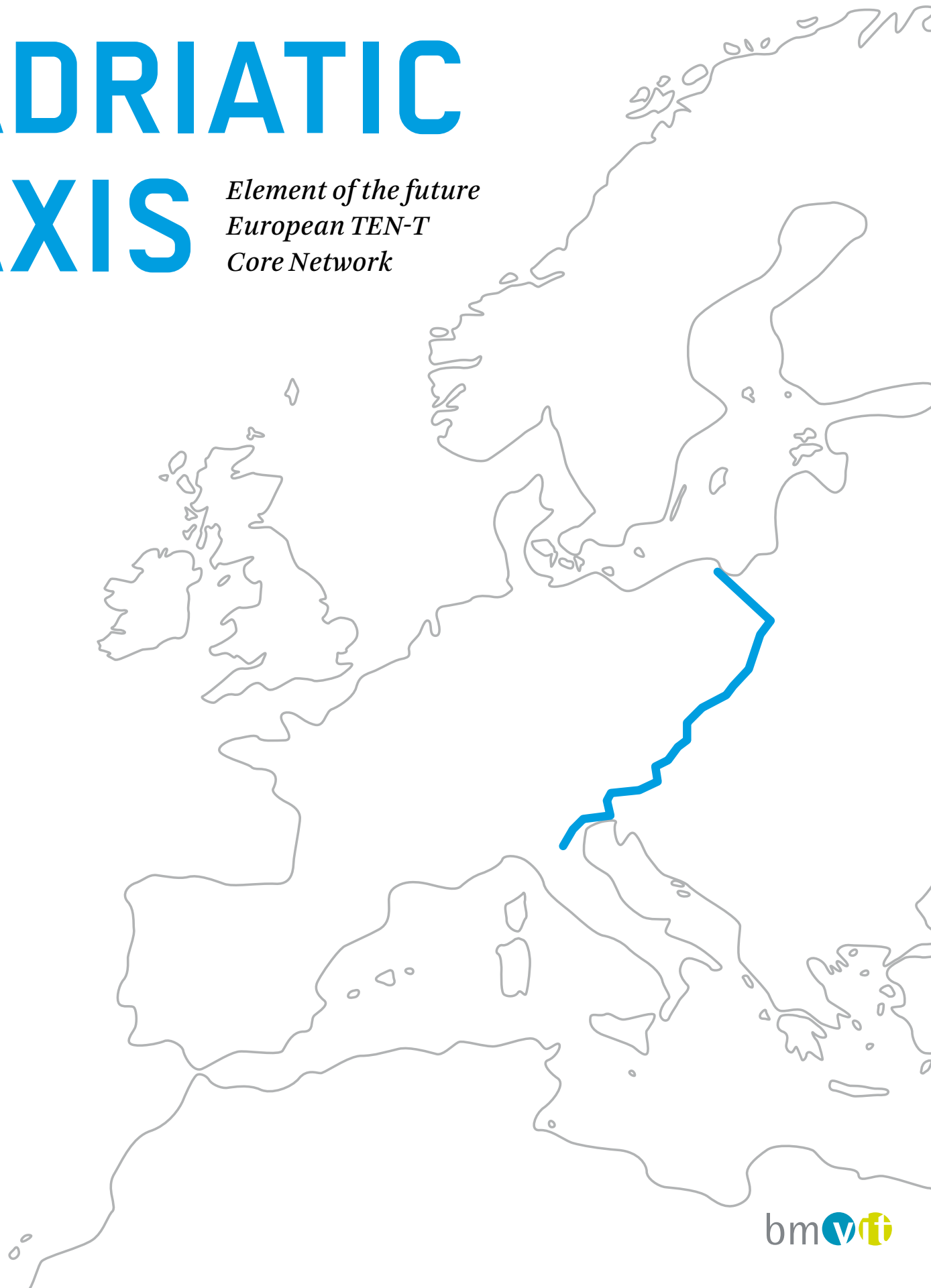
THE BALTIC ADRIATIC AXIS

Element of the future European TEN-T Core Network



THE BALTIC ADRIATIC AXIS

Element of the future European TEN-T Core Network

By order of
Federal Ministry of Transport,
Innovation and Technology

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PREFACE

Doris Bures, Austrian Ferderal Minister of Transport, Innovation and Technology

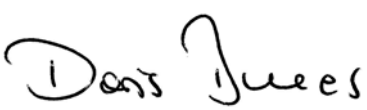
European Institutions are currently working on the reconfiguration of the foundations of the Trans-European Transport Network, to ensure its efficient contribution to reaching the goals of the European Union. Sophisticated transport networks are an essential prerequisite for Europe's economic development and investments in traffic infrastructure are a significant motor for economic growth, especially in times of crisis.

