16th Regional EST Forum in Asia

Sustainable Urban Mobility Solution-Empowering Cities Towards Low Carbon Pathways

Manila, 9 December 2024

Investing in Climate Resilient Transport Infrastructure in Asia

(Plenary 3: Quality Infrastructure)

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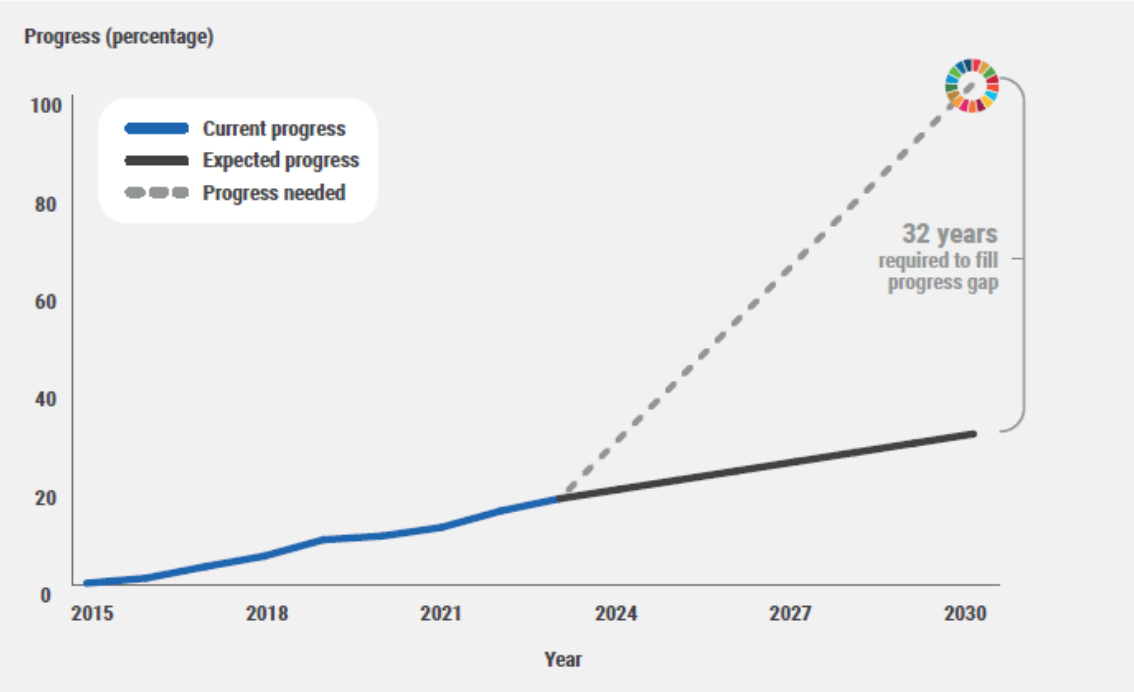
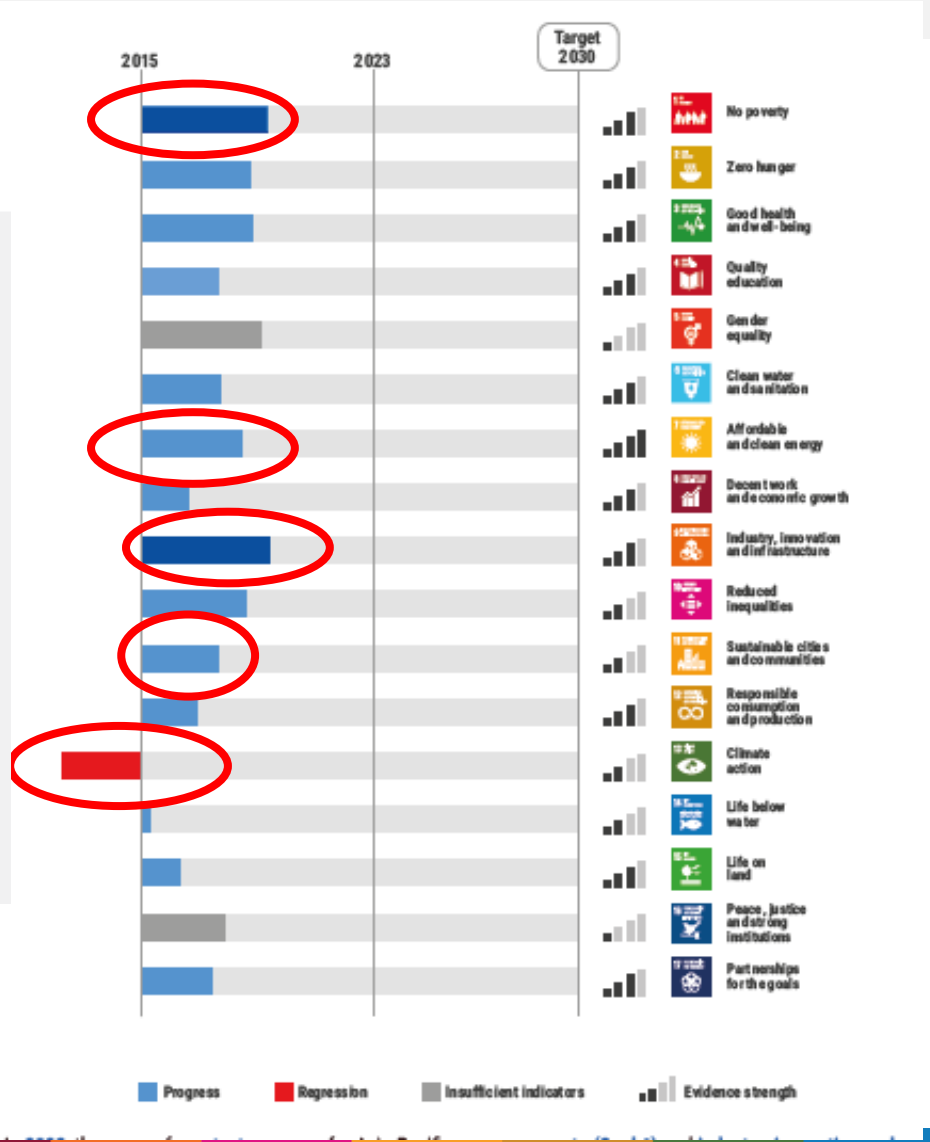
SDGs Progress: Asia-Pacific





