STRATEGIC ACTION PLAN FOR UIC ASIA-PACIFIC

↗ 2013-2016

INTERNATIONAL UNION
OF RAILWAYS

CONTENTS

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OF RAILWAYS

INTRODUCTION

The Asia-Pacific (AP) region of UIC has approximately 370,000 kilometres of rail network. The network has many missing links and is quite heterogeneous. The development of a regional working component, as part of the global dimensioning of UIC, commenced in 2007 and was clearly defined within the new UIC statutes in 2009. The Strategic Action Plan for UIC Asia 2009 has been developed at a time to meet the specific needs of Asian region.

Then, the Asia-Pacific region had four years of working experience. It should now be updated based on the experience of the past years considering the forthcoming challenges and new opportunities. This objective is to raise feasible and pragmatic actions from 2013 to 2016 with common interest for the 30 members of the Asia-Pacific region as the plan to implement the Strategy of UIC Asia-Pacific development up to 2025 is considered. The duplication work should also be avoided. Therefore, this *Strategic Action Plan* will be traced every year and can be slightly reviewed/updated in line with the real situation. By this process, the AP region will be more active and more developed.

Asia-Pacific Coordination Team

CONTEXT

Economy and transport in the Asia-Pacific (the AP) region are growing the most rapidly in the world. Railways are also already prerequisite for mobility in the Asia-Pacific region. The following is a summary of the critical factors having an impact on rail transport development in the Asia-Pacific region. It is originally based on "Asian Railways Vision 2025" and indicators are updated.

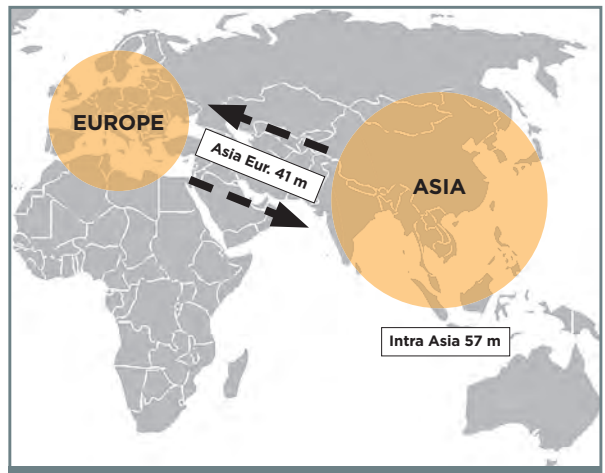
RAIL FREIGHT TRAFFIC AND GROWTH OF ASIAN MARKETS

Table 1 compares the freight traffic task (tonne-km) across a selection of AP countries. It shows a substantial difference in total freight task and growth in freight task, within and between AP sub-regions. For example, in 2009, China recorded a freight traffic task approximately 1,240.3 billion tonne-km greater than in 1995, representing a 4.9% annual increase. In terms of freight traffic, China's publicly owned and operated Chinese Railways network is the world's second largest behind that of the United States of America. Apart from China, in aggregate tonne-km terms, India, Australia and Kazakhstan handled the highest freight volumes and recorded the largest absolute increases in the total freight task, with increases of 301.9, 157.6 and 88.7 billion tonne-km respectively. That of the Russian Federation is not on the table, but according to UIC statistics, it shows 2,162,382 million tonne-km in 1995 and 3,507,607 in 2010. While a number of countries have achieved, to varying degrees, an increase in freight task between 1995 and 2009, a number have experienced decreases. As Table 1 above details, these countries include Japan, Republic of Korea, Malaysia, Tajikistan, Thailand, Sri Lanka, and the Philippines.

