National Capacity Building Workshop
on Sustainable and Inclusive Transport Development

Colombo, Sri Lanka 9-10 July 2015

Concept of Sustainable Transport: Planning and Designing for Sustainable and Inclusive Transportation Systems

UNESCAP Transport Division

Content

What is the presentation about?

- Main Challenges
- Concept of sustainable transport
- Long-term vision for the development of the region's transport system
- Planning sustainable transport System – Strategies and Barriers
- Way forward

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Our Main Challenges

Transport vital for economic development and personal welfare, but…

- **Difficult to meet growing demand** (economic and population growth, rising income) – faster than economies growing
- **Growing energy consumption and other resources –** 15- 20% or more of total import cost
- **Air pollution, emission of GHGs –** growing faster than GDP
- **Adverse health and social impacts -** outdoor air pollution contributed to 712,000 deaths in South Asia (GBD Study)
- **Road safety –** more than 2,800 road deaths in Sri Lanka in 2010 (WHO)
- **Non-inclusive development –** not all are benefiting

Combined cost could be up to 10% of GDP

Cannot do business-as-usual

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Concept

Sustainable Development

- The development that meets the needs of the present without compromising the ability of future generations to meet their own needs (Brundtland Report)

- Three pillars: economic, social, and environmental

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Concept

Main current approaches

- Reduction of transport demand → **Avoid**
- Promotion/improvement of more energy efficient and environment friendly transport modes → **Shift**
- Improvement in efficiency of the transport process → **Improve**
- Introduction of new technology → **Improve**

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Long-Term Vision

"An international ***integrated intermodal transport and logistics system***"

Endorsed by the Commission (2007 and 2012)

It is the system that has the intermodal network of well designed, maintained and interconnected highways, railways, inland waterways, sea ports, river ports, airports or dry ports that, through modal shift,

- optimizes the needs of transporting goods and passengers
- minimizes consumption of energy, land and other resources
- generates low emissions of, greenhouse gases and ozone depleting substances
- minimizes the adverse social impacts arising from transport operations.

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Key Factors

"An international ***integrated intermodal transport and logistics system***"

Economic Factors
- Cost
- Speed
- Capacity
- Flexibility
- Reliability

Social Factors
- Access
- Min. Accident
- Congestion

Environment Factors
- Energy Intensity
- Emission
- Pollution

The system combines the advantages of each mode of transport to achieve the balanced integration of ***economic, social and environmental*** benefits.

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Key Factors

Economic Advantages/ Disadvantages	Cost per Ton-Mile (USD)	Capacity (Truck Equivalent)	Speed	Reliability	Flexibility
	**High**	**Lowest**	**Moderate**	**Good**	**High**
	**Low**	**High**	**Moderate**	**Good**	**Low**
	**Lowest**	**Highest**	**Slow**	**Limited**	**Low**
	**Highest**	**Low**	**Very High**	**Very good**	**Medium**

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Key Factors

Environment Advantages/ Disadvantages	**Energy Intensity (BTU per ton mile) USA - 2006**	**CO2 Emission (per ton-km) Europe - 2011**	**Air Pollution* (Euro ct/tkm)**
	4047.00	75.33	0.73-0.93
	330.00	Electric - 17.89 Diesel - 28.88	electric - 0 Diesel 0.88-1.05
	571.00	12.02	0.09
	n/a	n/a	n/a

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Key Factors

Social Advantages/ Disadvantages	Opportunity cost of Land Use	Congestion (Euro/vkm)	Cost of accidents and injuries (Euro ct/tkm)	Access
	High	0.13-4.00	0.23-0.92	High
	Medium	minimal	0.02	Average
	Low	minimal	minimal	Low
	Low	n/a	n/a	Average

*Handbook on estimation of external costs in the transport sector (2008), Commissioned by European Commission DG TREN

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Example - Freight

Modal Shift

Photos Credit - SRT

Lat Krabang ICD Terminal

One of the most developed and advanced dry port in Asia, developed on Concession in 1993

27 Km East of Bangkok, 118 Km from Laem Chabang port (direct rail connection to port)

Modal shift from road to rail* at *Lat Krabang ICD Terminal

Volume moved by Rail in May 2015: **38,026 TEUs**

With Simple Calculation

- Appx **5,000 tons of CO2 reduction**/ month
- **Cheaper** options
- Free up at least 19,000 trucks along 118 km roads in that month – **less congestion at port**

(calculate using the average load of container at appx 24 ton/ TEU)

