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Roads and Rail

Policy Brief No. 8
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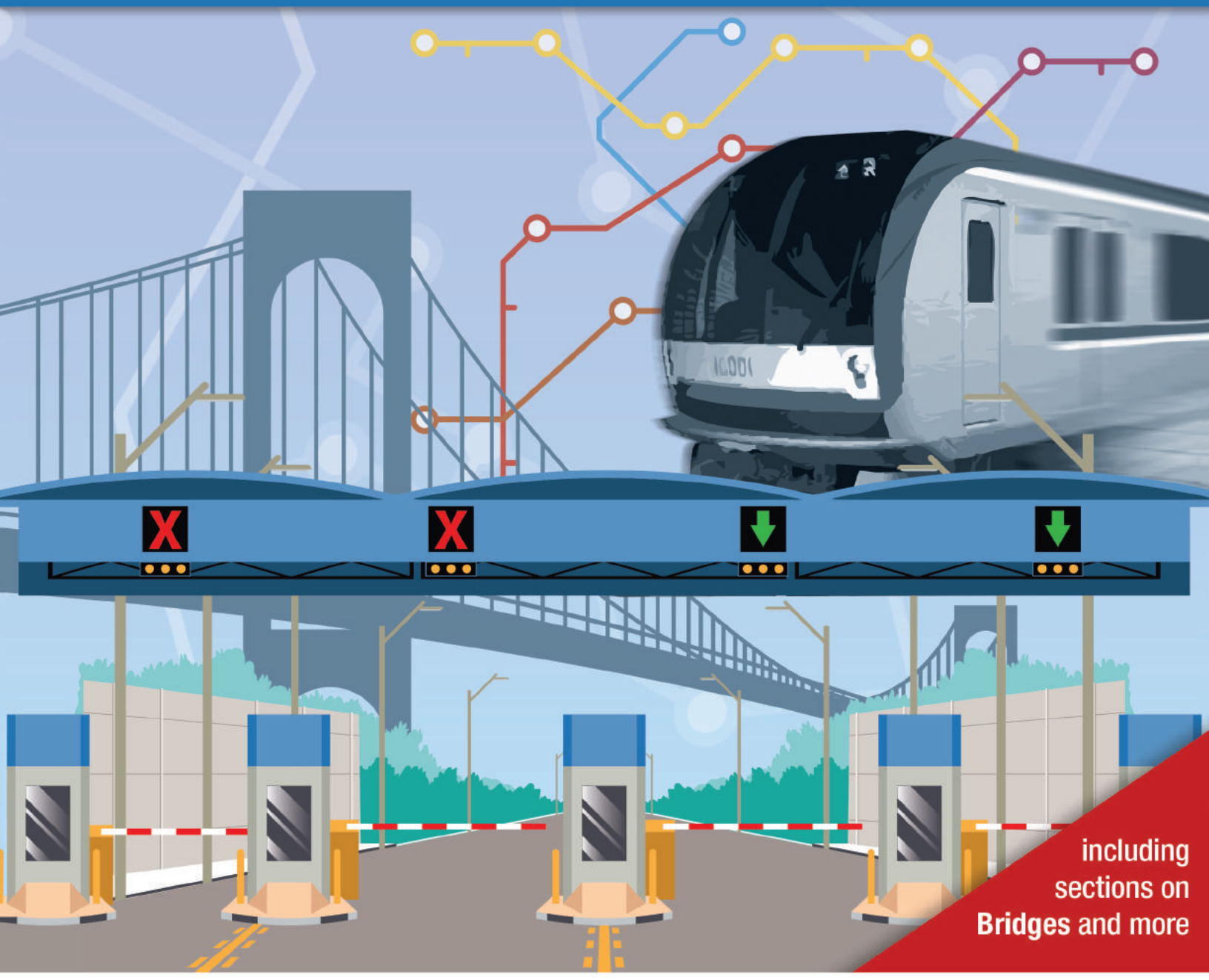

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Philippine Chamber of Commerce and Industry
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A POLICY BRIEF ON PHILIPPINE ROADS AND RAIL INFRASTRUCTURE

I. INTRODUCTION AND SUMMARY

Efficient transport overland of people and goods characterizes high-income developed economies. Implementing more efficient transport in the Philippines will help achieve the aspiration of the Aquino and Duterte administrations for a "comfortable life for all."

High-quality roads and bridges and extensive urban and inter-urban rail networks ease traffic congestion and enhance economic productivity. Better transport infrastructure drives higher growth, leading firms to invest more and increasing productivity of both labor and capital. The quality of health and education also improves when citizens travel with ease.

Conversely, an economy is inefficient when ground transportation is inadequate, burdening citizens with heavy congestion costs. This describes the Philippines in 2018, where "carmageddon" looms in urbanized centers.

Annual sales of new passenger and commercial vehicles are growing, moving steadily higher towards levels seen in more developed ASEAN countries. Traffic congestion costs the economy PhP 3.6 billion daily, and may rise to PhP 6 billion daily by 2030. The next president can expect to face the challenge of almost one million new vehicles a year, twice the current level.

Solutions include upgrading the extensive national and local road system, rapidly expanding the small network of freeways and elevated expressways, building larger bridges to span rivers and connect islands, building more light rail lines inside Mega Manila, expanding commuter rail lines, and rebuilding long-distance rail on Luzon. Such projects comprise much of the "Build, Build, Build" program of the current administration. Subsequent administrations will be obliged to continue to "Build, Build, Build" until the country has a modern transport system.

The Philippine government has only started to meet the challenge of modernizing ground transport. Infra spending, as a percentage of GDP, is now almost 5% and should go higher. The public works budget has increased over 1,000% since 2006 to over US$ 10 billion a year. New expressways and rail lines under construction will be operational in a few years, while more are in advanced stages of planning and approval. Sufficient funding is available, but implementation is slow.

This policy brief discusses plans for the expressway system to grow from 385 to 1,463 km and the rail system from 77 to 1,200 km by 2022. New skyways, bridges, and rail lines should ease Metro Manila traffic congestion, but only if new transportation projects are built much faster.

The policy brief includes recommendations made at a roundtable on April 26 at AmCham. We are grateful to the participants, especially to senior officials of DOTr, DPWH, and JICA, who made excellent presentations.

"**Transport infrastructure** is clearly our **most urgent need**. It immediately contributes to economic expansion and broadens the revenue base of countries. Businesses are able to **improve productivity** dramatically and households are able to **improve incomes** with the modernization of transport infrastructure."

- Carlos Dominguez III, Finance Secretary
During the Asian Infrastructure Investment Bank (AIIB) Governer's Business Roundtable on June 27, 2018

KEY RECOMMENDATIONS:

1. Issue/implement the comprehensive National Transport System Master Plan.
2. Observe continuity of projects and policies between administrations.
3. Maintain high levels of public and private sector investment in needed infrastructure.
4. Achieve intermodality in planning and implementation.
5. Be ambitious in land transportation modernization.
6. Advance Philippine country rank to top third in WEF "quality of road" ranking.
7. Be ambitious in rail transport modernization, especially in major cities.
8. Advance Philippine country rank to top half in WEF "quality of rail" ranking.
9. Accelerate project implementation.
10. Continue to improve ROW acquisition.
11. Assure project quality and efficiency.
12. Restructure regulatory agencies and provide adequate resources.
13. Open up land transportation to foreign firms.
14. Be prepared to subsidize rail.
15. Remember maintenance.
16. Conduct a robust PPP and privatization program.
17. Reduce political interference in infrastructure programs.
18. Enact other reform legislation.

II. LAND TRANSPORT: A SUPPLY AND DEMAND CRISIS

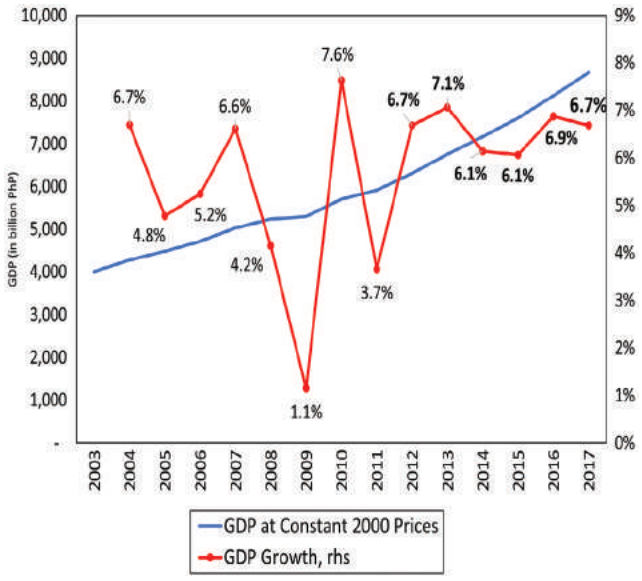
No modern economy can ignore developing safe and reliable public transport for citizens. Manila and other cities in the Philippines, short on road capacity for increasing numbers of vehicles, must prioritize developing quality public transport. Modern economies provide efficient urban bus transport, light rail, monorail, and inter-urban rail networks, and facilitate bicycles. These modes in the Philippines have long been neglected in favor of cars, jeepneys, and old buses.

With its still-growing population and strong economic growth, the Philippines is experiencing a surge in demand for land transportation. Expressway and skyway networks need to be expanded by hundreds and eventually thousands of kilometers to accommodate the increasing number of vehicles.

Mega Manila will be one of the largest mega cities in the world. Makati, Ortigas, and BGC will need much better public transport solutions to avoid worse congestion.

Economic growth has been steady between 6 and 7% since 2012. Government planners target 7 to 8% going forward (see Figure 1).

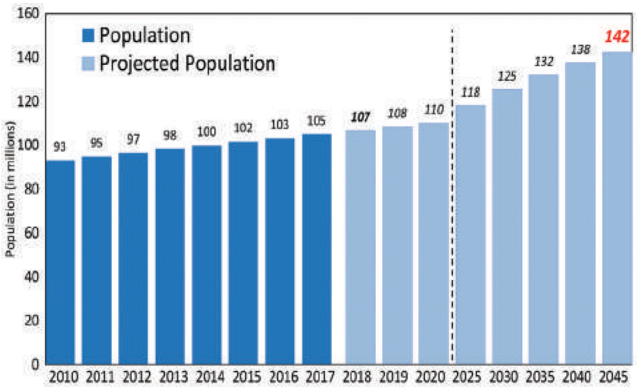
Figure 1: GDP, Philippines, 2003-2017



Source: Bangko Sentral ng Pilipinas

The Population Commission predicts total population will reach 142 million by 2045 or 35 million more than in 2018 (see Figure 2). JICA predicts continued strong population growth for Mega Manila at an annual rate of 2.3%, increasing from 24 million in 2015 to 38 million in 2035.

