INTERNATIONAL UNION
OF RAILWAYS

Rethinking Stations for Future Intermobility

Contents

Kazansky Station, Moscow, Russia. (Source: RZD)

Foreword

By the Director General of UIC

"Five major trends are coming increasingly to the forefront in the development of travel and mobility. Taking account at the earliest possible stage of customer needs, the emergence of numerous new operators, the search for modal and intermodal complementarity rather than competition, large-scale urbanisation which will see two billion people move to ever-more sprawling cities within the next 20 years, together these factors will lead to a new approach to intra-city and inter-city travel.

To respond to the changing needs of mobility, the station has become a place of vital importance for the management of all intra- and inter-modal interfaces, for the provision of services to customers, the management of waiting time, of information, of luggage and of traffic flows, for its civic role within our major cities, seeking to provide the best possible urban links (tube, tram, LRT, taxi, bus, electric car, bicycle, etc.) and enhancing local services for all those using it, be they passengers or not.

Whether we are renovating historic stations, the architectural heritage of our past, or building and financing new stations, this multidisciplinary nature must be taken into account. With the station becoming a major player both in making the travel experience more enjoyable and in providing quality services to customers, visitors and passengers alike, it has become a strategic element of the greatest importance.

Jean-Pierre Loubinoux,

Director General of UIC

Introduction

Today’s station

As the main point of intersection between the town and the railway, the station is the only link within the rail system that has the ability to leverage its positive effects. A showcase of railway activity, it is a key channel in the promotion and retail of transport products to travellers. As a structure in its own right it contributes to the identity and image of the transport medium it serves. As an everyday living space, it is the central link in the mobility chain as well as a key element in the organisation of intermodal transport. The station also represents the modernity, progress and development that have been embodied by rail transport since it was first invented.

In the history of rail transport, the functions of the station have gradually evolved. Today it has become much more than the point of access to the rail network or a place serving the railway alone. It is now an infrastructure attributed with the most ambitious of objectives (a tool in economic development, in spatial planning, in social or even cultural initiatives, and much more).

The station and the challenges of "intermobility"

Stakeholders in the railway sector and, in this case, those operating in stations, are coming up against new challenges to which they need to adapt.

In this age of mass mobility, the station is being called upon to adjust to growing numbers of passengers, arriving, leaving and even lingering within the station area. Today the station is increasingly likely to develop into a full-scale complex where ever-greater numbers of passengers, from all destinations and walks of life, are called upon to cross paths. The station has become a hub, a place of exchange between various modes of transport. It is now the scene where the challenges of "intermodality" are played out (see box). Many sectors are involved: politics, economics, local and regional development, technology, business strategy, etc.

The station is an eminently political entity. Its organisation lies at the heart of the governance strategies which all the stakeholders of "intermobility" have to put in place. The station, the backbone of this "intermobility", needs to have policies at its disposal to ensure all the players can coordinate to provide efficient interconnections, accurate, up-to-date information, integrated fares and ticketing, and a harmonised image of the whole rail sector.

The station is also considered to be a key element in development policy. By improving connectivity in order to open up certain areas and by creating new urban hubs, the equilibrium of the townscape round the station can be redefined, reconcentrated and densified, becoming a central element in town planning policy.

In addition, station organisation is increasingly influenced by the use of information and communications technology (ICT), which has revolutionised the travel process for those using not just the train but also other means of transport. The latest generation of this technology (NICT or new ICT) is contributing to enhancing the experience of station users, but is also creating new demands from passengers using the rail network, meaning new services need to be provided.

This brochure is intended to explain and illustrate the different aspects of the station of tomorrow, which are likely to become the components of the "intermobility" of the future.

Reggio Emilia Station, a project designed by the architect Santiago Calatrava, was opened on June 8th 2013. Its sinusoid or wave form is created by a succession of porticos with closed sections and differing geometrical shapes.
(Source: Fotolia)

Definitions

Intermodality:

Door-to-door travel without any break between the different means of transport used, whether private or public, motorised or not, within the same journey.

Plurimodality:

Availability for travellers of a choice between several modes of transport;

Multimodality:

Utilisation de différents modes de transport sans qu'il y ait forcément une organisation de l'interconnexion.

"Intermobility":

Organising principle intended to improve the complementarity between modes of travel, or making different networks, on different scales, more complementary. For our purposes, this term, which first appeared in social science literature (human geography and town planning), is used to define the overall operation of intermodality within a multimodal exchange hub, in which the traveller's journey is organised and flagged by operators.

N.B.: Although it is accepted that setting up multimodal exchange hubs should be a standard and universal aim, putting them into practice constitutes a significant challenge for stakeholders in the rail system.

Multimodal exchange hub or "major multimodal station":

A contemporary station designed as a place of exchange and complementarity between transport modes, a living space providing other services, and the heart of a densely-populated, sustainable urban district.

Wuhan Station (China). April 2010. AREP/ Photographer: T. Chapuis, Architects: JM. Duthilleul, E. Tricaud.

Managing "intermobility": from station to multimodal exchange hub

Main players in the management of intermobility within the station

- The station manager (the contact and intermediary for all other players)
- Transport network operators (rail and others)
- Local authorities
- Businesses operating in or near stations (logistics companies, retail firms, etc.)

It is more often in the multimodal exchange hub than in a simple railway station that a chain of transport providing door-to-door service is organised. It is also within such a structure that so-called "green" or environmentally friendly transport can be developed, including bicycles and cycle lanes, car-sharing systems, electric vehicle charging stations and pleasant and safe pedestrian routes.

Efficient connections, regulated timetables, fast and accurate information services for passengers (signage, real-time display of delays, etc.), integrated fares or the possibility of combined travel tickets, these are some of services the modern multimodal station is expected to provide. With the rail system being the backbone of any mobility policy, it would be difficult to conceive of an effective intermodal policy without the existence of organised hubs that are practical for users and accessible to all.

A multitude of stakeholders within the station

The station is where many people involved come together in one place, bringing quite possibly very distinct or even incompatible, ways of operating, methods and interests. “Intermobility” encourages station managers, network operators, local authorities, logistics firms, retailers and other operators to pool their expertise to enable all the stations’ functions to be properly organised and run.

The station manager has a key role, not as station owner but as head of operations in it. The task of station managers is not to operate transport services, but to facilitate the devising and implementation of projects for the development of stations, which they will later run on a day-to-day basis. In this way, they guarantee projects are successfully carried through. They are also specifically in charge of the station environment (cleanliness, safety, security, activities and events). They liaise daily with the tenants and franchise holders of public spaces in the station. These “masters of the house” also ensure the station buildings are well maintained and the annexes of the multimodal exchange hub are properly run. They are responsible for the quality of customer service, the effectiveness of multimodal information within the station and for smooth and efficient relations with the various parties.

