operations, maintenance, and management for local roads is handled by the City Engineers' Office (CEO)
- Air pollution control is governed by the City Environment and Natural Resources Office (CENRO) for most cities. However, a large portion of city respondents indicate that they are unsure in air pollution management.
- Majority of cities indicated that they have GIS, although most only use it for land use planning and disaster risk reduction and management. Only 52% indicate that they use it for transport management.

Respondents were also asked "What kind of transport issues they encounter in the city?" and multiple answers were allowed (Figure 29). Unsurprisingly, majority of respondents indicate congestion (95%) as the top issue on transport, followed by road accidents (75%) and air pollution (53%). Interestingly, the supply of public transport seems to be the transport issue that majority of respondents (71%) do not perceive as a concern. Prior to the PUV Modernization Program and the LPTRP roll out, LGUs have governance over tricycles only, while other road public transport is handled by National government.

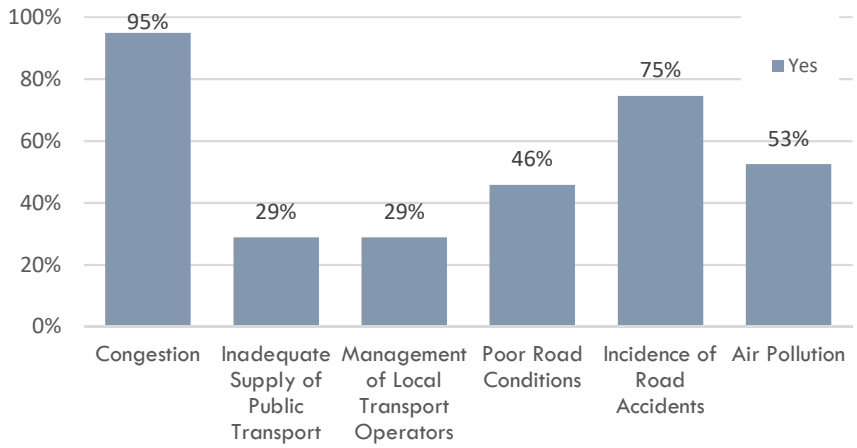


Figure 29. Perceived transport issues by local government units

Across all responses, there is general agreement that urban planning (Figure 30) is led by the City Planning and Development Office (CPDO). Interestingly, however, some respondents from the LGUs are not sure which office handles urban planning. Meanwhile, transport and traffic engineering (Figure 31) is led by the City Transport and Traffic Management Office (CTTMO) for most respondents. A key component of urban mobility is public transport, and respondents were asked which office in their LGU manages public transport for the city (Figure 32). Majority of the respondents also deem that CTTMO is to lead public transport management alongside the City Public Order and Safety Office (CPSO). A few respondents were unsure which office handles public transport. About 77% of the respondents also said their respective LGUs have their own GIS system.

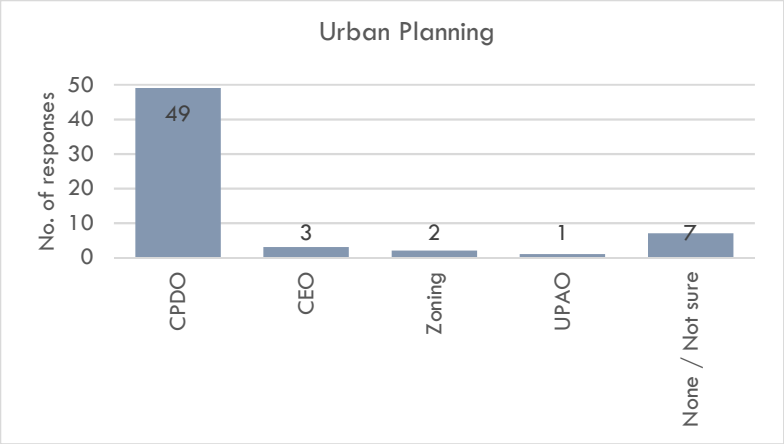


Figure 30. Local government office handling urban planning

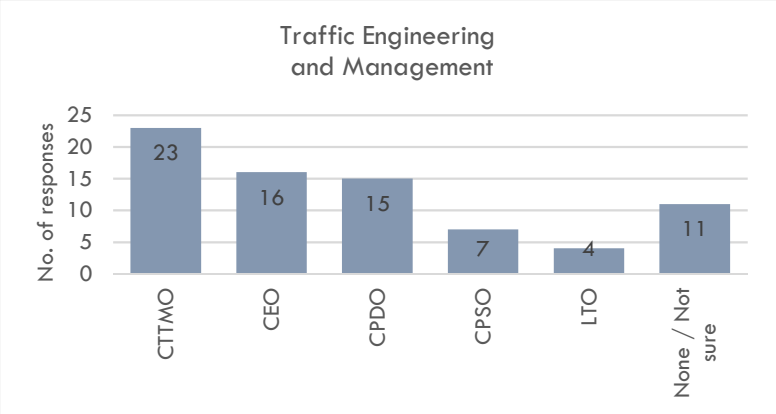


Figure 31. Local government office handling traffic engineering and management

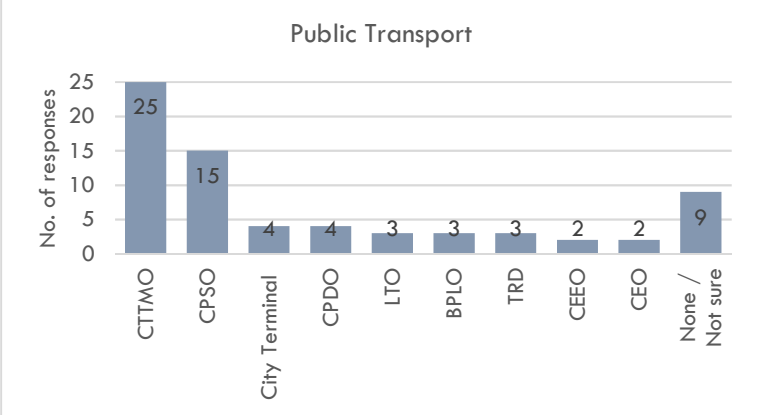


Figure 32. Local government office handling public transport

At the LGU level, transport project ideas are identified through the following sources:

- Local chief executive and other local officials
- Grassroots through the constituents

- Private sector such as businessmen and entrepreneurs
- Non-governmental organizations
- Development agencies
- Others

Projects are included in the 3-year comprehensive development plan of the LGU which are disaggregated into three annual slices and budgeted accordingly in the form of annual investment plans (AIP), proposed by the executive branch of the local government and approved for budgeting and implementation by the local legislative council. Transport projects may be physical infrastructure or transport or traffic management in nature. Transport projects must be in line with the existing local traffic ordinances or the Traffic Management Code of the LGU.

Transport projects that involve the private sector can be operationalized through public-private partnership (PPP) arrangements. Common projects include public transport terminals and parking facilities, both of which are developed with integrated commercial and other revenue-generating facilities and services. The Grand Transport Terminal Project in Batangas City is an example[19].

3.3.2. Other Urban Mobility Stakeholders

There are other urban mobility stakeholders which in various ways work with local governments in the provision of transport services.

Property developers provide transport facilities that make their properties accessible to users. Mall developers, for instance, provide space for public transport terminals within their premises aside from space allocated to private vehicles. They work with LGUs in determining the scale and appropriate location of terminal facilities within their property, ensuring that public transport services will be efficient and will be compatible with traffic management outside their premises. Such need for public transport facilities are identified as early as before the property development is undertaken (e.g. when a Traffic Impact Assessment or TIA is conducted) or when the property business has started operations.

NGOs that advocate sustainable urban mobility are also important stakeholders. These are groups that have specific advocacies on urban mobility. For example, bicycle use is advocated by the Firefly Brigade, Padyak, Bikes for the Philippines, the National Bicycle Organization, and others. Road safety is advocated by SafeKids, Safety Organization of the Philippines, Automobile Association of the Philippines, and others. These NGOs work with the national and local government, academe, private business, or with each other in pursuing their advocacies.

Public passenger transport and freight transport operators are important stakeholders in urban mobility. They provide services for people and freight movement and their vehicles compete for space with each other and with private vehicles. It is important that demand management is undertaken so that the movement of people and cargo is made in the most efficient and safest manner. Such demand management may involve temporal strategies (time-based vehicle volume reduction schemes and truck bans), spatial (truck bans in certain areas), or their combination. Clearly, the cooperation of these stakeholders is important in achieving sustainable urban mobility in local areas.

[19] https://www.batangascity.gov.ph/web/current-news/1746-batangas-city-isa-sa-mga-best-sa-ppp

International development agencies provide technical assistance and funding for the development of urban mobility interventions for cities. Some mass transit projects are undertaken through the assistance of international agencies. For example, the Cebu BRT project is being undertaken by the Philippine national government, the Cebu City local government, the World Bank, the French Development Agency (AFD), among others. The Mega Manila Subway project is being pursued with technical and financial assistance from the Japanese Government through JICA.

It is important to consider the involvement of the aforementioned stakeholders working with local governments in the planning, design, and implementation of urban mobility interventions in local areas.

It is important to consider the involvement of many stakeholders working with local governments in the planning, design, and implementation of urban mobility interventions in local areas.

4. Financing Transport

4.1. Financing sources

Transport plays a vital role in contributing to the national economy and also supporting individual social objectives. As such, transport infrastructure and transport services have national importance and investment in transport infrastructure and provision of transport services are often seen as an important role of government.

This section reviews the financial support for transport services, derived from a range of sources, identifying the key funding sources for both transport infrastructure investment and provision of transport services and examining the financial aspects relevant to the transport sector.

The following main players providing financial support for transport services and infrastructure have been identified:

- National Government
- Local Government
- National Development Banks
- Official Development Assistance (bilateral and multilateral donor agencies and co-operation partners)
- Households/the general public
- Private Sector
    - Transport operators
    - Commercial developers
    - Private sector investors

Where data permits, the scale of financial support available to urban transport is disaggregated from the overall funding available.

4.2. Central Government Budget

Central Government Agencies play a key role in planning and investment in transport infrastructure and in oversight of the transport sector. We can identify two key departments as having particular importance to transport:

The Department of Public Works and Highways (DPWH)– responsible for the planning and investment in national infrastructure as 'the State's engineering and construction arm'.

The Department of Transportation (DOTr) - responsible for the development and provision of efficient, effective and secure infrastructure in the transportation and communications sectors. The department covers road, rail, water, communication and aviation industries, ensuring effective transport and communications infrastructure to allow for economic progress

Other central government agencies may also have overlapping involvement in capital investment and operational oversight, including the Department of Finance, the independent National Economic and Development Authority (NEDA) and the Department of the Interior and Local Government.

The Philippine national budget for 2018 stands at PHP 3.77 trillion ($72 bn). The figure below shows the breakdown of the budget allocation of different government agencies for 2018 and the previous year.

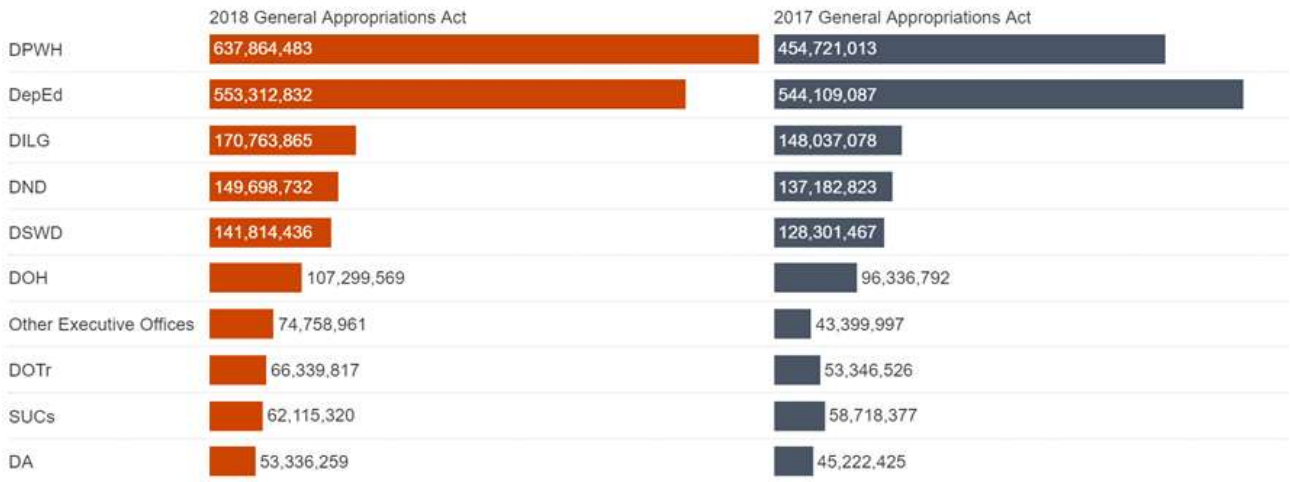


Figure 33. 2018 General Appropriations Act: Budget by Government Department

Under the 'Build, Build, Build' agenda of the Duterte administration, the two agencies most relevant to the financing of transport infrastructure have seen significant increases in their annual budget allocations, with DOTr seeing a rise of almost 25%, and over 40% increase for DPWH.

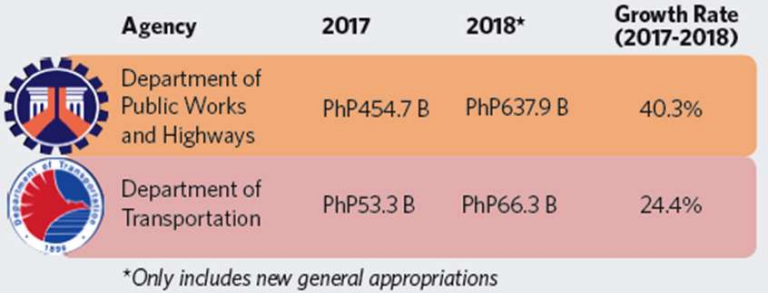


Figure 34. Evolution in budget of key transport related government departments

The national government departments with responsibilities relating to national infrastructure have seen a large increase in budget, but this is primarily for a program of capital investment

4.2.1. Department of Public Works and Highways

According to the detail of the General Appropriations Act budget allocation for 2018, the majority of DPWH spending will be directed towards capital investment. Capital outlay account for PHP623bn of planning budget spending, whilst maintenance and operating expenses amount to PHP 18bn, or just 3% of overall budget, as seen in the table below.

Type of Expenditure	Amount PHP(m)	%
Capital Outlay	623,732	96%
Maintenance & Other Operating Expenses	18,271	3%
Personnel Services	8,871	1%
Total	**650,874**	

* Source: GAA 2018

However, capital outlay includes expenditure on maintaining existing assets, where capital spending is required to keep the current network in a good state of repair. The 'Asset Preservation Program' specified in the general allocation amounts to PHP75bn in 2018, or 11.5% of the overall budget.

Disaggregating expenditure on highways from that on buildings and other infrastructure is challenging. Also, breaking down expenditure between urban and non-urban spending is not possible based on the GAA figures. DPWH is responsible for strategic roads, with the responsibility for the maintaining of local roads sitting with local government. Within the DPWH budget, there is however a specific program of expenditure entitled 'Local Program' which

4.2.2. Department of Transportation

The DOTr expenditure is allocated between different agencies within the Department. The greatest proportion of the budget is allocated to the Office of the Secretary, whilst various other agencies share the remaining third, as shown in the table below.

Type of Expenditure	Amount PHP(m)	%
Office of the Secretary	52,485	77%
Philippine Coast Guard	13,233	19%
Maritime Industry Authority (MARINA)	1,096	2%
Office for Transportation Security	1,072	2%
Civil Aeronautics Board	132	0.2%
Office of Transportation Cooperatives	87	0.1%
Toll Regulatory Board	30	0.04%
Total	**68,135**	

Some of the major programs included within the 2018 budget of the Office of the Secretary are as follows:

DOTr Program	Budget Allocation in 2018 - PHP(m)
RAIL TRANSPORT PROGRAM	24,059
AVIATION INFRASTRUCTURE PROGRAM	9,785
MARITIME INFRASTRUCTURE PROGRAM	5,464
MOTOR VEHICLE REGULATORY PROGRAM	1,731
LAND PUBLIC TRANSPORTATION PROGRAM	7,348

The rail transport program includes investment in enhancement and expansion of the MRT and LRT lines in Manila. The Land Public Transportation Program includes the PUV Modernization which has a budget of PHP843m allocated for 2018.

Some of the major projects included in the 2018 budget are as follows:

- Mindanao Railway – PHP 5,782m
- North South Railway Project Phase II – PHP 3,213m
- Cebu Bus Rapid Transit project – PHP3,081m
- North South Commuter Railway Project – PHP2,503m
- LRT Line 1 North Extension and Cavite Extension – PHP1,200m and 1,334m respectively
- Metro Manila Subway Project Phase 1 – PHP 1,000m
- MRT 3 Rehabilitation and Capacity Expansion – PHP1,000m

Despite appearing in the 2018 general allocation, the status of the Cebu BRT project, and also of the Manila Line 1 BRT project are presently in limbo, and the funding on hold. This highlights the ever-evolving nature of transport expenditure and investment.

Another important area of expenditure is the subsidy requirement for urban operations, with subsidy support for the MRT3 representing the second largest single item within the budget at PHP4,788m for 2018. Again, expenditure items such as this are inherently subject to change, as the subsidy requirement will be dependent on outturn passenger numbers and farebox revenues generated.

DOTr's budget includes allocations for specific transport schemes, with rail projects accounting for the most sizable component of spending.

A number of the most sizable projects under the land transportation program budget have been put on hold since the GAA was signed, which if not proceeding leave the land transportation budget at just a fraction of spending in other areas. The largest non-infrastructure program is the PUV modernisation program. The budget for this, at under 1bn for 2018, represents a small component of the overall transport budget by comparison with infrastructure investment, whilst the impacts are likely to have much more widespread effect.

4.2.3. Taxation on transport related activities

Central government funding is derived largely from tax generation through national taxes, with some borrowing also featuring.

