


Low-Carbon Land Transport Options towards reducing Climate Impacts and achieving Co-Benefits

Moving Africa Forward: Transport Policies for Growth and Integration-SSATP Annual Meeting 2010-
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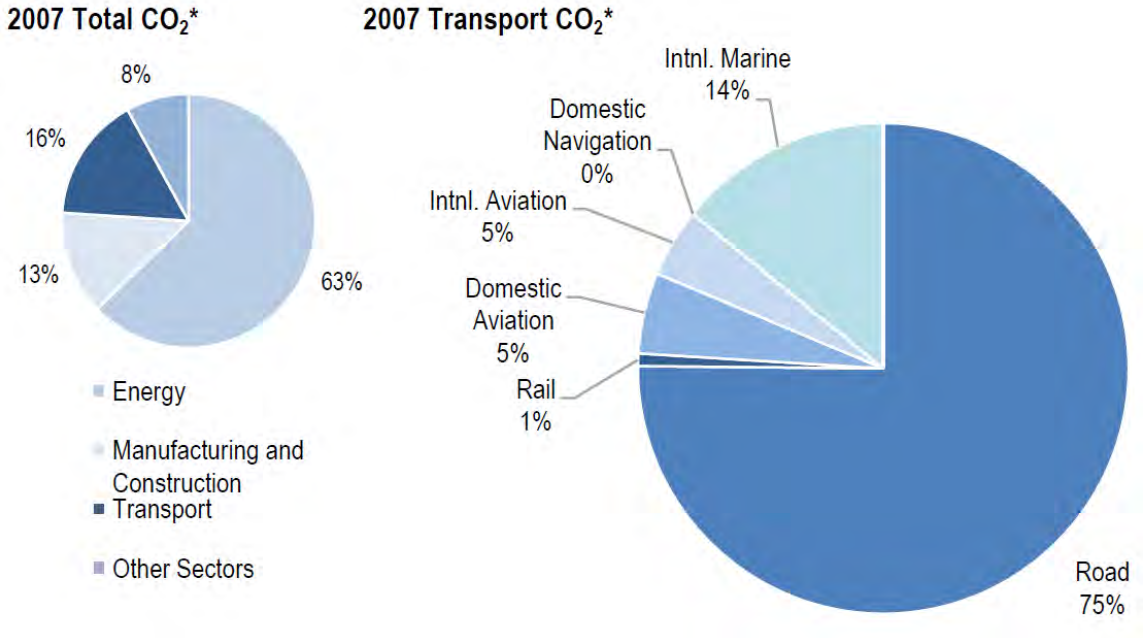
GTZ – Water, Energy, Transport

Challenges in Urban Transport

Transport accounts for 13% of global GHG emissions; in developing countries energy consumption and CO2 emissions from transport are increasing rapidly.

E.g. in South Africa, 2007, **Transport contributed to 16% of the country's total CO2 emissions, with road transport producing 75% of transport emissions.** Many developing countries experience the same situation.