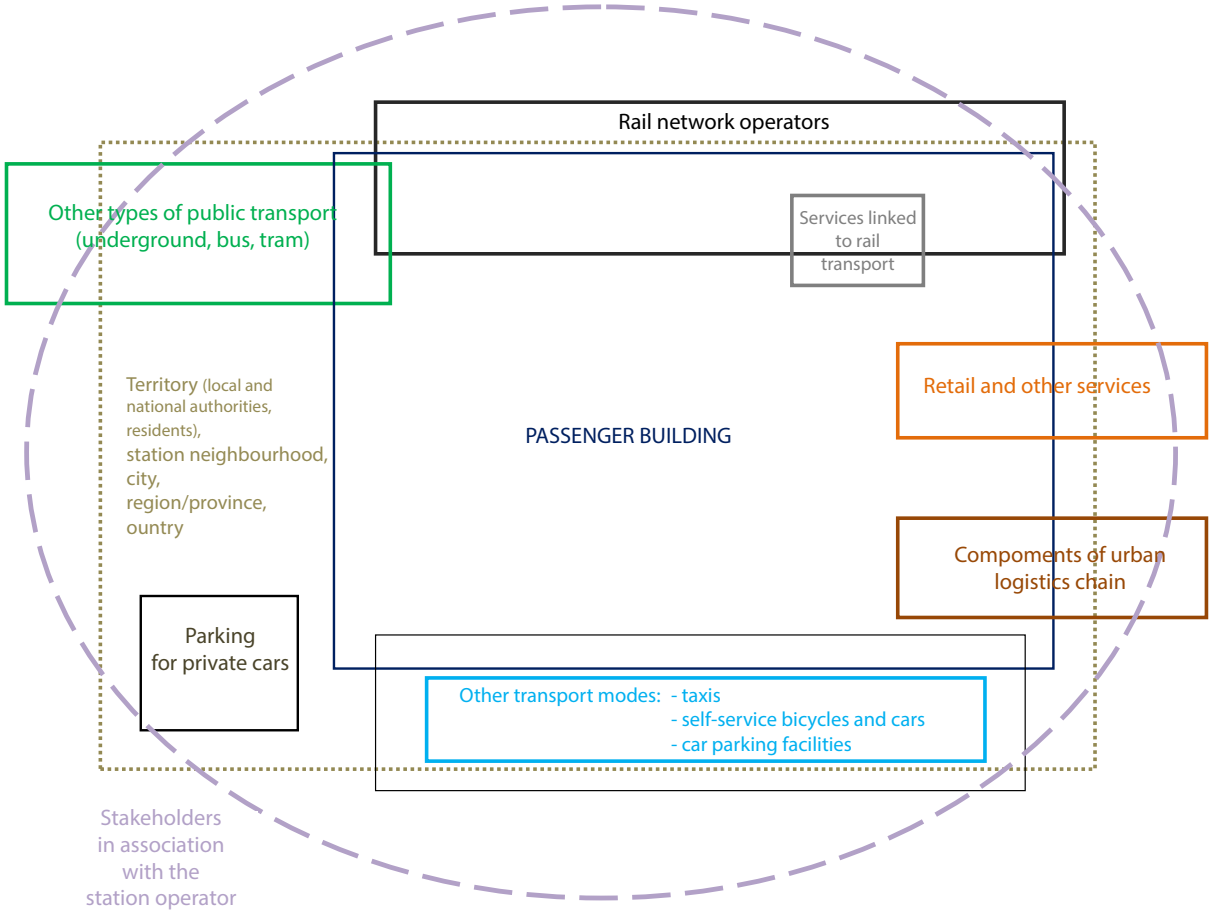


Diagram of stakeholders in multimodal stations

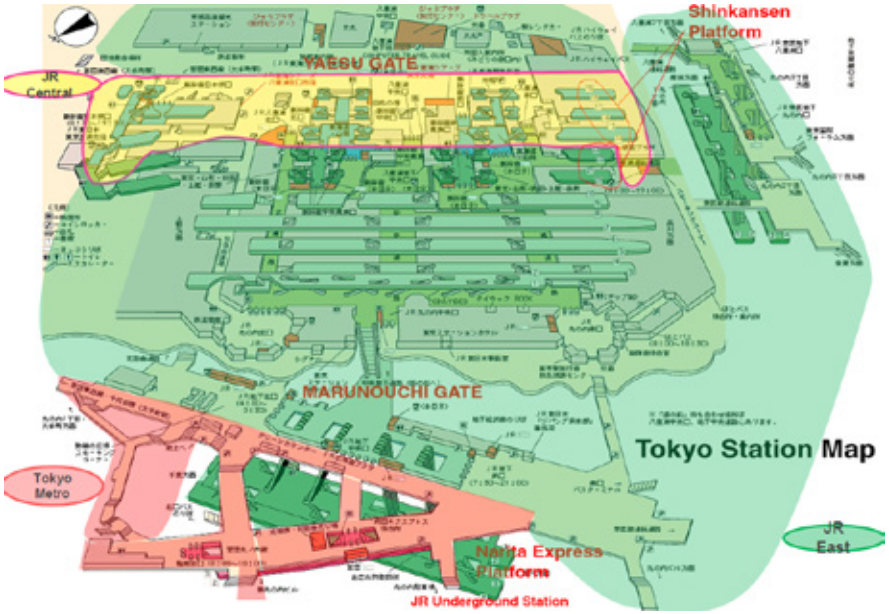
Self-service bicycle station in Moscow (Russia). (Source: Fotolia)

Taxi rank in front of Atocha Station in Madrid (Spain). (Source: Fotolia)

A variety of models for stations management

Although it is true that in certain respects there has been a move among stakeholders in the railway sector to standardise elements such as station signage and ticketing, it is nevertheless difficult to ignore specific local characteristics in the management of stations, and even more unacceptable to disregard features of railway systems that may have been in operation for decades.

The existence of a variety of models for station management show that "intermobility" can take many forms, all of which are equally worthy of attention.



Tokyo Sation Map. The Japanese (passenger) railway system is governed on a regional basis: JR Kyushu, JR Shikoku, JR West, JR Central, JR East, JR Hokkaido. Tokyo Station is run principally by JR East, but certain parts of the infrastructure are administered by other rail companies (in this case JR Central for trains on the Shinkansen high-speed line) or by firms responsible for modes of transport other than the train (Here, Tokyo Metro). (Source: JR East timetable).

The role of different stakeholders in the governance of italian stations

RFI (Rete Ferroviaria italiana)

- Public enterprise in charge of transport-related business
  - Information, ticketing
  - Allocation of tracks and access to platforms
  - Services linked to rail activities
- Implementation of investment plans for the expansion, development and modernisation of stations.
- Management of the commercial and real estate sectors of Grandi Stazioni and Cento Stazioni.
- Management of stations with no commercial activities (small stations).

Grandi Stazioni

- Management of the 13 main railway stations in Italy and in the Czech Republic.
- Renovation and development of stations.
- Other services not linked to transport activities.
- Owned by FS (Ferrovie dello Stato) Holding (60%) and Eurostazioni (40%).

