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**Track: Innovations in Energy Efficiency**

**Session: High Impact Energy Efficiency Policies for NDCs**

# **Role of Energy Efficiency in the Transport Sector NDCs of Sri Lanka**

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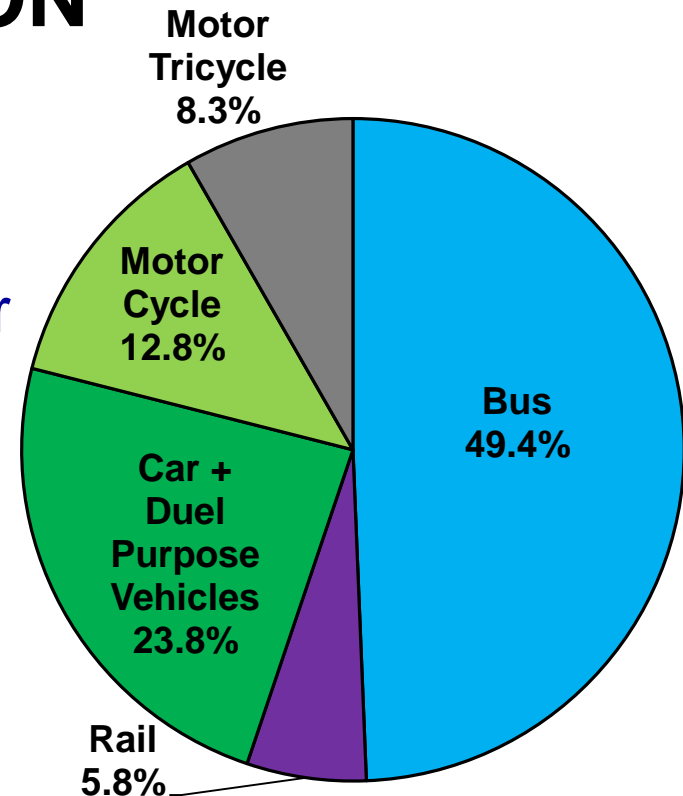
**University of Moratuwa**

**06<sup>th</sup> June 2017**

# INTRODUCTION

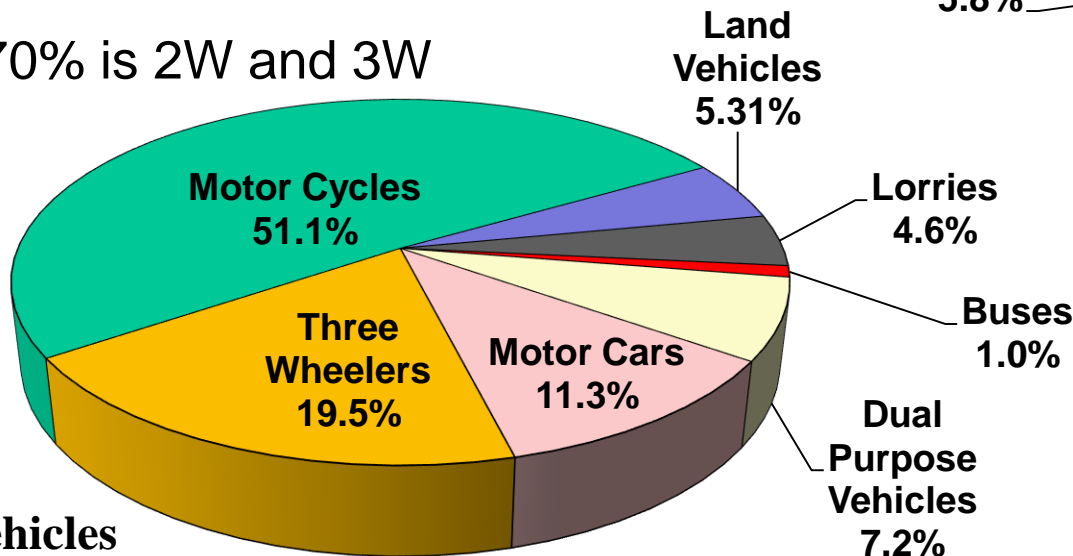
- Transport Sector in Sri Lanka
  - Dominated by road transport
  - 140 billion passenger-km per year
    - ✓ 94.0% road; 6.0% rail
  - Contribute to 40% of the GHG emissions

