



Enabling Smart and Sustainable Cities

TEAM PISHDA

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PRESENTATION OUTLINE

1. Introduction
2. ASEAN Rapid Urbanization
3. Registered Motor Vehicles and Traffic Problems
4. Plastic Waste Problem
5. Adapt the ASEAN Sustainable Urban Strategy
6. Recommendations
7. References



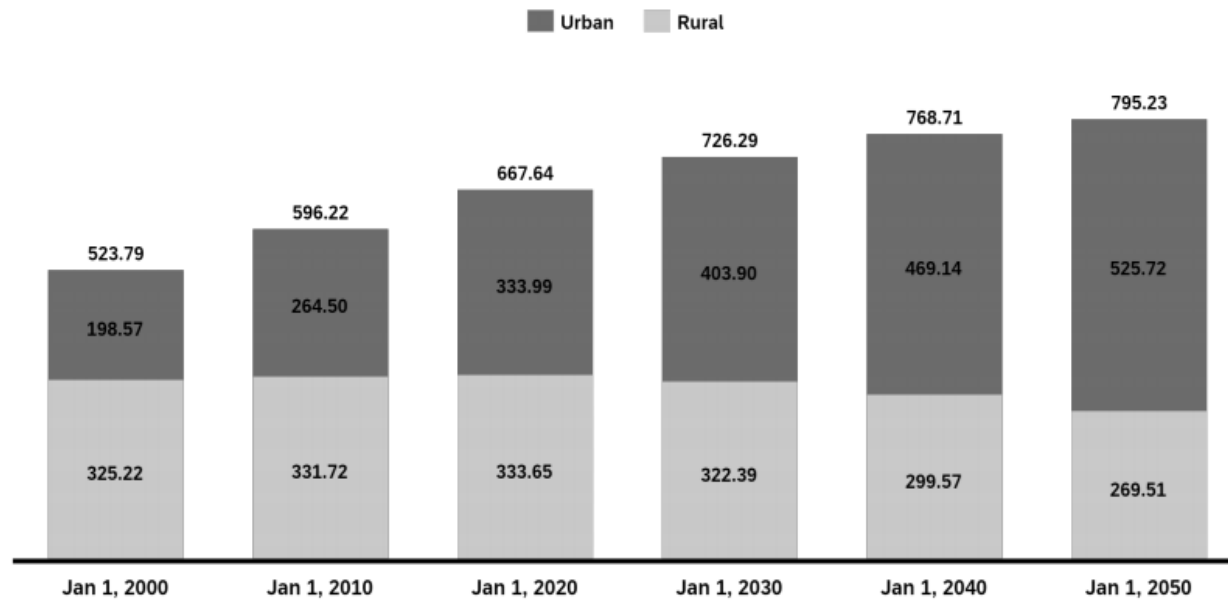
Main SDG11 Targets:

- By 2030, ensure access for all to adequate, safe and affordable housing and basic services and upgrade slums
- By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons
- By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management