Cento Stazioni

- In charge of 103 medium-sized stations in Italy, their development and property management
- Property of FS Holding (60%) and Archimede (40%)

The governance of Italian stations: in Italy operational management is assured by the RFI infrastructure manager, and property and commercial business is managed by FS subsidiaires, Grandi Stazioni and Cento Stazioni.
(Source: RFI)

Chair of the Supervisory Board chosen by the State, heads the state-owned group

Supervisory Board

- State representatives (the majority), Parliamentary representatives, employee representatives, representatives of the regional authorities

Management Board

- Chair of rail operator
- Chair of infrastructure manager
- Functions: strategic steering and supervision, economic rigour, industrial integration, corporate unity

SNCF réseau (previously RFF, Réseau Ferré de France)

- Railway infrastructure manager
  - Engineering and projects
  - Access to network
  - Traffic flow
  - Works and maintenance

SNCF Mobilité

- Rail operator, carrier
  - SNCF Voyageurs. The Gares&Connexions Division is responsible for running French stations.
  - SNCF logistics
  - Keolis
  - Performance

New organisation of SNCF: on 1st January 2015, a single SNCF holding company and two new state-owned enterprises, SNCF Mobilité and SNCF Réseau, were created.
RFF (Réseau Ferré de France) was reintegrated into the SNCF group.

Towards managing "intermobility"

Accountability and coordination are two key factors in the integration of all the links in the mobility chain, enabling smooth running of the exchange hub. With stations attracting many businesses, they involve many different decision-makers with different issues which have to be reconciled with each other. The management of intermobility in the station is thus a very political matter.

A further challenge, a technical one but also organisational, involves the application of new information and communications technology (NICT) in facilitating the use of several modes of transport in one journey by, for example, making one sole ticket available to passengers. Such a move implies that all the transport operators involved in supplying this type of ticket co-ordinate with each other.

(Further details of this aspect of "intermobility" will be given in the chapter entitled "Information and communications technology: evolving tools serving the station".)

An endless flow of travellers in a station.
(Source: Fotolia)

Gares&Connexions published its first report on finance and accountability in 2014.

"Stations, perhaps even more than transport activities, must be run in an exemplary fashion as regards all their stakeholders, including local authorities, operators, customers, partners and passengers. The easiest way to provide high-quality, impartial services is to put all our cards on the table and say simply **the way the stations are run is not a secret.**"

Patrick Ropert, Manager of Gares&Connexions.
Source : Gares&Connexions

Security is also an important issue to take into account in the management of increasingly large and complex multimodal exchange hubs. Whether in the case of rail accidents or terrorist attacks, the multimodal station, with thousands of travellers passing through daily and the wealth, architectural and otherwise, concentrated in it, is a high-risk location.

Key points

"Intermobility" involves the participation of large number of players with a wide variety of profiles. It can take various forms depending on local policy.

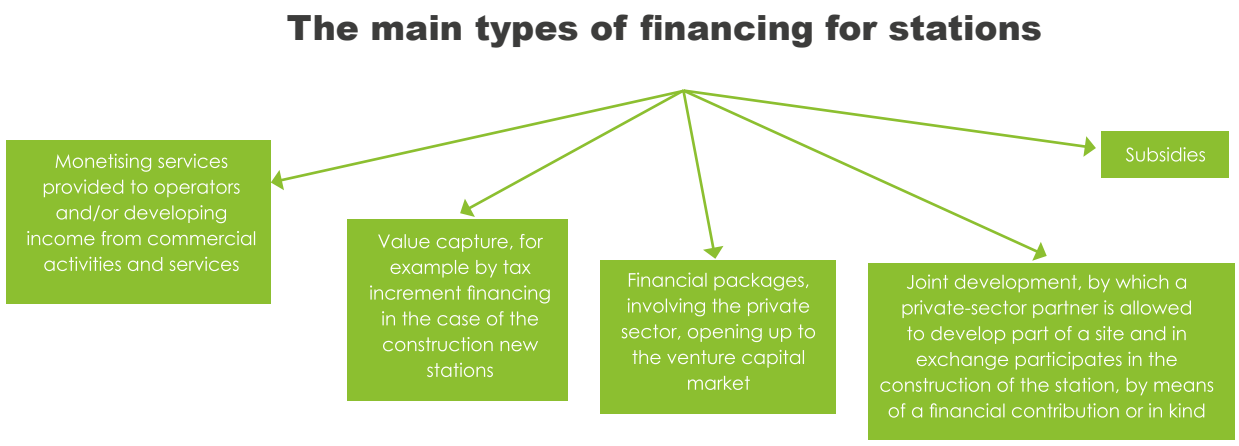
The lack of a standard model of “intermobility” is one of the main challenges involved in putting it into practice.

A paradigm shift has taken place and the station is no longer merely the point of access to the rail network but an increasingly complex space providing new services to travellers. As a result of the growing complexity of station organisation, to be a station manager is now to be the manager of a hub.

Atocha Station, Madrid, Spain. (Source: Fotolia)

The economic model of the multimodal station

The advantages of "intermobility"



The issue of financing stations is a crucial one. From planning right through to operation, significant funds are necessary to maintain, run and develop stations. It is important to understand what sources of income a station can provide and above all to take on board how stations can become potential markets through the opportunities offered by multimodal exchange hubs and "intermobility".

The primary sources of income for stations are naturally linked to rail services: reception of trains in the station, provision of station facilities, providing assistance to passengers, etc. However, it should be borne in mind that the station is not merely an incidental element alongside the main activity, that of transport. It is rather a focus point where travellers, rail operators and other service providers come together. It is a place in its own right where a wealth of opportunities are concentrated for all those ready to seize them.

With traditional sources of funding for transport infrastructure becoming increasingly thin on the ground, it has become essential to seek new types of financing. For this reason, we see station managers turning more and more to commercial activites to help finance infrastructure projects. In this way, a part of the economic potential of the station can be tapped by operating multi-modal exchange hubs, even though the funding of infrastructure cannot rely entirely on this.

The contribution from commercial activities to the financing of stations can be likened to what happens in the case of airports. It should nevertheless be emphasised that the two cases are not interchangeable. The types of users and their purchasing habits, the time spent on site, the structural organisation of the buildings in which the travellers congregate, and even the long-standing involvement of rail transport operators are all elements that differentiate the two transport systems.

Commercial activity in the station

Opportunities linked to different types of business activity in the station

Type of commercial activity	Opportunities
Ownership	The station manager can receive all the revenue from any type of activity.
Concession of commercial premises	The station manager can concentrate on his principal functions, those of service to travellers and reducing the costs and expenses of other services.
	The station manager limits the risks arising from the business not being profitable if it is badly managed.
Délégation d'activité commerciale	The quality of the services transferred can be high if they are provided by specialised firms.
	The station manager limits the risks arising from the business activity not being profitable if it is badly managed.
	Dividends estimated by the sales manager (in the case of a joint venture or similar entity).

