New Economic Models for Urban Transportation : Green Infrastructure and Transport Systems

Dr. Jin Young Park

Urban Development Specialist (Transport)
Regional & Sustainable Infrastructure Division
Asian Development Bank

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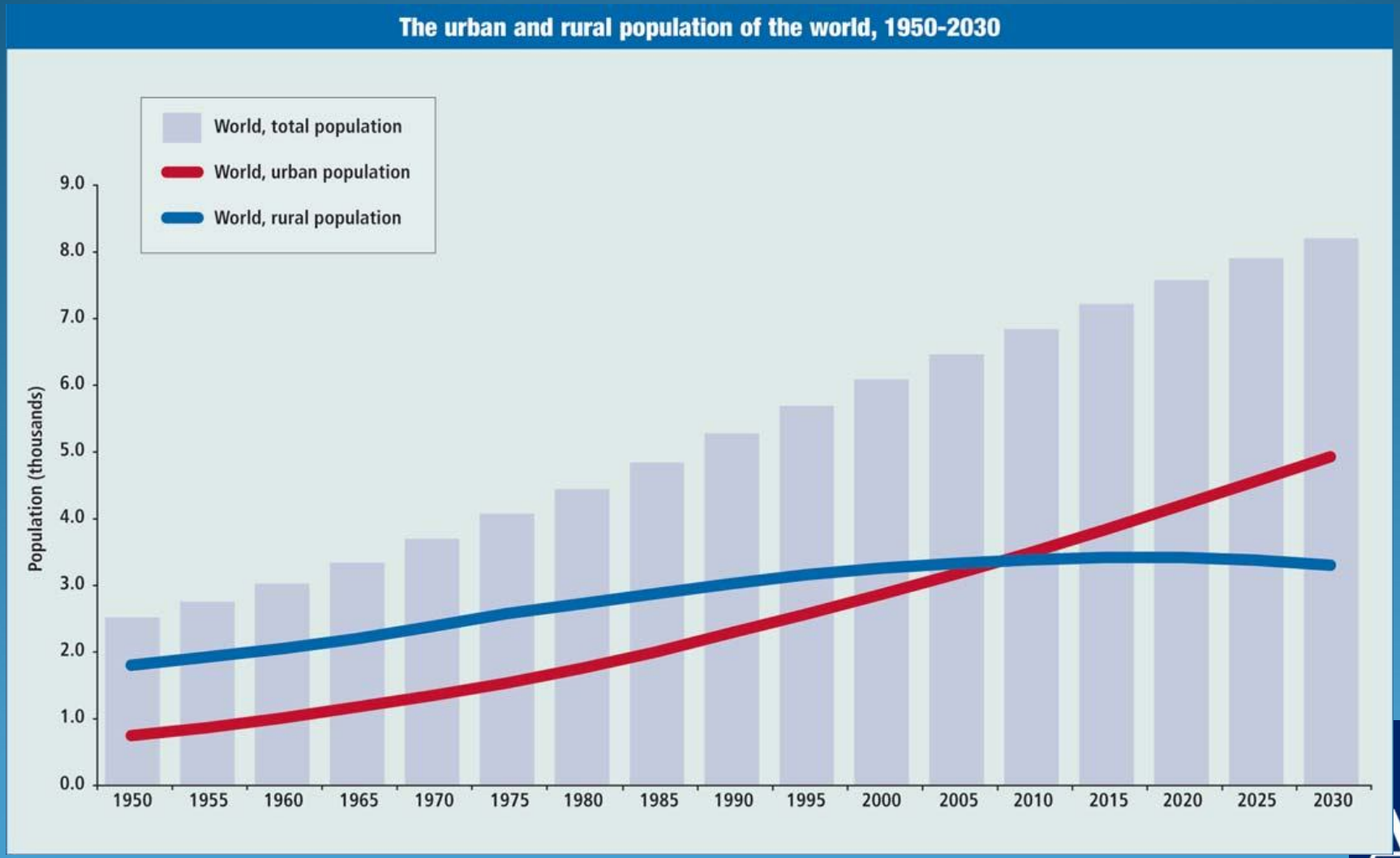
Contents