OBJECTIVES

1. Optimize land areas for sustainable spaces
2. Reduce adverse per capita environmental impact of cities

Rural and Urban Population of ASEAN until 2050 per Million



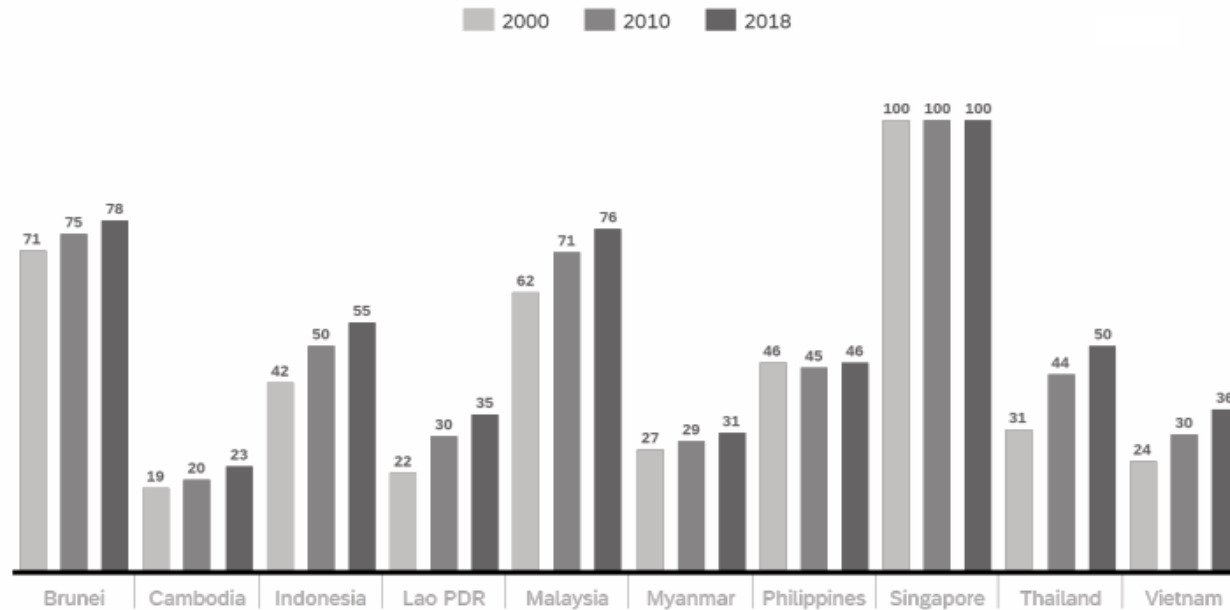
ASEAN IS A HUB FOR RAPID URBANIZATION

It is predicted that **500 million people** will be living in urban areas by 2050

ASEAN countries experience overpopulation due to rapid urbanization

ASEAN IS A HUB FOR RAPID URBANIZATION

Slum Population Across ASEAN Countries



Urbanization from 2000-2018 shows
increase in slum areas

Most Registered Vehicles

Top 5 Registered Vehicles per 1000 Population

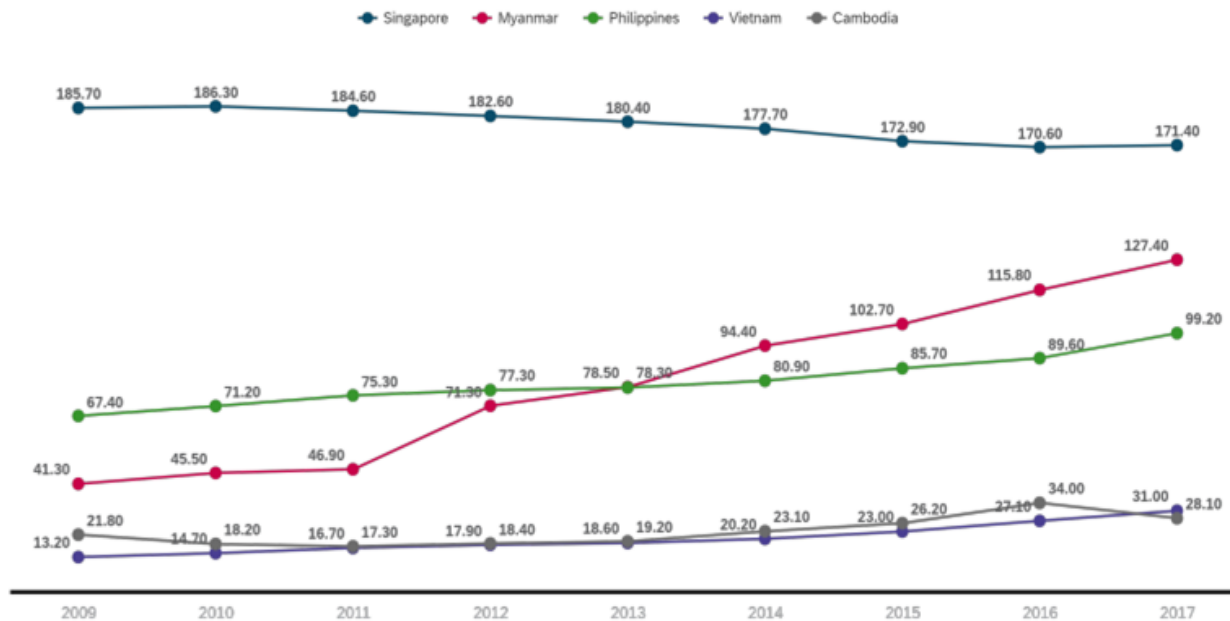


REGISTERED MOTOR VEHICLES

More than **3,661 vehicles** in South East Asia have been registered in 2017 per 1000 population