Figure 2: Population growth, Philippines, 2010-2045



Source: Philippine Statistics Authority

A fast-growing middle class, low interest rates, lower fuel prices, and TNC apps (e.g. Grab and Uber) in recent years have combined to produce rising demand for private cars. The *Ambisyon Natin* 2040 vision of NEDA foresees one car for every Filipino family in 2040 (see Figure 3).

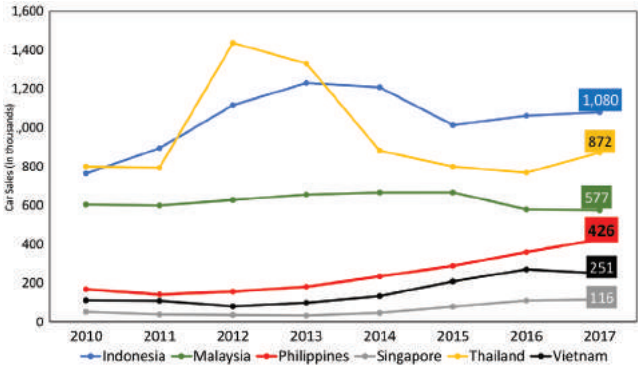
Figure 3: Vision of the future Filipino family

Source: National Economic Development Authority

In 2016, there were 23 million Filipino families. There could be several million more by 2040. Infrastructure planners will have to meet the huge transportation requirements for so many cars, possibly 3-4 times the current number.

Vehicle sales are growing more than 10% per annum. Sales in more mature ASEAN automotive markets indicate the potential level Philippine sales may soon reach. Annual sales in Malaysia have held steady at around 600,000 since 2010.[1] Annual sales in Thailand peaked at 1.4 million then declined to around 900,000 units. Indonesian sales have been above 1 million every year since 2012 (see Figure 4).

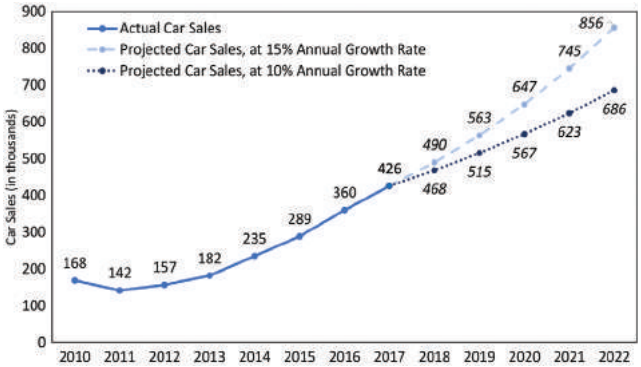
Figure 4: Car sales, ASEAN-6, 2010-2017



Sources: ASEAN Automotive Federation; For Thailand, sales data for passenger cars do not include Mercedes Benz, BMW, Mini, and Volvo from November 2011 onwards

Annual car sales in the Philippines have yet to reach the levels of Indonesia, Malaysia, and Thailand but are steadily increasing and should soon exceed 500,000 units. Figures 5 projects continued sales growth and car volume by 2022 under two scenarios - 15% and 10% rates of increase. In the 15% scenario sales could reach 850,000 units a year in 2022, while in the 10% scenario this would happen three years later in 2025. Both scenarios involve millions of additional cars on the roads.

Figure 5: Five year car sales, Philippines 2010-2022E



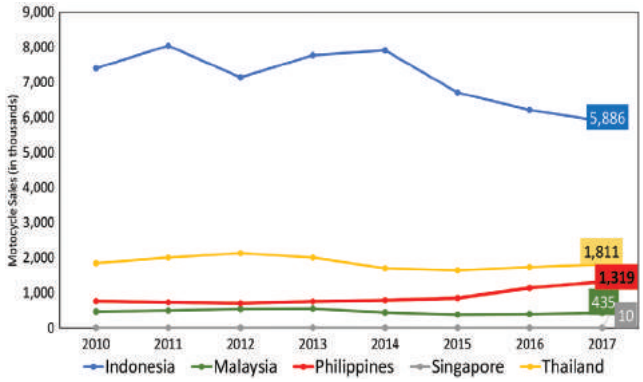
Source: ASEAN Automotive Federation and author's calculations

1 *Malaysia has the third highest car ownership rate in the world, according to Neilsen.*

In Mega Manila, more than 2.5 million vehicles were registered with LTO in 2016. MMDA reports that 29% of all vehicles in the country are registered in the National Capital Region.

Motorcycles also add to congestion (see Figure 6). The annual number sold in the Philippines is growing rapidly, rising from 851,000 in 2015 to 1.3 million in 2017, an increase of more than 50% over two years. Also, more commercial vehicles are continuously needed to service the fast-growing economy.

Figure 6: Motorcycle sales, ASEAN-5, 2010-2017



Source: ASEAN Automotive Federation

JICA has estimated that the cost to the economy of traffic congestion in Metro Manila in 2018 is PhP 3.5 billion a day, rising to PhP 6 billion per day by 2030. JICA estimated almost 50% of the Mega Manila road network operates at a speed below 20 km/hr.

JICA recommends that Mega Manila develop new urban centers outside Metro Manila to the north and the south between Tarlac City and Lucena City. These should be linked to Mega Manila by expressways and commuter rail lines.

Metro Manila and most other cities are choking with traffic congestion that will worsen unless better infrastructure is built, among other reforms. This paper does not analyze road safety[2] or traffic challenges in detail. However, the box below lists some short term recommendations to ease congestion.

SHORT TERM RECOMMENDATIONS TO EASE TRAFFIC CONGESTION

from Eduardo Yap, Robert Siy, JICA

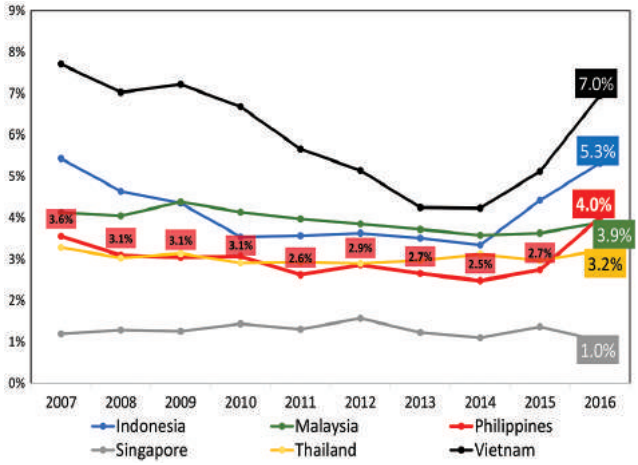
1. Remove all obstructions on roads and sidewalks, including illegally parked vehicles on public roads.
2. Increase the number of traffic enforcers deployed in heavy traffic areas during rush hours and special events.
3. Install more CCTV cameras to monitor road activity, especially in critical traffic areas, and expand no-contact, camera-based apprehension of traffic and parking violators in all LGUs in Metro Manila.
4. Implement an Intelligent Transport System (ITS) in Metro Manila through the use of new technology such as driving aide apps and GPS systems to identify alternative roads for private vehicles and track public transportation services for commuters.
5. Review the number coding system and consider lifting coding for public transport vehicles and use of high occupancy private and public use lanes on major thoroughfares.
6. Strengthen implementation of public transportation regulations, such as loading/unloading zones and times and provision of a dedicated lane for buses on congested tollways and expressways.
7. Promote walkability and the use of non-motorized forms of transportation through the provision of pedestrian facilities and networks of greenways and bikeways.

2 *10,012 people died in road vehicle accidents in 2015 – a 46% increase from 6,869 deaths in 2006. Rappler, April 12, 2017. https://www.rappler.com/move-ph/issues/road-safety/166151-road-crashes-philippines-awareness-safety*

III. PHILIPPINE INFRASTRUCTURE SPENDING CATCHING UP

Philippine government planners are fully aware of the country's infrastructure deficit and the need to catch up with more progressive neighbors. For many years the Philippines was spending only between 2% and 3% of GDP on infrastructure, while Indonesia, Malaysia, and Vietnam spent a higher percentage of GDP (see Figure 7).[3]

Figure 7: Percentage of GDP used for infrastructure, ASEAN-6, 2007-2016



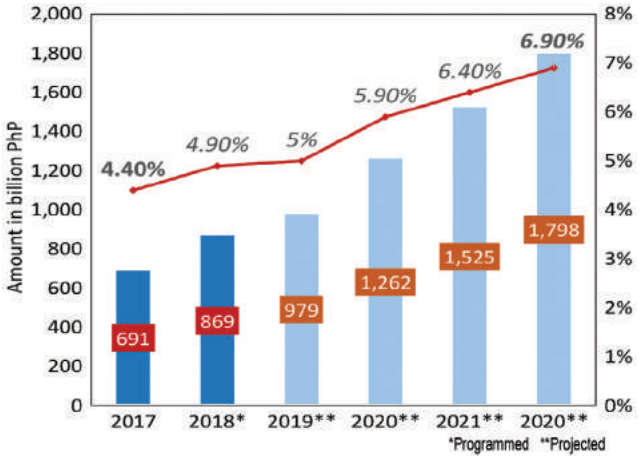
Source: Global Infrastructure Hub

In February 2013, the Aquino administration adopted the policy: "What is needed for more inclusive development is better infrastructure. Infrastructure spending by government needs to increase from 2.6 percent to 5 percent of the GDP by 2016."[4]

The Duterte administration declared its economic policy principles in May 2016 in its Ten-point Socioeconomic Agenda. Point 4 states: "Accelerate annual infrastructure spending to account for 5% of GDP, with Public-Private Partnerships playing a key role."

The Duterte administration has adopted infrastructure spending targets higher than 5% as it announced its "Build, Build, Build" program in mid-2017 to implement a "Golden Age of Philippine Infrastructure" (see Figure 8). From 4.9% of GDP in 2018, the administration targets increasing spending to 6.9% of GDP by 2022. By 2019, this will amount to almost PhP 1 trillion (US$ 19 billion), as much as the total national budget of the government in 2007. The total amount the administration targets spending on infrastructure by 2022 is an ambitious PhP 8-9 trillion or US$ 160-180 billion.