Source: ITF data 2010

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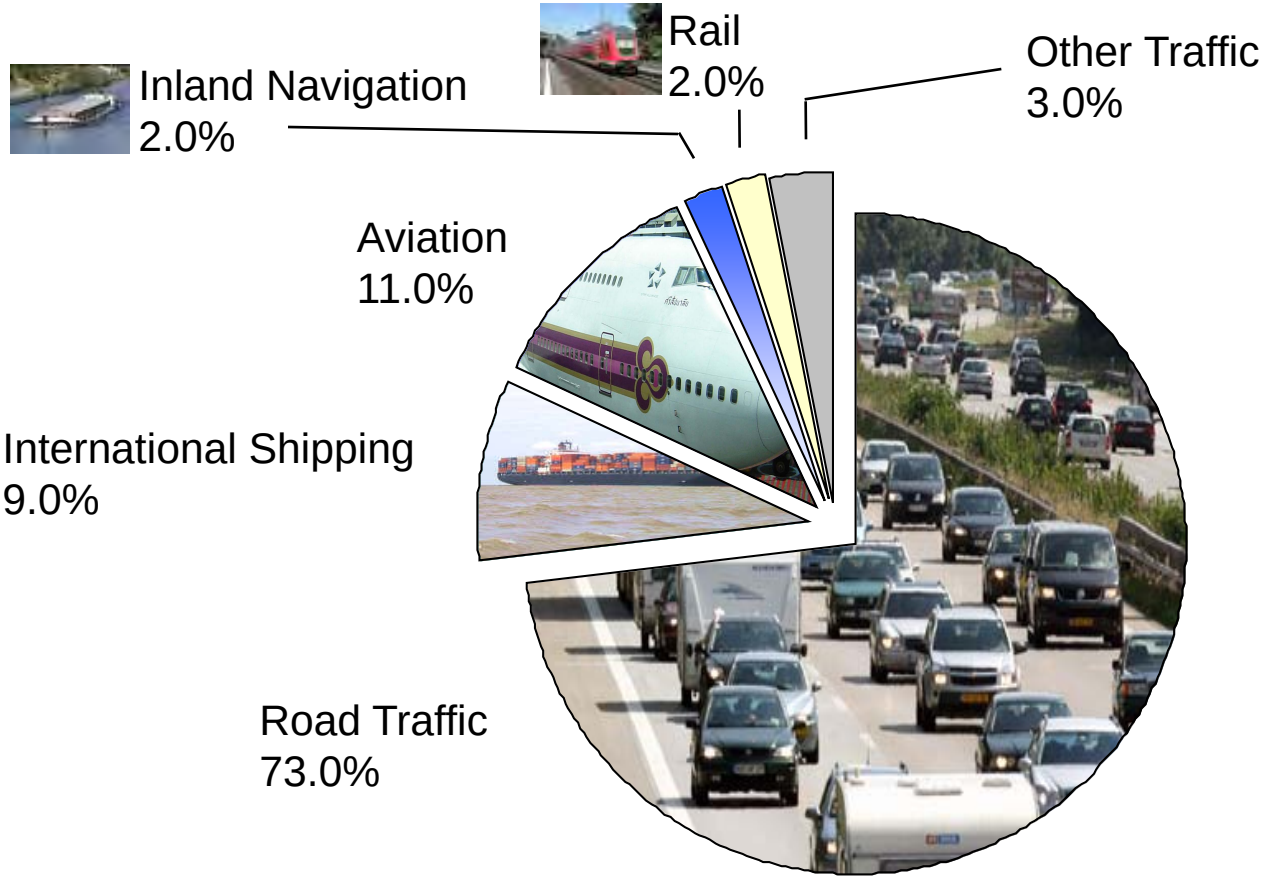
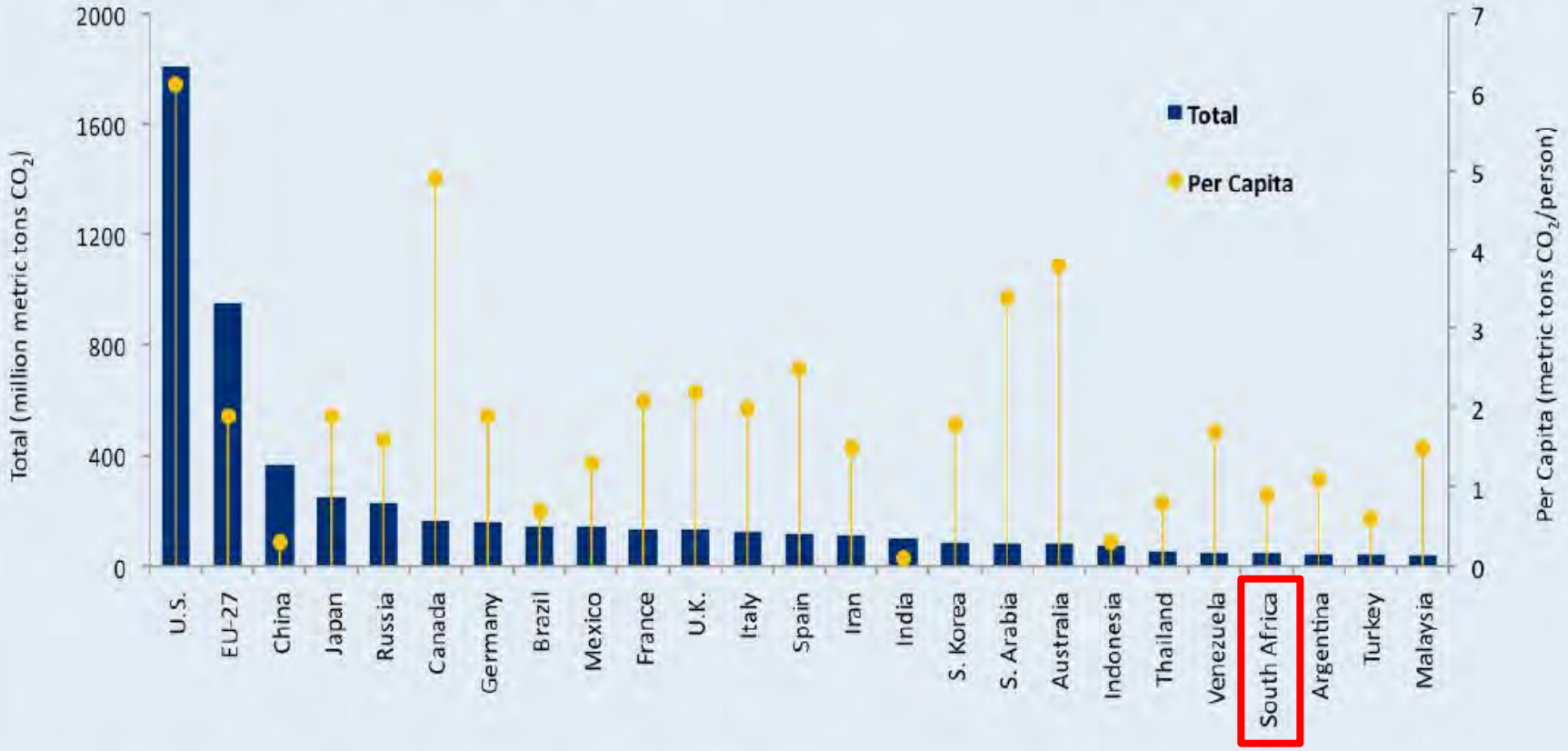
Transport CO_2-Emissions by Mode (2005)