1. Reduce Poverty

7. Energy

9. Infrastructure

11. Cities

3. Climate Change

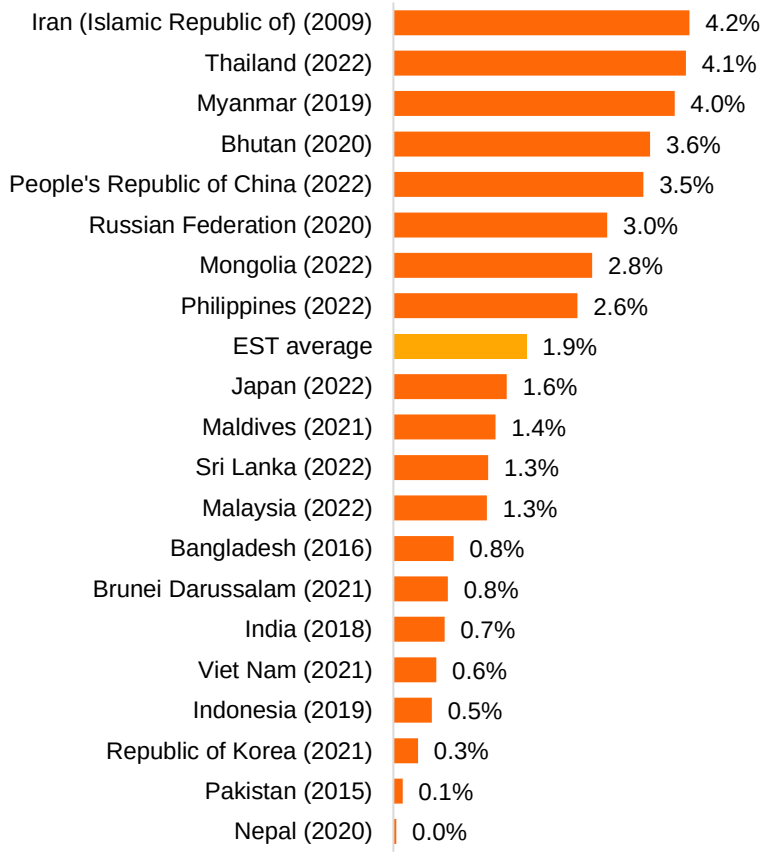
Source: ESCAP, SDG REPORT 2024

State of Transport in Asia

- Different forms and modes of transport systems
  - Highways, Railways, Maritime and Urban
- Urban modes: Metro, Subways, Urban Rails, Bus Rapid Transit, Bus
- Road Transport: High Share of Emissions-75%
- Railway/Urban Railways: High investment
- Cities: Production and Economic Centres-produce more emissions
- Growth of private vehicles- high share of two wheelers
- Sustainable and Resilience Transport & Mobility Plan
- Good public transport: Seoul, Singapore, Hong Kong, China, Tokyo
- China and India: Electric Mobility, Metro and BRT
- Road Safety: Alarming- 56% of fatalities in Asia (720,000)
- Investment in Mass Transit Projects – growth of ridership?
- Innovations: ITS, on-demand service, data, digital payment

Investment in Transport & Contribution to GDP

Capital Investment in transport, Storage & communication (5 yr av)