Taxation on motor vehicles account for an important part of government revenue generation. These include:

- Customs duty on imported vehicles
- Vehicle excise taxes
- Fuel taxation
- Road Vehicle Users Charge (RVUC) or 'road tax'

Customs duty on vehicles imported into the Phillipines are significant at an average of 40%, plus VAT plus ad valorem tax. Vehicles purchased domestically are also subject to tax, known as vehicle excise tax. These are levied according to the net manufacturer's/importers selling price (NMISP), with higher rates for more expensive vehicles.

Fuel taxation is applied to the pump price whilst the Motor Vehicle Users Fund is essentially a 'road tax' intended to contribute to the maintaining and upgrading of the national highway network. It represents a combination of registration fees for vehicles and penalties for overloaded vehicles collected by the LTO. According to Republic Act (RA) 8794, funds collected from the MVUC should be placed in four special accounts in the National Treasury: Special Road Support Fund (80%), Special Local Road Fund (5%), Special Vehicle Pollution Control Fund (7.5%) and Special Road Safety Fund (7.5 %). The tax forms the bulk of the annual motor vehicle registration.

The increase in overall central government expenditure for 2018 and in future years will be supported largely by increased taxation revenue resulting from the recent changes to the tax regime under the Comprehensive Tax Reform Program known as TRAIN (Tax Reform for Acceleration and Inclusion). Review of the sources of government revenue and the target areas for increased taxation, it can be seen that taxation on transport related expenditure forms a key component to increased government revenues.

Vehicle excise rates have recently been revised under TRAIN, and are now a higher percentage of NMISP applied on an increasing rate from 4% on private vehicles up to PHP 600,000 increasing to 50% on vehicles over PHP4m.

The table below highlights the impact of the proposed tax reform program, with vehicle related measures highlighted. Increasing taxation on (in particular) private vehicle ownership and usage provides valuable revenue streams to support investment in sustainable mobility.

Particulars	2018 Projection	2019 Projection	2020 Projection
Comprehensive Tax Reform Program[a/]			
Bureau of Internal Revenue	(8,823)	48,681	63,951
Personal Income Tax	(141,361)	(155,453)	(172,143)
Estate and Donor's Tax	(3,122)	(3,238)	(3,367)
Value-Added Tax (VAT)	36,950	74,749	82,100
Excise Tax on Petroleum	35,595	60,333	73,282
Excise Tax on Automobiles	1,713	2,870	3,042
Sugar-Sweetened Beverages	42,265	44,378	46,597
Tax Administration	13,138	25,042	34,440
Tax Amnesty	6,000	-	-
Bureau of Customs	129,780	170,521	193,064
Excise Tax on Petroleum	38,058	64,128	77,781
Value-Added Tax (VAT)	44,017	48,308	53,082
Excise Tax on Automobiles	12,353	20,522	21,753
Sugar-Sweetened Beverages	4,696	4,931	5,177
Tax Administration	30,655	32,633	35,271
Motor Vehicle User's Charge	12,877	14,353	15,861
TOTAL REVENUES	133,833	233,555	272,877

Source: 2018 BESF
Numbers may not add up due to rounding off
[a/] Consistent with House Bill 5636 with Complementary Measures

As seen from the table above, more than PHP 100bn of the PHP 133bn in additional revenues estimated from the comprehensive tax reform program are generated from taxation related to the use of automobiles.

Based on the tax reform, the anticipated income generated from automobile use at the national level is set out in the following table.

Tax component	2017 (program)	2018 (projection)	
Bureau of Internal Revenue			
Excise tax on fuel	PHP 13,718m	PHP50,181m	+265%
Excise tax on other misc.*	PHP 3,269m	PHP5,023m	+53%
Bureau of Customs			
Other collections (Excise)*	PHP39,857m	PHP53,181m	+33%
Import duties and taxes*	PHP55,949m	PHP111,955m	+100%
Department of Transportation			
Motor Vehicle Tax	PHP12,250m	PHP25,837m	+110%
Total	**PHP125,043m**	**PHP246,177**	**+97%**

* cannot be disaggregated from available data

The tax components which include taxation on motor vehicle stand at PHP125bn for 2017, representing around 3.3% of the national budget and more than twice DOTr's overall budget. These tax revenues are projected to almost double in 2018.

Vehicle based taxation represents an important component of revenue generation for national government. The Motor Vehicle User Charge represents a revenue source which is ring fenced for re-investment in transport.

4.3. Local Government

Local government receives funding from national government through the Internal Revenue Allotment (IRA) and other shares of national tax collection. The Republic Act No. 7160 specifies allocation of IRA to LGUs in the following manner: provinces: 23%; cities: 23%; municipalities: 34%; barangays: 20%.

The scale of the allocation amounts to around 17% of national spending (see figure below), with 2017 IRA allocation standing at PHP555bn. For 2018, the LGU allocation has seen a reduction to PHP522bn ($9.9bn) with PHP120bn ($2.34bn) distributed to the 145 city LGUs. However, for 2019, it has been announced that the IRA will increase by 10% to PHP 575bn ($10.9bn), of which PHP 134bn ($2.55bn) distributed to the city LGUs (source DBM).

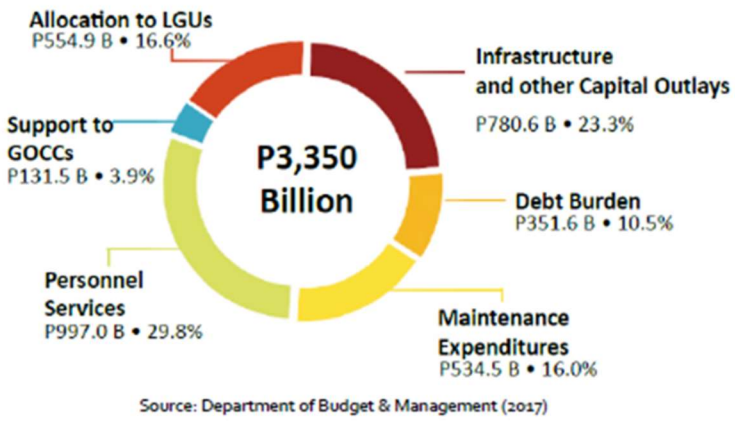


Figure 35. 2017 Philippine budget allocation

The IRA is however not the only source of financing open to LGUs, who may also raise local taxes and access private financing streams. (see figure below).

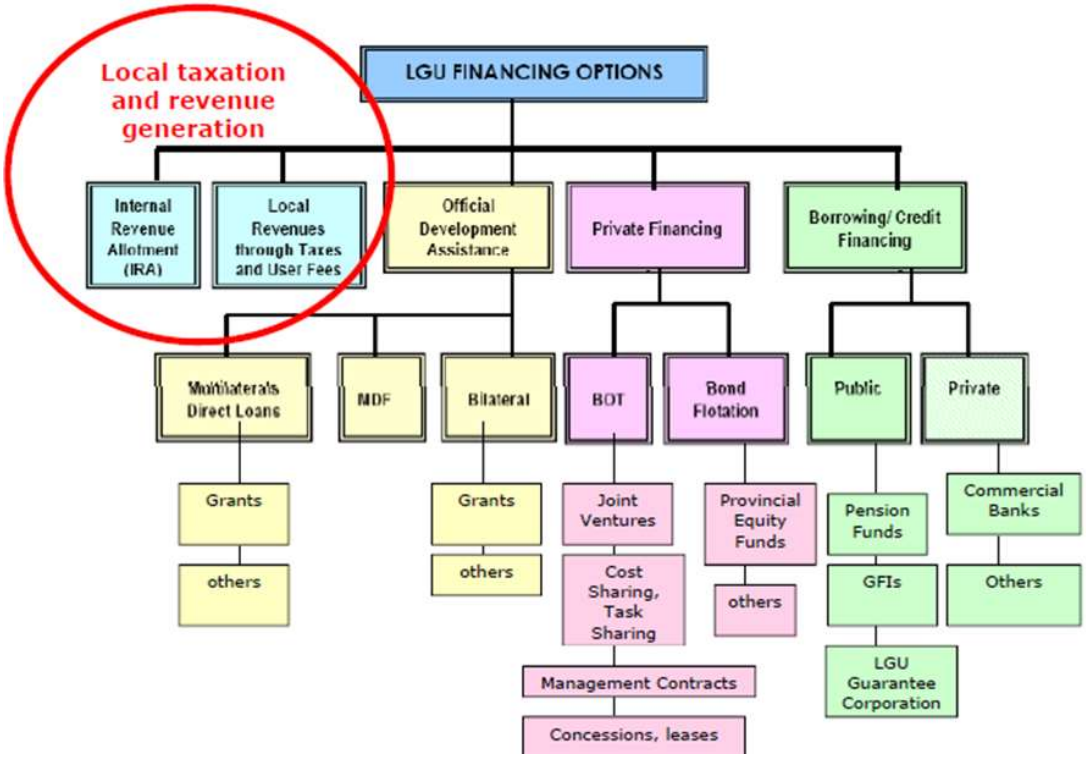


Figure 36: LGU Financing Options

Breaking down the expenditure of LGUs to determine what amounts are spent on transport related investment or support is challenging. LGUs are not required to publish details of expenditure and the available data only classifies expenditure into broad categories. Transport expenditure is likely to mainly be accounted for within the largest category within the breakdown, namely 'General Public Services'.

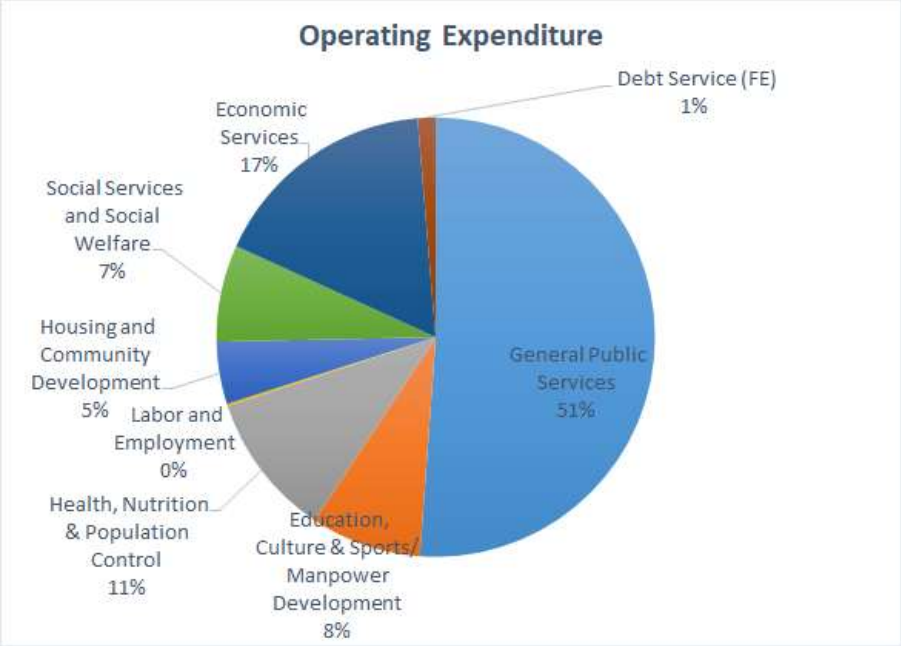


Figure 37: Expenditure profile of City LGUs (Source: Bureau of Local Government Finance)

The present data gaps represent a challenge to determining whether levels of local expenditure on transport are sufficient, and to enable benchmarking of expenditure between different LGUs to provide a foundation for best practice guidance.

LGUs have access to revenues to invest in urban transport, through the IRA and also local revenue generating powers. The devolved nature of decision making and the lack of transparency in spending hamper gaining a clear picture on the nature of local spending on transport.

4.4. Official Development Assistance (ODA)

International development agencies, including multi-laterals such as the World Bank, the Asian Development Bank and the Japanese International Cooperation Agency represent a significant source of finance for investment in major infrastructure projects in recent years. Technical support and financing of capacity development have also been extended by agencies including GIZ, the agency providing cooperation services on behalf of the German Government. As the table below highlights, within the transport sector, over $4bn (PHP 225 bn) in funding commitments were extended in 2015.

Sector	Net Commitments (in USD M)		Increase / Decrease (in USD M)	Increase / Decrease (%)
	CY 2014	CY 2015		
Energy, Power & Electrification	449.57	400	(49.57)	(11.03)
Social Infrastructure	603.28	250.21	(353.07)	(58.53)
Transportation	2,130.79	4,343.84	2,213.05	103.86
Urban Infrastructure	340.08	285.33	(54.75)	(16.10)
Water Resources	794.91	751.12	(43.79)	(5.51)
TOTAL	4,318.63	6,030.50	1,711.87	39.64

Source: National Economic & Development Authority (2016)

The relative scale of lending and support provided by the various development partners can be seen in the figure below.

Development Partner	Loans	Grants	Total Count	Loan Net Commitment (US$ M)	Grant Amount (US$ M)	Total ODA (US$ M)	% Share on Amount
GOJ-JICA	22	-	31	5,474.34	149.32	5,623.67	36.06
WB	11	-	33	3,035.46	89.00	3,124.46	20.03
ADB	13	-	41	2,881.40	100.37	2,981.78	19.12
USAID/MCC	-	69	69	-	1,343.73	1,343.73	8.62
Australia-DFAT	-	73	73	-	823.78	823.78	5.28
KEDCF/KOICA	7	-	22	522.38	78.71	601.09	3.85
UN System*	5	-	120	108.84	381.64	490.48	3.14
EU	-	12	12	-	217.32	217.32	1.39
GIZ/KfW	3	13	16	26.12	87.99	114.11	0.73
Canada-DFAT	-	11	11	-	74.14	74.14	0.48
AFD	1	9	10	54.94	9.92	64.86	0.42
OFID	2	-	2	51.61	-	51.61	0.33
Italy	1	-	3	28.27	5.61	33.88	0.22
Austria	1	-	1	22.12	-	22.12	0.14
AECID	-	14	14	-	19.00	19.00	0.12
NZAid	-	3	3	-	8.13	8.13	0.05
China	-	1	1	-	1.56	1.56	0.01
TIKA	-	3	3	-	0.90	0.90	0.01
NoRad	-	1	1	-	0.32	0.32	0.00
TOTAL	66	400	466	12,205.49	3,391.44	15,596.93	100.00

* UN System is composed of FAO, IFAD, ILO, IOM, UNDP, UNICEF, UNIDO, UNFPA, UNEP, UN-ESCAP, UN Women, UNAIDS, WFP and WHO

Source: NEDA ODA Review 2017

Note that the above table does not disaggregate lending just to the transport sector. However, according to the ODA portfolio review from which the figure was sourced, the DOTr has the largest share of active loans, with 23% of the overall loan value (US$3.56bn, featuring 11 loans and 3 grants).

Much of the ODA support within the transport sector focuses on major infrastructure projects including highway, rail and other mass transit. A number of urban transport studies have also been supported by international development parties.

4.4.1. Japanese International Co-operation Agency (JICA)

As can be seen from the scale of lending, JICA plays an active role in the Philippines, and is currently implementing over one hundred official development assistance (ODA) projects within the country. The amount of investment (US $3.3bn in 2014) puts JICA as one of the most active ODA partners of the Philippines.

This involvement includes the transport sector, with JICA having completing a transport strategy for Metro Manila, titled the 'Roadmap for Transport Infrastructure Development for Metro Manila and Its Surrounding Areas', with the development of a hierarchical, integrated and well-coordinated transport network known as the 'Dream Plan'.

JICA is presently supporting a commuter railway project (North – South Commuter Railway Project Malolos – Tutuban), providing 42 billion yen in concessionary loan (0.1% annual interest rate, 40-year repayment term) with procurement of various elements of the project tied to Japanese technology. JICA has also recently been supporting the improvement of river transport, and has been supporting the financing of water taxis in Manila.

4.4.2. World Bank

The World Bank has been actively supporting transport projects in the Philippines in recent years, and in particular Bus Rapid Transit Schemes. The status of the most recent schemes, including the BRT schemes in Cebu and Manila, are now in question, but the

In 2012, the World Bank funded a study looking at the rationalisation of the public transport network, to identify key mass transit corridors which may be served by BRT, entitled the Road Transit Network Rationalisation Study (RTRS). This study was supplemented by a follow-on study (RTRS2) which focused on the network rationalisation which could be undertaken in the short term whilst awaiting the delivery of the infrastructure to support the mass transit corridors.

4.4.3. Asian Development bank

The Asian Development Bank (ADB) has also been active in the transport sector in the Philippines, and has been supporting urban public transport schemes including the Davao Sustainable Urban Transport project and innovative public transport projects in Manila such as the e-trike program. Much of this activity has been focused on supporting initiatives at the technical or capacity building level rather than in terms of direct financing, with the e-trike program being an example of this approach.

4.4.4. GIZ

GIZ has been providing technical support and assistance in a range of areas in the transport sector, supporting DOTr initiatives including the PUV Modernization program with technical expertise on sector understanding, recommendations for technical standards and scrappage programs, and scheme financing. GIZ is also currently supporting the development of this National Sustainable Urban Mobility Program.

ODAs play an important role in providing finance and technical support for the development of urban transport schemes.

4.5. Households Expenditure on Transport

Whilst the government forms the principal source of investment in transport infrastructure, the public play a major role in supporting this funding, through taxation, and also in funding the majority of transport operations.

Estimates relating to the scale of household expenditure on transport vary widely according to the source, but the most recent Family Income and Expenditure Survey (2015) provides aggregated estimates of expenditure on transport by income. The table below shows the overall expenditure on transport, disaggregated by category.

Total Family Expenditure on Transport by Income Decile, Philippines: 2015

Income Decile	Transport Expenditure (Estimates are in millions.)			
	Total Transport Expenditure	Purchase of vehicles	Operation of personal transport	Transport services
Philippines	360,515	57,229	102,925	200,361
First Decile	8,357	611	1,300	6,445
Second Decile	13,019	1,702	2,446	8,870
Third Decile	15,871	1,732	3,252	10,887
Fourth Decile	19,634	2,366	3,823	13,445
Fifth Decile	24,076	2,908	4,932	16,235
Sixth Decile	29,966	3,201	6,067	20,698
Seventh Decile	34,238	3,688	7,741	22,808
Eight Decile	42,433	4,692	10,849	26,892
Ninth Decile	56,740	8,356	15,885	32,499
Tenth Decile	116,182	27,971	46,630	41,582

Source: PSA, 2015 Family Income and Expenditure Survey

Overall annual expenditure on transport amounts to PHP 360bn ($6.9bn) which spread between the 22.98m households would amount to an expenditure of PHP15,690 ($300) on transport per household per annum. The average household income in 2015 was 22,000 pesos per month ($420), with the national household expenditure figure estimated by FIES totalling 4.88 trillion so based on these figures, transport accounts for just 7% of average household expenditure.