On the other hand, the state of national budgets poses great challenges for financing these infrastructural developments. Austria, too, has to currently re-evaluate priorities for infrastructural projects because of the necessity to consolidate national finances. Independent of these requirements, the long-term planning and definition of a high-ranking European Core Network, as it is currently being discussed at European level, is an essential contingent. Due to its geographical location Austria definitely plays a crucial role in this Core Network, as well as a node between important north-south and east-west connections. One of these core routes is the Baltic-Adriatic Axis, which poses a high-ranking connection of Baltic ports and states over industrial regions and centres in Poland, the Czech Republic, Slovenia and Austria to the economic area of Northern Italy and the Adriatic ports. The Baltic-Adriatic Axis sets a clear focal point on a sophisticated rail connection and thus makes an essential contribution to an environmentally sound traffic system.

Just how important and well founded the incorporation of the Baltic-Adriatic Axis into the future Core Network is, will be presented in this document. It was commissioned by my Ministry in cooperation with the Austrian regions along the Axis, Carinthia, Lower Austria, Styria and Vienna and the ÖBB-Infrastruktur AG.

At this point I would also like to thank the other Member States along the BAA, Poland, Czech Republic, Slovakia and Italy for their support in the making of this study, also in content. The Baltic-Adriatic Axis is not only a traffic route, it has also become an axis for cooperation between the states and between the regions. It therefore incorporates the idea of a Europe growing together, not only spatially.

With best regards



MANAGEMENT SUMMARY

THE TRANS-EUROPEAN TRANSPORT NETWORKS

Based on the Maastricht Treaty of 1992, the European Union (EU) issued Guidelines for the **Trans-European Transport Networks (TEN-T)** in 1996, in order to enhance the internal market. It contained a dense comprehensive network based on proposals of the 15 Member States and a list of 14 priority projects.

In the course of a major revision in 2004, taking into account EU enlargement 2004 and 2007, the number of priority projects was extended to 30. (*see Figure M-1*)

Currently the European Commission is working on a thorough review of TEN-T policy: While maintaining the **Comprehensive Network** of road, rail, inland waterway, ports and airports with only minor adjustments, the focus will be the identification of a **Core Network** of the strategically most important connections within the EU and to its neighbours.

For the first time, **TEN-T planning** will be carried out top-down, based on a clear and transparent geography-based methodology, in line with the goals of the "Europe 2020" Strategy and following, in a balanced way, among others, the **objectives** of:

- Enhancing the internal market and territorial, economic and social cohesion,
- Strengthening the global competitiveness of the EU,
- Supporting the sustainable mobility of passengers and goods, while taking into account environmental aspects and the goal of decarbonisation.

At the same time it ensures the territorial, economic and **social cohesion of the Union**, social welfare as well as safety and security for European citizens, while also taking environmental aspects such as climate change, pollution and protected areas into account.

To ensure a maximum continuity from the past to the future, the core network shall **succeed the current 30 priority projects**.

NEW GLOBAL CHALLENGES

The recent years have shown an economic downturn, which has affected almost all sectors of economy and transport in particular. Despite of current indications of recovery, there is strong evidence that this is more serious than just a temporary crisis, but might introduce a more thorough **change in world economy**. Fossil energy is becoming scarce,