Structure des revenus selon les différentes formes d'activités commerciales

Type d'activités commerciales	Source de revenus
Ownership	Income from sales and services
Concession of commercial premises	Rents: a) Fixed b) Fixed + % of turnover
Establishment of a joint venture with a third party	1. Payment by the sales manager for the right to do business a) Fixed b) Fixed + % of turnover c) % of turnover with a predetermined minimum 2. Revenue from commercial activities paid by the sales manager in the form of shareholder divdends
Delegating to a third-party undertaking	Payment by the sales manager for the right to do business

In a study of station operation for the Station Manager Global Group, Ekaterina Koryreva, RZD, shows the extent to which commercial activity can provide a source of income for stations: 1) depending on the form the commercial activity in the station takes, and 2) showing the different opportunities these types of commercial activities can offer to stations. (Source: Ekaterina Kozyreva, RZD)

Berlin Hauptbahnhof: the picture shows the shopping centre and the platforms on the lower levels. (Source: berliner-bahnen.de.)

Berlin Hauptbahnhof (Germany) (Source: imblacknitravel.com)

It is above all in the running of the station that "intermobility" can play an important role in the generation of income. People passing through the station are not exclusively rail passengers, (or not even users of transport services) and so there can be an opportunity to create a market in and around the station. Indeed, retail and other services can bring added value to the time spent in the station between using two modes of transport, and also to the day-to-day lives of people living near the station. What is more, its often central location and the large numbers of people using it, confer many advantages on the multimodal station and mean it can provide numerous services.

In the context of this, the station is increasingly considered as a new marketplace where marketing strategies such as customer profiling, advertising, etc. have their place. The first creations of commercial space in stations occurred in Europe. When certain German stations were renovated, Deutsche Bahn (the German railway company) set up a specialised subsidiary in charge of commercialising stations such as Berlin and Leipzig. This was followed in Italy in the 1990s by Grandi Stazioni who renovated the Roma Termini station, creating a full-scale shopping mall.

Gares&Connexions Subsidiary (France): A2C commercialises and develops business opportunities in SNCF stations. Commercial concessions account for 15% of the company's turnover, of which 11% is from rental revenue.

Leipzig Hauptbahnhof (Germany): the platforms at ground level and the shopping centre on the lower floors. (Photo courtesy of Andreas Taubert)

The central station in Prague is one of Prague's most important intermodal hubs: 800 000 people pass through it everyday and 35 million a year. These figures are expected to double following the setting up of new urban transport services and the closing of Masarikovo station with the subsequent transfer of its passengers to the central station. (Source: www.novinky.cz)

The redistribution of income from commercial activity in the station

Increased commercial activity in certain parts of stations can not only make the infrastructure more attractive, it can also be used to contribute to station finances.

This can be in the form of contributions for renovation or construction work in stations through funding from operators of commercial premises, through setting up innovative commercial concepts, or even by using the proceeds of property development in the case of regeneration schemes for complete neighbourhoods in cities. This was how Prague central station was converted into a full intermodal hub within the Czech capital, when the Czech rail operator Ceské Dráhy decided to use a private investor (following a public-private partnership between Ceské Dráhy and Grandi Stazioni) to finance and oversee refurbishment work, who would then benefit from the operation of the commercial space within the station.

Central Station, Prague (Czech Republic) by night. (Source: www.zelpage.cz)

Scale model of Milan Central Station, Milano Centrale (Italy). For its renovation, a quantitive analysis of passenger flow and passenger and visitor expectations (brands and products) was carried out. (Source: La Fabrique de la Cité/PwC)

The new station in Milan is based on a new model of passenger flow governance. The main services in the station have been moved to meet customer needs and expectations more effectively. (Source: La Fabrique de la Cité)

The renovation of the central station in Milan is another example of innovative commercial development. Since the early 2000s, Grandi Stazioni has been launching commercial initiatives in the Italian stations for which it is responsible. The new marketing plan for Milan Central Station consists of renegotiating contracts and allocating new retail areas through a process of competitive tendering. It has been possible to use the cash flow from these commercial areas in stations covered by the general renovation plan to reimburse the loan from the European Investment Bank.

Key points

The growing scarity of traditional sources of income has made it necessary to create innovative schemes to finance multimodal exchange hubs.

In the same way as in airports (but with different criteria), commercial activity can be an important source of income for stations. The intermodal station needs to establish its finances based on its capacity to generate revenues from sources other than those linked to rail activity. Station users are not only passengers, they are also potential customers.

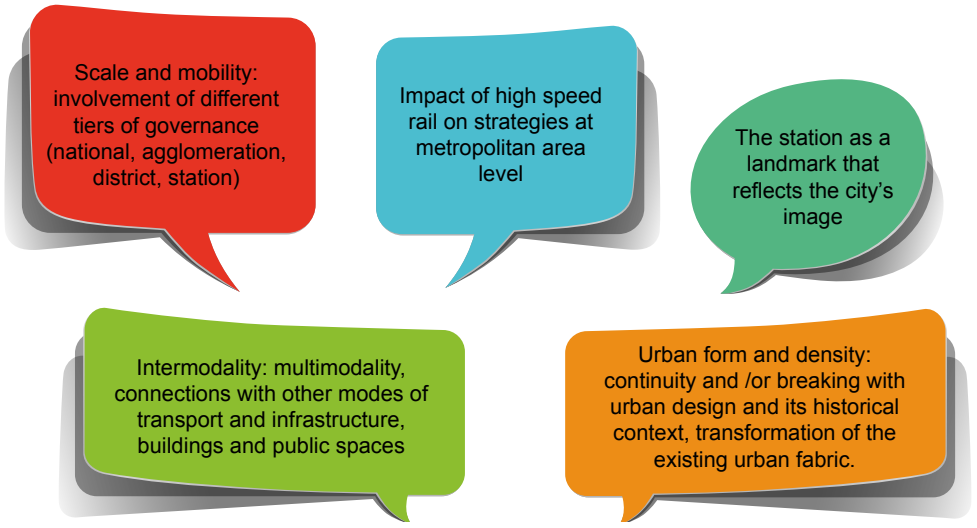
The commercialisation of the station gives rise to new and complex schemes to increase the added value of passage through the station. This entails above all implementing proper marketing strategies and financing packages.

Hamburg Station, Germany. (Source: Fotolia)

The station and its territory

The station is a highly symbolic place. As part of the cultural and historical heritage of a town, a political object and an economic tool, a multitude of roles can be ascribed to the station. It is an element of the transport infrastructure in which several types of authority may intervene. The multimodal station, which gathers together so many stakeholders and through which so many people pass, invites reflection concerning its impact on the city and the nation, and on a smaller subnational or regional scale. Whether through its influence on daily life in the local area or on long-term development strategies, the station is an emblem that imposes its presence within its territory.