SUBREGION	COUNTRY	GROWTH			FREIGHT TRAFFIC (m tonne-km)	
		CAGR	FROM	TO	FIRST YEAR	LAST YEAR
East and North-East Asia	China	4.9%	1995	2009	1,283.601.0	2,523.917.0
	Japan	-1.4%	1995	2009	24,747.0	20,432.0
	Mongolia	9.1%	1996	2009	2.541.0	7,852.0
	Republic of Korea	-2.4%	1995	2010	13.712.0	9,452.0
North and Central Asia	Armenia	5.0%	1995	2005	403.0	654.1
	Azerbaijan	11.6%	1995	2008	2,409.0	10,021.4
	Georgia	11.1%	1995	2009	1,246.0	5,433.0
	Kazakhstan	3.7%	1995	2010	124,502.0	213,174.0
	Kyrgyztan	4.5%	1995	2009	403.0	744.5
	Tajikistan	-3.5%	1995	2009	2,115.0	1,282.0
	Turkmenistan	2.3%	1995	2009	8,568.0	11,765.0
	Uzbekistan	2.0%	1995	2009	16,800.0	22,227.0
Pacific	Australia	6.1%	1995	2000	99,700.0	257,320.0
	New Zealand	5.0%	1995	2000	3,202.0	4,078.0
South and South-West Asia	Bangladesh	1.8%	1995	2008	689.0	870.0
	India	5.8%	1995	2009	249,564.0	551,48.0
	Pakistan	0.7%	1995	2008	5,661.0	6,187.0
	Sri Lanka	-0.1%	1995	2007	137.0	135.0
South-East Asia	Cambodia	17.5%	1997	2003	35.0	92.0
	Thailand	-0.2%	1995	2007	3,242.0	3,161.0
	Malaysia	-0.2%	1995	2009	1,416.0	1,384.0
	Myanmar	3.3%	1995	2004	659.0	885.0
	Philippines	-20.5%	1995	2004	6.0	0.8
	Viet Nam	6.3%	1995	2009	1,751.0	4,139.0

Source: Portheawl Pty. Ltd. estimates, based on data from the Railisa database maintained by UIC, available at http//www.uic.org

The Asia-Pacific region contributes to an important share of exports (36.3%) and imports (34.7 in the world merchandise trade 2011. The economic emergence of China and India transformed the economic landscape of East and South Asia. These economies are driving the world trade in spite of global recession. High trade growth has been projected between ASEAN and South Asia. The growth will drive the freight transportation volumes especially container volumes in the region. The IRJ magazine, September 2012, mentioned that the global rail market is set to grow by 17.5% by 2016. Container traffic flows on TEUs as indicted below between Asia and Europe will reach 41 million and those on TEUs intra Asia will reach 57 million in 2025.



Container traffic flows 2025 (TEUs)
41 million/57million

TEU: The 20-foot equivalent unit is based on the volume of a 20-foot-long (6.1 m) intermodal container, a standard-sized metal box which can be easily transferred between different modes of transportation, such as ships, trains and trucks.

DEMOGRAPHICS AND RAILWAY ROUTE LENGTH

More than 4.2 billion people are estimated to be in Asia-Pacific in 2011. It is 60% of the world population. Also by 2025 it is accepted that half of the population of the developing economy in the AP region will bring passenger transportation by rail.

Since the 1990s, concerns over issues such as greenhouse gases, fossil fuel dependency and energy efficiency have led to renewed interest in the inherent quality of rail. Environmental issues will influence the future demand for public transport and intercity rail transport. However, the extent of rail infrastructure development and the utilization of the rail mode offer a contrasting picture across the region. Table 2 shows railway route length as well as the most common track gauges in each country. Just five out of these 30 countries (Australia, China, India, Japan and the Russian Federation) account for 76% of this route length.

COUNTRY	ROUTE LENGTH	GAUGE (mm)
Armenia [2]	826 km	1,520
Australia [3]	34,163 km	
Azerbaijan [4]	2,080 km	1,520
Bangladesh [5]	2,835 km	1,000
		1,676
Cambodia [6]	602 km	1,000
China [5]	91,000 km	1,435
Georgia [4]	1,570 km	1,520
DPR Korea [4]	5,235 km	1,435
India [5]	63,974 km	1,676
Indonesia [5]	6,535 km	1,067
Japan [3]	20,035 km	1,067
		1,435
Kazakhstan [4]	14,210 km	1,520
Kyrgyztan [4]	417 km	1,520
Lao People's Dem. Republic [5]	3.5 km	1,000