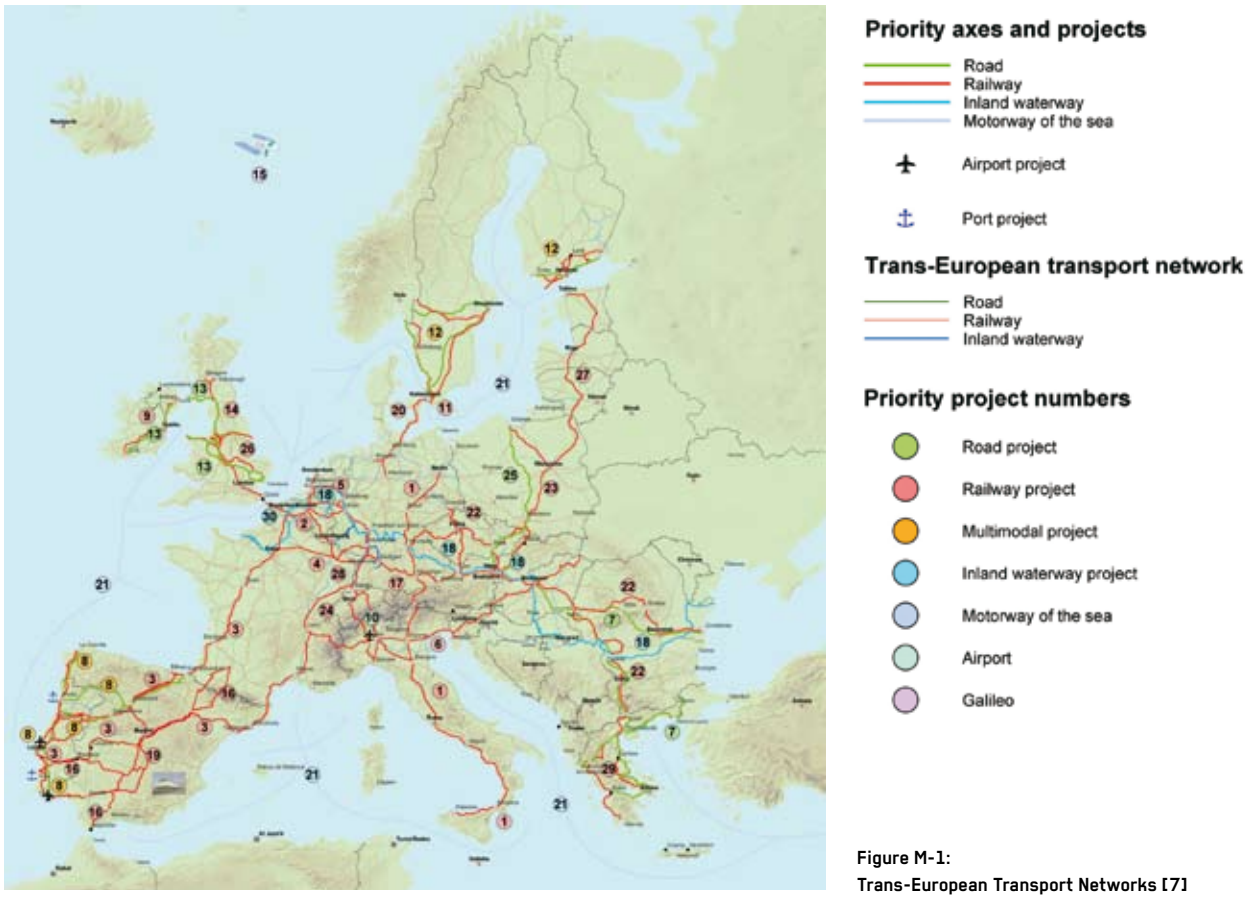


Figure M-1:
Trans-European Transport Networks [7]

leading to increasing fuel prices. Railways, being relatively **highly energy-efficient**, can be expected to play a stronger role in the future. Even as a factor of location quality, the integration of a city or a region into a well developed railway network will probably gain importance.

The current economic development also shows a gradual **shift of the global economic centre towards East and Southeast Asia.** This has been observed for a long period and this tendency seems to become even stronger. Against this background, trade with Asian countries will increase in absolute and relative quantities. A great part of cargo flows transported on sea have to pass the Suez Canal and the Mediterranean Sea, a growing share might also use the rail connections through Russia.

Mediterranean ports are in a favourable position. Against a detour through the Straight of Gibraltar, their distance to Asia is far more than 2.000 km shorter than from the North Sea. The potential reduction of transport time amounts to five days, accompanied by a corresponding saving in fuel consumption, CO_2-emissions and costs. It will depend on

the logistic performance of the Mediterranean ports, but also on their hinterland connections, to which extent they will be able to take advantage from this development.

Following the political changes in Central and Eastern Europe since the fall of the "Iron Curtain" and, in particular, since the recent EU enlargement, a process of economic catching-up in these regions, a "tilting of European economy towards east" (Paolo Costa) is not only to be expected, it is also a political goal.

THE BALTIC-ADRIATIC AXIS

On October 12, 2006, upon an initiative of the Austrian Federal Ministry of Transport, Innovation and Technology (BMVIT), Poland, the Czech Republic, Slovakia, Austria and Italy signed a **Letter of Intent** for the extension, within the next TEN-T revision, of the TEN-T PP23 (rail) and TEN-T PP25 (road) Gdańsk – Warszawa – Katowice – Ostrava – Brno – Wien with a branch Katowice – Zilina – Bratislava via Wien – Graz – Klagenfurt – Villach – Udine – Trieste/Venezia to Bologna, to form the "Baltic-Adriatic Corridor".

Among the most recent activities in this matter, an **"Alliance of 14 Regions"** along the BAA was founded. On October 6, 2009, representatives of these regions signed a "Declaration on the extension of TEN-T PP23" in Brussels.

