International Training Workshop on Smart Cities Building safe, resilient, inclusive, livable and sustainable cities and communities Kobe, Japan, 13-15 May 2025

Fostering Resilience & Sustainability in Urban Infrastructure: Asia-Pacific Initiative on Electric Mobility

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Urban Development, Transport, SDGs & the Paris Agreement



Global, Regional, National Process New Urban Agenda Review of SDGs Progress

- High Level Political Forum- New York
- Asia-Pacific Forum on Sustainable
 Development- Bangkok
- Voluntary National Review

Paris Agreement: limit growth of temp <1.5°C

- Accelerated GHG reduction
- Transition to EV
- Shift to renewable energy

UNFCCC- COP29, COP30

- Unconditional & Conditional Targets
- Moving away from fossil fuels
- Funding -300 billion/year

Mode Share of Public and Active Transport



Public Transport Active Mobility



Active Travel England

Co-benefits WHO: 150 to 300 min of physical activity (walking, cycling, wheeling) per week



Powered 2 and 3 Wheelers in Asia, 2018





Source: WHO, 2021

Safety: Road Fatality Rate 100,000 Population, 2021



VRU 67% in 2021 Users of 2- & 3-wheelers- 35%

Risk Factors:

- Helmets
- Speed
- Drink-driving
- Seat belts

Safe Systems Approach Urban speed management & improving public transport, NMT

Source: WHO, 2023

Resilience: Impacts of Climate Events

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

Enhancing Resilience: Adaptation Measures

- Reactive Approaches to Climate Events
- Assessment of Risks and Vulnerabilities
- Hazard Mapping, Minimize Impacts
- Comprehensive Adaptation Strategies
- Update Guidelines and Design Standards
- Life Cycle Assessment of Costs
- Implementation of Adaptation Plan and Strategies
- Natured Based Solutions- Community Engagements
- UNDA 15 Project on Strengthening Sustainable Urban Mobility
 - Five pilot cities: Almaty (Kazakhstan), Bishkek (Kyrgyzstan), Chisinau (Moldova), Kragujevac (Serbia), and Vushtrri (Kosovo)
- Digitalization of Public Transport: Innovation and Emerging Technology

- Identify key issues and cities' vision
 - Smart city
 - Low carbon mobility
 - Sustainable, Resilient and Accessible Infrastructure



81st Commission

Social Inclusion in Urban Development and Mobility

The region is urbanized and now more that 50% of population are living in urban areas

> 690 million persons in the region have some form of disabilities

Only 41% of the urban population currently

have access to public transport

Travel pattern of woman are dependent on public and non-motorized transport

Affordable Housing



630 million persons in the region do not have access to a good quality road network

Ageing population and society

Fewer than 20% of woman are employed in transport jobs Sustainable & Accessible

Asia and the Pacific FROM GROWTH TO RESILIENCE

Urban Transformation in

ESCAP

Public Infrastructure

t Commission Regional cooperation for resilient and sustainable urban development in Asia and the Desifier development in Asia and the Pacific



Barrier Free Access



Universal Design

- Inclusive meet the needs of the largest range of users (including women, the elderly, and people with disabilities),
- Promotes the idea of usable built environments for all people
- Early design of built environments- avoid retrofit and

costs



Sustainability: Urban Mobility- SUTI

No	Indicators	Measurement	Weights	Range	
		units		MIN	MAX
1	Extent to which transport plans cover public transport, intermodal facilities and infrastructure for active modes	0 - 16 scale	0.1	0	16
2	Modal share of active and public transport in commuting	Trips/mode share	0.1	10	90
3	Convenient access to public transport service	% of population	0.1	20	100
4	Public transport quality and reliability	% satisfied	0.1	30	95
5	Traffic fatalities per 100,000 inhabitants	No of fatalities	0.1	10	0
6	Affordability – travel costs as part of income	% of income	0.1	35	3.5
7	Operational costs of the public transport system	Cost recovery ratio	0.1	22	100
8	Investment in public transportation systems	% of total investment	0.1	0	50
9	Air quality (pm10)	µg/m3	0.1	150	10
10	Greenhouse gas emissions from transport	CO2 Eq. Tons	0.1	2.75	0
	SUM		1.00		

