Discussion paper issued without formal editing

FOR PARTICIPANTS ONLY
23 April 2013
ENGLISH ONLY

UNITED NATIONS
CENTRE FOR REGIONAL DEVELOPMENT

In collaboration with

Ministry of Transportation, Government of Indonesia
Ministry of the Environment, Government of Japan

SEVENTH REGIONAL EST FORUM IN ASIA
&
GLOBAL CONSULTATION ON SUSTAINABLE TRANSPORT IN THE POST 2015 DEVELOPMENT AGENDA,
23-25 APRIL 2013, BALI, INDONESIA

RAILWAYS IN EST TOWARDS POST RIO + 20 DEVELOPMENT

(Background Paper for Plenary Session 7 of the Provisional Programme)

Final Draft

This background paper has been prepared by Mr. Alexander Veitch and Mr. Nick Craven for the Seventh Regional EST Forum in Asia. The views expressed herein are those of the authors only and do not necessarily reflect the views of the United Nations.

Railways in EST towards Post-Rio+20

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7th EST Forum + Global Meeting on Sustainable Transport Bali, Indonesia, 23 - 25 April 2013

1. Background

Introduction to Railways in EST and Sustainable Development
UIC, the international railway association which celebrated its 90th anniversary in 2012, counts 200 members across five continents (railway companies, infrastructure managers, rail-related transport operators). UIC's chief task is to promote railway transport around the world and help its members to meet all the current and future challenges of mobility and sustainable development.

According to the association's statutes, UIC's mission focuses mainly on:

- Promoting rail transport around the world with the aim to meet current and future challenges of mobility and sustainable development.
- Promoting interoperability, creating new world standards for railways, including common standards with other transport modes.
- Developing and facilitating all forms of international cooperation among members, facilitating the sharing of best practices (benchmarking).
- Supporting members in their efforts to develop new business and new areas of activity.
- Proposing new ways to improve technical and environmental performance of rail transport, boosting competitiveness and reducing costs.

UIC has a strong tradition of working on sustainability issues, both in supporting members in improving their sustainability performance, as well as communicating on the sector level towards key external stakeholders in order to support the development of sustainable transport systems.

UIC is the official railway representative to the United Nations and is an active stakeholder in international climate change and sustainable development negotiations. For example, UIC attended the Johannesburg World Summit on Sustainable Development in 2002, and also Rio+20 in 2012.

A particular highlight in recent years was the Train to Copenhagen initiative (www.traintocopenhagen. org), run in partnership with UNEP and WWF, which took the climate message of train travel from Kyoto to Copenhagen. Part of this initiative was the Climate Express, which was a special train arranged by railway operators from Brussels to Copenhagen. More than 400 passengers took the Climate Express, including Achim Steiner, Executive Director of UNEP, James P. Leape of WWF International, members of national government delegations, journalists, and railway representatives

More recently, UIC was very active in the planning of Rio+20 and at Rio+20 itself, organizing a series of activities to engage the UN in sustainable transport concepts and issue. Please see section 3 of this paper for more details on the implications of Rio+20 for the rail sector, and see the Appendix for a summary of information UIC activities before and during the Rio+20 Earth Summit.

The UIC is proud to cooperate with the United Nations, in many different fora and negotiation sessions. The Environmentally Sustainable Transport conference offers a unique opportunity to discuss with colleagues in the Asian region the opportunities for sustainable transport, and to make the case that railways have an important contribution to make.

The UIC was delighted to co-operated in EST 2011 in New Delhi, India, where our representative Mr. Mukul Mathur presented at a dedicated session on railways, on the topic of “railways in emerging economies. We are similarly honoured to have been invited to present this paper to EST 2013, and we look forward to continued cooperation in the future.

Issues and challenges

Mobility and transport have a variety of impacts that affect the economic, environmental, and social aspects of society in both positive and negative ways. The growth of mobility has delivered economic growth, but has also created environmental and social challenges. For example, in Beijing, People's Republic of China, new car registrations, which had reached a height of 60,000 per month, were limited by government authorities to 20,000 per month in the year 2011 due to concerns over congestion and pollution[1].

This trend in car ownership and use can be seen on a global level where transport already accounts for over 50% of world fossil fuel use. This share is expected to increase to over 60% by 2035[2]. The majority of fossil fuel is used in the road sector, and therefore it is the road sector that produces the majority of carbon dioxide (CO2) from transport.

Railways can help address the transport and mobility challenge. For example, Rail is a high capacity but low carbon mode. Therefore, moving passengers onto rail from air and road transport can deliver reductions in CO2 emissions. Rail has approximately a 6%[3]. share of the world transport market, but only produces 2% of transport GHG emissions[4].

Rail is also more resource-efficient than other modes, for example with a lower land-take requirement than roads, and providing lower-carbon, less-polluting, accessible passenger and freight transport that simultaneously alleviates traffic congestion and provides access to employment, goods and services. Linked to integrated public transport and sustainable freight delivery systems, rail can be the backbone of a truly integrated sustainable transport network.

2. Trends in Railway Development – best cases around the world

Railways all over the world are engaged in all manner of projects to improve their own sustainability performance, and/or to improve the overall sustainability performance of transport systems. This paper selects some brief examples of some of the most important and interesting projects, considering environmental, social and economic aspects of sustainability[5].

Energy and CO2

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1 Beijing dramatically limits new vehicle registrations 2012, Just-Auto.com, January 4th 2011

2 EIA, International Energy Outlook 2010

3 UIC estimate

4 International Transport Forum, "Greenhouse Gas Emissions: Country Data 2010"

5 For more information please see the UIC Sustainable Development Report 2012, and many other studies and reports, at www.uic.org/environment

The global railway sector is working extremely hard to maintain its environmental advantage by improving its energy efficiency and reducing its CO2 emissions. Several railway companies have established their own targets.

For example, U.S. passenger operator Amtrak joined the Chicago Carbon Exchange (CCX) in 2003 and voluntarily made a commitment to reduce Greenhouse Gas (GhG) emissions by 6% from 2003 through 2010, using the baseline years 1998-2001, at that time the largest single voluntary commitment of any company in the U.S. Amtrak achieved its target as planned in 2010. There are collective targets too. For example, 28 European members of UIC have collectively committed to reduce CO2 emissions per passenger kilometer and ton/kilometer by 50% by 2030, and are well on track to meet this target.