It should be noted that the proportion of transport expenditure by household is actually estimated to increase by income level, with the lowest decile spending just 4% of income on transport, increasing to 10% for the highest decile. Whilst a low proportion of spending may imply affordability, it is conversely possible that lowest income groups are priced out of using transport services, and consequently spend less on them.

Data on household expenditure on transport appears to be particularly inconsistent, with wide ranging discrepancy between sources.

The burden of transport costs are a particularly important area of understanding in making appropriate transport investments and regulatory decisions relating to fare structuring.

It is important to note that at the national level, spending on transport services (including PUV and other modes of transport excluding private car) exceed spending on private vehicle use. It is only the highest income decile for which spending on private transport outstrips expenditure on other transport services.

4.6. Transport Sector Revenues

The estimated PHP 200bn spent on transport services by Filipino households, will be spread across a range of different modes of travel. As outlined earlier in the overview of transport modal shares, the majority of motorised trips are made on public utility vehicles, principally jeepney, tricycles or buses. The informal nature of operations, the fragmented industry structure and the fact that many are likely to presently outside of the formal tax system means that revenues generated for each form of transport mode are largely unknown. The data available on each mode is reviewed below, with estimates of likely revenue generation made where feasible:

4.6.1. Tricycle

Tricycles providing intra-urban transport serving short-distance trips and also providing feeder services to the mass-transit modes. Tricycles are regulated by the LGUs, with franchises issued at the local level. There is no central record for the number of franchises in operation. Vehicle statistics provide an estimate of the number of tricycles and motorcycles registered in the Philippines, with the number for 2014 standing at almost 4.5 million. The number of tricycles cannot be disaggregated from this data, but separate estimates of the number of tricycles operating 'for hire' stood at 650,000 in 2013 (LTO, 2013), therefore representing the most prolific form of PUV in the Philippines.

Operated by 'micro-operators' typically with just a single unit, with no formal record keeping and typically sitting outside of the formal tax system, there is no robust means of estimating tricycle sector revenues. However, operator surveys provide insight into typical daily farebox revenues, with estimate ranging from PHP400 (Cabanutuan City, Balaria 2016) through PHP720 (Mandaluyong, DOE 2012) up to PHP1,000-1,500 in Boracay (ADB, no date).

Taking a conservative PHP500 per day, and assuming 300 days of operation (allowing for some vehicles being off-road, colour coding etc), the fleet of 650,000 tricycles may be generating sector revenues of approaching PHP100bn. This represents half of overall household spend on transport services (ie PUV).

4.6.2. Jeepney

With an estimated 235,000 franchised jeepney vehicles (LTFRB) operating nationally, the jeepney is the most prevalent mode of public transport. The majority of the jeepney are old vehicles, owned by small scale operators and offering the cheapest form of motorised transport available in the Philippines. As with tricycles, there is no issuing of tickets or formal record keeping, so no accurate data on total jeepney trips or sector revenues. However, based on operator surveys and ridership data collected from past studies, we can make an indicative estimate of the scale of the market size.

Typical daily ridership per vehicle is observed to be in the order of 200-300 passengers per day in Manila (RTRS, 2015), with an average fare paid of PHP 10 (RTRS1, 2014). Taking the lower estimated patronage, which may better reflect the conditions outside of Metro Manila, and the same annualization factor of 300, annual jeepney farebox revenues may be in the order of PHP600,000 per annum. The total household expenditure on jeepney would therefore total PHP 141bn.

4.6.3. Bus

Buses form an important form of public transport, particularly in Metro Manila and for the longer distance inter-city and provincial services. The bus fleet is smaller than that of the tricycle and jeepney, with 23,750 buses were registered for hire in 2013 (LTO, 2013). However, buses have higher carrying capacity, higher per km fares, and typically serve longer journeys.

The average bus fare paid in Metro Manila in 2014 was PHP24, by comparison with the PHP10 observed for Jeepney. Average daily carrying capacity for buses in the capital is typically within the range of 600-800 passengers. Fare revenues per bus per day were estimated to be approximately PHP15,000-20,000 (RTRS1).

Operating profiles will differ greatly between urban and inter-urban services, but whilst ridership numbers may be higher on urban services, distances travelled and hence fares, will be higher on provincial services. Taking the more conservative estimate of daily revenue of PHP 15,000 on average would suggest annual fare revenues in the order of PHP4.5 million per vehicle per annum. With a vehicle fleet of 23,750, this implies a likely revenue generated by the bus sector of just over PHP100 bn.

4.6.4. Urban Rail

There are a number of rail lines serving urban transport movements. These are principally in Metro Manila, with sections of the Philippine National Railway (PNR), the MRT3 rail line and the light rail lines 1 and 2 serving the capital.

Typical of most rail systems worldwide, their operation requires government subsidy, whether explicit or implicit, as revenues generated from passengers are insufficient to fully cover operating costs and investment in new rollingstock, let alone contribute to the cost of the infrastructure. A UNESCAP paper summarised the DOTC approach to fare setting with the following table:

Public transport mode	Fare-Setting Objectives		Consequences	
	Social Acceptability	Financial Viability	Impact on fares	Fiscal burden
Rail based	√		Artificially low fares	High subsidy
Road based	√	√	Profitable fare	No subsidy

Source: Mijares et al, 2014, UNESCAP

The three rail mass transit systems, LRT1, LRT2 and MRT3 each have different ownership structures. MRT3 has been operated jointly by the government and private sector, whilst LRT1 is operated by a private sector consortium and LRT2 is solely government run.

Unpicking the true scale of the government subsidy is not straightforward given the differing contractual arrangements for each line, and the challenges in disaggregating capital costs for infrastructure construction and rolling stock renewal, infrastructure maintenance, commercial operating costs ongoing maintenance with stated ridership and farebox revenues.

Establishing accurate figures for the level of rail subsidy per passenger trip, or per passenger km forms an important part understanding the urban transport financing picture.

For each rail line, we review the available data on ridership, revenues and government subsidy

4.6.5. LRT Line 1

LRT1 has historically been the more successful of lines in terms of financial performance. Operated by government until 2014, the system farebox ratio was said to cross-subsidize the more poorly performing line 2 (excl. infrastructure and depreciation costs).

The LRT Line 1 extension, operation and maintenance contract awarded in 2014 is the largest PPP contract awarded by the Philippine Government to date. The value of the contract was PHP65bn ($1.24bn). Although there was finally just one bidder, that winning bid by Light Rail Manila Corporation entailed a PHP9.35bn was for a PHP9.35bn premium payment to the government rather than an operating subsidy. It should be noted however, that a premium payment does not imply that the LRT line will operate in surplus, or generate a profit for the government, but rather that based on the contractual obligations set out, the bidder is willing to pay a premium to enter into the contract as it is written.

Maximum ridership has topped 500,000 passengers daily. Annual patronage has not been reported for 2017, but from its unaudited operating report for Q1 2017, an average daily patronage of 445,000 was stated, indicating an annual patronage of c. 160 million. Average fares currently rage from PHP15-PHP30, suggesting annual farebox revenues may total PHP3.6 bn

It is the nature of the contract which determines the true cost to the government and to the public of the LRT operations, and this included obligations on the government for land acquisition and the assumption of the payment of full property taxes over the 32 year period (which may amount to PHP64bn)and a liability to cover the difference in fares if they are not to rise in line with the significant growth rates set out within the contract (10.25% every two years plus 5% on opening of the extension). Indeed, the private operator has already filed petitions 2018 for the government to provide subsidy of PHP300m to cover the offset of a planned fare in 2017 and most recently requested an additional fare increase to help recoup investment (May 2018).

4.6.6. LRT2

The financial statement of the LRTA for 2017 posts gross revenues of 1.272bn, with an annual ridership of 65.96m. This implies a revenue yield per passenger trip of just under PHP20. The recorded farebox ratio was 1.04, indicating that revenues exceeded operating costs (excl depreciation).

However, including all cost items, the recorded operating loss for the year was 2.7bn, a deterioration from the 1.67bn recorded in 2016, demonstrating full accounting costs to be more than twice the farebox revenues. A government subsidy of PHP819m was recorded within the accounts for 2017, down from PHP1.68bn in 2016.

4.6.7. MRT3

When operating at full service, MRT-3 carries as many as 500,000 passengers per day, well in excess of the design capacity. It is owned by the Metro Rail Transit Corporation (MRTC), which financed the construction of the railway under a 25yr Build-Lease-Transfer (BLT) agreement with the Philippine Government. The maintenance contract has changed hands, from Sumitomo Corporation to Busan Universal Rail Inc, and then to DOCT after operating performance and system maintenance was deemed unacceptable. DOTr is currently working with JICA on a rehabilitation programme and to mobilise a new maintenance provider.

Given the maintenance problems, system capacity has been severely hampered in recent years, with the standard running of 20 trains falling to 15 in November 2017 and then down to less than 10 in early 2018.

Annual ridership figures for 2017 are not available, but a DOTr press release quoted a 'total ridership of 463,202 passengers' from July 2016 to June 2017, up from 379,223 from July 2015 to June 2017. This implies a 2016 annual ridership of c. 150m.

Farebox revenues for 2016 were recorded to be PHP2.16bn, which based on the above ridership implies an average fare of just under PHP15. The fares for this line are held artificially low through subsidy to provide a social service. In the same year, the accounts indicate an annual subsidy of PHP6.29bn from national government. Hence, the level of government subsidy amounts to three times that of the fare paid. The subsidy allocation for MRT3 within the 2018 GAA budget is PHP4.79bn.

> The subsidy per passenger for LRT2 and MRT3 travellers is estimated to be around PHP45, or the equivalent of at least 4 typical jeepney trips.

4.6.8. Taxi

Taxis form an important mode of urban mobility, and their numbers have been increasing in recent years with the increasing popularity of Grab and Uber (now taken over by Grab).

LTFRB issues taxi franchises, but many of the new app-based service vehicles are operating without franchise. As such, total numbers of taxis are unknown, and ridership data is not freely shared. The intensity of operation amongst the app-based taxi drivers is also a grey area as many choose to drive on a part-time basis, or as a second source of income.

Prior to Grab's acquisition of Uber, there were an estimated 66,000 Uber cars and 52,400 Grab cars which had made at least one 'for hire' journey in the year 2016/2017. Recent evidence given by the head of Grab however suggests that in terms of active vehicles after the acquisition, only 35,000 drivers were operating, and that this number only sufficient to meet to meet three-quarters of the demand of 600,000 bookings per day. LTFRB has recently raised the number of ride-hailing vehicles allowed franchises under the transport network vehicle services (TNVS) to 65,000 units in Metro Manila, 1,500 in Metro Cebu and 250 in Pampanga.

> There is a lack of clarity on franchised taxi vehicles and also on the scale of activity undertaken by taxis, particularly ride-hailing services. This frustrates estimates of sector size and of wider impact on the transport network.

These vehicles are additional to the LTFRB franchised taxi vehicles which operate in cities and serve the airport. These numbers are estimated to be 40,000.

With the revised franchise limit, it is possible that 100,000 taxis would be operating in the country. Based on a typical 12 journeys per day (Grab figures), the number of taxi trips may exceed 1 million per day.

With metered taxi fares presently standing at PHP40 for the first 500m and 13.5 per km, and Grab fares often sitting higher than this, a typical fare for an 8km journey would be around PHP140. Taking an estimated 1m trips per day, and the same annualization, this sector could be generating PHP42bn in fares per year.

4.6.9. Public Transport Expenditure Summary

The calculations presented above provide indicative figures for the potential scale of expenditure on different modes of transport in the Philippines presently. Whilst these cannot be directly validated and are based on some extrapolation from known figures (typically from Metro Manila), they nevertheless provide some insight into the relative scale of financial flows within the PUV and mass-transit sector.

Mode	Fleet size (estimated)	Daily Revenue/vehicle (estimated)	Annual Revenue/ household expenditure (conservative, rounded)
Tricycle	650,000	PHP500-PHP1,000	PHP 100bn
Jeepney	235,000	PHP2,000-PHP3,000	PHP 141bn
Bus	23,750	PHP15,000-PHP20,000	PHP 100bn
Taxi	100,000*	PHP1,400-PHP2,000	PHP 42bn
Total			**PHP 383bn**

*Including extension of franchise limit

The expenditure on rail, is estimated in the table below:

Line	Annual Patronage	Government Subsidy	Annual Revenue/ household expenditure (conservative, rounded)
LRT1	160 m	Unknown	PHP 3.6bn (est.)*
LRT2	66 m	PHP819m	PHP 1.27bn
MRT3	150 m (2016)	PHP 6.29bn (2016)	PHP 2.16bn
Total			**PHP 7.03 bn**

* based on average fare

The public transport sector revenues estimated above, which total PHP390 bn for PUV and rail, plus a further estimated PHP43bn for taxi, are more than double the estimated household expenditure on transport services recorded in the FIES. Whilst these are made based on broad estimates which may vary from true operating performance in some cases, the FIES estimate of just 7% of household income spent on transport would appear unjustifiably low. A common transport accessibility indicator is a target for a 10% or less expenditure on transport for the lowest income groups. Based on the FIES data, transport affordability might be seen as not being an issue.

> Farebox revenues generated from transport users forms the largest single source of financing of transport. The figures above are national, but with 45% of the population living in urban areas, the expenditure on urban transport may amount to over PHP200bn per annum.

4.7. Development banks, Commercial Banks and the Private Sector

Some of the expenditure made by the government, households and operators is financed through borrowing. As such national banks, commercial banks and other private investors also play a role in the financing of transport infrastructure, the vehicle fleet and in some cases in ongoing operations through PPP arrangements.

Below, we consider the main lenders related to the transport sector.

4.7.1. National Development Banks

Landbank and the Development Bank of the Philippines are two of the largest banks (by lending volume) in the Philippines. Part government owned, these institutions have historically provided the mechanism for extending credit to socially beneficial sectors. Transportation represents a 'priority sector' for both organisations. Based on latest available data, the level of lending extended in relation to transport for each organisation is as follows:

- Landbank – PHP38.9bn, representing 7% of the overall lending of PHP564bn to priority sectors in 2017
- Development Bank of the Philippines – PHP76bn of an overall loan portfolio of PHP219bn lent to infrastructure and logistics projects

Both Landbank And DBP have been instrumental in financing major transport infrastructure as well as extending credit to the transport sector for fleet purchases. Most recently, the development Bank of the Philippines has committed to providing a PHP 1.5bn financing facility for the PUV Modernisation program.

4.7.2. Commercial Bank Finance

Commercial banks providing financing support for mobility through a variety of market areas. The largest of these is through auto loans for private vehicle purchase. The commercial sector as a whole extended PHP475 bn ($9.1bn) in 2017 (source BSP), having seen significant year-on-year growth from the PHP 86bn extended a decade earlier.

The ability to access consumer credit at reasonable rates of interest is likely to have had a strong impact on motorization rates and to support the total number of vehicles on the roads in urban areas.

Commercial banks also support public transport fleet operators. Statistics are more challenging to come by, but bus and jeepney operators have been able to access finance through mainstream lenders

provided sufficient collateral could be offered. Without the necessary collateral however, many smaller operators have resorted to micro-finance at much higher rates of interest.

4.7.3. Private Sector Investors

The private sector has also been seen to be instrumental in financing, investment and innovation in the transport sector.

Public-Private Partnership (PPP) has played an important role in the rail sector, with the LRT1 contract being the largest PPP contract awarded in the Philippines to date. PPP is likely to play a pivotal role in expansion of the rail network with the financing, the construction and operation of future lines delivered in partnership with private sector participants.

The Public Private Partnership Centre provides details of the PPP projects completed and in the pipeline. The following transport related projects are found in the database:

Project	Value (PHP)	Agency	Status
Daang Hari-SLEX Link Road Project (	2.23bn	DPWH	Completed
Automatic Fare Collection System (AFCS)	1.72bn	DOTr	Completed
NAIA Expressway (Phase II) Project	17.93bn	DPWH	Completed
Metro Manila Skyway (MMS) Stage 3 Project	37.43bn	TRB	Under construction
Southwest Integrated Transport System (ITS) Project	2.5bn	DOTr	Under construction
MRT Line 7 Project	62.7bn	DOTr	Under construction
LRT Line 1 Cavite Extension and O&M	64.9bn	DOTr & LTRA	Under construction
South Integrated Transport System Project	5.2bn	DOTr	Under construction
NLEx-SLEx Connector Road	23.3bn	DPWH	Under construction
Operation & Maintenance of LRT Line-2	No capex	DOTr & LTRA	On Hold
LRT Line 6 Project	65.09bn	DOTr	On Hold
Road Transport IT Infrastructure Project (Phase II)	0.3bn	DOTr & LTFRB	Under procurement
Cebu Bus Rapid Transit (BRT) Project - Operations and Maintenance Project*	3.058bn		On Hold
Motor Vehicle Inspection System Project**			Under development
BGC Bus Rapid Transit Project			Under development
Total	**PHP280bn+**		

Major corporations feature prominently in many of the PPP schemes. For example, the Ayala Development Corporation forms part of the LRT1 consortium and is also an important player in a consortium investing in Clark airport.

However, new initiatives and transport schemes are also supported by smaller scale investors. Private finance has been instrumental in supporting new ventures such as the COMET electric jeepneys.

> The private sector plays an important role in the provision and financing of urban transport.

5. Review of Inventory and Diagnostic Analysis of Status Quo

A review of the inventory of urban mobility as presented above provides a picture of the status quo in urban mobility patterns and characteristics in the main cities in the Philippines and also highlights a range of important observations on the challenges observed in urban transport and shortcomings in the present arrangements.

The analysis also identifies gaps in the available data which prevent a full understanding of the current situation, and presents limitations to effective planning.