- Road Transport:
  - Active fleet: 5.0 Million
    - ✓ 70% is 2W and 3W



**Modal share  
(% of passenger km)**

**Public: 55.2%**  
**Private: 44.8%**

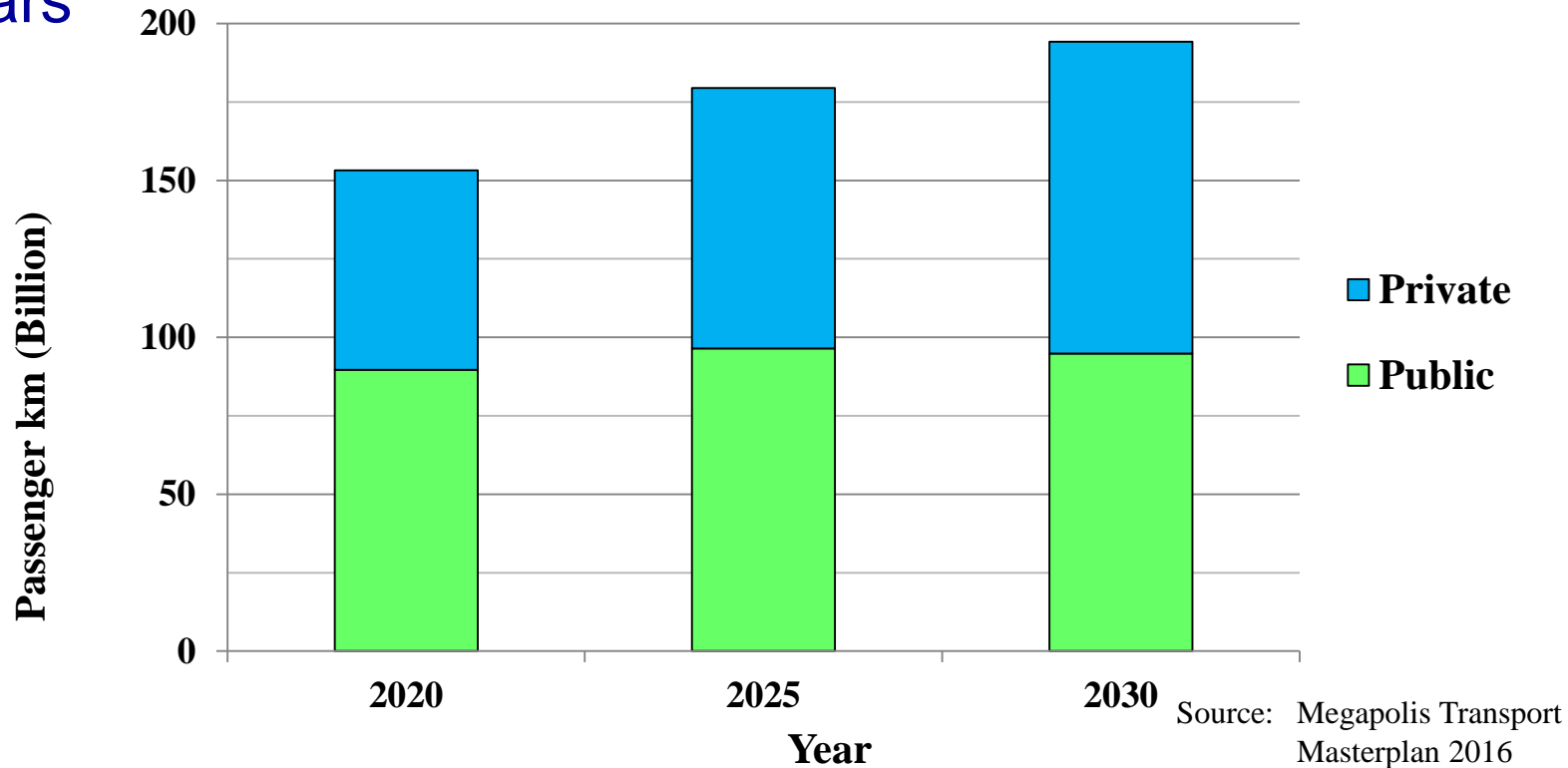


**% No. of Vehicles**

# INTRODUCTION

## ■ Demand Growth

- About 2.5% annual growth is expected during next 15 years



- Contribution from public transport is predicted to decrease continuously from 55% to below 50% by 2030
  - ✓ This will have adverse impact on overall energy efficiency and emissions in the transport sector.

# TRANSPORT SECTOR NDCs OF SRI LANKA

## ■ An Overview

### □ Intended Nationally Determined Contributions (INDCs)

- ✓ As with other member countries of UNFCCC, Sri Lanka has consented to publishing its INDCs as a strategic document to contribute to the mitigate the rise of global temperature.
- ✓ First version was submitted in October 2015, followed by an improved version in April 2015.
- ✓ Subsequently, NDCs of Sri Lanka were prepared covering 14 sectors based on the Readiness Plan 2017-2019 for the Implementation of INDCs, and submitted in September 2016.
- ✓ Transport is one of the key sectors.

### □ NDCs in the Transport Sector

- ✓ A target of reducing GHG emissions by 10% against business-as-usual (BAU) scenario.