Terms related to stations and their territory



The meeting of tradition and modernity: the imposing presence of Chhatrapati Shivaji Terminus (formerly Victoria Station) in the city of Mombai in India. Listed as a UNESCO World Heritage Site in 2004, it is a Victorian neogothic structure with traditional Indian architectural features. (Source: Fotolia)

Chhatrapati Shivaji Terminus built between 1878 and 1888. (Detail). (Source: Fotolia)

The station as a landmark in the city

From a point of embarkation or disembarkation, it became a station, then a passenger building and more recently a multimodal exchange hub. The station is once again an essential element in the contemporary city, as an architectural monument, providing transport facilities, connecting hubs and urban centres. It is flexible, interconnected, versatile, multipolar and multifunctional.

The architectural history of the city in which it is situated can be traced through the station. Combining tradition and modernity, it is gradually changing by inviting the city into its precincts. It is now a fully-fledged living space, integrated in the new urban landscape in which the station has become a centre not just for travellers passing through but for all city dwellers.

Reggio Emilia Station, a project designed by the architect Santiago Calatrava, was opened on June 8th 2013. Its sinusoid or wave form is created by a succession of porticos with closed sections and differing geometrical shapes.
(Source: Fotolia)

The meeting of tradition and modernity: Tokyo Station (Japan), designed at the end of the 19th century, contrasts sharply with surrounding skycrapers, symbols of the 21st century. (Source: Fotolia)

King's Cross St Pancras (London, UK). This historical London station acquired a modern touch in 2012, thanks to the work of the architect John McAslan. (Photo courtesy of Hervé Aubert, Marc Guigon)

The station as a living space: how to dynamise the station and its neighbourhood

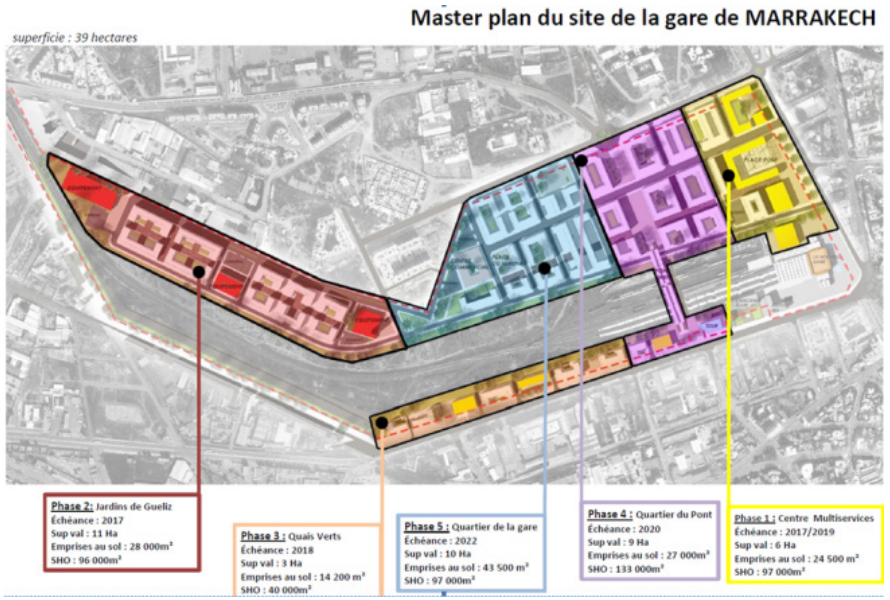
The station presents a challenge to town planners and for this reason it must be taken into account in land development strategies. The station is increasingly thought of as a public space to such an extent that the public areas in the station and in the town come to be thought of as a single space.

The station epitomises the economic development around which the city increases in density and forms new urban centres. Several examples illustrate how reinventing the station also means reinventing the neighbourhood round the station.

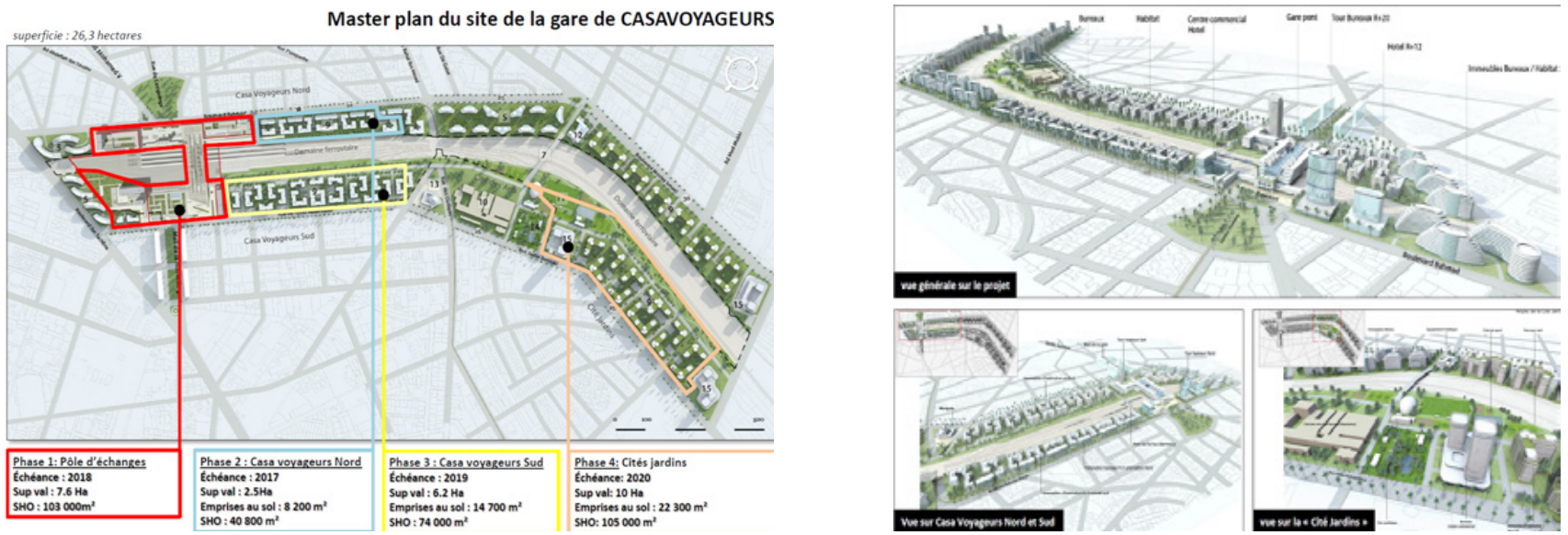
In Morocco, urban regeneration plans around the stations of Marrakesh and Casablanca (Casa-Voyageurs), have sparked off cultural heritage projects in the station neighbourhood. In fact, these projects stem from a plan to develop the national rail network by doubling the entire existing 140km–long track between Settat and Marrakesh, so ONCF can meet the growing demands of both passenger and freight transport. This will reduce the travel time between Marrakesh and Casablanca by 45 minutes (2 1/2 hours instead of 3 ¼) and the number of trains daily will gradually increase to reach 60 by 2020.

