



STRATEGIC ACTION PLAN FOR UIC ASIA-PACIFIC

↗ 2016-2019

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INTERNATIONAL UNION
OF RAILWAYS

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FOREWORD

The 20th UIC Asia-Pacific Regional Assembly on 17 November 2015 in Kuala Lumpur adopted the “UIC Asia-Pacific Vision 2050” which was produced to contribute to the realization of a UIC vision for Asia-Pacific to 2050. In line with this vision, the Strategic Action Plan for Asia-Pacific has been updated with more developed context and strategy.

The Asia-Pacific region of UIC covers a huge area and each member has different needs. In this huge and diversified region, it is important for us, railways, to know and understand

each other, to find common issues and interests, and to move forward in a collaborative manner in order to execute our responsibility to support the sustainable development of the Asia-Pacific region.

I hope that many projects of common issues and interests will be proposed in accordance with this strategic action plan and that the members get together for selected projects to discuss, share best practices and disseminate deliverables. I believe that, by this process, the Asia-Pacific region of UIC will be more and more active and developed.

Satoshi Seino

Satoshi Seino

Chairman of East Japan Railway Company and
Chairman of UIC Asia-Pacific Region



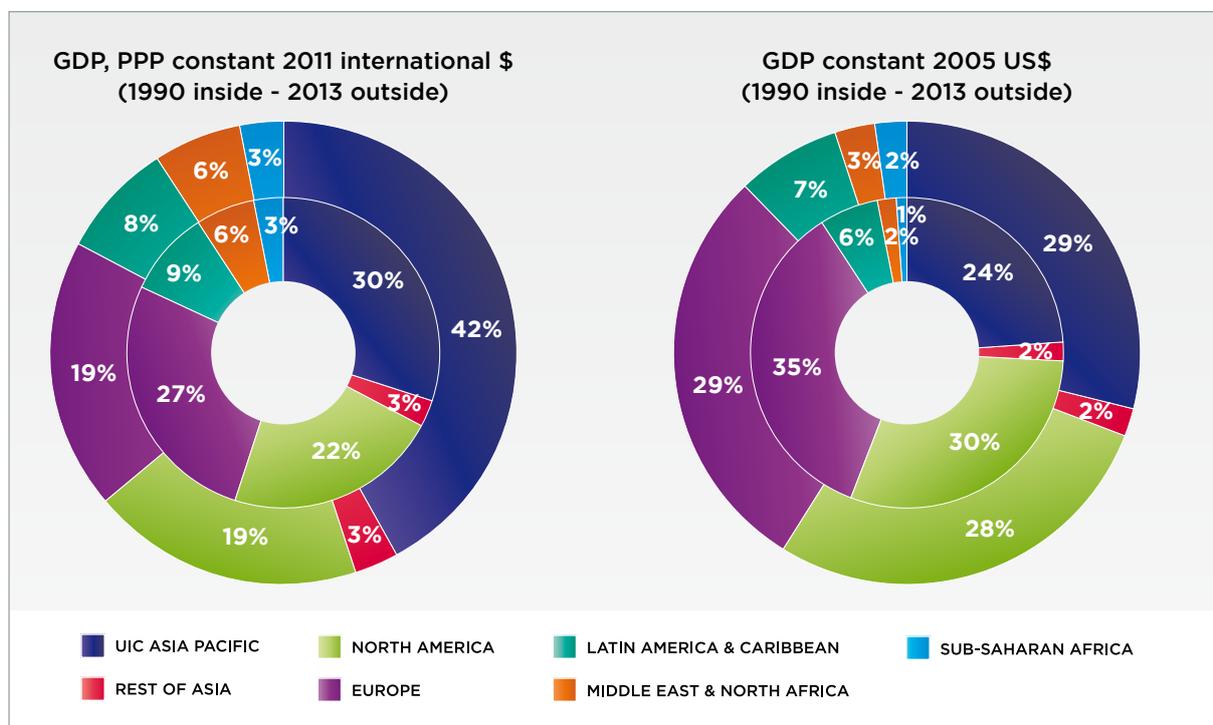
CONTEXT

Economy and transport in the Asia-Pacific 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 “UIC Asia-Pacific Vision 2050”.

ECONOMICAL, ENVIRONMENTAL AND SOCIAL ANALYSIS OF ASIA-PACIFIC REGION

The UIC Asia-Pacific region’s countries account approximately for a third of the world GDP, at market exchange rate. Currently (2013), the comprehensive GDP of the UIC Asia-Pacific region reaches 16 210 billion USD. Based on GDP adjusted for purchasing power parity (PPP), the weight of Asia-Pacific economy is even stronger. In 2013, the total GDP of the UIC Asia-Pacific region was 42% of the world economy, with the three largest Asian economies alone (China, India, Japan) reaching 27%.