1. Changes in Urban Transport
2. ADB Strategy
3. Implementation : new economic models

1. Changes in Urban Transport

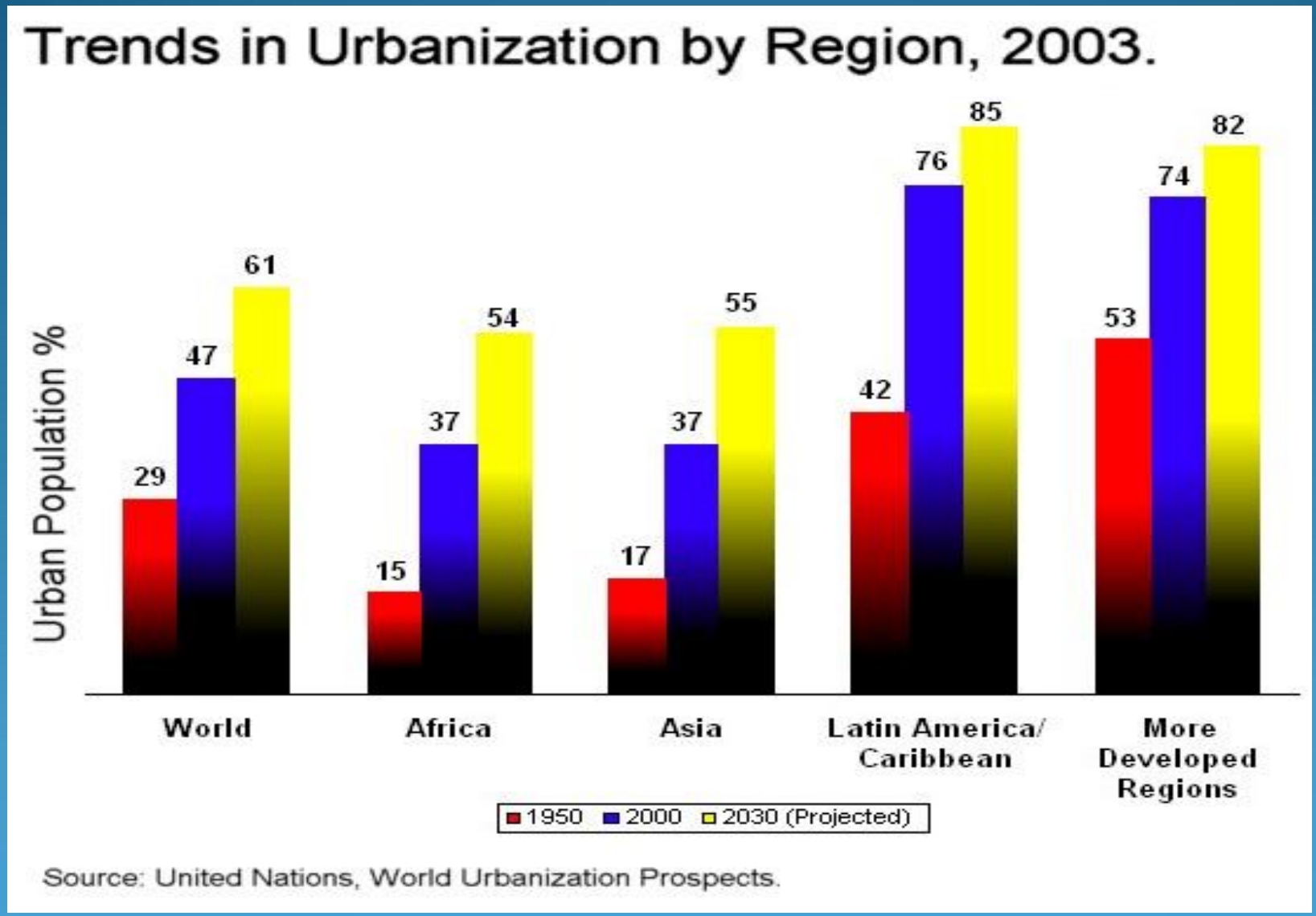
Urbanization

4.9 billion people are expected to be urban dwellers in 2030



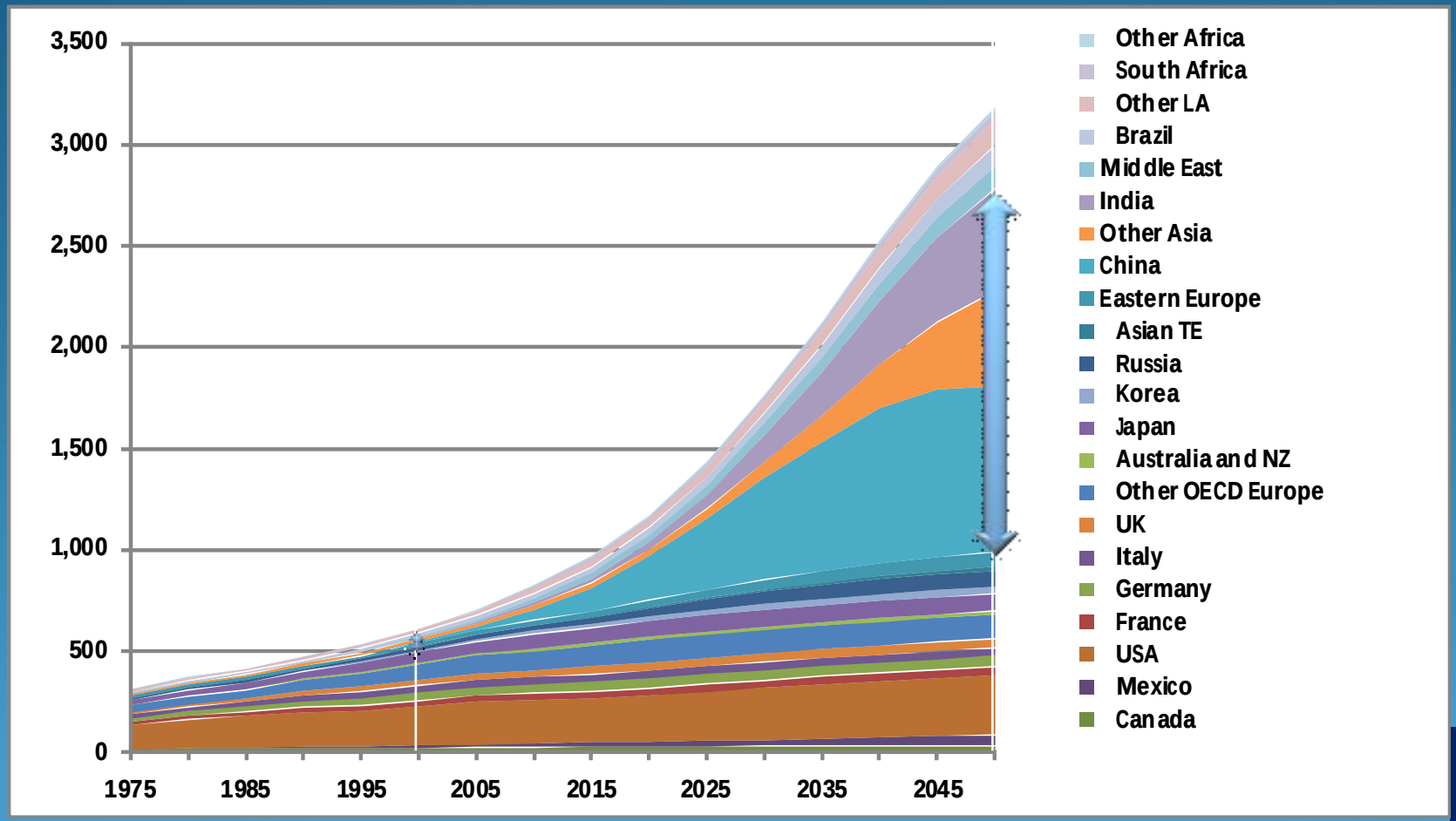
Urbanization

Asia shows fast incresae of urban dwellers



Motorization

IEA vehicle ownership projections



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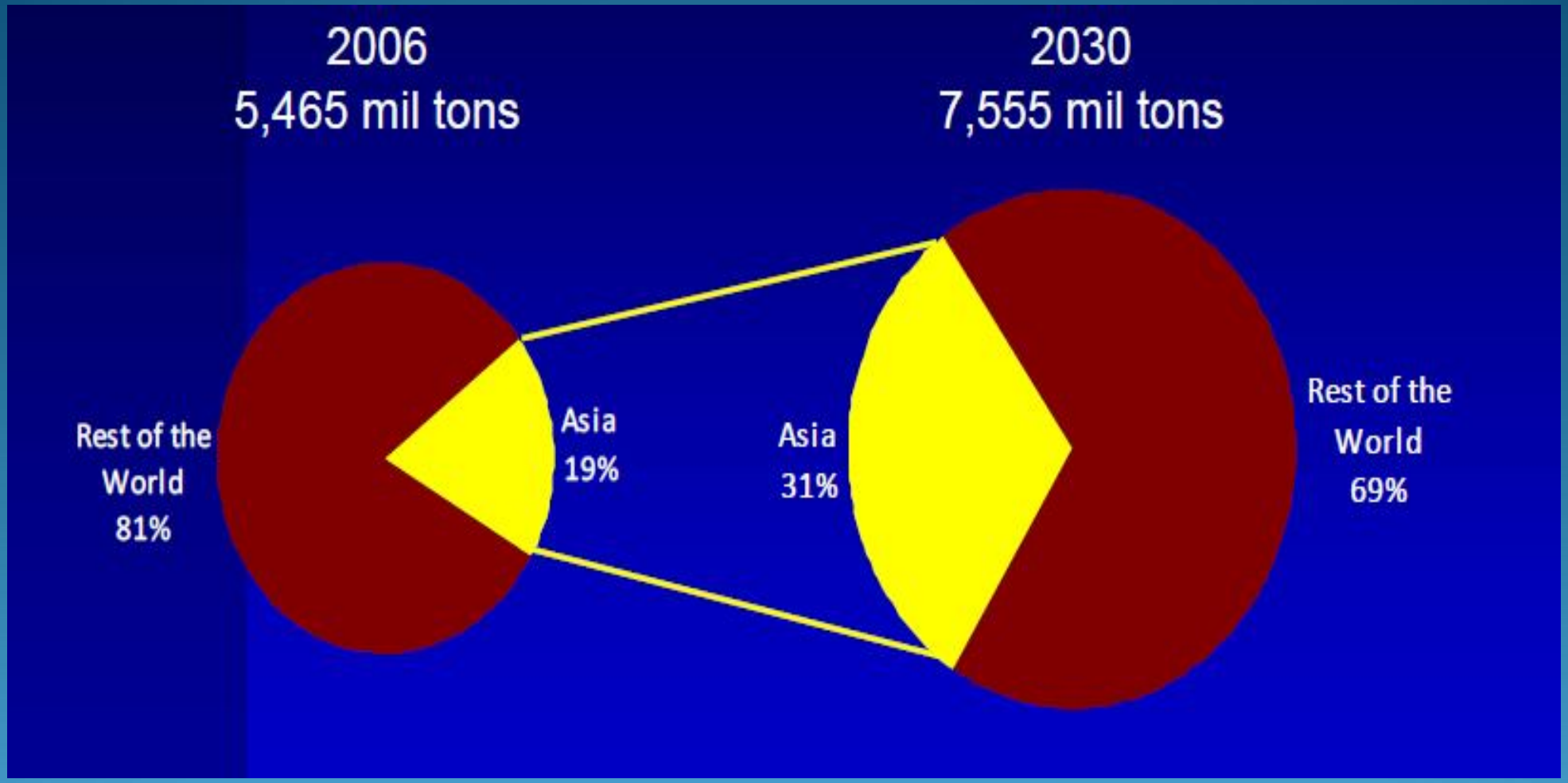
Energy Security

image: bgnentrepreneur.net

GHG(CO_2) emissions from transport sector



Source: IEA, World Energy Outlook 2008

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Asian Perspectives

Transport is a key driver of development, but ...

