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**In collaboration with**

**Ministry of Construction and Urban Development, Mongolia  
Ministry of Roads and Transport Development, Mongolia  
Ministry of Environment and Tourism, Mongolia  
Municipality of Ulaanbaatar, Mongolia  
United Nations Economic and Social Commission for Asia and the Pacific**

**INTERGOVERNMENTAL ELEVENTH REGIONAL ENVIRONMENTALLY  
SUSTAINABLE TRANSPORT (EST) FORUM IN ASIA**

**2-5 OCTOBER 2018, ULAANBAATAR, MONGOLIA**

**Railways and Its Interfaces with the Urban Areas  
(Background Paper for EST Plenary Session-7)**

**Final Draft**

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This background paper has been prepared by Mr. Milko Papazoff and Mr. Marie-Luz Philippe, UIC for the Eleventh Regional EST Forum in Asia. The views expressed herein are those of the author only and do not necessarily reflect the views of the United Nations.

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## **Eleventh Intergovernmental Regional Environmentally Sustainable Transport (EST) Forum in Asia**

2 Oct 2018 - 5 Oct 2018

Ulaanbaatar, Mongolia

**Theme: "Sustainable Urban Design and Development ~ Role of Environmentally Sustainable Transport"**

**Background paper**

Milko Papazoff

Marie-Luz Philippe

**Title: Railways and its interfaces with the urban areas**

## INTRODUCTION

Today, about half of total passenger transport activity (measured in pkm) takes place in urban environments, serving a global urban population that exceeded 3.9 billion in 2015. By 2050, urban population is expected to have grown by another 2.5 billion people, reaching 66% of the total global population, up from 54% in 2015 (UNDESA 2014). Urban areas in all global regions are expected to grow, but Africa and Asia, currently the least urbanized regions, together will make up nearly 90% of this increase until 2050 (UNDESA 2014). This is expected to lead to a significant growth of urban transport activity, primarily in developing economies. Over the past decade, personal vehicles (passenger cars and 2-wheelers) have been responsible for most of the growth (76%) in urban passenger activity. This is consistent with the observed trend that car ownership tends to grow with increasing income levels, affording greater comfort and status (IEA 2016). As incomes continue to rise across a wider range of countries and a broader base of their populations, this trend is expected to continue. Without adequate policies, this may have significant climate and health-related implications, especially given the projected surge in urban transport demand.

There is an obvious increase in mobility demand and hence in mobility needs. Not only are demography and urbanization playing a role there, but passengers are also becoming more and more demanding and switching behaviors – depending on where they are from – and this leads to the real necessity to implement an efficient modal shift and promote intermodality as a safe, sustainable and affordable solution for passengers. Moreover, increasing rail market share, as a part of a more sustainable balance between transport modes is an important component of the climate change two-degree scenario.

Rail can potentially serve very well the great volumes of traffic centered in the metropolitan cities, coming and going from the suburbs and the outskirts of the city. The car congestion of the roadways entering the city is a competitive advantage for rail.

This document will present UIC data and commitments for a more sustainable future within urban areas. Railway can be the backbone of an Integrated transport system by improving multi-modal hubs at rail stations.

## WHAT IS UIC?

UIC, the worldwide professional association representing the railway sector and promoting rail transport.

UIC leads an innovative and dynamic sector, helping Members find continuing success and opportunities. Members are invited to take a proactive role in the UIC working groups and assemblies where the railways' position on regional/worldwide issues is shaped. Active participation in the working groups is a unique opportunity to voice opinions and benefit from the weight of the railway sector at a coordinated worldwide level. UIC is the association for technical cooperation amongst railways, and coordinates the sector's position as it negotiates its evolving relationship with the supply industry and research and develops needs in order to draw full advantage of potential interest to railway companies. Members are regularly informed of key developments on the dossiers UIC deals with and which impact on their activities. This allows Members to anticipate regulatory and technical changes and integrate them effectively and more smoothly into their own business operational processes.

UIC's mission has the following main focuses:

### **Overall objectives for UIC**

To enable UIC to effectively fulfil its mission, 3 levels have been defined for international cooperation activities:

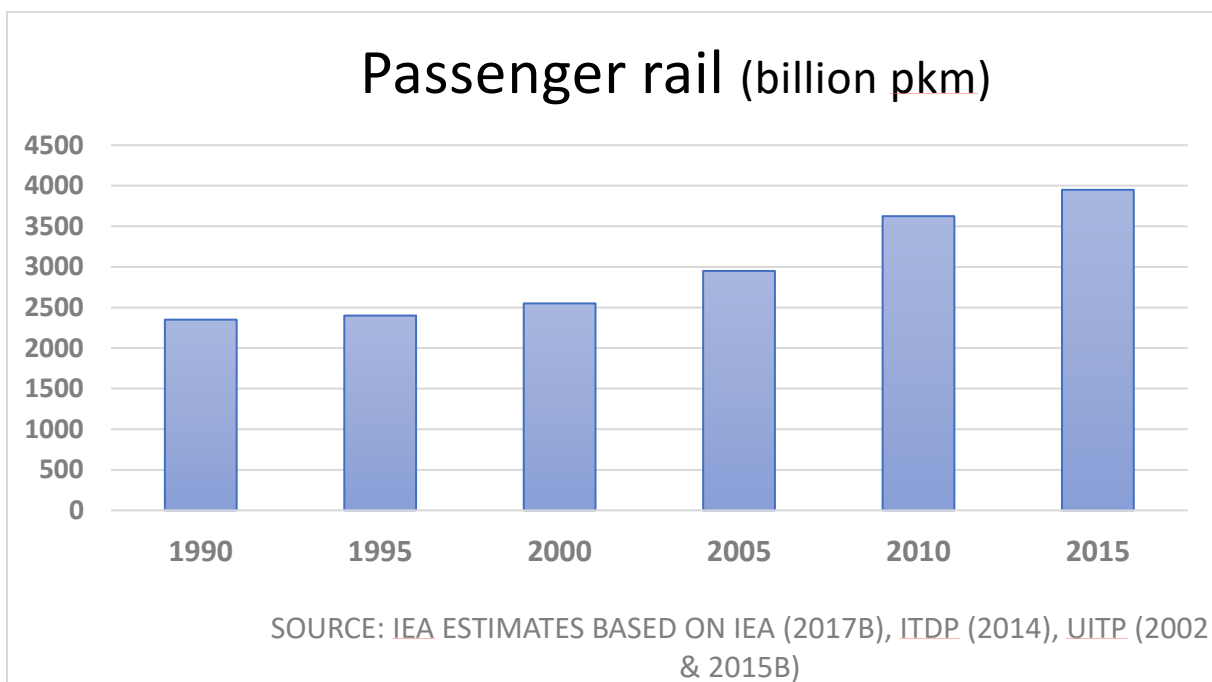
- **Strategic level:** coordination with and between the 6 UIC Regions created as part of the new Governance (activities steered by the UIC Regional Assemblies for Africa, Asia, North America, South America, Europe and Middle-East).
- **Technical/professional** cooperation level (structured around the following railway activities): Passenger, Freight, Rail System – including infrastructure, rolling stock, operations – and Fundamental Values including cross-sector activities such as Sustainable Development, Research Coordination, Safety, Security, Expertise Development). Strategic priorities for technical cooperation activities are set out by forums and platforms composed of member representatives.
- **Support services level:** (Finance, Human Resources, Legal, Communications and Institutional Relations).