In this chapter, we first review the missing information with a 'gap-analysis'. We then review the information which has been identified in the inventory, undertake an evaluation and 'SWOT' analysis (Strengths, Weaknesses, Opportunities, Constraints) of the status quo, and draw observations upon which we base our recommendations on the structure of the NUMP.

We focus in particular of the key areas in which the national government can have influence over urban mobility, namely.

- Governance
- Finance
- Capacity Building
- Technology

General observations on present arrangement within each of these categories are drawn before considering in turn how these relate to the main areas of urban transport provision, with individual consideration of the following:

- non-motorized transport,
- public transport,
- freight

5.1. Governance

One of the key areas determining the planning and delivery of urban transport is the prevailing governance arrangements. This includes the institutional and regulatory structures in relation to the government agencies involved, the legislation relating to the responsibilities of the various parties and the planning framework put in place.

5.1.1. Institutional and regulatory framework

The examination of the institutional framework identified a large number of government bodies and agencies who have some degree of involvement or determined interest in urban mobility. Alongside the two main national government agencies with direct responsibilities for transport networks – the DOTr and DPWH - and the city LGUs, overseen by the Department of Interior and Local Government, who have responsibilities over local roads and some regulatory responsibilities for PUV regulation, we also identify a range of other agencies with overlapping and cross-cutting objectives and responsibilities.

These include the Department for the Environment and Natural Resources, the Housing and Land Use Regulatory Board, the Department of Trade and Industry, the Department of Energy amongst others.

The allocation of roles and responsibilities identified during the inventory analysis can be summarized as follows:

- DOTr takes the role as primary planning, programming, coordinating, implementing and administrative entity with regard to urban transport service provision, policy and regulation.
- The LGUs are mandated to plan and regulate the use of land within their territories and provide basic services to their constituents, subject to the guidelines of other government agencies, and with the DILG overseeing and enabling the LGUs to perform their allocated functions.
- The DPWH is mandated to undertake the planning, design and construction of nationally important infrastructure, such as national roads and bridges, flood control, water resources projects and other public works. The DPWH's involvement in urban mobility relates principally to the strategic road infrastructure located in urban areas.

A number of important observations can be drawn in relation to the current institutional arrangements:

- The number of different agencies involved in urban mobility in some form or other lead to a complex and multi-faceted nature of the institutional arrangements and necessarily results in numerous co-dependencies, overlaps and necessary linkages between the different agencies.
- The present allocation of urban transport planning responsibilities is heavily weighted towards national government and specifically to the DOTr. This leads to highly centralized power and decision-making structure with regard to city transport which runs counter to the principle that urban transport is primarily a local issue. The devolving of urban public transport planning currently underway will go some way to rebalancing this situation.
- The state regulates the acquisition, ownership, use and disposition of property, through the constitution. However, it is only the planning /control of the USE of land/property which is devolved to the local level, through the LGUs Comprehensive Land Use Plans (CLUPs)

5.1.2. Transport and land use planning framework

For the institutions responsible for mobility to effectively deliver to their mandate, they must be supported and guided by a well-defined policy framework, with a guiding strategic vision for what they should be aiming to achieve, clear objectives against which performance can be measured and detailed planning guidance and regulations upon which to implement the strategy.

When considering the appropriate policy framework in relation to urban mobility, there must be recognition of the balance to be struck between the development of a locally driven and appropriate vision, whilst remaining in alignment with national objectives and considerations. This is typically achieved by the defining of an overarching national policy framework, which then supports the development of regional and local transport plans.

The National Transport Policy (NTP), developed by NEDA and DOTr, and passed in 2017, sets out the State's vision for transport and to synchronize decisions and investments of all transport related

agencies to better coordinate such efforts between national and local government. As such this policy aims to provide the afore mentioned balance between national and local level policy. The most pertinent content of the NTP in relation to its linkages with urban mobility, and the development of the NUMP is as follows:

The State's Transport Vision is **a safe, secure, reliable, efficient, integrated, intermodal, affordable, cost-effective, environmentally sustainable and people oriented** national transport system that ensures improved quality of life of the people

The NTP recognizes

- the recurring historical issues of a lack of integrated and coordinated transport network and overlapping and conflicting functions of transport agencies
- the role that the NTP must play in ensuring effective and efficient inter-government co-ordination, local government participation and stakeholder collaboration in order to achieve
    - good governance through rationalized transport agency functions
    - policies aligned with government priorities and programs
    - alignment with international agreements and adherence to safety standards
    - promoting green and people-oriented transport systems
    - create new economic growth centers for inclusive growth

Specific sub-components to the policy state that:

- National transportation agencies and local government units will work together to address transport sector needs
- The focus is on moving people rather than vehicles and that public mass transit in urban areas shall be given priority over private transport
- In addressing of traffic congestion on urban roads, mobility management measures will be preferred to infrastructure facilities
- LGUs should periodically develop transport and traffic management plans to ensure integration with the areas land use plans, supported by the regional offices of the transport agencies
- The DOTr shall work closely with other agencies to ensure that all transport modes are intermodal
- All concerned agencies, the LGUs and academia will work together in enhancing institutional capacities and capabilities, and effectively engage the private sector and civil society in the development of transport projects

As such, the implementation of the NTP if effectively implemented, should provide an effective overarching framework for the National Sustainable Urban Mobility Program and the local urban mobility plans. This plan is intended to feed into the Philippine Transport System Master Plan, and also is supported within the Philippine Development Plan (2017-2022).

Integration with the land use planning framework is however also vital, for the transport plan to be effective. The National Urban Development and Housing Framework (NUDHF) 2017-2022, developed for the HLURB, recognizes the importance of this linkage and recommends the integration of mobility and transport planning in land use planning. Further, it advocates the shift from car oriented to people-

oriented mobility, in line with the NTP, with a hierarchy of transport prioritizing pedestrians and other non-motorized transport before public transport, commercial vehicles and finally private car.

A review of the present status of the existing governance structures is considered below, within the SWOT framework.

5.1.3. Strengths

The passing of the National Transport Plan (if implemented according to its policy statements) represents a significant strength in that it sets out clearly the vision and objectives for transport at the national level, whilst also providing the framework for transport delivery at a local level.

The recent National Urban Development and Housing Framework brings transport into the planning framework with a focus on people-oriented mobility and accessibility which is appropriate to dealing with urban transport issues.

The move to devolve public transport planning responsibilities to the LGUs as part of the Local Public Transport Route Planning (LPTRP) requirements should also be seen as a strength in that it moves responsibilities to the local level which is the level at which impacts of the planning are most keenly felt.

5.1.4. Weaknesses

The development of the NTP, and the strengths of this policy as highlighted above, has been driven by the historical (and still currently existing) weaknesses mentioned. These include the weakness of the previous policy framework, the lack of clear division of responsibilities between agencies, the lack of co-ordination and co-operation, and the failure to involve local stakeholders in planning decisions which would be best developed at the local level. The passing of the NTP is an important first step in addressing these weaknesses, but unless effectively implemented, many of these may remain.

The lack of co-ordination between transport planning and land use has been highlighted in the status quo analysis, and indeed is a challenge which is seen worldwide. Whilst the HLURB is adopting a positive strategic direction with the new NUDHF, this will only be effectively delivered if the co-ordination between agencies can be greatly improved.

Notwithstanding the recent move to decentralize some planning responsibilities, the overall structure of planning and transport delivery responsibilities remains more centralized than seen within the institutional structures in other countries. The figure below shows by example the Swedish planning framework, in which the great majority of the transport, traffic and development planning work is undertaken at the municipal (local) level, with the national government responsible mainly for setting the national plan and overarching planning framework.

We recognize that the path to devolving of planning powers must be balanced with the status of planning capacity at the local level, and that therefore this process may take time. The principal that urban transport planning is first and foremost a local issue should however be explicitly recognized within the development of the NUMP and that the best path towards greater planning responsibilities devolved to the local level should be considered.

DP=Development Plant; RDP= Regional DP; LDP= Land DP

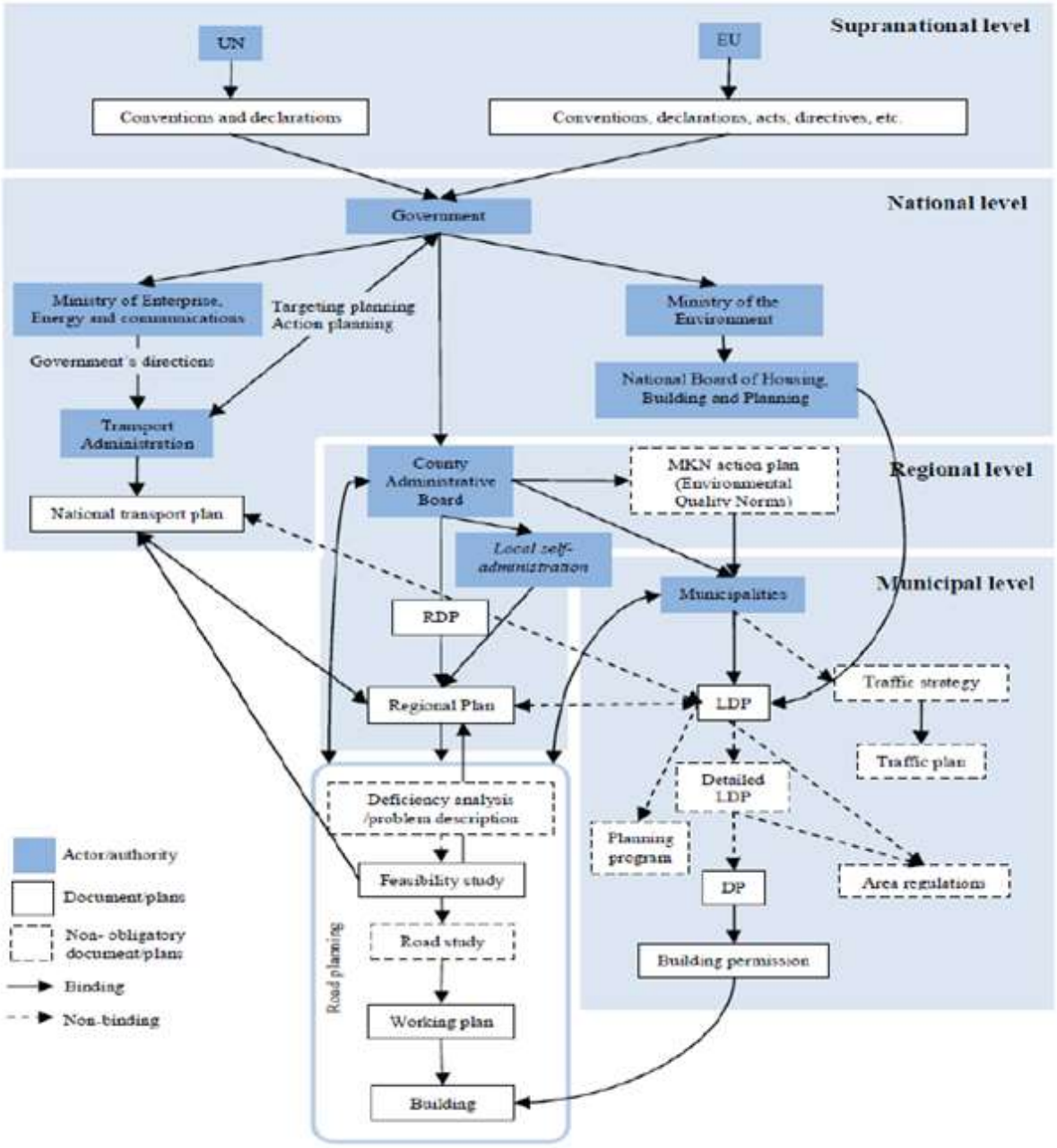


Figure 38: Schematic of Swedish planning process

5.1.5. Opportunities

The NTP represents a significant opportunity to forge a new direction in urban transport planning. The commitments to sustainable transport provide support for a wide range of initiatives which may be pursued at the local level. The focus on people rather than vehicles, and on sustainable travel rather than the private car provides clear strategic principles upon which local transport plans will need to be based, which should place constraints on less progressive local authorities who may wish to prioritise investments for private motoring at the expense of the majority of the population.

There is also a strong commitment to improved co-operation between national and local government in order to meet the challenges presented in improving urban mobility, and to the necessary co-ordination of investment and programs between the national and local level agencies which is essential to delivering coherent transport facilities and services at the city level. The devolving of public transport planning responsibilities and the associated capacity building is a first step in this process.

In light of the above, we believe that the NUMP can be developed in full consistency with, and supported by, the national strategic policy framework.

5.1.6. Threats

The analysis of the planning framework highlighted a vast number of historic plans which had been developed and then superseded, and ultimately not implemented. This serves to highlight the fact that plans alone do not deliver change. A main threat, given this past experience, is that despite the new plans, implementation will be lacking.

The reasons for the non-delivery of the plans are multi-fold, but we can identify the following which may represent threats to seeing transformational change:

- Vested interests can often disrupt plans for change, with strong political forces present amongst the transport operators and those benefitting from the status-quo
- The political cycle is short within the LGUs (3 yrs) and even at national level, the political terms require rapid implementation of programs before the threat of administration change
- The legislative framework in the Philippines presents significant barriers to change, slowing the necessary procedures and processes and increasing the risks of non-delivery

5.1.7. Recommendations

Drawing in the assessment of governance structures, and the opportunities and constraints identified within the SWOT analysis above, we make the following specific recommendations with respect to governance structures and the policy framework:

Commitment to devolving of urban transport planning responsibility

Urban transport is first and foremost a local issue, affecting the people who inhabit and travel within the urban area. As such, there should be strong local influence and input into transport planning and decision making at the local level.

There are however also impacts and implications of urban transport which extend beyond the local level. The National Sustainable Urban Mobility Program provides a mechanism for ensuring that local government is equipped to effectively take on urban transport planning responsibilities, but that locally made planning decisions take account of the wider impacts and strategic objectives

The tactical phase of NUMP development should define areas in which planning responsibilities can be devolved to local government, with consideration of the findings of the SWOT analysis, and the areas in which support has been identified as a requirement for local government to perform its functions effectively.

Integration of transport planning and land use planning at the local level

The historical lack of integration between land use and transport planning, and co-ordination between the agencies involved in these areas has led to disjointed development which performs poorly in terms of sustainability and effective transport accessibility.

The recent development of the National Urban Development and Housing Framework (NUDHF 2017-2022) provides a step forward in the prioritization of sustainable transport as part of the strategy. The existence and future evolution of this framework offers the opportunity for stronger integration of transport planning (or mobility planning) with land use planning at the local level. Opportunities for greater input into this next revision of this document by DOTr should be sought.

Consideration of NMT within local planning framework

NMT is presently poorly served within the streetscape, despite its vital importance to urban mobility. Consideration should be given to the inclusion of NMT (pedestrian & bicycle) facilities and usage in local Traffic Codes and Zoning Ordinances for implementation at the local level. The DOTr working with the DILG and the HLURB can affect the stronger linkage between transport and land use planning at the local level.

Increased collaboration between agencies

The analysis of governance structures highlighted the multitude of agencies at the national and local level involved in different facets of urban mobility. Effective urban mobility planning requires effective inter-agency and inter-ministerial collaboration in the governance of urban mobility.
This requires working groups to be established on urban mobility matters and input across agencies to the development of the policy framework.

There also needs to be a strengthening of NGA and LGU linkages in the planning and implementation of urban mobility actions at the local level.

5.2. Budgeting and Finance

The nature of the financing of urban transport has important implications over its planning and delivery. The inventory and status quo analysis identified a range of sources of financing or urban transport provision, with differentiation made between infrastructure provision and service delivery. Although in many cases the financing streams lacked a certain element of transparency, estimates were made regarding the scale and relativity of the financial flows and revenue streams.

5.2.1. Government funding

Both national and local government play a role in the financing of urban transport, principally through infrastructure spending, with subsidy of transport service provision limited to rail services.

The size of the budget of the two main central government agencies, the DOTr and DPWH, has increased significantly for year 2018, rising by 40% and 24% respectively, and is anticipated to remain elevated to support delivery of the 'Build, Build, Build' program.

Disaggregation of spending by type of investment is frustrated by the nature of presentation of the spending components, but the major spending programs were outlined in the earlier analysis. Infrastructure spending, on highways by DPWH, and on rail networks and aviation infrastructure by

DOTr, form the largest expenditure components. Spending on softer measures, and on urban public transport facilities and support beyond rail schemes pale into insignificance against the major cost items.

The largest non-rail related urban transport schemes relate to bus rapid transit schemes for Cebu and Manila, but the status of these is presently in question, with funding put on hold. The budget allocated to what may be considered to be the most significant transformational change in urban public transport within recent history totals just PHP843m in 2018 - 1.2% of the DOTr budget, and less than a fifth of the amount allocated to subsidize the MRT3 line in 2018. If the government is serious in its recognition of the importance of public transport in delivery of urban mobility objectives, it would appear that the budget allocation does not fully reflect this.

Taxation of transport activities represents a significant source of government revenue with the new TRAIN taxation regime seeing this area of taxation increase by almost 100% from PHP125bn in 2017 to 246bn (estimated) in 2018. Hence, the scale of transport related tax revenues amounts to around half of the overall combined budget of the DPWH and DOTr. The use of these funds to not only support the maintenance of the existing networks, but to support sustainable transport, particularly in urban areas where greatest impact can be achieved represents a significant opportunity.

Expenditure on the urban transport network at the local government level is non-transparent, and it is not possible to determine the nature or scale of investment in local roads, public transport infrastructure provision, or in delivery of local planning functions.

5.2.2. Household Expenditure on Transport

Household expenditure on transport represents by fare the main source of support for transport services. According to the Family Income and Expenditure survey, PHP360bn is spent on transport annually (2015) of which PHP200bn relates to expenditure on public transport services, and the remainder on private vehicle ownership and operation. This compares to a government subsidy support (for rail services) of under PHP10bn.

Whilst a significant sum, overall household expenditure represents only 7% of total household spending, which may be considered low by comparative standards (less than 10% is often considered to reflect good affordability). More concerningly, the proportion of expenditure is estimated to be much lower at lower income deciles, suggesting in fact a lack of affordability.

