RAISE-IT - Activity 3 “Corridor Concept”

Guidelines for Seamless Interregional Passenger Rail along the Rhine-Alpine Corridor

Task 13 - Milestone 17

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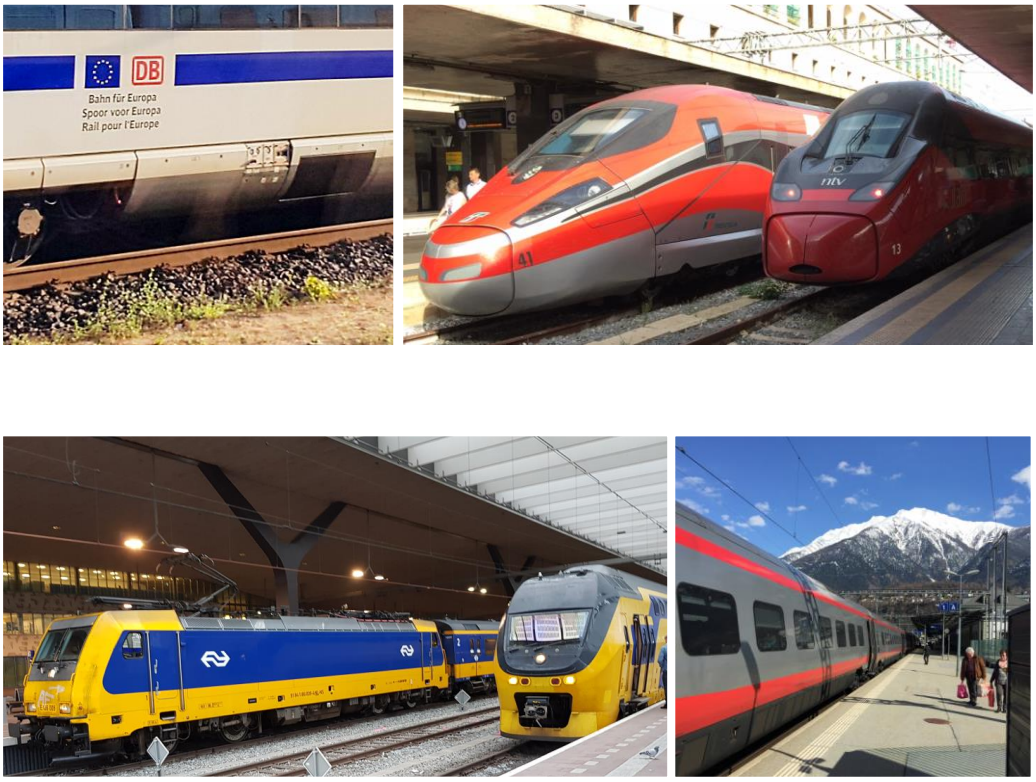

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1. Introduction to Guidelines

The key focus of the European Union's political agenda is to strengthen economic, social and territorial cohesion towards the creation of a European single market. To this end, it is important to ensure better connectivity between European regions by making them benefit from good rail access and frequent long-distance rail services. For these guidelines long-distance rail means connecting nodes over longer distances beyond the regional level[1]. Good connections lead to a reduction in transfer time. The long-distance rail network and operations in Europe are an essential ingredient to achieve the European single market. According to the EU White Paper on Transport issued in 2011, passenger related issues contributed towards a trebling of the high-speed rail infrastructure by 2030, with a shift from road and air to rail for medium distances by 50 % and a target reduction of CO_2-emissions by 60 % until 2050[2]. High-speed rail comprises of new infrastructure with a maximum operating speed of 250 kph or higher or at least 200 kph if services run on upgraded conventional rail lines[3]. Though high-speed rail has achieved some positive changes in mode split towards rail, there are some impacts that need to be addressed, such as the relatively high construction costs and suitability for connecting larger cities of around 500,000 inhabitants located 120-150 km apart[4]. Trains stopping in smaller cities sometimes involve serving so-called "TGV-generation"[5] stations out of the centres. The EU-Commission qualifies some of them as catalyst for development of high-speed rail and thus encourages development in this direction[6].

To obtain effective connectivity, high-speed rail should be integrated into a long-distance rail strategy, ensuring seamless travel chains and accessibility for the cities served by high-speed rail or other long-distance rail services. To ensure seamless connectivity for the regions, high-speed and long-distance rail need to be integrated with regional services.

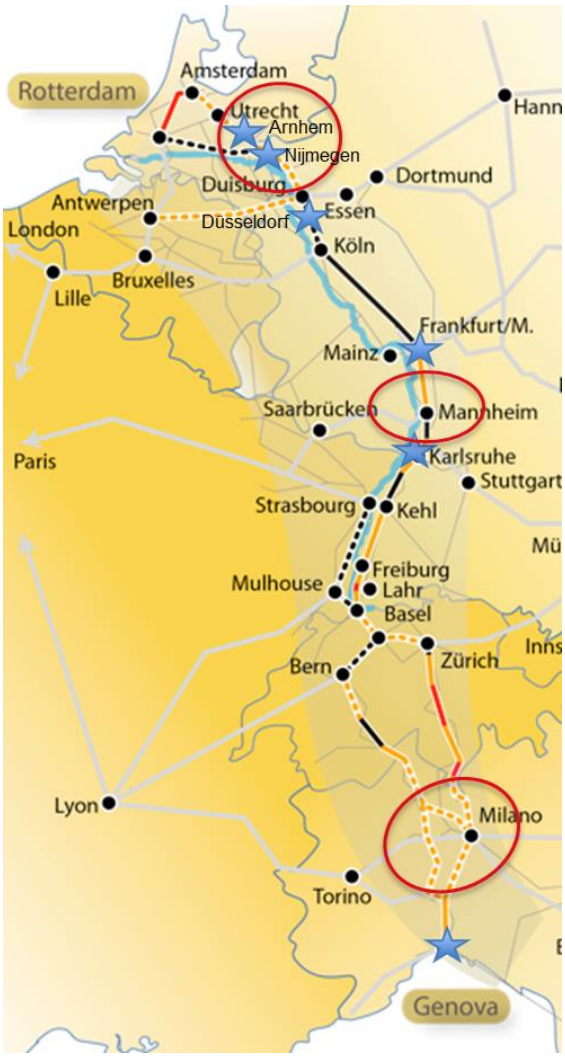
[1] This includes mainly train products such as ICE, TGV, Freccia Rossa or Euro-City respectively Inter-City trains. This latter train product category serves in countries like the Netherlands or Switzerland where long-distance travel requires an overnight stay. In Germany or France, it is generally comprising trips 100 km or longer (European Parliament, 2012).
[2] European Commission, 2011
[3] Council of the European Union, 1996
[4] Vickerman, 2015
[5] Authors' own qualification of high-speed rail stations that were developed in addition to the so far existing central station of a city and often located outside the city or on the edge as it happened in serval French cases where high-speed train TGV is used.
[6] European Commission, 2010