- ✓ There are 11 categories of activities proposed, which are formulated under 8 strategic policy elements.
- ✓ Covers all modes of transport: Road, Water/Sea and Air.

# TRANSPORT SECTOR NDCs OF SRI LANKA

## ■ Role of Energy Efficiency

### □ Key Strategies

- ✓ System-efficiency improvements,
- ✓ Trip-efficiency improvements,
- ✓ Vehicle-efficiency improvements.

### □ Key Interventions

- ✓ Policy, regulatory, institutional frameworks and information management,
- ✓ Public/mass transport (Bus, Rail and Rapid Transit Systems),
- ✓ Clean and Efficient Vehicle Technologies: Electric/Hybrid vehicles; railway electrification,
- ✓ Vehicle emission standards / Fuel economy standards,
- ✓ Non-motorized transport systems,
- ✓ Inland water transport systems,
- ✓ Transport demand management (use of ICT; avoidance/reduction)

# ENERGY EFFICIENCY OF TRANSPORT

## ■ Key Indicators

### □ Expressed by fuel economy

- ✓ Average fuel volume or energy per unit distance (l/100 km, MJ/km)
- ✓ Average fuel volume or energy input per unit passenger-distance (l/100 passenger-km, MJ/passenger-km)
- ✓ Could represent a certain class/category of vehicles/fleet or whole fleet/transport sector.