The present paper demonstrates that the "Baltic-Adriatic Axis" (BAA), the railway part of this corridor, i.e. TEN-T PP23 with its extension to Italy, is needed as an economic backbone in Central Europe. Taking advantage of existing lines and key projects at different stages of implementation, its routing according to the Letter of Intent of October 12, 2006 would best correspond with the goals of TEN-T policy and would fit into the future core network, according to the methodological criteria of the TEN-T policy review:

- The BAA would meet with the challenges of global trends, such as an expected shift of global cargo flows towards Mediterranean ports and the economic catch-up of the CEE-countries.
- Connecting old and new EU Member States across the former "Iron Curtain", it would improve accessibility and cohesion and enhance economic development of Central European countries and regions, by providing access both to Baltic and Mediterranean ports and the respective Motorways of the Sea.

- ➔ It would further connect Member States' capitals (Warszawa, Bratislava, Wien and – along its logical branches within the network – also Tallinn, Riga, Vilnius and Roma), other important cities, industrial agglomerations and gateway ports in the north and in the south, following and improving current and future traffic flows in a traditional direct transport corridor and supporting network integration.
- ➔ Last but not least, the Baltic-Adriatic Axis would contribute to sustainability: to decarbonisation and to reduction of road accidents, by an effective modal shift to rail.

Figure M-2:
The BAA and its links to other axes and ports

1

OCCASION: TEN-T POLICY REVIEW 2010/11

1.1 EUROPEAN UNION

Based on the Maastricht Treaty 1992 the EU defined Trans-European Networks for the advancement of its internal market in 1996. 30 priority projects were designated in 2004.

Figure 1-1:
States and regions along the BAA

The European Union is currently on a review of TEN-T policy. The fairly dense "Comprehensive Network" of rail, road, inland waterways, ports and airports will be overlaid by a basic layer of the TEN-T, the "Core Network":

- → the **"Comprehensive Network"** will be upgraded, mainly based on the plans of Member States and
- → a **"Core Network"** of the strategically most important nodes and links will be identified, on which the common interest will be focused

The Core Network will consist of a geographical and a conceptual pillar. The geographical pillar of the Core Network shall link relevant main gateways and nodes inside the EU as well as the markets beyond the Union borders and reflect, in its shape, important traffic flows. The conceptual pillar includes the consistency with the objectives of EU transport or other relevant policies.

1.2 FROM TEN-T PP23 TO BAA

As a result of the EU enlargement in 2004 and 2007 the need for a fast, short and reliable connection of the industrial regions of Upper Silesia (Katowice), Northern Moravia (Ostrava), the eastern part of the Czech Republic and the western parts of Slovakia to the Adriatic ports in Italy is emerging to ensure connectivity and accessibility.

Therefore, already in 2006 in Luxembourg, the Ministers of Transport and Infrastructure of the adjacent states of the TEN-T PP23, Poland, Czech Republic, Slovakia, Austria and furthermore Italy signed a **"Letter of Intent"** for the realization of the Baltic-Adriatic Axis. These states advocate the extension of the TEN-T PP23 from **Wien/Bratislava** via **Graz – Klagenfurt – Villach – Udine** to **Trieste** and to **Venezia – Bologna**. [1] The overall goal is a high-quality, highly efficient rail infrastructure covering the entire course of the corridor, targeting to meet the needs of a growing economy in these regions, but also to support and accelerate this process, which was recently called **"tilting of European economy towards east"**.

Figure 1-2 illustrates the integration of the BAA into other axes.

The most recent activities in this matter are the formation of the **"Alliance of 14 Regions"** and the Declaration on the extension of the TEN-T PP23 of October 6, 2009 in Brussels: the representatives of 14 regions signed a Declaration demanding a consistent and rapid implementation of the **Baltic-Adriatic Corridor** between **Gdynia/Gdańsk** and **Bologna/Ravenna**, motivated by the wish for improvement of transport infrastructure as a prerequisite for the economy as well as traffic safety and the consolidation of the new Europe [11].

In this Declaration six principles are stated:

- “Consequent and immediate realization of the Baltic-Adriatic Corridor [...]
- Securing economic development and competitiveness of the signatory regions [...]
- Improvement of accessibility for the economic regions along the Baltic-Adriatic Corridor
- [...] accomplish the EUs commitment concerning climate package

Figure 1-2:
The BAA and its links to other axes and ports

- → Strong focus on intermodal transport nodes and services along the Baltic-Adriatic Corridor
- → Traffic safety along the Baltic-Adriatic Corridor"
  (Alliance of 14 regions, October 6, 2009)

Furthermore a **questionnaire** realised 2010 by the 14 regions associated in the BAA Declaration illustrates that the project would efficiently complete and strengthen regional and local transport systems and therefore also economic development. It confirms the leverage effect of the BAA on investments of EU Structural Funds, national and local resources for regional development.