The Rhine-Alpine Corridor is one of the priority axes in Europe and forms part of the Trans-European Transport Network (TEN-T). It connects 70 million people living and working in some of the busiest regions in Europe. There are historically-grown ties between the regions regardless of national affiliation. Whether there is cultural exchange, economic activity or tourism in the Alps, along the Rhine, on North Sea or the Mediterranean Sea, good connections are indispensable to strengthen the coherence of the corridor. The Rhine-Alpine Corridor is densely structured with medium-sized cities much below the aforementioned 500,000-population threshold, but these cities have considerable regional catchment areas. The preceding European project CODE24 (Corridor 24 Development Rotterdam – Genoa)[7], funded under the Interreg IVB NWE programme of the EU, revealed the necessity of taking the hinterland into account and that a sole focus on high-speed rail worsens the regional accessibility and limits the network capacity (notably for freight which is important for the Rhine-Alpine Corridor). Travel time is lost in many already saturated nodes due to transfer, insufficient connections and timetable restrictions. The Interregional Alliance for the Rhine-Alpine Corridor[8], founded in 2015 as European Grouping for Territorial Cooperation (EGTC)[9], accounts for 25 members among the regions, municipalities, ports and think tanks from all countries along this axis. It pursues an interregional strategy for better connections. The strategy further stresses the coherence along this economic, living, cultural, leisure and science axis. The strategy builds upon outcomes from CODE24 and strives for better connections and optimised nodes.

The Rhine-Alpine Integrated and Seamless Travel Chain (RAISE-IT)[10] project was initiated by the EGTC and involves five EGTC members and four other institutions (Figure 1). RAISE-IT intends to strengthen rail based long-distance transport and therefore aims to contribute to the CO_2-emission reduction goals mentioned above. The project highlights the necessity to develop a seamless travel chain along the Rhine-Alpine Corridor and exemplarily demonstrates the need for a better coordination between the long-distance and regional transport. The project emphasises the role of urban nodes where transport flows are bundled and where trains stations act as the gateway to the corridor. Urban nodes have been explored at three spatial levels: local, regional and corridor-wide. Three activities have been

[7] CODE 24 Action 17 Team, 2015
[8] For more information look at egtc-rhine-alpine.eu/
[9] Legal form based on Regulation (EU) No 1302/2013
[10] For more information look at raise-it.eu

developed accordingly, as shown in the following figure. In these guidelines, the focus is on the corridor-wide level named the Corridor Concept (Activity 3).



- **Name** Rhine-Alpine Integrated and Seamless Travel Chain (RAISE-IT)
- **Duration** 2017 – 2019
- **Funding** Connecting Europe Facility of European Union (50%)
- **Lead Partner** Interregional Alliance for the Rhine-Alpine Corridor EGTC
- **Partners:** 5 EGTC's affiliated members (Provincie Gelderland, Regionalverband FrankfurtRheinMain, Verband Region Rhein-Neckar, Regionalverband Mittlerer Oberrhein, Uniontrasporti), ILS Forschung, Links Foundation, IIC, Comune di Genova
- **Information** raise-it.eu/

Activity 1
Urban Node Accessibility
Guidelines for improving urban nodes with respect to the urban integration and function as multimodal hub. Nodes: Arnhem, Nijmegen, Düsseldorf, Frankfurt am Main, Karlsruhe, Genova

Activity 2
Seamless Connections from the Nodes
Action plans to enhance regional accessibility from the nodes and connection with long-distance trains.
Case studies: Arnhem, Mannheim and Milano including their respective hinterland

Activity 3
Corridor Concept
Timetable and accessibility concept for hourly connections along the Corridor and improving cross-border travel.

Figure 1. RAISE-IT at a glance. Source: Adapted by Otsuka, Delpiano and Endemann based on map used by CODE24 initiative[11] .

[11] https://egtc-rhine-alpine.eu/de/code24/, last accessed 18 December 2019.

1.1 Purpose

This guidelines report is based on the main findings of the RAISE-IT project, including both desktop analysis and expert hearings (with network and long-distance rail operators, researchers and local/regional stakeholders), aiming at a seamless corridor travel chain from the passengers' perspective and from the interests of the regions seeking to be better connected along the Rhine-Alpine Corridor. The achieved outputs revealed the need for a common acting ground and led to five key elements being considered to pave the way towards better and more passenger train options along the Rhine-Alpine Corridor. The guidelines thus present open issues and lessons learnt in the RAISE-IT project. They refer to issues ranging from geographic, regulatory and institutional barriers, to the gaps in the travel chain and the manifold user groups and interregional trips travelled along this corridor. The guidelines thus serve to disseminate the RAISE-IT messages and to raise awareness for these messages among different stakeholders. The stakeholders encompass responsible actors on a European, national and regional level in charge of infrastructure development, territorial planning, rail network organisation and operation as well as those institutions setting the framework for rail regulation and operation. It would be appreciated if policy makers considered these messages in their long and short-term strategies, as well as their daily business. The guidelines intend to further draw attention from interest groups and associations to the corridor. They may fulfil an important role as multiplier to push the guidelines' aspirations.

1.2 Structure

The report is structured as follows.

Chapter 1 introduces to the RAISE-IT project and its European policies scope, up to familiarise with the guidelines' goal and structure.

Chapter 2 provides an overview on the RAISE-IT context on which the guidelines are based and developed[12]. The methodological approach and the main outputs achieved at corridor-wide level (Corridor Concept) are summarised here, up to define a list of five key issues as backbone for a seamless corridor.

[12] More detailed information is contained in several reports prepared in the course of the RAISE-IT project. These are listed at the end of this report.

Chapter 3 is the core part of the guidelines and provides explanation of the five key issues defined in the previous chapter. These issues reflect the lessons learnt from the RAISE-IT project and represent the key messages to be addressed to policy makers and stakeholders.

Chapter 4 provides suggestions for further processing these guidelines beyond the project's lifetime, stressing the need to go a step forward and push for a common vision among key European stakeholders' groups who can effectively support the corridor framework improvement. The aim is to address RAISE-IT messages at the relevant policy, planning or operational bodies and plot a road map for the future.

2. Context

This chapter provides an overview on the approach and main outcomes on which the guidelines are drawn up. The intention is to summarise why a seamless corridor is required for rail passengers and how this can be developed. The analysis enabled gaps to be spotted (especially at cross-border sections) and led a list of five key issues to be defined as guidelines towards a seamless corridor.