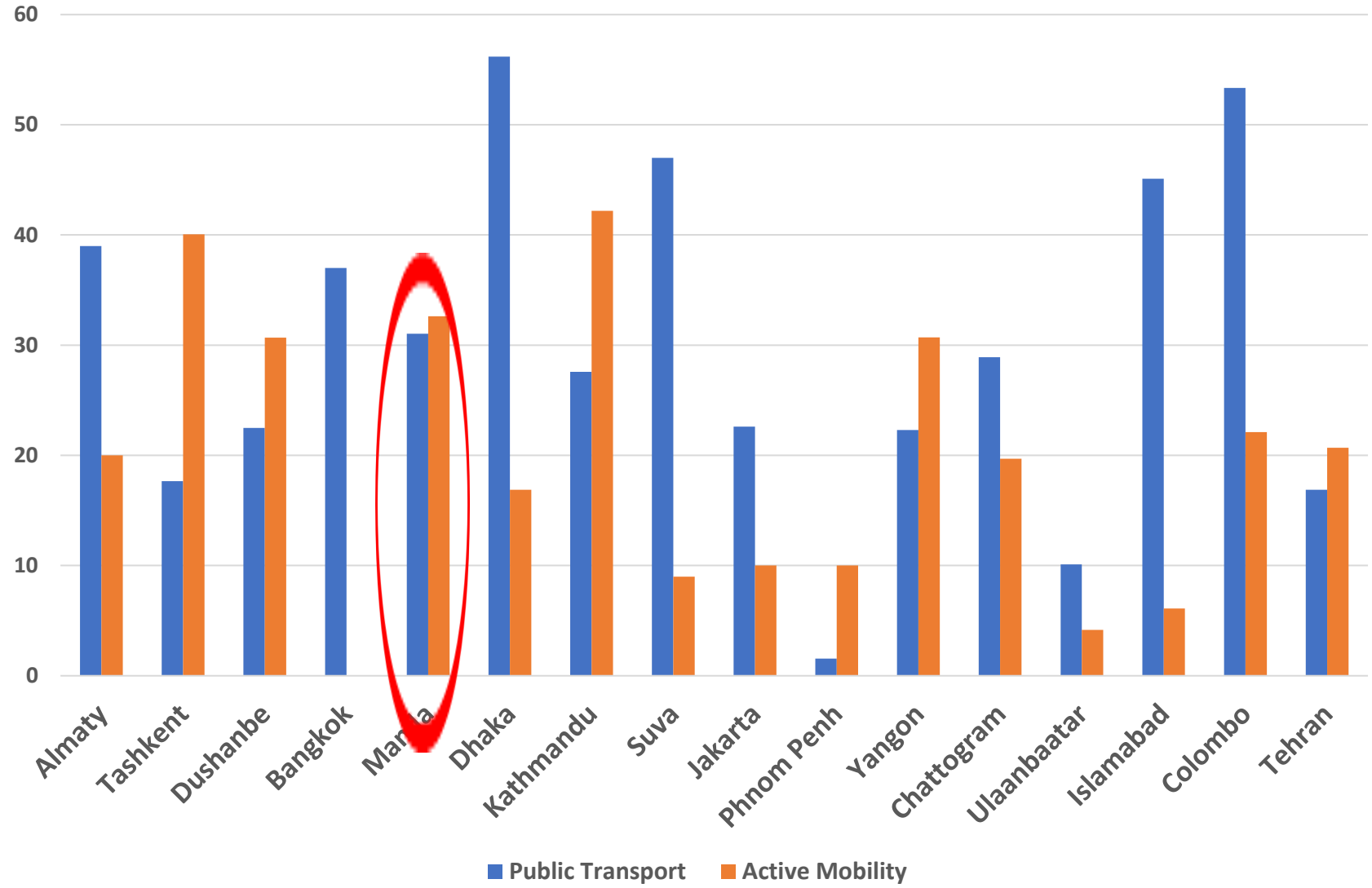


Source: World Bank (2023)

- A shift in MDBs Investment
  - Highways to Railways/Urban Transport
- Transport Gross Value Added
  - 9% of GDP in 2022
- EST Transport GVA Share
  - 41% of Global

Wide Funding Gap
Utilization of Resource: Procurement and Project Management
Bankable Project Development