1.3 INTENTION

Having in mind the ongoing process of TEN-T policy review and the existing cooperation of the BAA, this paper intends to show the arguments for an extension of the Railway **TEN-T PP23** Gdynia/ Gdańsk – Warszawa – Wien/Bratislava to a "Baltic-Adriatic Axis" via Wien – Graz – Klagenfurt – Villach – Udine – Trieste/Venezia – Bologna by rail as a core North-South Axis in the eastern part of the European Union. This report is based on studies of the BMVIT and ÖBB [14] and refers to the results of a number of expertises, including EU co-funded studies on regional development along the corridor [3].

The goal of this study is to present the essential arguments concerning following topics:

- → Significance and advantages of the axis for Europe, especially from an Austrian point of view;
- → Infrastructural measures for the realization of the BAA;
- → The BAA's contribution to a future Core Network.

This study shows that the Baltic-Adriatic Axis can be usefully integrated into the future Core Network, which brings the current Priority Projects (like e.g. the Brenner and Danube Axis) together into a new European Core Network.

2
THE WORLD CHANGES: MEGA-TRENDS

2.1 SYNOPSIS

The importance of transport axes has to be viewed against the backdrop of global mega-trends. From a social trend-analysis of 55 mega-trends [5], following key trends can be identified for the issue at hand:

- Scarcity and **price increases of fossil energy** in the future, which will also affect maritime transport;
- Progressing **climate change**, entailing the need for decarbonisation in all fields, including transport,
- **Shift of global economy and trade** towards Asia, with corresponding changes in international cargo flows;
- Following **EU enlargement**, a gradual catching-up of Central and Eastern European economy may be expected.

Seen against this background, there is a tendency of a gradual **shift of global cargo flows** from and to **Asia** from North Sea to Mediterranean ports, dependent also on possible bottlenecks along the hinterland connections in North-Western Europe. **Northern Adriatic ports** have a potential gateway function for Central Europe and may be expected to gain importance, provided that their logistic infrastructure and services improve and become more efficient (which may be expected as a response to global developments) as well as their hinterland connections.

The logical response to all the mega-trends described above would be a high-performance direct and flat railway axis linking the regions of **Central Europe** with the highest growth potential and their connections to the **Russian railways** not only to the Baltic but also to the Adriatic and other Mediterranean ports, the Motorways of the Sea and the strong economic centres of Northern Italy. The Baltic-Adriatic Axis will respond to these challenges in the best possible way.

The mentioned key trends will be described in the following chapters.

2.2 FUTURE SCARCITY AND PRICE INCREASES OF FOSSIL ENERGY

The consumption of non-renewable energy will necessarily lead to shortages, especially since, with growing global economy, the demand is constantly growing. China and India are becoming important consumers, while **stocks of oil and gas are shrinking worldwide**. Peak oil might already have been passed, additional oil resources might be found, but exploitation becomes more and more expensive and, as a recent example shows, also more dangerous.

The high cost of fuel in 2008 and the "Peak-Oil-Discussion" [10] have shown the **limitedness of fossil fuels** as an energy source and the dependence on oil-producing countries. Natural gas will certainly be available for a longer period of time, but here also price increases are foreseeable.The automotive industry and current policies are focusing on the electrification of the power train in road vehicles. These technologies will be very important in future local traffic but for long distances the railway has significant advantages.

2.3 CLIMATE CHANGE, CALLING FOR DECARBONISATION IN THE TRAFFIC SECTOR

The reduction of CO_2-emissions to limit climate changes is a global goal. **Traffic is one of the main emitters of CO_2**, due to the key role of passenger cars and trucks whose source of energy is covered to almost 100 % by fossil fuels. That also applies to planes and ships. Railway can fall back on a mix of energy sources on electrified stretches, which can already be CO_2-emission-free today. As seen in *Figure 2-1* and *Figure 2-2*, by using electricity from multiple energy sources the railway is the lowest specific CO_2-emitting mode of transport for passengers and freight.

In the course of energy policy and its goals of supplying long-term, CO_2-free and renewable energy, railway is currently best equipped to contribute to **decarbonising traffic**. Only this mode of transport can convert correspondent energy into traffic power.

Against the background of the CO_2-reduction-potential of railway compared to road transport the advantages of the BAA are clearly evident. This specific aspect should be examined in detail.