Figure 8: Infrastructure spending, 2017-2022



Source: DBM

> "We envision that by the time we step down in 2022, we would have ushered in the **Golden Age of Infrastructure** in the Philippines (...) We have to close the infrastructure gap soon if we are to realize our development objectives of becoming an upper middle income country by 2022 and reduce poverty rate by 14%. (...) We plan to spend 8 to 9 trillion [pesos] or approximately 160 to 180 billion dollars in the next 6 years."
>
> **- Benjamin Diokno, DBM Secretary**
> During the Sixth *Arangkada* Philippines Forum on September 14, 2017

3 *The Philippine private sector is responsible for most investment in electric power generation and distribution and telecommunications. Under the PPP program,the private sector is also involved in airport terminals, expressways, and light rail lines.*

4 *Report of World Bank Country Representative Motoo Konishi. http://www.worldbank.org/en/news/speech/2013/02/06/Press-Statement.*

IV. ROAD TRANSPORTATION

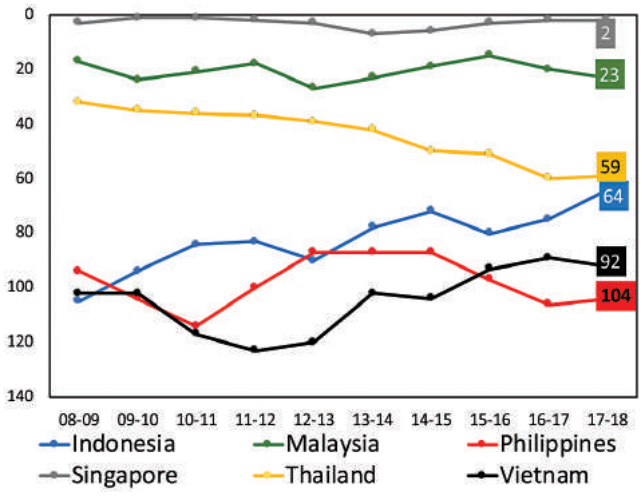
The Philippines has an extensive network of roads, at par with ASEAN competitors, but a large percentage is of poor quality. Ninety-four percent of national roads - 31,035 of 32,868 km - is paved. However, only 31% of the more extensive local road network (provincial, municipal, city, and barangay) - 64,514 of 210,463 km - is paved (see Table 1). The country has 8,260 bridges, most spanning rivers. One bridge links large islands (Leyte and Samar), while two bridges link Cebu Island to nearby industrial estates and the country's second busiest airport on Mactan Island.

Table 1: Road quality and road density, Philippines, 2017

	Total road network, km	Share of paved roads to total road network, %	Population per km of road	Population per km of paved road
Indonesia	503,604	90%	524	142
Malaysia	144,303	81%	222	1,467
Philippines	210,463	31%	489	1,597
Singapore	3,496	100%	1,604	160
Thailand	180,053	99%	383	380
Vietnam	280,000	16%	343	1,752

Sources: ASEAN Secretariat, DPWH, Land Transport Authority (Singapore), Department of Rural Roads (Thailand), Ministry of Transport (Vietnam)

Figure 9: Quality of roads rankings, ASEAN-6, 2008-2018



Source: World Economic Forum, various years. Out of a total of 137 countries.

Among the ASEAN-6, the quality of Philippine roads rank, as measured by the World Economic Forum (WEF), is last and has not improved over the past decade (see Figure 9). Singapore and Malaysia have the best road quality among the ASEAN-6. Indonesia is the most improved. According to the World Bank, the poor quality of roads in the Philippines results in intercity freight rates 50% higher than in Thailand or Vietnam.

In another competitiveness comparison, the WEF lists the most problematic factors for doing business in the Philippines in its annual Global Competitiveness Report (see Table 2). For the period 2013 to 2017 "inadequate supply of infrastructure" was ranked in the top three problematic factors for doing business every year and was the top factor in 2013 (21%) and 2016 (18%).

Table 2: Most problematic factors for doing business, Philippines, 2013-2017

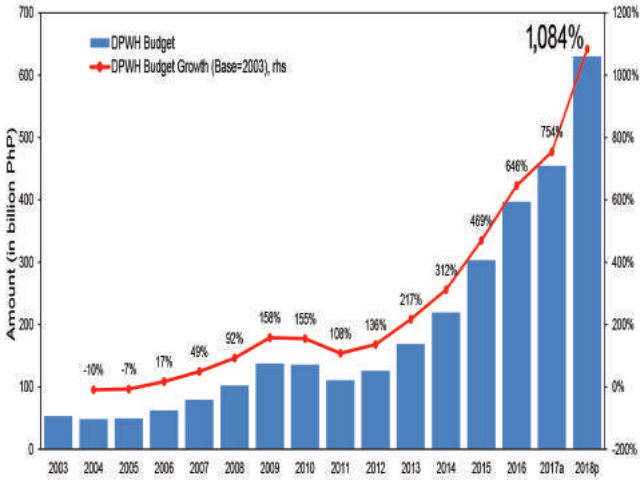
	2013	2014	2015	2016	2017
Inefficient government bureaucracy	17%	13%	19%	18%	20%
Inadequate supply of infrastructure	21%	16%	17%	18%	18%
Corruption	18%	18%	16%	17%	14%
Tax regulations	9%	13%	12%	8%	11%
Tax rates	6%	10%	10%	11%	9%
Policy instability	7%	5%	8%	7%	8%

Source: Global Competitiveness Report 2017, World Economic Forum

Fortunately, the infrastructure gap is not being neglected by government. The DPWH budget has increased by more than 1,000% over the last decade from PhP 53 billion in 2003 to PhP 651 billion in 2018 (see Figure 10). The largest part of the budget is spent on roads and bridges. DPWH is improving the quality of national roads, constructing and widening roads and bridges, bypass and diversion roads, flyovers, interchanges, and underpasses throughout the country.[5]

5 *DPWH is the lead agency for building civil works for flood mitigation structures along major river basins. Its budget for its Integrated Water Resources Management Program and Disaster Risk Reduction and Climate Change Adaptation Program increased from US$ 2 billion in 2017 to US$ 3 billion in 2018.*

Figure 10: DPWH budget, 2003-2018

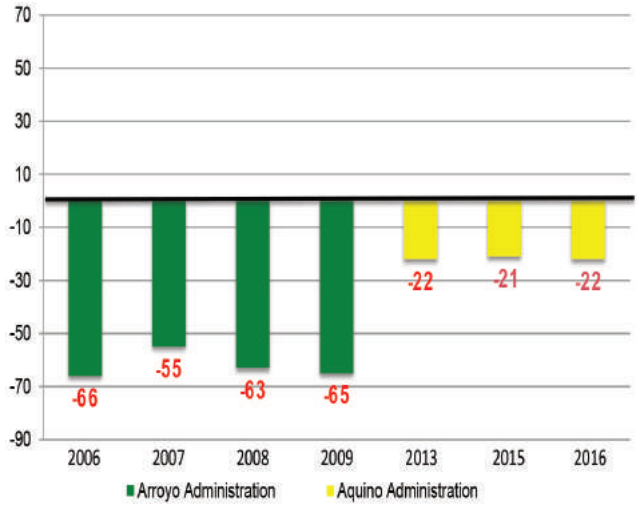


Source: DBM (Total Obligations; Adjusted Budget; Actual Expenditure)

Once viewed as one of the most corrupt departments, the DPWH reportedly decreased corruption under the present secretary and his predecessor, who was said to have removed 30% of corrupt spending in his first year in office.

The respected Corruption Perceptions Survey of the Social Weather Stations shows a large improvement over the period 2006 to 2016 in the "sincerity in fighting corruption" measure (see Figure 11). Although still negative, many more respondents saw the department as less corrupt.

Figure 11: DPWH net sincerity ratings, 2006-2016



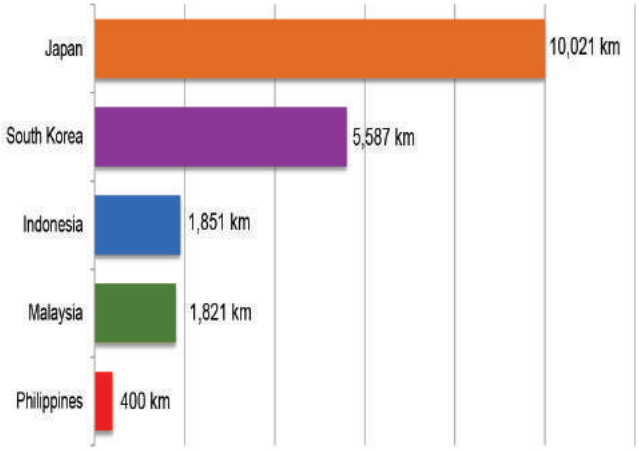
Source: Social Weather Stations

ROAD TRANSPORTATION: EXPRESSWAYS

There are currently 385 km of expressways in the Philippines, all in Mega Manila and Central Luzon. Most are four lanes, widening where traffic is heavier. Expressways allow vehicles to travel safely at high speeds and reduce logistics costs. Unlike on other roads, slow-moving vehicles and other common impediments to traffic flow are not allowed.

Developed Asian countries Japan and Korea have over 10,000 and 5,000 km, respectively, in their expressway networks (see Figure 12). Japan has 25% more land area than the Philippines and a 20% larger population; but the Philippine population is likely to exceed Japan's in a decade. As the Philippines moves along the path towards higher income, it should build expressway networks that begin to approach the length of more advanced countries.

Figure 12: Total expressway network, select Asian countries, 2017



Sources: DPWH, Malaysian Highway Authority, Japan Ministry of Land, Infrastructure, and Transport, Indonesian Toll Road Regulatory Agency.

Following is a map of the Luzon Spine Expressway Network (see Figure 13). When completed, the length of the north-south expressway on Luzon will total 1,267 km. DPWH officials predict that a trip of this distance from Ilocos to Bicol will be reduced from 19 hours and 40 minutes to 8 hours and 15 minutes.

Figure 13: Luzon Spine Expressway Network

Source: Department of Public Works and Highways

Current expressways. From north to south on Luzon there are 10 expressways ranging from 4 to 94 km in length and totaling 385 km (see Table 3). Following are details of those that exceed 10 kilometers in length:

Table 3: Current expressway network, Km

NO.	EXPRESSWAY	
1	Tarlac-Pangasinan-La Union Expressway (TPLEX)	78
2	Subic-Clark-Tarlac Expressway (SCTEX)	94
3	Subic Freeport Expressway (SFEX)	9
4	North Luzon Expressway (NLEX)	80
5	Manila-Cavite Expressway (CAVITEX)	14
6	Metro Manila Skyway (Stages 1 and 2)	16
7	NAIA Expressway (NAIAX)	12
8	South Luzon Expressway (SLEX)	36
9	Muntinlupa-Cavite Expressway (MCX)	4
10	Southern Tagalog Arterial Road (STAR)	42
	Total current network (km)	**385**

Sources: DPWH, TRB, NLEX Corp, CAVITEX, PPP Center, San Miguel

1. **Tarlac - Pangasinan - La Union Expressway (TPLEX)**, 78 km. PPP operated by San Miguel. Cost US$ 488 million. Connects northern end of SCTEX in Tarlac to Rosario, La Union. Construction began in 2010.