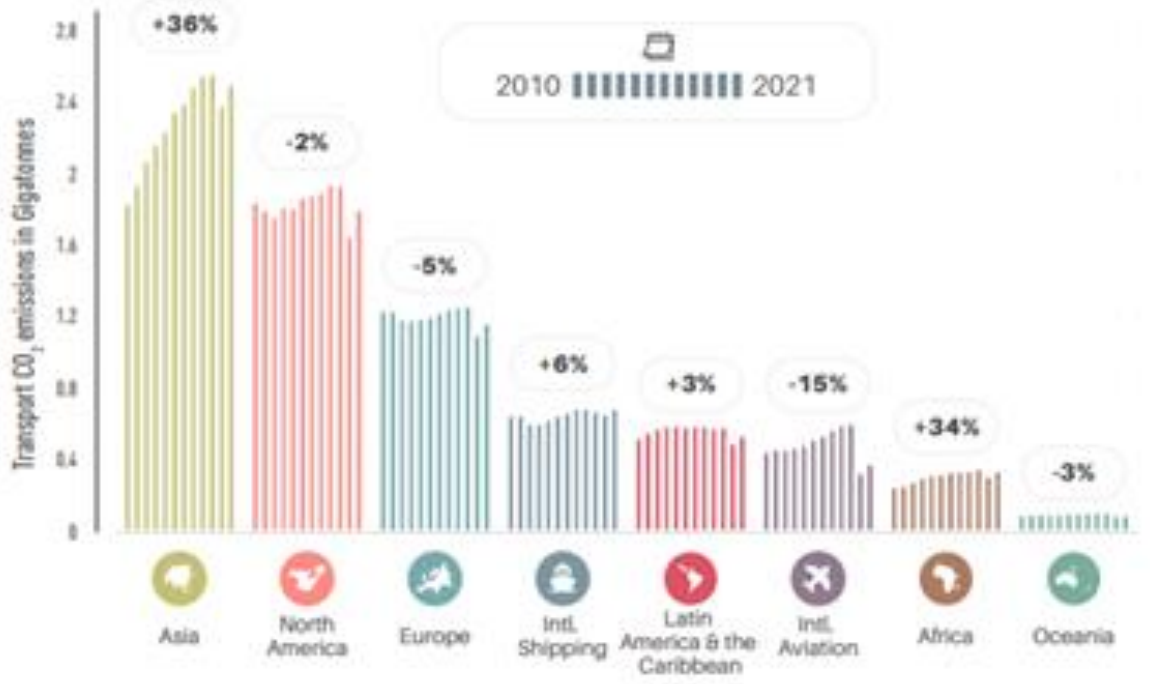
Mode Share of Public and Active Transport