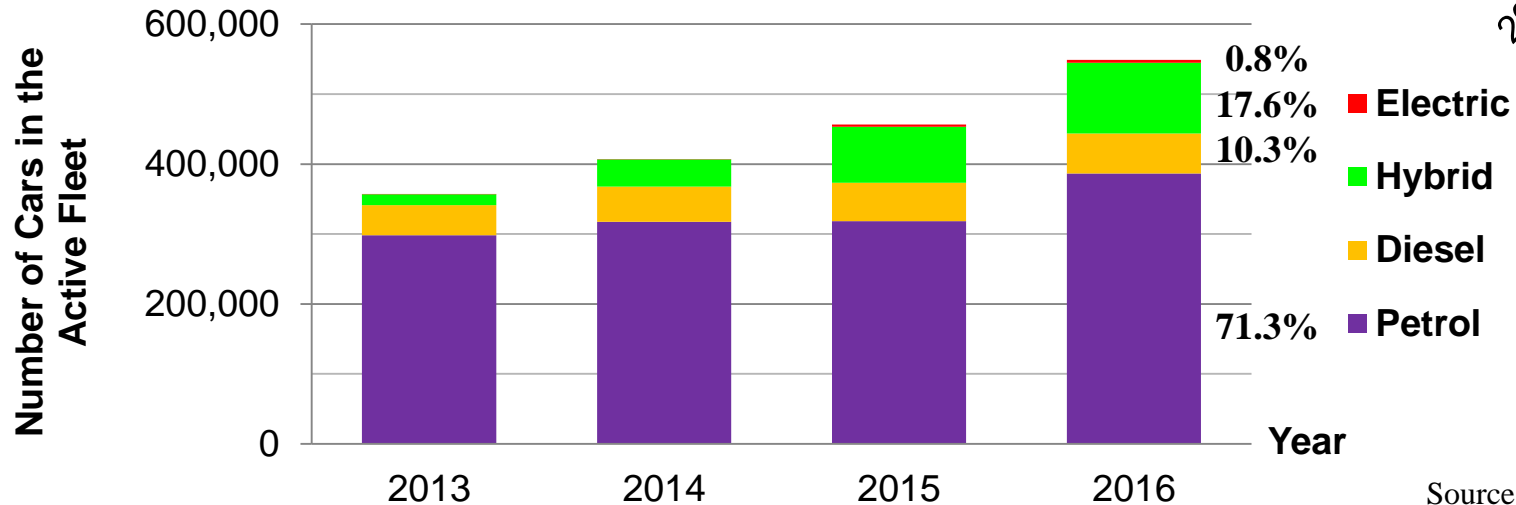
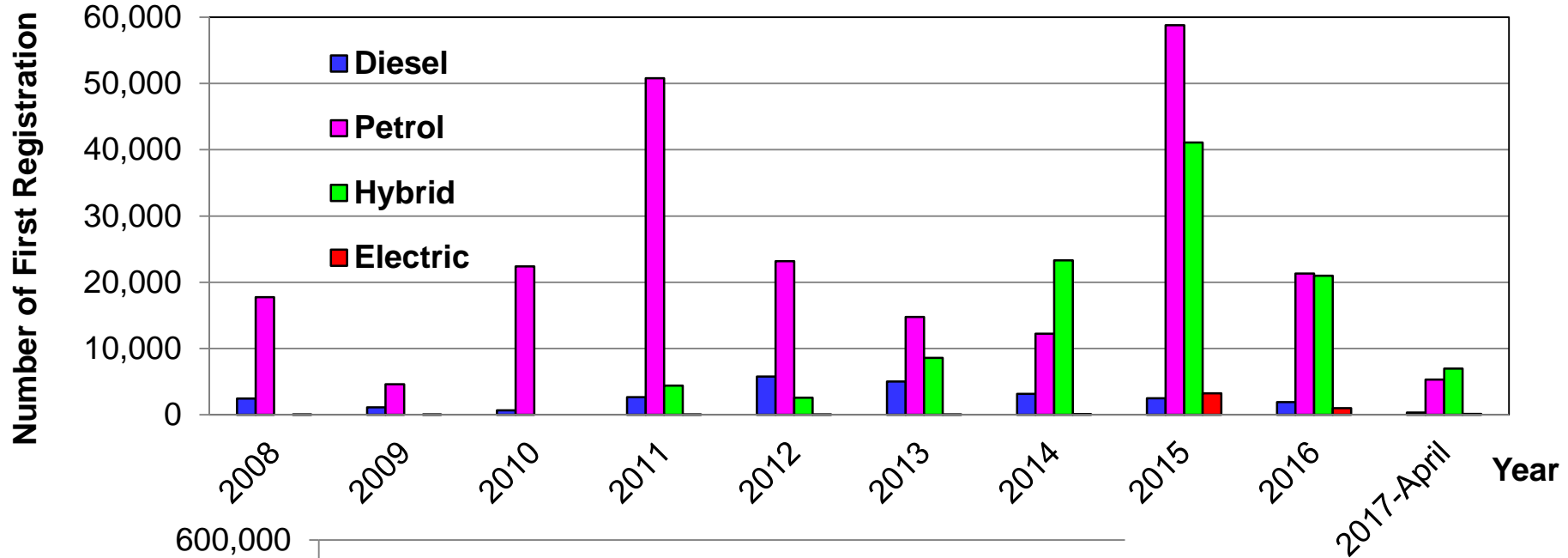
### □ GHG Emissions