Our own calculation of individual PUV sector revenues, which place the total farebox revenues (which are paid by households ultimately) at approaching PHP400bn, almost double the FIES estimate of spending on transport services, putting those figures into question.

In terms of relative importance of different public transport modes by revenue generated, the largest sector is the jeepney sector, which is estimated to generate c. PHP140bn in revenues, followed by the bus and tricycle sectors with PHP100bn each. There is a lack of clear data on taxi services, although it is recognized that with the introduction of the app-based ride hailing services, this has been a high growth sector. Current revenues within the taxi sector are estimate to just over PHP40bn.

5.2.3. Land value capture and other financing possibilities

Transit-oriented development (TOD) refers to and integrated land use and transport development where a high-quality mass transit system serves as the major access mode to a place which plays host of

a mix of various land use activities. The high-quality mass transit system provides accessibility to a place thereby making it an attractive location for various uses. With improved accessibility comes attractiveness of the place and therefore, higher property values. The increases in property values resulting from improved accessibility is a potential source of funding resource for infrastructure. The mechanism of harnessing these increases in property values for infrastructure investments is called land value capture (LVC). This is an established funding mechanism of urban infrastructure in some cities in Japan, the United States, China, and India, to mention a few.

The leading modalities of LVC is development-based and tax-based. Development-based LVC refers to joint development of property served by the mass transit system by the transit proponent and property developers or by charging property developer for increased floor area ratio or for air rights development. Tax-based LVC refers to increases in tax rates on property as a result of improved access created by the new mass transit system. There are many variations of each of these modalities.

At present, there is no formal practice of land value capture in Philippine cities. Mass transit systems are developed either by the government (e.g. Light Rail Transit Authority or LRTA) of by a private proponent which the government has designated as concessionaire (e.g. MRT Consortium for the MRT 3, or San Miguel Infrastructure for MRT7). Whatever increases in property values resulting from proximity to a transit station are solely enjoyed by the private sector.

The closest semblance of LVC in the country is in the current practice of the government to set as bid parameter the highest premium payments offered by competing infrastructure project bidders to win PPP projects. These premium payments serve as payment to the government for the privilege of winning the concession. The winning bidder then integrates transport infrastructure development with land development, consequently enjoying the windfall of benefits emanating from new and improved accessibility of places resulting from the transport project.

TOD dovetailed with LVC is a two-pronged approach to sound development of urban areas. Together, they provide a means for financing infrastructure. In addition, they are means for good urban development, without which no increases in property values will be created and hence captured.

A SWOT analysis of the present financing arrangements is set out below:

5.2.4. Strengths

The increase in budgets for the main agencies responsible for the delivery of transport infrastructure and the planning and regulation of transport services can be considered a very positive development, increasing the ability of these agencies to effectively deliver on their mandates.

High levels of public transport usage and a large proportion of overall household expenditure directed towards public transport services as opposed to private transport offers a strong support for the commerciality of public transport service provision.

5.2.5. Weaknesses

Despite the increase in budgets, expenditure on infrastructure provision and facilities for the most dominant modes of transport, namely walking and PUV journeys remains a fraction of overall spending. Prioritization of ‘big ticket’ infrastructure schemes such as new highway, metro and rail schemes

inevitably comes at the expense of sufficient spending in these areas which must be seen as a priority, if the objectives of urban mobility are to be achieved.

Expenditure on land-based mass public transport remains low, particularly with the putting on hold of the BRT projects. Support and facility provision for PUV services which carry by far the greatest number of motorized trips is limited to the amounts allocated for the PUV modernization program, despite the scale of impact of that program having fare greater impact than the implementation of new rail lines, if delivered successfully.

The ability for government to have influence of public transport services through direct support is limited, constitutionally, by scale of resources, and by the policy position adopted within the NTP which states that fares and charges for transportation services shall as far as practicable be cost based.

Lack of transparency in local government spending, and a lack of clear linkage between national and local government financing flows in relation to urban transport provision hamper the ability to assess the appropriateness of current expenditure patterns.

5.2.6. Opportunities

Greater taxation of transport services, and in particular of private motoring forms a strong funding platform for future spending on sustainable transport provided that the revenues generated are able to be directed towards this purpose. This ongoing funding stream should be used

Whilst the policy position set out within the NTP favours full cost recovery for all transport services, there is provision for subsidies, incentives and government undertakings when justifiable on economic, environmental or social grounds.

5.2.7. Threats

Without sufficient support and improvement in service levels of the public transport sector, there is great risk that as incomes increase, patronage is lost from public transport, undermining sector revenues and hampering commercial performance. This pattern has been observed in many countries as they have developed and become richer, and is seen to develop a vicious circle where loss of passengers reduces service levels, making public transport even less attractive. It is essential that the maintaining and ideally the increasing of public transport model share is adopted as a target of government, as a means of improving urban mobility and avoiding the negative impacts associated with urban transport.

Historic challenges in achieving full disbursement of budget has been identified as a weakness, driven in often by lack of tight management of projects (in part perhaps due to understaffing).

The creditworthiness of many transport sector participants including the PUV operators and many freight operators represents a barrier to investment and also to professionalization of these industries.

5.2.8. Recommendations

Achieving significant improvement in urban mobility will require funding both of an appropriate level and directed towards the required areas.

The status quo and SWOT analysis identified a lack of clarity in the level of expenditure on urban transport, particularly in terms of non-infrastructure spending, and spending at the local level. Devolution in planning responsibilities will require devolution in transport investment spending also, and additionally, supported by funding for the necessary resourcing, both personnel and technical.

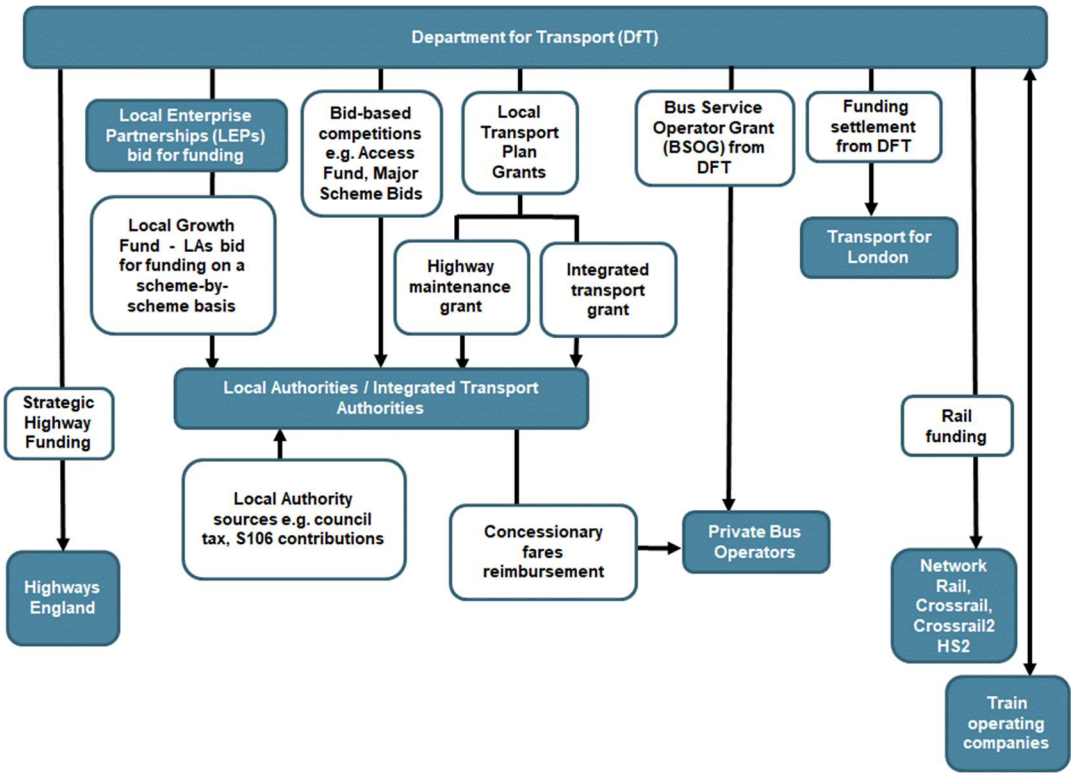
The recommendations build on these findings:

Develop clearly defined urban transport funding linkages

There are presently no clear linkages between national government spending on transport and urban transport expenditure. Presently, national government takes a lead (with some limited exceptions) in defining and developing urban transport schemes, and in financing of these schemes through national government departmental budgets, whether DOTr or DPWH.

Local government expenditure on urban transport is non-transparent, and the ambition and expenditure will vary greatly between LGUs. The devolution in transport planning responsibilities could be supported by the establishment of a specific national government budget for urban transport, earmarked for the implementation of LGU-planned local urban mobility actions that have been approved by the DOTr.

Clear funding mechanisms, between national and local government provide transparency and an understanding of both the funding available and the areas in which it is to be spent. An example of such a mechanism as relating to the UK is shown in the figure below.



Objective specific funding 'pots'

In addition to the LGU urban transport action plan support funding, there is opportunity to encourage transport initiatives which are aligned with national objectives for transport through the development of objective specific funding for which LGUs can apply to implement schemes related to that objective.

Such a funding mechanism has been used to great success in supporting 'exemplar cities' in the areas of walking and cycling infrastructure, sustainable land use planning, low carbon transport technologies in the UK. The placing and relationship between this funding and other areas of local government finding can be seen in the funding stream figure presented above.

Balance expenditure on infrastructure spending

Disaggregating DPWH and DOTr budgets by thematic area of expenditure has proved challenging and has hampered the ability to gain a clear picture of the proportion of budget allocated to capital expenditure on new infrastructure, maintenance of existing infrastructure and of ongoing operational expenditure to deliver the functions required of the government departments. The lack of transparency in local government expenditure has also made such a task impossible.

It is clear however from the major cost items and review of the budget components, that the latest budget and the trajectory of future spending is heavily skewed towards infrastructure investment. Whilst this might be compensating for historic underinvestment in transport infrastructure or hardware, this must not come at the expense of ineffective funding of software components such as transport planning functions, regulatory authorities and enforcement.

It must also be recognised that unlike national infrastructure, the ability for infrastructure investment to solve urban transport issues has limits, and that much of the directional change requires investment in travel demand management and behavioural change which is not infrastructure-heavy. This can be evidenced by spending patterns and programmes in cities with effective urban mobility.

5.3. Capacity Development

Ensuring that the key agencies and personnel involved in the planning and delivery of urban transport infrastructure and services is vital to the successful implementation of the NUMP.

Stakeholder feedback on internal capacities at the national and local government level has been sought, and a review of industry capacity conducted based on observed performance and associated studies.

5.3.1. Capacity within Central Government Agencies

The educational levels and caliber of personnel within Central Government Agencies is strong, with highly capable and motivated staff. Many come from a non-transport related educational background, however, and must assimilate an understanding of transport-related issues within the role.

In terms of staff numbers, the scale of project work and the processes and procedures which have been established to conduct the duties of the agency place significant strain on the scale of the resources available. Limited staff resources mean that programs do not get the level of resourcing required for

successful delivery. This also compounds an identified issue of governance that many initiatives are rushed and not fully thought out or consulted on before moving towards implementation.

Resourcing pressures also places limitations on the vital co-ordination between agencies to align initiatives and ensure effective integration of the functions of the different bodies.

5.3.2. Local Government Capacity

Capacity levels within local government vary, as does the structure of each LGU. Accordingly, where certain roles exist within some LGUs, these may not be present, or covered within a different department with staff of different skill-sets in another LGU. Therefore, making generalizations about the scale of capacity in relation to sustainable transport planning, NMT infrastructure provision, or transport data collection for example, cannot easily be done.

Stakeholder responses identify capacity limitations within the LGUs in the area of transport planning. This is considered often to fall into the void between the highway engineering department and the development planning department. The roll-out of the LPTRP capacity building program is anticipated to make a positive impact on the LGU abilities to collect local transport data and to develop public transport route plans.

5.3.3. Guidance and best practice

There is generally considered to be a shortage in guidance and best practice. The devolution with planning responsibilities is being supported by the development of the LPTRP manual for LGUs, the first version of which is complete. This sets out the means of collecting local transport data and using this information to undertake the process of urban route planning in a logical manor.

The DILG is the body responsible for overseeing the LGUs and their ability to deliver their responsibilities. It should play a key role in the development and dissemination of best practice. Beyond the LPTRP manual however, there is little by way of other guidance to the LGUs for transport planning.

Support from international agencies has in the past formed a source of compendia of best practice and a range of manuals and guidance offered to central government on a range of transport issues and practices.

5.3.4. Data collection tools and methods

The inventory analysis has highlighted shortcomings in the availability and quality of transport data at the urban level, particularly for cities beyond Metro Manila. A lack of standardization in data collection techniques, or specific requirement on cities to collect certain types of data places limitations on data availability and comparability. Data is often collected only as part of specific plans or projects, and hence survey work undertaken solely with that purpose in mind, as opposed to wider uses and ongoing update.

The LPTRP manual does however now set out the types of data to be collected at the local level for the purposes of public transport route planning, and the way in which LGUs should collect that data. There is opportunity to widen the scope of the data collection requirements, and set out standard formats and

methods of collection, perhaps in the form of mobility audits, which will allow aggregation of urban data to the national level, and comparison and benchmarking between cities.

5.3.5. Resource centers and expert networks

Expertise in transport related matters, and also in vehicle technologies are present within the academic sector within the Philippines. University departments specifically focused on transport include:

- National Center for Transportation Studies - University of the Philippines:
- Center for Engineering and Sustainable Development Research – De La Salle University
- School of Urban and Regional Planning – University of the Philippines Diliman

The Philippines forms a partner to a number of international networks aimed at promoting sustainable transport, and also through the events and networks maintained by the international agencies who work with the Philippine government.

These include the TransFER program developed though GIZ, the Open Transport Partnership through the World Bank and WRI (relating to open data) and ADBs transport forums.

5.3.6. Strengths

The caliber and education level of the staff within central government and also in many cases in local government can be seen as a great strength. The motivation of these staff to tackle the issues being faced, with resourcefulness and intelligence, is an asset to the development of the NUMP.

5.3.7. Weaknesses

The lack of specific academic background in transport planning of many government staff both at the national and local level increases the steepness of the learning curve in relation to urban mobility and planning issues. In general, there is considered to be a lack of transport professionals within the available labour pool.

The understaffing of central government agencies and also some local government departments limits the role which these can play in effective planning and implementation of sustainable transport schemes.

Present linkages between the government agencies and academia are considered to be weak, and could be improved.

Staff at the grass-roots level of the agencies responsible for the enforcement of traffic regulation, both traffic and PUV, are considered not to have the necessary skills, expertise and training to effectively deliver their responsibilities.

5.3.8. Opportunities

The capacity development program for LGUs in relation to local public transport route planning provides a strong opportunity to consolidate the level of understanding and planning capacity within the LGUs and the approach and links established can form a platform to extend the capacity development beyond network planning to cover sustainable transport planning, travel demand management and transit-oriented development.

The forthcoming MRV study undertaken in the NUMP tactical phase, should outline data collection requirements for the cities, providing a template and methods for the collection of this data.

5.3.9. Threats

A high turnover of staff, whether through personal career path choices or through the reassignments following each change of administration, mean that the level of retained institutional knowledge and role stability is poor. As a result, the value in capacity building programs is severely curtailed.

The burden on the LGUs in terms of preparing plans is already sizable, with responsibility for around 30 planning documents already set as a requirement. The addition of further planning responsibilities is likely to stretch capacity and resources.

5.3.10. Recommendations

There is a need for capacity development within both national and local government to deliver on urban planning responsibilities and on the majority of the specific recommendations set out within this chapter.

The recommendations on capacity development are split by national and local government below:

National government capacity development

Build national government capacity to oversee urban mobility that integrates land use, public and private passenger transport, urban freight transport, and non-motorized transport through the collaboration of the DOTr, DILG, and HLURB.

Local Government capacity development

Build local government capacity and awareness in planning and implementing urban mobility policies and programs. A good foundation for such a program is already present in the capacity development training as part of the LPTRP. The linkages and processes established as part of this training program should be leveraged to enable wider roll-out of capacity development in the areas of sustainable transport planning, NMT infrastructure design and delivery, urban transport data collection methods and other areas of local urban mobility responsibilities.

Consolidate and enhance capacity promoting partnerships

Create strong partnerships between government, academic institutions, and non-government organizations. Harness existing organizations such as the League of Cities of the Philippines (LCP) in the sharing of knowledge, best practices, and challenges in implementing urban mobility actions. Promote the creation of a community of practice among people coming from various sectors who share the same principles and advocacy of urban mobility.

5.4. Technology

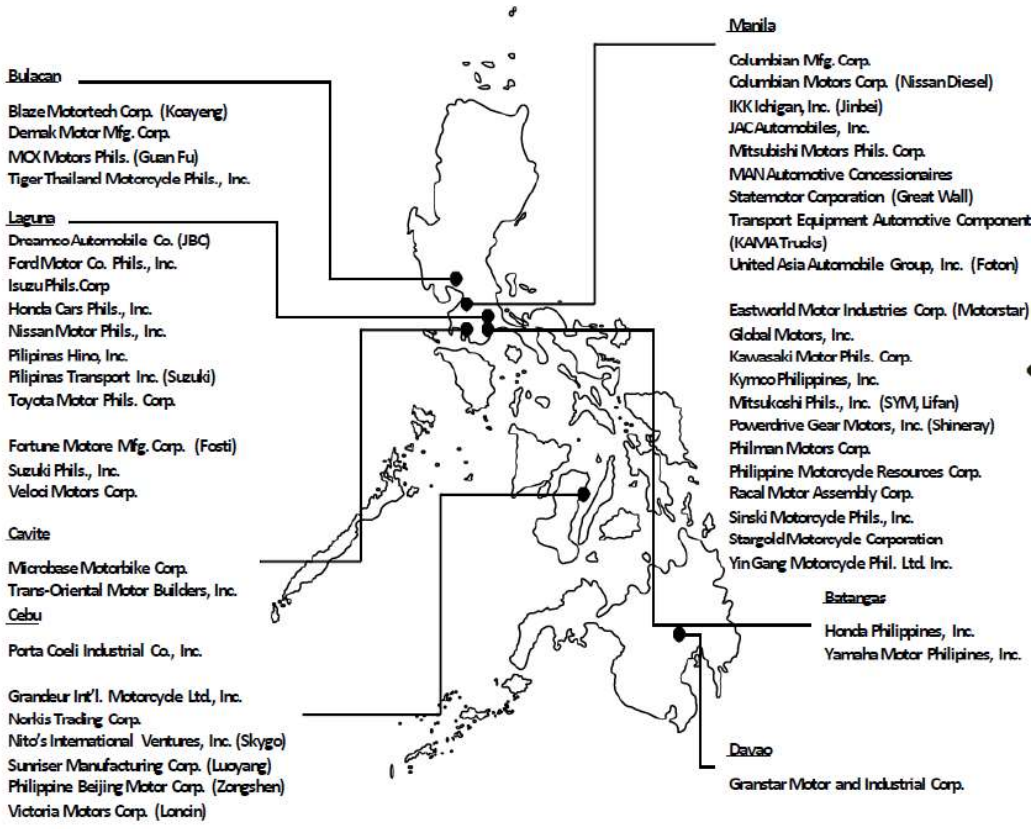
Efficient transport systems are increasingly dependent on technology to manage movement of vehicles, whilst new vehicle technologies are playing a major role in reducing the externalities associated with emissions, safety and noise.