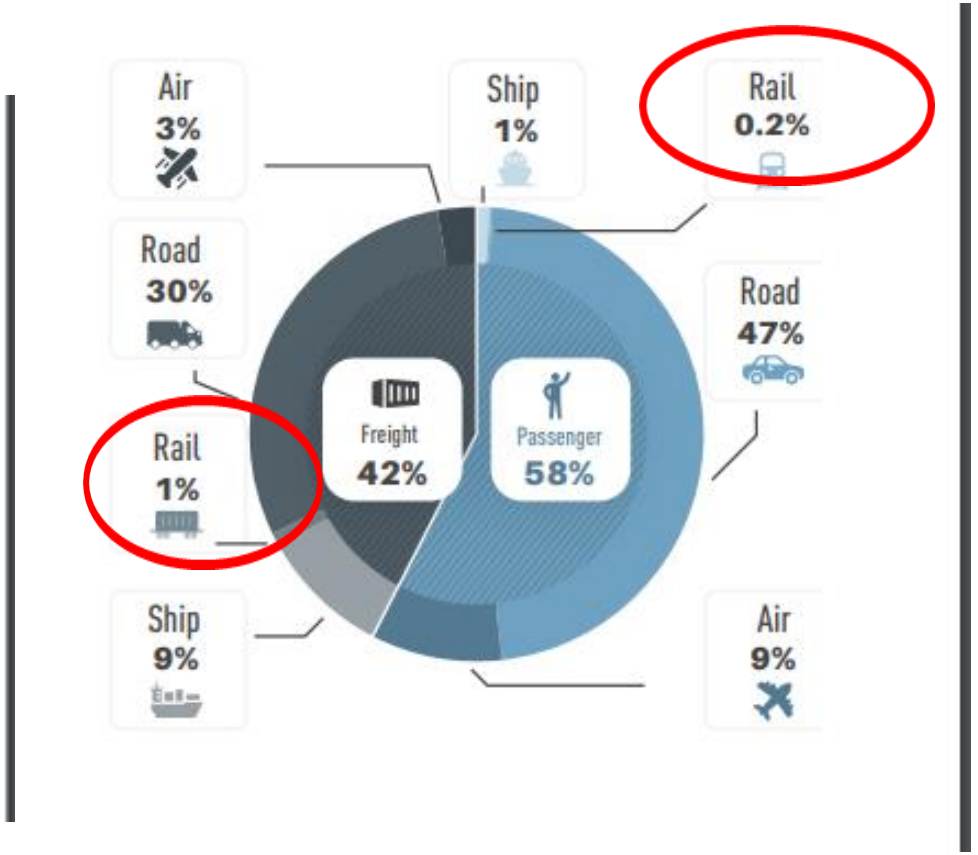


Active Travel England

Transport Emissions in Asia

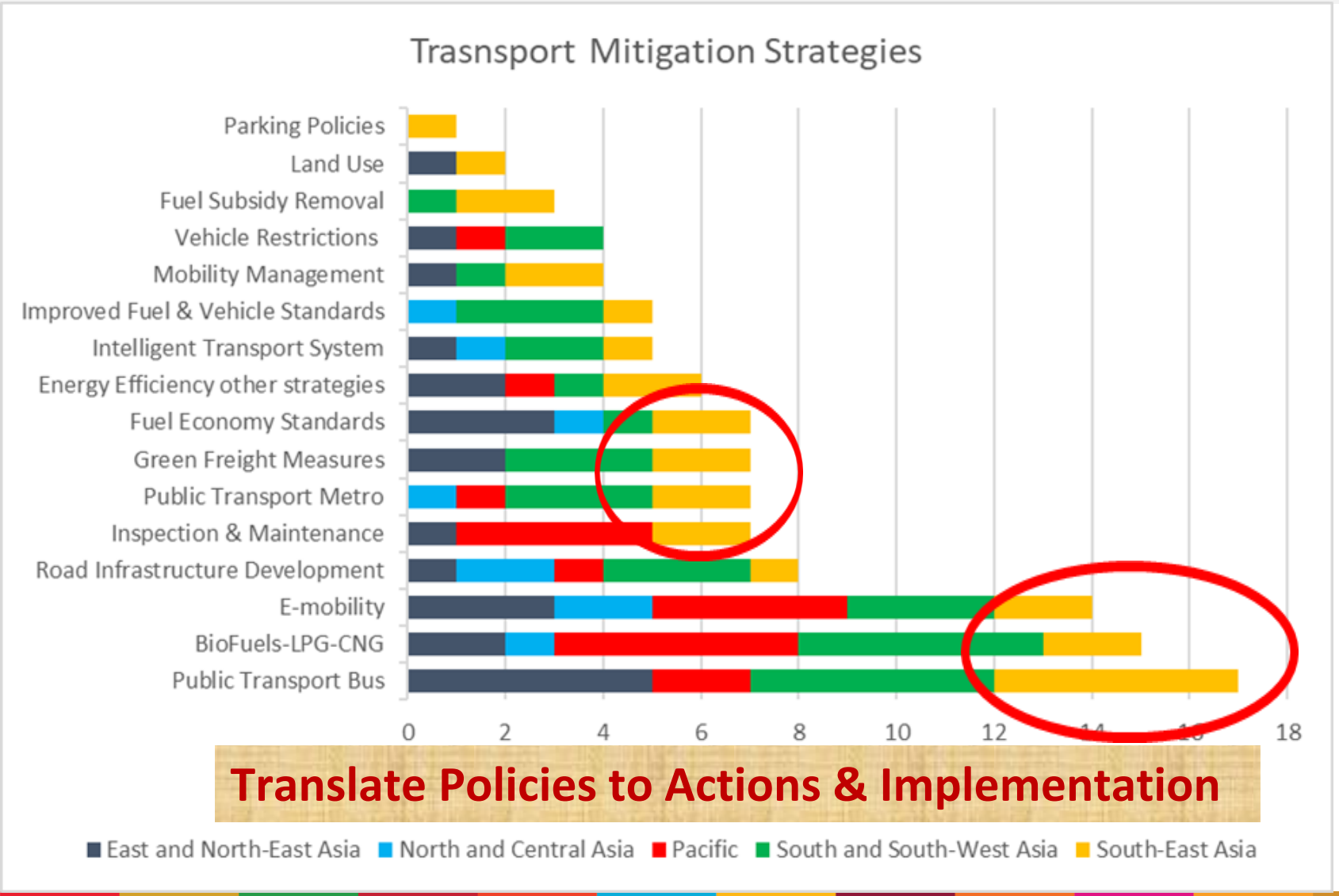
36% growth of Transport Emissions in Asia, 2010-2021