Share of World GDP (PPP and market exchange rate) 1990 and 2013

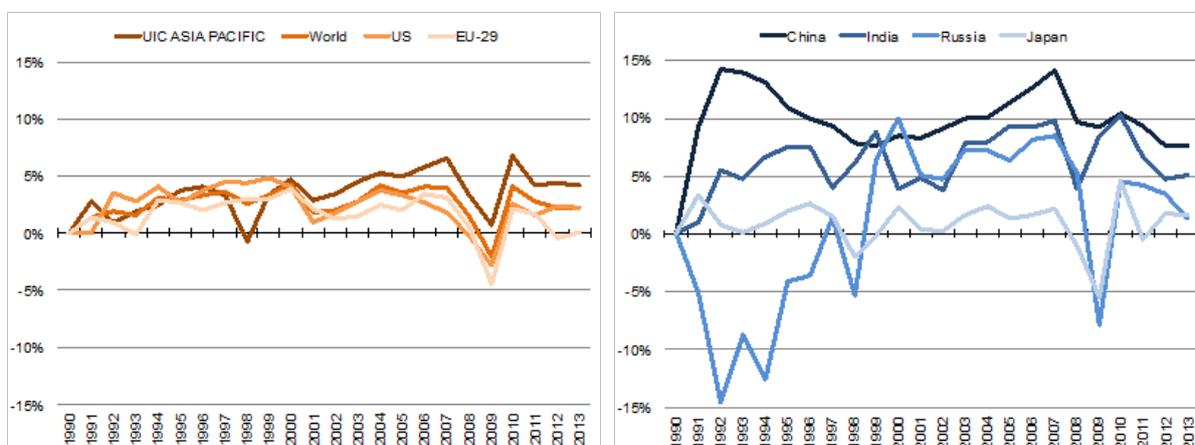


Source: World Bank, International Monetary Fund

The growing weight of the Asia-Pacific region economies observed in the last years is the result of a different and higher growth rate than other economic areas of the world. The extraordinary economic growth accompanying Asia-Pacific emerging economies coupled with the integration into global markets is largely due to the development of global supply chains and heightened inter-

national mobility of capital. The rapid development of information and communication technologies (the ICT revolution), the lower transportation costs and the vast wage differences between developed and developing nations allowed a more granular division of labour worldwide, generating the so-called “second unbundling”.

Trends of growth rates of world regions (left) and countries in the Asia-Pacific region (right), 1990-2013



Source: World Bank

From 1990 to 2010, in Asia the number of extremely poor declined by 745.4 million. Asia also stands out if the “moderate poverty” line of \$2/day/person is used: the number of moderately poor declined by 566.31 million in Asia between 1990 and 2010, while increasing far less in other regions.

The analysis of **Millennium Development Goals** (MDG) indicators shows that the Asia-Pacific region is generally aligned to the targets. The developing economies in the region have made substantial progress toward universal primary education, gender parity, reduction of child mortality, improvement of maternal health.

Despite Asia’s recent growth resulting in a dramatic decrease in poverty, income inequalities have continued to rise. **Inequality** as measured by the Gini coefficient has been rising in a number of countries in Asia-

Pacific. Another indicator of inequality, the ratio of the income of the top quintile to the income of the bottom quintile of the population, is relatively high – ranging between 6 and 9 in a number of countries – and in a few cases increasing.

The population of Asia is still for the most part rural when compared to other parts of the world, the Americas and Europe in particular; still, it is the region of the world that according to UN will have the highest **urbanization rates** together with Africa, reaching 64% of population in 2050. Between 2014 and 2050, the urban areas are expected to grow by 404 million people in India and 292 million in China. In 1990 there were 10 cities with more than 10 million inhabitants, half of which in Asia. Today, the number of megacities has nearly tripled to 28: 16 of those are in the Asia-Pacific region.

This being said, in Asia most of the population is concentrated in urban areas with less than 500 000 inhabitants, and the fastest growing urban agglomerations are medium-sized cities and cities with less than 1 million inhabitants located in Asia.

With these growth rates, the increase in **energy consumption** implies a progressively larger claim on global energy resources. Despite a slight downturn due to the economic recession that emerged in 2009, Asian energy demand has continued to rise, driven by population increase and rapid economic growth. The region accounted for more than 46% of global energy demand in 2012. Most Asian economies require imports in order to meet energy demand.

PRC, a net exporter of energy until the early 1990s, has now become a large importer of oil. India's oil import volumes increased from 1.6 mb/d in 2000 to 2.5 mb/d in 2009 and are expected to reach 14 mb/d by 2050.

The Asia-Pacific region is characterised by an outdated electric production system, a massive use of coal and a strong dependence on fossil fuels in the transport sector. This implies an increase of **CO₂ emissions** with rates even higher than for energy consumption increase. The Asia-Pacific CO₂ emissions have more than doubled in the last 22 years, mainly because of an upsurge in energy consumption but also due to the constant rise of the carbon intensity per unit of consumed energy.

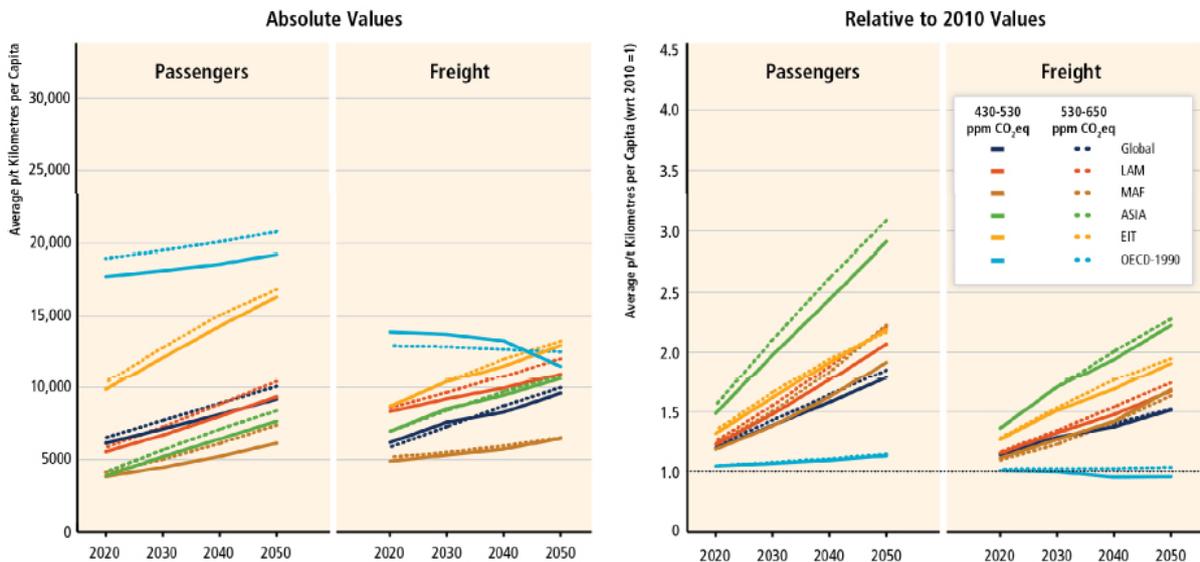


TRANSPORT SCENARIO

According to the IPCC WGIII AR5 scenario, the **world transport demand** – for both passenger and freight – will grow in the next decades until 2050, with most of this growth happening in emerging countries, where higher rates of income and population growth are forecasted. All scenarios analysed by IPCC show how, due to a strong correlation between passenger mobility and disposable income, the highest rate of growth will be in non-OECD countries, Asia-Pacific countries in particular.



