

# INSIGHTS ON TRANSPORT AIR POLLUTION

& Co-Benefits in Sustainable Transport

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### Improving Air Quality through Sustainable Transport

SDG 3.9 Reduce the number of deaths and Reduced air pollution illnesses from hazardous chemicals and air, water Better air quality and soil pollution and contamination. SDG 11.6 Reduce the adverse environmental impact of cities, including by paying special attention to air quality DEVELOPMEN<sup>1</sup> GOALS Improved health **SDG 8** Decent Work and Economic Growth **SDG 13** Climate Action **Reduced inequality SDG 14** Life below Water Cleaner environment **SDG 15** Life on Land

CO-BENEFITS AND SECONDARY EFFECTS



#### Framework of this presentation

1. What is the trend of transport air pollutant emissions?

- 2. What drives this trend?
- 3. What is Asia doing to improve the situation?

#### AIR POLLUTANTS DESCRIBED IN THIS PRESENTATION

Particulate Matter small inhalable particles from tailpipe emissions, brakes, and tyres Nitrogen Oxides in the form nitric oxide and nitrogen oxide causing lung infection and respiratory problems Sulfur Oxides most prevalent as sulfur dioxide released when burning sulfur-containing fuels

#### OTHER AIR POLLUTANTS FROM THE TRANSPORT SECTOR

Black Carbon also known as soot, a climate pollutant released from incomplete combustion Carbon Monoxide poisonous gas released from incomplete combustion Volatile Organic Compounds (VOC) highly-reacting pollutants causing smog and respiratory irritation



# What is the trend of transport air pollutant emissions?

STATE OF PLAY





#### Air Pollutant Emissions in the Asia and Pacific

**Transport contribution to ambient PM 2.5** 



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#### **Health Burden due to Air Pollution**





Every hour, someone prematurely dies in Indonesia due to exposure to tailpipe emissions



# What drives this trend?

#### DRIVERS AND OTHER CATALYSTS



## **Multifaceted Drivers of Air Pollutant Emissions in Transport**



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Asian

Transport Observatory

### **Transport Energy Consumption Mix**



AIIB

ADB

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Biofuel consumption in the road sector, 2022







## **Other Drivers of Road Transport Air Pollutant Emissions**







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# What is Asia doing to improve the situation?

POLICIES, CASE STUDIES, AND BEST PRACTICES





#### The Avoid, Shift, and Improve framework



\* The A-S-I diagramme presents a non-exhausive list of measures for illustrative purposes only.

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SLOCAT

#### AVOID MEASURES Land Use and Urban Form



#### Share of urban population near parks vs. near highways

- People near parks and other car-free places
- People near highways



ITDP, 2024

Asian



#### AVOID MEASURES Case Study: Singapore Vehicle Quota System

• Lack of space



#### Growth rate of road vehicles vs. externalities since 2000





World Bank, Country Official Statistics, EDGAR, WHO

#### Cost of Certificate of Entitlement



# SHIFT MEASURES Public Transport



Country	Policy measure	Policy document The Brunei Darussalam Road Safety Strategic Plan 2025		
Brunei Darussalam	Install <b>Cyclists and Public Buses</b> facilities			
Cambodia	Promote integrated public transport systems in main cities	Cambodia's Third National Communication, 2022		
Indonesia	Development of <u>Mass Rapid Transit</u> /MRT, Light Rail Transit/LRT, and tram;	Roadmap of SDGs Indonesia: A Highlight, 2019		
Lao People's Democratic Republic	New <u><b>Bus Rapid Transit</b></u> system in Vientiane Capital and associated Non-Motorized Transport component	Updated Nationally Determined Contribution - LAO, 2021		
Malaysia	Increase the number of Stage Buses in GKL and main cities	Low Carbon Mobility Blueprint 2021-2030		
Myanmar	The railway network will play a key role in Urban MRT in Myanmar as more trains will be introduced	Updated Nationally Determined Contributions - MMR, 2021		
Philippines	Bus rapid transit systems will be adopted to enhance the efficient use of public transport vehicles and existing road spaces.	Philippine Development Plan 2023-2028		
Singapore	Singapore is taking steps to make public and shared transport, and <u>active mobility the preferred mode</u> <u>of travel;</u>	Second Update of First Nationally Determined Contribution, 2022		
Thailand	Development of public or mass transit systems in major cities	Strategies for the Development of Thailand's Transport System for a 20-Year Period (2018-2036)		
Viet Nam	Shifting passengers to public transport: BRT: 4 routes in 3 cities (13 routes in 5 cities - conditional)	Implementation of NDC for Transport in Viet Nam, 2021		

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#### SHIFT MEASURES Public Transport (continued)





#### SHIFT MEASURES Case Study: Kochi Water Metro



15 identified routes
10 islands
78 km
78 fast, electrically
propelled hybrid ferries
Diesel-electric

Comprehensive Mobility Plan (2023)



#### **Potential Ridership**

**by 2025:** 45,000 to 70,000 passengers **by 2035:** 60,000 to 150,000 passengers

Parameter	Reduction in Emissions of Pollutants (Tonnes/Year)					
	2019	2020	2021	2025	2035	
CO <sub>2</sub>	3103	8955	8578	10237	16278	
CO	21.01	61.59	60.10	72.21	114.28	
HC	7.71	22.61	22.06	26.51	41.95	
NOX	20.24	59.32	57.88	69.55	110.07	
PM	1.06	3.10	3.02	3.63	5.75	
Total	3153.02	9101.62	8721.06	10408.9	16550.05	

#### Table-4.12: Reduction in pollution emissions after project commissioning

Figure 53: Proposed Public Transportation Plan (Source: Master Plan -2040 – Draft Report)



#### **IMPROVE MEASURES E-mobility**

q

150

100

50

0

2010



500 Other targets 450 ■ Transport GHG emission 400 Transport asset management 350 Modal shift targets 005 Active mobility 250 Number 500 Road crash fatalities

**Cumulative transport-related targets** 



Share of electric vehicles in total road vehicle imports (in USD

Close to 80% of electric vehicle stock is in Asia ٠

biofuels

90% of EVs sold are 2-wheelers ٠

2020

2015

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#### IMPROVE MEASURES Case Study: Indonesia Vehicle Emission Standards





#### Key Takeaways

**Emission Trends**: While transport-related air pollutant emissions have increased over time, not all modes have contributed equally. Road transport historically has been a significant contributor, but emissions have shown regional reductions in recent years due to vehicle emission standards and improved fuel quality. However, emissions from domestic waterways and inland shipping have increased notably. However, the trends vary significantly among sub-regions and countries.

Health Impact: Despite overall reductions in volume and share in economy-wide emissions, urgency remains as air quality in cities remain poor and health burden remains high.

**Factors Driving Emissions**: Asia continues to grow and, along with it, transport infrastructure, vehicle population, and transport activity will scale accordingly. Road sector continues to be fossil fuel dominated in energy consumption and imports of vehicles have not reached its tipping point.

**Policy Initiatives**: Various policy initiatives aim to mitigate air pollution, including bans on the trade of used vehicles, emission standards, and incentives for cleaner vehicles. However, challenges such as limited infrastructure for public transit and incomplete legislation across transportation modes persist.

**Co-Benefits in Transport:** Sustainable development in the transport sector benefits in cross-cutting synergies which can be harnessed and fostered.



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