Tarlac-Pangasinan-La Union Expressway (TPLEX) • Source: Rappler

2. **Subic-Clark-Tarlac Expressway (SCTEX)**, 94 km. ODA Japan, operated by Metro Pacific. Cost US$ 425 million. Connects two former US military bases converted to SEZs. Connects to TPLEX in Tarlac. Opened 2008.

Subic-Clark-Tarlac Expressway (TPLEX) • Source: BCDA

3. **Northern Luzon Expressway (NLEX)**, 80 km. GAA/PPP operated by Metro Pacific after Benpres. The country's first expressway, built under President Marcos and extended under President Ramos. Connects EDSA in Quezon City to Angeles City, Pampanga and SCTEX.

North Luzon Expressway • Source: NLEX Official Website

4. **CAVITEX (Manila-Cavite Expressway)** (also known as Coastal Road), 14 km. PPP operated by Metro Pacific. Extends from Roxas Boulevard in Parañaque to Bacoor, Cavite. Will connect to CALAx.

5. **Metro Manila Skyway (Stages 1 and 2)**, 16 km. PPP operated by San Miguel. Built by Citra. Cost US$ 450 million. Opened in 1999. Connects Makati Central Business District to Alabang.

Metro Manila Skyway • Source: SMC Infrastructure

6. **NAIA Expressway (NAIAX)**, 12 km. Solicited PPP operated by San Miguel. Cost US$ 361 million. Connects Skyway system and CAVITEX to NAIA airport terminals and PAGCOR Entertainment City.

NAIA Expressway (NAIAX) • Source: DPWH Sec. Mark Villar Official FB Page

7. **SLEX (Southern Luzon Expressway)**, 36 km. PPP operated by San Miguel. Started in late 1960s, and extended and upgraded by Indonesian, Malaysian, and Philippine firms. Connects Makati to Calamba, Laguna and Santo Tomas and STAR Tollway in Batangas.

8. **STAR Highway (Southern Tagalog Arterial Road)**, 42 km. PPP operated by San Miguel. Connects SLEX at Santo Tomas to Batangas Port.

STAR Tollway • Source: Eagle Cement Official Website

Table 4: Expressways under construction, Km

NO.	EXPRESSWAY	
1	TPLEX Extension to Rosario	11
2	Central Luzon Link Expressway (CLLE) Phase 1	31
3	NLEX-Harbor Link	17
4	Metro Manila Skyway Stage 3	15
5	Metro Manila Skyway Stage 4	58
6	CAVITEX - C5 South Link	8
7	Cavite-Laguna Expressway (CALAx)	45
8	SLEX Toll Road 4 (SLEX TR4)	57
9	New Bacolod Economic Highway	21
10	Davao City Coastal Road	19
	Total expressways under construction (km)	**282**

Sources: DPWH, NEDA, San Miguel, MPIC, SLTC

Expressways under construction. There are 10 expressway projects under construction in the country, most in Central Luzon, totaling 282 km (see Table 4).

1. **TPLEX (Tarlac - Pangasinan - La Union Expressway)**, 11 km to Rosario, La Union. PPP operated by San Miguel. Final section from Pozorrubio to Rosario to open by mid-2019. SMIC has submitted a PPP proposal to extend to San Juan, La Union.

2. **Central Luzon Link Expressway, Phase 1 (Tarlac-Cabanatuan-Nueva Ecija)**, 31 km. ODA Japan. Cost US$ 299 million. Phase 1 connects Tarlac to Cabanatuan. Completion in 2020 with PPP for O&M.

CLLEX groundbreaking ceremony • Source: CLLEX Facebook Page

3. **NLEX-Harbor Link, Segment 8.2 and Segment 10**, 17 km. PPP Metro Pacific. Cost PhP 16 billion. Connecting Mindanao Avenue exit of NLEX to Commonwealth in Quezon City and elevated link above PNR railroad tracks through Valenzuela and Malabon City. Segment 10 to be completed in 2018 and Segment 8.2 in 2021.

NLEX-Harbor Link Segment 10 Construction • Source: MNTC

4. **Metro Manila Skyway (Stage 3)**, 15 km. PPP San Miguel. Cost PhP 37 billion. Connects Buendia Avenue, Makati to Balintawak, Quezon City. By connecting Skyway/SLEX and NLEX, Stage 3 will relieve traffic on EDSA. A BRT lane is planned. Approved in 2010, completion expected in 2019; delays due to ROW and utility relocation issues.

Skyway Stage 3 Ongoing Construction • Source: ABS-CBN News

5. **Metro Manila Skyway Stage 4**, (South East Metro Manila Expressway), 58 km elevated and surface. PPP San Miguel. Cost PhP 45 billion. Connects Batasan Complex, Quezon City to Skyway/FTI in Taguig. Broke ground in late 2017; to be completed in 2020.

6. **CAVITEX-C5 South Link**, 8 km. PPP Metro Pacific. Cost PhP 10 billion. Connects CAVITEX to SLEX and C-5. Will relieve heavy traffic on southern side of NAIA. To be operational in 2020.

7. **CALAx (Cavite-Laguna Expressway)**, 45 km. Solicited PPP Metro Pacific. Cost PhP 36 billion. Connects CAVITEX (Kawit) to SLEX (Mamplasan). Notice of award June 2015. Completion target 2021.

Map of CALAx • Source: MPIC

8. **SLEX Extension (South Luzon Expressway Toll Road 4)**, 57 km. PPP San Miguel. DPWH acquiring ROW. Scheduled to be completed by 2021.

9. **New Bacolod Economic Highway**, 21 km. GAA. Cost US$ 116 million. Alternative 4-lane circumferential bypass highway. Construction commenced in 2017. Scheduled completion 2021.

Construction of New Bacolod Economic Highway • Source: DPWH

10. **Davao City Coastal Road**, 19 km. GAA. Cost US$ 396 million. Connecting Matina Aplaya to Sta. Ana Pier. Construction began in 2017; expected completion 2022.

Table 5: Expressways planned and proposed, Km

NO.	EXPRESSWAY	
1	TPLEX Extension to Ilocos	59
2	Central Luzon Link Expressway (CLLE) Phase II	36
3	North Luzon East Expressway Stage 1	19
4	North Luzon East Expressway Stage 2	91
5	NLEX-SLEX Connector Road	8
6	NLEX-CAVITEX Port Expressway Link	15
7	C-3 Elevated Expressway	9
8	Delpan-Pasig-Marikina Expressway	25
9	Manila-Taguig Expressway	18
10	C-5 Expressway	27
11	NAIAX extension	8
12	CAVITEX extension Segment 5	10
13	CAVITEX-Sangley Extension	5
14	Manila-Quezon Expressway	102
15	Cavite -Tagaytay-Batangas Expressway (CTBEX)	49
16	Quezon-Bicol Expressway	180
17	Camarines Sur Expressway	16
18	Metro Cebu Expressway	74
19	Davao City Bypass	45
	Total planned and proposed expressway projects (km)	**796**

Sources: San Miguel, DPWH, PPP Center, NEDA

Expressways planned and proposed. A large number of additional expressways are planned or proposed. Most are on Luzon. Nineteen are described below, totaling 796 km. The DPWH website lists 7 projects "for feasibility study" and 8 projects "for evaluation." We have included most below (see Table 5).[6]

1. **TPLEX Extension (Tarlac-Pangasinan-La Union Expressway extension)**, 59 km. PPP, San Miguel is submitting an unsolicited proposal to DPWH to extend TPLEX from Rosario, La Union to San Juan, La Union.

2. **Central Luzon Link Expressway, Phase 2 (Tarlac-Cabanatuan-Nueva Ecija)**, 36 km. GAA. Cost PhP 12 billion. Connecting Cabanatuan and San Jose, Nueva Ecija.

3. **Northern Luzon East Expressway, Stage 1, La Mesa Parkways**, 19 km. Unsolicited PPP Ausphil Tollways. Cost PhP 8 billion. Connects Commonwealth – La Mesa to Norzagaray, Bulacan. First proposed in 2001. MWSS awarded notice to proceed in 2007. Placed on hold under Aquino Administration. In May 2018 DPWH justified the project to NEDA-ICC.

4. **Northern Luzon East Expressway, Stage 2**, 91 km. Unsolicited PPP Ausphil Tollways. Cost PhP 45 billion. From Norzagaray, Bulacan to Cabanatuan.

5. **NLEX-SLEX Connector Road**, 8 km elevated expressway. PPP Metro Pacific proposal submitted 2010. Cost US$ 466 million. Over PNR railway line from Skyway Stage 3 to C3 in Caloocan City. Contract awarded in 2016. Start of construction December 2018. Completion target 2020.

6. **NLEX-CAVITEX Port Expressway Link**, 15 km 6 lane expressway (combined elevated and tunnel). Unsolicited PPP Metro Pacific submitted June 2017. Cost Php 92 billion. Connects NLEX Segment 10 to CAVITEX providing truck route directly linked to Manila Port Area. Under evaluation by DPWH.

7. **C-3 Elevated Expressway**, 9 km. Unsolicited PPP SM and Ayala. Cost PhP 24 billion. Connects Skyway Stage 3 at Sta. Mesa across San Juan and Pasig rivers through Sta. Ana in Makati City to northern edge of Makati CBD then to Diokno Boulevard in Pasay City. Under evaluation by DPWH.

8. **Delpan-Pasig-Marikina Expressway**, 25 km elevated along banks of Pasig River from Delpan, Manila to Marikina. DPWH is supporting a feasibility study.

9. **Manila-Taguig Expressway**, 18 km elevated along banks of Pasig River. Unsolicited PPP proposal Indonesia PT Citra, submitted 2016 and revised 2017. Cost PhP 67 billion. Under evaluation.

10. **C-5 Expressway**, 27 km elevated. Unsolicited PPP San Miguel. Cost PhP 93 billion. Connects end of NLEX Segment 8.2 in Luzon Avenue, Quezon City to CAVITEX-C-5 South Link. Amended proposal submitted December 2017.

Drawing of NLEX-SLEX Connector Road • Source: Manila Bulletin

6 Scheduled commencement dates are derived from DPWH, Build, Build, Build websites, and media research. Most projects have completion dates of 2022 (end of term of incumbent president) or earlier. Given the history of delays for major infrastructure projects, the 2022 target as a best-effort target must be considered. It will be very important for the next administration to complete projects underway expeditiously.