High Speed Rail (HSR) also delivers CO2 reduction benefits. A study for UIC, which analyzed HSR in France and People's Republic of China, concluded that the carbon footprint of HSR can be up to 14 times less carbon intensive than car travel and up to 15 times less than aviation even when measured over the full life-cycle of planning, construction and operation[6].

Improving energy efficiency is the most important aspect of the railway's strategies to reduce CO2 emissions, and of course has significant business benefits by reducing costs. For example, French railway SNCF's energy costs are around €800m annually, with 80% used to power trains and 20% to operate buildings. SNCF is introducing a 19-step energy-saving program to reduce this consumption, and shaving 5 or 10% off their energy use would deliver not only significant environmental benefi ts but also help reduce costs.

Railway operators with electrified systems have the opportunity to use renewable energy to reduce their CO2 emissions, and many already do this. For example in Finland, VR has switched entirely to hydro- electric power, thus halving its CO2 emissions. In January the Board of Swiss Railway SBB decided to cover future additional energy demand (400 GWh) with hydro- electric power. In Spain, the high production of renewable energy in the electricity sector (around 46% in 2010), allowed the Spanish rail infrastructure manager Adif to achieve a renewable energy consumption of around 34.5% of its traction energy supply.

Some railways produce their own renewable energy. A particularly innovative example is the Schoten Rail Tunnel near Antwerp in Belgium, where infrastructure manager Infrabel has installed 17,820 solar panels on the roof, covering a total length of 3.4 kilometers (or 8 football fields) which will deliver 3,300 MWh of electricity every year. This corresponds to the average annual consumption of around 950 families and will save 47.3 million kg CO2 over 20 years.

Nature and Biodiversity

In several countries the railway is one of the largest land owners and managers, creating a special responsibility to manage land in the best interest of nature and biodiversity. For operational reasons, railways need to manage vegetation near the line and take care of animals living on, near or crossing the lines. This section highlights just two examples of how railways around the world are dealing with these issues.

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6 High Speed Rail Carbon Footprint Study www.uic.org/environment

The increasing number of Bald Eagles along the Hudson River in upstate New York is a success story for the natural environment, but unfortunately increases the risk of bird strike for the railway. Amtrak and government organizations have established a plan to reduce eagle mortalities. For example by removing dead animals, which are a source of food for eagles, from near the railway, fewer eagles are attracted to the tracks. A comprehensive Eagle Conservation Plan is being developed.

In Bulgaria the poles that support the catenary system are popular places for the White Stork to build nests. Unfortunately, the overhanging boughs can short- circuit the electric system, causing the nests to catch fi re causing disruptions on the line and burning the eggs or young birds. The Bulgarian Railway (NRIC) received permission from the Ministry of Environment and Waters to remove a number of nests and re-build them on special platforms built over the catenary poles. Between February-March 2010, forty-three insulated platforms were installed protecting both the nests and the infrastructure.

Social Benefits: Safety

Safety is a key aspect of the social aspects of sustainable development and is also one of the most important subjects for any transport mode where the key objective is the transportation of people and products. Passenger railways are typically safer than using road transport, and are comparable to aviation in this regard.

A particularly important project in promoting international safety is the International Level Crossing Awareness Day (ILCAD), a yearly campaign aimed at making the road users and pedestrians aware of the dangers at and around level crossings. In the majority of cases accidents at level crossings are due to misuse by motorists and pedestrians, and education is therefore important, to highlight the risks and make people aware of the potential consequences if they do not follow the rules of the road.

Running under the motto “Act safely at level crossings” the railway community, in conjunction with road sector organizations, the European Commission and the United Nations Economic Commission for Europe (UNECE), has established the ILCAD campaign to raise awareness among road users and pedestrians of the risks at level crossings and to change their behavior. More than 40 countries around the world were engaged in ILCAD in 2012[7].

Economic benefits

Commuter railways play a key economic role in major cities worldwide. Economic centres such as Tokyo, Mumbai, Moscow, Sao Paulo, Paris, and Buenos Aries (not to mention London, Berlin and many, many more) rely heavily on railways to bring people to work and back, avoiding putting cars on the road and alleviating congestion.

Passenger railways therefore provide a vast positive economic benefit due to the high economic impacts of congestion. A study by the Texas Transport Institute concluded that the cost of congestion in the United States has risen from $24 billion in 1982 to $115 billion in

7 For more information on ILCAD see www.uic.org/safety

2009[8]. A UK government review estimated that traffic congestion may cost the UK economy up to 22 billion in lost time by 2025[9].

As part of an integrated public transport system, railways reduce transport costs for individuals and households. In cities and metropolitan areas with a car-based economy, the amount spent out of the local GDP on mobility can be twice as high as in cities where the majority of trips are made by public transport, walking and cycling. For example, Singapore, Hong Kong Special Administrative Region of China and Munich spend about 6% of their GDP on mobility, whereas Houston spends 14%, and that includes both the cost for the society and individual[10].

Employment and staff

Railways also have a social and economic benefit by providing stable employment for millions of people worldwide. The railway sector employs people both directly (e.g. operational railway staff) and indirectly (e.g. suppliers and maintenance workers). The railways in many countries have a unique place in society. Many either are, or were state-owned organizations, and as such have a long reputation of being responsible and sustainable actors and employers.

The table below gives some examples of some of the largest railways by number of staff; in total UIC estimates the railways employ up to 8 million people worldwide directly, and two to three times that number work in supply and associated industries.

Railways: Top 10 countries by number of direct railway staff ('000)		
1	People's Republic of China	2 042
2	India	1 386
3	Russia	1 031
4	Germany	240
5	France	156
6	Japan	129
7	Poland	113
8	Kazakhstan	93
9	Italy	87
10	Belarus	77
Source: UIC Statistics		

8 Texas Transportation Institute, Urban Mobility Report 2010

9 UK Department for Transport, the Eddington Transport Study, 2006

10 UITP, http://www.uitp.org/news/pics/pdf/MB_IntegratedUrbanMobility1.pdf

Sound governance and transparent reporting

Finally, it should be noted that modern rail companies are constantly in the public eye as large employers and providers of large scale mobility services for the public. Sustainability and sound corporate governance are fundamental values for the railway sector. Most railway companies provide extensive sustainability and corporate reports, and 50 of the UIC's 200 members have signed up to the UIC Declaration on Sustainable Mobility[11].

External Costs: An integrated measurement of sustainable mobility

An interesting analytical approach to understanding the sustainable development aspects of different transport modes is to examine the "external costs" of each mode. These externalities are negative effects of transport such as accidents, air pollution, climate change or congestion, which are not included in costs paid directly by transport users. A study for UIC by a team of highly respected consultants quantified these external costs of transport in the EU show that the road sector generates 93% of total external costs while rail's part is just 2%[12].