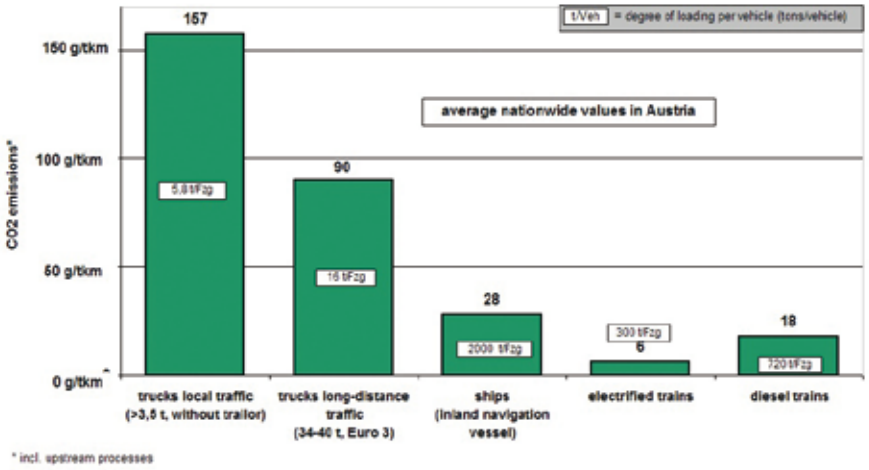


Figure 2-1:
CO_2-emissions of different modes of transport per person and kilometre in Austria [BMVIT 2008]

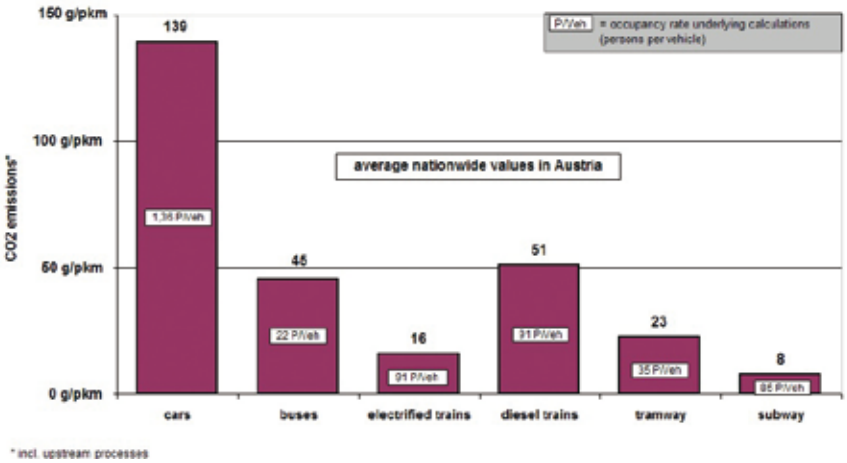


Figure 2-2:
CO_2-emissions of different modes of transport per person and kilometre in Austria [BMVIT 2008]

2.4 GLOBAL AND INTERNATIONAL TRANSPORT FLOWS

Asian countries and Russia bear the **biggest economic potential** in the world today: This trend will go on in the future because of population and economical developments and the on hand local know-how. Shipping from Germany to the East alone, amounted to 18 million tons in 2005 and is supposed to increase to 40 million by 2030 [12]. This shows the **increasing significance of Russian and Asian markets** for sales and purchase to the European Union: The relative importance of traditional trade flows towards North America will shift further towards Russian and Asian markets. The following *Figure 2-3* shows the connection of markets by railway and by sea (excluding air traffic).

Due to the following trends the Adriatic ports will have increasing significance:

- According to several studies, the **overall transport volume** from and to Central Europe will increase by 50–70 % within the next 25 years. [12]
- Improved **infrastructure and services in Mediterranean ports**, including their hinterland connections, could lead to a long-term shift from the North Sea to Mediterranean ports as part of the freight flow from/to Asia, depending also on the capacity constraints of the hinterland transport infrastructure in North-Western Europe.
- The global cargo shifts resulting from these changes in world economy, will be accompanied and supported by an expansion of the **Suez Canal**, to allow larger vessels to pass.
- **Circum Equatorial Route**. With the expansion of the Panama Canal expected to come online in 2014, a relative parity will exist for the

first time between the Panama and Suez canals. In such a setting, maritime shipping companies may choose to establish circum equatorial routes in both directions with the usage of high capacity (8,000 to 12,000 TEU) containerships.

➔ A high frequency „conveyor belt“ could support a significant share of global east-west freight movements in a cost effective way. This does not imply a homogeneous service as several different configurations of ports of call are possible along this route, particularly if a 300 nautical miles deviation is considered. This enables different circum equatorial network configurations [15]. Hub systems within the Circum Equatorial Route might also foster the role of Adriaticports.

The Adriatic ports in Italy can play an important role in this, depending on logistic concepts.

Summarizing all the **mega-trends** described above, scarcity and price increases of fuels, the need for decarbonisation and the shift of the global economic activities will require a high-quality, direct and flat, north-south railway axis connecting important Central European regions not only to the **Baltic Sea** but also to **Northern Adriatic (and other Mediterranean) ports**, to the motorways of the sea and with railways from/to Russia. The Baltic-Adriatic Axis will respond to these challenges in the best possible way.