Source: SLOCAT, Transport, Climate and Sustainability Global Status Report, 2023

Transport Strategies in NDCs

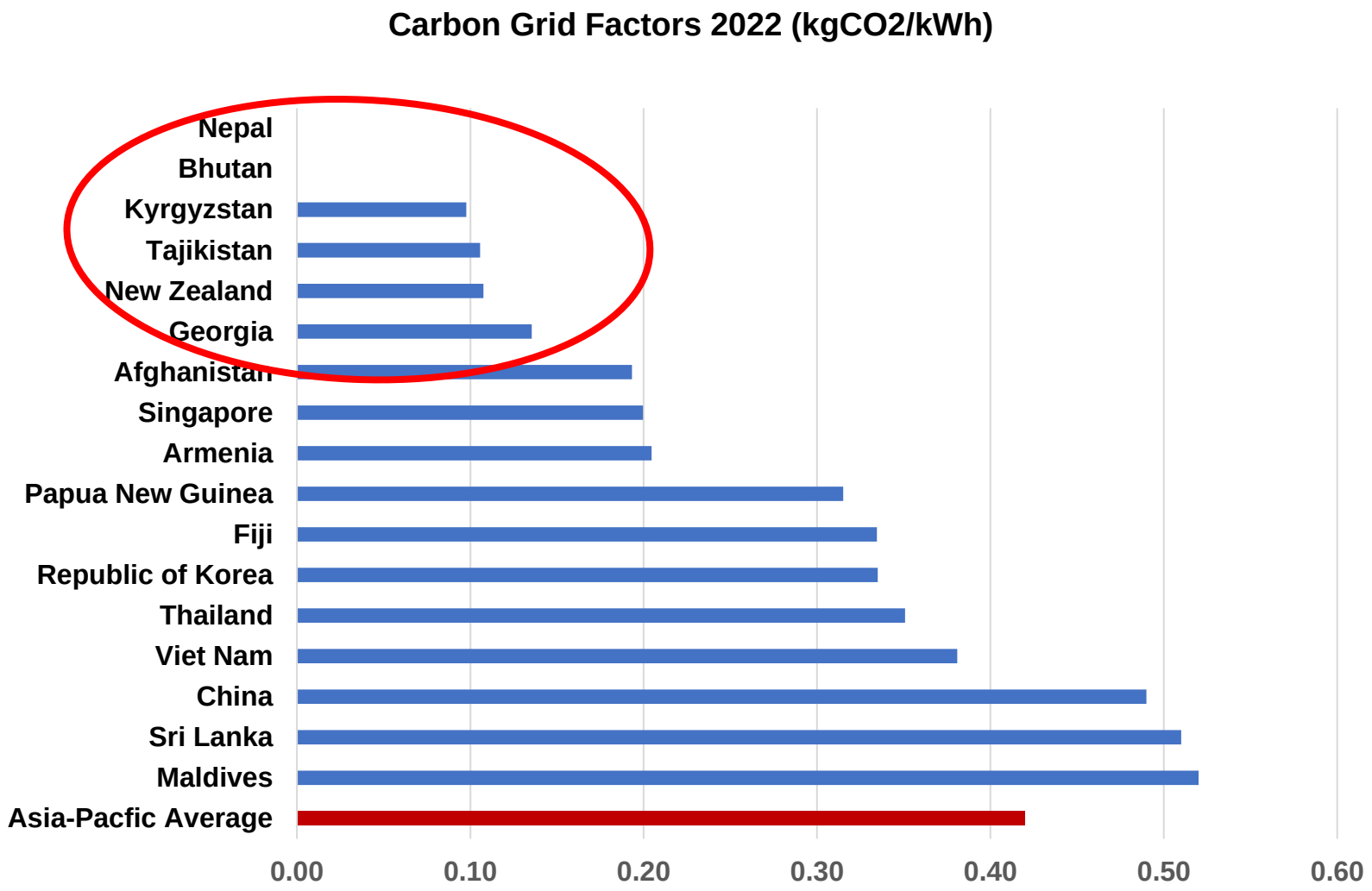


Nepal: Unconditional
EV share 25% of private by 2025, 200 km of electrified railway by 2030, 90% of private vehicle sales EV
8% emissions reduction in Transport

Thailand: EV production hub, 30by30

Source: ESCAP, 2019

Carbon Grid Factors, 2022



Source: UNFCCC

Source: ESCAP, 2019

Transition to Electric Mobility

ASIA-PACIFIC INITIATIVE ON ELECTRIC MOBILITY

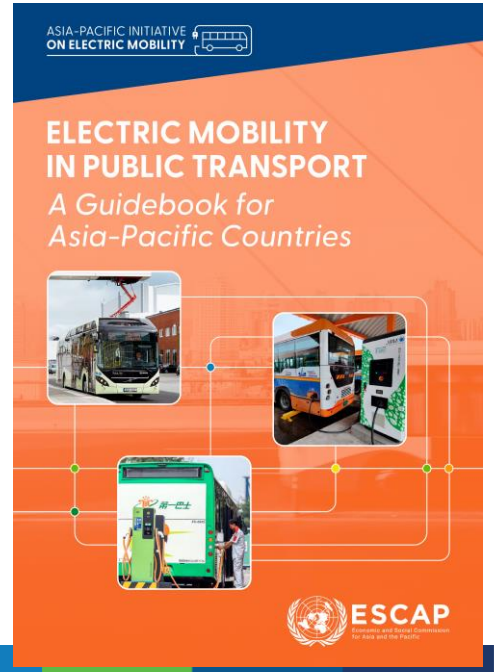
Accelerating Transition to Electric Mobility in Public Transport:

- Nepal, Lao PDR, Cambodia, Fiji, Georgia, Thailand,
- Growing interest of countries on EV: CECP- II
  - Mongolia
  - Tajikistan
  - Philippines
  - Sri Lanka
- Targets for Phasing out ICE/registration
- ASESN EV Accelerator Programme (2025)
- Regional Cooperation Mechanism on Low Carbon Transport
- COP29 in Azerbaijan

- National EV Policy Framework
- Knowledge sharing
- EV Ecosystem
- Collaboration: EV stakeholders

China:

- 82% YOY Growth (21/22)
- NEV Share 58%
- Public Transport: Guangzhou, Shenzhen, Xi'an