2.1 Corridor Concept – Approach and Main Findings

The corridor-wide spatial level is based on the idea that all kinds of users (with any travel purpose from business to leisure) can move with rail based public transport within an interregional space without boundaries. The approach focused on how the interconnectivity of the nodes and the regions along the Rhine-Alpine Corridor can be improved. The key for improvement is densifying long-distance services through more frequent and "regular services" according to the principles of a so called International Integrated Timed Transfer (IITT)[13]. The intention is to reduce the number of transfers or optimise the transfer time as trains are inter-connected in one node at the same time most notably around minutes 00 or 30. Furthermore, it has been checked that there is potential to target the air market through additional long-distance services ("train on-top" services[14]) along the Rhine-Alpine Corridor. There is some potential to shift from air to rail for connections like Amsterdam-Zürich or Milano-Frankfurt, though the numbers are generally low in comparison with road transport. This latter aspect therefore shows that a train on-top needs to be carefully assessed but may function as a catalyst for more corridor coherence.

It is clear that the target was not the trains running through from the Netherlands to Italy, but trains connecting sections of the Rhine-Alpine Corridor where there is potential for improvements toward a seamless travel chain. In order to appraise the performance of the whole corridor (urban nodes as well as the regional accessibility), it was indispensable to have a whole picture of the interconnectivity between nodes, network capacity and related train services. This overview of the corridor allowed to spot the current gaps (mainly concentrated at border sections) and assess the potential for improvement measures up to

[13] Clever, 1997.
[14] Train on-top refers to one or more sped-up train services calling at less stations and on top of the regular hourly running train services.

2035. Consequently, various regions and their respective long-distance rail stations have been considered.

Starting from a literature review, national plans have been analysed in order to check the infrastructure requirements and how they may help to overcome the perceivable gaps at the border sections, reduce capacity limits at key nodes (such as Amsterdam, Frankfurt am Main, Köln, Mannheim, Milano) and increase the reliability of the railway system. The current level of supply (timetable 2018) identified gaps between Germany and the Netherlands (only one train every two hours) and in Switzerland for cross-country connections from the Netherlands/Germany towards Italy. The challenge is to adjust timetables in Basel/Brig (German or Italian side)[15] - Figure 2.

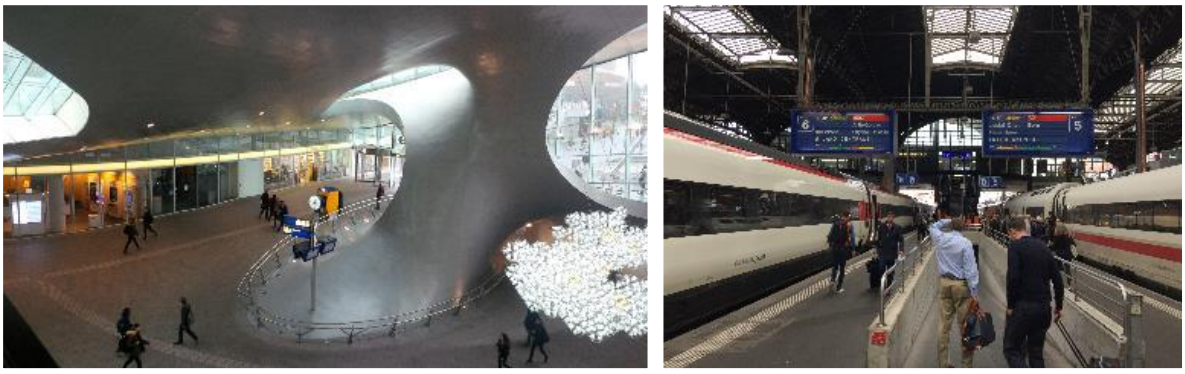


Figure 2. Arnhem Centraal and Basel SBB are good examples for rail integration into good national networks if the gaps will be filled. © Peter Endemann

In addition, the desktop analysis has been validated and fed with inputs obtained at several expert hearings with network operators, long-distance rail operators, regional/local authorities and researchers (at different stages during the project development)[16].

The limitations of the analysis can essentially be found in the rail market assessment due to the lack of demand data availability (partial and/or not harmonised) and their harmonisation along the Rhine-Alpine Corridor. This issue was dealt with by taking over a macroscopic approach. Two relevant sources of O-D matrices, which together can cover the whole corridor, have been merged to assess the transport market in view of rail potential; the German Federal Transport Plan - Bundesverkehrswegeplan (BVWP) 2030 for traffic flows

[15] Delpiano et al., 2017.
[16] Delpiano and Endemann, 2019a and 2019b.

from/to/through Germany and the National Swiss Traffic Model 2040 to complement the German source.

Towards the future level of supply, it has been assessed that the most effective way to improve the current supply level of long-distance train services is to best define train routes at a repeated interval interlinking the respective lines between cities or nodes, using the Swiss timetable as pivot element, and thus make the offer more attractive for travellers.

The accessibility of the Rhine-Alpine Corridor can indeed be significantly improved through synchronised timetables[17] with good or improved connection options, where regional trains feed long-distance trains at reasonable transfer times and vice versa but without additional waiting time in the station as it would be the case with an IITT. Selected routes originating or ending in Germany can be connected to the Swiss network in order to reduce the number of transfers. But, due to dense traffic and infrastructural constraints along the Rhine-Alpine Corridor, it is not yet fully achievable to introduce additional routes (such as “train on-top” services) on the already congested Corridor. Applying synchronised timetables revealed to be successful in increasing the attractiveness of rail for international passengers, leading up to +60 % of additional potential trips for international long-distance services[18].

Furthermore, the analysis of the corridor and the valuable expert hearings shed more light on detecting discrepancies in the regulatory as well as transport planning and operational framework existing in the corridor countries. Notably, the current fragmented regulatory framework calls for solutions at European level. It is not prepared to the full interoperability, especially at border sections (e.g. rolling stock, staff skills, power supply, network access charge, signalling systems, and integrated ticketing). Such differences between two systems makes also market entrance for competitors difficult. In the interest of an integrated approach, a competitor should be enabled to run services and offers tickets that maintain the seamless travel chain. This latter issue is true for timetabling and especially the aspiration for offering synchronised train paths throughout the day. Another drawback to competition lies in cooperation for cross-border train services which so far is the solely working option apart from transferring trains at borders or regional offers.

[17] Trains run regularly on an hourly or even bihourly basis calling on regionally relevant nodes and thus ensuring seamless connection to/from the region. The advantage for long-distance trains is that they are not interdependent with regional trains as it would be the case with an IITT where all trains stay a certain time in the station around minute 00 or 30 allowing direct transfer between all these trains. For some basic reflections compare Pachl, 2018.

[18] Ramboll/RMCON, 2019

At the moment, a common vision is lacking at corridor level, and priorities and time-horizons for planned measures are not coordinated. Since many changes (infrastructure and operational) will take a long time, a stepwise implementation of measures favouring rail use is suggested. This is also due to the delay in the projects' implementation because of limitations in financial resources and planning capacity. Measures to improve the condition for rail operation should thus be envisaged as early as possible before 2035[19] when according to most national plans large infrastructures will be implemented. This is necessary in order to make rail ready to attract passengers from other more polluting modes (such as road or air) and thus meet the EU strategy for climate change issues. To do that it is crucial to involve all the relevant stakeholders and consider different levels of market such as commuters, leisure, business travellers and the necessary connections with the node's hinterland.