COUNTRY	ROUTE LENGTH	GAUGE (mm)
Malaysia [5]	1,658 km	1,000
Mongolia [4]	1,810 km	1,520
New Zealand [7]	7,791 km	1,067
Myanmar [5]	5,460 km	1,000
Nepal [5]	53 km	1,676
Pakistan [2]	7,791 km	1,676
		1,000
Russian Federation [4]	85,280 km	1,520
Republic of Korea [5]	3,557 km	1,435
Singapore [5]	23,5 km	1,000
Sri Lanka [7]	1,463 km	1,676
Tajikistan [4]	616 km	1,520
Thailand [5]	4,071 km	1,000
Turkmenistan [4]	3,110 km	1,520
Uzbekistan [4]	4,230 km	1,520
Viet Nam [4]	2,350 km	1,000

1. Asia Development Bank ; 2. International Union of Railways, Statistics (2010) ; 3. Consultant ; 4. OSJD bulletin of statistical data on railway transport for 2009 (published 2010) ; 5 Government sources ; 6 Toll Co. LTD ; 7 Railway Directory, 2011.

ENERGY SECURITY AND ELECTRIFICATION

In 2009, the Asia-Pacific region produced more energy than any other region in the world, accounting for 46% of total global production. Rail transport accounts for 2% of the consumption of oil connected to transport. During the period 1995-2009, the overall demand for Asian and Pacific rail passenger transport services grew by 76%, freight transport grew by 89% to 2010. Asia-Pacific's demand for oil is more than three times the region's production. The remaining consumption of oil (2/3) is import. This will impact on the cost side of transportation in general, as well as the operation on non electrified lines which is two thirds of Asia-Pacific's network.

Table 3 shows the total electrified route length in those countries and their share in each individual network. So far only 16, i.e. under half, of the railways in Table 1 have embraced electric operation. Together they total 137,000 km of electrified route, i.e. slightly over 35% of the region's overall railway route length. The figures show that AP members vary greatly in the level of rail network electrification. In terms of electrification of route length, Georgia and Armenia top the table with 94.6% and 87% of their networks being under electric traction, respectively. They are followed by the Democratic People's Republic of Korea with 81% of its network electrified and Japan, the Republic of Korea and Azerbaijan which each have 60% of their networks under wire. In terms of overall electrified route-km, the Russian Federation has the most extensive electrified network, with over 43,000 km of electrified routes, i.e. over 50% of the country's total network. It is followed by China and India with 42,000 km and 18,900 km of electrified routes, respectively. Although the rail network in Australia is the fourth largest in the region at 34,163 km, only 7.8% of it is electrified.

COUNTRY	ELECTRIFIED ROUTE-KM	% OF NETWORK
Armenia [1]	719 km	87
Australia [2]	2,649 km	7.8
Azerbaijan [3]	1,251 km	60
China [4]	42,000 km	46
DPR Korea	4,220 km	81
Georgia [3]	1,486 km	94.6
India [4]	18,927 km	30

COUNTRY	ELECTRIFIED ROUTE-KM	% OF NETWORK
Japan [2]	12,230 km	61
Kazakhstan [3]	4,054 km	28.5
Malaysia [4]	330 km	20
Pakistan [1]	305 km	4
Russian Federation [3]	43,165 km	50.6
Republic of Korea [4]	2,150 km	60.4
Uzbekistan [3]	589 km	14

1. International Union of Railways, Statistics (2010) ; 2. Consultant ; 3. OSJD bulletin of statistical data on railway transport for 2009 (published 2010) ; 4 Government sources.

RAIL TECHNOLOGY

Railway technology is often conventional and is used for a long time because of replacement cost, reliability, and safety while commercially available technology in other industries is drastically changing in the world. Up-to-date railway technology such as train control system by radio communication, asset management, and energy management for smart grid can be effective and helpful in terms of life cycle cost, comfort, reliability, and safety. Technological changes like source of fuel, improved border crossing arrangements, information systems and tracing systems will be focus areas for the development of regional rail networks and for reducing the cost of transportation and enhancing movements across the borders.

OPERATIONAL CONDITIONS AND MISSING LINKS

Non-homogeneous regulations, rolling stock and procedures make border crossings complicated, having an impact on the development of effective logistic chains. Considering the growth potential in the region the railway network in Asia-Pacific will have to be enhanced two to three times.