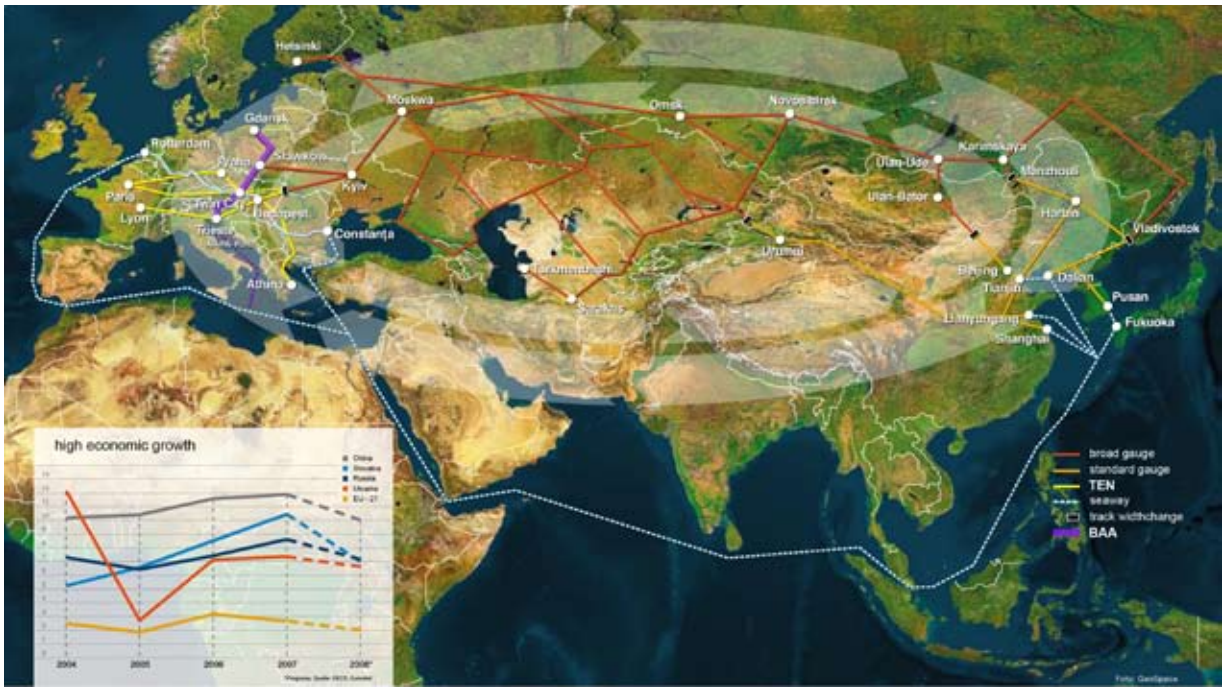


Figure 2-3:
International trade routes by land and sea
[9, additions by the author]

3

TEN-T POLICY REVIEW: A NEW APPROACH TO A CORE NETWORK

3.1 UNIVERSAL GOALS OF THE EUROPEAN UNION

The enhancement of the internal market and supporting the global competitiveness of the Union are major goals of the EU since the Maastricht Treaty of 1992. This includes **territorial, economic and social cohesion**. At the same time one needs to take aspects like climate change, pollution and protected areas into account while developing infrastructure. Therefore the axes of the Core Network must achieve the following goals of efficiency and sustainability:

- Enhancing the internal market and global competitiveness.
- Supporting territorial, economic and social cohesion of the Member States, in particular connecting "old" and "new" ones.
- Furthering social welfare, safety and security for European citizens.
- Taking into account environmental aspects such as climate protection, air pollution and protected areas.
- Supporting sustainability of transport for passengers and freight by providing high-performance services.

An efficient traffic infrastructure plays a major role in the decarbonisation of transport.

3.2 PRINCIPLES AND CRITERIA FOR A FUTURE CORE NETWORK: NODES AND LINKS

For furthering the development of the TEN-T the EU has commissioned six expert groups, of which no. 1 (Methodology for TEN-T planning) and 4 (Connections of TEN-T with third countries) are of particular importance for the identification of the Core Network. According to the recommendations of these groups, the Core Network will consist of following elements [16]:

- Nodes, providing connections within the different modes and **intermodal interfaces**
- **High-performance links** between the nodes, according to the objectives of EU transport and general policy fields.
- **Linkages to third countries** and the rest of the world (land-bound, ports and airports)