# PASSENGER RAIL ACTIVITY

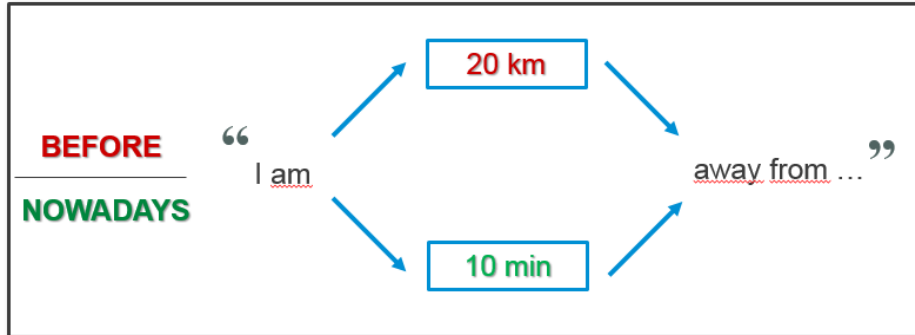
## EVOLUTION OF THE PASSENGER RAILWAY ACTIVITY

The rapid urbanization that we are witnessing in developing countries is both a challenge and an opportunity to change steer the world towards a more sustainable trajectory. Rail guarantees mobility for everyone, including persons with reduced mobility, children and the elderly. Rail has a strong safety record compared to other transport modes, a key aspect in the world we currently live in.

While by 2030 the modal shift is expected to have a greater effect on passenger traffic volumes and modal share to 2030 and 2050. Rail has shown over decades as the best partner of bikers and pedestrian, we are a key element to foster sustainable mobility in urban areas.



- **Increase in mobility demand / needs**
  - **Demography & urbanization**
    - **Modal shift**
    - **Promotion of intermodality**
- **Development of international railway networks**
  - **More affordable**



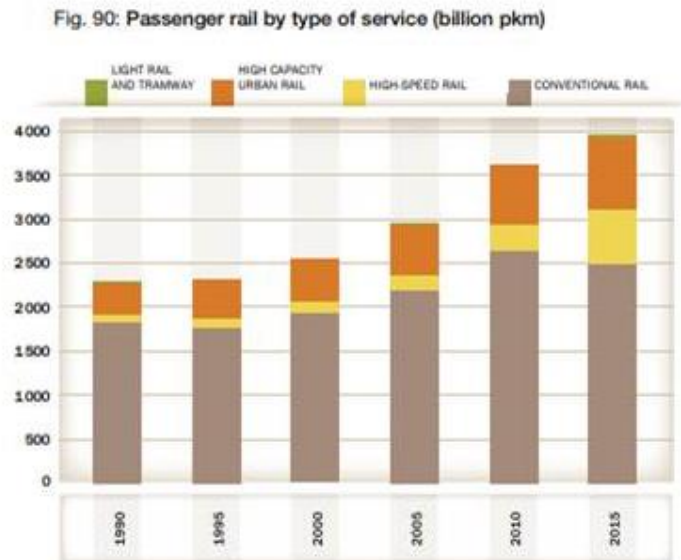
**Shift from the traveled distance to the travel time model**

## FIGURES

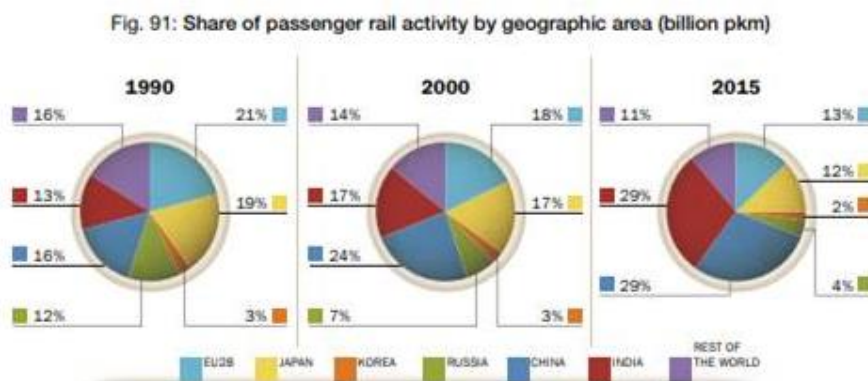
UIC-IEA Energy and CO2 Railway Handbook provides insights into the rail sector’s developments in terms of tracks implementation, electrification, high-speed rail growth and the sector’s energy and carbon performance.

The data presented in each handbook is compiled from IEA statistics and inputs from UIC members (Union Internationale des Chemins de Fer) to provide solid and consistent information to policy and decision makers, promoting the role of sustainable transport as one of the key actors towards a more energy efficient and low carbon future.

Figures and content from the UIC IEA RailwayHandbook 2017 can be found below.



