



**Asia-Pacific
Economic Cooperation**

2011/SOM1/EWG/WKSP3/004

Agenda Item: III-A-3(a)

Assessing and Integrating Efficient Transport into Sustainable Development

Submitted by: ADB



**APEC Cooperative Energy Efficiency
Design for Sustainability - Energy Efficient
Urban Passenger Transportation
San Francisco, United States
14–16 September 2011**

Assessing and Integrating Efficient Transport into Sustainable Development

14 September, 2011

CEEDS Phase 3

Energy Efficient Urban Passenger Transport

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Asian Development Bank



A Crisis in Transport and Urban Development

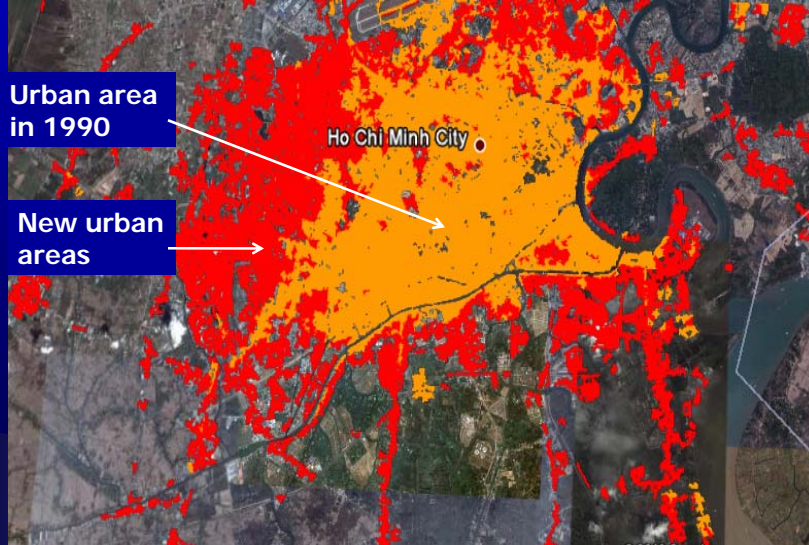
- Congestion costs 2-5% of Asian GDP
- Road accidents cost 2-5% of Asian GDP
- Local pollution - respiratory health cost
- Energy use ~ 30% of World energy
- Fuel security - US\$50-150/barrel
- CO₂ - 23% from transport sector

Impacts

- Economic development
- Equitable access
- Quality of Life
- Sustainable development

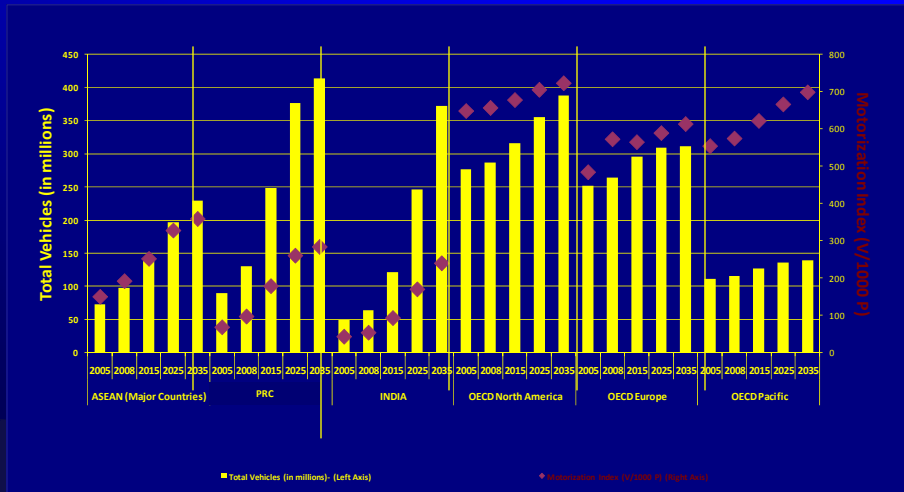


Urban Development



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Vehicle growth projections



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Energy use for Transport

Energy Use	=	Number of Vehicles	x	Utilization	÷	Fuel Efficiency	x	Fuel Energy Intensity
KJ		units		km/yr		km/L		KJ/L

- China: 6 - 9% per year
- India: 5 - 8% per year

6% per year for 20 years is over 300% !!