11 For more on corporate sustainability reporting in the rail sector, and the UIC Declaration on Sustainable Mobility and Transport, please see the dedicated UIC website for international sustainability www.uic-sustinability.org

12 Van Essen et al, "External Costs of Transport in Europe: Update Study for 2008

Case study - Railway Contribution to Sustainable Development in Russia

Russian Railways (JSC RZD) is one of the most influential actors in sustainable development in Russia, and indeed in the Europe-Asian region. It plays a crucial role in the social, economic, and environmental pillars of sustainable development. The main achievements in these areas are summarized below.

JSC RZD plays a crucial social role in terms of stable and progressive employment. JSC RZD is one of the largest employers in the country, employing about one million people. Regarded as the company's key assets, RZD implements a strong social policy supporting employees for professional development and providing multilevel social support.

One of the main thrusts in the company's policy is its youth policy, aimed at attracting and keeping young specialists in the company, involving them in important company decisions, and enhancing their personal and professional competence. At the same time the company provides support to retired employees. This focus on supporting and developing staff has delivered strong results – for example during the economic crisis not a single working day was lost due to staff disputes.

JSC RZD is also a key driver of economic growth for Russia and the wider region, forming a crucial trade link between Europe and Asia. Currently, the Russian railway network is implementing a set of measures to establish multimodal terminals and logistics centres along international transportation corridors running through Russia. At the same time a backbone network for regular container routes is being developed, covering the junction points in the Russian railway system.

More broadly, the Russian railway is in fact a key factor in the economy. JSC RZD (Russian Railways) is the largest transport company in Russia servicing over 44% of goods turnover and 30% of passenger turnover. According to some estimates, the company's share in GDP is about 1.8%. Being an active investor RZD is one of the largest taxpayers in Russia. In 2011, the company paid over 268 billion rubles to the national budget.

JSC RZD pays serious attention to improving its environmental performance. The company has been deploying the long-term environmental strategy for several years already. This entails a significant reduction of harmful effects on the environment: 35% by 2015 and 70% by 2030. In 2009, "The RZD Environmental Strategy" won the Russian Ministry of Natural Resources and Environment "Best Environmental Project" award for the integrated environmental protection approach.

From 2008 – 2011 RZD cut its stationary source emissions by 45% compared to 2007. Since the company's establishment and early years, from 2003 to 2011, it has spent 3.9 billion rubles on environmental protection according to the "Ensuring Environmental Safety" investment project. In 2010, JSC Russian Railways together with other UIC members signed the Declaration on Sustainable Mobility and Transport based on the UNEP programme and the UN Global Compact agreement.

Source: Summary of Keynote Speech by President of Russian Railways, Mr. Vladimir Yakunin, RZD, at the UIC Sustainability Conference 2012
http://www.uic.org/com/article/president-of-jsc-russian-railways?page=thickbox_enews

Case study - Railway Contribution to Sustainable Development in Japan

The Great East Japan Earthquake on March 11, 2011 caused devastating damage in the JR East Group's service area and to its railway facilities. Owing to comprehensive safety measures, there were no injuries to the passengers on board JR East trains. However, in some cases this was also due to good fortune, which helped JR East to appreciate that there is more to be done to be better prepared against future disasters.

Following the earthquake, together with the great support of related parties and the ceaseless efforts of each and every JR East Group employee, JR East was able to overcome the many challenges and restore its railway facilities. JR East considers March 11, 2011 to be the company's second starting point, with the first being the privatization of JNR. Based on this realization, in October 2012, JR East formulated its 5th management vision since the foundation of the company, "Management Vision V - Ever Onward".

The basic missions of the JR East Group, to adhere to customer demands for safe and high-quality services and to contribute to the development of wayside areas through railway and life-style business services, will remain unchanged. In order to continue to respond to the expectations of society, the JR East Group will persist with its ceaseless efforts to improve the contents and quality of these services.

First, for measures to achieve unsurpassed levels of safety, JR East has commenced seismic reinforcement measures totaling 300 billion yen in preparation for a possible earthquake occurring directly beneath the Tokyo metropolitan area. At the same time, JR East has also been taking other measures to increase its standing as an increasingly disaster-resilient railway, including measures to strengthen its resilience to natural disasters and abnormal weather.

Second, JR East is working to become No.1 in customer satisfaction in the railway industry through service quality reforms and teamwork. JR East aims to establish new discretionary travel flows and expand tourism to cover wider areas through further improvements to transport quality, and enhancements to the Tokyo metropolitan area network

Third, JR East desires to further strengthen its coalitions with local communities. Based on the pressing need for disaster restoration, JR East is focused on measures for the revitalization and promotion of local areas, for example tourism campaigns in coalition with local communities, and to support the manufacture of local products through the sales network and know-how of the JR East Group.

The JR East Group considers global environmental issues to be one of its most important management concerns however, owing to the 2011 disaster the company are currently facing a new business challenge, an electricity shortage which is forecast to continue into the foreseeable future. Additionally, railways have to innovate to retain their environmental superiority compared o other modes.

JR East aims to promote measures from a number of viewpoints, including the commercialization of a storage battery-driven electric railcar system, the introduction of smart grid technologies to the JR East Group's railway power system, the expanded introduction of

renewable energies and introducing various environmental preservation technologies to stations.

With the ultimate aim of realizing a sustainable society, JR East is committed to actively addressing global environmental issues over the long term.

Source: Adapted from a message by President and CEO East Japan Railway Company, Tetsuro Tomita, which forms the preface to the JR East Sustainability Report 2012 http://www.jreast.co.jp/e/environment/index.html

Case study - Railway Contribution to Sustainable Development in India

The Indian Railways Vision 2020 sets out a firm commitment sustainable development. This includes electrification of an addition 14,000 km of track, allowing a reduction in harmful emissions and a shift to low carbon energy sources. It also sets targets of a 15% improvement in energy efficiency and also taking 10% of energy from new and renewable sources. Since 2007 Indian Railways has been buying only products rated at BEE 3-star or higher.

