Railways in EST towards post-Rio+20

Background paper on railways and sustainable development

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Sustainable Development
Bali, 23rd April 2013
UIC: The International Union of Railways

200 members worldwide

Created in 1922 – HQ in Paris, France
### UIC in numbers - 2010

<table>
<thead>
<tr>
<th><strong>200</strong></th>
<th><strong>50</strong></th>
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<tbody>
<tr>
<td>Members on 5 continents</td>
<td>international expert working groups</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>2,5</strong></th>
<th><strong>180</strong></th>
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<tbody>
<tr>
<td>billion passenger-kilometres</td>
<td>cooperation projects</td>
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</table>

<table>
<thead>
<tr>
<th><strong>9,5</strong></th>
<th><strong>670</strong></th>
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<tbody>
<tr>
<td>billion tonne-kilometres</td>
<td>“UIC Leaflets”</td>
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<table>
<thead>
<tr>
<th><strong>1 000 000</strong></th>
<th><strong>200</strong></th>
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<tbody>
<tr>
<td>kilometres of lines</td>
<td>reference documents</td>
</tr>
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<thead>
<tr>
<th><strong>6</strong></th>
<th><strong>85</strong></th>
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<tbody>
<tr>
<td>regional assemblies</td>
<td>training sessions, conferences, seminars</td>
</tr>
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<tr>
<th><strong>7</strong></th>
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<tr>
<td>forums and platforms</td>
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**UIC Chief’s Task**: to promote railway transport around the World and help its members to meet all the current and future challenges of mobility and sustainable development.
UIC Mission

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

Promoting interoperability, creating new World standards for railways

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 and the United Nations

UNFCC Train to Copenhagen – 2009
The transport challenge....
Transport is the fastest growing sector in terms of emissions

Transport CO₂ emissions in emerging economies

India

+70%

China

+350%
Road transport is the dominant source of transport CO2

Source: IEA 2011
Rail transport is more resource-efficient than other modes

- Rail: lower land-take requirement than roads
  Highway / 4 lanes = 9 to 10 hectares / Km
  Highway / 6 lanes = 10 to 11 hectares / Km
  High Speed Rail double track = 5 to 7 hectares / Km

- Providing lower-carbon, less-polluting, accessible passenger and freight transport

- Simultaneously alleviating traffic congestion

- Providing 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.

www.uic.org/environment
# Rail is resource efficient

<table>
<thead>
<tr>
<th>Comparisons in land use</th>
<th>Motorway</th>
<th>HS Railway</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 x 3 lanes 75m</td>
<td>2 x 1.7 passengers / car</td>
<td>Double track 25m</td>
</tr>
<tr>
<td></td>
<td>2 x 4,500 cars per hour</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2 x 7,650 passengers / h</td>
<td></td>
</tr>
</tbody>
</table>

High Speed Railway
Motorway
Rail is a low carbon transport mode

www.ecotransit.org
(global carbon footprinting freight)

www.ecopassenger.org
(carbon footprinting passenger Europe)

28 European members of UIC have collectively committed to reduce CO2 emissions per passenger kilometer and ton / km by 50% by 2030
Rail is a low carbon transport mode

Rail transport is environmentally friendly

Road transport = 111 g CO² per passenger/km
Air transport = 180 g CO² per passenger/km
Rail transport = 2.7 g CO² per passenger/km

Rail transport has a high energy profile

Air transport (domestic) = 7.14 litres of diesel fuel per 100 km per passenger on average
Road transport (private) = 3.3 litres of diesel fuel per 100 km per passenger on average
Rail transport = 0.7 litres of diesel fuel per 100 km per passenger on average
## Rail companies - employment and staff

### Railways: Top 10 countries by number of direct railway staff (‘000)

<table>
<thead>
<tr>
<th>Rank</th>
<th>Country</th>
<th>Staff (‘000)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>China</td>
<td>2,042</td>
</tr>
<tr>
<td>2</td>
<td>India</td>
<td>1,386</td>
</tr>
<tr>
<td>3</td>
<td>Russian Federation</td>
<td>1,031</td>
</tr>
<tr>
<td>4</td>
<td>Germany</td>
<td>240</td>
</tr>
<tr>
<td>5</td>
<td>France</td>
<td>156</td>
</tr>
<tr>
<td>6</td>
<td>Japan</td>
<td>129</td>
</tr>
<tr>
<td>7</td>
<td>Poland</td>
<td>113</td>
</tr>
<tr>
<td>8</td>
<td>Kazakhstan</td>
<td>93</td>
</tr>
<tr>
<td>9</td>
<td>Italy</td>
<td>87</td>
</tr>
<tr>
<td>10</td>
<td>Belarus</td>
<td>77</td>
</tr>
</tbody>
</table>