Expert opinion: Fabienne Keller, *La gare contemporaine* [The Contemporary Station]

"If by nature the station is a district of the city, then like the city, it must ensure there is a balance between public spaces (areas for walking around and resting, suitably proportioned to give travellers a sense of wellbeing), business areas (offices, shops, etc.) and services for the general public and for passengers, the whole designed harmoniously."et services au public et aux voyageurs dans une conception d'ensemble harmonieuse. "



"The urban regeneration project for railway-owned land round Marrakesh Station is part of a blueprint for upgrading stations and railway installations in various cities in the Kingdom of Morocco. […] Spread over a total covered area of 465 000 m², this project involves the construction of a new, versatile, multifunctional urban hub, including residential, retail, hotel and office space and green areas […] The project is divided into five phases and will be completed between 2017 and 2022." (Source: ONCF)



Casa-Voyageurs Station in Casablanca is part of the same renovation scheme as that of Marrakesh Station, a project to upgrade Moroccan stations and railway installations. (Source: ONCF)

View of Vienna Central station. The plan for the Austrian capital includes the construction of a central station to replace two terminus stations and the reorganisation of the tracks over an area of 55 hectares. In the zones reserved for urban development round the station, nearly 8 ha will be dedicated to roads, pedestrian paths, cycle tracks and parks. The construction of the latter will be financed by the city of Vienna. The majority of the remaining land has been sold by ÖBB to various third-party developers and investors to build housing, office buildings and hotels which will generate sufficient income to cover their construction costs. (Source: ÖBB (Österreichische Bundesbahnen, Austrian Federal Railways) quoted in La Fabrique de la Cité)

Sectors concerned by the Vienna Central Station project. (Source: ÖBB in La Fabrique de la Cité/PwC)

In the Netherlands, Rotterdam Station has been modernised as part of an ambitious urban development project for Rotterdam Central District. The economic capital of the country is located at the heart of a European high-speed rail network, which is of international dimensions but must respect a long local tradition of urban and architectural construction. This is the so-called "glocal", a compromise between the local and the global in which the station can play its full role both on a local level and internationally.
(Source: Brunel Awards 2014)

Atocha Station, Madrid

- *Easy access to high-speed lines from suburban trains (served by 7 lines);*
- *Transfer time: just 5 minutes;*
- *Additional services with the arrival of high-speed trains: VIP lounge, automised systems and dedicated embarkation area;*
- *27% of high-speed train passengers leave the station by taxi, 14% by underground, 12% by suburban trains and 9% on foot;*
- *Atocha station in Madrid connects the capital to the country's second city, Barcelona.*

(Source: High Speed and the City 2010, UIC)

High speed and the intermodal station: connecting the local to the global

The arrival of high-speed trains has brought with it fundamental changes, reducing the scales of time and distance. It has brought European cities closer together with the distances between them being measured now in numbers of hours rather than in kilometres. Urban areas are changing scale and their relationship with the local and the global has evolved.

With high-speed rail travel, the station becomes the interface between so-called ‘green’ or environmentally friendly forms of transport (foot, bicycle, public transport, etc.) and those connecting the city with a globalised world (plane, train, car, etc.).

In terms of spatial planning, there are high expectations of high-speed rail. It is considered to be a planning tool capable of meeting the growing demands for mobility by drawing on local areas, of linking the metropolitan cities to the decision-making centres, and to a lesser extent of attracting jobs. Although it is true that the impact of high-speed lines on a specific area is hard to measure, it has been proven that the choice of location of stations and access to them is fundamental in the economic dynamics of high-speed rail. If it is part of an overall project, high-speed rail can be a key factor in the structural development, attractiveness and influence of a region.

Key points

The station is increasingly considered as a public space, a continuation of the city. As a result, the design of new stations is a good example of the link between town planning and the development of rail transport infrastructure.

The station is a histocial, political and economic symbol in the heart of the city, whose influence is felt at all levels.

The intermodal station with access to high-speed rail lines enhances communication at all levels, from local to global.

Reggio Emilia Station, Italy. (Source: Fotolia)

Information and communications technology: constantly evolving tools serving the station

Information and communications technology is an essential tool in the smooth running of a multimodal station. Real-time posting of information in stations, ticketing, internet connections, etc. are all necessary for the "intermodality"of the future.

The station is the scene of all types of innovation, impacted by today's digital world, and intermobility is a particularly favourable ground for pioneering initiatives, with new tools arriving on the scene to modernise rail transport.

"Intermobility 2.0"

Several factors have fostered the development of new technology in the field of transport for passengers who are increasingly connected to their smart devices. New technology has appropriated this domain, in particular in the field of ticketing, real-time information and geo-positioning. There are many opportunities arising from the need to respond to people's growing mobility. New mobility services have emerged and the trend is to gradually digitalise "intermobility".

L'Open data

Making data available – Open Data – allows third parties to use existing data and devise new ways of exploiting them, enhancing their value by creating increasingly innovative mobile services and applications.

SNCF open data
OUVRONS LA VOIE À DES SERVICES INNOVANTS

SNCF has recently allowed access to the data on its website.

The journey is not just in the train, but also within the station, where it is crucial to be able to find one's way around. Above is a plan of St Lazare Station, Paris (overground, regional trains and intercity lines) on OpenStreetMap.

The Smartphone

More and more passengers have smartphones with internet connections, allowing them to have real time access to information. This enables them to devise or alter their journey en route and to react to information they have received. The traveller is now an active participant, a "producer" in the transport sector.

Smartphones are increasingly important in public transport. Here, underground train users in Korea.
(Source: businesskorea.co.kr)

The sharing economy

It is more and more common for passengers to exchange information online. Crowdsourcing, the system in which information is gathered, shared online and rectified where necessary by the users themselves, is increasingly used by travellers and ICT professionals.

Car sharing: a new concept from the sharing economy has transformed mobility strategies. Above: parking spaces exclusively for car sharing in a German station.
(Photo courtesy of Daniel Shoene)

New information and communications technology (NICT) - new actors in the field of intermobility

Intermobility at our fingertips: with the growing use of smartphones and the development of applications, passengers use their mobile phones increasingly both as a travel document and to obtain real-time information to plan their journeys.
(Source: Fotolia)

What digital innovations are there in the station?

Information for passengers: before, during and after the journey

The new mobility services that have been made possible by technological advances have created new participants in the field of “intermobility” who are tending to become new strategic partners for the traditional stakeholders in the transport domain.

Internet and telecommunications giants were the first to benefit from the advantages of Open Data. They have unique skills and special technical know-how enabling them to handle all this information. More and more start-ups and firms specialising in the digital field coupled with that of passenger transport are also taking advantage of the availability of this data. They are then well placed to make the most of the demands of travellers who are online, to develop their business.

It has alway been seen as important, when managing the flow of passengers through the station, to provide them with information, but the form this takes is constantly changing. Nowadays the functions are customised to a greater or lesser extent (provision of ticket prices and timetables, route planning optimised according to certain criteria, advice and guidance, etc.), and are available on a wide variety of media and in various forms (paper, radio, television, web, telephone, interactive terminals, ticket offices, etc.), and at all stages of the journey (during planning, during the journey and on arrival).