The vision also calls for 25,000 km of new lines to be constructed by 2020, supported by a major increase in financing by Public-Private Partnerships. Of this 10,000 km will be constructed as a long term investment with priority given to social benefit over short term economic

In 2011 Indian Railways reduced energy usage and green house gas emissions by replacing high energy 60W and 100W incandescent lamps with more efficient 14W and 20W Compact Fluorescent Lamps (CFL). More than 1.4 million light bulbs have been distributed, resulting in a savings of 112500 MWh energy consumption and 90,000 tonnes of CO_2 emissions per annum, over 400,000 households have benefited from lower electricity bills. The program used the United Nation's scheme for Certified Emission Reduction Points and was monitored by the Indian Government Bureau of Energy Efficiency.

In 2010 Indian railways worked in partnership with the Defense Research Organisation to develop an environmentally friendly Bio-toilet system. Pilot were have now been successfully completed on the Gwalior-Varanasi Bundhelkhand Express in August 2011. The Bio-toilet disposes of human waste in an eco-friendly manor and generates colour-less and odour-less inflammable biogas and clear water. The toilets use a fixed tank to prevent waste disposal onto the tracks thus protecting the environment and damage to infrastructure.

In addition to the above, Indian Railways is improving accessibility for disabled passengers by implementing an ambitious program to at over 1,500 strategically chosen stations.

Sources:
http://www.indianrailways.gov.in/railwayboard/uploads/directorate/planning/downloads/vision_2020_blue_050411.pdf
http://www.indianrailways.gov.in/railwayboard/uploads/directorate/infra/downloads/VISION%202020_Eng_SUBMITTED%20TO%20PARLIAMENT.pdf

Case study - Railway Contribution to Sustainable Development in People's Republic of China

People's Republic of China has committed to a plan of massive investment in rail. Between 2003 and 2020 it is proposed to construct of 27,000 km of new lines, bring rail connections to most cities with populations over 200,000 and increasing the extent of electrified lines by 50%.

This investment both supports the demand created by recent economic growth and catalyses even greater growth. The electrified rail network is the only national transport network immediately compatible with low carbon energy sources, complimenting investments in hydropower and other sources of renewable energy. By facilitating modal shift to rail, away from less sustainable forms of transport such as road and air, harmful emissions can be reduced.

Data published by the Chinese Statistics Centre from the Ministry of Railways demonstrates how the rail system has consistently increased its efficiency. The data shows year on year reductions in the energy consumption per unit transport workload between 2003 and 2009, averaging around 5% improvement per year.

Studies of transport development is People's Republic of China have shown that about half as much land (1.74 to 2.54 times less) is required for a rail system compared to road when assessed per unit carrying capacity. Further improvements on this have been realised in the Shijiazhuang-Zhengzhou Railway Project. This project used viaducts for more than 60% of the alignment across flat plains reducing the footprint of the 18 m wide railway to just it's supporting columns. This allows easy under bridge crossing and means that the railway has minimal impact on farming activities.

Great care has been taken when deciding on the route for each new railway line. For example, during the planning phase of Guiyang-Guangzhou Railway Project (requiring the construction of 857 km of electrified railway with design speed of 250 km/h) forty-seven environmental sensitive sites were identified, these included nature reserves, forest parks, scenic areas, water resources protection areas and historical sites. This analysis allowed changes to be made to the alignment so that 40 of these areas could be avoided.

Sources:

[1] People's Republic of China Railway Construction Corporation http://www.crcc.cn/536-1712-4104.aspx
[2] Lou, R (2004) The comparative Study of Land Occupation between highway and Railway. Comprehensive transportation. 2004(05) 18-20
[3] People's Republic of China: The Environmental Challenge of Railway Development Peishen Wang, Ning Yang and Juan D. Quintero World Bank Office, Beijing (http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2012/06/04/000333037_20120604005740/Rendered/PDF/694910BRI00P120Environment0EN0final.pdf)