2.2 Identification of Guidelines Issues

As explained in the previous section, there are manifold aspects that have to be considered for making rail more attractive. They are all urgent for the overall goal of improving and harmonising the current framework on the Rhine-Alpine Corridor. These manifold aspects have been grouped in five key issues as the backbone for a seamless corridor. They reflect the lessons learnt from the RAISE-IT project and represent the key messages to the policy makers and stakeholders. Furthermore, they intend to suggest, as main lesson learnt, that a rail journey should be improved in a holistic way.

The issues are introduced in brief hereafter and then explained in Chapter 3, the core part of these guidelines.

Interregional Space without Boundaries

The Rhine-Alpine Corridor area has to be considered as a unique interregional space overcoming national boundaries. The intention is to create a common vision for this entire space where users, with different travel purposes and needs, can move smoothly, without infrastructural, operational and institutional barriers. A common vision is the first step to define priorities and develop actions on the same ground.

[19] This year 2035 was chosen as main reference year defined in the national plans from the Netherlands, Germany and Switzerland as planning horizon.

Incentivise Cross-Border Traffic

The current framework is not favourable for cross-border traffic. The border crossing is the point of connection of the railway networks of two neighbouring countries and contextually the point of discontinuity in transport services. The level of technical interoperability of the two networks is decisive for providing the ground for smooth trip making of any international train from origin to destination. The framework for cross-border train regulation and operation needs to be amended and harmonised.

Seamless Connections at National and Regional Level

Good hinterland accessibility through integration of national and regional services is the backbone of seamless travel chain (Figure 3). In order to achieve it, long-distance rail should be connected at an hourly basis. This is justified by the increase in demand, the hopefully better regulatory framework in the future and the promising plans of the different governments, network and long-distance rail operators. With more frequent train services, reduced transfer times and increased direct trains could be achieved.

Stressing Customers' Perspective

Efficient international railway transport depends on a high level of interoperability. When taking rail customers' perspective, it goes beyond the timetabling issue and includes also ticketing and information issues. Interoperability of railways, indeed, is a very broad concept and its implementation requires the cooperation of many entities, large budgets and a long period of time. It is very important for the involved countries to define as precisely as possible the level of interoperability they intend to achieve, most likely in a gradual approach.

Get the Stakeholders on Board

A broad stakeholder participation in transport policy development is crucial to avoid an implementation gap between policies and concrete actions of planning and implementation. The crucial and challenging matter is to generate a joint perspective of main objectives among the stakeholders, find a common ground for activity, and define the key players which can have a strong potential to bring stakeholders together. A corridor approach aims to bring all concerned stakeholders together and enhance a coordinated infrastructure planning and

thereby strengthen the connection between infrastructure planning in different levels of stakeholders' commitment.

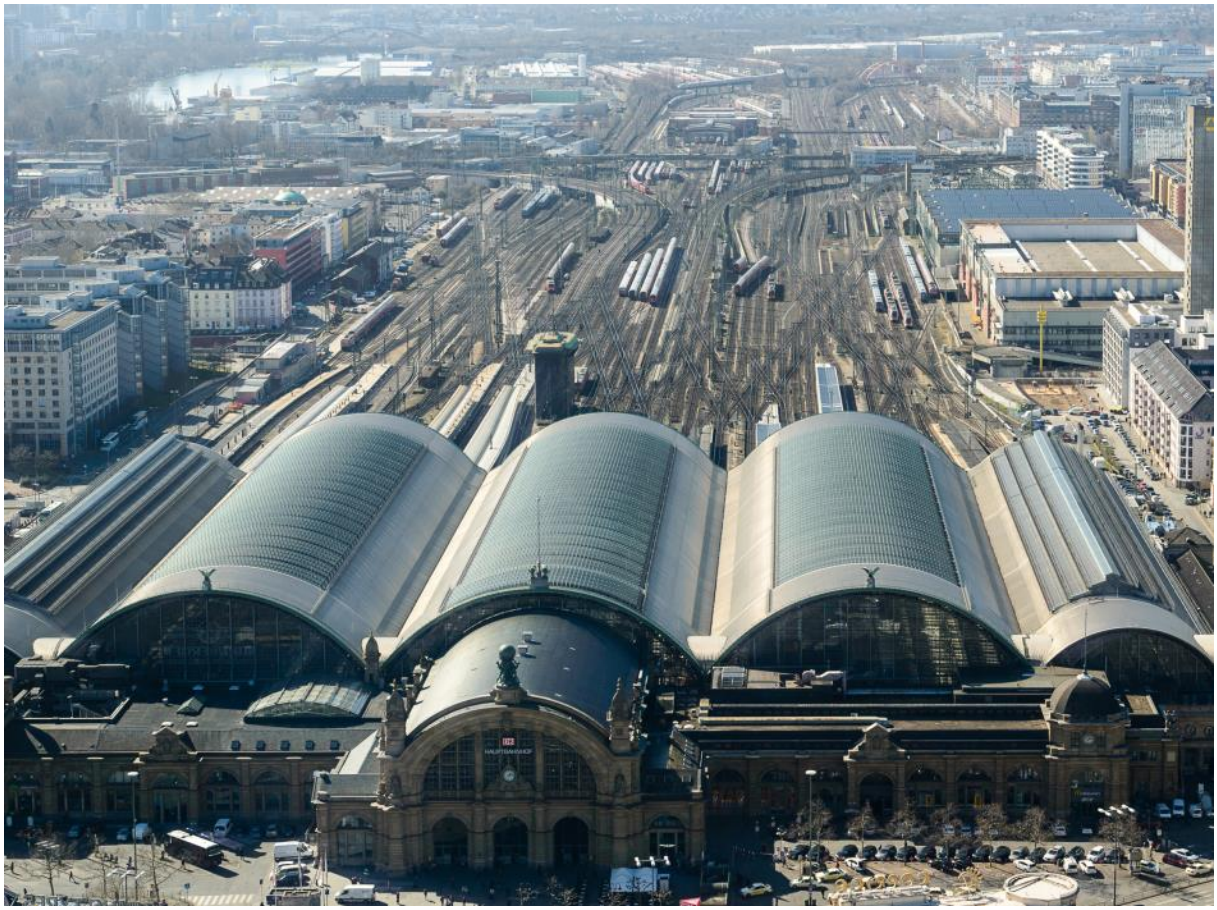


Figure 3. Rail nodes are crucial for reliable and seamless travelling and include more than the station premises, like here Frankfurt am Main Hbf. © Karin Göbel

3. Guidelines Issues

Long-distance rail is a vital alternative and backbone for interregional accessibility and corridor coherence. The future is promising and infrastructure improvements are perceivable. But rail needs to be pushed to fulfil climate change goals and the EU-Policy targets. Therefore, backed by considerable infrastructure improvements, a paradigm change is necessary. Rail needs to be in the position to be successful as modal alternative towards its competitors, road and air transport. Numerous measures need to be taken to achieve this goal and include: access to/from rail, regulation, user friendliness, taxation, and intelligent infrastructure. This needs to be done step by step as early as possible and before 2035 and as a continuous process whilst new infrastructure is being implemented. This approach includes also measures to enhance capacity especially in the nodes is required.