40 Cities Assessed



Urban Forms, Integrated Urban & Transport Planning

- City planning based on public transport
- Integrated urban, land use and transport planning
- Satellite/Compact city planning
- More open and green space- shelter
- Development of integrated mobility plan
 - Active mobility
 - Integrated stops, interchange facilities
 - Fare and service integration- digitalization
- Increase mode share, accessibility and improve quality and reliability



Transit Oriented Development: For New & Emerging Cities

particularly

















TRAFFIC MANAGEMENT









INTEGRATION

DEVELOPMENT

MIX OF USES



and diverse and livable communities.

benefiting

or infrastructure enhancem

Focus on creating urban development patterns which facilitate the use of public transit, walking and cycling as primary modes of transport which **support vibrant**

Land value capture captures increased land value from changes in land use, public investment, or decisions,

areas

Development (TOD) and contributing to future development



near



Transit-Oriented







Source: Prof. Swamy

Transport Emissions

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





Source: SLOCAT, Transport and Climate Change

Transport Strategies in NDCs





Lao PDR NDCs: 1% EV share by 2025, 30% of private by 2030, BRT, NMT,2-3 wheelers

Update NDC 2025

East and North-East Asia North and Central Asia Pacific South and South-West Asia South-East Asia

Source: ESCAP, 2019

18

Electric Vehicle Sale in 2022 (BEV+PHEV)





China NEV Share 58%

Source: https://www.ev-volumes.com/

Transition to Electric Mobility in Public Transport

Electric Mobility in Public Transport Project:

- Nepal, Lao PDR, Cambodia, Fiji, Georgia, Thailand
- Growing interest of countries on EV: CECP-II
 - Lao PDR
 - Tajikistan
 - Philippines
 - Sri Lanka
 - Mongolia
- ASEAN EV Accelerator Programme (CEF)

Focus on Electric Public Transport

- High upfront investment
- Charging infrastructure
- Individual operators
- Diversify energy sources

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

ASIA-PACIFIC INITIATIVE ON ELECTRIC MOBILITY

- Policy support
- Knowledge sharing
- EV Ecosystem
- Collaboration: EV stakeholders
- Private & Public

China- 100% electric public transport

- Guangzhou
- Shenzhen
- Xi'an



ELECTRIC MOBILITY IN PUBLIC TRANSPORT A Guidebook for Asia-Pacific Countries



Governance & Investment in Resilient Infrastructure

- A shift in MDBs Investment
 - Highways to Railways/Urban Development/Mobility
- ADB, World bank
- Bilateral donors
- EIB, AIIB cofinancing
- Blended finance- WAPPP
- Bankable Project Development
- Led by Ministry of Environment/Climate Change
- Coordination Challenges
- Access to Climate and Green Funds
- Implementation of Adaptation Plan and Strategies
- Natured Based Solutions, Community Engagements

- 3 Levels of Gouvernement & Many Institutions:
- Wide Funding Gap
- Utilization of Resource: Low cost solutions
- Low Disbursement: ADB, WB
- Absorptive capacity of developing countries
- **Procurement and Project Management**

Lead institution, accountability, governance and coordination

*Source: ADB Country Assistance Program Review, 2024

Innovations in Public Transit

- Suroboyo Public Bus- Surabaya
- Purabaya Bus Terminal
- E-Jeepney- Manila (scaling-up)
- Active Travel England: NMT
- Metro Manila Bike Network
- Electric Mobility China, India, Norway
- Electric Bus: Bangkok (Carbon credit)-private
- Integration: Tokyo, Seoul, Singapore,













Policy Options: Resilient & Sustainable Urban Infrastructure

- Evidence Based National Sustainable & Resilience Urban Policy
 - Transition Towards Net Zero
 - Prioritize Adaptation
 - Governance of Climate Change
- Integration Urban and Transport Planning: Low Carbon Public Transport
- Shift to Renewable Energy Sources
- Nature Based Solutions: Community Resilience
- Translate Knowledge/Guidelines to Actions/Implementation
- Market Led Approaches
- Mobilize Climate and Green Funds
- Coordination and Partnerships: Public & Private & sectors: Urban, Energy, Transport & Environment



Thank You

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