- Motorization doubling every 5-7 years
- Congestion costs 2%-5% of Asian GDP
- Road accidents costs 2%-5% of Asian GDP
- Energy use ~ 30% of World energy
- Fuel security - US$50-150/barrel
- CO_2 - 23% from transport sector
- Local pollution – health problems and cost

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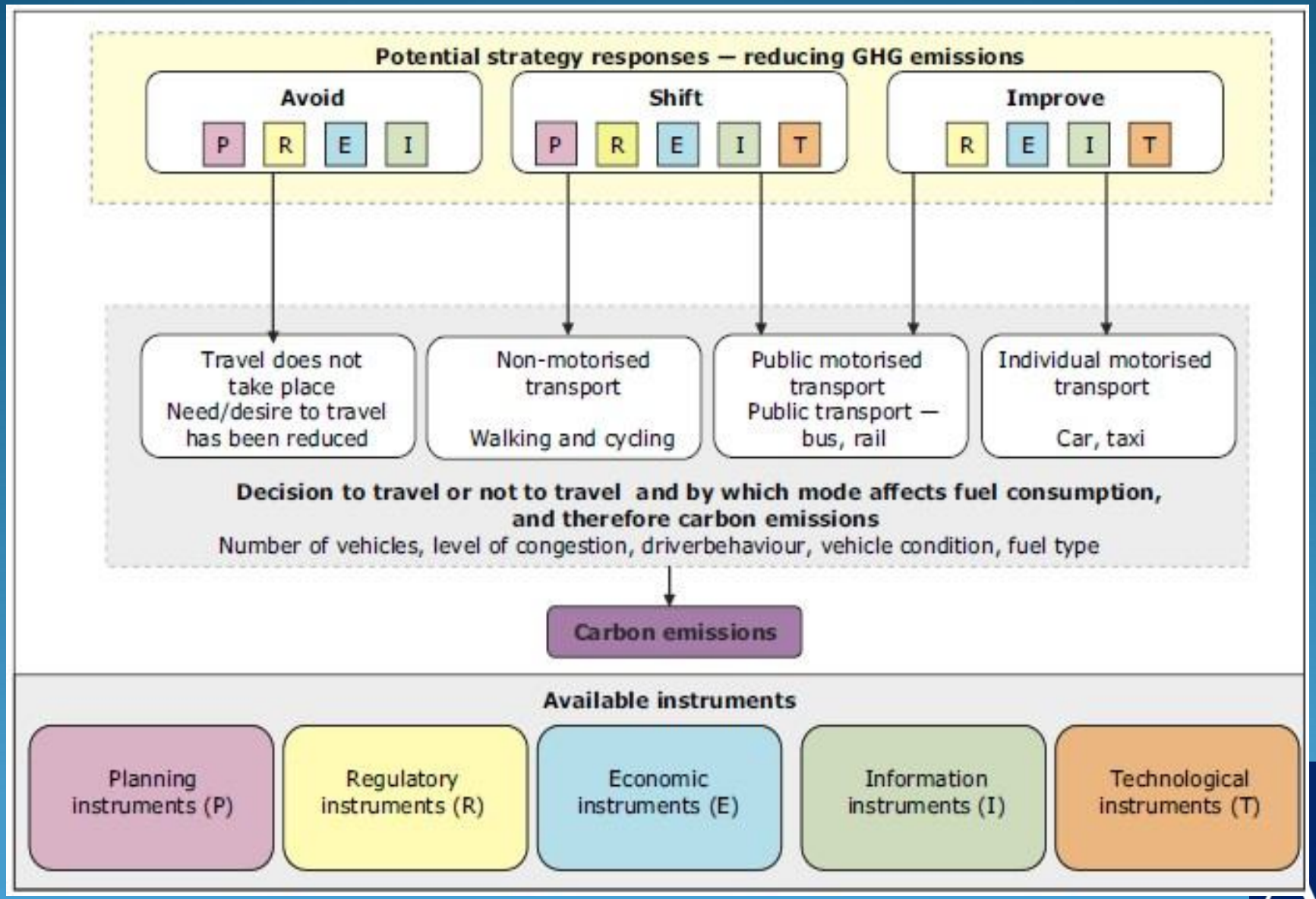
2. ADB Strategy

This Inconvenient Truth has served as a wake-up call for ADB...

- ADB's transport portfolio has always been large
- ADB is a trusted partner in the transport sector
- Transport has been the backbone of ADB lending operations

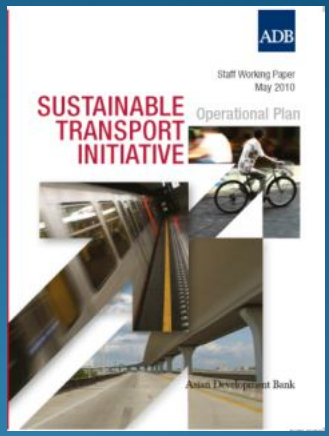
However changing times require New Direction..