Source: IEA estimates based on IEA (2017b), ITDP (2014), UITP (2002) and UITP (2015b)



Source: IEA estimates based on IEA (2017b), ITDP (2014), UITP (2002) and UITP (2015b)

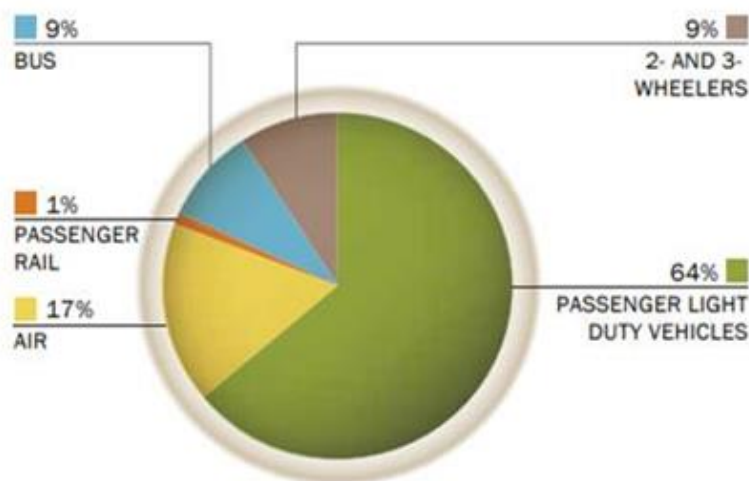
Activity on conventional rail declined in recent years, redirecting a shift towards high-speed rail services in P. R. China. Whereas activity on urban rail services increased, redirecting a continuous expansion of urban rail networks, especially in Asia.

In 2015, around 75% of the passenger rail activity took place in Asia.

Asian economies accounted for around 60% of global passenger rail activity in 2000, compared to 50% -fifteen years earlier. Most of this change can be attributed to the development of urban and nonurban (primarily high-speed) rail networks in P. R. China and India, which has seen a remarkable acceleration over the past two decades. This change was accompanied by significant increases of rail pkm in Republic of Korea and the ASEAN region.

Japan still represented a significant share of the global passenger rail activity (12% in 2015), but passenger rail activity in Japan experienced a much lower growth in the past few decades compared to rapidly growing Asian economies.

**Fig. 94: Share of final energy demand in passenger transport by mode, 2015**



Source: IEA estimates based on IEA (2017b) and IEA (2017c)

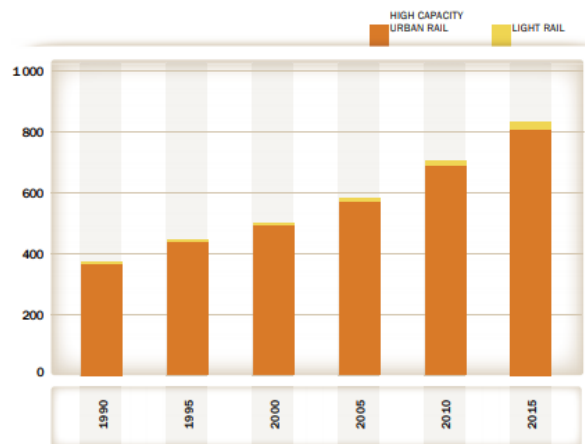
In 2015, the passenger rail sector consumed one third of the final energy use across the whole rail sector, close to 700 PJ. Electricity accounted for three quarters of this value, while diesel fuel was used for most of the remaining part. The share of electric energy used for passenger rail is increasing over time. This is consistent with the growth of rail activity in urban and high-speed services, both characterized by a high dependence on electric traction. Today, passenger rail is the most energy efficient passenger transport mode per pkm. It has a specific energy consumption averaging well below



200 kJ/pkm across all geographical regions and all types of services. Passenger rail requires less than one tenth of the energy needed to move an individual by car or by airplane. This explains why, despite accounting for 9% of the global passenger activity (expressed in pkm) in 2015, passenger rail services only represent 1% of the - nal energy demand in passenger transport.

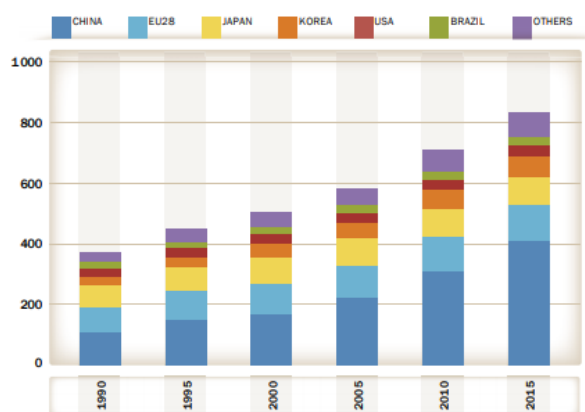
### Urban rail Activity

Fig. 101: Urban rail activity by mode (billion pkm)



Source: IEA estimates based on IEA (2017b), ITDP (2014), UITP (2002) and UITP (2015b)

Fig. 102: Urban rail activity by geographic area (billion pkm)



Source: IEA estimates based on IEA (2017b), ITDP (2014), UITP (2002) and UITP (2015b)

High capacity urban rail services account for the vast majority of the global urban rail activity (estimated in pkm). These services comprise both metros and high capacity/high frequency commuter rail services. The latter are typically operated by vehicles specifically designed for rapid boarding operations and do not share their networks with other rail transport services. Tramways and light rail account for a small complementary fraction of urban rail. This is explained by the much lower vehicle capacity and operational speeds of tramways and light rail services compared with metros and

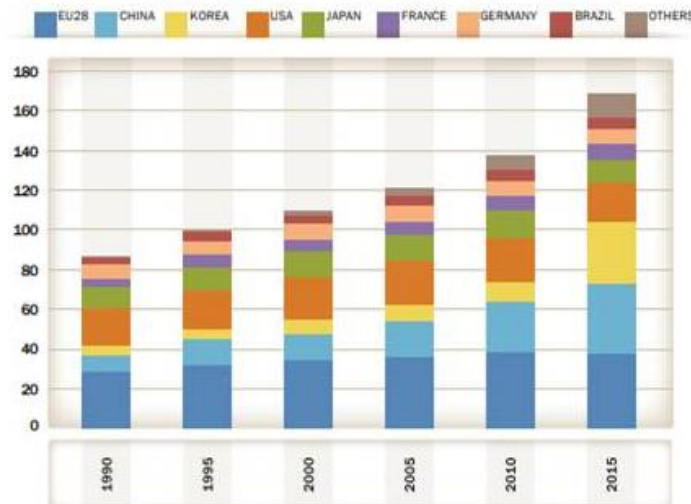
commuter rail, combined with a network extension that is concentrated in a relatively small fraction of global economies. In 2014, 162 cities had a metro system and two-thirds of the world’s metro systems were located in Asia and Europe (IEA analysis based on UITP 2015b and ITDP 2014). The geographic distribution of metro systems achieves a good match with the estimation of urban passenger rail activity: in 2015, P. R. China accounted for almost half (49%) of the total urban rail transport activity, followed by the European Union (14%), Japan (11%) and Republic of Korea (8%). Urban rail activity increased significantly in recent years, primarily driven by metros and high capacity/high frequency commuter rail networks. Since 2010, these networks grew by more than 600 km a year on average, a third more than in the previous 5 years, and more than double the global annual construction rate occurring in 2000 to 2005 (ITDP 2017). P. R. China was the main driver behind the growth of these systems. Activity taking place on networks located in Chinese cities grew by 150% between 2005 and 2015.