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.
External Costs – per 1,000 km

**ECONOMY** Average external costs per transport modes
(Euros per 1,000 passenger-kilometres)

- Climate change (difference low/high scenario)
- Climate change low scenario
- Urban effects
- Up and downstream processes
- Nature & landscape
- Air pollution
- Noise
- Accidents

<table>
<thead>
<tr>
<th>Mode</th>
<th>External Costs (£)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Car</td>
<td>76.0</td>
</tr>
<tr>
<td>Bus</td>
<td>37.7</td>
</tr>
<tr>
<td>Train</td>
<td>22.9</td>
</tr>
<tr>
<td>Airplane</td>
<td>52.5</td>
</tr>
</tbody>
</table>
External Costs - total

Relevance of the transport modes

- Car: 61.1%
- HDV: 12.7%
- LDV: 9.4%
- MC: 5.6%
- Bus/coach: 3.6%
- Rail Pass.: 1.2%
- Rail Freight: 0.7%
- Air Pass.: 5.2%
- IWW: 0.3%
UIC Declaration on Sustainable Mobility and Transport

Objective

• Public commitment to Sustainable Development
• Show ongoing progress via regular reports

18 commitments on sustainable development

• Includes commitments to reduce environmental impact, and to better serve our customers and society.

Signed by 50 UIC members, including IR, RZD, JR-East and Chinese Ministry of Railways
Role of Railways in the context of Rio+20

UIC activities before Rio+20

UN meetings that UIC engaged with before and the Rio+20 summit.

1. Input to “Compilation Document” (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

2. 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.

3. 2 UIC Side Events (December 2011):
at Regional Prep Meeting Europe / Transport in a Green Economy - Why Rio should tackle the transport sector and

at 2nd Preparatory Conference for Rio+20: Why transport is fundamental to sustainable development - A Rio+20 Action Agenda.

4. UIC Sustainability Brochure 2012 (Published on 5 June 2012 – World Environment Day)
Key Outcomes of Rio+20 and how Railways can help deliver them

UIC engagement at Rio+20 (event participation and workshop)

1. Financing sustainable transport to support sustainable development
2. Sustainable transport in the Cities of the Future
3. Implementing Voluntary Commitments on Sustainable Transport
4. Global Forum on Human Settlements and Electric Mobility
5. Workshop on Sustainable transport in the Cities of the Future with UITP and UNIFE (including a Joint Statement by UIC, UITP and UNIFE)
How Railways can deliver the key objectives from Rio+20

Improved accessibility

All Passenger Railways in the European Union offer assistance to people with reduced mobility. This assistance includes telephone numbers to book assistance at stations, and information on how to plan a rail journey using stations with step free 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.

Indian Railways is implementing an ambitious program to improve accessibility for disabled passengers at over 1,500 strategically chosen stations.
How Railways can deliver the key objectives from Rio+20

Improving city economies

Congestion worldwide costs economies an estimated 1 to 3% of GDP – the cost of moving to a green economy. Singapore, Hong Kong 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.

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.

Reducing traffic injuries and fatalities

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

Between 1988 and 2008, international combined transport increased by 215% worldwide.
Way forward - Recommendations

UIC policy recommendations for Rio+20
(made together with UITP and UNIFE)

- 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.
Sustainable Development - Case Studies

Russia

- Russian Railways (JSC RZD) is one of the most influential actors in sustainable development in Russia, and indeed in the Europe-Asian region.

- JSC RZD is one of the largest employers in the country (about 1 million people).

- Strong social policy supporting employees for professional development.

- Youth policy (enhancing personal and professional competence).

- Crucial trade link between Europe and Asia (plan for new multimodal terminals and logistics centres).

- Largest transport company in Russia servicing over 44% of goods turnover and 30% of passenger turnover.

- Improving its environmental performance (significant reduction of harmful effects on the environment: 35% by 2015 and 70% by 2030).
Sustainable Development - Case Studies

Japan

- To adhere to customer demands for safe and high-quality services.
- Seismic reinforcement measures totaling 300 billion yen in preparation for future possible major earthquakes (becoming an increasingly disaster-resilient railway).
- JR East working to become No.1 in customer satisfaction in the railway industry.
- Promotion of local areas, for example tourism campaigns in coalition with local communities.
- Commercialization of a storage battery-driven electric railcar system and introduction of smart grid technologies, expanded introduction of renewable energies and introducing various environmental preservation technologies to stations.
Sustainable Development - Case Studies

India

- The Indian Railways Vision 2020 sets out a firm commitment sustainable development (with 25,000 km of new lines to be constructed by 2020).