Within the transport sector, road traffic is responsible for the largest share of emissions:



Source: ITF/IEA

Top Emitters of CO_2 from Transportation, Total and Per Capita, 2006



Source: WRI, CAIT v. 7.0 (http://cait.wri.org) based on IEA, 2008. Adapted from Figure 12.4 in *Navigating the Numbers* (Baumert et al., 2005).

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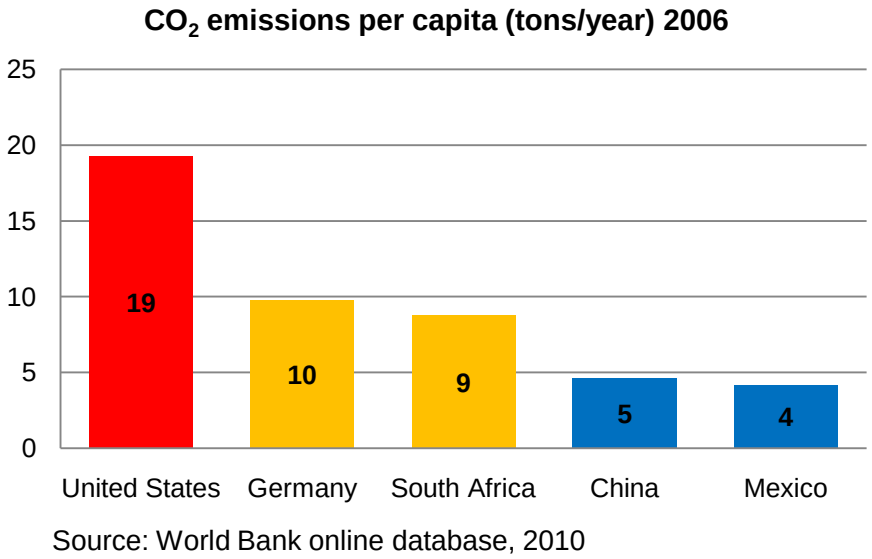
Long-term objectives

- Global warming limited to below 2°C in relation to pre-industrial times (before 1900)

- Tolerable **2 t CO_2** per capita and year over all countries



Source: World Bank online database, 2010

- Required reduction until 2050
  - in industrialized countries: **80-90 %**
  - In developing countries: **50 %**

Humans love to **move**, **travel**, **discover**…

by different ways and modes…

In most cities, **mobility** is dominated by **personal motorized transport.**

Many people choose **cars** to move around…

Road transport is a major contributor to **air pollution** and **climate change.**

Transport contributes to **23%** of energy-related CO2 **emissions** and is still growing!