### Energy use and energy intensities

#### Regional differences

In 2015, high capacity urban rail services consumed nearly 160 PJ of energy (mostly electricity), a value of similar magnitude to high-speed rail.

Fig. 105: Final energy consumption in urban rail by geographic area (PJ)

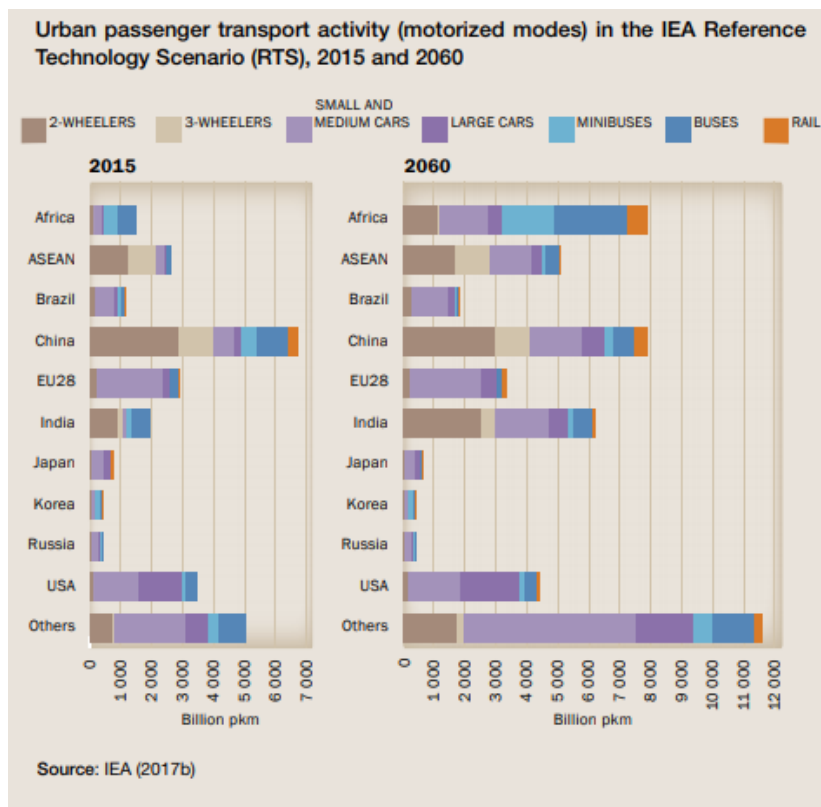


Source: IEA estimates based on IEA (2017b), ITDP (2014), UITP (2002) and UITP (2015b)

Available data suggest that capacity and occupancy of European high capacity urban rail services is, on average, lower than in Asia: the average number of passengers per train in Europe ranges between 150 and 300, in Japan and Republic of Korea the range is 400 to 500 and estimates for P. R. China exceed 700 (IEA analysis based on UITP 2002). This is consistent with historical developments and the nature of urban agglomerations. Many of the European systems started to be developed earlier than in Asia, at times when tunnel-boring machines were not yet in use, posing technical and economic challenges to the construction of underground networks accommodating high capacities. The average

size and population of European urban agglomerations tends to be significantly smaller than Asian megacities hosting high capacity urban rail networks. Metros in Europe are therefore more likely to be designed to accommodate a smaller flow of passengers, and high capacity/high frequency systems (such as the RER in Paris) are limited to the largest metropolitan areas.

The energy intensity of urban rail can be compared with other modes. The specific energy consumption of high capacity urban rail, including metros and high capacity/high frequency commuter rail (measured as energy use per pkm) is the lowest of all urban passenger transport modes. Passenger movements taking place on these systems require, on average, less than a tenth of the energy needed to move individuals on urban passenger light duty vehicles (PLDVs). High capacity urban rail is also over two times more energy-efficient per pkm compared to tramways and light rail systems, and likely more energy efficient than other commuter rail services. This is primarily due to higher capacity utilization rates (see the section on Insights on commuter rail for a more detailed discussion). Due to the share of 3% of urban rail in the total urban transport activity and much lower energy use per pkm compared with all other modes, urban rail services accounted for less than 1% of the total energy demand for urban passenger transport.



Rail is currently a sustainable alternative to less sustainable competitors; rail performance and potential efficiency in terms of carbon ensure this advantage for the next future.



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In addition to the energy efficiency advantages, Rail is the only mean of transport consuming renewable energies in a relevant proportion. Electrical rail doesn't need further technological developments to adopt green and clean energy electricity

Rail combines the satisfaction of the transport demand, the cost effective performance and the sustainable development, as a best case of decoupling activity and carbon footprint reducing externalities and maximizing the benefits of the investments.

In the case of passenger services, the city center location of the station allows intermodality with urban public transport services and with cycling and walking modes and efficient models of car travelling as car sharing or carpooling, profiting the rail electricity connections for the deployment of electric vehicles in a smart grid frame.

This multimodal transport environment interoperability across different rail networks and countries is required to get an effective modal shift in the global logistics transport and for the international passengers market, playing railways a relevant role in global, regional, and local levels.

There is also a new situation ongoing: a shift from the traveled distance to the travel time model, meaning a shift in perception of travelling. So, the distance does not matter anymore as long as the travel time is acceptable, which opens new horizons. Railway became more and more adapted to answer to emergent mobility needs by adopting the door-to-door concept as the core of its development strategy.

## NEW PARADIGMS IN A DIGITAL WORLD

### SMART STATIONS IN SMART URBAN AREAS

- Station as the interface between various modes of transport
- Station as multi-dimensional hubs where modern meet historical
- Station can represent a dream of future mobility, for the smart mobility
  - **Stations at the heart of the mobility web**

#### STATIONS IN THE CITIES

Cities and megacities produce more than 70% of CO2 emissions. The city centre location of railway stations enable effective intermodality through transfers to urban public transport services in addition to cycling, walking, car sharing and city logistics.

The high capacity offered by rail systems can serve the high transport generated within and between cities. The World Bank (2013) concluded that compact, mixed-use, pedestrian-friendly development organized around a mass transit station is one of the most effective strategic initiatives to address the negative effects of motorization and identifies rail transit systems as the backbone of urban development.