Per-capita passenger and freight demand in different regions based on scenarios differing by CO_{2eq} concentration levels in 2100 (average pkm and tkm per-capita per year)

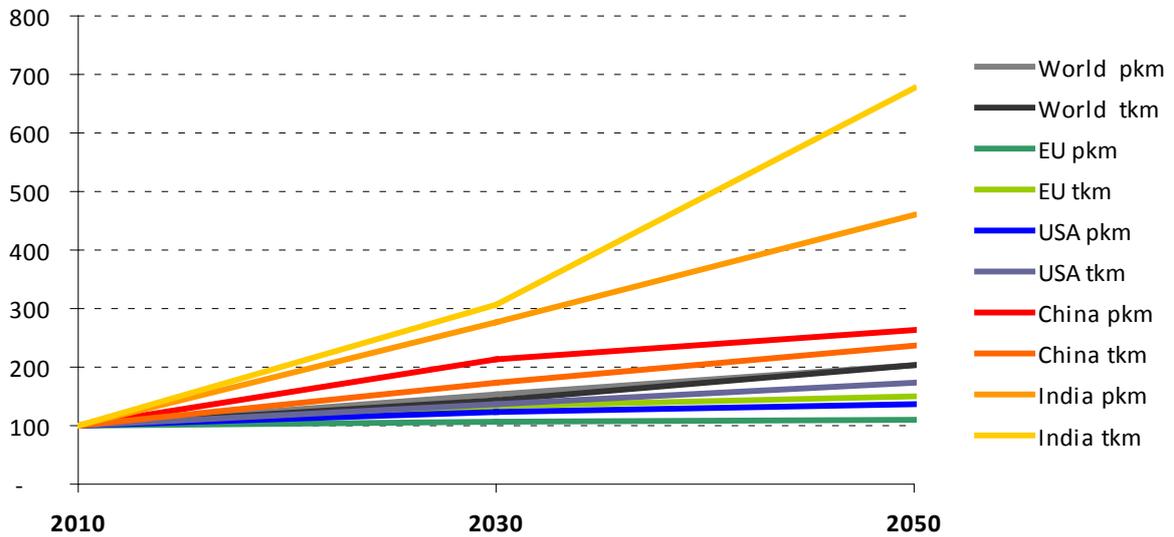


Source: IPCC (Intergovernmental Panel on Climate Change)

The IEA (ETP 2012), in the 6DS and 4DS scenarios, conjectures that the global **passenger demand**, in a business-as-usual (BAU) perspective, will double between 2010 (baseline) and 2050, with an average rate of 19.3%

in 10 years. The IEA assumes that passenger demand will rapidly increase, in particular in non-OECD Asia-Pacific countries, because of multiple factors: among those, the forecasted growth in population and income.

Growth of passenger and freight transport demand according to the IEA 6DS and 4DS scenarios, for World, EU, USA, China and India (2010=100)



Source: International Energy Agency

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According to ITF/OECD forecasts a shift in world **freight patterns** with an increase of global activity by 350% tonne-km in the 2010-2050 period. The Asia-Pacific region is already by far the most important region for container trade. The world's ten leading container ports are located in East and South-east Asia with the only exception of Jebel Ali, port of Dubai.

The ITF Outlook 2013 estimated that in 2050 the **number of vehicles** circulating at global level will double or even grow fourfold compared to 2010 levels (from 835 million

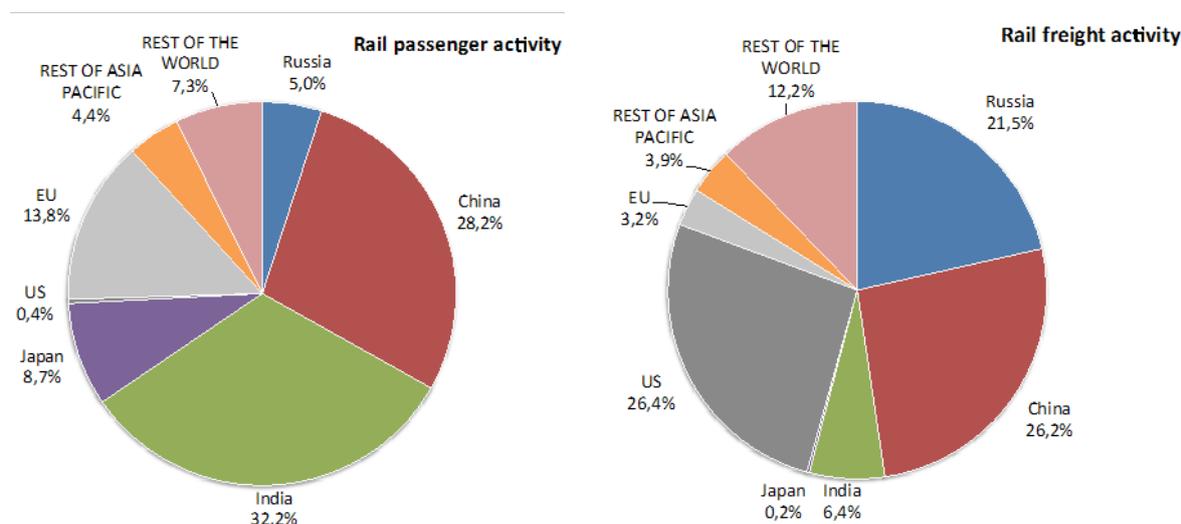
vehicles estimated in 2010 to 1.8 or 3.3 billion vehicles) if no measures are taken to contain the spread of private vehicles and if the world economic growth will have the same speed it had before world financial crisis of 2007/2008: a high or very high growth rate is expected in Asia, because of the strict relationship between prosperity and spreading of private mobility. For former Soviet Union countries the growth rate foreseen is more moderate, but anyway twice the amount of the growth in North America, Europe and OECD Pacific countries (Japan, South Korea, Australia and New Zealand).