Worldwide, 1.2 Million **road deaths** and more than 20 Million **people injured** per year

10-25% of urban areas are taken by **road** transportation infrastructure
a lot of space for cars but…

…where is the **space for people?**

the **silent** pedestrian, the **invisible** cyclist must be **seen**… and **heard**

There is an **alternative** to automobile dependency:

- Compact cities
- Mixed land use

Redesigning urban space

Sustainable transport modes:

- walking
- cycling
- public transport

We can **simply share** our space: pedestrians, cyclists, vehicles…
public and private, motorized and **non-motorized**

…we can even **reclaim** our space and **enjoy** the people's mobility!

making our cities full of **life** and **happiness**

Seoul, 2005: the City **tore down** 5.8 km of elevated **freeway** and exhumed a buried river…

less space for cars and more space for people!

Before

After

Can you find the differences?

Co-benefits of low carbon transport for SSA

Sustainable Low Carbon Transport …

- Increases energy security
- Reduces congestion and high public health costs
- Reduces land demand
- Increases international visibility and acknowledgement of cities that demonstrate leadership
- Opens new sources for funding (e.g. carbon related funding schemes)
- Enables political co-benefit: In London the popular major Ken Livingston was elected mainly because of his innovative transport policies.

Vision for a low carbon transport system

- **Dense** but **green** and **mixed** land use
- Modern, high quality links and **good integration**
- High quality **alternatives** to individual car-use, esp. efficient public transport and good non-motorized infrastructure and its proper integration;
- Efficient, inter-modal freight transport and smart urban logistics
- Vehicle and fuel efficiency
- Managing transport demand

Paris

Hong Kong

Curitiba

Zürich

Recent Achievements

- ✓ Bogotá
- ✓ Curitiba
- ✓ Copenhagen
- ✓ Zurich (#2, Mercer)
- ✓ Freiburg
- ✓ Vienna (#1, Mercer)
- ✓ Seoul
- ✓ Singapore (most livable city in Asia, Mercer)
- ✓ Hongkong

All of these successes featured an integrated and packaged approach:

1. **High-quality public transport**
2. **Improved conditions for walking and bicycling**
3. **Effective integration of modes**
4. **Supportive land-use policies**
5. **Car-restriction measures**

CO_2 emissions from passenger transport vs. modal split: Selected cities

	Share (%) of public transport, walking and cycling	CO_2 emissions (kg per capita per year)
Houston	5%	5690 kg
Montreal	26%	1930 kg
Madrid	49%	1050 kg
London	50%	1050 kg
Paris	54%	950 kg
Berlin	61%	774 kg
Tokyo	68%	818 kg
Hongkong	89%	378 kg

Source: UITP

ASI - Approach

AVOID/REDUCE	SHIFT	IMPROVE
Reduce or avoid travel or the need to travel	**Shift to more environmentally friendly modes**	**Improve the energy efficiency of transport modes and vehicle technology**
• Integration of transport and land-use planning • Smart logistics concepts • …	• Transport Demand Management • Mode shift to Non-Motorized Transport • Mode shift to Public Transport • …	• Low-friction lubricants • Optimal tire pressure • Low Rolling Resistance Tires • Speed limits Eco-Driving (Raising Awareness) • Shift to alternative fuels • …
1	2	3

1. GHG reduction through land use

1

Example: Carbon footprints (residential emissions only) in different neighborhoods in Toronto, Canada

East York - 1.31 tCO2e/cap (residential only)

High-density apartment complexes within walking distance to a shopping center and public transit:
1,31 tCO2e/capita

Etobicoke - 6.62 tCO2e/cap (residential only)

High-density single family homes close to the city center and accessible by public transit:
6,62 tCO2e/capita