11. **NAIAX Extension**, 8 km. Unsolicited PPP San Miguel. Connects Bonifacio Global City to NAIAX Skyway. Detailed engineering plans submitted to DPWH.

12. **CAVITEX Extension Segment 5**, 10 km. PPP, Metro Pacific has finished feasibility study. Cost PhP 23 billion. Connects southern end of CAVITEX to two towns further south. For TRB approval.

13. **CAVITEX-Sangley Extension (Sangley Boulevard)**, 5 km. Unsolicited PPP Cavitex Holdings. Connects Kawit Interchange to Cavite City and Sangley Airport on reclaimed land and bridges. DPWH awaits complete proposal for evaluation.

14. **Manila-Quezon Expressway**, 102 km. Unsolicited PPP letter of intent August 2016 Grand Metro-Manila Gateway. Cost PhP 67 billion. From Pasig to Candelaria, Quezon crossing east shore of Laguna de Bay. Pending submission of full proposal.

15. **CTBex (Cavite-Tagaytay-Batangas Expressway)**, 49 km. Unsolicited PPP by Metro Pacific approved by DPWH. Connects CALAx at Silang, Cavite to Nasugbu, Batangas and decongests Tagaytay area. Target completion 2022.

16. **Quezon-Bicol Expressway**, 180 km from Pagbilao, Quezon to San Fernando, Camarines Sur. Under study by DPWH.

17. **Camarines Sur Expressway**, 16 km from San Fernando to Pili. Cost PhP 2 billion. Under study by DPWH.

18. **Metro Cebu Expressway**, 74 km with a tunnel. GAA. Cost PhP 28 billion. Scheduled to commence in 2018. Connects Naga City to Danao City. Feasibility studies completed. Project announced by DPWH secretary.

Metro Cebu Expressway • Source: DPWH/Autoindustriya

19. **Davao City Bypass**, 45 km with tunnel. ODA/GAA. Cost US$ 396 million. Phase 1 (29 km) funded by JICA; Phase 2 by GAA. Connects Toril, Davao City and Panabo City, Davao del Sur. Scheduled to commence in 2019.

Davao City By-Pass • Source: DPWH

ROAD TRANSPORTATION: BRIDGES

Bridges span natural barriers for roads and rail to cross, usually over bodies of water. There are thousands of bridges in the Philippines, mostly short and spanning rivers. The common way of moving between islands is by boat. Very few bridges connect nearby islands, let alone span longer inter-island distances. The San Juanico Bridge connecting Leyte and Samar is the longest in the country at 2.2

km. It was completed in 1973.[7] Cebu has two bridges connecting Mactan Island to the main island; both carry heavy bumper-to-bumper traffic. The second bridge was opened in 1999.

Traffic along a bridge connecting Cebu and Mactan • Source: SunStar Cebu

The longest bridge in Southeast Asia is the Sultan Abdul Halim Muadzam Shah Bridge, 24 km long (17 km over water), connecting the island of Penang to the nearby Malaysian mainland. The bridge opened in 2014.[8]

China has two of the longest bridges in the world. Opening in 2018, the Hongkong-Zuhai-Macau bridge is 55 kilometers long, took 9 years to build, cost over US$ 15 billion, and connects three major urban centers in the Pearl River Delta.

Another long bridge over water is the 27-kilometer Jiaozhou Bay bridge on the southern coast of the Shandong Peninsula in northeastern China. The bridge was built in four years, has 5,200 pillars, and cost US$ 2.3 billion.[9]

Five new bridges are under construction or expected to start construction in 2018 (see Table 6).

Table 6: Bridges under construction, meters

NO.	BRIDGE	
1	Sta. Monica-Lawton Bridge	961
2	Binondo-Intramuros Bridge	734
3	Estrella-Pantaleon Bridge	506
4	Cebu-Cordova Link Expressway	8,000
5	Panguil Bay Bridge	3,770
	Total length of bridges under construction (m)	**13,971**

Sources: NEDA, DPWH

1. **Sta. Monica-Lawton Bridge** (Center Link Road Project), 961 m. GAA. Cost PhP 2 billion. Crosses Pasig River connecting BGC and Pasig. Ground broken July 2017; for completion March 2020.

Source: DPWH

2. **Binondo-Intramuros Bridge**, 734 m. ODA China. Cost PhP 2 billion. Crosses Pasig River from Binondo to Intramuros. Construction to begin in 2018. Ground broken in July 2018. Completion in 2020. Objections have been raised over potential harm to adjacent historical and tourist sites.

3. **Estrella-Pantaleon Bridge**, 506 m. ODA China. Cost PhP 1 billion. Crosses Pasig River from Makati to Mandaluyong. Construction to begin

7 *Bridges are expected to spur economic growth, but after 45 years about 140 vehicles per lane per hour pass over this bridge.*

8 *Bridge construction took 6 years by China Harbour Engineering with Malaysian firms. The bridge was financed with a $800 million loan from the PRC Eximbank at an interest rate of 3% and a term of 20 years.*

9 *Wikipedia, quoting China Daily and Guiness Book of World Records.*

in 2018. Ground broken in July 2018. Completion in 2020.

4. **Cebu-Cordova Link Expressway** (Cebu-Cordova bridge), 8 km. Unsolicited PPP Metro Pacific. Connects Cebu City and Cordova, Mactan. Expected to handle 40,000 vehicles daily, easing congestion on bridges near Mactan Cebu International Airport. Ground-breaking in March 2017. For completion in 2021.

Artistic rendering of Cebu-Cordova Link • Source: Metro Pacific

5. **Panguil Bay Bridge**, 4 km. ODA/Korea. Cost PhP 5 billion. Connects Misamis Occidental to Lanao del Norte, cutting travel time from 2.5 hours to under ten minutes. This project was studied for 10 years with traffic of over 1 million vehicles per year recorded. Start of construction expected in 2018. Completion in 2021.

Artistic rendering of the Panguil Bay Bridge • Source: DPWH

OTHER MAJOR BRIDGE PROJECTS. The government is planning 11 additional bridges for Luzon, and 9 in the Visayas, and 1 in Mindanao. There are proposals for several other large bridges elsewhere, but only Caticlan-Boracay at this time has a construction proponent.

Currently Metro Manila has 30 bridges. Adding more will allow for smoother flow of vehicles especially during rush hours.

1-10. **Metro Manila bridges**, ten bridges crossing the Pasig and Marikina Rivers are included in the NEDA list of Infrastructure Priority Projects (see Table 7). Feasibility studies have been completed for all. DBM reported in August that 5 of the 10 will be financed by loans from China.

Table 7: Proposed and planned bridges, meters

NO.	BRIDGE	
1	Palanca-Villegas Bridge	438
2	Beata - FY Manalo Bridge	637
3	Blumentritt - Antipolo	364
4	Marikina - Vista Real	415
5	JP Rizal - Lopez Jaena Bridge	549
6	JP Rizal - St. Mary Bridge	1,178
7	Mercury - Evangelista Bridge	527
8	East-West Bank Bridge 1	200
9	East-West Bank Bridge 2	1,178
10	North and South Harbor Bridge	2,026
	Total length of proposed and planned bridges (m)	**7,512**

Source: NEDA

11. **Bataan-Cavite Interlink Bridge** (Cavite-Corregidor-Bataan bridge), 28 km. A proposal has been made for a bridge across the entrance of Manila Bay anchored near Corregidor Island. This would create a new transportation corridor west of Manila.

12. **Mactan-Cebu bridge**, 420 m. DPWH Secretary Villar has stated JICA will undertake a feasibility study for a fourth Mactan-Cebu bridge, which could be completed by 2022.

13. **Caticlan-Boracay bridge**, 2 km. Unsolicited proposal by San Miguel to link Caticlan airport to the tourist island of Boracay. Cost PhP 3 billion. Construction period of two years.

14-21. **Inter-Island Linkage Project**, eight bridges connecting islands to adjacent mainlands and island groups are envisaged to transform the economies of the Visayas and other islands (see Table 8).

Table 8: Inter-Island Linkage Project bridges, Km

NO.	BRIDGE	
14	Camarines-Catanduanes Friendship bridge	11
15	Mindoro-Batangas Super Bridge	15
16	Panay-Guimaras-Negros Link Bridge	19
17	Negros-Cebu Link Bridge	6
18	Luzon-Samar Link Bridge	18
19	Cebu-Bohol Link Bridge	25
20	Leyte-Surigao Link Bridge	23
21	Bohol-Leyte Link Bridge	22
	Total length of the Inter-Island Linkage Network	**139**

Source: DPWH

22. **Davao-Samal bridge**, 4 km. A pre-feasibility study to build a bridge over the Davao Gulf to connect Davao City to Samal Island was completed in 2016. DPWH targets beginning construction in 2019.

ROAD TRANSPORTATION: BUS RAPID TRANSIT

Source: Wikimedia Commons

Although this policy brief focuses on expressways/ bridges and rail system, buses also can move large numbers of passengers efficiently in urban areas. Bus Rapid Transit (BRT) projects have been successful in crowded urban areas globally. One of the earliest systems can be found in Jakarta. It is an efficient, orderly system of transporting commuters by bus, compared to the undisciplined bus services on major thoroughfares of Manila. They require an exclusive lane for buses to flow at frequent, scheduled intervals.[10]

Over the last decade, several BRT projects have been proposed for the Philippines in Metro Manila and Cebu, with support from ADB and the World Bank. The Duterte administration inherited four proposed BRT projects from its predecessor. The DOTr decided not to proceed with the projects in Metro Manila but to go forward with one in Cebu. One private sector BRT project is planned.

1. **Metro Manila Skyway BRT,** San Miguel plans to operate a BRT on the Metro Manila Skyway after Phase 3 is completed.

2. **Metro Manila BRT – Line 1 (Quezon Avenue)**, 12 km. Expected to serve 291,500 customers daily. Suspended by DOTr in 2018.

3. **Metro Manila BRT – Line 2 (Central Corridor EDSA)**, 49 km. Cost PhP 38 billion. Suspended by DOTr in 2018.

4. **Metro Manila BRT – Phase 3 (BGC-NAIA)**, Cost PhP 40 billion. Suspended by DOTr in 2018.

5. **Cebu BRT**, 23 km. Cost PhP 17 billion. World Bank/France ODA loan. After being delayed for several years by local indecision, a second NEDA-ICC approval was given in July 2018 for the project to operate on roads with three lanes. Target completion is 2021. This would be the country's first BRT.

10 *The model BRT system has long been operating in Curitiba, Brazil, which since 1974 has provided city residents with a low-cost, accessible public transport system. Over two million passengers use the system daily. The Curitiba model has been followed in over 150 cities around the globe.*

PUV MODERNIZATION PROGRAM

Model of a modernized jeepney • Source: DOTr Official Facebook Page

The Duterte administration intends to implement a bold reform to modernize the quality of service of 200,000 traditional jeepneys and 4,000 city buses that transport 40 million persons daily. The replacement, the e-jeepney, is a much larger, more spacious vehicle that is air conditioned, low-emission, and much less polluting.