General strategy



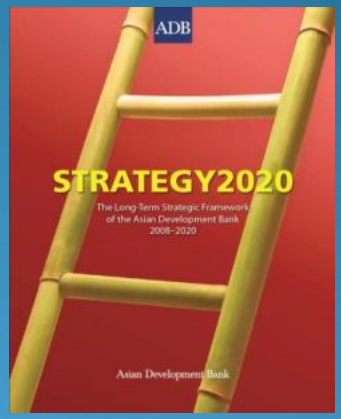
Source : Dalkmann, & Brannigan, 2007

These New Directions are Captured in ADB's New Sustainable Transport Initiative (STI)



ADB has recognized the need to align its transport operations with Strategy 2020, which is based on three core pillars:

- inclusive economic growth,
- environmentally sustainable growth and
- regional integration



ADB has also recognized the need to align its transport operations with the changing needs and demands of the Asia and Pacific Region.

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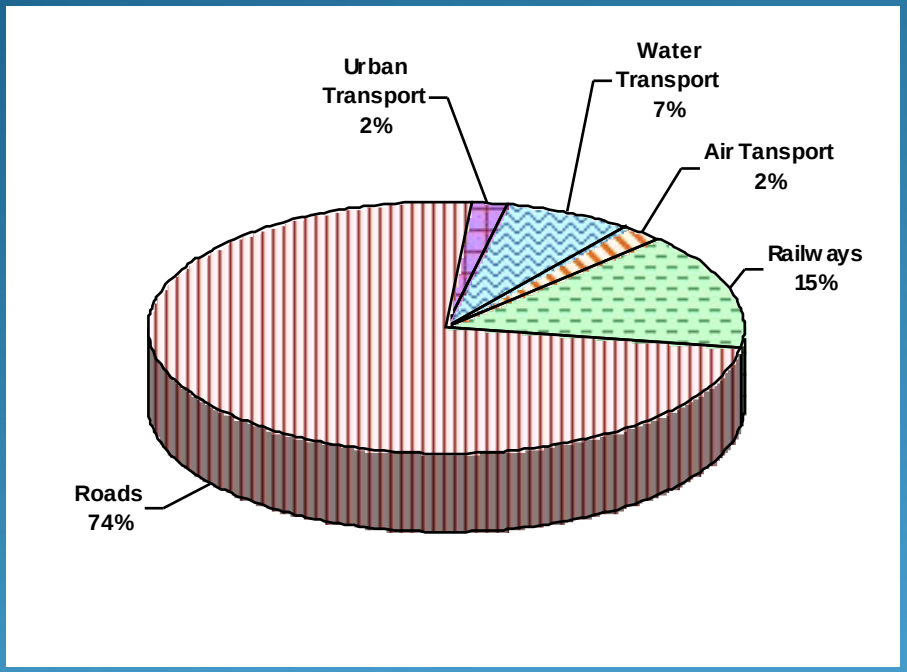
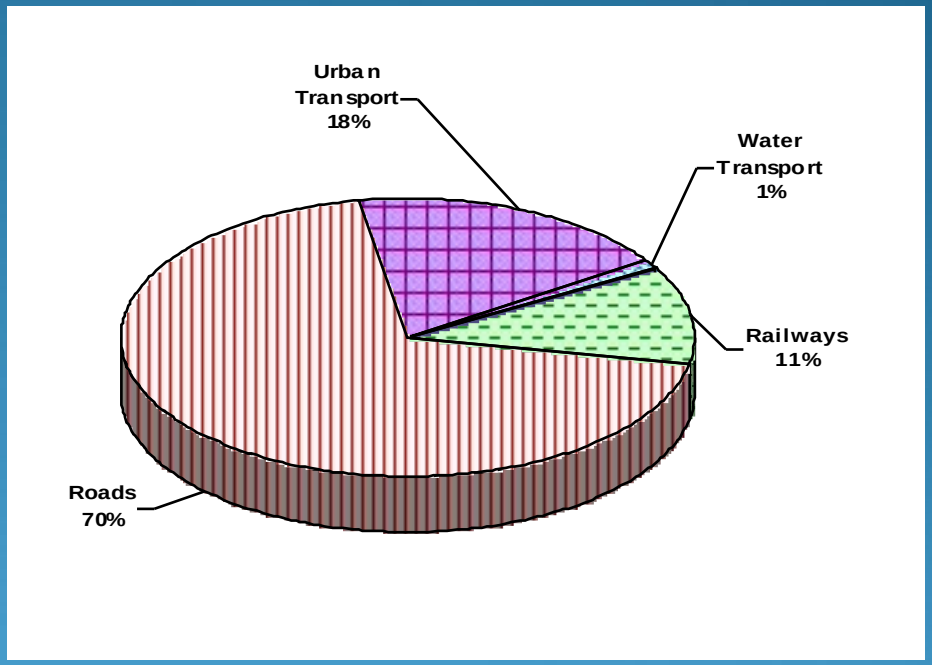
ADB's Transport Operations are Changing

1970-2009



2010-2012



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ADB Road Sector Assistance…

- **Over the years, ADB's support in the Road Sector has focused on improving access, enhancing economic opportunities, and increasing mobility especially for remote rural communities and farmers.**
- **Key outputs (2005-2009)**
  - 1,400 km of expressways
  - 40,000 km of national highways, provincial and rural roads.
- **Road loans included…**
  - strengthening the capacity of road institutions
  - increasing private sector participation
  - complementary investments to increase poverty reduction impacts
  - road asset management
- **ADB's sub-regional programs…**
  - improved physical connectivity
  - economic integration of neighboring countries

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ADB's Sustainable Transport Initiative
Opportunities for New and Enhanced Operations

- **Scaling-up urban transport** – scale-up operations, promote model projects such as BRT and rail MRT
- **Mainstreaming climate change** – model projects for mode shifting and distance shortening
- **Improving cross-border transport and logistics** – more effective transport and trade facilitation
- **Supporting road safety and social sustainability** – scale-up, strengthen approach, and partner with road safety organizations and social development institutions

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Sustainable Transport Initiative Phasing

STI implementation in 3 phases

2010-11	2012-15	2016-20
• Mainstreaming • Scale up early opportunities • Study further opportunities	• Full implementation of early opportunities • Scale up further opportunities	• Full implementation

The Sustainable Transport Initiative was approved by ADB Management on 20 July 2010