A "missing link" is an absence of physical connection between the railway networks of neighbouring countries, or an absence of continuous railway infrastructure within one country. Table 4 sums up the breakdown of gauge points in the Trans-Asian Railway (TAR) network. Figure 1 shows a map of the TAR network. Local geography such as lakes and seas may cause interruptions to railways. Missing links between networks of neighbouring countries occur either because the link was never there in the first place (for example, between China and Myanmar) or because it ceased to exist due to political events – for example, between the Democratic People's Republic of Korea and the Republic of Korea. In total, the TAR network still includes 10,500 kilometres of missing links. While continuous rail infrastructure already connects North-East Asia and Europe, the infrastructure is somewhat less coherent in other sub-regions when it comes to cross-border rail connections.

		COUNTRY CONCERNED	GAUGE TRANSITION		
China	⟷	Viet Nam	1,435 mm	⟷	1,000 mm
China	⟷	Russian Federation	1,435 mm	⟷	1,520 mm
China	⟷	Kazakhstan	1,435 mm	⟷	1,520 mm
China	⟷	Mongolia	1,435 mm	⟷	1,520 mm
Russian Federation	⟷	Democratic People's Republic of Korea	1,520 mm	⟷	1,435 mm
Turkmenistan	⟷	Islamic Republic of Iran	1,520 mm	⟷	1,435 mm
Pakistan	⟷	Islamic Republic of Iran	1,676 mm	⟷	1,435 mm
Armenia	⟷	Turkey	1,520 mm	⟷	1,435 mm
Bangladesh					
East Zone	⟷	**West Zone**	**1,000 mm**	⟷	**1,676 mm**

With the growing interest of high speed train operation in other than European railways, it is necessary to spread awareness and benefits of high speed train operation in the AP region. Table 4 shows high speed route kilometres in operation and under construction & planned. Its spread in the region is limited to China, Japan, Russia, South Korea, and Taiwan-China. India is planned. Potential exists for expansion in a few AP countries. On the other hand, some AP countries consider upgrading conventional line for speed-up instead of building a high speed line.

NATURAL DISASTER

Global climate change poses new disaster scenarios and operational challenges for railways in the AP region. Table 5 shows economic damage on natural disasters in AP region. A few types of natural disaster which can give big railway damage by country between 2001 and 2012 are picked up. Amount of damage includes not only damage on the railway, but also that on public infrastructure. Operational railway systems in various geographical locations may experience different types of natural disaster such as earthquake, tsunami, flood, typhoon, strong wind, winter snowing, heat and sandstorm. Exchanging information among members would be useful.

COUNTRY	TYPE OF DISASTER	TIME	ECONOMIC DAMAGE (MILLIONS US$)
Australia	Flood	Dec-10	7.3
Australia	Storm	Feb-11	2.5
Bangladesh	Storm	Nov-07	2.3
Bangladesh	Flood	Jun-04	2.2
China	Earthquake	May-08	85.0
China	Flood	May-10	18.0
China	Flood	Jun-12	8.0
India	Flood	Jul-06	3.4
India	Earthquake	Jan-11	2.6
Indonesia	Earthquake	Dec-04	4.5
Japan	Earthquake	Mar-11	210.0
Japan	Earthquake	Oct-04	28.0
Japan	Earthquake	Jul-07	12.5
South Korea	Storm	Sep-03	4.5
South Korea	Storm	Aug-02	4.2
Myanmar	Storm	May-08	4.0
New Zealand	Earthquake	Feb-11	15.0
New Zealand	Earthquake	Sep-10	6.5
New Zealand	Earthquake	Jan-11	3.0
Pakistan	Flood	Jul-10	9.5
Pakistan	Earthquake	Oct-05	5.2
Sri Lanka	Earthquake	Dec-04	1.3
Russia	Wildfire	Jul-10	1.8
Russia	Extreme temp.	Jan-06	1.0
Taiwan	Storm	Sep-01	0.8
Taiwan	Earthquake	Mar-10	1.0
Thailand	Flood	Aug-11	40.0

Sources:

1. Railway of Asian visions 2025 (background paper, UIC strategy, September 2006)
2. Review of developments in transport in Asia and the Pacific 2011 (UN ESCAP)
3. Statistical year book 2012 (UN ESCAP)
4. Figure data 2009 (EIA)
5. The international disaster database2001-2011 (EM-DAT)
6. High Speed database in UIC website

STRATEGY

Members have identified some key organizational challenges within their own networks relating to competition, financial performance, regulation, knowledge retention, environmental sensitivity, technical advancement, public image and staffing issues.