Least Registered Vehicles

Bottom 5 Registered Vehicles per 1000 Population

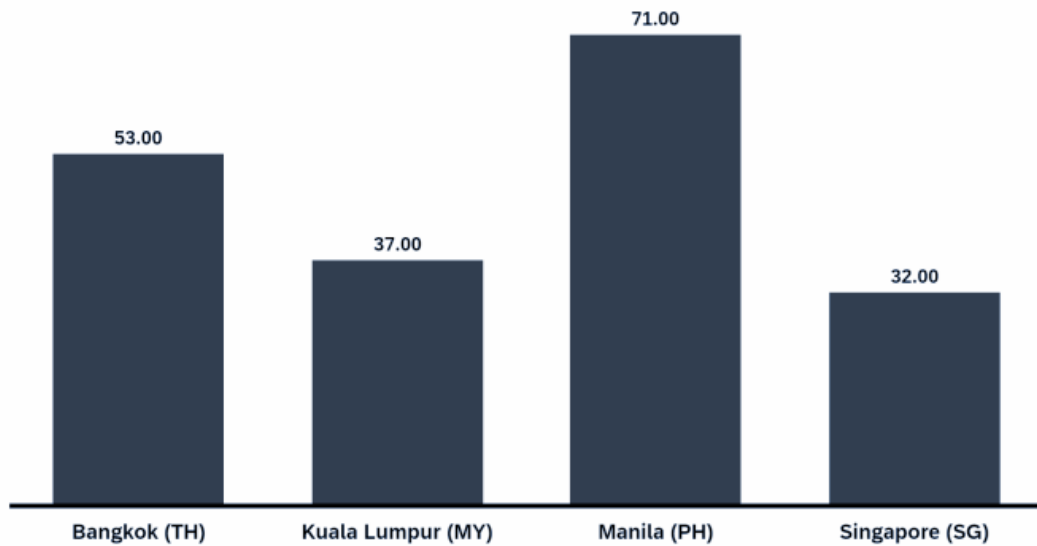


REGISTERED MOTOR VEHICLES

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Congestion Levels per Capital City

Traffic Congestion Level (%) per Capital City (2019)



4/10 ASEAN countries
are among the world's worst
congestion levels

TRAFFIC PROBLEMS

Time Spent in Traffic



City	Time Spent in Traffic (days per year)
Bangkok	24
Jakarta	22
Manila	16

Average Car Volume Daily



City	Average Car Volume Daily (million)
Bangkok	5
Jakarta	9.9
Manila	2.7

Average Speed



City	Average Speed (kph)
Bangkok	23.5
Jakarta	23.14
Manila	16.14

CITY:



Bangkok



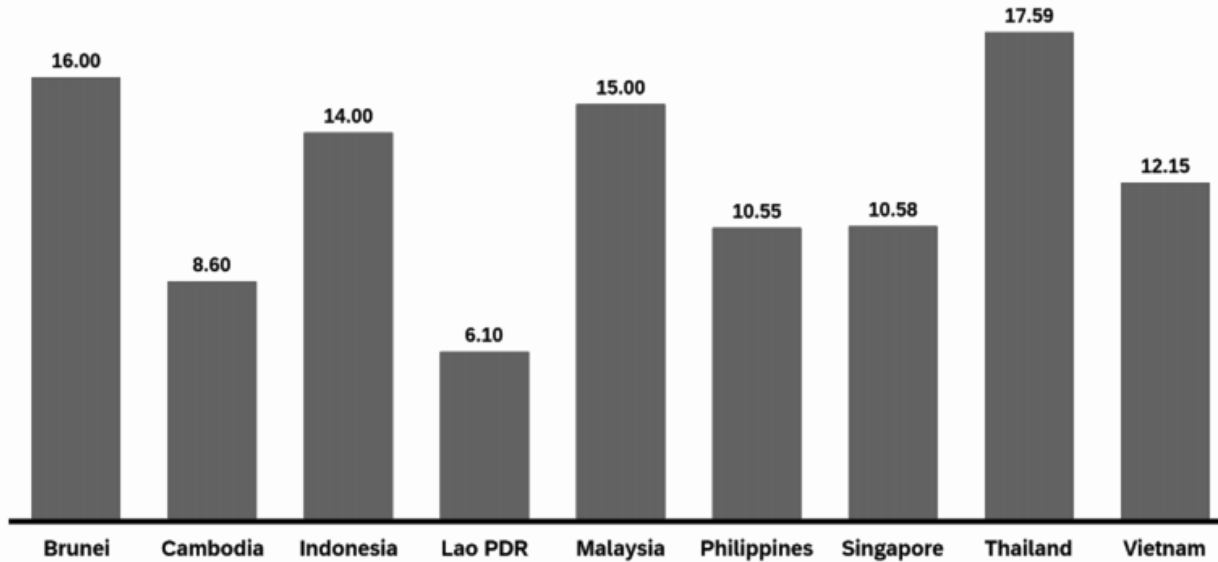
Jakarta



Manila

PLASTIC WASTE PROBLEM

Plastic Waste Produced per Country



ASEAN countries produce an average of **12kg of plastic waste** per country a day