Rail has shown over decades as the best partner of bikers and pedestrians, our stations are a key element to foster sustainable mobility in urban areas connecting urban city centers and having a hub role for public and sustainable transport. Connecting rail to cycling, walking, buses or ferries is an essential issue to provide sustainable door-to-door transport solutions.

Railway stations have a structuring potential that needs to be harnessed. To use this momentum however, smart stations need to grow in harmony with the urban space and the economic environment they occupy. Smart station is a source of innovation, suited to local specificities, which can add extra value.

Stations are the interface between various modes of transport and are multi-dimensional hubs where the modern world can meet the historical world. Station can represent a dream of future mobility, for a smart mobility. In urban areas railway stations are the “hubs” of sustainable mobility: The World Bank recommends a vision of sustainable cities based on compact, mixed-use, pedestrian-friendly development organized around a train station. Increasing rail market share and reducing rail greenhouse gas emissions will also reduce local air pollution.

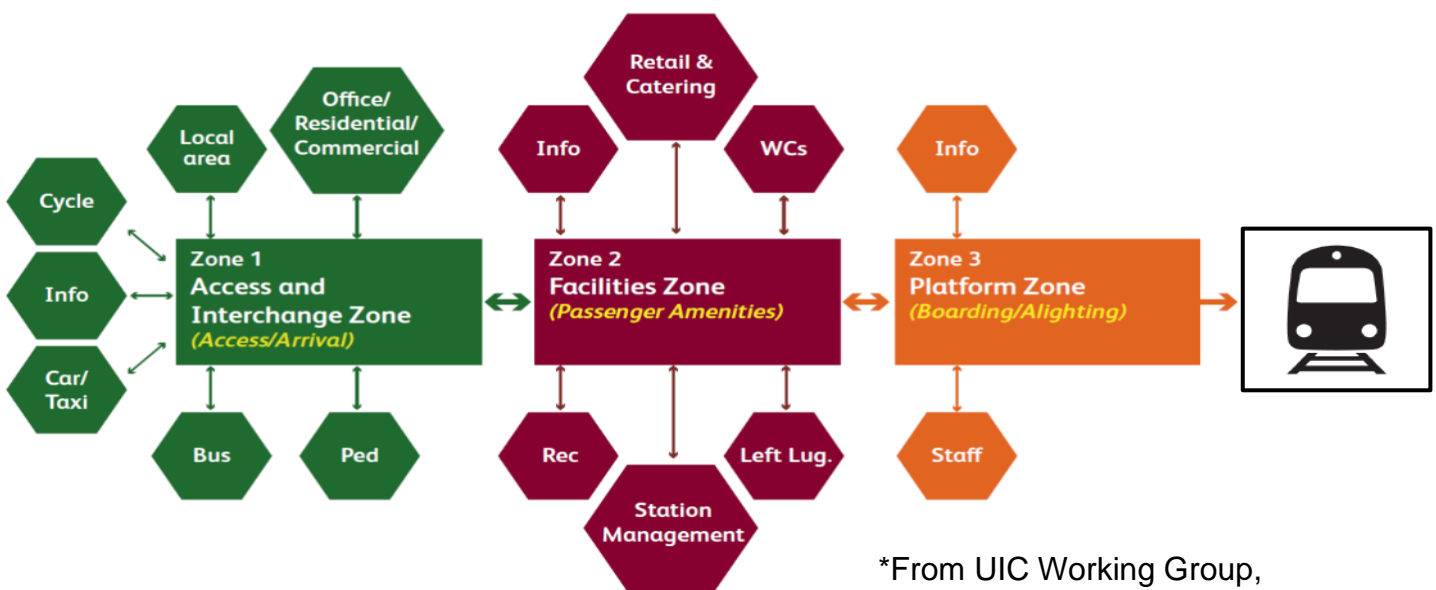
Taking a smart approach to develop stations will add value to the way stations operate and/or the services they provide. It is all about seeking out new, faster, more effective methods and processes which chime better with the challenges facing cities and railways.

It is also about reducing, as far as possible, the adverse impact of railway business on urban areas and their inhabitants and users (in particular reducing stress and conflict arising from competing uses).

Stations must adapt to their users and their environments. Stations must be able to go the extra mile and their reach should exceed their grasp. Stations should be modelled on their city, unique, attractive, appealing and symbolic. Railway stations have witnessed many revolutions over history (industrial, railways, technological, cultural and historical).

New behaviour patterns result from the influence of technological innovation on users. New products create new needs, and consequently new practices. These in turn create new types of tension requiring new solutions. As well as solving new potential or real conflicts, smart solutions can make the impossible possible.

First of all, it should be pointed out that stations are unique in terms of role, location, services and use, both in terms of time and space. The criteria used to define a smart city also apply to stations. However, the smart city model does need to be adapted before it can be transposed to the railway environment, which has specific requirements.



\*From UIC Working Group, Station Managers Global Group (SMGG)

## SMART APPROACH

Just as there are different smart city models, there are also various options to make a smart station. A station manager, who has to cater for local needs, can adapt parts of the model to their particular context.

A smart station is designed to broaden its area of influence in a smart city, via the networks (transport, energy, digital). A smart station should take into account how its railway business will tie in with not only with key societal but also important business-related issues of the future.

Smart stations should both be able to anticipate and respond systematically and quickly to conflicting uses. Smart stations do everything in their power to ensure the role they play in a city goes beyond being a simple transport hub. This means that stations should be a source of innovation, suited to local specificities, which can add extra value.



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Making a station smart is about promoting its legitimate place in a city, as the main mode for long-distance transport. It is also about diversifying a station's commercial activities, to turn it into a successful business model.

The three main pillars of a SMART STATION are: SMART MANAGEMENT, SMART INFRASTRUCTURE and SMART MOBILITY.

#### SMART MANAGEMENT

The process of dealing with or controlling things or people with the new information and communication technology. The manager seeks constantly how improve his process, going beyond "classical" actions to create new opportunities and respond to new challenge.

#### SMART INFRASTRUCTURE

Adding value, either through improved features, through for example better design or use of new technology.

#### SMART MOBILITY

Using new technology to facilitate the flow of individuals and information in time and space, using smart information and communication infrastructure.

#### SMART MANAGEMENT

Smart management comes from a smart governance, which itself is based on the Smart City model. Station management promotes railway business by improving the station's function, making it more attractive, pleasant and efficient. Smart stations listen to what users and those working in them have to say (station managers, employees, users, political institutions, and other infrastructure managers). Smart management is the station manager's voluntary effort to broaden the scope of the business, in order to anticipate developments that will come with the next inexorable paradigm change (increasing mass mobility, denser passenger flows, station infrastructure user diversification).