Taking these challenges as an appropriate background context, the future development of the UIC AP region will also need to give priority to the effective realization of activities for harmonization and further mutually advantageous development. This will involve the identification of the perspectives and specific needs of UIC AP members particularly towards common traffic and development of international corridors. Such development will depend upon the harmonization and unification of basic international law documents (agreements) and technical acts (standards, regulations) and economic relations development and implement of common technical policy.

In this regard, the following generic topics appear appropriate as a foundation for further UIC AP development.

- Defining the financial & economic conditions and direction of the railway activity in the region
- Implementation of new technology, improving traffic process, technical standardization
- Formalization of legal conditions of transportation, taking into account all aspects of particular railway development
- Determining the technical requirements and means to comply with standard decisions relating to technical and operational compatibility on a global level
- Developing economic/business models, which will promote participation in new traffic areas in cooperation with other international organizations operating in the region, such as OSJD, UN, ADB, World Bank, etc.
- Harmonization of international law documents and using experience of railway administrations in the process in relation to export, import, and transit railway transportation
- Reflect other needs from many countries in the AP region

ORGANIZATION

The UIC headquarters in Paris over the last 90 years of its existence has been able to assimilate capacities and resources which have provided great value to its members. The UIC AP, which is a nascent body, will need to be nurtured to make it more resourceful and useful to its members. Effective and efficient functioning of the region will be essential to support the members. Considering the huge size of the region and potential for development activities in the region, regional contacts need to be established to complement the work with the UIC Regional Director.

METHODOLOGY

The AP region lacks the strong regional research institutional support which exists in Europe. This has resulted in the lack of qualitative documentation on the basic activities carried out by members within the region. A three pronged approach will need to be adopted for the development of specific regional documentation; firstly, through interaction among the sector experts; secondly, through workshops and seminars on relevant areas of common interest and thirdly, through executing studies, with the assistance of reputed consultants in the region, where necessary.

MEMBERSHIP

UIC AP has very few active members at present. The existing members perhaps represent the sub-regions where the growth prospects are strongest. Nevertheless, the growth prospects in these countries depend not only on railways, but as the *Vision 2025* document has brought out, also on well functioning port connections, inland connections and corridors. Many of these inland countries and other stakeholders, which will

influence the productivity of UIC member countries, are not presently members.
The future intermodal logistic chain will blur the clear defined present roles of railways, container operators, industry associations and ports. Consideration will need to be given as to membership which may be extended to clearly understand and incorporate the future intermodal logistic chain.
Europe has an inherent advantage of a number of railway research agencies which have been associated with UIC for a long time. It would be appropriate to make similar efforts to involve railway research agencies and academic institutes in UIC AP activities in order to combine all research efforts to ensure sustainable and economic rail transport development.

Asian members' needs (result of Asia members' survey 2010)

- Cooperation among countries due to economic stagnation
- Development of inter-regional business opportunities such as between Europe and AP
- Reduction of the cost (finance, daily operation, and efficient organization)
- System interfaces & standardization (OSJD, CEN/CENELEC, IEC, signature of MoUs)
- Interaction with manufacturing sector
- Signalling and system control

PROJECTS

Considering the diverse nature of railways in the AP region, interoperability, as defined within the strict European context, may be seen as a more long term aspiration for AP and not the predominant focus area at this point in time. Notwithstanding this, railways can derive economic benefit through aligning and streamlining operational processes with business partners along common rail corridors. Benefit can also be gained from common research and economies of scale in terms of promoting converging technological solutions.

A more professional and organized position in frontof the railway supply industry and in representing the UIC AP region's position with international organization and intergovernmental agencies should increase the effectiveness with which the common voice of the region is heard and taken into account.