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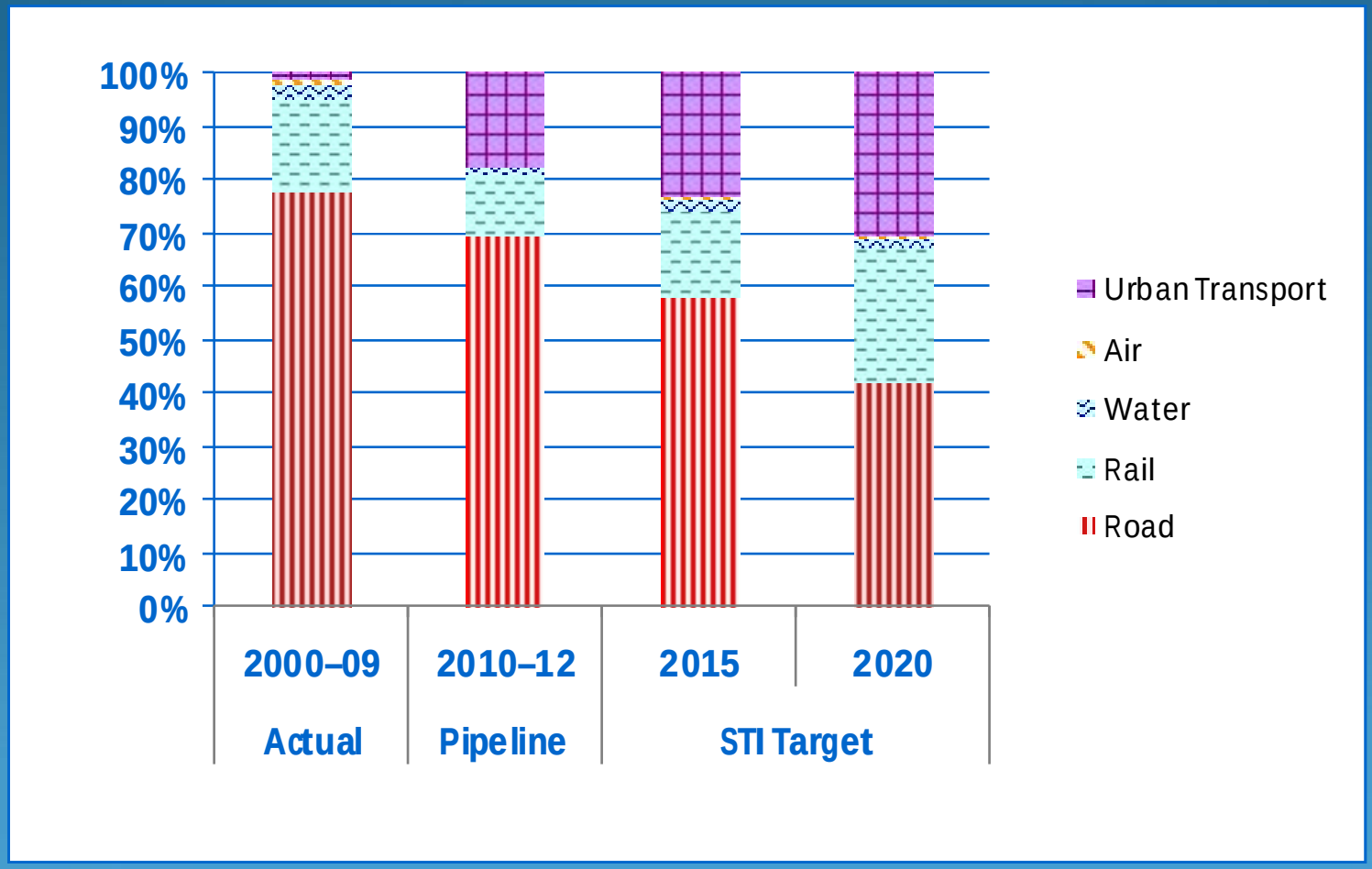
Annual Transport Lending – Actual and Targets



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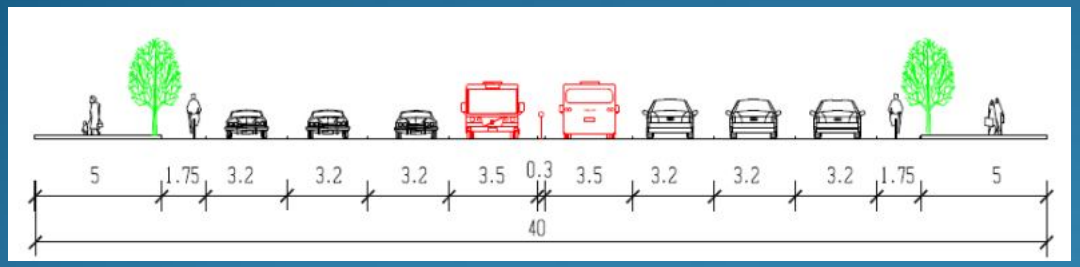
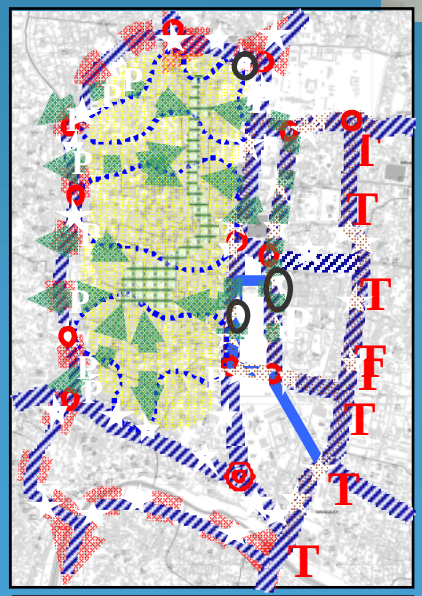
Early Opportunities: Scaling-up Urban Transport

BRT projects in Lanzhou and Pimpri, Pune, Ulaanbaatar



Metro Rail projects in Ho Chi Minh, Hanoi, Tbilisi



Integrated urban transport in Kathmandu, Dhaka, Davao, Vientiane, Xian, Yerevan

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Early Opportunities: Mainstreaming Climate change:

- **Railways**
  - Afghanistan: Hairatan to Mazar-e-Sharif (75km)
  - PRC: Energy Efficiency and Safety Enhancement Investment program
  - Cambodia: Rehabilitation 600 kms of track
- **Road projects** – national, state highway and rural roads
- CO_2 emitted over **full life cycle**
- Ongoing Study on **Reducing Carbon Emissions** from Transport Projects
- **Impact Assessment**

Afghanistan, People's Republic of China, Cambodia Bangladesh, Viet Nam, India, Azerbaijan

Carbon Footprinting of Transport Projects

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Improving Cross-border Transport and Logistics

- Multi-country regional projects to improve border crossings
- Cross-border transport and logistics within regional cooperation programs e.g. GMS, CAREC, SAARC
- Proposed regional infrastructure integration facility, including support for Asian Highway