RAILWAYS

Railway activity in Asia-Pacific in 2010 was 79% of global demand for passenger service and 58% for freight service. China, Russia and India alone account for 54% of rail freight transport worldwide and India, China, Russia and Japan account for 74% of passenger traffic.

Share of rail activity of Asia-Pacific in the world, 2010



Source: UIC

Even in terms of **modal share** in the different national transport markets, the Asian railways feature some of the best performances in the world. In the passenger sector, the modal share of railways in India stands out, followed by Japan and China; in the freight sector, Russia runs most of its freight by rail, while China and India have a rail modal share of more than 60% in freight.

The socio-economic development process observed in the last decades has obviously involved the transport sector as well. In general, in countries that had a higher development such as China and India (but also in some North-Central Asian countries), demand for railway has increased in absolute terms, both for passenger and for freight. However, railway has lost market share in favour of competing modes (aviation and road for passenger, road and waterways for freight).

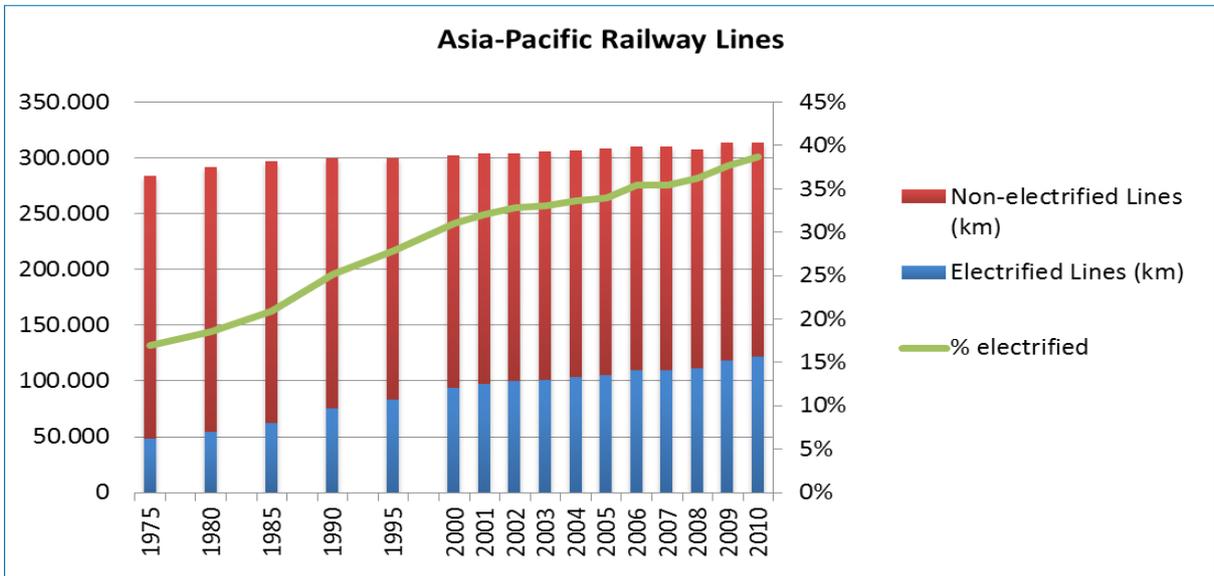
The Asia-Pacific **rail infrastructure** represented 30% of the world's railway lines in 2010, growing from 23% in 1975. Even though rail infrastructure is increasing, it is not reaching the growth levels of road infrastructure. Paved roads have increased by 321% between 1975 and 2010, with a Compound Annual Growth Rate (CAGR) of 4.2% compared to the 0.3% of rail.

In comparing the density of rail and road infrastructure per capita in Asia-Pacific, it can be that the huge population increase in the region (66% between 1975 and 2010) was more than matched by the expansion of road construction, not so much so by rail: road density increased by 154% since 1975 (when it was 0.9 m per capita), compared to rail density which in fact decreased by 33% in the same period. Road density in 2010 was 2.3 m per inhabitant, nearly 30 times higher than rail density.

The analysis of infrastructure density over GDP clearly shows how gross domestic product in the 29 Asia-Pacific countries considered is being used to fund the construction of road infrastructure much more than the construction of rail infrastructure: the amount of road infrastructure in the region per dollar of GDP has increased by 53% between 1975 and 2010, while in the same period the same indicator for rail decreased by 60%.

Electric railways are taking an increasing importance in Asia-Pacific: while only 17% of railway lines were electrified in 1975, this ratio became 31% in 2000 and 39% in 2010; anyway there is still a long way to go to reach the level of the European Union, where more than half of the lines are electrified, but there is a clear progress towards more electrified railways, which are more efficient and less polluting.

Trend of railway lines in Asia-Pacific, 1975-2010 (km)



Source: Susdef elaboration from UIC data

High-speed lines have also grown dramatically, especially in China: China makes up more than half of the high-speed lines in the region. However, it is easy to note how high-speed rail is only present in four of the countries of the region, despite the growing urbanization and need for people interconnection in Asia.

The beginning of the 21st century has brought renewed interests for a **long distance inland connection** between Asia and Europe, especially with the booming Asian trade and the increasing pressure to ship containerised freight in a time sensitive manner over long distances.