In the Philippines, the transport sector has typically been seen as innovative and a driver of technological progress, although on the counter-side, the lengthy operational life of vehicles in use can act as a brake on the uptake of new technologies.

5.4.1. Manufacturing Base

The Philippines has a sizable and active manufacturing base both for vehicle assembly and vehicle parts manufacture, supported by high government tariffs on the import of assembled vehicles from abroad. The figure below lists the main motor vehicle assembly industries.

There is strong support for the local manufacturing of vehicles. The Comprehensive Automotive Resurgence Strategy (CARS) program has been implemented to attract new investment into the industry, to stimulate demand and implement industry regulation that will revitalize the Philippine automotive industry and develop the country as a regional automotive manufacturing hub.



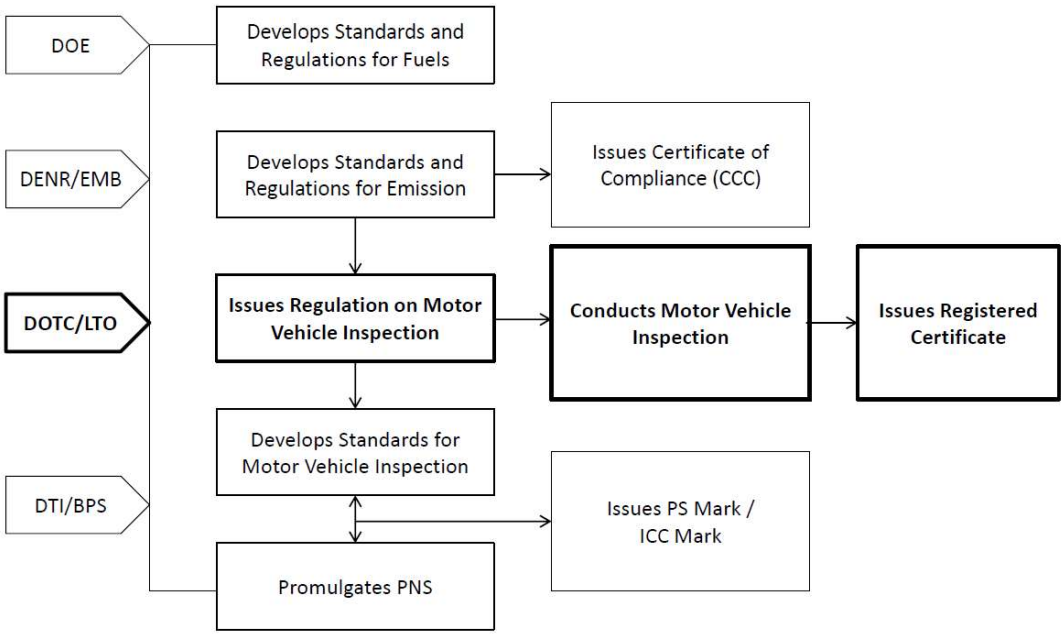
5.4.2. Vehicle standards and Regulations

Unlike many countries around the world, the Philippines is not a signatory to the 1958 Agreement which comprises of UN regulations relating to the harmonization of vehicle standards and the setting or type

approval. However, the Philippines adopts many of the standards though the Annexing of the UNECE standards to national legislation.

There is however a desire to move towards harmonization of standards, and the adoption of the 1958 agreement, not only in the Philippines but across the Asian Free Trade Area (AFTA), and the ASEAN Automotive Product Working Group (APWG) has been tasked with developing a harmonized ASEAM regulatory regime.

At present, the responsibility for the development of standards in relation to the transport sector, and the inspection, certification and type approval of vehicles falls across a number of government agencies, as shown in the figure below:



There have been a number of initiatives to promote the cleaner and more sustainable vehicle technologies, including promotion of low engine displacement and hybrid vehicles by reducing the rates of import duty on completely-knocked-down parts and components for such vehicles and reducing the import duties on natural gas motor vehicles to 0% in an effort to promote CNG vehicles in the country.

The latest vehicle regulatory changes relate to the new requirements for PUV vehicles to comply with a range of design and technology standards including meeting minimum Euro IV standards and minimum safety specifications.

5.4.3. Innovation in transport technologies

From the time in which American jeeps were converted to passenger vehicles to become the iconic jeepney, the transport sector in the Philippines has been innovating to find new ways to meet market demands.

More recent examples of innovation are widespread, with private sector stakeholders within the PUV sector adopting ultra-low carbon technologies in the form of e-jeepney (such as COMET) and a range of e-tricycle operations which are operating commercially and successfully, encouraging entrepreneurs to import the vehicles and develop innovative business models to allow operators to purchase or lease the vehicles.

The Electric Vehicle Association of the Philippines (eVAP) is a very active organization promoting the adoption of electric vehicles and supporting the advancement and wider roll-out of electric vehicle technologies.

5.4.4. Strengths

The Philippines has a local transport industry which has a long history of innovation, complemented by a private sector willing to take risks in adopting new technologies and challenging the status quo. This innovation is seen in vehicle manufacturing -including of course the original jeepney coachbuilders, the electric trike kit importers, and in operators including the FX express operators and the ride-hailing service providers.

The tightening of vehicle standards and regulation require industry to adapt and will therefore incentivize further innovation and technological progress.

Fuel quality in the Philippines supports modern combustion engine vehicle technologies.

5.4.5. Weaknesses

The present status of the vehicle fleet, particularly the public transport and freight fleets, is one of ageing vehicles with old technology. Extended vehicle life (prior to the new regulations) has led to low rates of penetration of new technology.

The use of technology and planning and traffic management is typically data intensive, and a lack of planning data and traffic data may limit the effectiveness of the introduction of technology.

Existing traffic signaling technologies are outdated and operating less efficiently than they could be.

5.4.6. Opportunities

The CARS program offers government support to encourage the motor industry in its role to make new investment in plant and technology, to manufacture vehicles to higher technological standards, and hence to support the implementation of stricter regulations.

5.4.7. Threat

A significant identified threat to the introduction of new vehicle standards is the ability of industry to respond within the timescales, and with the volumes required to replace existing vehicles which will soon no longer be able to operate. The PUV modernization program requires the renewal of over 200,000 jeepney vehicles which based on current timescales must be completed over the next 5 years.

A lack of infrastructure for ultra-low emission vehicles (ULEVs), including electric vehicles and other alternative fueled vehicles, may constrain the potential for uptake of ULEVs without significant investment in supporting facilities.

As in many other places, there is a strong lobby which has vested interest in maintaining the status quo and in fighting technological progress.

5.4.8. Recommendations

The adoption of new technology and the advancement of domestic technological capabilities will play a role in supporting urban mobility objectives.

The SWOT analysis identified a domestic industry which has a strong track record in innovation in vehicle design whilst existing government support programs have incentivised the introduction of technological advances and high capacity manufacturing of vehicles to meet the demands of more stringent regulations.

Technology is not limited only to vehicles however. The use of 'big-data and technology to effectively plan and manage the transport network is also an important part of achieving the highly efficient urban transport systems seen around the world.

The recommendations below define specific actions which can be taken within the implementation of the NUMP to support, leverage and accelerate best use of technology within urban transport.

Promotion of innovation in the development and adoption of clean vehicle technologies

Innovation has been observed in the commercial sector, governmental and private sector on the adoption of clean vehicle technologies. Examples include the 'cottage industry' development and adoption of e-jeepney and e-trikes on a commercial basis and the use of hybrid vehicles as part of the government fleet.

The PUV modernisation program will ensure minimum technological standards for vehicles, bringing about a major improvement in the environmental and safety standards of the PUV fleet. The new franchising requirements will however bring to an end the moratorium on franchise issue, which has in part been responsible for the innovation and adoption of ultra-low emissions vehicles by new operators. Consideration should therefore be given to initiatives which maintain the attractiveness of going beyond the minimum standards and encouraging further innovation.

Such initiatives are likely to be linked with the financing, and provision of specific funding for priority areas. The legal restrictions on providing direct financial incentives to the private sector mean that an incentive programme will need to be carefully constructed, potentially channelling funding through LGUs for supporting infrastructure (eg electric vehicle charging points) or through leveraging of regulatory powers to ringfence particular routes as 'ultra-low emission corridors' or similar.

Action Plan for the promotion of Ultra-Low Emissions Vehicle

Following from the above recommendation, we identify the potential for accelerated uptake of electric vehicles brought in by the combination of tax exemptions under the new TRAIN Laws, initiatives by the Department of Environment, and the PUV Modernization Program.

To support this opportunity, there is a need to define the necessary supporting infrastructure and to develop an implementation plan to deliver it. This plan will include a review and appraisal of the most appropriate charging technologies, and identify strategic locations within the major cities which will

achieve maximum impact. Guidelines should be developed to assist LGUs in planning, financing and implementing supporting infrastructure.

Support Developing Roadmap for Fuel Economy Standards

The DOE currently leads the development of fuel economy policy in the Philippines, although the DOTr is part of consultations. It is noted that the NDCs includes fuel economy policies as a measure for transport GHG reduction. It is strongly recommended for DOTr to continuously and actively support the DOE initiatives on transport energy efficiency.

In addition, fuel economy can be included as public transport requirements under Department Order 2017-011 also known as the Omnibus Franchising Guidelines. Currently, emission standards have been included as public transport requirements. The addition of implementing guidelines on public transport energy efficiency can pave the way for sustainable mobility even further.

Strengthen Enforcement of Vehicle Emission Standards for both Private and Public Vehicles and Envision Leapfrogging to Higher Standards

The DOTr should expedite the Motor Vehicle Inspection System development and implementation to better enforce emission standards of both private and public modes. This facilitates fleet transformation towards cleaner technologies.

Additionally, the DOTr and DENR should jointly envision the roadmap for leapfrogging vehicle emission standards towards Euro 6 or better. The current global landscape is in the opportune moment to establish cleaner vehicle technology markets.

Lastly, freight vehicles (trucks and trailers) should be explicitly covered and be part of the modernization initiatives that is also happening in the public transport sector. Vehicle emissions testing should be improved for large vehicles not only for emissions compliance but also for safety and efficiency benefits.

Increase LGU Capacity for GIS Application on Urban Transport Management Systems

In the stakeholder surveys conducted, GIS in LGUs are being used primarily on land use planning and disaster risk reduction and management. There is an opportunity to apply GIS on urban mobility planning and management, especially now that public transport management has been devolved to LGUs through the LPTRP. GIS should be used to plan routes, visualize travel demand and overlay with public transport performance indicators.

Implement GPS Monitoring Systems for Local Public Transport as Recommended in the LPTRP

In line with increasing capacity to use GIS, Geographic Positioning Systems (GPS) can serve as invaluable technology for day-to-day monitoring of public transport performance. A sound monitoring system can directly monitor proforma routes and schedules, conduct service audits on public transport operators and ensure that service is delivered within standards (i.e. the Omnibus Franchising Guidelines). Additionally, GPS opens the opportunity to monitor other sustainable transport headline indicators such as VKM, fuel consumption, and emissions.

5.5. Summary

A summary of the key points raised within the SWOT analysis, based on feedback from stakeholders and the status quo analysis, is summarized in the SWOT table below.

	Strengths	Weaknesses	Opportunities	Threats
atory setup	The passing of the National Transport Policy (NTP) which sets out clear vision for transport and aims to improve co-ordination between national and local planning and investment Local government code – allocating responsibility to LGUs	Highly-centralized structure – DOTr staffing capacity limitations, little autonomy of local areas to develop schemes/projects LGUs may not have the capacity to meet the devolved planning responsibilities Lack of clarity in roles and responsibilities between DOTr and LGUs Procurement capacity	Devolution of planning responsibilities for local transport networks New vehicle legislation and regulation proposed PUV modernization plan	Capacity at the local government level Significant challenges with complexity of legislative environment, limitations on government support, legal challenges etc. Rush to get things done, without sufficient planning, thought, consultation Social management and environmental issues LGU politics (3 years cycle) If uncertainty in structure and procedures, then even with funds, nothing might get done
rriers	Significant increase in budget allocation for DOTr and DPWH for 2018/19 Transport sector profitability for larger vehicles Renewed focus on taxation of private mobility to support sustainable transport	Centralized budget, limited autonomy of cities/local gvt Focus on building infrastructure, potential to exacerbate urban problems if not well targeted at PT Limited access to finance	Investment in priority infrastructure to support transport sector profitability Need to provide the ideas on what to do with the funds Could channel some funds to universities to	Worsening congestion undermining sector profitability, further promoting private vehicle use Ensuring full disbursement of available budget within allocated period

Capacity Development • Guidance/training documents • Capacity within institutions, training and scale of resources • Research programmes/centres • Knowledge exchange/best practice • Private sector capacity	Highly educated capable professionals within national government. UP NCTS	Limitation on scale of personnel Capacity more limited in local gvt with regard to transport planning Lack of *transport professionals* DOTr academia linkage weak Traffic enforcers don't have the skills to effectively manage traffic. No skills development.	Capacity building programs as part of devolution of planning responsibilities Planning handbooks	LGUs required to prepare large number of plans currently (c. 30), so adding additional requirements will further stretch capacity and risk insufficient resources spent on important planning function
Transport technology and measures • transport standards and regulations • scale of development of local industrial sectors • innovation within the industry • development/adoption of new transport systems/technologies • Smart data/big data • Digital planning tools	History of local innovation – jeepney, pool taxi, FX, uber	Low level of vehicle standard at present Limited planning data Certain lobby wanting to maintain status quo Signaling systems outdated Design standards and intersection design not efficient	New regulations will significantly improve standard of vehicles Associated equipment supports wide range of smart data/planning applications once rolled out	Challenge for industry to respond to new regulations with necessary investment

5.6. Specific recommendations emerging from gap analysis

The gap analysis identified shortcomings across a number of areas which hampered understanding of the current urban mobility situation and hence the ability to effectively tackle identified problems and make appropriate planning decisions.

These are covered below, with specific recommendations given to deal with the areas of shortcoming:

5.6.1. Data availability for urban transport

Issue/challenge:

The status quo analysis identified significant gaps in urban transport data availability, particularly for the cities outside of the major conurbations of Metro Manila, Davao and Cebu.

Recommendation:

Develop an urban transport database which contains the necessary transport data to support effective transport planning decisions, to measure transport conditions and to monitor the effectiveness of policies and interventions. Statistics collected at the national level cannot serve this purpose.

A local data and monitoring framework should be developed which will allow the key statistics relating to urban transport to be collected, to allow monitoring at the local level, but also comparison and benchmarking between cities and aggregation at the national level. The proposed framework may take the form of an 'urban mobility audit', or 'scorecard'.

The framework for urban monitoring should form part of an MRV study which establishes appropriate indicators at a city level, ensuring that data collection requirements are not overly onerous and therefore manageable at the local level. Training in the collection of data should form part of the capacity development training for LGUs.

5.6.2. Data on non-motorized modes

Issue/Challenge

Walking plays an important and often overlooked role in urban mobility. However, collection of information on non-motorized trips is often lacking, leading to an underestimate of the scale of trip making, and often a complete disregard for these trips (as is typical within transport models).

Recommendation:

The collection of robust data on NMT trips is challenging, and prior to the adoption of new surveying techniques and leveraging of 'smart-data' (for example through use of mobile phone data), accurate information on the scale and characteristics of walking and cycling trips across all urban areas will remain challenging.

However, it is important that the existing data collection is reviewed to assess whether there is opportunity to better capture information relating to these trips, and whether sample surveys could be utilized to develop a better understanding of the importance of NMT within cities (not only Metro Manila). This brief should form part of the MRV study which should include a review of international best practice on such data collection.

5.6.3. Affordability and household expenditure on transport

Issue/Challenge

There is great discrepancy between surveys on household expenditure on transport. Broad calculations of the scale of revenues generated by the transport services sector within this report have highlighted that the commonly referenced estimates based on the FIES survey are likely to be underplaying the true level of expenditure. Survey data collected within MUCEP for Metro Manila highlighted much greater issue with transport affordability amongst lower income classes.

Recommendation

The reasons behind the discrepancy between estimates have not been established. However, it is essential that transport expenditure and affordability is well understood in order to make effective policy decisions. It is therefore recommended that a study be undertaken to consider the issue in more depth, with further surveying of households outside of Metro Manila to establish the real situation.

6. NUMP Components

When considering urban transport, the following 'components' are seen as being critical to effective delivery:

- Non-Motorized Transport (NMT): Walking and cycling as a means of undertaking short journeys and as a vital 'last-mile' component even of motorized journeys
- Public transport – public utility vehicles (PUVs) and rail providing a means of collectively moving people to deliver mass transit and offer an alternative to private motorized transport
- Freight – the delivery of goods to commerce and households, and the removal of waste is essential to the smooth functioning of the city

Below, we review what has been learnt with regard to each of these components within the status quo analysis, highlighting strengths and weaknesses in the existing situation and also opportunities for inclusion within the National Sustainable Urban Mobility Program.