3. Role of Railways in the context of Rio+20 – The Future We Want

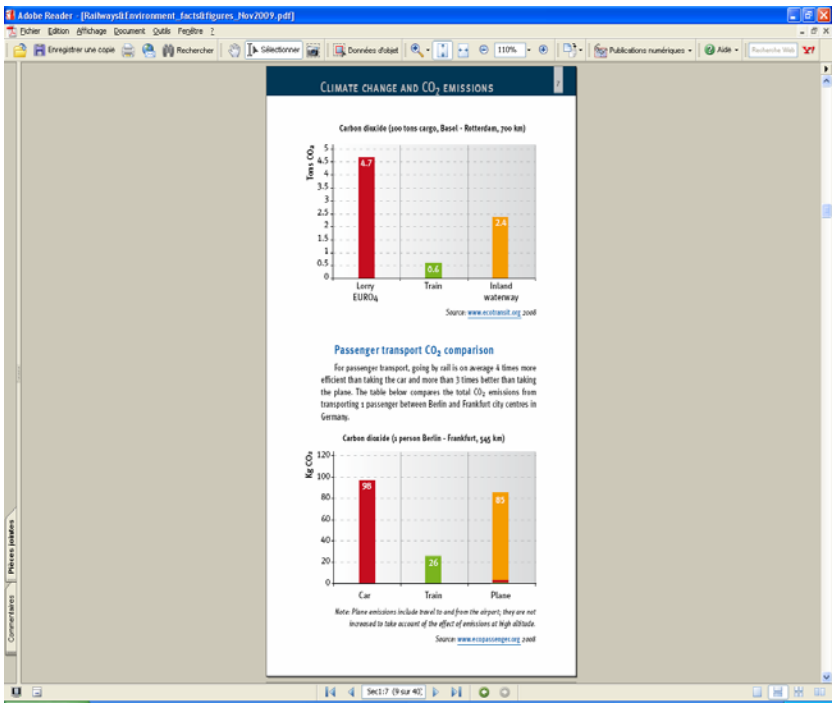
Background to Rio+20

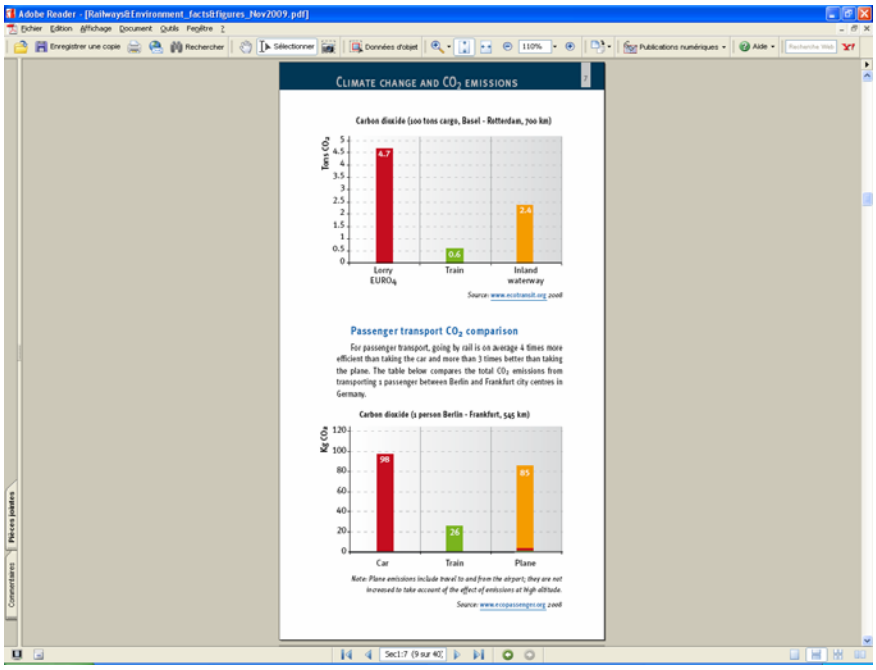
After two years of preparatory work the United Nations Conference on Sustainable Development was held in Rio de Janeiro, Brazil, from 13-22 June 2012, marking the 20th anniversary of the first Earth Summit in Rio. The purpose of the conference was to assess progress since the first Earth Summit in 1992, and to set out a high-level strategy for sustainable development going forward.

UIC have been active in the lead up to and during Rio + 20. A summary of these activities is presented in the appendix to this paper. Throughout this period UIC worked partnership with other transport interest groups (eg UITP, UNIFE, & SLOCAT) to promote informed policy and decision making. This has been achieved by presenting recent analysis and case studies on transport and sustainable development.

Eco-Transit & Eco-Passenger

UIC have been instrumental in developing eco-comparator tools Eco-Transit & Eco-Passenger. These allow both the public and specialists to make quick and easy comparison of the environmental impact for specific journeys using different modes of transport. Examples of these calculations are shown below:





UIC study on the external costs of transport

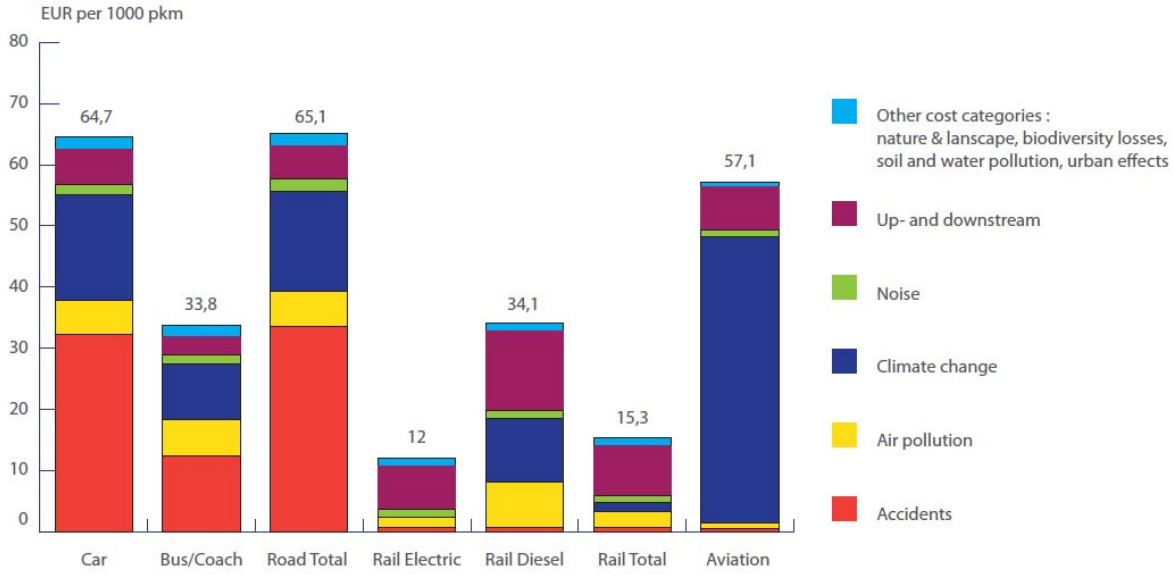
We all know that many people die in road accidents every day. We are all subjected to the smell of exhaust fumes from vehicles. We have all observed congestion or been stuck in traffic jams. We regularly witness extreme weather events that experts say are being increased in their severity and frequency by the effects of climate change. But when we take our car, we typically do not consider the resulting pollution, traffic congestion or the risks we subject ourselves and others to. These effects are external to the transport system because they are created by transport users but not paid by them. This means that the price of the private car is lower than it should be, distorting competition between modes, and incentivising the growth of road traffic.

It is possible to attribute monetary values to external effects. They can be the basis of new incentive taxation. They can also be added to internal costs to calculate the full costs. This allows for more consistent and equitable decision-making.

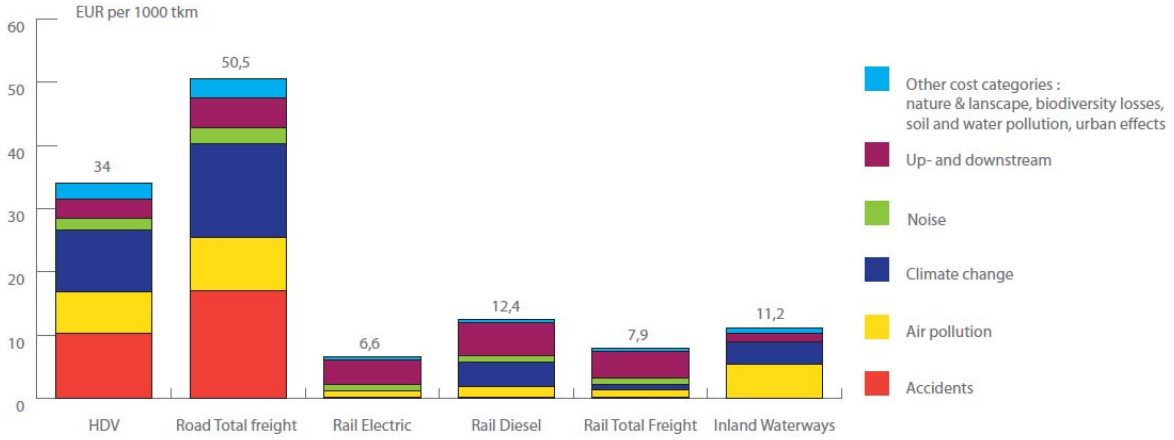
A study recent study of the external costs of transport in Europe examines intermodal comparisons. It calculates the costs that could be avoided by means of shifting from one mode to another one with less external impact.