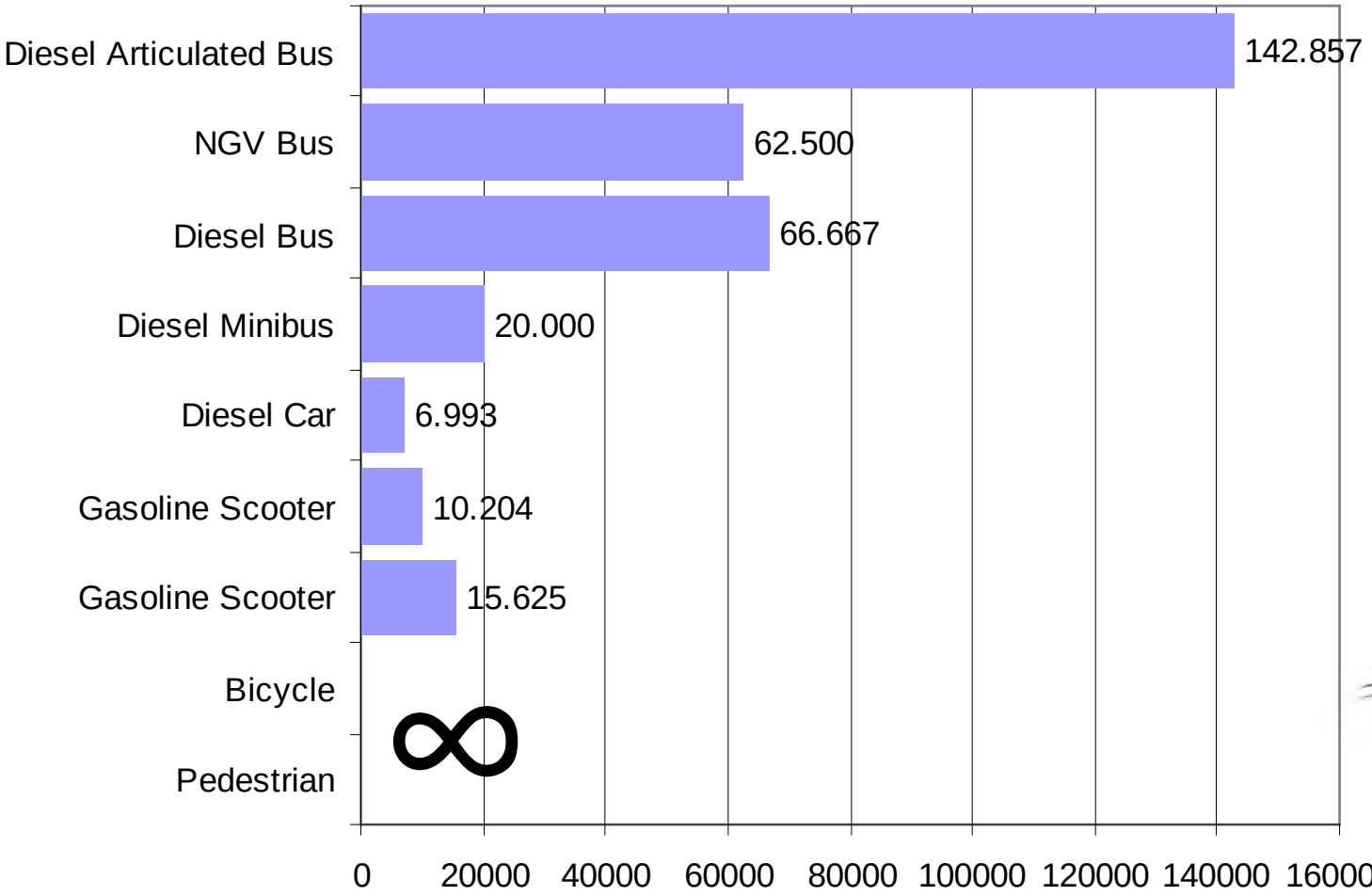
Whitby 13.02 tCO2e/cap (residential only)

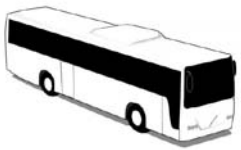
Suburbs with large, low-density single family homes that are distant from commercial activity and public transit:
13,02 tCO2e/capita

Source: Dan Hoornweg/World Bank 2010, http://blogs.worldbank.org/climatechange

How far can I travel on 1 ton of CO_2 ?

2





Source: GTZ Sourcebook Module “Transport and Climate Change”, 2007, based on Hook / Wright, 2002

