Improving the sustainability of transport – The rail sector as a case study

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The rail industry in numbers

- 200 Members on 5 continents
- 2.7 billion passenger-kilometres
- 9.5 billion ton-kilometres
- 7.1 million railway staff
- 1,000,000 kilometres of lines worldwide

UIC in numbers

- 6 Regional Assemblies
- 7 Forums and Platforms
- 50 International Expert working groups
- 180 Cooperation projects
- 670 UIC Leaflets
- 200 reference documents
- 85 training sessions, conferences, seminars

Africa
- 6 active members
- 20 associate members
- 3 affiliate members

Asia-Oceania
- 8 active members
- 16 associate members
- 12 affiliate members

Europe
- 46 active members
- 26 associate members
- 16 affiliate members

Middle-East
- 4 active members
- 7 associate members
- 4 affiliate members

North America
- 1 associate members
- 1 affiliate members

South America
- 2 associate members
- 2 affiliate members
UIC Mission

Promoting the development of rail transport at world level, in order to meet challenges of mobility and sustainable development
The mobility challenge

> The explosion in global mobility has created environmental challenges

> Transport accounts for over 50% of world consumption of fossil fuels – forecast to increase to 60% in 2035

> Within transport rail accounts for 2% of CO2 emissions

Rail is a low carbon transport mode

www.ecotransit.org
(global carbon footprinting freight)

www.ecopassenger.org
(carbon footprinting passenger Europe)
Rail compared to other modes

Capacity

1 HST
129 cars
11 bus
3.5 planes

CO2

17 g CO2
30 g CO2
115 g CO2
153 g CO2

Source: Data by Alstomi and Calculation by SYSTRA

Safety

Deaths per billion passenger - km in Germany 2008

2.77
0.16
0.01

Car
Bus
Rail

Source: Allianz pro Schiene, Germany 2010

Noise

Total number of persons above 55 dB (day) and above 50 dB (night) in millions

Source: Henning Schwarz, UIC - UN CSD 19 Learning Centre – New York May 10th 2011
The general concept for transport:

- AVOID
  Reduce or remove demand for transport through better land-use planning, public transport integration and remote working

- SHIFT
  Move to more environmentally friendly modes such as walking, cycling and public transport

- IMPROVE
  Improve the environmental performance of transport, by improving the fuel economy and air pollution emissions from road vehicles and railways
Shift – Example High Speed Rail in Spain

Example AVE Madrid-Sevilla
Although one third of passengers are induced traffic overall CO2 emissions reduced by 60% on the corridor

Source: Renfe 2009
Improve – Strategic ambitions of European rail sector

**Target 2020**
Reduction of specific CO2 emissions from train operation by 30%*

**Target 2030**
Reduction of specific CO2 emissions from train operation by 50%*

**Vision 2050**
European railways will strive towards carbon-free train operation by 2050

* Base year 1990: measured per passenger-km (passenger service) and gross tonne-km (freight service)
Bringing it together: Declaration on Sustainable Mobility & Transport

> 18 statements on rail’s contribution and commitment to sustainable development

> 2012: Rio 20+: First rail sector sustainability report
Conclusions

> Rail is...
  - a low carbon mode
  - a very safe transport mode
  - a very resource efficient mass transport system

> Rail has an important social and economic role:
  - We are a major employer
  - We are key to the movement of freight
  - We are a solution to traffic congestion

> The challenge is to design fully inter-modally connected sustainable mass transport systems!
Outlook – sustainable transport

> A sustainable transport system combines the strengths of all transport modes in one integrated system

> Policies and funding strategies should follow a set of key sustainability indicators for transport

Qualified decisions for policy making

Qualified decisions for investment

> Rail is prepared to be the backbone of such sustainable transport systems!
Thank you for your kind attention!

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Rail has lowest environmental impacts

![Bar chart showing average costs in 2000 by cost category & transport mode (Euro / 1000 pkm)]

- Car
- Bus
- Rail
- Aviation
- Road
- Shipping
- Rail
- Aviation

Source: INFRAS/IWW, External costs of Transport, 2004
 Worldwide approaches to saving energy

**Australia** - The Freightmiser system is an in-cab advice system that assists long-haul train drivers to stay on time and minimise fuel consumption. Industry trials have found fuel savings of between 5% and 20%, with no increase to journey times.

**USA** - Regenerative braking is a whereby electric traction motors become generators, converting the energy of the train brake into usable power. In the United States these braking systems have allowed Amtrak to reduce energy consumption by 8%.

**Sweden** – The “Gröna Tåget” (Green Train) research shows further potential for reductions in energy consumption per seat km by 32% on the existing Stockholm to Gothenburg line through increased seating capacity and an increase in regenerative energy capacity.

**Japan** – Improvements in the design of Japanese Shinkansen trains, such as optimizing the length and shape of the lead nose and significantly reducing weight, have reduced energy consumption by 40% despite increase in maximum speed.