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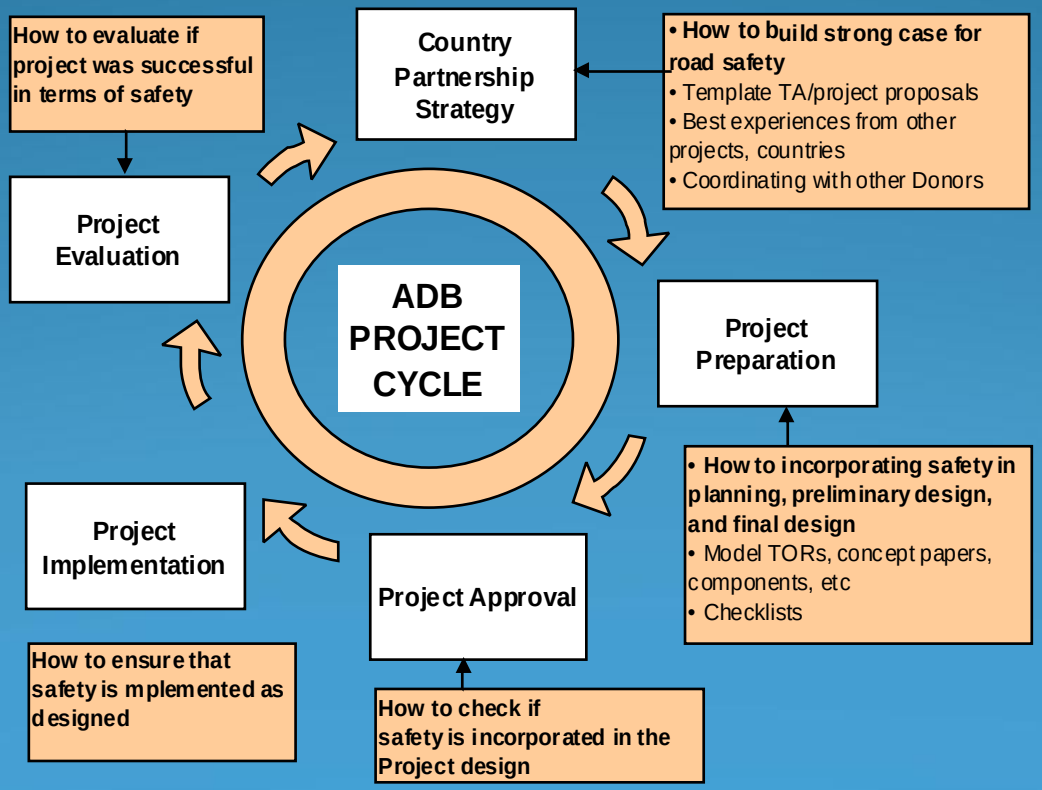
Supporting Road Safety Initiatives

- ADB Road Safety Action Plan under development
- Road safety components of road projects
- Stand-alone road safety projects



3. Implementation : New economic models

Evaluation of transport project : sustainability issues

Economic	Social	Environmental
Mobility/Accessibility	Equity objectives	Air pollution
Congestion reduction	Affordability	Noise pollution
Road and parking facility costs	Human health	Water pollution
Consumer costs	Community cohesion	Climate protection
Employment and business activity	Cultural preservation	Habitat preservation
Tax burden	Community livability	Avoidance of irreversibility
	Public Participation	Aesthetics

Evaluation of transport project : conventional considerations

Generally Considered

- Financial costs to governments
- Travel time / congestion delays
- Vehicle operating costs
- Per-mile crash impacts
- Project environmental impacts

Often Overlooked

- Downstream congestion
- Parking facility costs costs
- Vehicle ownership costs
- Crash, energy & pollution impacts of changes in mileage
- Land use impacts (sprawl)
- Impacts on mobility for non-drivers/equity impacts
- Public fitness and health

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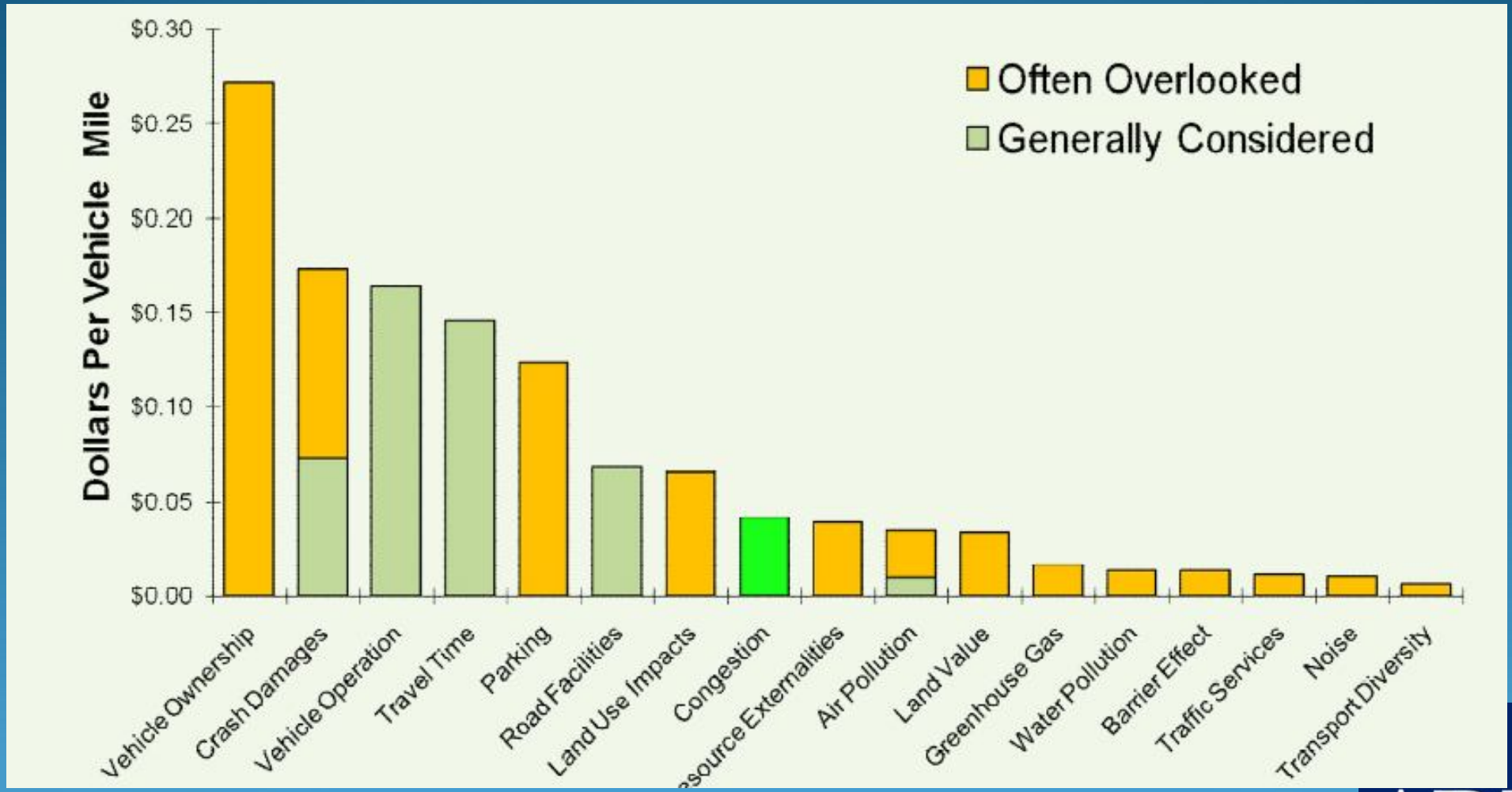
Evaluation of transport project : comparing costs



Source : Litman , 2010

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Evaluation of transport project : more comprehensive evaluation

- Travel speeds and congestion impacts
- Barrier effects (delays vehicle traffic imposes on pedestrians and cyclists)
- Road and parking facility costs
- Consumer costs and affordability
- Quality not just quantity of time
- All accident risks (to users and others; from changes in total mobility)
- Energy costs (including economic costs of oil imports)
- Air, noise and water pollution
- Quality of mobility for non-drivers (equity impacts)
- Support for strategic land use objectives (such as habitat preservation and economies of agglomeration)
- Public fitness and health
- Impacts of induced travel (from expanded roads and sprawl).