The strategy employs a framework of sustainable urbanisation centred around 6 areas and 18 sub-areas



SOURCE: Centre for Liveable Cities (CLC), Team analysis

ADAPT THE ASEAN SUSTAINABLE URBANIZATION STRATEGY

Based from the data visualizations, the area of recommendations expound on the following sub areas also included in the sustainable urbanization strategy:

- upgrade slums
- better transportation system
- waste management

Apply topological analysis on urban design, granting capabilities in upgrading slums and efficient roads



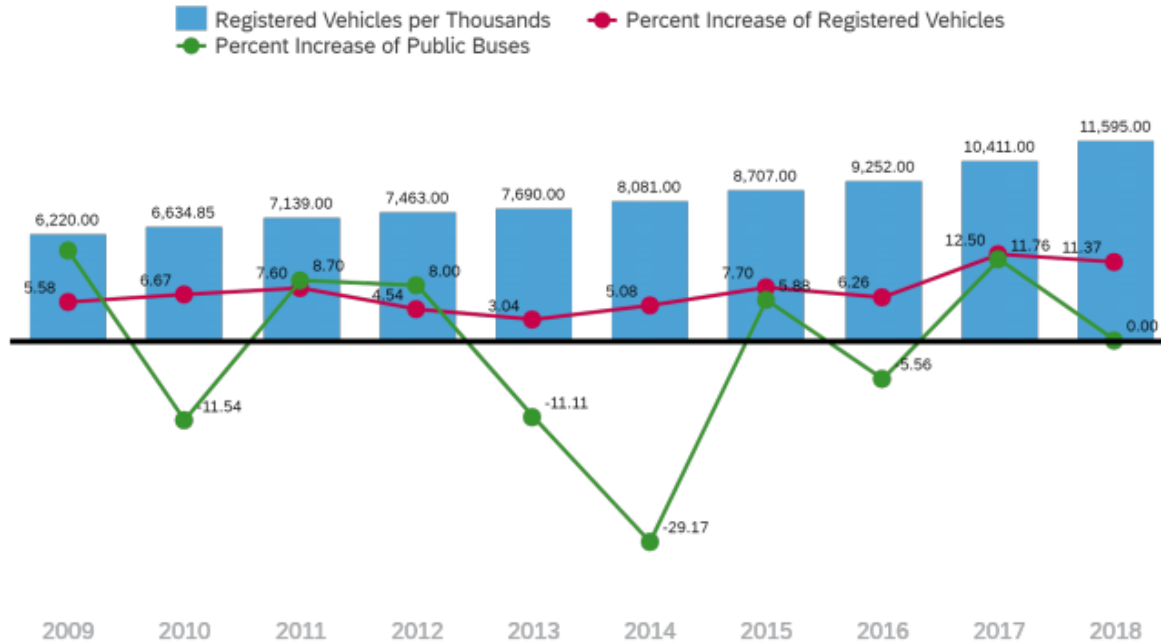
"By 2030, ensure access for all to adequate, safe and affordable housing and basic services and upgrade slums" - ASEAN

RECOMMENDATION 1

How does Topology Work?

- Create topological diagram of slum/urban area
- Identify areas in slums/urban areas inaccessible to roads
- Generate cost effective and optimal roads in those areas (partnering with respective agencies that handle public works and highways)
- Connect roads to outside services (hospitals, schools, food supply)

Registered Vehicles and Percent Increase in the Philippines



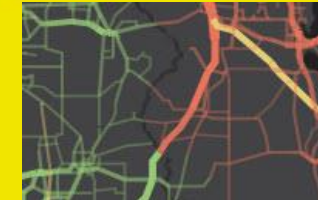
In congested cities like Philippines,
public buses have decreased by 26.9%

"By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons." - ASEAN

RECOMMENDATION 2

Flexible public transportation and provide more bike lanes

Identify Most Congested Areas



- Flexible transportation and provide more bike lanes
- Identify Most Congested Areas (topology)
- Provide point to point routes with flexible transportation features in congested areas
- Provide Bike Lanes in routes where public transportation is not accessible



"By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management." - ASEAN

RECOMMENDATION 3

Invest in smart solid waste management systems

Use of Internet of Things (IoT) and analytics in monitoring waste bins



Waste is collected when bins are detected full by sensors



Analytics show waste collectors shortest distance and most areas with full bins



Analytics from sensors of the bins in detecting type of wastes help in future decisions



References

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