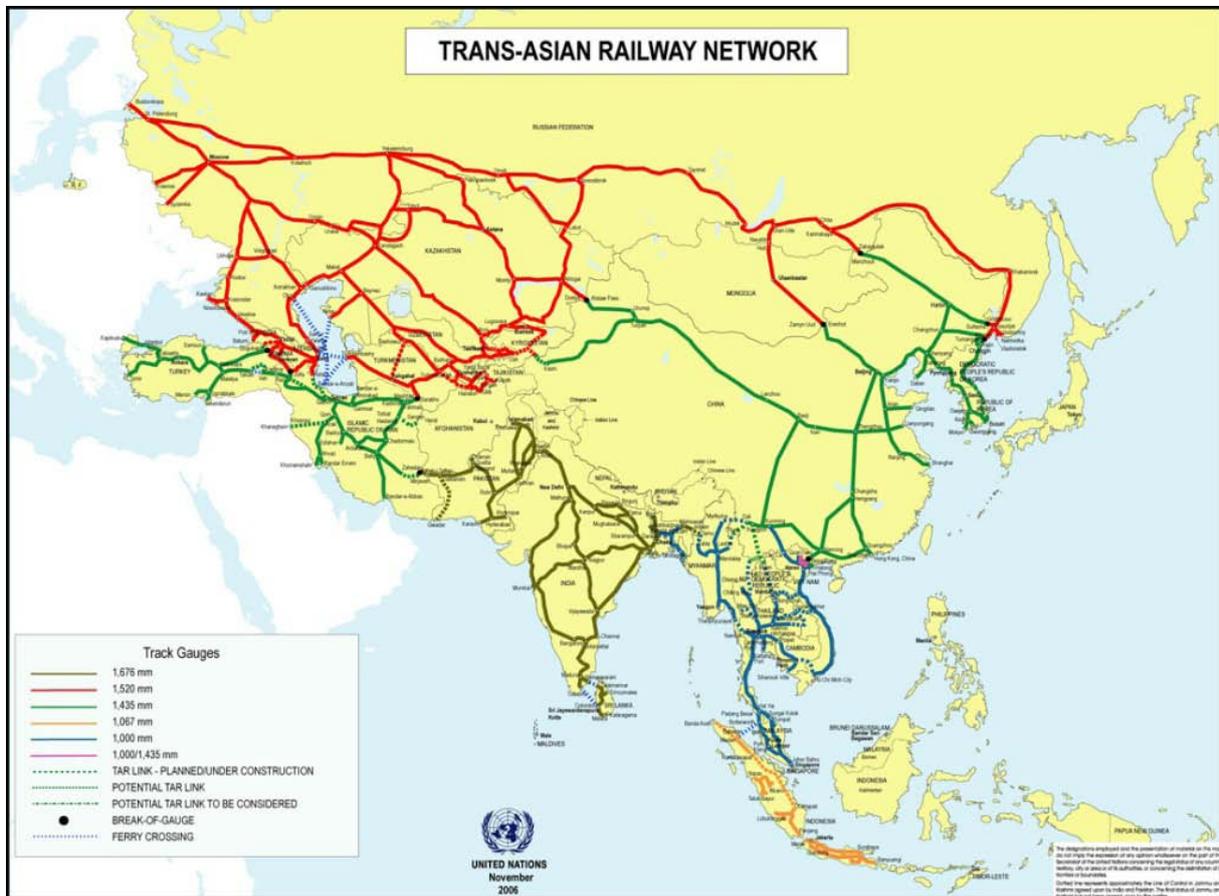
This is one of the central topics both for the Asia-Pacific region and globally, due to technical, socio-economic and geopolitical reasons.

Therefore, there are several national, regional and cross-region initiatives in development since many years.

In the framework of its Transport Division activities, the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP) carried out a project called 'Operationalization of international intermodal transport corridors in North-East and Central Asia'.

Under the project, **four railway corridors** have been identified based on existing routes of the Trans-Asian Railway (TAR).

- the Northern Corridor connecting China, Kazakhstan, Mongolia, Russia and the Korean Peninsula (1995, refined in 1999);
- the ASEAN and Indo-China sub-regional network covering Cambodia, China, Indonesia, Lao PDR, Malaysia, Myanmar, Singapore, Thailand and Viet Nam (1996);
- the Southern Corridor connecting Thailand and the southern Chinese with Turkey through Bangladesh, India, Iran, Myanmar, Pakistan, Sri Lanka (1999);
- the North-South Corridor linking Northern Europe to the Persian Gulf through Russia, Central Asia and the Caucasus region (2001).



The Euro-Asian Transport Links (EATL) project, a joined initiative between the United Nations Economic Commission for Europe (UNECE) and the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP), has identified **nine rail corridors** that link Asia and Europe for priority development and cooperation.