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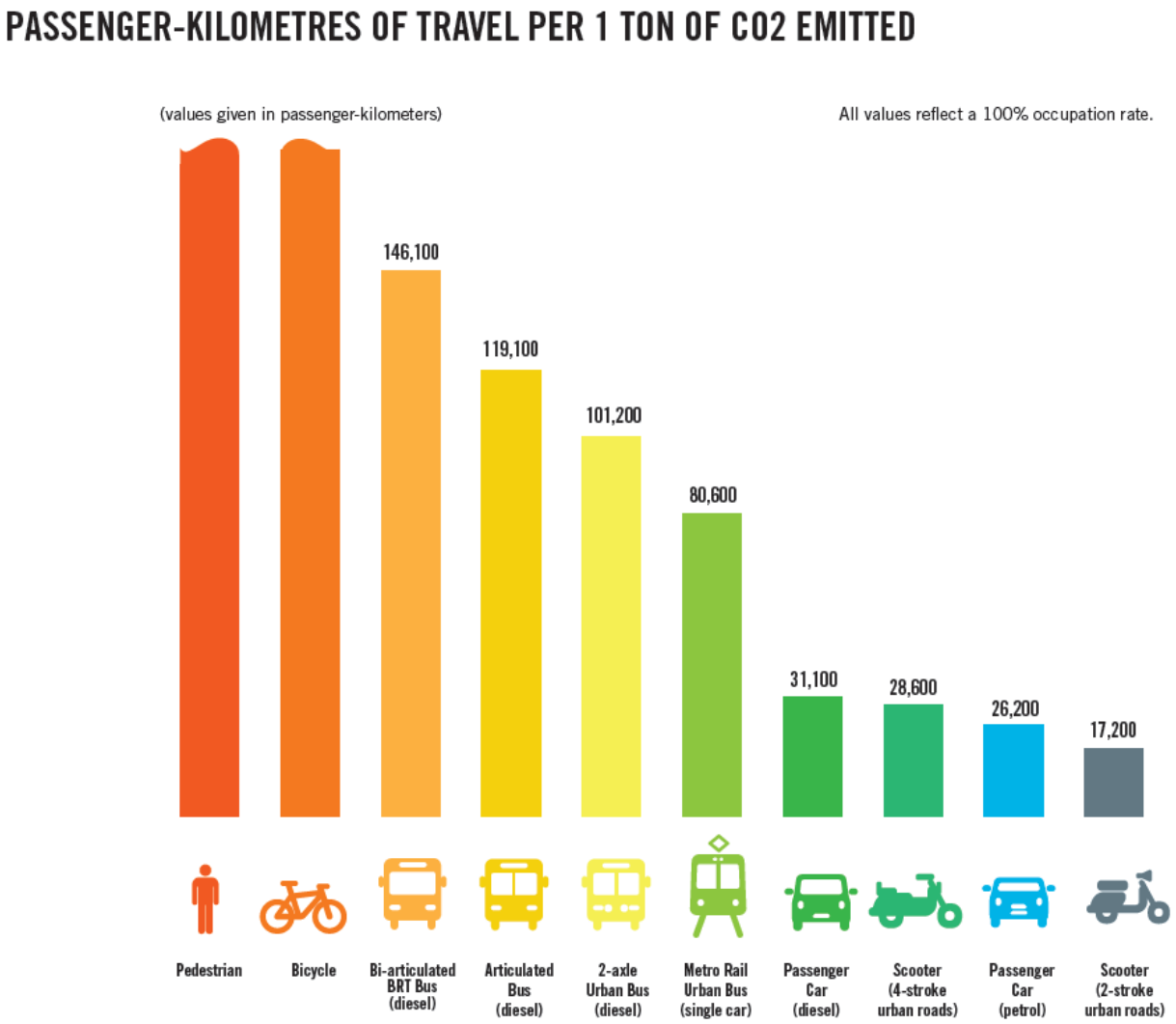
Urban Transport