Some 500 of the new vehicles have initially been introduced. With a price tag over PhP 1 million, the PhP 80,000 government subsidy seems too little to support owners who must earn sufficient profit to repay loans from government and private banks.

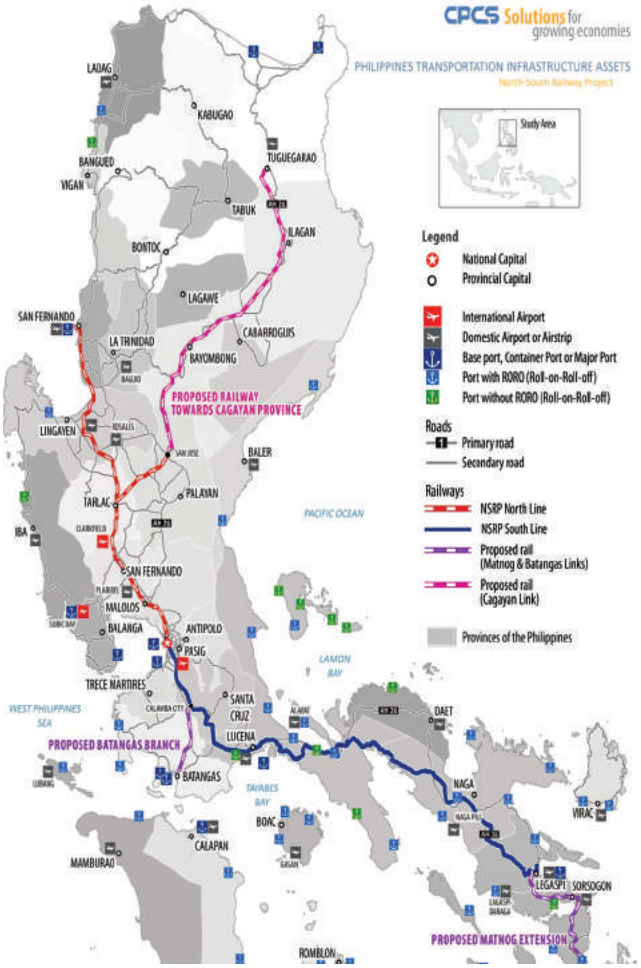
The PUVMP is a worthy program to improve travel for citizens; thus strong efforts should be made for its success.

V. RAIL TRANSPORTATION

As an archipelago, the Philippines is not well-suited for an extensive cross-country rail network, where efficiencies result from long distance movement of passengers and freight. An efficient road network often better move of passengers and freight from multiple points-to-points than by rail.

Movement of passengers and freight by rail is restricted to stations served by the rail line. Time and expense is required to reach stations and to wait for and transfer on and off trains. By contrast, a truck transports goods from a warehouse directly to multiple delivery points and fleets of buses, modernized jeepneys, and FXs can service tens of thousands of points.

High-speed trains are an alternative to air travel in advanced economies, while long-distance freight trains haul containers, cars, fuel, and bulk cargo efficiently over long distances. Examples include the "land bridge" across the US from West Coast ports, trains used to haul mineral ores and coal from mines to ports, and the new China-Europe freight route that exceeds 12,000 kilometers and is faster and shorter than marine transport.[11]



Luzon Rail Map • Source: PPP

11 *For a video of this train see http://www.dw.com/en/first-freight-train-linking-uk-with-china-arrives-in-yiwu/a-38635908*

Rail transport was developed in the Philippines during the Spanish and American colonial periods when an inter-urban network on Luzon and a tranvia network in Manila operated. World War II destroyed this infrastructure, which never fully recovered. Rail networks elsewhere in Southeast Asia survived the war in better condition.

Train service of the Philippine National Railways (PNR) has declined from long distance operations over many hundreds of kilometers north of Manila to San Fernando, La Union and south to Legazpi to a mere 28 kilometer commuter service from Tutuban to Alabang. Although almost entirely unused in recent decades, railway right-of-way of around 1,000 kilometers remains.

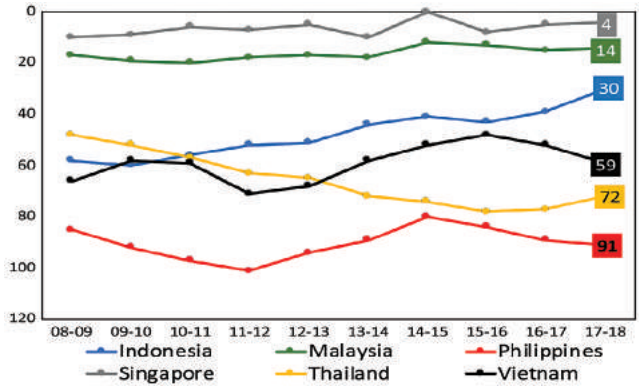
The importance of trains for moving freight in the Philippines is less certain given the short distances potentially involved and the potential low volumes of freight in comparison to costs of construction and of operating and maintaining frequent train services over long distances.

Manila has three light rail lines, which together carry more than one million passengers on weekdays. More urban light rail lines is of critical importance for megacities like Metro Manila. Commuter rail is also an important public transport mode over longer distances in densely populated regions. The JICA Dream Plan endorses commuter rail servicing "suburbs" both north and south of Mega Manila to decongest the capital.

This low level of rail infrastructure places the Philippines lowest among the ASEAN-6 in the quality of rail infrastructure (see Figure 14).

By comparison, Singapore has an excellent commuter rail network. Thailand has four light rail lines in Bangkok, including a subway, and over 4,400 km of inter-urban rail. Vietnam operates a 2,600 km north-south line from Ho Chi Minh City to Hanoi and the PRC border. Indonesia has over 5,000 km on Java and Sumatra and is building its first light rail in Jakarta and a US$ 5 billion PRC bullet train between Jakarta and Bandung. As part of its Belt and Road Initiative, China is supporting construction of a high-speed rail line from Yunan south through Laos, Thailand, and Malaysia to Singapore.[12]

Figure 14: Quality of railroads rankings, ASEAN-6, 2008-2018



Source: World Economic Forum, various years.

Public transportation planning for Mega Manila, with its projected population of 38 million in 2035, includes an extensive network of light rail and commuter rail lines. JICA proposed such a system in its "Dream Plan" approved by the NEDA Board in 2014 and updated recently as part of the forthcoming National Transportation Plan.

Light rail is being supported as a transportation solution in Cebu, with support from the World Bank, in the Integrated Transportation System involving LRT, monorail, P2P buses, and BRT. A commuter line train is also planned in Davao between Digos and Tagum.

Current LRT and PNR lines. There are three existing light rail lines in Metro Manila and one PNR commuter line for a total operating system of 77 kilometers (see Table 9 and Figure 15).

Table 9: Current light rail and commuter line, Km

NO.	RAIL	
1	LRT-1 (Roosevelt to Baclaran)	18
2	LRT - 2 (Recto to Santolan)	14
3	MRT - 3 (North Ave to Taft)	17
4	PNR Commuter	28
	Total current railway network (km)	**77**

Sources: DOTC, LRTA, PNR, PPP

12 *The high cost of this line has become controversial. The new government in Malaysia of Prime Minister Mahatir suspended the planned connection between Kuala Lumpur and Singapore.*

Figure 15: Current Metro Manila rail system

Sources: LRTA, DOTr, PNR

1. **LRT-1 (Roosevelt to Baclaran)**, 18 km, 18 stations. ODA/PPP hybrid. Cost PhP 3 billion. Commenced operations 1984. Planned and built in five years with Belgian financing. First LRT in Southeast Asia. Daily ridership in 2018 of 500,000. Operated by LRTA until private Light Rail Manila Corp. took over operations in 2015 after award of solicited PPP project.

2. **LRT-2 (Recto to Santolan)**, 14 km, 11 stations. ODA Japan. Cost US$ 2 billion. Commenced operations 2003. Average daily ridership in 2017 of 240,000. Operated by LRTA.

LRT 2 • Source: Light Rail Transit Authority

3. **MRT-3 (North Avenue to Taft)**. 17 km, 13 stations. Unsolicited PPP proposal. Commenced operations 1999. Average ridership in 2018 of 350,000. Metrorail Transport Corp. operated until operations management assumed by DOTr.[13]

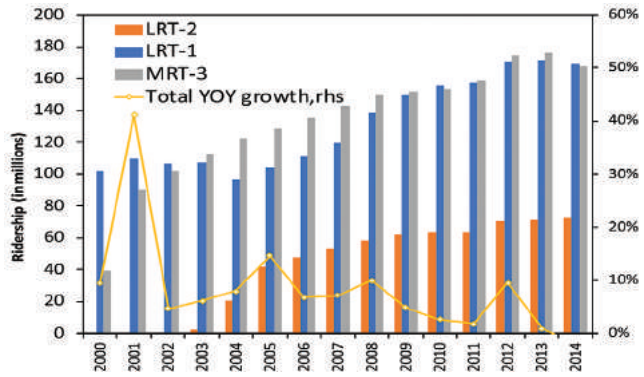
MRT-3 • Source: DOTr

4. **PNR commuter** (Tutuban to Alabang), 28 km. Average ridership 50,000 to 70,000 a day. Operated by PNR. Seven new trains costing US$ 47 million have been ordered from Indonesia for delivery by 2019.

PNR commuter • Source: Philippine National Rail

13 *A PhP 22 billion loan from JICA is being processed to rehabilitate MRT-3, which experienced a crisis of poor maintenance and an order of unusable rolling stock from China.*

Figure 16: Light Rail Ridership (LRT-1, LRT-2 & MRT-3), 2000-2014



Sources: LRTA and Metrostar Express; 2014 Data from DOTC website. Note: MRT-2 and MRT-3 only started operating in April 2003 and December 1999, respectively

Expansion rail projects under construction. As of mid-2018, there are two LRT extension projects and one new line project under construction for a total of 39 km and 26 new stations. One PNR commuter line of 38 km should begin construction in 2019. A common station for three LRT lines is also being built. The project to resume PNR service north of Manila is also starting after almost 30 years of false starts (see Table 10).