- ✓ Based on the fuel economy, GHG emissions could also be estimated.
- ✓ GHG intensity is expressed in mass of CO<sub>2</sub> per unit distance or per unit passenger-distance (g CO<sub>2</sub>/km, g CO<sub>2</sub>/passenger-km)
- ✓ Average fuel volume or energy input per unit passenger-distance (l/100 passenger-km, MJ/passenger-km)
- ✓ Simple relations are available for converting fuel economy to GHG emissions, which depend on the type of fuel (diesel / petrol).

# ENERGY EFFICIENCY OF TRANSPORT

## ■ Impacts of Hybrid Vehicles

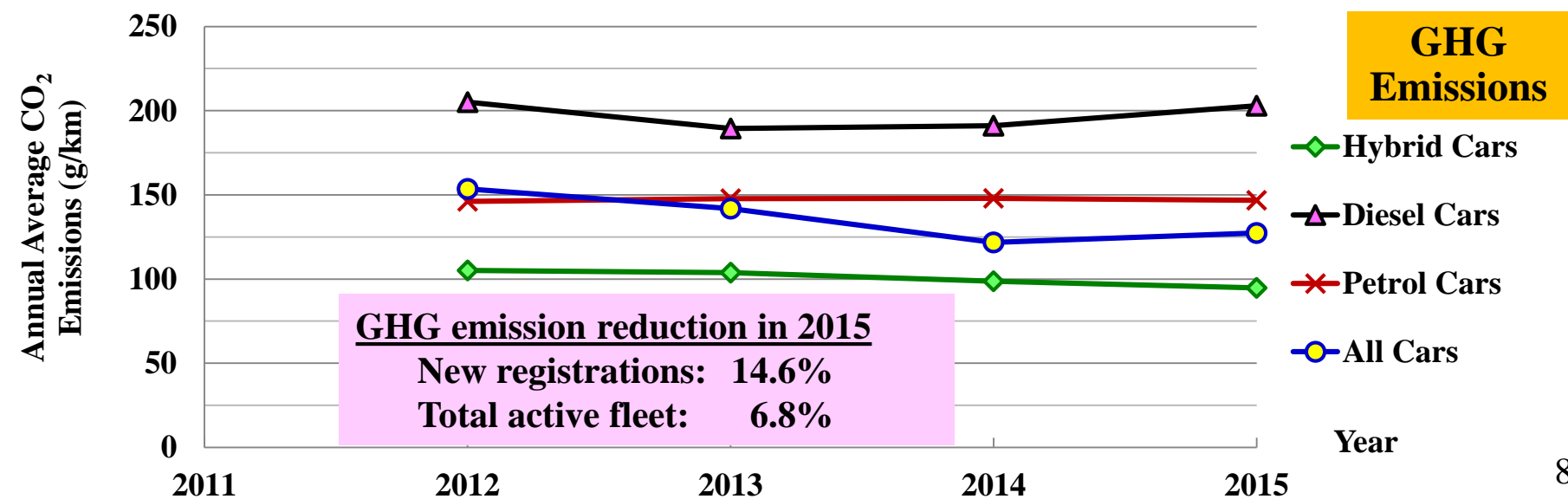
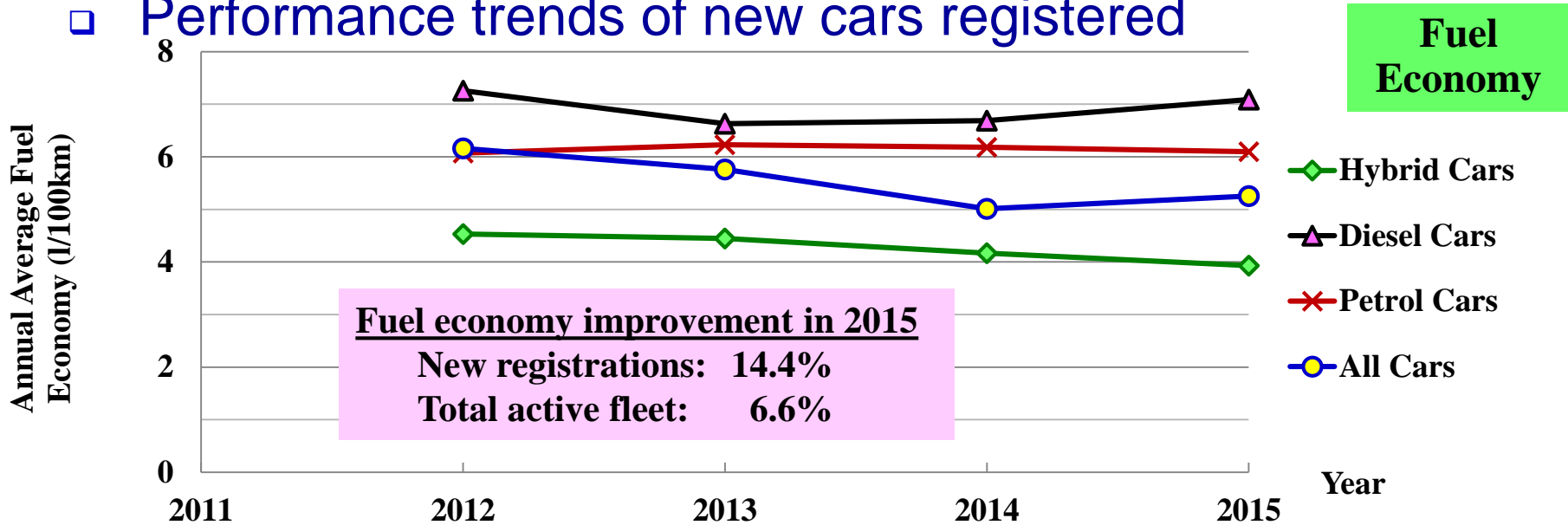
### □ Emergence of hybrid/electric cars in Sri Lanka