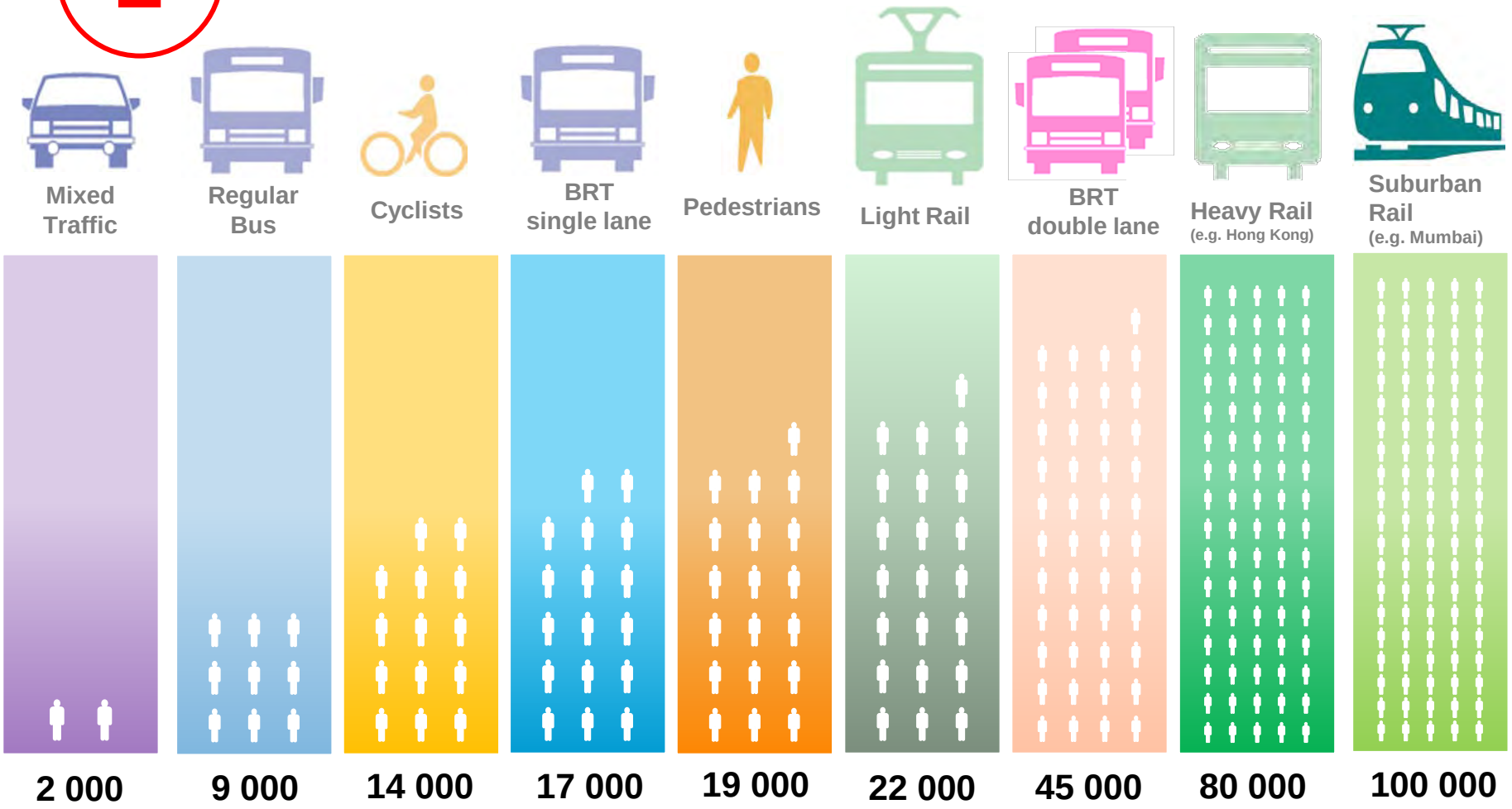
gtz Partner for the Future. Worldwide.

Inefficient use of urban road

Corridor Capacity

2

(people per hour on 3.5 m wide lane in the city)



Source: Botma & Papendrecht, TU Delft 1991 and own figures

Vehicle Efficiency

3

gearbox with long transmission

gearshift indicator

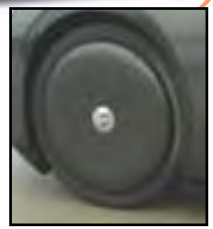
engine stop at idling

Light weight seats

Latent- heat storage

smoth under flow

lower body



smoth covers

narrower low rolling resistance tires

Slide by Axel Friedrich

Breaking the Trend

Energy consumption and transport

	Modal share of walking, cycling and public transport		Average energy consumption per person (MJ)	
	1995	2001	1995	2001
Athens	34,1	40,9	12.900	12.600
Geneva	44,8	48,8	23.600	19.200
Rome	43,2	43,8	18.200	17.100
Vienna	62	64	10.700	9.050

Cities which increased the modal share of walking, cycling and PT saw a decrease in the consumption of energy for passenger transport per capita.