Table 10: Rail projects under construction, Km

NO.	RAIL	
1	LRT-1 Cavite extension	12
2	LRT-2 East extension	4
3	MRT-7 (San Jose Del Monte, Bulacan to North Ave)	23
4	MRT-LRT Common Station (LRT-1, MRT-3, MRT-7)	*
5	PNR North Phase 1	38
	Total rail projects under construction (km)	**77**

Sources: LRTA, San Miguel, DOTr

1. **LRT-1 Cavite extension** (Baclaran to Bacoor, Cavite), 12 km, 8 stations. Hybrid solicited PPP with Japan loan for new rolling stock. Cost PhP 65 billion. Project began in 2000 with a JV between LRTA and SNC-Lavalin (dissolved). The World Bank tried without success to get a PPP project implemented. Finally, the Aquino administration completed a PPP contract award to an Ayala-Metro Pacific consortium, which took over O&M on the existing LRT-1 in 2016. Construction delayed three years by ROW acquisition. Target completion 2021.

2. **LRT-2 East extension** (Santolan to Masinag), 4 km, 4 stations. GAA. Cost PhP 10 billion. Construction was divided by DOTr into four parcels. Partial construction completed; bidding for additional works ongoing.

3. **MRT-7** (San Jose Del Monte, Bulacan to North Avenue), 23 km, 14 stations. Cost PhP 78 billion. Unsolicited PPP proposal submitted 2001, ground-breaking 2016. Current developer is San Miguel. Initial planned ridership 400,000 daily.

4. **MRT-LRT Common Station**, (serving LRT-1, MRT-3, and MRT-7) GAA. Cost PhP 3 billion. To serve 1,500,000 commuters daily. Construction started mid-June 2018.

Artistic rendering of the MRT-LRT Common Station • Source: DOTr

5. **PNR North Phase 1**, (Tutuban to Malolos), 38 km, 10 stations. ODA Japan. Cost PhP 105 billion. Target completion 2021.

The DOTr targets expanding the current 77 km of operating rail to 1,900 km by 2022. Currently, 77 additional kilometers are under construction (see Table 10). To meet this target in the next four years, the pace of implementation has to pick up greatly. Projects totalling another 1,746 km would need to be completed by 2022 (see Tables 11 and 12). In the decade preceding 2018, a mere 5 km of additional rail was completed.

Rail Projects: Medium Term

Rail transportation is a very important component of the "Build, Build, Build" program. Over PhP 1 trillion in light rail and intercity rail lines is being proposed. The following 9 projects are scheduled to begin construction in the medium term:

Table 11: Rail Projects under construction soon, Km

NO.	RAIL	
1	PNR North Phase 2	69
2	Subic-Clark Railway	71
3	LRT-2 West Extension	3
4	Metro Manila Subway	30
5	Monorail (Makati - BGC Skytrain)	2
6	PNR South Commuter	72
7	PNR Bicol	581
8	Cebu Light Rail	116
9	Mindanao Railway Phase 1	102
	Total rail projects under construction soon (km)	**1,046**

Sources: DOTr, PPP, NEDA

1. **PNR North Phase 2** (Malolos to New Clark City), 69 km, 7 stations. ODA Japan/ADB. Cost PhP 211 billion. Target completion 2022
2. **Subic-Clark Railway**, 71 km, parallel to SCTEX. ODA China. Cost PhP 50 billion. Approved by NEDA board April 2018.
3. **LRT-2 West Extension (Recto to Pier 4)**, 3 km. GAA. Cost PhP 10 billion. Operational by 2022.
4. **Manila Metro Subway** (Mindanao Avenue to NAIA), 30 km, 14 stations. (North Ave, Mindanao Avenue and Tandang Sora stations to open by 2022). ODA Japan. Cost PhP 357 billion. Groundbreaking by end 2018. Partial operations in 2022.
5. **Monorail** (skytrain) (EDSA Guadalupe Station, Makati to Uptown BGC), 2 km. Unsolicited proposal by Alliance Global. Cost PhP 3.5 billion. Approved by DOTr. Capacity 60,000-100,000 passengers daily.
6. **PNR South Commuter** (Tutuban to Calamba), 72 km. ODA Japan/ADB. Cost PhP 124 billion. Completion target 2022.
7. **PNR Bicol** (Manila to Batangas and Sorsogon), 581 km, 9 stations. ODA China. Cost PhP 175 billion Partial operations target 2022.
8. **Cebu light rail**, 116 km, 5 lines. Unsolicited PPP proposal from a Filipino/Singapore/Chinese consortium to build LRT lines with a subway in Cebu City and above ground from Talisay to Carcar, from Mandaue to Danao City, and from Mandaue to the MCIA. PhP 150 billion.
9. **Mindanao Railway Phase 1** (Tagum-Davao-Digos), 102 km double track, 8 stations. GAA. Cost PhP 35 billion. NEDA approved June 2017. Targeted start of construction December 2018 and completion 2022.

Rail Projects: Planned

Over 1,000 additional kilometers of rail projects are currently planned.

Table 12: Rail projects planned, Km

NO.	RAIL	
1	PNR North long-haul northwest	159
2	PNR North long-haul northeast	309
3	LRT-4 (Sta. Mesa - Taytay)	11
4	LRT-6 (Niog to Dasmarinas Cavite)	19
5	Makati Mass Transit System	11
6	Mactan Monorail	-
7	Mindanao Railway 2	208
8	Mindanao Railway 3	285
9	Mindanao Railway 4	234
	Total planned railway projects	**1,236**

Sources: DOTr, PPP, NEDA, PNR.

1. **PNR North Long-haul northwest route** (Clark-Tarlac-La Union), 159 km.
2. **PNR North Long-haul northeast route** (Tarlac-San Jose-Tuguegarao), 309 km.
3. **LRT-4** (Sta. Mesa to Taytay, Rizal), 11 km, PPP. Cost PhP 43 billion.
4. **LRT-6** (Niog to Dasmarnias, Cavite), 19 km, PPP. Cost PhP 65 billion.

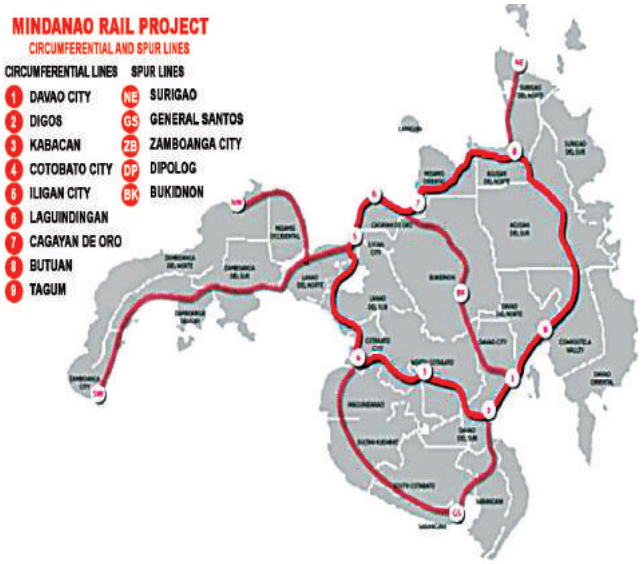
5. **Makati Mass Transit System**, 11 km, subway with 8-10 stations. Unsolicited project awarded Original Proponent Status by Makati City. Proponent IRC Properties joined by China Harbour Engineering and other PRC companies with rail experience.

6. **Mactan Monorail**. Will connect Mactan Cebu International Airport with resorts on Mactan Island.

7. **Mindanao Railway 2** (Tagum-Butuan), 208 km.

8. **Mindanao Railway 3** (Butuan-Iligan), 285 km.

9. **Mindanao Railway 4** (Iligan-Digos), 234 km.



Mindanao Rail Project Map • Source: DOTr

VI. RECOMMENDATIONS

1. **Issue and implement the comprehensive National Transport System Master Plan**. The NEDA Board in September 2017 approved preparing a plan to carry out the vision of "a safe, secure, reliable, efficient, integrated intermodal, affordable, cost-effective, environmentally sustainable, and people-oriented" national transport system. This multi-year and multi-modal plan should be completed and released soon and implemented by successive administrations.

2. **Observe continuity of projects and policies between administrations**. Completion of major projects transcends administrations. Project cancellations should be rare and only for bad projects in early stages.

3. **Maintain high levels of public and private sector investment in needed infrastructure**. Whether under "Build, Build, Build" or another name, national government should continue to spend above 5% of GDP on infrastructure. Much of this annually-increasing sum should support modernization of land transportation. Policies should continue to enable the private sector to partner in building major transportation projects, thus utilizing private sector funds to supplement public sector investment.

4. **Achieve intermodality in planning and implementation**. Smooth interconnection of different means of transport of goods and people should be a priority. The DOTr approach to an Integrated Transport System for Cebu is one example, involving surface light rail, subway, P2P buses, BRT, monorail, and expressways. Another is the Common Station, where LRT-1, MRT-3, and MRT-7 intersect with EDSA.

5. **Be ambitious in land transportation modernization**. Adopt and implement ambitious targets for expanding/upgrading road networks to meet increased traffic volume. Expressways should be built to levels

"Our doors are open to any developer with viable proposals. After all, now is the golden age of infrastructure as we find more routes that pave the way to progress of our nation."

- Mark Villar, Secretary of Public Works and Highways
On the approval of the original proponent for Cavite-Tagaytay-Batangas Expressway.
July 27, 2018

comparable to Malaysia and Indonesia (see Figure 12). By 2030 the country should have more than 2,000 kilometers of expressway/skyways. National roads should be upgraded to the standard of Malaysia. Unpaved roads should be paved. Roads that serve ports, tourist destinations, and farm-to-market roads should be prioritized. More bridges should be built in urban and rural areas.

6. **Advance Philippine country rank to top third in WEF "quality of road" ranking**. From last among ASEAN-6 and bottom third of 137 countries rated by the World Economic Forum (WEF), the Philippines should target a comparable rating with Indonesia, Malaysia, and Thailand and reach the top third in global rankings (see Figure 9).

7. **Be ambitious in rail transport modernization, especially in major cities**. Adopt and implement ambitious targets for expanding urban rail networks with private sector operations. Priority should be Metro Manila and Cebu, where congestion is most severe. Each president should start two or more new lines until a large network is operational. Luzon has an unused rail network of over 1,000 kilometers. Restoring and extending these services will involve borrowing large sums and appropriating large subsidies to operate and maintain. Tradeoffs and careful cost/benefit comparisons to investing in expressways, which can be funded by the private sector, should be part of decision-making. The same caution should apply to decisions to build and operate a large Mindanao rail network.

8. **Advance Philippine country rank to top half in WEF "quality of rail" ranking**. From last among ASEAN-6 and bottom third of 137 countries rated by the WEF, the Philippines should seek a comparable rating with Indonesia, Malaysia, and Thailand and reach the top half in global rankings (see Figure 14).