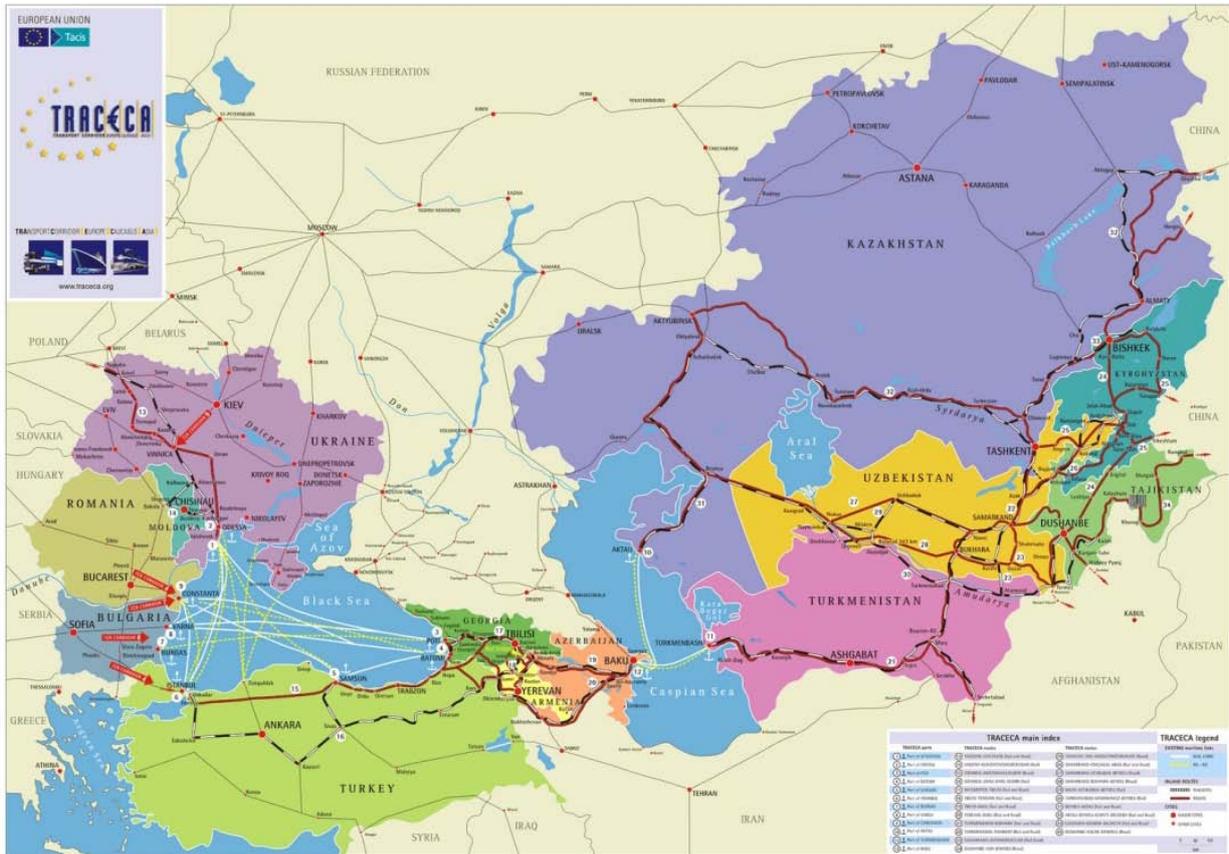
EATL Railway routes



Source: UNECE (UN Economic Commission for Europe)

The European Union (EU) has promoted different initiative to extend its transport networks into neighbouring states to its north and east: the Pan-European corridors and the “Transport Corridor Europe-Caucasus-Asia” (**TRACECA**) programme, a multilateral agreement between the EU and 14 other Asian states promoting optimal integration of the international transport corridor Europe-Caucasus-Asia into Trans-European Networks (**TENs**).

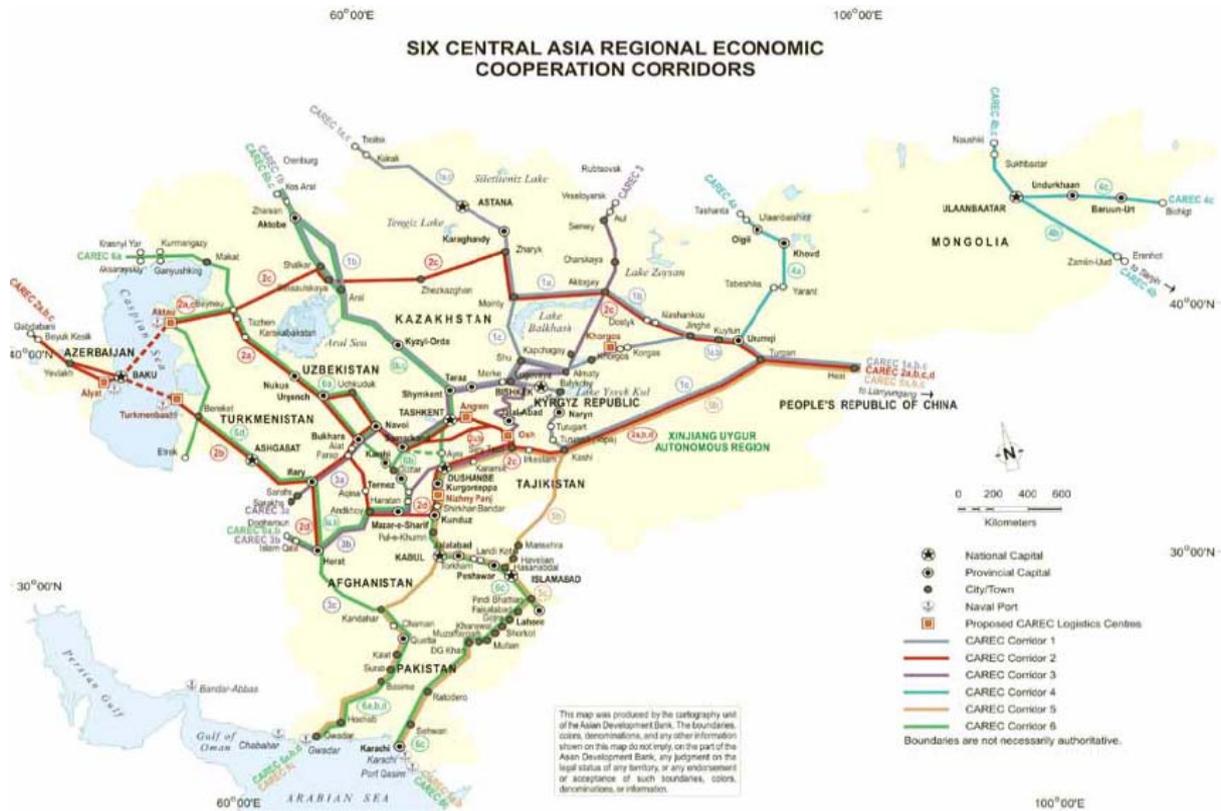
TRACECA rail and road network



Source: TRACECA

The Central Asia Regional Economic Cooperation (**CAREC**) Program involves nine countries of Central Asia, People’s Republic of China and six multilateral institutions with the aim of facilitating regional transport and trade, and improving trade policy. The plan to link Central Asia to global markets has already led to the construction and rehabilitation of 7,672 km of quality road and rail links between key cities and towns, also connecting innumerable communities along routes that often trace the ancient Silk Road. Almost \$19.6 billion had been invested from 2001 to 2014 in 107 CAREC-related transport projects along the six CAREC corridor routes, where the potential for economic development and returns is greatest.