To address all these aspects, the five key issues, as previously identified in terms of lessons learnt from RAISE-IT project, are outlined in the following in more depth.

3.1 Interregional Space without Boundaries

A corridor is more than a continuous line. It is a continuous space with interacting built environments and landscapes linked to transport infrastructure. Rail is the backbone to enable good interregional connections and links and where the national boundary should not exist or not be perceivable if a smooth and seamless travel chain is envisaged. To reach such a target and overcome barriers, RAISE-IT revealed that there are different spatial levels to consider and which need to be linked smoothly. The levels comprise the nodes, the local and regional catchment area and the corridor itself. The nodes represent as gateway to the corridor and connect areas between the corridor and the regions. The improvement of nodes (rail stations) and their connections to hinterlands by regional train services guarantee seamless travel by rail from the trip's origin to the trip's destination, thus ensuring seamless connection to and from regions.

Travel purposes, user groups and destinations are manifold and comprehend different socio-demographic, socio-economic status, commuters, business or leisure travellers travelling domestically between larger cities or between smaller communities and other regions abroad, the seaside, the mountains or any type of individual's location choice. Such a

concept of multi-scale accessibility[20] is promising but is it realistic? Is there a different approach necessary? If rail is the core of a climate-friendly transport system, a corridor approach has to target all these levels and cannot prioritise.

A good corridor strategy has to be aware of national projects and timetables, and seek to interlink all the information. It helps then to harmonise the vision/plans of different regions/countries with the aim to serve to a corridor vision for better interregional connections and coherence including the synchronisation of timetables. Such work done in RAISE-It is very valuable and recommended to be considered in any similar case.

To create coherence along the Rhine-Alpine Corridor and to raise awareness throughout the corridor beyond pure data collection and assessment, a corridor vision is helpful that:

- justifies the need to better connect and presumably use larger events (EURO 2020, EURO 2024, Olympic Games 2024 or annual music or film festivals all along this axis) as a catalyst to highlight the necessity to take into account a corridor-wide perspective[21],
- illustrates the points of interest like sights or regional assets (e.g. Lago Maggiore, the Alps, Middle Rhine Valley, Amsterdam, European institutions, business centres) stressing the coherence of the Rhine-Alpine Corridor, and
- makes the link to develop additional long-distance rail services (some kind of induced traffic still effective after the event).

Such a vision should be backed by numerous stakeholders and interest groups.

3.2 Incentivise Cross-Border Traffic

A rail network with no administrative, regulatory and geographic barriers is the backbone for European-wide travelling options and the competitiveness with respect to the road and the air sector where cross-border operations work better.

RAISE-IT results reveal numerous areas where the framework is so far inhibiting better cross-border rail operation. Insofar the guidelines raise awareness with respect to the necessity to strengthen a European regulation that sets a framework in which the national rules can be developed according to the national situation but without infringing cross-border

[20] Frankhauser et al., 2008.
[21] EXPO 2015 was a good example, where additional long-distance trains from Switzerland and other parts of Italy were offered towards Milano.

rail or hampering the entrance of (new) market participants. In case of conflict the European regulation should prevail. A European office of rail regulation may be established in order to better coordinate between the respective national authorities. It should also involve the network operators as they have an important role to fulfil in the short and long-run. The regulation should aim to make the following issues more operator-friendly and thus enabling more cross-border travelling for the users possible:

- Admission of rolling stock should be harmonised between the different countries and avoid multiple permit requests (Figure 4).
- Locomotive drivers' permit to drive should be as much as possible allowed in other countries. Solution for tackling the language and know-how issues should be found.
- Rail traffic management (interoperability) and the further implementation of the European Rail Traffic Management System should be reinforced by the European Union in close coordination with the Member States.
- Rolling stock equipment is very costly. Any further effort to keep the costs low is welcomed. It should be assessed if more standardised rolling stock pool can be provided to long-distance rail operators willing to enter a market.

Network access for a long-distance rail operator is a further crucial issue both in terms of administrative efforts and costs. The following examples require better solutions in the interest of better cross-border situations:

- Process and framework for network access/train path allocation should be laid out as much transparent as possible. In case of conflict, the respective long-distance rail operator may be controlled by the regulatory authority.
- Network access charges incentivise the cross-border "effort" of a train operator and thus should not be higher than the domestic level.
- There are further experiences made on the day-to-day operations that should be taken into consideration by the network managers. An example is the deadline for announcing the implementation of a construction timetable which differs between network operators and thus has consequences for the organisation of a reliable cross-border service.