A station manager must simultaneously face several challenges: How to improve staff management? How to improve crown management? How to guarantee and improve station security? How to identify and translate into concrete terms user needs? How to make a station profitable? How to improve the integration of the station into the city? How to improve user experience? How to improve user experience for those using the station every day? What can new technology offer stations?

Of course, station managers already face all these challenges, the question now is how to handle them in a smarter way, and how to improve approaches to move towards sustainable development (in every possible way). If stations are sustainable they will have greater legitimacy, not just in terms of their function, but also in terms of expanding their scope of influence as a stimulus to the economy and society.

To achieve this, station managers need to innovate and harness the potential of new economic drivers in cities, and of new technology.

#### SMART ENVIRONMENT

The idea of a Smart Environment stems from sustainable development. Smart stations should not be a burden on their surrounding environment. The term 'environment' encompasses ecology, society, culture, and the urban environment, but also the functional environment of the station. A Smart



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station should not be a source of conflict, rather it should help to resolve any tensions that may be a legacy of its history.

Smart Environment is about knowing how to incorporate the station into a viable and sustainable ecological policy. In the current context of excessive energy consumption and wasting of natural resources, smart stations, with the support of smart cities must act.

#### SMART DESIGN

Smart design is about rethinking infrastructure, buildings and other facilities and equipment that make up smart cities and smart stations. Designer engineers aim to add value to each component constituting a smart station (outside building, internal features, furnishings).

This topic only makes sense if it is part of a collective effort involving all players in the local mobility chain: a station is only one of the cogs in the mobility machine, that depends just as much on other modes of transport as they depend on railways.

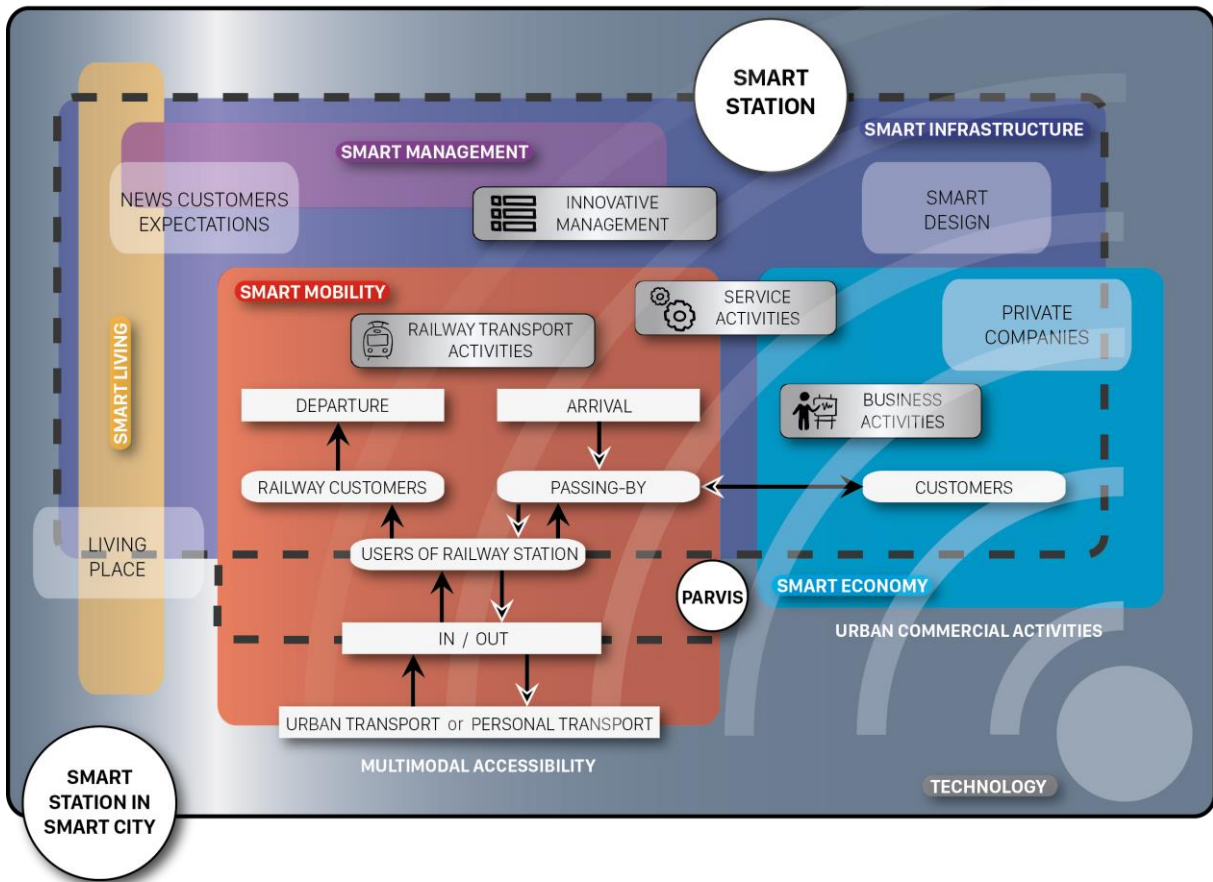
Stations are a pivotal hub for transport. Whether in a major urban environment or in a rural setting, stations form the focal point for at least one other mode of transport: the car. In urban areas, stations are frequently also the meeting point for up to three or four other modes of transport too (cars in particular, or chauffeured vehicles, buses, bicycles, trams, metros, Mass Rapid Transport, electro-mobility and pedestrians).

More smart mobility means easier access to railway infrastructure, to improve quality of service. This can be achieved only through cooperation between the relevant players, which does not mean loss of each party's independence, but rather a more open mind-set, which is more fitting for a smart city. Cooperation should make it possible to better meet mobility needs.

Smart mobility is above all about facilitating mobility, regardless of individual differences. It is also about having the will to reduce the negative impact of mobility, such as pollution, accidents, congestion, conflict of use (electro-mobility versus pedestrians on pavements). SMART MOBILITY is about offering more sophisticated and more choice in intermodal mobility, by working in association with mobility players, to sharpen the competitive edge against private car use. SMART MOBILITY is also about improving modal shift and setting the stage for a win-win strategy involving mobility players and users.