Emerging Asia will demand 45% of the total world increase in oil use

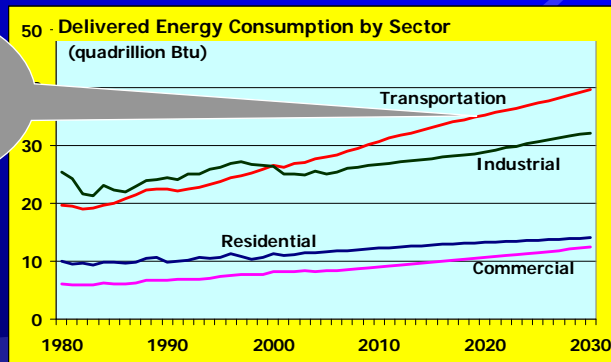


Source: Energy efficiency and climate change considerations for on-road transport in Asia, ADB, 2006

Transport Energy Consumption

Transport is the largest and fastest growing sector

Transport is responsible for 60% of the increase in total world-wide GHG emissions 2002-2025



Source: US EIA Annual Energy Outlook 2006 with Projections to 2030

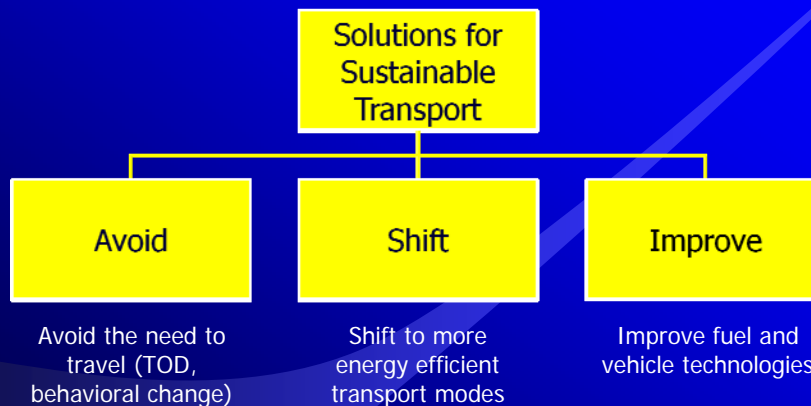
Transport Energy Efficiency

Transport mode	US Department of Energy MJ per passenger-kilometer	IEA Mobility Model Asia (2010) MJ per passenger kilometer
Walking	0.205	0.205
Bicycling	0.112	0.112
Average car (including all types)	2.302*	1.820
Gasoline Car		1.832
Diesel Car		1.724
Efficient Hybrid	1.088*	1.243
Electric Car		0.508
Motorcycle	1.216*	0.625
Three-wheeler		0.917
Minibuses		0.451
Buses (Transit)	2.776*	0.440
Intercity Rail	1.737*	0.291
Urban Rail (Transit Light & Heavy)	1.825*	
Rail (Commuter)	1.964*	
Air	2.138*	2.605

Source: Davis, Stacy C.; Susan W. Diegel, Robert G. Boundy (2009). *Transportation Energy Data Book: Edition 28*. US Department of Energy, pp. Table 2.12. ORNL-6984 (Edition 28 of ORNL-5198). <http://cta.ornl.gov/data/index.shtml>.

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A Sustainable Transport Path



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Energy Efficiency for a Livable Community?