Source: UITP

National Level Policy Packages

Policies	Basic Package	Advanced	Deluxe Package
1. Removal of fuel subsidies Remove incentives for non-sustainable transport modes			
2. Fuel taxation above European minimum taxation level Give incentives to travel less, use low carbon modes and purchase fuel efficient vehicles			
3. Low carbon long distance infrastructure Earmark a considerable share of the transport investments in low carbon modes.			
4. Efficiency standards Regulate car producers and correct market failures			
5. Removal of car-oriented subsidies e.g. for business cars in order to remove barriers for sustainable transport modes; replace with job-tickets			
6. Incentive Programme for municipalities to set up TDM, public transport and NMT investments and integrated land-use and transport plans			
7. Vehicle registration tax/ license auctioning e.g. taxing fuel inefficiency or weight			
8. Low-carbon fuel standards Incentivizing low carbon fuels, e.g. electric cars			
9. Research, Development and Demonstration For fuel efficient cars, electric bikes, busses and smart public transit			

Local Level Policy Packages

Area of Activity	Basic Package Minimum requirements	Advanced Package Standard approaches	Deluxe Package Premium low carbon approaches
1. Make roads people friendly	• side walks • reduce barriers • speed limits • bicycle lanes	• pedestrian and bicycle short cuts • Diverse street environment • Trees along roads • Separated networks for bicycles and pedestrians	• Public bicycle scheme • Shared space concepts
2. Manage parking demand	• Prohibit side walk parking	• maximum requirements for parking places for cars • minimum requirements for parking spaces for bicycles • Pricing for existing parking places	• Reduce/limit number of parking spaces in urban areas • Zero parking in new developments

Local Level Policy Packages

Area of Activity	Basic Package Minimum requirements	Advanced Package Standard approaches	Deluxe Package Premium low carbon approaches
3. Move to high quality public transit	• public transit clean and convenient • Increase speed through priority signaling	• Integrated ticketing / fares • Information / marketing • Green procurement of vehicles • Bus-only lanes along high-density areas • High quality interchange • Level boarding, and off-bus/metro fare collection to speed up transit	• Comprehensive bus rapid transit system • Urban rail network • Full integration of PT and NMT • Full integration with land-use
4. Provide inclusive information	• Information campaigns	• Cooperation with companies • Car-sharing • Bike-sharing • Car free days	• Travel information (Web 2.0)
5. Reap the benefits of technological advancement	• clean fuels and vehicles	• ITS • Green procurement • Prioritization of PT and NMT	