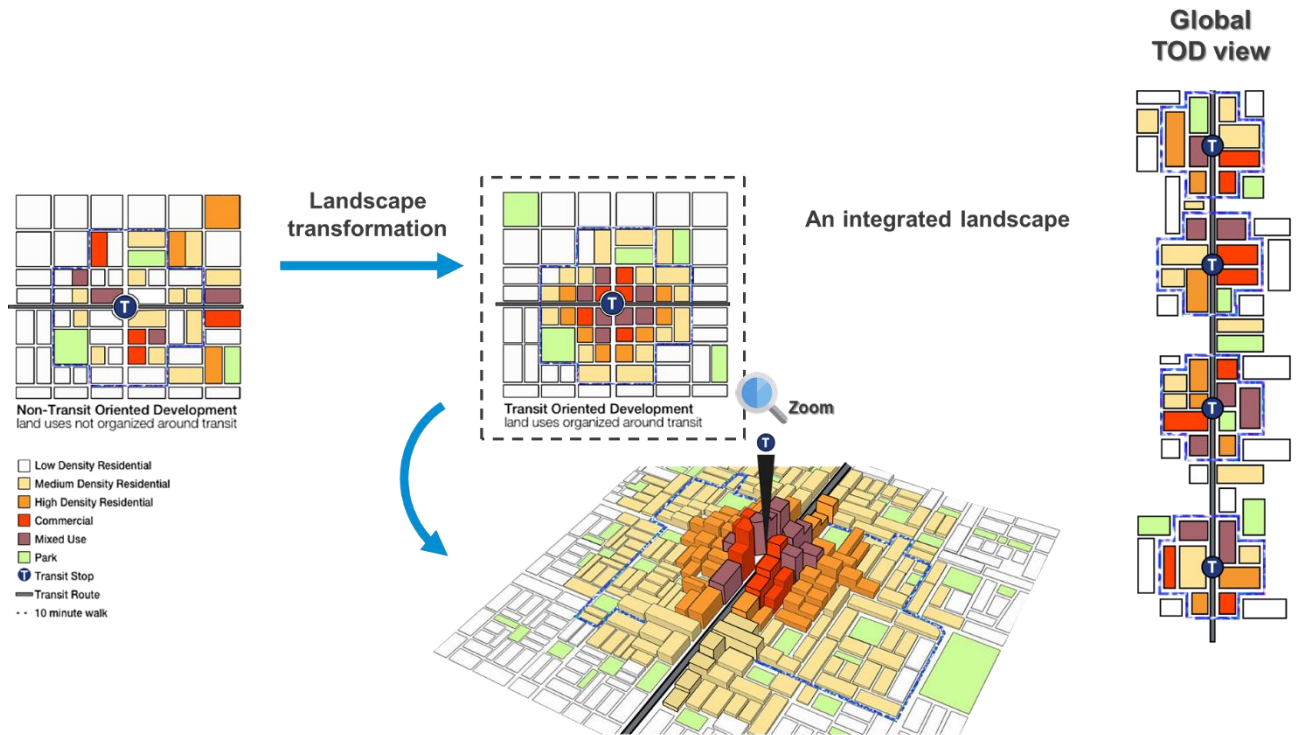
To achieve this, smart cities and smart stations have to tackle two facets of mobility: information mobility and mobility of individuals. Two independent and yet complementary factors. Just as a station is an intermodal transport hub, smart stations are also hubs of information exchange for operators, business players and station users. Sharing information is therefore central to this model.





\* UIC Handbook, NEXTSTATION 2017

Note that stations are part of the TOD Model. TOD model is defined as Transit Oriented Development. Most of cities are car-oriented but if we would like to develop a people-centric concept for the UITP event, TOD is the key. Rural access is also important on this concept. The car is the best way to access to the gate of TOD, but the chain of mobility is oriented both on mass transport and soft mobility (walking, bicycle, electromobility, urban autonomous vehicles).

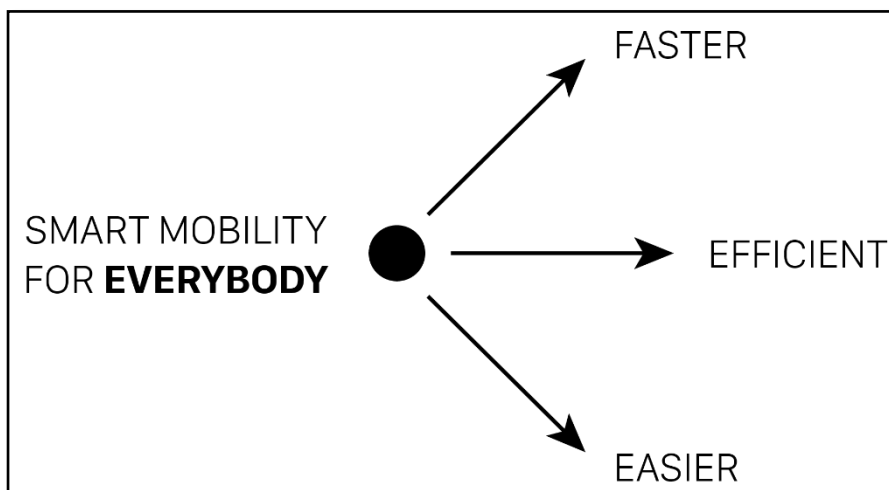


## DIGITALIZATION

Digitalization make the impossible real, the Urban mobility needs to be facilitated by the railway digitalization. Re-thinking and re-engineering business models to capture the full advantages of the present and future digital revolution is now necessary. Smart mobility is key for the new intermodality chain and it puts people at the heart of digitalization.

Digitalization is changing the game of the mobility. Big Data offers new possibilities and gives insights to transport actors for a better decision making for the development of new projects and the smart and efficient management of operating projects. Within the next decades autonomous road vehicles are highly likely to become a major element of individual passenger mobility on long distance trip and door to door services.

UIC aims to promote new ticketing concepts to succeed a fluid intermodal experience; one form of ticket, one digital ticket and to promote a more integrated and sustainable door to door experience through adopting new mobility services and modes.



# COMMITMENTS & ASIA PACIFIC EXAMPLES

## SUSTAINABLE DEVELOPMENT GOALS

Sustainable transport is essential to achieving most, if not all, of the Sustainable Development Goals (SDGs). Although sustainable transport is not represented by a standalone SDG, it is mainstreamed across several SDGs and targets, especially those related to sustainable consumption and production, health, safety, energy, infrastructure and most notably cities and human settlements.

SDG 11 on inclusive, safe, resilient and sustainable cities includes a target on expanding sustainable public transport. This can only be achieved if we can foster a constructive dialogue among member states and the sustainable transport community.