6.1. Non-Motorized Transport (NMT)

As highlighted in the mode share statistics, walking is the dominant mode of transport for Filipinos. Even motorized trips will typically entail walking stages, for example to the PUV network or to and from a parking space.

Despite the importance of walking, pedestrians are typically very poorly served in cities, with priority given to space for motorized vehicles and sidewalks, if present, typically narrow and littered with obstacles such as streetlighting, drains and bollards.

A hostile environment for pedestrians detracts from the livability of the city, and the quality of life for all of its residents. Better planning of new infrastructure, and reallocation of existing space to pedestrians will enhance the cityscape and improve mobility in urban areas.

Cycling is not a widespread form of transport in the Philippines. Indeed, statistics on cycle modal share are difficult to come by.

6.1.1. Strengths

The State recognizes the importance of NMT as a means of mobility, and the NTP specifically identifies that measures to achieve inclusive mobility and accessibility shall include prioritization of pedestrians and provision of facilities which include elevated walkways, covered walkways, sidewalks and bike lanes.

The DOTr has a current program specifically focused on NMT infrastructure (the Greenways programs). New planning guidelines including The National Urban Development and Housing Framework (NUDHF) 2017-2022 prepared for the HLURB place emphasis on the movement of people rather than vehicles and place importance on non-motorized accessibility.

Cycling related initiatives are also ongoing and include the establishment of the Marikina Bikeways Office (MBO) and IEC activities (information, education, & communications) to promote bicycle use in the capital city.

6.1.2. Weaknesses:

Current NMT provision in Philippine cities is very poor. Perhaps as a consequence, Filipinos will choose not to walk if possible. Cycling is uncommon. Whilst the planning framework now places greater priority on non-motorised transport accessibility, the application of these principles at the local level may remain variable. Developers and local government planning officers may have differing priorities and the awareness/capacity of effective planning for NMT will vary.

6.1.3. Opportunities:

The new planning policy framework provides a good foundation for effective inclusion of NMT facilities within new development. DOTr's greenways programs also present good opportunities to showcase good design principles and demonstrate that if facilities are provided, people will use them.

There is therefore the opportunity to build on these developments, using the showcase schemes as a means of raising awareness in design best practice, and by pursuing schemes in different cities across the country, to build capacity and awareness at the local level.

6.1.4. Threats

Improving MT facilities in cities across the country will be a major undertaking. Whilst new development offers opportunity for better design, there is a need to improve existing facilities, which are in areas already developed. This will require change to the current streetscape which is likely to need reallocation of space. Reducing space for motorized vehicles can often prove politically challenging. The benefits of doing so must be clearly conveyed.

6.1.5. Recommendations

Given the importance of NMT to current and future urban mobility, this must form a central component to the NUMP.

Effective delivery of improvements to NMT facilities will require a combination of good policy and planning, and also effective implementation capabilities which itself requires capacity development and sufficient resources (personnel and scheme financing).

Planning/Governance

The provision of NMT facilities needs to be delivered at the local level, but within a clear framework of requirements and design standards set at the national level.

Consideration should be given to the inclusion of NMT (pedestrian & bicycle) facilities and usage in local Traffic Codes and Zoning Ordinances for implementation at the local level

Financing

At present, the funding for NMT facilities simply forms part of the LGU highway budget. The exception to this is the national government expenditure on specific showcase schemes such as the Greenways projects, for which the scheme costs form part of the DOTr annual budget.

A number of opportunities exist to improve funding mechanisms to enable the allocation of funds specifically for NMT facility provision.

Firstly, developer contributions are a potential source of funding for improved accessibility to new development. This may extend beyond highway upgrading/realignment, to also focus on pedestrian accessibility to new sites.

Secondly, national government can play an important role in encouraging city governments to develop progressive schemes for implementation within their localities through allocating national government budget for such schemes, in a similar way to the Greenway programs at present. Local governments should be incentivized to develop their own schemes (with capacity assistance from DOTr if required) and to bid for funding to enable implementation. Further analysis of the potential mechanisms for such financing of NMT schemes will be undertaken in the tactical phase of NUMP development.

Capacity Development

There is wide variation in capacity levels within local government, and different structures mean that identifying where the roles and responsibilities for NMT sit may be different for different LGUs. There is a need to raise of local government capabilities in identifying NMT issues and designing and implementing schemes to improve facilities to a baseline level to ensure that they can deliver their required functions effectively. Partnering with national government in the development of showcase schemes provides the opportunity for capacity development at the local level and also awareness raising within the LGU with regard to the importance and effectiveness of good NMT accessibility.

6.2. Public Transport (Public Utility Vehicles and Rail)

Public Utility Vehicles form the backbone of the urban transport network, transporting the greatest share of motorized trips. Jeepneys and tricycles between them carry over half of motorized trips in Manila (source DOTr, 2014).

Public transport plays a vital role in delivering urban mobility in all world-class cities. This is because the spatial constraints within large cities mean that efficient mobility simply cannot be delivered through private modes. Ensuring that there is an attractive and effective public transport system to provide an alternative to private motoring will be critical to avoiding the most severe challenges faced within cities – congestion, emissions and hostile cityscape for residents.

6.2.1. Strengths:

The national government recognizes the importance of public transport to cities and this is a priority area for the DOTr. The NTP states that 'public mass transportation in urban areas shall be given priority over private transport' and that 'high capacity public transport systems shall be the preferred mode in high passenger density corridors'.

Public transport presently has a high modal share within the cities, meaning that investment and improvement in PUV services will deliver significant impact to a large proportion of the urban population.

6.2.2. Weaknesses

Despite its importance, the PUV sector is characterized by poor standards of service, with old vehicles operating on the congested highway network and a fragmented market structure which limits the ability of operators to deliver efficient services and make the necessary investments.

The PUV route network has largely been operator led rather than as a result of clear strategic planning.

The funding of the sector is presently very limited, with all PUV services operating on a commercial basis without subsidy, and with very little in the way of support through infrastructure provision or other facilities. The rail services are the exception, with subsidy directed towards MRT operations amounting to approaching PHP5bn in 2018 and support for the LRT lines which is also significant, although less transparent.

6.2.3. Opportunities

A PUV modernization program is presently underway, with the objective to transform the sector through modernization of the vehicles in operation, consolidation and professionalization of the operators and the rationalization and re-planning of the PUV network. There is committed funding in the 2018 budget to support these activities, and new Departmental Orders have put into law the new requirements.

The DOTr is also progressing other public transport initiatives including extensions to the urban rail lines and also PUV initiatives including the introduction of a government operated bus service on EDSA.

6.2.4. Threats

There are many challenges faced in modernizing the PUV sector, with the present fragmented industry structure presenting difficulties in financing of investment, managing and regulating of operations and delivering professionalized services. The various components to the PUV modernization program seek to address these.

However, even if great success is achieved through the program, there remain headwinds to the delivery of efficient urban mobility. The majority of public transport services are road based, and therefore subject to the same congestion experienced by private vehicles and taxis. The worsening levels of congestion observed in most cities lead to deteriorating service levels and also undermine the commercial performance of public transport services

6.2.5. Recommendations

The quality and efficiency of urban mobility is dependent on an effective public transport system. Indeed, the main challenges and issues relating to urban transport can only be tackled through

improving the quality of public transport. Congestion in cities will not be solved by further infrastructure, which simply encourages more private traffic, but by the offer of faster and more comfortable public transport which attracts a greater proportion of trips to be made in a space efficient way.

The government is pursuing a range of programs to deliver on this vision. Below, we consider the main implementation levers and make recommendations on where further efforts can be focused:

Planning/Governance

Under present arrangements, regulation of the PUV sector is split between national and local government, with the LGUs responsible for the issuing and regulation of franchises for tricycles and the national government for other PUV modes, through the LTFRB.

The planning of urban public transport networks is being devolved to the local level, with LGUs tasked with submitting their own Local Public Transport Route Plans (LPTRP). As urban transport is first and foremost a local issue, this devolution in responsibilities should be welcomed, in that those with greatest knowledge of the local transport issues will have greatest influence over planning of future provision and also have greatest incentive to deliver improvements which will be felt locally.

Regulation of transport services is also best achieved at the local level, with regional departments of LTFRB being responsible for ensuring that services are delivered according to the franchise conditions. The introduction of the new franchising arrangements and increased franchise requirements will place greater responsibility on the regulator. As such, LTFRB will need to work closely with local government to effectively deliver its responsibilities.

Financing

In considering the financing of public transport service provision, we can distinguish between the financing of operations, and the financing of supporting infrastructure.

As outlined above, the majority of public transport services operate commercially and wholly unsubsidized. Farebox revenues must cover all operating costs and allow some profit for the vehicle owner/operator. The size of the public transport sector in the Philippines is significant, and given the large proportion of trips carried, the scale of fare revenues generated across the public transport sector is significant. By our own calculations presented above, household expenditure on public transport may be approaching c. PHP400bn, of which the vast majority being on PUV services. This is significantly higher than the estimates based on national household expenditure surveys. Half of this could conceivably be expenditure on urban transport, based on the proportion of the population in urban areas and the propensity to travel.

Fare levels are however relatively low, and partly as a consequence, the quality of service is typically poor, although with regulated fare levels set by LTFRB, operators have no scope to adjust revenues beyond increasing operating hours, and engaging in the on-street 'penny-wars' typical of paratransit operations. Low fares limit the potential for operator investment in new vehicles.

Planned government investment in supporting the principal modes of public transport remains very low as a proportion of overall public transport sector revenues. The PUV modernization program budget for 2018 of PHP843m represents just 0.2% of sector revenues. The overall Land Public Transport program budget of 7.35bn is less than 2% of sector revenues. By comparison, in many developed countries, the

government spending on public transport accounts for over a quarter of total sector revenues, with further expenditure on infrastructure.

Much of the sector spending in the Philippines is focused on the rail networks, which represent a very small proportion of the public transport service provision. Rail operations are subsidized, with travelers on MRT paying only 1/3 of the true cost of their journey, and implicit subsidy to the LRT lines also.

Given the pivotal important of public transport in ensuring the success of cities and the country as a whole, and in tackling the externalities relating to urban transport, consideration must be given both to the size of the spending on public transport and also how best that spending is directed to deliver maximum value.

The potential for subsidy support channeled directly to PUV operators to facilitate investment in the vehicle fleet and improved service levels is limited by a number of factors:

- political reluctance to subsidize public transport services, now enshrined in the NTP statement.
- the constitutional constraints on supporting private sector operators, even if the political will is present
- the scale of the government budget – the whole of the DOTr budget is less than 20% of the sector revenues, which highlights the limitations on providing direct subsidy support to the whole sector

In view of the above considerations, the provision of subsidy to the sector as a means of enhancing service quality is considered to be limited. However, direct subsidy support is not the sole means of delivering improved services. The financing of facilities and infrastructure to increase the efficiency of the public transport sector represents an effective means of leveraging limited government budgets to deliver significant sectoral impact. One of the major constraints to efficient PUV operations is the scale of congestion experienced on urban routes. This has a number of negative impacts, firstly reducing the level of daily revenue which can be generated by each vehicle, increasing the costs of operation, and also making services unattractive.

Investment in public transport priority measures has the potential to unwind the vicious cycle described above, promoting increased efficiency, a reduction in sector operating costs and greater attractiveness of services to travelers. Delivering this increased efficiency can lead to a rationalization in the number of vehicles required, lower fare levels and improved road conditions for all road users as a result of greater numbers of people choosing to travel by space efficient modes of transport. In developed cities, there is now a realization amongst planners that a point is reached where encouraging greater travel by sustainable modes is the only way to alleviate congestion, as other forms of traffic management and road building only result in short-term problem alleviation. In the world class cities, priority infrastructure including bus only corridors, bus-lanes, queue-jumps at junctions to allow public transport vehicles to bypass other traffic, and off-carriageway bus stops and depots all form part of the typical infrastructure provision.

The PUV modernization program, with its components of route and fleet rationalization and industry consolidation offers a significant opportunity to combine with an initiative of priority public transport infrastructure provision with the sectoral reform program.

6.3. Freight

The movement of goods and services within urban areas plays a vital role in ensuring the economic vibrancy of the cities and ultimately of the country as a whole.

Freight operations face many of the same challenges as passenger transport, and also these movements contribute the negative effects of transport. Inclusion of urban freight within the NUMP is therefore essential.

The inventory analysis and the recent assessment of the freight sector undertaken by CAA outline the characteristics of the industry and highlight some of the challenges faced in improving urban freight. Some of the key points raised are as follows:

- Freight movements are growing at a rate even faster than that of passenger travel demand, increasing by 178% between 2000 and 2015
- Goods vehicle comprise around 36% of traffic
- The sector is characterized by a large number of smaller operators, with half having less than 10 employees
- Many vehicles are old, and the vehicles contribute more than proportionately to emissions

A SWOT assessment based on the findings of the CAA report and inventory analysis is set out below

6.3.1. Strengths

Despite the fragmented and small-scale nature of much of the freight activity, over half of the freight companies surveyed within the CAA surveys stated that they monitored their fleet's fuel consumption, and as a result, a proportion of these companies pursued measures to improve fuel economy by implementing fuel saving measures.

Almost a half of companies indicated that they have a carbon-emissions reporting mechanism.

6.3.2. Weaknesses

Many weaknesses are identifiable within the freight sector. The small-scale nature of many operators and the use of ageing vehicles is reflective of the sector, and has similarities with the PUV sector where a lack of scale and access to finance limits investment and is closely associated with poor levels of service.

Old vehicles are higher polluting and less safe. They are also more prone to breakdown and time off the road. Freight movements a generate significant emissions in relative terms and also contribute to congestion, particularly in urban areas.

The Freight study identified empty miles as a significant issue to the efficiency of freight movements.

6.3.3. Opportunities

The freight study has identified a range of measures and initiatives which may be pursued to reduce the impact of freight activity and increase efficiency. These are considered in more detail below.

With the growing market, new market entrants are incentivized to join the sector, and larger players are becoming more prevalent. Larger companies are better equipped to be able to monitor performance, invest in new technology and take steps to improve their efficiency.

6.3.4. Threats

Increasing urban congestion negatively impacts freight and undermines efficiency. As the pressure for space grows, the allocation of loading areas and facilities for freight becomes increasingly challenging as trade-offs need to be made between competing priorities.

6.3.5. Recommendations

Drawing on the findings of the CAA study, there are a number of recommendations which can be made across the different implementation areas. These are summarized below:

Governance

The freight sector typically has a strong incentive to improve efficiency to increase its commercial performance. It is however the areas in which individual companies are not able, in isolation, to take the necessary steps to make improvements, or require regulation to avoid the negative impacts of their activity, that the government must step in.

Almost all industry survey respondents in the CAA study stated that closer collaboration between the government and the private sector would be essential to improving efficiency within the sector. There was also a recognition of the role that governance should play in ensuring that the rules relating to overloading which was commonly observed were better enforced.

Financing

A lack of access to finance was identified as a preventative to investment in new vehicle technologies, and it was proposed that a modernization program with government support (similar to the PUV modernization) would be required to enable the necessary freight fleet modernization.

Government incentives to invest in energy efficient vehicles were seen as a means of encouraging appropriate investment decisions.

Capacity Development

Smaller operators have limited capacity to effectively monitor their operations or remain up-to-date with evolution in best practice and new technological advances and methods to enhance efficiency. Building capacity within such a fragmented sector is challenging, and industry consolidation is seen as a requirement to improve sector efficiency and performance and provide the foundation for capacity development.

The implementation of public-private partnerships to support enhanced capacity through green freight programs, and the participation in regional and international initiatives to share best practice also form part of the recommendations emerging from the sectoral assessment.

Technology

The introduction of new technology to the freight sector can play an important role in enhancing efficiency and reducing the negative externalities.

Investment in new infrastructure to support freight operations, including consolidation centers, combined with better planning of logistics can significantly reduce freight miles, minimizing empty miles and ensuring the use of appropriately sized vehicles at different stages of delivery.

Increasing opportunity for multimodal freight activity also offers potential to reduce emissions and even the cost of freight movements, but this needs to be supported by the necessary infrastructure and efficient planning systems to manage the increased complexity of intermodal trips.

7. NUMP Development

Through the process of inventory assessment, stakeholder engagement -including the visioning workshop- and analysis of the status quo, the team has developed a recommended framework for the National Sustainable Urban Mobility Program. This is set out below.