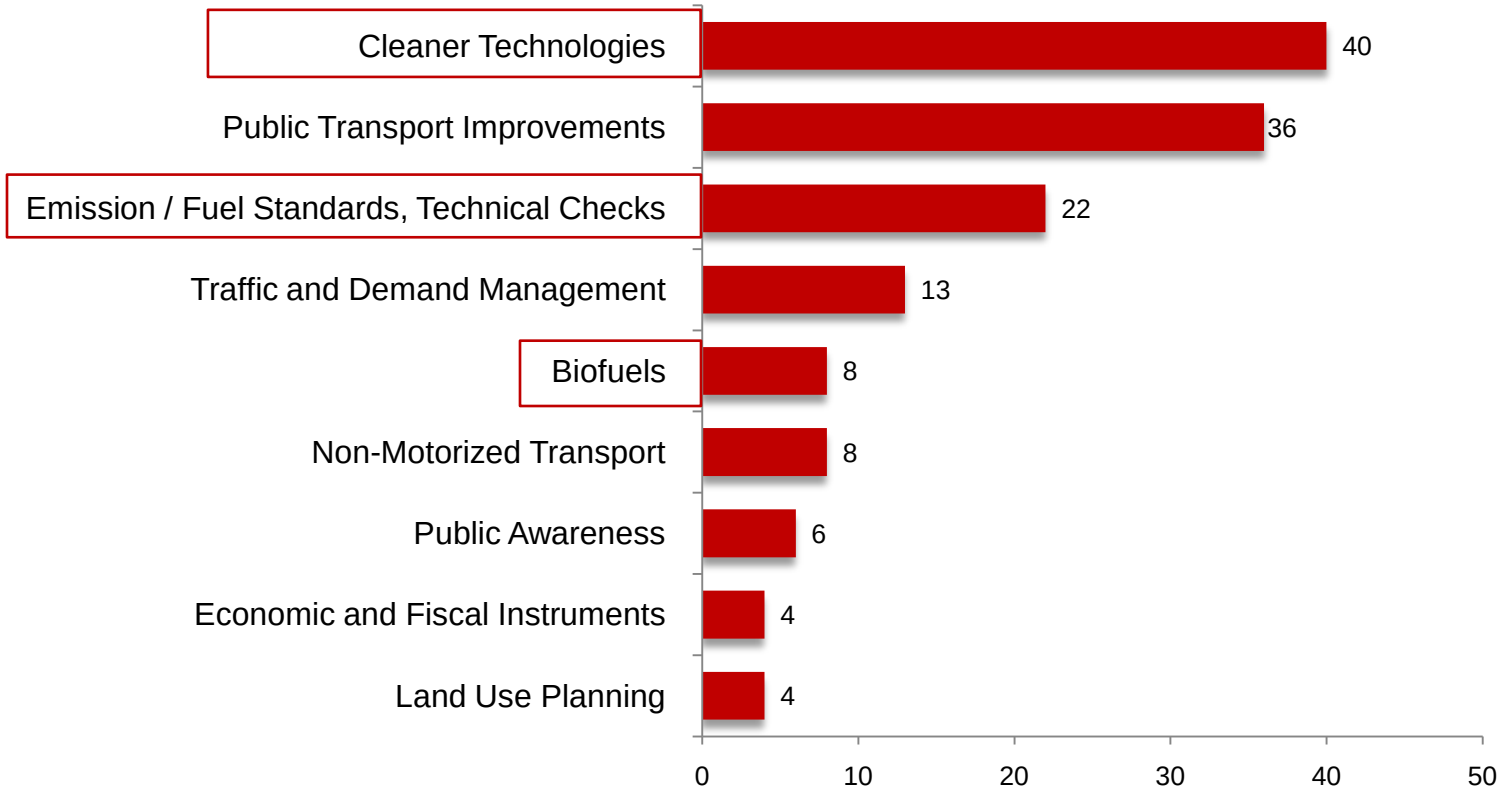
Local Level Policy Packages

Area of Activity	Basic Package Minimum requirements	Advanced Package Standard approaches	Deluxe Package Premium low carbon approaches
6. Change the role of cars	• Speed limits • Physical car restrictions	• Reduce investments for motorized traffic • Low emission zones • ITS	• Limitation of access to city centers • Congestion charge • Advanced city toll
7. Reinvent mixed-used, high density cities	• Mixed land use	• Land use regulation • TOD • Green belts	• Advanced integration of land-use and transport into planning • Accessibility of public transit
8. Create/ Live in urban spaces	• Wide side-walks • Pedestrian areas	• Urban greening • Diversity • Small public places	• Adapted architecture

3. Towards Transport NAMAs
(Nationally Appropriate Mitigation Actions)

Developing Countries Needs

An analysis of the transport chapters of 71 TNAs



Included in Annex 2 of the UNFCCC TNA Handbook

21 out of 71 analyzed Technology Needs Assessments do not have a transport chapter

Source: Bongardt/Schmid 2009

(Sustainable) **Transport NAMAs**

Nationally Appropriate Mitigation Actions

- When a new climate treaty is agreed, sustainable transport policies as listed above could be registered as NAMAs at the UNFCCC.

4. Selected GTZ Activities

Bridging the Gap- Initiative

Pathways for Transport in a Post 2012 Process

www.transport2012.org

Include transport in the climate agenda

Objective of the Initiative:
Integrate transport in the climate change negotiations

gtz TRL VEOLIA TRANSPORT ITDP Institute for Transportation & Development Policy UITP

Website in 4 Languages serving 4200 members in 5 continents

Chinese

Spanish

www.SUTP.org (Chinese website: www.SUTP.cn)

Sustainable Urban Transport: Knowledge base

The key features of the Sourcebook include:

- **A practical orientation, focusing on best practices in planning and regulation and, where possible, successful experiences in developing cities.**
- **Contributors are leading experts in their fields.**
- **An attractive and easy-to-read, colour layout.**
- **Non-technical language (to the extent possible), with technical terms explained.**
- **Updates via the Internet.**

1. Institutional and Policy Orientation
2. Land Use Planning and Demand Management
3. Transit, Walking, Cycling
4. Vehicles and Fuels
5. Social Issues in Transport
6. Environment and Health

Financing Sustainable Urban Transport

The newest Module “Financing Sustainable Urban Transport” has been be launched In August 2010.

Next Modules to be launched in November will be:
Urban Freight
Parking Management