Time management is of paramount importance for the traveller. Even before starting out, passengers need to know what to expect during their journey.

"Ecopassenger" is a tool developed by the German Institute for Energy and the Environment and IVEmbH, commissioned by UIC and its European members. It makes it possible to measure the energy consumption of an intermodal journey and suggests the best possible routes. (Source: www.uic.org)

The multimodal exchange hub is a strategic location in which to try out new information technology. It is in fact a critical moment in the transport chain, the place where time which was gained elsewhere can be lost, and where the risks of discontinuity between different information systems may be most clearly felt.

New information technology now makes it possible to exploit in real time all the information from each of the modes of transport which are connected to each other through the multimodal exchange hub, and then to display it by means of variable message sign boards, to communicate it via audio announcements, and to pass it on to the staff of all the transport companies present in the station.

ICT can also be of direct assistance to travellers themselves by helping them to select the most relevant information for their chosen journey.

The intermobility of the future is closely linked to new smart communication devices. (Source: HaCon)

This type of service is critical in the issue of intermobility in that it it makes it possible, even before alighting from the train, to know what other transport possibilities there are available in the station (self-service bicycles or cars, buses, taxis, pedestrian, etc.), as well as other practical details (timetables, availability, traffic conditions, journey times, etc.) enabling travellers to decide on their route with a complete lack of stress.

On the European level, the implementation of the TAP (Telematics Application for Passengers) regulations will further increase the amount of information, such as timetables, tickets and prices, shared between the operators of the various modes of transport and the third-parties involved (global distribution systems, ticket vendors, etc.)

Ticketing intermodality at the heart of the implementation of "intermobility"

keeping with this logic of organising "door-to-door" journeys with maximum ease, the medium of the travel ticket or pass is an element open to improvements in "intermobility". Intermodal ticketing not only reduces discontinuity when changing between different modes of public transport, but it is also indispensible in the efficient flow of passengers through the station, making the whole journey seamless. With a single ticket for all types of travel or a paperless ticket, it is less and less necessary to have a whole collection of tickets, for the train, plane, bus, underground, etc., making journeys from door to door so much less stressful.

NFC technology, the main innovation of the last ten years, also contributes to the fluidity of passenger movements through the station while making their lives easier. (Source: mobilepaymentsworld.com)

The example of air-rail intermodality

Complementarity between modes at all levels. Many large airports are connected to the high-speed rail network: Schiphol (The Netherlands), Frankfurt (Germany), Charles de Gaulle (France), Brussels (Belgium), Hongqiao (Shanghai), etc. For companies operating in these airports, high-speed rail gives them access to their main markets. For these companies, the high-speed rail network complements their "hub and spoke" model, even at times replacing short-haul flights. In fact, the setting up of rail-air intermodality is a good example as it illustrates all the challenges of "intermobility": reservation and issuing of tickets valid for both modes of transport, (compatible timetables and updating of availibity), the practical aspects of the journey as a whole (checking in and embarking, signage, facilities such as baggage handling, etc.), administration (e-tickets, payment, real-time information, etc.).

Key points

Making information available to travellers via the internet enables new strategies to be employed to implement "intermobility".

Ticketing (E-Tickets, NFC) and real-time information are the two main fields of innovation in "intermobility" over the last few years.

Shanghai Hongqiao Airport Station, an example of rail-air intermodality.

Antwerp Station, Belgium. (Source: SNCB)

The passenger experience in the station: the station as a day-to-day environment

Travellers increasingly demand high levels of service and they no longer expect the station to be just a place to pass through. For many, the multimodal exchange hub should be a place where it is easy to find one's way in order to cross from one mode of transport to another as quickly as possible. The best possible time management at these changeover points is therefore of vital importance in the multimodal journey. It is above all when waiting time is long that this period must be experienced positively, especially as it is estimated that travellers spend nearly 30% of their journey time changing between modes of transport.

One of the main challenges of intermobility is therefore to minimise the time spent in the station but also to improve the experience. Comfort, availibilty of services, attractive prices, information and accessibility are therefore key criteria contributing to improving the mobility chain where passengers flows meet and disperse in stations.

Improving these factors depends on the following issues: the quality of the interconnections and the variety of the modes available, the accessibility of the station, the sense of wellbeing and safety, the information provided, the availibiity of shopping facilities and local services.

Adapting to all station users

Stations are designed to ensure the smooth operation of a wide range of activities and to be adaptable to any changes that may take place within it. The conception of the station must take into account the various needs and expectations of the various stakeholders and users of the station.

Although qualities such as cleanliness, efficiency, security, fluidity and reliability are expected by all station users, certain groups of travellers in particular need special services. The criteria to consider in the design of a station and its ambiance depend on the different categories of passengers that can be distinguished. The reason for travelling, the point of departure, the destination, etc. are all factors likely to change travellers' priorities.

Commuters who are familiar with the station they use every day generally spend little time in the station, their objective being to minimise the time spent travelling. For this reason, they tend to demand in particular:

- A reliable service with real-time information on any traffic delays and problems (this point is valid for all passengers);
- Efficient connections;
- Direct access to the station's entrance and exit, and in particular to car parks, bus stops, cycle parks, and self-service bicyles and cars;
- Swift and efficient ticket purchasing and collection systems;
- Practical retail services.

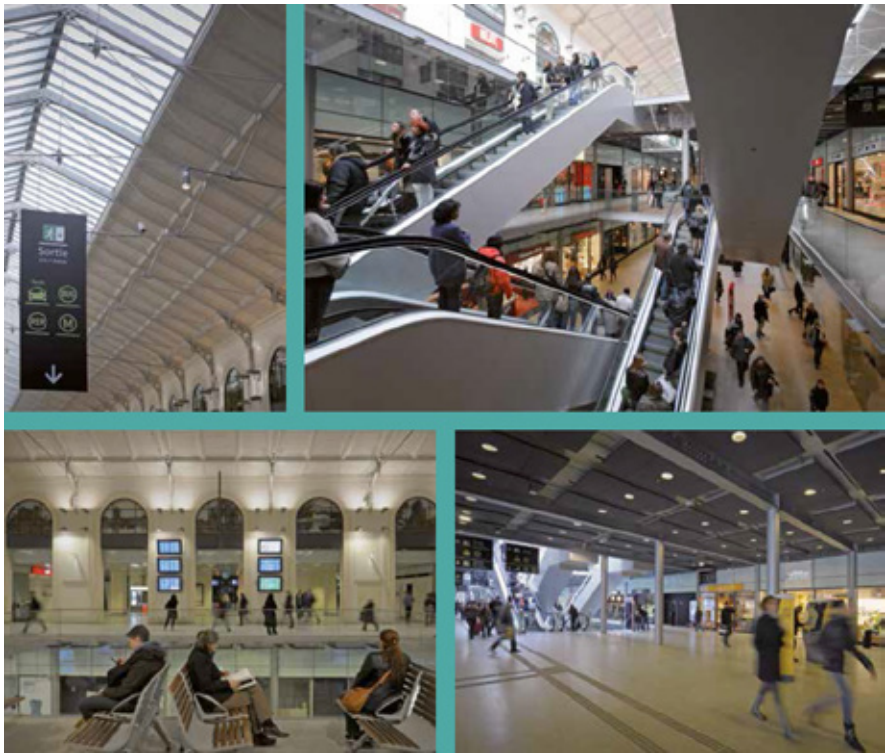
Business travel involves different priorities. A professional assignment involving a business trip often demands a higher quality of service. Professionals and businessmen may need to travel first class, with a high standard of comfort, and the time spent in the station may vary. Their requirements are above all:

- High-quality and comfortable waiting areas;
- Clean, efficient and practical facilities;
- Easily accessible places to eat;
- Wifi internet access and power points.