7.1. NUMP Structure

As a reminder of the objective of the NUMP, the MobilizeYourCity partnership defines it as follows:

'A National Urban Mobility Program is a strategic, action-oriented framework for urban mobility, developed by national governments, enacted to enhance the capability of cities to plan, finance and implement projects and measures designed to fulfil the mobility needs of people and businesses in cities and their surroundings in a sustainable manner'

Transport plans, whether national, regional or local, typically follow a similar structure, namely:

- Outlining the vision of the plan/strategy
- Defining the objectives and targets
- Setting out the thematic areas/components which will aid the delivery of the vision and objectives
- Specifying the action levers to implement the plan

This structure can be seen in two examples shown below, taken from city and regional plans:

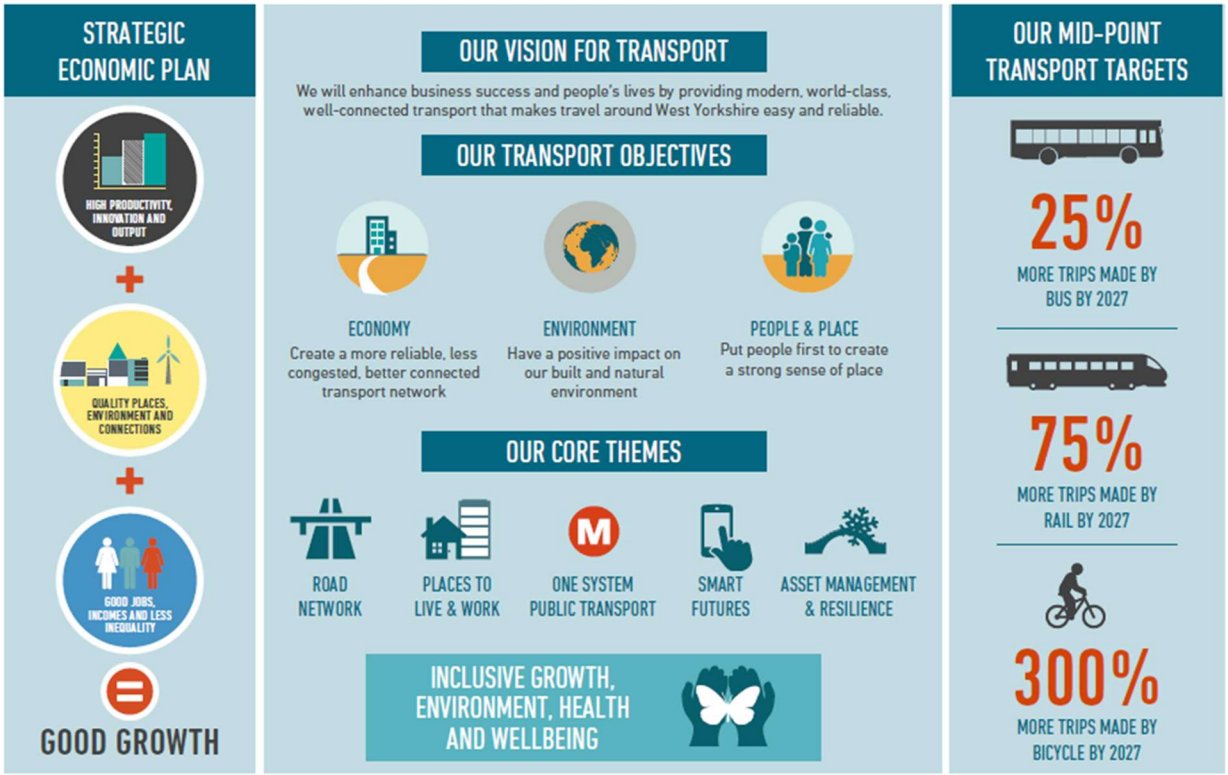
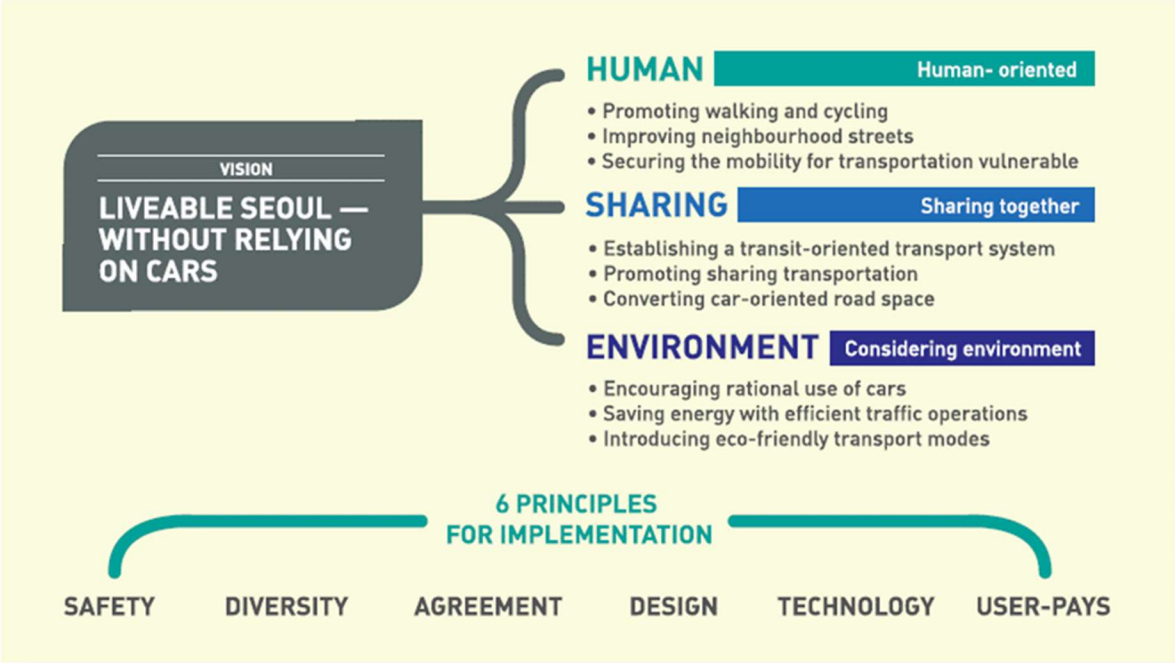


Figure 39: West Yorkshire Transport Strategy 2040



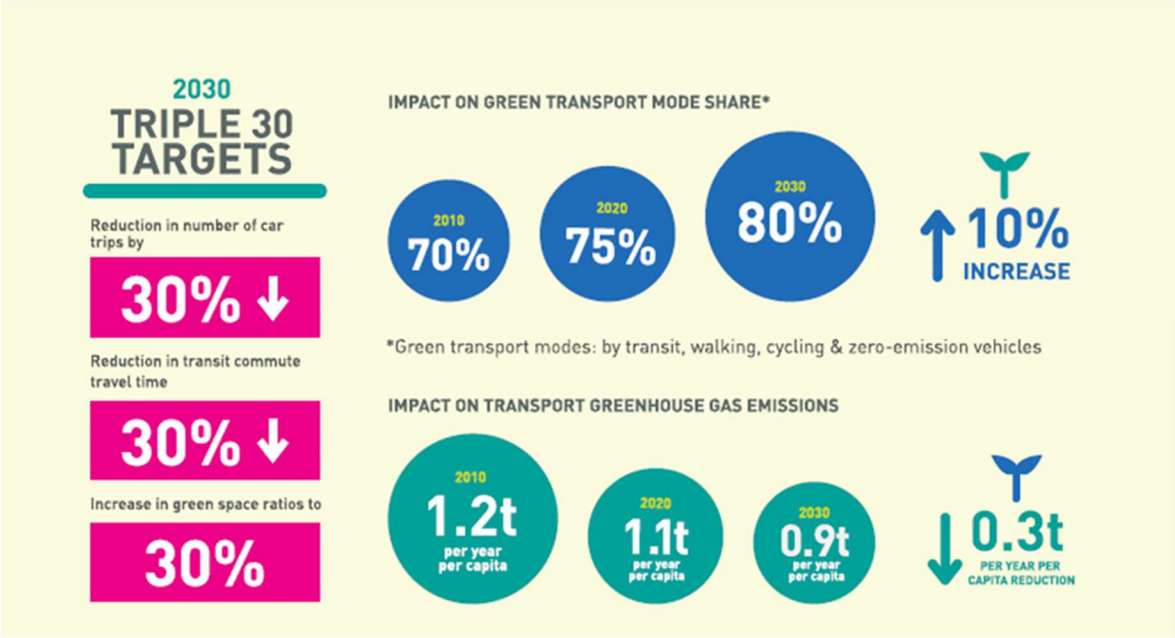


Figure 40: Seoul Transport Strategy

It can be noted that whilst the strategies differ, the framework adopted is the same, working from vision and objectives to targets, and implementation mechanisms.

Building on the feedback received within the visioning workshop, the team has formulated a NUMP framework which defines a vision for urban mobility in the Philippines, with strategic objectives, targets and implementation levers. The output of this is shown overleaf.

7.2. Recommended NUMP Framework

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Annex 1. Sustainable Transport Indicators

Parameter	Indicator	Source of Official Data in the Philippines
Fuel sold	Amount of Fuel sold/consumed (litre/MJ)fuel type in transport sector	Department of Energy
Population	No of inhabitants	Philippine Statistics Authority
Economic Development	GDP/Capita or GDP	National Economic Development Authority
Infrastructure	Km of infrastructure	Department of Public Works and Highways
Transport Activity	Total vehicle kilometre travel (VKT) per population	
	Freight Tonkm/GDP	
	Passenger kilometre travel/GDP	
Energy Consumption	Transport energy consumption per GDP	Department of Energy
GHG Emissions	GHG emissions from transport sector segregated by modes	Climate Change Commission
	Transport GHG per capita	
	Passenger GHG per PKM	
	Freight GHG per TKM	
Air Pollutants	PM Emissions from transport sector segregated by modes	Environment Management Bureau, Department of Environment and Natural Resources
	NOx Emissions from transport sector segregated by modes	Environment Management Bureau, Department of Environment and Natural Resources
Fuel Type	Proportion of vehicle fleet by alternative fuel type	
	Share of renewable energy in total transport fuel consumption	
Road Accident	Fatality/Million VKT	Department of Public Works and Highways; Philippine National Police
	Accidents/Million vehiclekm	
Motorization	Passenger and Freight Motorization Index (vehicles/1000 population)	
Freight Rates	Unit Price ($) per Tonkm for different modes	
Fuel Subsidy	Fossil Fuel Subsidy/Unit of GDP	
Investment	Transport Investments	National Economic Development Authority
	Climate Finance share in transport investments	National Economic Development Authority; Climate Change Commission
Fleet	Number of vehicles by vehicle registration type & fuel type	Land Transportation Office, Department of Transportation and Communications
Distance Travelled	Vehicle kilometre by vehicle type (in vkt) (mode & fuel)	
	Passenger Kilometre (pkm) (mode & fuel)	
	Ton Kilometre (tkm) (mode & Fuel)	
Trips	Total Number of Trips/Mode/Fuel type	
Load Factor	Average Occupancy (No of persons/Vehicle) (by mode & fuel type)	
	Average Loading (Tons/Vehicle) (by mode & fuel type)	Department of Public Works and Highways
Fuel Efficiency	Fuel Efficiency (kmpl or L/100km or MJ/km) (by mode & fuel type)	National Center for Transportation Studies, University of the Philippines
Speed	Speed by mode/fuel type	Department of Public Works and Highways

Annex 2: Projects Under the "Build, Build, Build" Program

As of April 2018

NO	PROJECT NAME	IMPLEMENTING AGENCY	SECTOR	COST (million PhP)	START DATE	STATUS
1	NLEX-SLEX Connector Road	DPWH	Roads and Bridges	23,202	5/6/2010	Project Implementation
2	Bonifacio Global City to Ortigas Road Link Project, Sta. Monica-Lawton Bridge and Viaduct (Phase I & II-A)	DPWH	Roads and Bridges	4,012	5/1/2012	Project Implementation
3	NAIA Expressway Phase II	DPWH	Roads and Bridges	20,450	5/1/2011	Project Development
4	Mandaluyong Main Drainage Project (MMDP), Phase II	DPWH	Flood Control	359	8/18/2014	Project Procurement
5	Pasig-Marikina River Channel Improvement Project, Phase III (JICA PH-P252)	DPWH	Flood Control	7,545	6/1/1998	Project Procurement
6	NLEX Harbor Link, Segment 10	DPWH	Roads and Bridges	9,000	5/30/2014	Project Implementation
7	Tarlac-Pangasinan-La Union Expressway Project	DPWH	Roads and Bridges	24,420	1/8/1996	Project Development
8	Cavite-Laguna Expressway	DPWH	Roads and Bridges	35,682	1/3/2005	Project Implementation
9	Panguil Bay Bridge	DPWH	Roads and Bridges	4,860	1/30/2018	Project Implementation
10	Bacolod Economic Highway	DPWH	Roads and Bridges	5,792	2/9/2017	Project Implementation
11	Metro Cebu Expressway	DPWH	Roads and Bridges	18,016	1/8/2018	Project Development
12	Mindanao Logistics Infrastructure Network	DPWH	Roads and Bridges	80,410	1/1/2015	Project Development
13	Central Luzon Link Expressway	DPWH	Roads and Bridges	14,940	5/1/2016	Project Implementation
14	Davao City By-pass	DPWH	Roads and Bridges	19,810	1/1/2018	Project Implementation
15	Leyte Tide Embankment Project	DPWH	Flood Control	7,900	1/4/2016	Project Development
16	Apayao - Ilocos Norte Road	DPWH	Roads and Bridges	3,670	1/7/2013	Project Development
17	Urdaneta City Bypass Road	DPWH	Roads and Bridges	1,643	1/4/2010	Project Implementation
18	Pigalo Bridge	DPWH	Roads and Bridges	437	4/10/2017	Project Implementation
19	Matnog - Sta. Magdalena - Bulusan Road	DPWH	Roads and Bridges	520	8/6/2015	Project Implementation
20	Zamboanga City By-Pass Road	DPWH	Roads and Bridges	2,230	1/9/2012	Project Implementation

21	Pinguiaman Bridge	DPWH	Roads and Bridges	400	3/6/2017	Project Procurement
22	Laguna Lake Highway	DPWH	Roads and Bridges	418	1/4/2016	Project Implementation
23	Bahile - Oyster Access Road	DPWH	Roads and Bridges	496	1/7/2013	Project Implementation
24	East-West Lateral Road	DPWH	Roads and Bridges	4,873	5/26/2015	Project Implementation
25	Bacolod Airport - Operations, Maintenance and Development Project	DOTr	Airports	20,260	1/1/2012	Project Development
26	Cebu Bus Rapid Transit	DOTr	Mass Transit	10,617	12/1/2011	Project Implementation
27	Central Spine RORO Alignment Project (CSR)	DOTr	Seaports	Not available	8/1/2014	Project Development
28	Davao Airport - Operations, Maintenance and Development Project	DOTr	Airports	40,570	1/1/2012	Project Development
29	Iloilo Airport - Operations, Maintenance and Development Project	DOTr	Airports	30,400	1/1/2012	Project Development
30	Laguindingan Airport - Operations, Maintenance and Development Project	DOTr	Airports	14,615	1/1/2012	Project Development
31	Mega Manila Subway	DOTr	Railways	227,000	3/1/2015	Project Development
32	Metro Manila Bus Rapid Transit - Line 1 (Quezon Avenue BRT)	DOTr	Mass Transit	4,789	9/1/2012	Project Development
33	Metro Manila Bus Rapid Transit - Line 2 (Central Corridor)	DOTr	Mass Transit	37,760	1/1/2015	Project Procurement
34	Mindanao Railway: Tagum-Davao City-Digos (TDD) Segment	DOTr	Railways	31,544	10/28/2015	Project Development
35	New Bohol (Panglao) Airport Development, Operations and Maintenance Project	DOTr	Airports	4,570	1/1/2012	Project Development
36	New Communications Navigation Surveillance/Air Traffic Management (CNS/ATM) Systems Development Project	DOTr	Airports	10,869	2/1/1998	Project Implementation
37	PNR North 1 (North South Commuter Rail)	DOTr	Railways	105,313	6/12/2013	Project Implementation
38	PNR North 2	DOTr	Railways	150,000	11/30/2016	Project Development
39	PNR South Commuter	DOTr	Railways	134,000	2/12/2014	Project Development
40	PNR South Long Haul	DOTr	Railways	151,000	2/12/2014	Project Development
41	Puerto Princesa Airport Development Project	DOTr	Airports	4,461	12/1/2011	Project Implementation

42	South Integrated Transport System	DOTr	Mass Transit	4,000	5/1/2013	Project Implementation
43	Southwest Integrated Transport System	DOTr	Mass Transit	3,153	11/15/2012	Project Implementation
44	Unified Common Station	DOTr	Railways	2,800	2/1/2017	Project Procurement
45	Cavite Barge Gateway Terminal	DOTr	Seaports	30	4/21/2017	Project Implementation
46	Modernization of RORO Transport System in the Philippines	DOTr	Seaports	5,701	9/1/2017	Project Development
47	Line 7 (MRT 7)	DOTr	Railways	1,540	2/1/2014	Project Implementation
48	LRT Line 2 East (Masinag) Extension Project	DOTr	Railways	9,511	10/1/2011	Project Implementation
49	Night Rating of Cauayan Airport	DOTr	Airports	205	1/1/2018	Project Development
50	Night Rating of Cotabato Airport	DOTr	Airports	189	TBD	Project Development
51	Night Rating of Dipolog Airport	DOTr	Airports	253	TBD	Project Development
52	Night Rating of Dumaguete Airport	DOTr	Airports	182	TBD	Project Development
53	Night Rating of Naga Airport	DOTr	Airports	168	TBD	Project Development
54	Night Rating of Ozamis Airport	DOTr	Airports	302	TBD	Project Development
55	Night Rating of Pagadian Airport	DOTr	Airports	244	TBD	Project Development
56	Night Rating of Tuguegarao Airport	DOTr	Airports	233	TBD	Project Development
57	Bicol International Airport Development Project	DOTr	Airports	4,789	11/1/2007	Project Implementation
58	Mactan-Cebu International Airport Project	DOTr	Airports	17,520	11/1/2010	Project Development
59	LRT 1 South (Cavite) Extension Project	DOTr	Railways	64,900	TBD	Project Implementation
60	Subic-Clark Cargo Railway Project	BCDA	Railways	57,600	10/20/2016	Project Development
61	BGC to NAIA Bus Rapid Transit (BRT) System	BCDA	Mass Transit	44,025	10/20/2016	Project Development
62	Clark International Airport Expansion (Phase 1)	BCDA	Airports	12,550	7/1/2017	Project Procurement
63	New Clark City - Mixed Use Industrial Real Estate Developments	BCDA	New Cities	Not available	1/11/2016	Project Procurement
64	New Clark City National Government Administrative Center (NGAC)	BCDA	New Cities	13,160	1/1/2018	Project Procurement

65	New Clark City - Philippine Sports City	BCDA	New Cities	97,000	1/1/2018	Feasibility Study / MOU
66	New Clark City- Food Processing Terminal and International Food Market	BCDA	New Cities	31,300	6/30/2017	Project Development
67	New Clark City- Mixed Income Development Housing	BCDA	New Cities	8,300	5/5/2015	Feasibility Study / MOU
68	New Clark City- Agro-Industrial Park	BCDA	New Cities	Not available	10/20/2016	Feasibility Study / MOU
69	Broadband Backhaul Modular IT Facilities	BCDA	Communication and Information	975	3/21/2016	Feasibility Study / MOU
70	BCDA Smart City Solutions	BCDA	New Cities	Not available	10/20/2016	Project Development

Source: Build Build Build portal, http://www.build.gov.ph/Home/Project