- Electrification: addition of 14,000 km of track, allowing a reduction in harmful emissions and a shift to low carbon energy sources.

- Target to a 15% improvement in energy efficiency and also taking 10% of energy from new and renewable sources.

- Reducing energy usage and greenhouse gas emissions by replacing high energy 60W and 100W incandescent lamps with more efficient 14W and 20W Compact Fluorescent Lamps (CFL).

- Development of an environmentally friendly Bio-toilet system.

- Improving accessibility for disabled passengers by implementing an ambitious program to at over 1,500 strategically chosen stations.
Sustainable Development - Case Studies

China

- China has committed to a plan of massive investment in rail.
- 2003-2020: to construct 27,000 km of new lines, to bring rail connections to most cities with populations over 200,000 and to increase the electrified lines by 50%.
- Reducing the energy consumption per unit transport workload since 2003, on an average base of around 5% improvement per year.
- Reduction of land use, allowing easy under bridge crossing and minimizing the impact on farming activities.
- Better protection of environmental sensitive sites (natural reserves and forest parks, scenic areas, water resources protection areas and historical sites.)
Sustainable Development - Case Studies

ASEAN

- **Malaysia** has committed with important public transport projects within its ETP (Economic Transformation Programme).
  - Building an Integrated Urban Mass Rapid Transit System in Kuala Lumpur which will account for at least half of all trips commuting to and from, and within Kuala Lumpur.
  - Aiming to reduce congestion in the Kuala Lumpur city centre by providing an efficient and environmentally sustainable mode of public transport.

- **Singapore** is actively promoting sustainable transport for more than two decades, and meeting two important objectives in the future - lower environmental footprint and more convenient travel.
  - Achieving a modal share of 70% of journeys made during morning peak hours via public transport by 2020, through doubling our rail network and developing a more integrated and seamless connection between our bus and rail services.
Missing links between GMS countries

- Myanmar - India
- Myanmar - China
- Lao PDR - China
- Thailand - Myanmar
- Thailand - Cambodia
- Cambodia - Viet Nam
- Thailand - Lao PDR

Important Rail Projects
Conclusion

Intermodal transportation is becoming more and more attractive as its possibilities for better mobility and sustainability become evident. It is:

- Better from the environmental point of view
- Better from the economic point of view
- Better from the passenger point of view
- Better from the transport operator point of view

Strengthening Network

Encourage Interoperability by construction of missing links to have regional rail network in place
Existing and Potential Corridors

- Develop a few main corridors to capture growing international trade
- Stronger focus on intermodality and cooperation with shipping lines
- Use UIC as a platform for development
Thank you for your kind attention

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www.uic-sustainability.org
sustainability@uic.org
Containers Projections for ASEAN: 2025

- ASEAN: 3.8 m
- CIS: 300k
- S. Asia: 2.2 m, 510 k
- W. Asia: 2.2 m, 130 k, 420 k
- NE Asia: 12.5 m, 4.5 m
- Intra ASEAN: 3.8 m, 1.6 m

2007:
- Europe: 3.7 m, 1.6 m
- CIS: 60 k
- NE Asia: 12.5 m

2025:
- Europe: 3.7 m, 1.6 m
- CIS: 60 k
- NE Asia: 12.5 m

Forward Steps

Strengthening Network

> Encourage Interoperability by construction of missing links to have regional rail network in place
> Harmonise important technical standards like Axle loads which enable free movement of containers
> Strengthen port to hinterland connectivity first
> Develop Inland Container Depots or Dry Ports for capturing freight traffic

Asset Management

> Have asset replacement strategy in place
> Plan rolling stock procurements with network expansion as part of integrated planning process
Forward Steps

Enhance efficiency by technological up-gradation

> Old signalling and communication systems needs to be replaced with efficient and safe systems
> Adopt track structure which suits the requirement for next 50 years
> Consider Life cycle costs while considering technological up-gradation

Restructure Organisation

> Give Railways freedom to plan and execute (Corporatisation ?)
> Focus on business lines rather than functional departments
> Infrastructure and Operation segregation is a difficult exercise, it needs to be done when institutional mechanisms and access charges regime is in place
Forward Steps

Financing

> Encourage PPP for generating finances for rail development
> Involve ports, local industry, shipping lines in developing freight terminals and freight lines
> Passenger tariff on commercial lines
> Lobby with governments for social service obligations to be paid to the operator for subsidising transport
> ADB/World Bank should also finance international rail corridor development and ICD development

Manpower Development

> Set up joint training and research facilities at the regional level