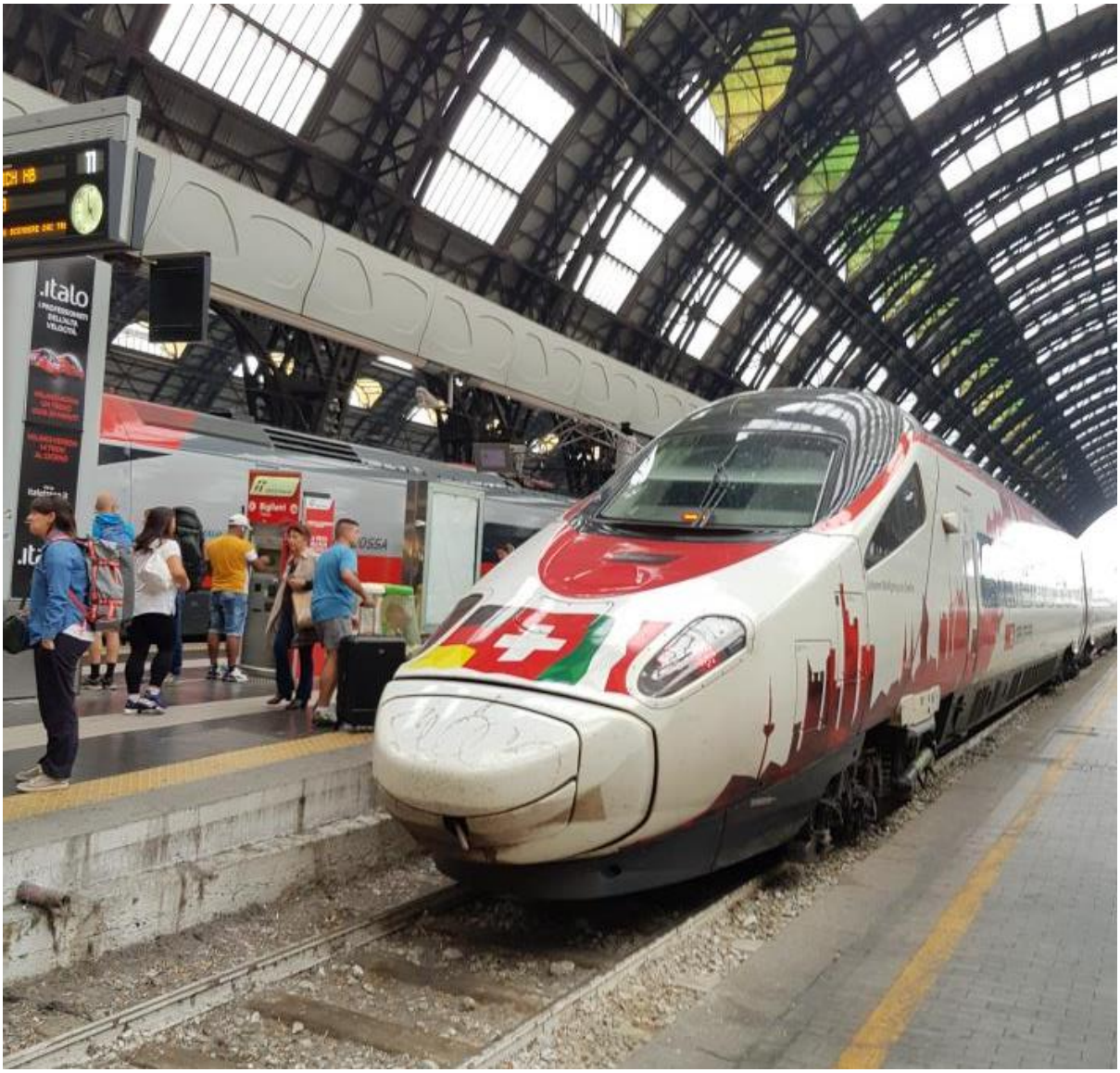


Figure 4. Cross-border operations are mainly operated in cooperation and require specific rolling stock. The trinational train Milano-Frankfurt is one of the few examples. © Peter Endemann

Cooperation between national train operators guarantees so far cross-border traffic which includes a coordinated fare system and in some cases the use of regional trains before or after taking the long-distance train. Competition is another ingredient to make rail efficient and affordable. Both forms should be possible. Apart from the aforementioned aspects, the following issues need to be addressed:

- Interoperability of train and track usage to improve direct cross-border services.

- To avoid “cherry-picking operations” and enable a regular customer timetable, incentives for long-distance rail operators should be taken in order to commit them offering more regular train services (e.g. bihourly routing) and to make the synchronised timetable work.
- As newly entering operators always compete with a strong incumbent long-distance rail operator, their access to offer a full travel chain including the power to sell tickets on regional and local trains should be supported.
- Both the national incumbent and the competitor should recognise the tickets of the other company in order to allow travellers to hop on the next available train, especially when some services’ delays/cancellations occur.

3.3 Seamless Connections at National and Regional Level

Along the Rhine-Alpine Corridor it is important to connect nodes and regions. As pointed out above, resolving hindrances cross-border-wide is one essential step towards the seamless travel chain and a breakthrough towards more international services. The underlying regional and local transport networks are an integral part of an interregional corridor. Key to success is therefore the harmonisation of the corridor as well as the conditions on the domestic and regional level in order to achieve a good hinterland accessibility.

The international train should be integrated into the respective domestic network, i.e. in terms of timetable, capacity and tariff. This makes such a train more interesting for one or more operators because relevant demand from two or more domestic markets can be tapped and thus the entrepreneurial risk for operating cross-border can be better controlled.

RAISE-IT demonstrates that an IITT is not attainable for long-distance rail but required at the regional level. This due to the fact that in the respective IITT-nodes long-distance trains would need to stop a longer time which in sum can make travelling by train less attractive for users and operators. Furthermore, long-distance nodes often serve as starting and ending points for (most) regional and local trains. Synchronisation however is still possible. Some nodes are appropriate to allow direct and smooth transfer between long-distance trains (e. g. Mannheim, Figure 5) at the same platform in order to make synchronised timetables work for numerous connections (including transfer).