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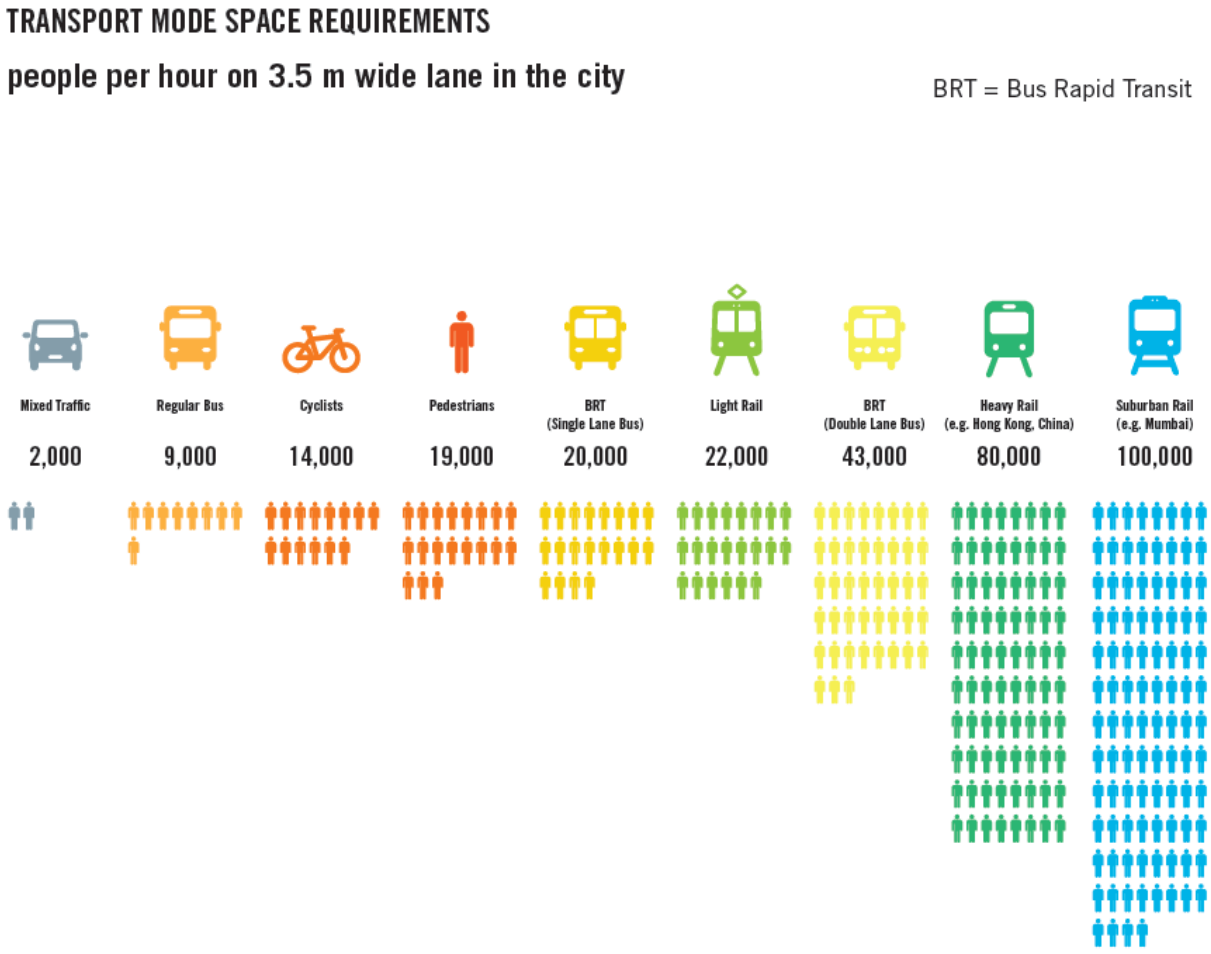
Urban Transport



SOURCE:
Adapted from ADB & GIZ (2011)

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Example – Passenger

- Better and integrated public transport systems – inclusive services
- Use of NMTs (including walking)
- Modal shift

Photo credit: Ridwan Quaium

Rajshahi, Bangladesh

Pun Pun Bike sharing, Bangkok

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Example – Passenger

Non-Motorized Transport

Bike Sharing System

Sky Train

Subway

Photos Credit – pun pun BKK Bicycle Share / member no. 2127723 at www.pantip.com

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Efficiency in Transport Process

Main strategies:

- **Improved system operation** (ITS application, integration of transport modes)
- **Demand management** (staggered working hours)
- **Economic instruments** (tax, subsidy, pricing, etc)
- **Regulatory standards** (vehicle, fuel, maintenance)
- **New technology** (engine, vehicle, fuel, material etc)

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Technology

- **Engine** (emission control, direct injection etc)
- **Vehicle** (safety, fuel efficiency)
- **Fuel** (higher emission standard compatible)
- **ICT/ITS** (coordinated traffic signals, transit operation, management of toll roads, expressways)
- **Infrastructure** (pavement, material etc)

ITS, Bangkok

ERP, Singapore

New Technology bus, Ottawa

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Potential Barriers

Institutional Barriers

- Planning and policy formulation – non-inclusive, technocratic
- Laws, regulations, rules – not always supportive
- Coordinated action by different agencies
  - difficulties in inter-agency coordination
- Social and cultural barriers – Car represent social status ?
- Resource barriers (including human resource)

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Potential Barriers

Policy and structural barriers

- Policy biases are common – eg., favouring road sector in resource allocation, ignoring sustainable development measures, – needs of marginal and other groups ignored

- Policy distortions (eg. energy pricing) – fuel subsidy in some countries; inconsistent, contradictory policies across sectors

- Sector and market structure in transport – eg, fragmented freight sector in most DCs, difficult to improve efficiency

- Regulatory institutions and performance standards - may be either lacking or deficient etc.

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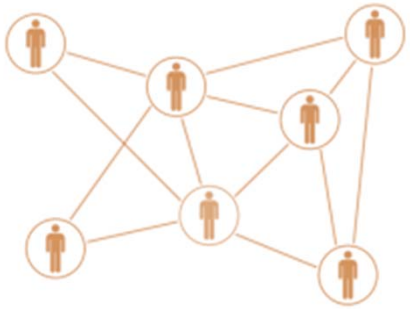
Strategies

Suggestions for consideration

- Inclusion of Sustainable transport (ST) in **national development framework**
- Formulation of an agreed **national policy framework** on ST (national and urban)
- Development of a framework of **indicators and benchmarks** for planning and monitoring the progress in sustainable transport development
- Institutionalization of **integrated** planning, policy formulation and **coordination** of action
- Creating a supportive environment (e.g. R&D)
- Social awareness and education



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Th@nk you

www.unescap.org/our-work/transport

Info.: escap-ttd@un.org