Most importantly, cities will play a critical role for a number of dimensions for effective and sustainable mobility: from the provision of access to safe, affordable, accessible and sustainable transport systems for all to improving and guaranteeing road safety. A lack of adequate access to transportation, especially in peripheral urban areas in developed countries and in marginalized neighbourhoods in developing countries, often aggravates economic and social isolation and segregation. Widespread congestion and traffic gridlocks have now become 'normal' in many cities, affecting the quality of urban life and the productivity of urban economies through an impactful set of negative externalities which can account for over 10% of a country's GDP.

With adequate support, however, cities and the transport sector can promote inclusive and integrated urban planning and policies in order to transform their transport systems – putting sustainable transport at the centre of their agendas, enhancing access for all and with special attention to the rights of women, youth, persons with disabilities, older persons and other vulnerable groups. Delivering a coherent and successful urban mobility system can facilitate access to education, jobs, markets and goods, as well as a full range of other services, with the aim of ensuring that no one is left behind. Efficient mobility systems enabled by sustainable transport reduce congestions, accidents, noise, pollution, greenhouse gas emissions, and the overall environmental impact of the system.

The Global Mobility Report – produced by the [Sustainable Mobility for All \(SuM4All\)](#) initiative, a worldwide consortium of over 50 leading organizations in the transport sector – assesses progress on sustainable mobility around the world. It shows that SDG 11.2 is still far away from being met meaning that the delivery of SDG 7, 11 and 12 are simply not attainable. If this is to change, we will need strong government systems and in particular strong statistical systems that can measure and incentivize progress across the goals. Given the different capabilities of countries and cities to collect and report urban access data linked to the SDGs, it will be necessary to support local monitoring and reporting as no data is being reported on how sustainable our urban transport systems linked to SDG 11. We urgently need to build capacity on data collection and reporting at the local level to support national

reporting on the SDGs and fill data gaps which leading international organisations, represented by UIC an, engaged on sustainable transport can provide and have been asked to do by the UN Statistical Commission.

## UIC COMMITMENTS

UIC's has commitments to new challenges of new mobility.

- Gender Equality: program for women protection in railway sector
- Affordable and clean energy: for trains and stations.
- Industry, innovation & infrastructure: smart station model will be introducing
- Sustainable cities and Communities: Smart Stations in Smart Cities, Smart Cities as viable and resilient mode.
- Responsible consumption and production: Smart Stations as green stations
- Climate action: Paris 2015, cooperation with UN (COP21). Climate change is the defining issue of our times. Rail offers an important part of the solution because of its very low carbon intensity. Based on expert analysis of transport energy consumption and carbon emissions by the International Energy Agency, UIC has set three targets; improve efficiency, decarbonise power and achieve a more sustainable balance of transport modes. UIC presented the "UIC Low Carbon Rail Transport Challenge" initiative during the UN Climate Summit in New York
- Life on land: Transit-Oriented Development for example and no more car oriented. Life on land means sustainable development, ecological protection. Both people and environmental centric (adequation) for a long-term development.
- Partnership for the SDGs: UN, UITP, CER, MoU...



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## ASIA PACIFIC EXAMPLES

### TARGETS SET BY INDIVIDUAL RAIL COMPANIES IN ASIA PACIFIC

| Companies                                                           | CO <sub>2</sub> targets                                                                                                                                     | Energy Targets                                                                                                                                     |
|---------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>INDIAN RAILWAYS</b><br>Country: India<br><br>Source: UNDP (2011) | Saving of 3.33 million tonnes of CO <sub>2</sub> by 2020 (80% over the period 2011/12-2020/21).                                                             | Saving of 4.05 billion kWh by 2020.                                                                                                                |
| <b>JR-EAST</b><br>Country: Japan<br><br>Source: JR-East (2014)      | Halving of CO <sub>2</sub> emissions from its railway business by FY 2030 compared to FY 1990.<br>CO <sub>2</sub> emissions: -30% by 2021 relative to 1991. | Energy Consumption: -8% by 2021 relative to 2011.                                                                                                  |
| <b>JR-WEST</b><br>Country: Japan<br><br>Source: JR-West (2016)      |                                                                                                                                                             | Energy consumption rate (MJ/Rolling-stock km) -3% compared to FY 2011.<br>83% Energy-saving railcars as a percentage of total railcars in FY 2018. |
| <b>KORAIL</b><br>Country: South Korea<br><br>Source: KORAIL (2015)  | GHG mid-term reduction goals: -8% by 2019 from 2015 levels.                                                                                                 |                                                                                                                                                    |
| <b>RZD</b><br>Country: Russia<br><br>Source: RZD (2014)             | Reduction of the negative environmental impact (CO <sub>2</sub> emissions) by 7% in 2017 and by 15% in 2030 compared to 2012 (optimistic scenario).         |                                                                                                                                                    |

## CONCLUSION

Urban public transport services become increasingly important in low-carbon IEA scenarios 2°C Scenario [2DS] and a Beyond 2°C Scenario [B2DS], consistent with a 50% chance of limiting global warming (to 2°C and 1.75°C, respectively).

Between 2015 and 2060, demand for urban rail services is projected to grow by a factor 6 in the 2DS and by a factor 8 in the B2DS, reaching 4.3 and 6.5 trillion pkm respectively in 2060. This is brought about by a significant modal shift from private vehicles (passenger cars and 2-wheelers) to more efficient public transport modes.

This transition needs to be facilitated by significant investments in public transport infrastructure, complemented by local and national policies capable of enhancing its competitiveness. At the local level, these measures include fiscal and regulatory policies designed to manage travel demand and influence choices (such as congestion charges, parking pricing and zero-emission zones), as well as a transition to urban designs capable of reducing the frequency and length of trips (through densification, mixed use and the integration of transport planning, e.g. via transit-oriented development). At the national level, policies supporting a shift to collective urban transport modes need to include an increase in the taxation of fossil fuels, reflecting growing carbon prices. Countries with high taxes on personal vehicles are also amongst the most successful, today, to dissuade consumers from opting for a private vehicle in their urban mobility choices.

Moreover, with time and urbanization, traveling at a national scale turned into a regional scale and a regional scale became local and new travel experience adapted to the digital era's standards. Digital connectivity is changing the game and its continued development has expanded the demand for mobility.

Digitalization on the mobility aspect is modifying deeply the behavior of travelers and UIC is ready to respond to this challenge.

The railway community has the opportunity today to share experiences and good practices on many topics to contribute to the cities and the mobility of the future.

## SOURCES

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