9. **Accelerate project implementation**. It is extremely important to complete major infrastructure projects faster in order to avoid further congestion. Much less time than two decades is sufficient to plan, design, approve, finance, to acquire ROW, and build a new light rail line or expressway.[14]

10. **Continue to improve ROW acquisition**. Although the law was changed in 2016 to strengthen government acquisition of needed right of way, this challenge continues to delay major projects. Agencies need qualified staff and funding to acquire ROW faster.

11. **Assure project quality and efficiency**. The quality of projects is more important than the quantity of projects. The NEDA planning goal of "safe, secure, reliable, efficient, integrated intermodal, affordable, cost-effective, environmentally sustainable, and people-oriented" projects should be the paramount concern. The efficiency of the project should be considered. In evaluating the expensive Interisland Linkage Project, spending a smaller amount to upscale Ro-Ro networks should be considered as an alternative mode that can be implemented sooner and as a "bridge" to the bridges.[15]

12. **Restructure regulatory agencies and provide adequate resources**. There should be a single regulatory authority for rail to oversee the Philippine National Railways, the Light Rail Transit Authority, the Mindanao Railway, the new Philippine Railway Institute, and PPP projects. Functions of regulating/planning and operating/training should be separated. The Toll Regulatory Board needs increased resources to execute its mandate

14 *Both LRT-1 south extension and MRT-7 are taking about twenty years and 3 to 4 presidential administrations from initial planning to start of operations.*

15 *For many decades, only ferries connected Penang Island with Butterworth on the mainland. Today, two bridges give vehicles an alternative, but the ferries still operate every 20 minutes for cars and pedestrians.*

more efficiently.[16] Regulation and operations should be separated into different agencies.

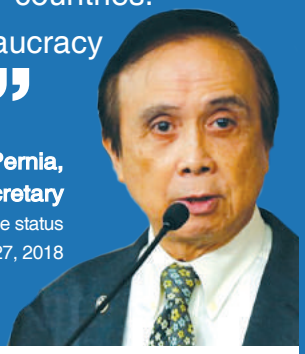
13. **Open up all aspects of land transportation to foreign firms**. Several Philippine laws restrict foreign participation in procurement of goods and services and construction of public works not funded by ODA or a BOT turnkey project. In view of the scale of "Build, Build, Build", qualified foreign firms should be allowed to participate in bidding on construction as well as operation of public works and services. They can provide improved technology and skills that may be in short supply or unavailable domestically.

14. **Be prepared to subsidize rail**. Around the world, governments subsidize most rail systems from construction through operations and maintenance. Government financial support for light rail in highly-urbanized centers is justified by the social benefits rail provides. However, social benefits for the full length of the proposed Luzon and Mindanao rail systems may not be very large, when inter-provincial long distance bus travel on better roads costs government much less than new rail systems. Subsidies for underused long distance rail will be very many times more than those for heavily urban lines than those for heavily used urban lines.[17]

15. **Remember maintenance**. Unless maintained, assets deteriorate. Poor government maintenance of MRT-3 trains resulted in enormous inconvenience for commuters. With abolition of the Road Board, a new source of road maintenance funding is needed.

16. **Conduct a robust PPP and privatization program**. Use the full range of PPP policy instruments, including solicited and unsolicited as well as hybrid (combines GAA/ODA with private sector). There are good examples of each: the new Mactan Cebu International Airport terminal (solicited), the new Clark International Airport terminal (GAA/solicited O&M), NAIA Expressway Phase 2 (solicited), LRT-1 (solicited privatization) with south extension (ODA/solicited), and NLEX-SLEX Connector (unsolicited).

> "There is a lot of red tape on the side of ODA countries, they are not moving as fast as we expected. We cannot define what's taking so long in ODA countries. They have their own bureaucracy in the approval process."
>
> **- Ernesto Pernia, Socoeconomic Planning Secretary**
> During the #AskNEDA Media Briefing on the status of the administration's 75 IFP on June 27, 2018



17. **Reduce political interference in infrastructure programs**. Congressional oversight of laws and implementation is important but, when overdone, can adversely effect implementation. Approvals should be left to executive branch regulatory agencies and not require congressional franchises. Projects of "national significance" should be insulated from LGU interference (while community consultations are essential for understanding and support).

18. **Enact other reform legislation**. (1) A high-priority bill amending the Public Service Act to clarify that foreign ownership of telecommunication and transportation are allowed is near approval in the 17th Congress; (2) a bill updating the BOT Act that almost passed in the 16th Congress is overdue; (3) the National Transportation Safety Board Act has reached the Senate plenary; (4) Senator Gatchalian has authored three bills to amend laws regarding construction licenses and bidding for public sector procurement contracts to allow foreign participation.

16 *The 2017 budget for the TRB was PhP 27 million.*

17 *The PNR line north of Manila closed after NLEX was built as travelers abandoned the train and drove instead.*

VII. CONCLUSION

Quality roads and rail are essential for a high middle income economy. With steady growth in personal automobile ownership, the Philippines can expect to reach levels of annual new car sales experienced in Indonesia and Thailand, approaching 1 million a year.

"Carmageddon" is not an option. Better highways, bridges, BRT, and rail service are the only solution to worsening congestion. Without remedy, the cost of traffic congestion in the NCR will reach PhP 6 billion by 2030, with a similar negative impact in most large cities.

The country's current total expressway network of 385 km is inadequate and should be expanded to more than 2,000 km. More skyways are critical for in Metro Manila and Cebu. All other roads need constant upgrading with continued high budget levels for DPWH.

More urban bridges are needed to allow traffic to efficiently cross water barriers. The proposed inter-island bridge network is ambitious, expensive, needs feasibility studies, and will likely take several administrations to complete. In the meantime, the Ro-Ro network should be improved with larger ships and better ports.

More light rail and commuter train lines are needed, primarily in the Mega Manila region. Rail lines should service major gateway airports.[18] If long delays due to bureaucratic approvals and ROW acquisition are compressed, needed projects can be completed faster.

Modern roads cannot avoid "carmageddon" without modern rail lines in the largest cities to move millions of commuters daily. Commuter rail should extend into adjacent provinces. The high long-term expense for the public sector of operating and maintaining large long distance rail networks on Luzon and Mindanao should be fully studied.

Administrations before the current one completed new expressways and rail lines much too slowly, bequeathing a ground transportation crisis in Manila, Cebu, and other major cities. The Duterte Administration has raised expectations that it will do much more. Many ambitious projects are being planned, by both the public and private sectors. They must move ahead quickly.

"Build, Build, Build" - and more.

Artistic rendering of a bridge, an expressway, and a commuter rail. • Sources: DOTr, DPWH

18 *San Miguel president and COO Ramon Ang was reported in the Philippine Star on August 31 saying SMC would build an express MRT loop to connect the future Bulacan Airport to EDSA. https://www.philstar.com/business/2018/08/31/1847264/smc-plans-mrt-loop-link-bulacan-airport.*

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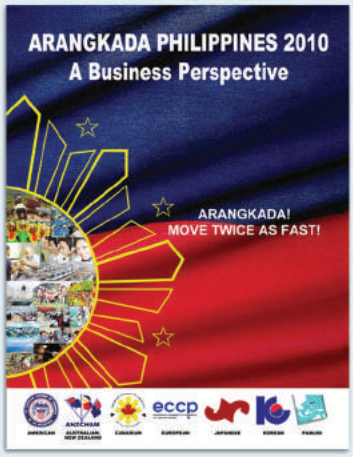

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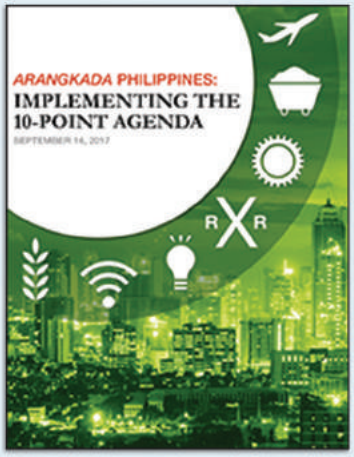

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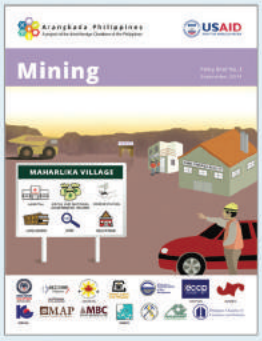

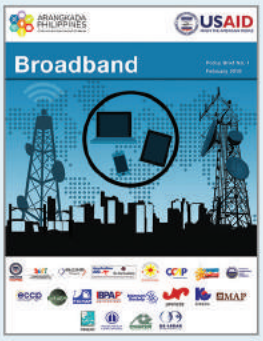

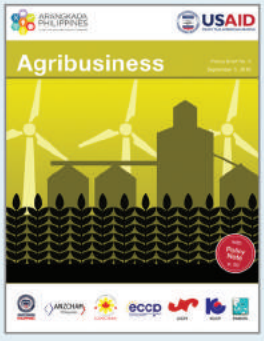

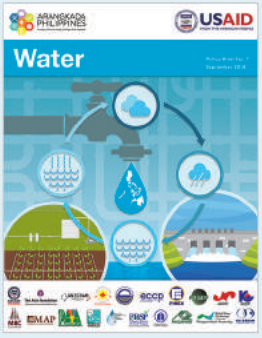

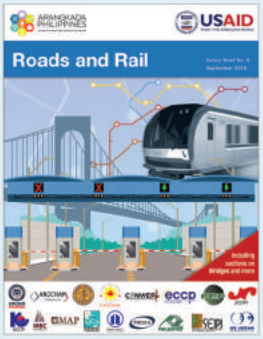

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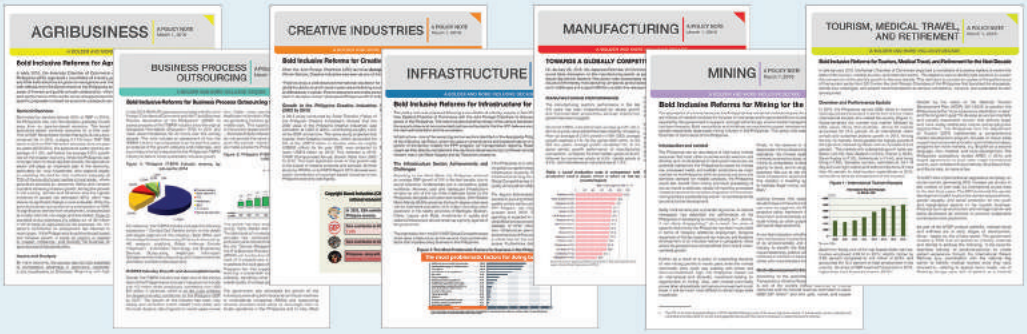

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