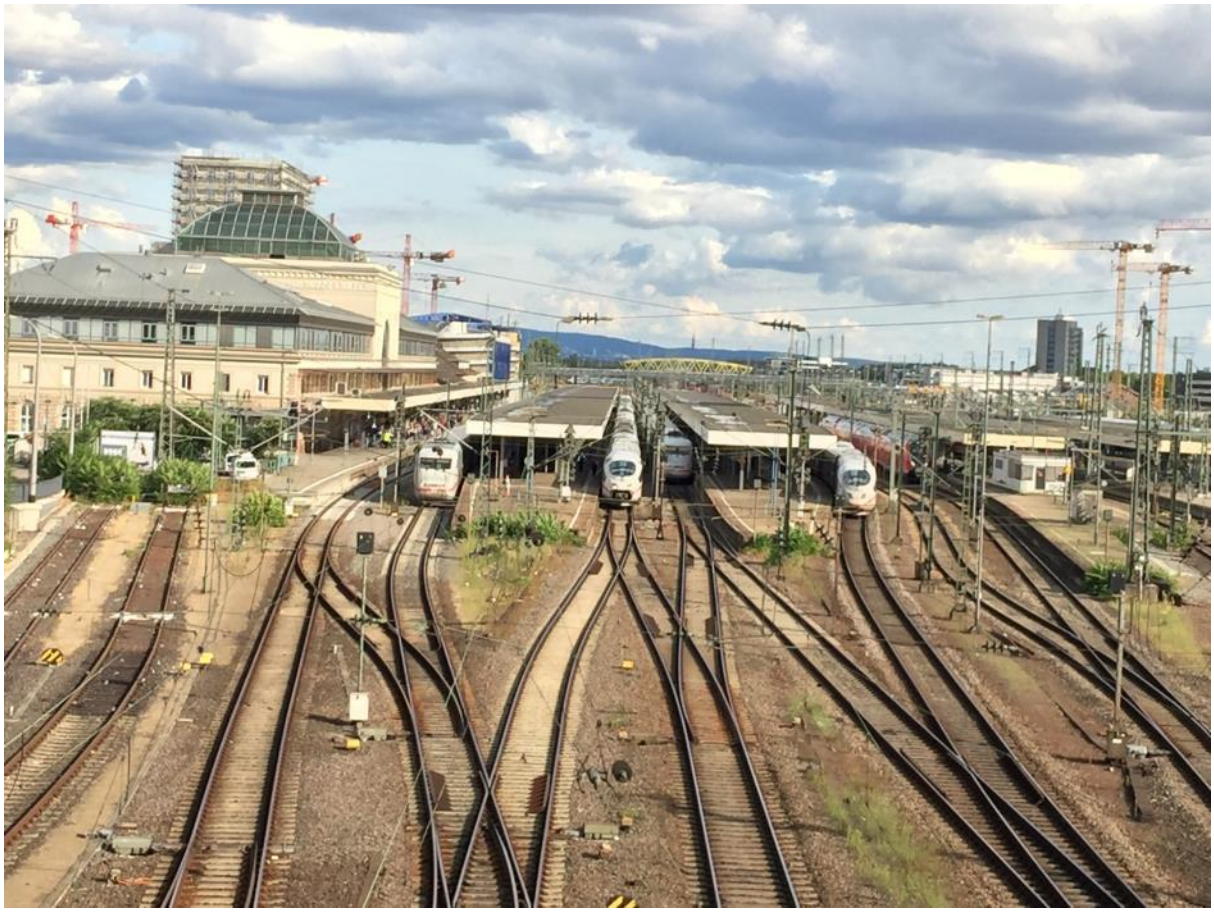


Figure 5. Mannheim stations fulfils an important role as regional hub and for synchronised smooth transfer between long-distance trains every hour and at the same platform. © Peter Endemann

Long-distance rail should operate at an hourly basis. This can be justified by the increase in demand, the hopefully better regulatory framework in the future and the promising plans of the different governments, network and long-distance rail operators. With more frequent train services, reduced transfer times are possible and more direct trains can be offered.

However, ITT at regional level is still required and has proven successfully (German Federal States, the Netherlands, and Switzerland). Long-distance routings are the backbone for it. The timetable coordination is here important. Harmonisation between long-distance trains and regional services could be achieved with and by straightening out the long-distance stopping patterns, e.g. long-distance trains stopping around minutes 00/30 and regional ITT organised around minutes 15/45. To be attractive, transfer time should not exceed 15 minutes.

Another issue referred to the exploration of a train on-top to target air market. Such a train could basically work but needs careful assessment of effects on an hourly synchronised timetable along the Rhine-Alpine Corridor. If implemented, it should be avoided that track capacity is too much affected and diversion of demand from the aspired long-distance hourly network occurs. Nonetheless, some supportive feedbacks from the train operators' side during the expert hearings show that there is an option in the future. To stress the corridor coherence, such a train product could be a pilot action.

Nodes fulfil an important role to ensure good and smooth connections and to increase corridor competitiveness. Nodes thus need to be enabled to allow good track and train operability and guarantee reliability. This includes appropriate organisation of platforms and tracks for simultaneous stops for regional trains or for two long-distance trains at the same platform. Otherwise, too much time will be lost due to a long transfer process.

Stations are an integral part of the node and indispensable for seamless travel and integration of long-distance and regional networks. The stations should not be located outside the city centre; exceptions need to be well justified and well connected with public transport.

3.4 **Stressing Customers' Perspective**

The purpose is to make rail based intermodal transport more attractive for users and to promote a more efficient use of existing infrastructure and services. It is a prerequisite for seamless intermodal door-to-door journeys.

Efficient international railway transport depends on high level of interoperability within the railway system that goes beyond the timetabling issue and includes also ticketing and information issues. The interoperability of railways is a very broad concept and its implementation requires the cooperation of many entities, large budgets and takes a long time. It is very important for the involved countries to define as precisely as possible the level of interoperability they intend to achieve, most likely in a gradual approach.

In the current transport market, the competitiveness among operators depends on three major factors: travel time, quality of service and tariff. These three major factors are interdependent and can only be effective, to make rail attractive, if they are not considered isolated.

It appears evident that interoperability also requires accurate and consistent information, independently of the information channel used, whom you ask or where you ask, avoiding patchy, inaccurate or conflicting information. In addition to this, integrated ticketing could be a step forward to the full availability of services in the public transport market. It could allow passengers to travel using different services of transport provided by one or more operators by purchasing one single ticket.

Rail passenger service deals with different categories of customers through specifically designed services. The various passenger rail market segments depend mainly on the distance travelled (long, medium and short distance) and on the territory served (regional, suburban and urban). Each rail market segment (long distance, regional, urban and suburban) may correspond to specific customer needs mainly depending on the distance and purpose of travel as well as on customers' expectations that largely depend on their age, education, employment status, gender, income and possible reduced mobility.

In order to attract more customers and consistently satisfy their requirements, more innovative and cost-effective ways need to be identified and implemented to increase punctuality, safety-security and capacity, improve performance at a system level and remove barriers to seamless intermodal transport and railway interoperability.

There are many elements that attract the customer to use rail other than travel time and costs. For example, train interiors that are comfortable, pleasant and adaptable to meet the needs of different groups of users such as families, business travellers or people with reduced mobility. For the operators too, meeting customer requirements and for their own business success, reliability, availability, maintainability and safety-security are considerable criteria that shall be part of their mission.

People expect the railway to offer a good service and get them where they want to go. Passengers put a high priority on reliability and performance. Disruption to services, and customers' frustration when it is handled badly, are the main drivers of dissatisfaction and disincentive towards public transport use.

3.5 **Get the Stakeholders on Board**

A broad stakeholder participation in transport policy development is crucial to avoid an implementation gap between policies to improve infrastructure use and get more trains

running and concrete actions to achieve these. The more the different stakeholders share their strategy and cooperate according to their competences the better and smoother an implementation can be realised taking into account the different requirements and needs set by the stakeholders.

The corridor-wide approach led to the conclusion that a common vision is needed, and the lack of international cooperation and coordination produces a number of operational gaps and inefficiencies. A broad range of stakeholders have to contribute in order to accomplish a well-functioning seamless travel chain for long-distance rail passengers. Thereby synergy effects can be gained in reaching the goals, through a combination of manifold initiatives led by different stakeholders at different spatial levels.

In its current state, domestic infrastructure and operational planning remains to a large extent myopic and disconnected from the requirements of a corridor-wide approach. A corridor approach works best if all concerned stakeholders coordinate the infrastructure planning and network operation, thus strengthening cross-societal responsibility and making borders obsolete.

The main actors are the European Commission and the concerned States, the rail network operators, the long-distance rail operators, the Interregional Alliance for the Rhine-Alpine Corridor EGTC and the Rhine-Alpine Corridor Forum[22]. Governance matters are an important part of developing the transport system on a European level. Depending on the actual transport initiative, and its objectives, stakeholder involvement can vary.

The European Commission should contribute to a better social dialogue regarding operational framework, as well as foster partnerships and cooperation.

To develop an international vision, it is required the involvement of national governments, rail network operators, but also train operators since the beginning. As indicated above, national laws and planning rules should be integrated in order to work jointly and overcome sole domestic perspectives. It is crucial to create consciousness on how rail services can be more appealing to the market, not only through low-cost marketing campaign, but effectively increasing rail performances such as in travel time, transfer time, frequency and overall travel experience.