https://www.unescap.org/projects/asia-pacific-initiative-on-electric-mobility

Impact of Climate Change on Transport

Climate event	Potential impacts	Vulnerable infrastructure and adaptation measures
Temperature	Extended warm weather can cause pavement deterioration due to liquidation of bitumen, heating and thermal expansion of bridges and buckling of joints of steel structure Low temperature can affect road transport operations; operation and maintenance costs are likely to increase for additional snow and ice removal as well as additional costs of salts to be used for snow melting Rail track deformation and buckling	Pavement: use of stiff bitumen to withstand heat in summer, soft and workable bitumen with solvent in winter, control of soil moisture and maintenance planning Steel bridges: selection of material, provision of expansion joints, corrosion protection
Rainfall	Increased intensity of summer and winter precipitation would create floods of roads, railways and tunnels, affect drainage, road pavement, railways tracks, driving condition and visibility, affect bridges and culverts waterways and clearance, damage bridges and culverts foundation due to scouring Rainfall can trigger landslides and of drain, drain slope mudslides in mountainous roads and can create roadblocks	Bridges and culverts: flood estimation, return period, design discharge, high flood level, clearance above high flood level, length of waterway, design load, wind load, foundation, river and bank protection, corrosion protection Drains: discharge estimation, size and shape Mountainous road: slope protection work, subsurface drains, catch drains Pavement: increase road surface camber for quick removal of surface water, frequency of maintenance, design of base and subbase, and material selection
Storms and storm surges	Rainfall and winds associated with storm/ cyclone can create flooding, inundation of embankments, and affect road transport. Disrupt traffic safety and emergency evacuation operations, affect traffic boards and information signs	Drains and cross drains: capacity enhancement, slope Road embankment: increase height Road signs: wind load, structural design, foundation, corrosion protection
Sea level rise	Rise in sea level will affect coastal roads, may be needed to realign or abandon roads in affected areas Damage to port infrastructure, disruption to shipping traffic, increase dredging requirements	Coastal road: protection wall, additional warning signs, realignment of road sections to higher areas, edge strengthening

Sustainability & Resilience Plan

- Reactive Approaches to Climate Events
- Assessment of Risks and Vulnerabilities
- Sustainable and Resilient Transport & Mobility Plan
- Update Guidelines and Design Standards
- Life Cycle Assessment Engineering Resilience
- Nature Based Solutions
- Community Engagement
- Governance
- Strengthen Role of Transport Sector in UNFCCC Process
- Implementation of Adaptation Plan and Strategies
- Translate Knowledge/Guidelines to Actions/Implementation

NDC, Transport & Energy Systems (Mongolia)

Existing Public Transport in Ulaanbaatar

- Trolley bus, bus, minibus
- Several studies: MRT, LRT, BRT
- Extreme traffic congestion
- Coordination: City and Ministry

NDCs:

- 22.7% (unconditional),
- 27.2 % (conditional) GHG reduction by 2030
- 44.9% total by 2030

Transport:

- Switch to Euro-5 standard fuel
- Mode shift to rail for freight
- Electric mobility and electric heating

ESCAP Support to EV & Public Transport

- National Workshop on EV, 28 Nov 2024
- Public Transport Strategy, 29 Nov 2024

0.07% of global emission, 164% growth (2000)

Energy: 2022 Energy supply, 69.8% Coal, 27.6% oil, 0.1% Hydro (Share of renewable 3%)

- **Coal powered stations, Solar and Wind Planned**

NDC measures:

Use of renewable energy sources: Hydro, Solar and Wind Power, - Nuclear? (Uranium mine)

Improve efficiency, reduce transmission grid losses

- **Reduce the internal use of combined heat and power plants (CHPP)**
- **Improve the efficiency of power plants, heat supply**