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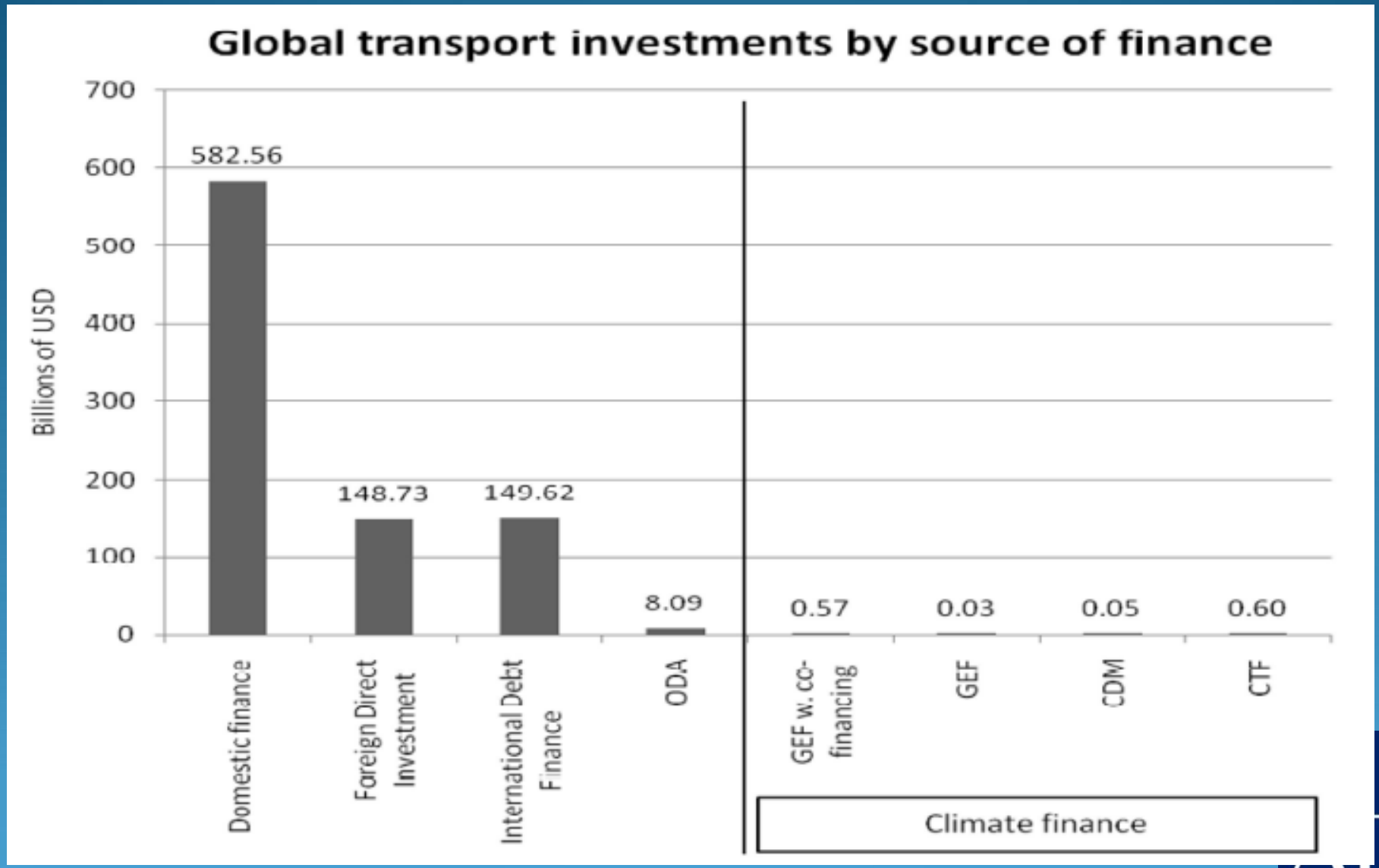
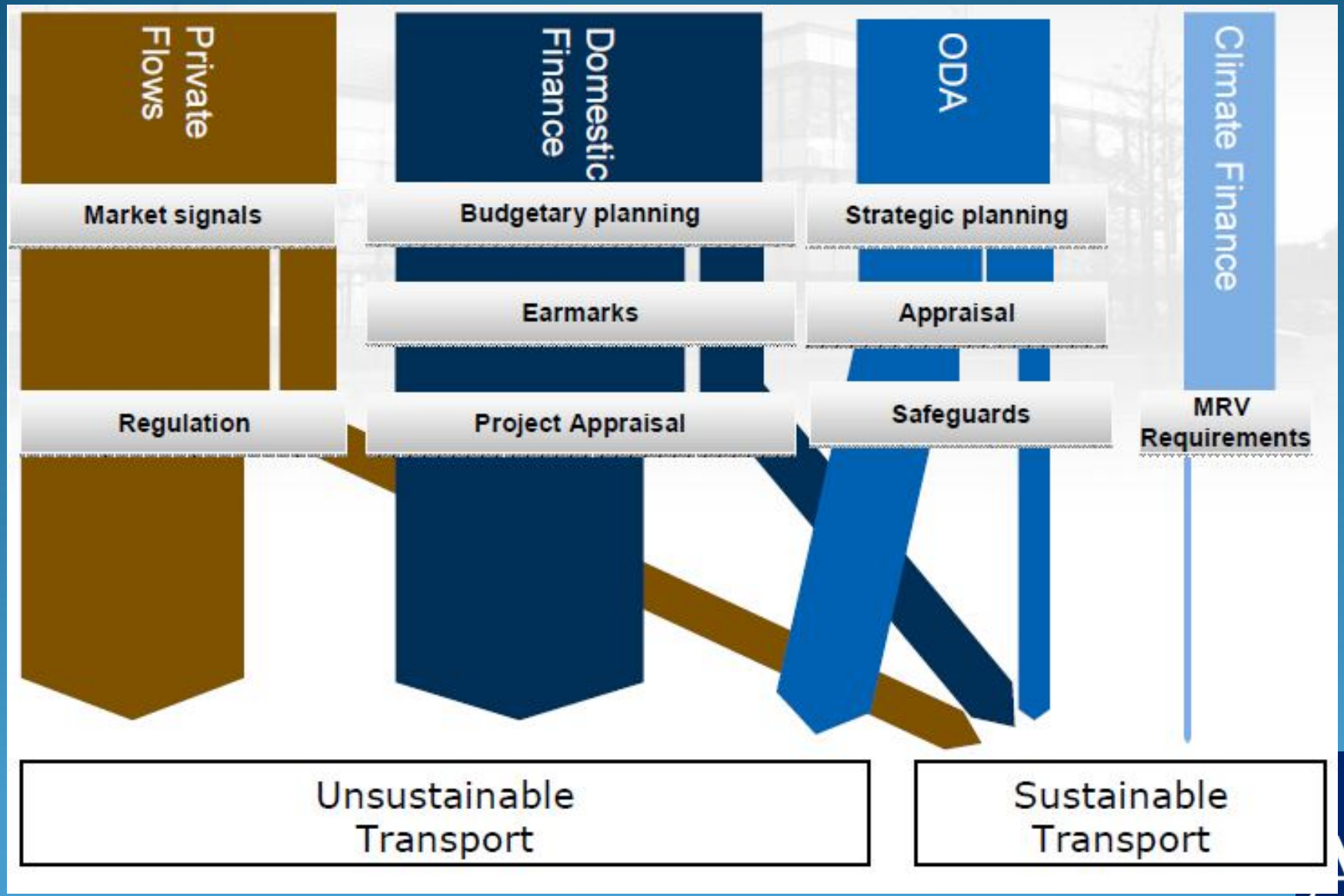
Financing for sustainable transport : source of finance