When considering the charts below it becomes clear that average external costs for road transport are more than four times higher than rail for freight and more than six times higher for passenger services (excluding congestion).

Average external costs 2008 for EU-27: passenger transport (excluding congestion & motorcycles and mopeds)



Average external costs 2008 for EU-27: freight transport (excluding congestion & without LDV)



The study calls for changes to transport policy, to introduce a consistent, fair policy framework for external costs

If we want “real prices” in transport that incentivise the best choice of mode of transport for sustainable mobility, we need to pursue internalisation:

- in each mode of transport, at the same time
- for all external effects, with the same definition in each case
- set at the ‘right’, scientifically-based level and not at the minimum level necessary for political acceptance

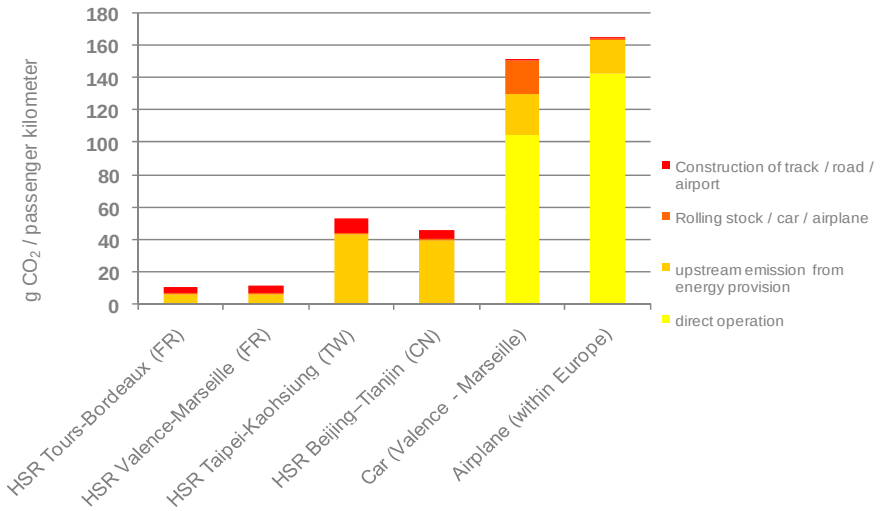
The executive summary and the full report are available on the UIC website:
http://www.uic.org/IMG/pdf/brochure_executive_summary.pdf
http://www.uic.org/IMG/pdf/external_costs_of_transport_in_europe-update_study_for_2008-2.pdf

High speed and sustainable mobility

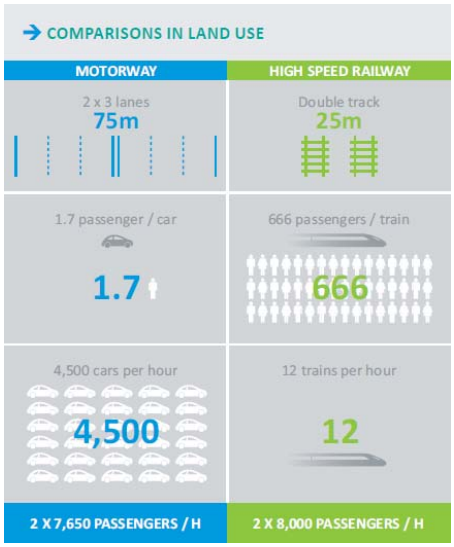
UIC have also completed studies on high speed rail as a sustainable mode of transport. This explores the strong economic benefits of high speed rail investment and how it can catalyze urban development. In addition to this the study documents the reduced land required by comparison to road networks and also the lower emissions and high levels of safety.

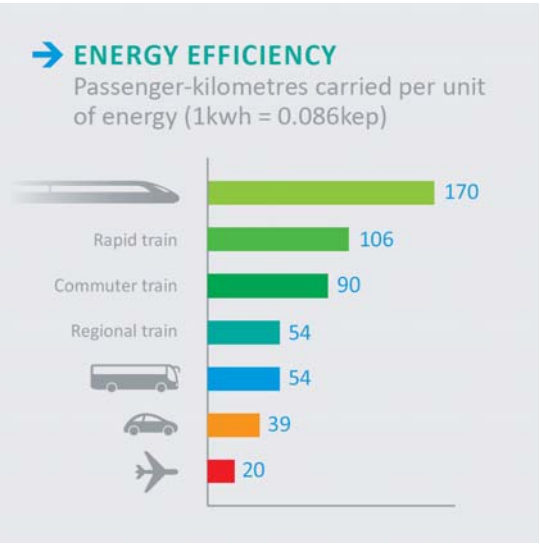
Some of the key findings are illustrated in below. More detail can eb found at the UIC web site http://www.uic.org/IMG/pdf/uic_lgv-web.pdf

Comparison of CO_2 emissions for high speed rail and other transport modes



Comparison of land use required by high speed rail and motorways





Comparison of energy efficiency for high speed rail and other transport modes

4. Key outcomes of Rio+20 and how railways can help deliver them

The most important outcome of Rio+20 was a document called "The Future We Want", in which Parties to the Rio+20 conference agreed a high-level strategy for sustainable development[13]. This section of the paper will look at how UIC helped develop these goals through active engagement Rio+20; will consider some of the specific goals agreed and briefly describe how railways can contribute to meeting these goals.

UIC Engagement at Rio
Sustainable cities and the Green Economy
One of the key themes of Rio+20 was the role of Cities in sustainable development, and the Green Economy. This section lists some of the main phrases dealing with Cities, Transport and the Green Economy, and then goes on to describe how railways can help achieve sustainable cities of the future.

- *Improved accessibility and better integration of the economy while respecting the environment; (*Para 132/ Rio+20 Outcome Document-The Future We Want)

- *Efficient movement of people and goods, and access to environmentally sound, safe and affordable transportation as a means to improve social equity, health, resilience of cities, urban-rural linkages and productivity of rural areas and sustainable cities;* (Para 132/ Rio+20 Outcome Document-The Future We Want)

- *Development of sustainable transport systems, including energy efficient multi-modal transport systems, notably public mass transportation systems, ……as well as improved transportation systems in rural areas;* (Para 133/ Rio+20 Outcome Document-The Future We Want)

- *Sustainable cities, human settlements and resilient communities* (Para 134 to 137/ Rio+20 Outcome Document-The Future We Want)

5. How railways can deliver the key objectives from Rio+20

Improved accessibility
Railways offer mobility to everyone, supporting the social equity component of sustainable development, but also help those who are less mobile. This section focuses on the ways in which railways worldwide offer assistance to passengers with reduced mobility. Today an increasing number of people choose to travel by rail even if they have a car and therefore rail services that are accessible to all offer access to employment, education and leisure services for the able-bodied as well as those who are not able to drive.