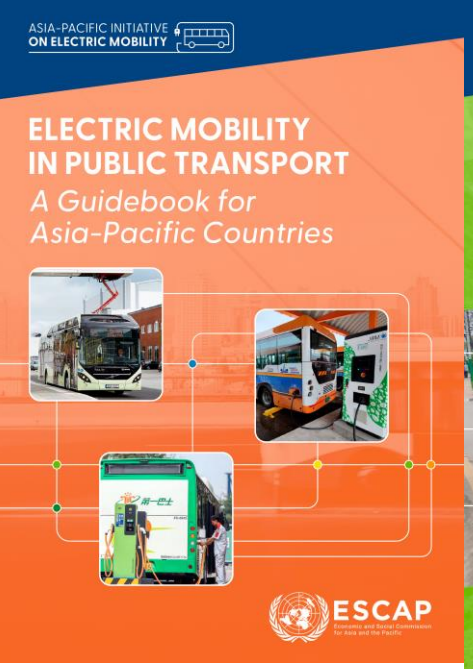
Source: IRENA

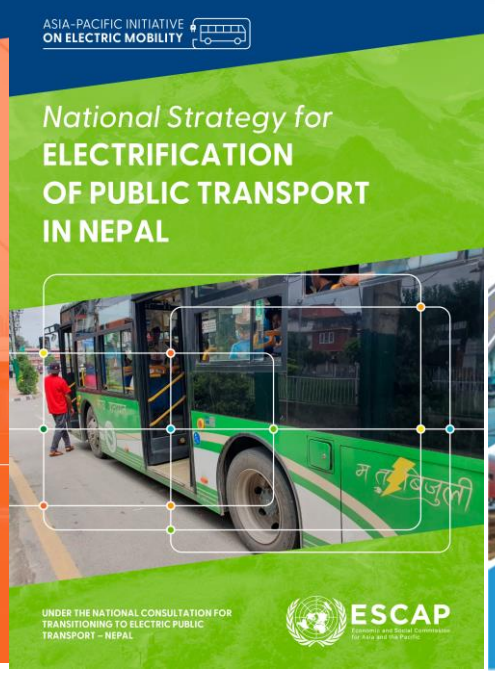
Green Innovations

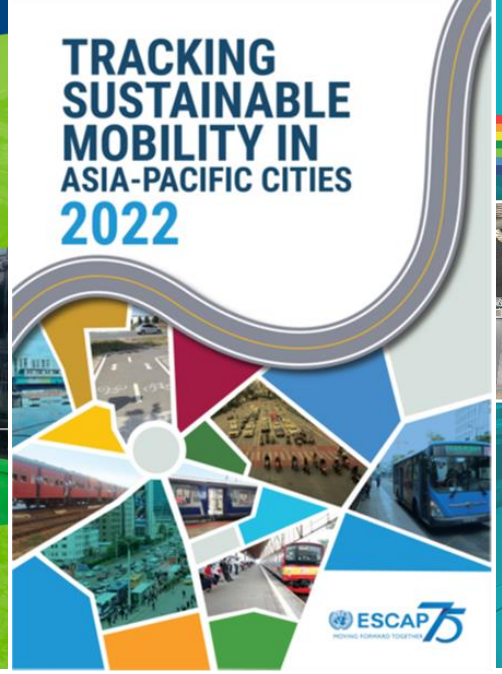
- Suroboyo Public Bus- Surabaya
- Purabaya Bus Terminal
- E-Jeepney- Manila (scaling-up)
- Electrification and Two and Three Whelers
- Active Mobility- England
- Electric Mobility –China, Nepal, India
- Public Transport- Metro, Bus, BRT

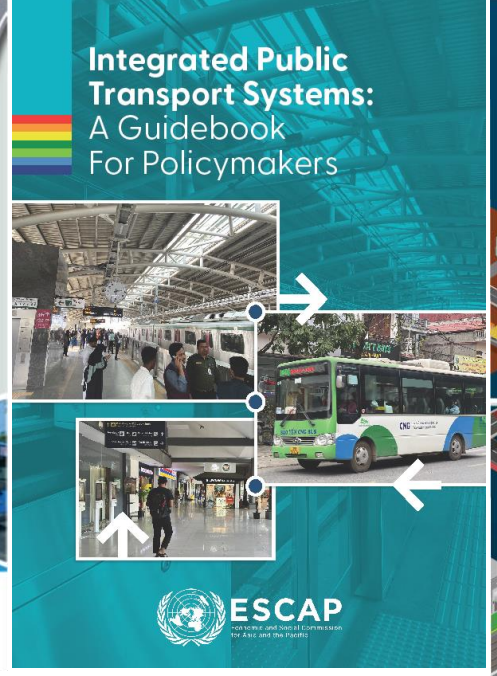
Policy Options: Climate Resilient Transport Infrastructure

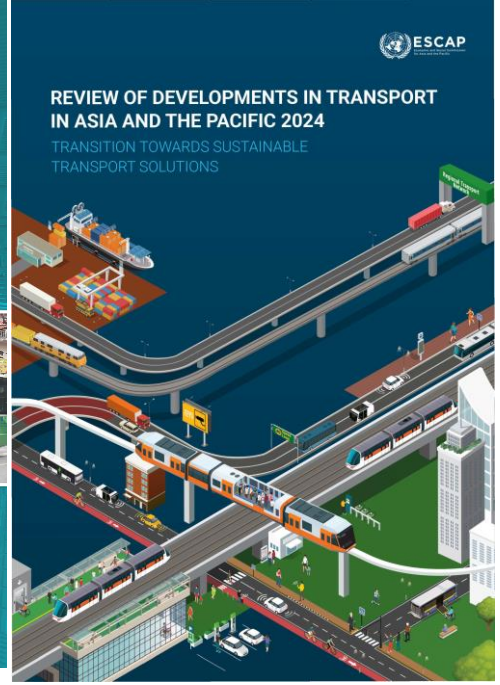
- Evidence Base Policies based on the Structure of Transport
  - Transition Towards Net Zero,
  - Prioritize Adaptation
  - Governance of Climate Change
- Life Cycle Assessment
- Integrated Urban and Transport, Multimodal Transport and Logistics Planning
- Invest in Resilient Infrastructure: Railways and Urban Rails
- Transition to Low-Carbon Transport: EV,
- Use of Renewable Energy in Transport: Solar, Hydro, Wind, Hydrogen
- Innovation & Technology Dependent Transition
- Access to Climate and Green Funds
- Coordination and Partnerships: Public & Private, Sectoral-Urban & Energy
- New Development Cooperation Paradigm? Review Appraisal Methods











Thank You

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https://www.unescap.org/kp/2024/review-developments-transport-asia-and-pacific-2024-transition-towards-sustainable

https://www.unescap.org/our-work/transport/suti

https://www.unescap.org/projects/asia-pacific-initiative-on-electric-mobility/national-policy-frameworks

https://www.unescap.org/kp/2022/tracking-sustainable-mobility-asia-pacific-cities-2022