Leisure and tourist trips are completely different. Tourists often have more time to spend on their journey but they are much less familiar with the stations than the commuters. Above all, they are likely to encounter issues related to their luggage, and barriers arising from insufficient knowledge of the language used in the station or from other cultural differences. These travellers therefore particularly need:

- A welcoming and safe environment;
- Ease of movement within the station with regular, clear and legible information;
- Visible and accessible staff;
- Luggage facilities.

Waiting room in Union Square Station, New York, USA.
(Source: Fotolia)



Saint-Lazare Station in Paris, France, has been upgraded so travellers now have the benefit of facilities such as the shopping mall, pleasant waiting areas and good connections between the underground floors and the part of the station at ground level.
(Source: Brunel Awards 2014)

Although the station is above all a place linked to the world of travel, many of those passing through have not necessarily come to catch a train. There are those who have come to welcome or see off travellers and/or to use the restaurant or shopping facilities. Their expectations are based on the diversity of the amenities and the services that are provided such as waiting areas and parking facilities.

Station accessibility

The multimodal station must meet the challenge of adapting to all kinds of disability and to people who have difficulty in finding their bearings in places they do not know. However, adapting to these problems, that is, by working on spatial legibility, clarity of signage and improving security among other things, can also be helpful to passengers who do not have a disability. Providing easy access to platforms can be particularly problematic as it involves simultaneously the choice of rolling stock, the management of train stops and the way the buildings are designed and used.

Near stations, the creation of safe and attractive pedestrian areas can enhance the accessibility to the infrastructure for a potentially large number of travellers. Although this appears obvious, it is actually a challenge because, as a place where various transport modes cross, the station is often a difficult place for pedestrians to access.

Several rail companies and station managers have created their own programmes to improve access to the rail transport network and the station itself, including "Station made easy" in the UK, "Atendo" in Spain and "B for you" in Belgium, etc..

In Hitachi station in Japan, the aging of the Japanese population has been taken into account in the redevelopment of the station. In addition, to give a sense of wellbeing, it has been designed with a view of the sea and so the sea can be reflected in the building materials used. (Source: Brunel Awards 2014)

(Source : Fotolia)

Signage on the ground and special wheelchair-friendly barriers for ease of access to platforms. (Source : Fotolia)

Design, feeling of safety and wellbeing: the main quality criteria of passengers

With the possibility of the time spent in the station reaching up to 30% of the entire journey time, the station environment and atmosphere cannot be neglected. Several factors help to make the time spent in the station more pleasant: cleanliness, luminosity, noise levels, the courtesy of station staff and the feeling of security (presence of police, checks, etc.). Although these factors may seem relatively subjective, a number of steps have been taken in this context to improve the experience in the station.

Atocha Station, Madrid (Spain). A green space has been created within the station so travellers can appreciate the local flora and fauna as soon as they step off the train. (Photo courtesy of Rafael Ramirez Lee)

In Horrem in Germany, Deutsche Bahn has developed an innovative concept of passenger building combining up-to-date ecological standards with a high level of customer comfort. Above is the "StationGreen building" with its living or green roof and photovoltaic panels. (Source: Brunel Awards 2014)

Culture bringing a different experience to the station: a performance of La Traviata by Giuseppe Verdi was put on in Zurich station, Switzerland, in May 2010. (Source: 20min.ch)

Self-service piano in Saint-Lazare Station.
(Source: SNCF)

In Shanghai South Station, security checks are carried out on passengers before they board trains.
(Photo courtesy of Marc Guigon)

However, the organisation of cultural activities in particular requires great logistical skills on the part of station managers and their partners. Safety standards must constantly be borne in mind and problems may arise from larger numbers of passengers staying for longer in the station. On top of co-ordinating the specific safety standards for each mode, personal safety is also a complex issue. In the current context of growing threats from terrorists, it can be said that maintaining high levels of security in increasingly large terminals with passenger numbers constantly expanding, is the new challenge for the "intermobility" of the future.

Key points

Taking the passenger experience into account is the defining factor of “intermobility”.

The methods used to enhance the experience of passengers in the station can be very diverse. The architecture, the immediate surroundings of the station, local culture and customs, etc. all may be harnessed to make the multimodal station a place where everyone can experience a sense of wellbeing.

In the context of growing terrorist threats in vulnerable places such as transport facilities where thousands of people are found on a daily basis, the issue of reinforcing safety measures for all users of intermodal stations is becoming an increasing priority.

Several stations across the world

Shanghai South station, China. July 2006. AREP / Photographer: T. Chapuis. Architects: JM. Duthilleul, E. Tricaud.

Kazanskiy Station, Moscow, Russia. (Source: RZD)

The new Casa-Port Station, Casablanca, Morocco. February 2015. AREP/ Photographer: Didier BOY DE LA TOUR.

Grand Central Station, New York, USA. (Source: Fotolia)

Tanger Ville Station, Tangier, Morocco. (Source: ONCF)

New RFI Turin Porta Susa Station, Italy: view of the concourse from above. October 2014. AREP/ Photographer: Mathieu Lee Vigneau. Architects: Jean-Marie Duthilleul and Etienne Tricaud, Silvio d'Ascia in association with A .Magnaghi.

Tokyo Station, Japan. (Source: Fotolia)

Victoria Station, Bombay, India. (Source: Fotolia)

Casa-Voyageurs Station, Casablanca, Morocco. (Source : Fotolia)

Barcelona Station, Spain. (Source: Fotolia)

Fez Station, Morocco. (Source: Marc Guigon, UIC)

Gare du Nord, Paris, France. (Source: Fotolia)

Komsomolskaya Station, Moscow, Russia. (Source : RZD)

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INTERNATIONAL UNION
OF RAILWAYS

International Union of Railways (UIC)
16, rue Jean Rey
F – 75015 Paris (France)
Tel: + 33 (0) 1 44 49 20 20
Fax: + 33 (0) 1 44 49 20 29
E-mail: info@uic.org
Website: www.uic.org

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