1.82 MJ/pax-km



0.44 MJ/pax-km



0.11 MJ/pax-km



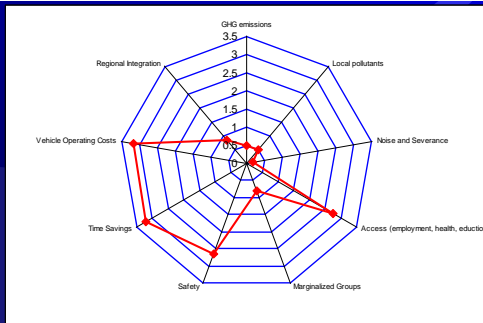
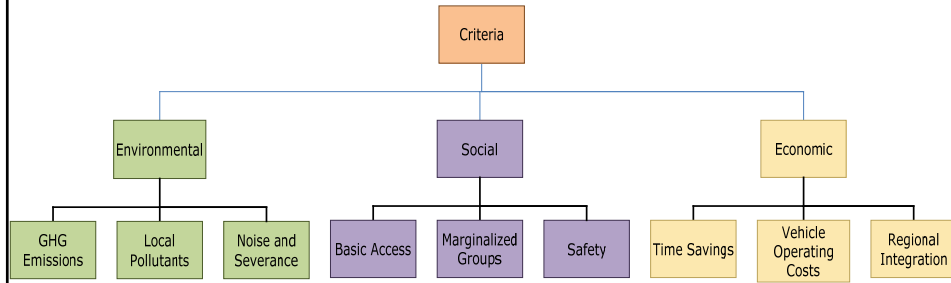
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Press Office City of Munster, Germany

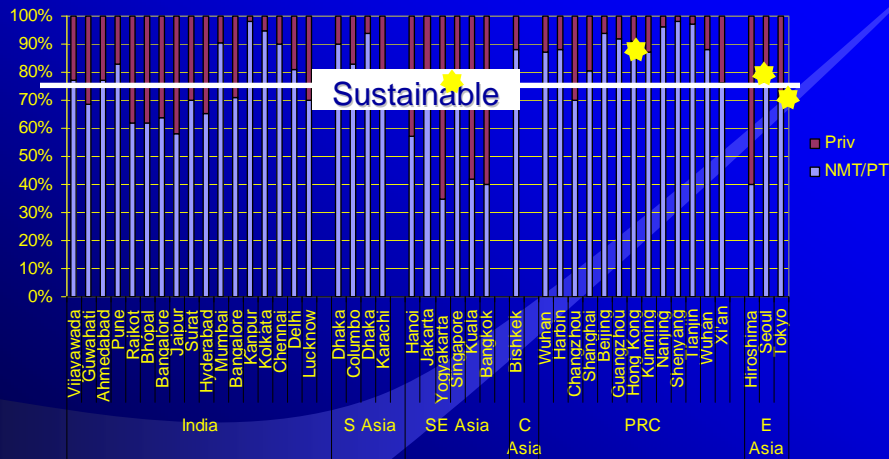
Transport Co-Benefits: Integrated Transport Packages

	Congestion	Pollution	CO ₂	Energy Efficiency	Livable Community
Avoid					
Land-use – Behavioral change	++	++	++	++	++
TDM/TOD	++	++	+++	++	+++
Shift					
Passenger transport:					
Mode switch	+++	+++	++	+++	+
Use larger units	++	+	+	++	+
Improve occupancy rates	++	++	++	++	+
Freight transport	++	++	++	++	+
Improve					
Technology/ vehicle change	?	+++	++	++	?
Behavioral change (Fleet mng, driver training)	+	++	+	+++	+
Fuel-switch (CNG, LPG, biofuels)	?	++	?	+	+

Assessing Sustainable Transport



What Makes Transport Sustainable in a Livable Community?



Source: various CAI-Asia Center, 2008



"Our Sustainable Transport Initiative will make more cities more 'people-friendly' and advance climate change mitigation objectives."

Haruhiko Kuroda
President, Asian Development Bank
2009 Delhi Sustainable Development Summit

Thank you

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