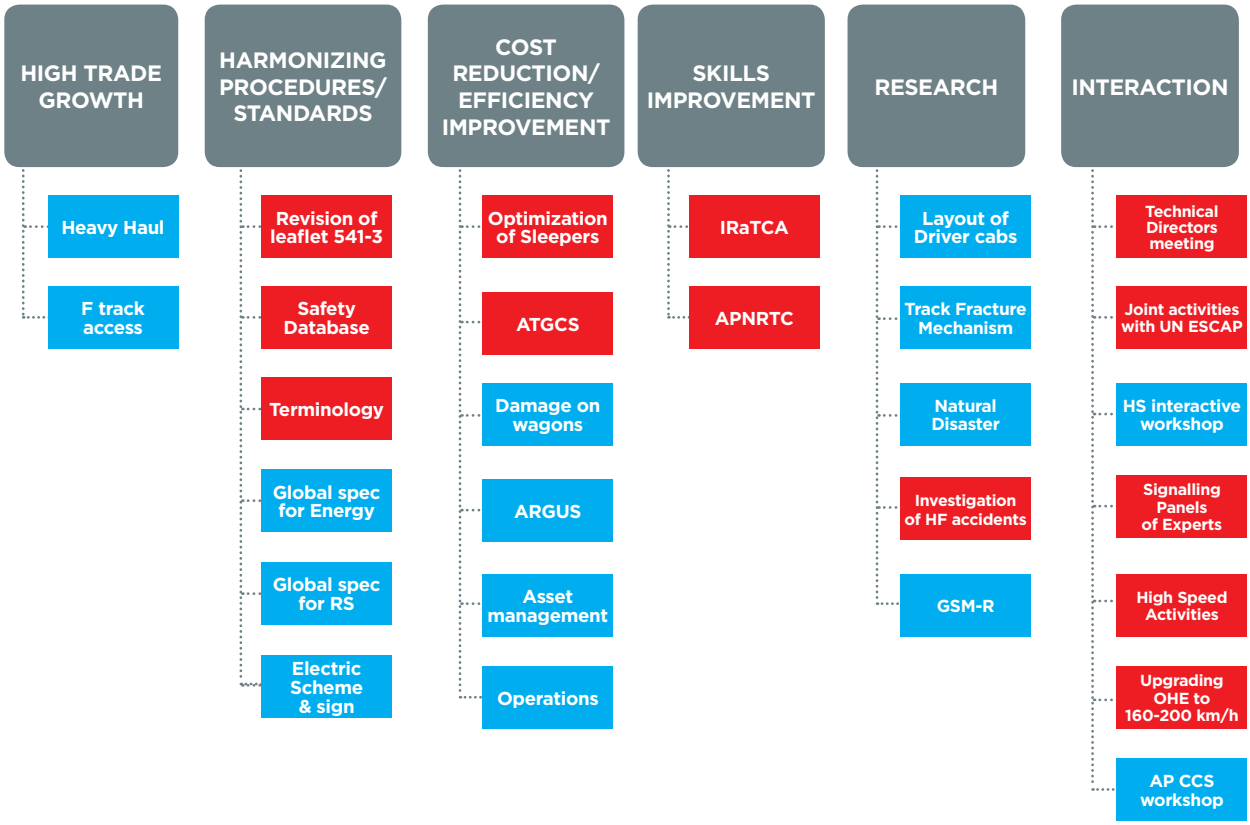
The projects which fall under the following broad areas would appear to address the above issues:

- **High trade growth:** Projects which support the high trade growth projected within AP and between Europe, Middle-East and AP
- **Harmonizing procedures/standards:** Projects which aim at harmonizing and standardizing the procedures
- **Cost reduction/efficiency improvement:** Projects aiming to reduce the cost of operation, and improve the efficiency.
- **Skills improvement:** Projects which aim to improve the skills of employees
- **Research:** Projects which encourage joint railway research
- **Interaction:** Projects which interact with members, industry, investors, and customers

In order to realize such projects effectively the following procedural steps are recommended:

1. Creating a work group on each project (to clearly determine the terms)
2. Compiling the information (to define the actual scope of work)
3. Working out a united position on the collected information, taking into account interests of all project participants (to define the objective and eventual use of the output-i.e. for training, report, guideline, code of practice, standard, specification)
4. Establishment of pilot projects, where necessary (to demonstrate the project's effectiveness and profit according to the interests of participating members)
5. Study results of pilot projects
6. Conclusions
7. Full project's realization

Some projects 2013-2016 have been developed for the action plan. Those are divided into three types of projects, Regional, Multi-Regional, and Global. Also, those projects are identified with the six categories below. The outline of projects is covered in the following pages.



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