Six Central Asia Regional Economic Cooperation Corridors



Source: CAREC

Actually the **TransSib Railway**, the backbone of Russian railways, is the main link of the North route for the Trans-Eurasian Connection. All railways of the countries along the TransSib corridor (Russian Federation, Kazakhstan, Mongolia) are members of the Organisation for Cooperation Railway Lines (OSJD) and of the Coordinating Council on Trans-Siberian Transportation (CCTT).

Since 1992, ADB's **Great Mekong Subregion (GMS)** Program has been an initiative similar to CAREC. GMS is comprised of 6 countries – Cambodia, LAO PDR, Myanmar, Thailand and Vietnam and the provinces of Yunnan and Guangxi in China – and its strategic thrusts are strengthening infrastructure linkages, facilitating public and private cross-border

trade. To develop the railway network in 2012 was created the Greater Mekong Railway Association (GMRA), a non-legal intergovernmental forum under the GMS Program, with the goal of ensuring that all GMS countries are connected to a GMS rail network by 2020.

In 2011 the Asian Development Bank Institute (ADBI) estimated that the total investments required for regional infrastructure projects for Asian connectivity to meet demand for the identified 1,202 regional projects is valued at approximately US\$ 320 billion, with an average infrastructure investment need of about US\$ 29 billion per year for the period 2010-2020. Of this total, investments for railway projects needed account for about 40%.

Asia's Total Regional Indicative Investment Needs for Identified and Pipeline Infrastructure Projects by Regional/Sub-regional Program: 2010-2020 (US\$ Million)

Regional / Sub-regional Program	Energy	Transport					Grand Total
		Airport / Port	Rail	Road	TF / Logistics	Total	
AH	-	-	-	17,425.0	-	17,425.0	17,425.0
TAR	-	-	107,469.0	-	-	107,469.0	107,469.0
ACP*	-	51,446.0	-	-	-	51,446.0	51,446.0
CAREC	15,667.0	1,347.7	5,131.3	12,932.9	9,925.1	29,337.0	45,004.0
GMS	2,603.8	200.0	1,523.0	3,972.0	163.0	5,858.0	8,461.8
ASEAN	11,583.0	-	16,800.0	-	-	16,800.0	28,383.0
BIMP-EAGA	100.0	-	-	-	-	-	100.0
SASEC	133.0	-	-	-	203.0	203.0	336.0
Other**	61,928.6	-	-	-	89.5	89.5	62,018.1
Total	92,015.4	52,993.7	130,923.3	34,329.9	10,380.6	228,627.4	320,642.8

Source: ADB Institute

ASIA-PACIFIC PERSPECTIVES 2050

Asia is in the midst of a truly historic transformation. If it continues to grow on its recent trajectory, it could, by 2050, account for more than half of global Gross Domestic Product, trade and investment, and enjoy widespread affluence. Indeed, this result is filled with multiple risks and challenges, e.g. inequities within countries, the risk falling into the *Middle Income Trap*, intense competition for finite natural resources, rising disparities across countries and sub-regions, global warming and climate change including increased natural disasters.

Despite the very different conditions in the countries that are part of the region, it is possible to draw the contours of the **great challenges** facing the region as a whole:

- Growth with inclusion;
- Fostering regional cooperation and integration;
- Managing massive urbanisation;
- Fighting climate change and resource depletion.

In this context, the **role of railways** can be traced along four key priorities/challenges:

- increase or maintain the market share of railways offering innovative transport services for a rapidly evolving socio-economic environment;
- promote and sustain the integration and cooperation at a regional and sub-regional level;
- promote transit oriented development and well-integrated urban and suburban railway network;
- improve continuously the environmental performance of railways.

Future projections of the mobility indicators correlated with economic growth, increase of disposable income, population and urbanisation show that the transport sector is one of the most sensitive and strategic sectors for **“green growth”**. Railways are an essential instrument for its performance in terms of environmental, social and economic impacts. This character implies that promoting, investing and fostering railway transport is not just a strategic issue of any industrial sector but a strategic instrument to boost *green growth* approach worldwide.

UIC ASIA-PACIFIC: A VISION FOR 2050

The vision statement for the UIC Asia-Pacific railways proposed here is:

“To be a common voice on strategic issues for the transport sector and influence railway growth in the Asia-Pacific region for the next decades”.