Financing for sustainable transport : current financing mechanism



Source : Dalkmann, 2010

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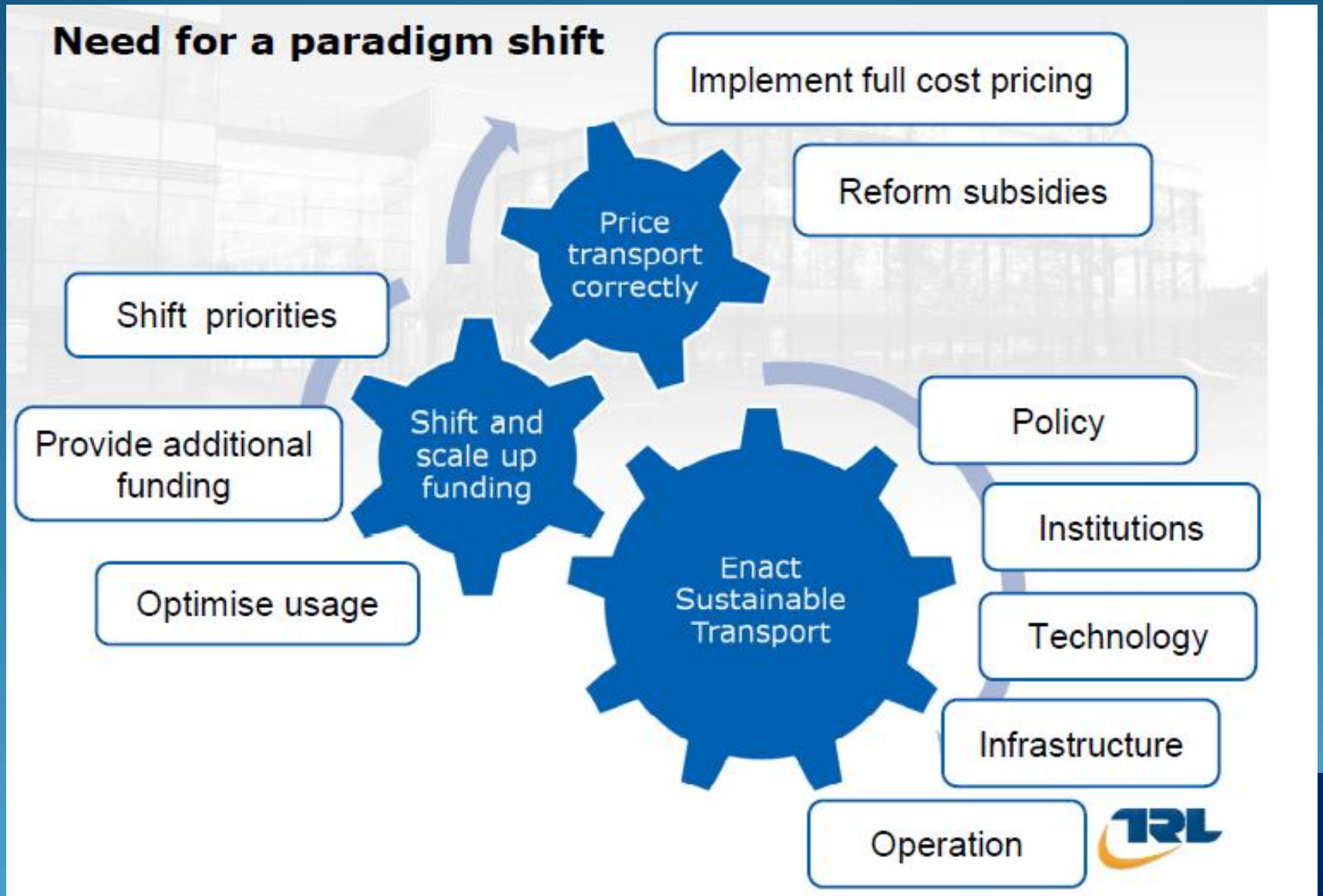
Financing for sustainable transport



Source : Dalkmann, 2010

Financing for sustainable transport : considerable funding sources

Funding mechanism		Avoid	Shift	Improve
Transport oriented funding mechanisms				
Public Sector Funding	Fuel tax	✓✓✓	✓✓	✓✓✓
	Vehicle taxes	✓✓	✓✓	✓✓
	Parking charges	✓✓	✓✓	
	Road pricing	✓✓✓	✓✓✓	✓
	Fare revenue*		✓	
	Public transport subsidies		✓	
	Business taxes		✓	
	Land related taxes and charges	✓✓✓	✓✓	
	Grants, loans, tax transfers	✓✓	✓✓	✓✓
Advertising			✓	
Private sector investments		✓	✓	✓✓✓
"Green" funding mechanisms				
Environmental taxation and subsidies		✓	✓✓	✓✓
CDM		P	PP	PP
ETS		P	P	✓ / P
GEF		P	✓	✓
Multilateral/ bilateral funds		P	✓ / P	✓ / P
NAMA related funding**		P	PP	P

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Financing for sustainable transport : relevant stakeholder's action

- **Developing country governments**

  - Shift their domestic budgets towards a sustainable direction

  - Request for international support

  - Provide market signal to the private sector to invest sustainable ways

- **Multilateral development banks and bilateral development agencies**

  Align their grant support and lending criteria with sustainable objectives

  - Catalyse major changes in domestic priorities as a result

- **The private sector**

  - Given the right market signals, invest in, innovate and create new technologies and services that are supportive of sustainable transport

Information about ADB's Sustainable Transport Initiative can be found at:

http://www.adb.org/Transport/default.asp