# ENERGY EFFICIENCY OF TRANSPORT

## ■ Impacts of Hybrid Vehicles

### □ Performance trends of new cars registered

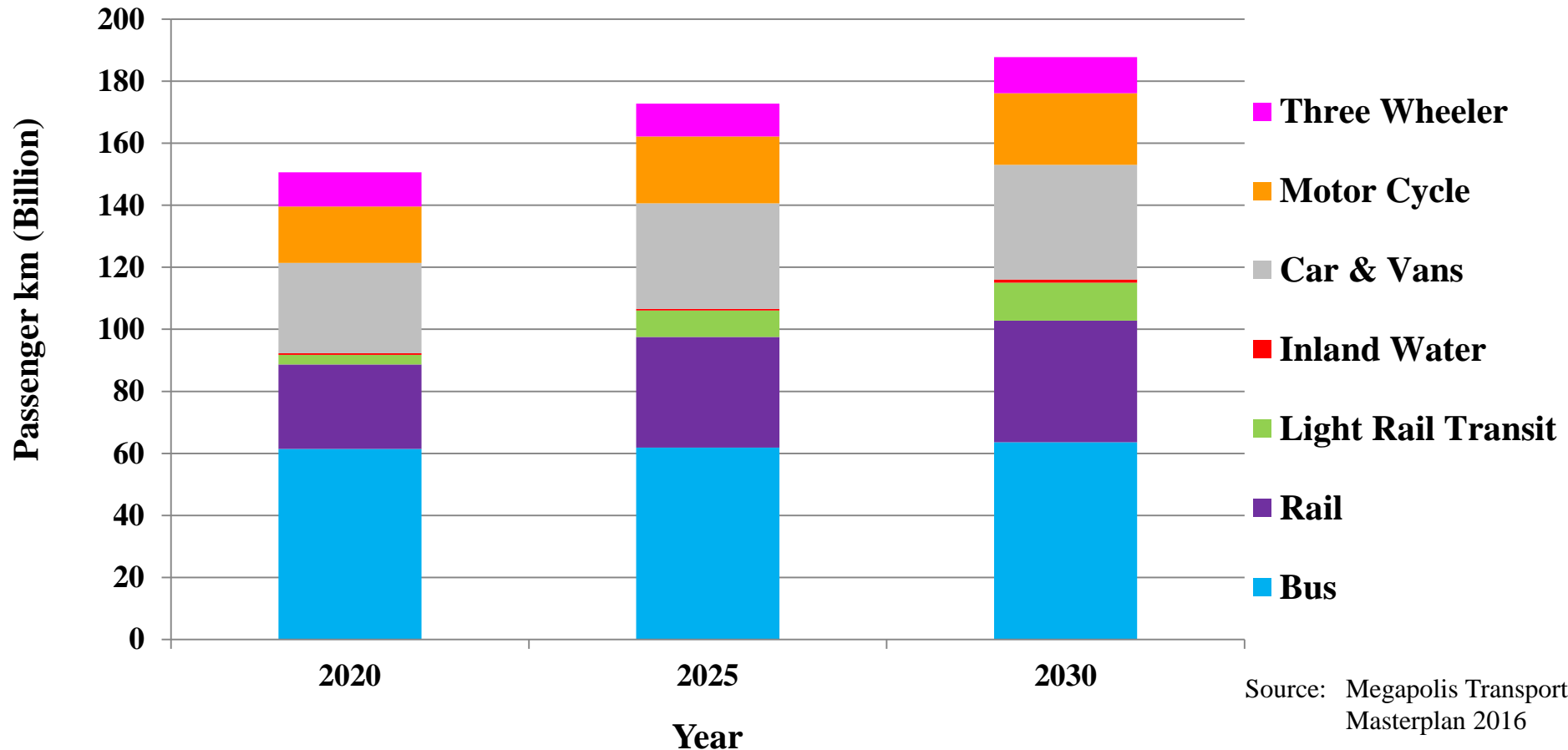




# ENERGY EFFICIENCY OF TRANSPORT

## Overall Impacts of NDCs (2020 to 2030)

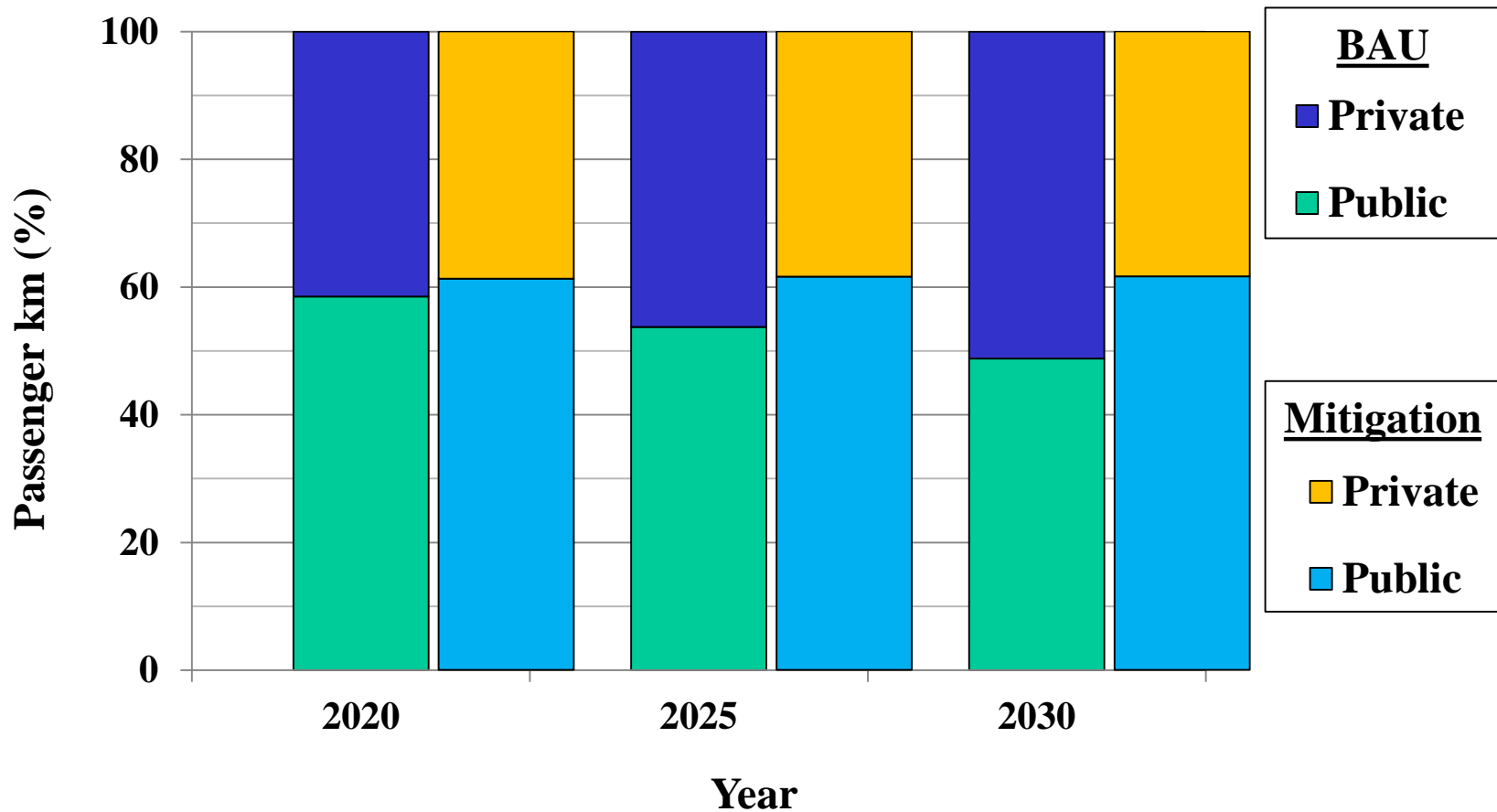
### Transport demand pattern



**Public transport share is improved to maintain at 62%**

# ENERGY EFFICIENCY OF TRANSPORT

- Overall Impacts of NDCs (2020 to 2030)
  - Share of public transport



Shift of passengers from private to public transport modes

2020: 5.6%; 2025: 7.4%; 2030: 12.4%

# ENERGY EFFICIENCY OF TRANSPORT

- Overall Impacts of NDCs (2020 to 2030)
  - Achievements by 2030

Scenario	Transport Demand (Billion Passenger-km)	Annual fuel demand (Million liters)	Fuel Economy		GHG Emissions	
			l/Passenger-km	MJ/ Passenger-km	Intensity (g/Passenger -km)	Total (k tons/year)
BAU	194.3	4738.4	0.024	0.95	59.7	11605.9
Mitigation	187.0	3838.1	0.021	0.79	51.0	9543.4
Improvements /Savings (%)	-	19.0	15.8	16.1	14.6	17.8

# CONCLUSIONS

- ❑ The implementation of transport sector NDCs could result in considerable reduction in GHG emissions with respect to BAU scenario, even well above the stipulated target of 10%.
- ❑ However, successful implementation of the mitigation actions requires transformational change of the sector governance; particularly related to policy, regulatory, institutional frameworks and information management.
- ❑ The anticipated levels of stakeholder engagement and resource mobilization for the NDC Readiness Action Plan 2017-2019 is not visible yet; challenging the effective commencement of the implementation in 2020.

***Thank You***