All passenger railways in the European Union offer assistance to people with reduced mobility. This assistance includes telephone numbers to book assistance at stations (this typically involves helping passengers with reduced mobility to get on and off trains safely, then helping

13 The full document is available in various languages here: http://www.uncsd2012.org/thefuturewewant.html

them either change platforms or leave the station), and information on how to plan a rail journey using stations with stepfree access. Many railways provide additional services.

East Japan Railways, In accordance with the Japanese Barrier-Free law, JR East has been installing elevators at stations serving more than 3,000 passengers a day, and has installed additional escalators at stations without a legal requirement. As of March 31 2011, JR East had completed installations at 469 stations. Currently, about 80% of stations at which elevators are required are barrier-free. Indian Railways Indian Railways is implementing an ambitious program to improve accessibility for disabled passengers at over 1,500 strategically chosen stations.

Accessibility may also refer to people with low incomes and low accessibility to transport services. Private motorised transport costs can represent up to 30% of household budgets – placing them in mobility poverty. Sustainable mass transport provides people with easy and affordable access to essential services, ensuring greater social cohesion.

Improving city economies

A thriving city economy is dependent on the movement of people and goods. By increasing connectivity and linking employers and their workforce or retailers and their customers, sustainable mass transport generates business activity and boosts the productivity of the urban economy. Congestion worldwide costs economies an estimated 1 to 3% of GDP – the cost of moving to a green economy. By using urban space more efficiently, sustainable mass transport alleviates congestion and increases travel time reliability.

Mitigating emissions, saving resources and keeping cities compact

If the share of urban trips made by sustainable mass transport doubled by 2025, urban transport emissions would be in line with the objectives of the international climate negotiations. Urban transport energy consumption would be decoupled from the growth in mobility if the share of sustainable mass transport doubled by 2025. Such stabilisation of urban transport would achieve a more secure and sustainable urban transport future. Sustainable mass transport supports relatively dense urban development patterns, which not only optimises energy and resource efficiency, it puts an end to uncontrolled urban sprawl.

Reducing traffic injury and fatalities

Urban air pollution and road traffic incidents, of which a significant proportion is generated by private motorised vehicles, are estimated to kill some 2.5 million people annually. This trend will only get worse if current patterns of urban mobility continue unchecked. Public and urban rail transport improves the health of the city by ensuring better safety for all and by promoting healthier life styles.

Greening the Freight sector

The railway is an important component of the freight sector, and is a key player in the global multi-modal network of freight, involving links to shipping and road to complete deliveries. There are frequent references in “The Future We Want” to the green economy in the context of sustainable development and poverty eradication (Para 56 to 74 and Para 105 to107 / Rio+20 Outcome Document-The Future We Want).

Rail freight has a strong sustainability performance, and therefore contributes to these goals. The eco-comparator website www.ecotransit.org offers a global logistics planning tool that also shows the environmental performance of various modes.

However it should be stressed that rail freight is part of a network of combined transport. Between 1988 and 2008, international combined transport increased by 215% worldwide. Freight operators are constantly looking for ways to streamline the movement of goods between transport modes. For example in Turkey, TCDD and partners have combined train-ferry freight transport between Samsun (Turkey) and Kavkaz (Russia), and also a demonstration train between Wels (Austria) and Halkali (Turkey).

6. Way Forward- Conclusion and Recommendation

UIC policy recommendations for Rio+20

UIC, together with our partners UNIFE and UITP, made a series of policy recommendations for Rio+20. These were

- Endorse modal shift towards the most sustainable transport modes.
- Strengthen institutional arrangements to advance sustainable transport involving UN development agencies and banks, carbon finance instruments and the private sector.
- Shift development finance towards creating more sustainable communities recognising the essential link between land use and infrastructure.
- Endorse and reward actions aiming to achieve the ambitious target of doubling the market share of urban sustainable transport by 2025.
- Adopt targets and indicators to better measure progress towards sustainable transport.

This section looks at the Rio+20 outcomes against each of these policy recommendations and discusses how UIC and its members can help deliver these recommendations.*Modal Shift towards the most Sustainable Transport Modes*

As noted above, several parts of "The Future We Want" outcome document called for more sustainable transport, while falling short of specifically calling for modal shift. In addition to the passages of the report quoted above, paragraph 133 called for an *integrated approach to policymaking at the national, regional and local levels for transport services and systems to promote sustainable development in Asia*.

UIC has many members in the Asia region and railways are a key component of the transport systems in many Asian countries. UIC itself is involved to some extent in the Asian region, a particular highlight being the Memorandum of Understanding between the UIC and the Asian Development Bank, where UIC and its members offer expert assistance to the ADB on railway issues.

Strengthened institutional arrangements

One of the key tasks of Rio+20 was the examination of the institutional framework for sustainable development at the United Nations and to suggest changes where necessary. Perhaps the most important decision was the creation of a new, "universal intergovernmental high-level political forum", which will "build on the strengths of the Commission on Sustainable Development (CSD), and subsequently replace the Commission".

The CSD was the body set up to oversee the implementation of Agenda 21 after Rio 1992, with a rolling programme of work The CSD held 19 sessions of talks (broadly speaking 1 session per year following Rio 1992) to look at thematic issues and assess progress (UIC was involved with the 19th session of the CSD, which discussed Transport)[14].

The exact function of the "high level political forum" is not defined. There will be an intergovernmental negotiation process with the new forum to be launched at the beginning of the sixty-eighth session of the UN General Assembly (2014).

14 For information on UIC involvement at CSD – 19 visit http://uic-sustainability.org/spip.php?article112

The other key institutional framework point was the agreement to strengthen UNEP, through more stable budget and through greater national representation. However it stops short of giving any regulatory powers to UNEP. This has, in practice, little impact on the rail sector, although UNEP is generally supportive of sustainable modes of transport such as railways.

Adopt targets and indicators to better measure progress towards sustainable transport
The Rio+20 summit took the first tentative steps toward agreeing targets and indicators to measure progress towards sustainable development. The agreement was made in principle to develop new "Sustainable Development Goals" (SDGs). Similar in principle to the Millennium Development Goals, these SDGs will be agreed objectives on various topics with action plans and monitoring put in place.