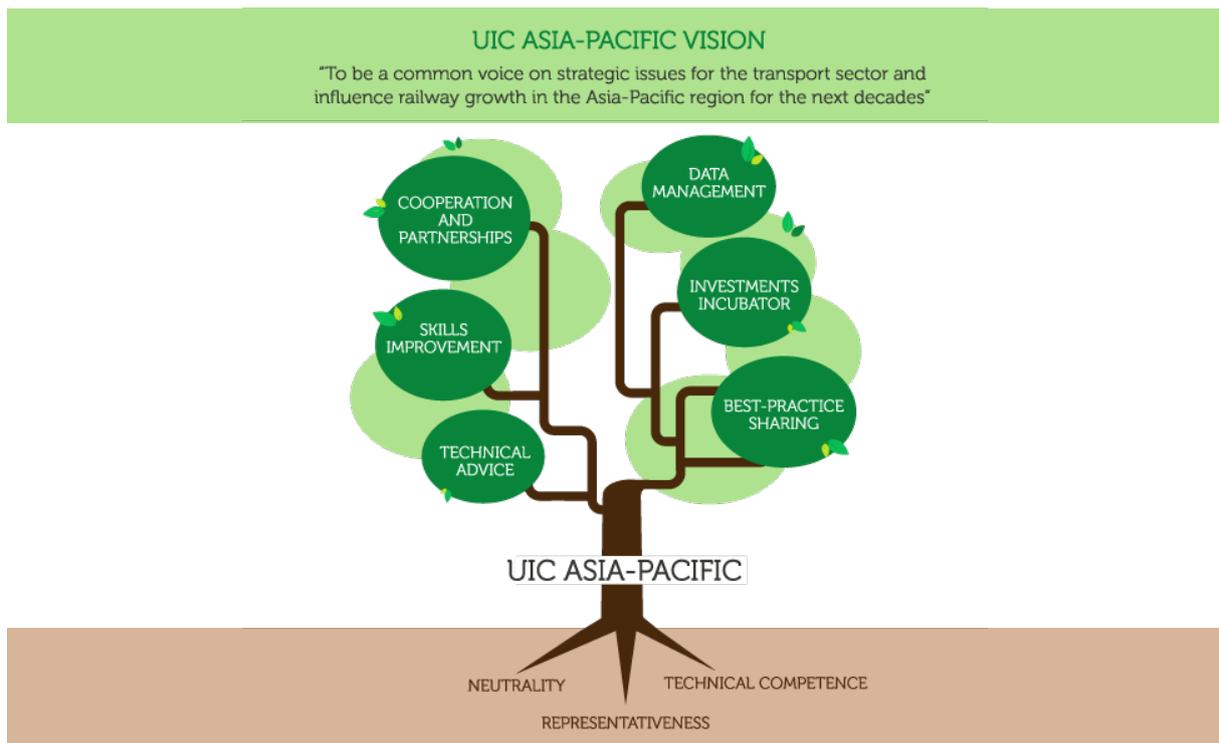
Between what UIC Asia-Pacific is today (mission, core values, core competencies) and what it aspires to be in the future (the vision) a bridge has to be built, with the activities of the Regional Assembly as bricks. The central activities have to be the Action Plans, which select, promote and guide specific working projects.

The UIC Asia-Pacific action needs to cover a regional and sub-regional level and it has to be able to represent the UIC AP region’s position with international organisations and intergovernmental agencies, with national authorities and governments and with the railway manufacturing industry.

In order to take this role in the future, the UIC Asia-Pacific region needs to leverage the core competencies of the UIC organisation towards the organisation internally, towards members and towards external parties.

The **core competencies** of UIC are identified as:

- **Neutrality:** UIC is neutral with respect to all members;
- **Representativeness:** UIC represents a vast number of railways worldwide, not only as a sector and a trade association, but also as a mode of transport to be promoted to reach strategic objectives at various levels;
- **Technical competence:** UIC has expertise on a wide array of railway topics, through the know-how developed in the field by all its members worldwide.





In order to reach the vision outlined in the previous section, the UIC Asia-Pacific region has to focus in the period leading to 2050 on a series of action areas. These areas leverage the core competencies to effectively foster the role of railways in the region and give UIC Asia-Pacific a central role in the development of the transport sector.

The **strategic action areas** identified are:

- *Cooperation and partnerships with the multilateral organisations active in the region:* from the main intergovernmental organisations such as ADB, EDB, UNESCAP, ASEAN, to the railway organisations such as OSJD and CAREC. The cooperation can take different forms: stronger partnerships (e.g. Memorandums of Understanding or Cooperation Agreements) or specific actions such as development programmes for new infrastructure or urban railway service.
- *Data quality improvement:* there is still in the region a “data gap” to be filled by UIC. Railways in the region have a wealth of data that needs to be collected, shared among members and used on one hand for the improvement of the quality of railway service in the region, and on the other hand to promote a more productive cooperation with international bodies and investors. The data on a number of topics could be collected: e.g. production, safety, infrastructure, energy consumption and CO₂ emissions, modal shift, new projects, etc.
- *Being an incubator for investments in Railways:* the Regional Assembly and the UIC headquarters will leverage their technical competences and their connections with national and regional institutions to foster public and private investments in the region.
- *Best-practice sharing and technology transfer between Members:* Asia-Pacific railways often face similar problems, so it would be beneficial for them to share among each other the issues met, the lessons learned and the innovative solutions found, and to start a productive dialogue with European railways based on “lessons learned”.
- *Technical Advice and Peer Review:* UIC can offer its services and competence to support public and private entities for the study of new projects, as well as for the elaboration and the evaluation of tenders
- *Skills Improvement:* UIC Asia-Pacific members will put their technical competences in service of the common good, through capacity building initiatives such as training sessions, workshops, e-learning or staff exchange.

The activities of the UIC Asia-Pacific region mainly encompass single projects rather than fixed activities. It is thus necessary to build a framework that can support in the definition and production of the projects for the future **Action Plan**. A framework has been delivered, that can be described as a “matrix” which has on one axis the well-known UIC technical cooperation areas (Passenger, Freight and Rail System) and on the other axis a set of high-priority objectives to reach the Vision of UIC Asia-Pacific:

- Cost reduction and efficiency improvement;
- Harmonisation and standardisation;
- Regional Integration (New Pillar);
- Research and Innovation;
- Quality and Customers (New Pillar);
- Environmental Sustainability (New Pillar);
- Urban Development (New Pillar);
- Safety;
- Security;
- Expertise development and training (New Pillar).

Each project of the future Action Plan will be represented inside the matrix: obviously, some projects may be related to different areas and/or objectives, even though there is usually a main area/objective of focus.

Framework Matrix for future UIC Asia-Pacific projects

	Passenger	Freight	Rail System
Cost reduction / Efficiency Improvement			
Harmonisation / Standardisation			
Regional Integration			
Research and Innovation			
Quality and Customers			
Environmental Sustainability			
Urban Development			
Safety			
Security			
Expertise development and training			

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