[22] The Corridor Forum is a consultative body of institutions sent by the respective Member States in order to exchange on the progress of the Work Plan of the European Coordinator for the Rhine-Alpine Corridor. Basis is the EU Regulation No 1315/2013.

A further issue not to be neglected refers to the harmonisation of transport relevant data in order to effectively appraise the cross-border and cross-institutional development of strategies. This mainly involves network and long-distance rail operators, but also the national bureaus of statistics that in turn need appropriate access to demand data.

Key stakeholders which can actively contribute to progress and new ideas need to be connected to the process. Developed working groups, ideas laboratories and similar, on a geographical basis for parts of the corridor or for a specific topic, need to be adequately bridged to a European level. If all these stakeholders actively develop a corridor consciousness and bear in mind the interregional dimension in their daily business and strategic development, a relevant move forward will be made.

4. Further Actions

The mission of RAISE-IT is to provide the ingredients to achieve better interregional connections in order to make the Rhine-Alpine Corridor a continuous living and mobility space where national and inherently linked institutional, geographic and regulatory borders should no longer exist. Otherwise, they inhibit seamless passenger travel by rail in the future if rail wants to be competitive with the road and air sector. To do so, and to maintain this need for change in the long run, beyond the RAISE-IT project's lifetime, some initiatives may need to be taken. The Interregional Alliance for the Rhine-Alpine Corridor EGTC is by its nature a key player to move forward the guidelines' contents and capitalise on the lessons learnt.

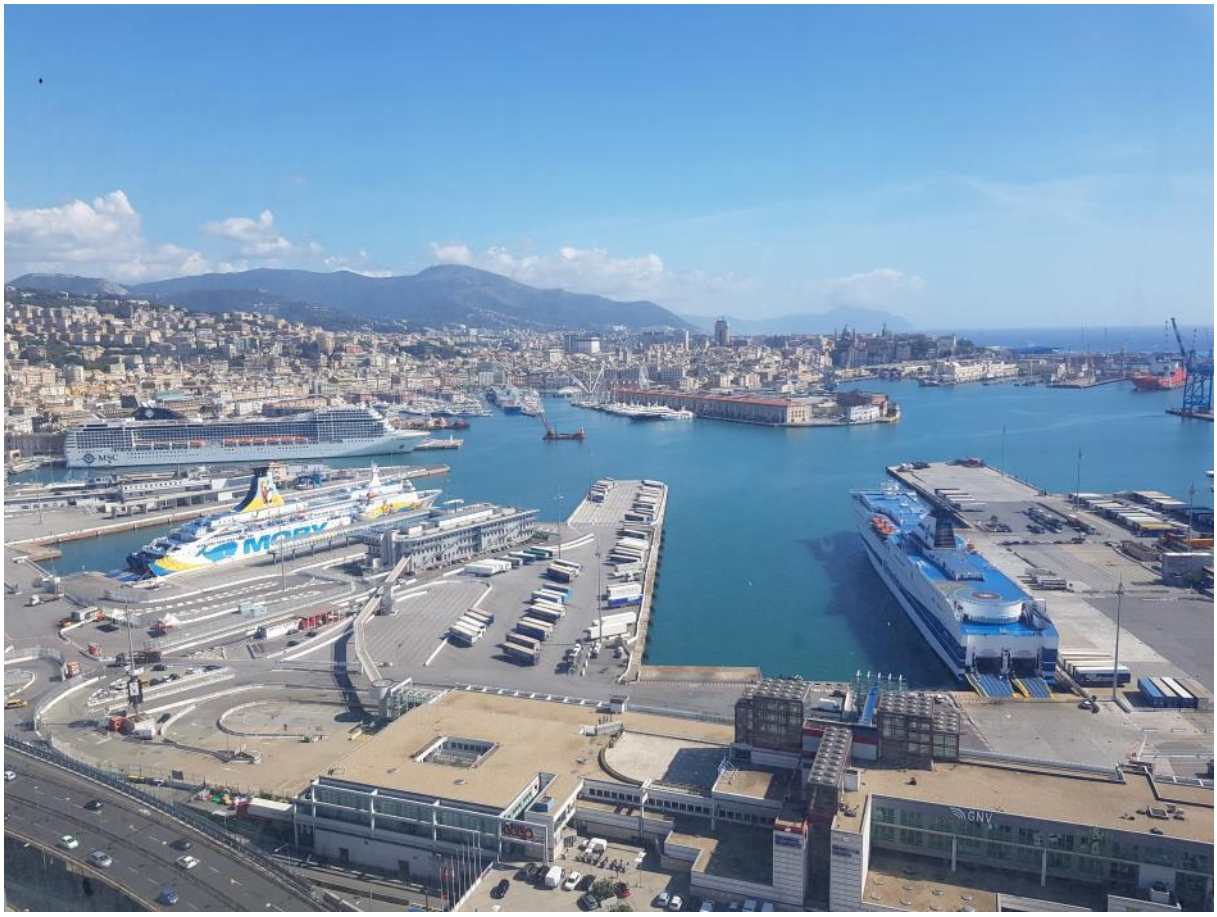


Figure 6. Genova is an important destination for people transferring to cruise shipping and ferries. Good connections from the corridor can help to strengthen its position. © Peter Endemann

In the following is a list of the main actions that the EGTC could push forward for the Rhine-Alpine Corridor:

- Creating a Corridor Vision for long-distance passengers: a vision helps to stress the corridor's coherence and stimulate the common purpose of all involved stakeholders by highlighting the different levels of passenger mobility and the different origins and destinations along the corridor as outlined in section 3.1 (Figure 6). Such a vision should also address the necessity for enabling competition without losing the necessity of spatial, information, timetable and ticketing integration along the corridor. A unique space similar to the regional transport associations could be at the forefront, a so called "Rijn-Alpino Verkehrsverbund[23]".
- Involving the stakeholders and raising the awareness among them for corridor issues in their every day and long-term thinking and acting. Some of them are involved in the Rhine-Alpine Corridor Forum led by its European Coordinator. Furthermore, the national bodies need to be involved. These stakeholders serve as multiplier for bringing all the issues on the agenda. The EU-Commission and the Committee of the regions are further institutions at European level to be asked for involvement and support. The Members of the European Parliament are the elected voices from the different states and regions to be heard and asked for support. Awareness raising may be undertaken in regular meeting forums.
- Participating in European-wide or national timetable conferences where all rail network and long-distance rail operators are grouped.
- Stressing corridor coherence also through an upgrade of the existing Corridor Info System platform[24] (CIS, the interactive Web GIS-based instrument for information exchange on the Rhine-Alpine Corridor). For example, by uploading further elements, such as points of interests and attractions along the Rhine-Alpine Corridor.

[23] German word for transport associations where joint marketing, ticketing and timetabling is organised at regional or Federal State level (German "Bundesländer").
[24] Look at www.urbantoolbox.it/project/egtc-rhine-alpine-corridor

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