Rio+20 did not actually agree what these SDGs will be, or how they will be monitored. All that Rio+20 did was get agreement that in principle SDGs would be useful things to have. The process for developing them has begun. UIC will watch this development closely and propose SDGs that support rail and other sustainable modes of transport.

Shift development finance towards creating more sustainable communities
Perhaps the greatest achievement of Rio+20 was outside the political and diplomatic arena, namely the successful encouragement of actors in the public and private and multilateral sectors to make Voluntary Commitments to implement sustainable development in their own business/organisation/sphere of influence. UIC itself submitted a commitment to further develop and promote the UIC Declaration on Sustainable Mobility and Transport[15].

The most important Voluntary Commitment from the transportation point of view, and perhaps the most important from the entire Rio+20 process, was the decision by the group Mulitnational Development Banks (MDBs) to commit to vast funding streams for transport, including sustainable transport.

The Asian Development Bank led a coalition of multilateral developmental banks committing $175 billion, over ten years, toward transportation projects worldwide with an emphasis on sustainable transport[16]. UIC and the rail sector in general will now follow up with the MDBs and make the case that railways have strong sustainable development benefits, and as such should be eligible for a proportion of this funding.

15 Sustainable transport commitments: http://www.uncsd2012.org/index.php?page=view&type=12&menu=153&nr=371&theme=17

16 More information on this commitment can be found here: http://www.adb.org/news/billions-benefit-rio20-transport-commitment

Appendix 1- Summary of UIC activities before and during Rio + 20

UIC activities before Rio+20

The table below summarizes the communications activities, consultation responses, and UN meetings that UIC engaged with before and the Rio+20 summit.

UIC Activities before Rio+20
Input to "Compilation Document" *Date: October 2011* The UN ran a consultation process inviting stakeholders to provide their input to Rio+20. The UIC response can be viewed online here : http://www.uncsd2012.org/index.php?page=view&type=510&nr=45&menu=20
Communication to Members *Autumn 2011* UIC wrote to all members actively involved in the EES Platform to ask for their support to promote Rio+20 with their national governments.
UIC Side Event at Regional Prep Meeting Europe: Transport in a Green Economy - Why Rio should tackle the transport sector *Date: 2nd December 201* This Side Event at the United Nations HQ in Geneva featured speakers from UIC, UNEP, UNECE and the Austrian Ministry for Transport. It explained to an audience of national government delegates the importance of including transport in the Rio+20 process.
UIC Side Event at 2nd Preparatory Conference for Rio+20: Why transport is fundamental to sustainable development - A Rio+20 Action Agenda *Date: December 15th, 2011* This Side Event updated delegates on the state of negotiations on transport at Rio+20, and explained the reasons why transportation is crucial for sustainable development.
UIC Sustainability Brochure 2012 *Published on 5 June 2012 – World Environment Day* New report summarizing progress from UIC members worldwide on sustainable development, written in time to be promoted in the run up to Rio+20. The report is available online here: http://www.uic.org/IMG/pdf/brochure_env2012_web.pdf

UIC Engagement at Rio+20

The table below summarises the main UIC activities at Rio+20.

UIC Activities at Rio+20 – see http://www.uic.org/spip.php?article2872 for more information
Panel Speaker: Side Event Financing Sustainable Transport to Support Sustainable Development *Date/Time: Thursday 14th June, 13:30 – 15:00* UIC participated on an expert panel to discuss options and practical examples of financing sustainable transport. UIC focused on the development of railways in emerging economies in Asia and Africa. The lead organizer of this event was the Institute for Transport Development and Policy. More information
UIC Side Event - Sustainable Transport in the Cities of the Future *Date/Time: Friday 15th June, 13:30 – 15:00* This side event, organized and Chaired by UIC, explored the sustainability challenges facing urban areas today and in the future, and how sustainable transport can meet these challenges. Other speakers included UIC, UITP International Association of Public Transport, UNIFE Union of European Railway Industries, the Japan International Transport Institute, and Holger Dolkmann, Director, EMBARQ / WRI. More than 70 people attended this event. More information
Panel Speaker: Side Event - Implementing Voluntary Commitments on Sustainable Transport *Date/Time: Sunday 17th June 11:30 - 14:00* All participants at Rio+20 were encouraged to make voluntary commitments. These were compiled into an online compendium of commitments on the Rio+20 website. UIC has submitted our Declaration on Sustainable Mobility and Transport as the international railway sector's Voluntary Commitment for Rio+20. UIC was a panellist at this event, hosted by the EU, which featured brief remarks from transport organizations describing their Voluntary Commitment.
Conference Speaker: Global Forum on Human Settlements and Electric Mobility *Date: Monday 18th June* UIC was invited by the United Nations to address an important 1-day Conference on Electric Mobility being held as an associated event at Rio+20. UIC Director General Jean-Pierre Loubinoux made a presentation in Session 4 on the topic of the integration between railways and electric road vehicles. UIC also co-moderated Session 3 on the experiences using electric vehicles in urban fleets.
UIC / UITP / UNIFE Half-Day Workshop - Sustainable Transport in the Cities of the Future *Date/Time: Tuesday 19th June 09:00 – 14:00*

This half-day workshop welcomed over 70 transport professionals, national government and UN officials, journalists and other stakeholders, to showcase ways in which transport can contribute to a greenGREENGREen heavy duty ENgine economy. Speakers included the President of FeTranspor, the CEO of Brazilian railway association EDLP, UIC Director General Jean-Pierre Loubinoux, and a representative of the Colombian city of Bogota.

Evening Reception : Sustainable Transport in the Cities of the Future
Date / Time : Tuesday 19th June, 19:00 - 22:00

UIC, UNIFE, UITP and the SLOCAT Partnership welcomed 80 guests to a high-level evening cocktail reception for diplomats, UN officials, national government representatives, transport professionals and the media. The event will celebrate the many different Voluntary Commitments that have been developed by the sustainable transport sector, coordinated by the SLOCAT partnership. Guest of Honour was Mr. Paulo Sergio Passos, Federal Minister of Transport.

Joint Statement with UITP and UNIFE: Sustainable Transport in the Cities of the Future
Launched on 20 June 2012

This short document sets out the challenges facing mobility in cities and puts forward the key rail and public transport messages to decision makers at Rio+20. The statement is available here: http://www.uic.org/IMG/pdf/joint_statement_unife_uic_uitp_rio_20_final.pdf