GENERAL GOALS / PRINCIPLES OF NETWORK DESIGN / CRITERIA	EXPLANATION
Territorial, economic and social cohesion Geographical or spatial aspects	Spatial integration and accessibility, defined as ease of access to markets. Improving the accessibility of a region is most effective if a region is also sufficiently endowed with other relevant factors of location quality (e.g. capital, fixed assets, sufficiently skilled human resources).
Multimodality, including intermodal links and facilities for co-modal and/or combined transport	The core network configuration should be coherent, allowing direct interaction between the individual link (in and between certain corridors). Interconnectivity between available modes should be foreseen at all major nodes to enhance comodal mobility and logistic chains.
Interconnectivity and network optimisation	
Interoperability and improved efficiency of all modes of transport	
Sustainability, including CO_2 savings due to infrastructure measures	Reducing greenhouse gas emissions or decarbonisation Avoid impairment of land Impacts on pollution and noise
Attention to climate change-proofing of infrastructure	
A focus on quality of transport infrastructure	The large ports and airports and the mayor inland corridors to neighbouring regions are the main gateways of the Community. Improving infrastructure and services in Mediterranean ports, including their hinterland connections, could lead to a long term shift from the North Sea to the Mediterranean ports of a part of the freight flows from/to Asia. For urgent cargoes, the routes through Russia or Central Asia are a further alternative of the future.
External and global trade flows	
Passenger and freight flows and costumers' needs	TEN-T addresses to long-distance and/or border-crossing traffic volumes
Removal of bottlenecks	
Reduction of travelling times and improvement in punctuality and reliability	
Safety and security of transport infrastructure	Should be considered already at the planning stage
Application of advances technologies and ITS	Innovative cross modal ITS equipment should be foreseen.
Traffic Management logistics, co-modal services	
Minimisation of investment, maintenance and operational costs, while nevertheless meeting the criteria above in a balanced way.	The partly substantial investments into new infrastructure have to be set in relation to their extremely long service life.

Table 3-1:
Goals, principles and explanation of the TEN-T Core Network [16]

For the node and network design, the European Commission focuses on following general principles [16]:

- Multimodality, including intermodal links and facilities for co-modal and/or combined transport,
- Interconnectivity and network optimisation,
- Interoperability and improved efficiency of all modes of transport,
- Sustainability, also through CO_2 savings due to infrastructural measures and attention to climate-change proofing of infrastructure,
- Focus on quality of transport infrastructure,
- Safety and security of transport infrastructure,
- Application of advanced technology and ITS, and
- Minimisation of investments, maintenance and operational costs, while still meeting all mentioned criteria of the European Commission in a balanced way.

The European Commission defined the criteria for shaping the network configuration. *Table 3-1* connects principles and criteria with a short description of the same. The verification of the principles and criteria for the BAA will be examined in *chapter 7*.

3.3 CONCEPTUAL ELEMENTS IN THE REVISION OF TEN-T POLICIES

The future development of the TEN-T aims for a "two-level" structure with a sophisticated Comprehensive Network and a Core Network, thus defining a paramount part of the network but also incorporating and supporting the integration of current developments of traffic infrastructure.

The further development of the Comprehensive and Core Network should not lead to a new infrastructural programme of enormous scope. It should rather build the foundation for a **much more efficient European transport system.** The primary requirements of this development can be outlined with the terms

- Preservation of continuity of current projects
- Elimination of bottlenecks
- multimodality and interoperability
- Security and protective measures
- Low carbon consumption (positive Life Cycle Assessment)

This should ultimately guarantee sustainable mobility for passengers and freight at low cost and maintenance.

Besides economic efficiency, the use of sophisticated technologies should also ensure the inclusion of **environmental aspects** such as climate protection, atmospheric pollution and consequently the conservation of natural resources.

The adopted approach correlates therefore with Europe's basic objectives for promoting the **internal market** and **global competitiveness**, as well as securing territorial, economical and social cohesion within the Union. In this context timely and modern mobility is seen as the chief element of social prosperity and the security of European citizens.

3.4 CURRENT WORK PROCESS

The European Commission's current work process comprises the technical preparations for further developing the Transeuropean Networks (*cp. Figure M-1*) with the current priority projects into an extended Comprehensive Network with a Core Network.

Based on the developed "Methodology for TEN-T planning", a political decision-making process thereon will take place in the next months. This process was started with the TEN-T Days 2010 in Zaragoza (June 8/9, 2010).

4

PRESENT CHARACTERISTICS AND ROLES OF THE BAA

4.1 CHARACTERISTICS AND POTENTIALS OF THE BAA

The Baltic-Adriatic Axis is a major transport connection within the extended EU running mainly from northeast to southwest between **Gdańsk** and **Bologna**. It resumes the age old tradition of the "Bernsteinstraße" ("Amber Road") as the connection between the **Baltic** and the **Adriatic Sea** as the modern era's railway line and opens up important agglomerations and economic areas.

With the recent enlargement of the EU towards East and the intensification of economic **connections between Central and Eastern Europe**, a wide area between the Baltic and the Adriatic Sea is crystallizing, in which similar economic interlacing as in the already established economic core regions between London – Paris – the Rhine region – Switzerland to Northern Italy (often referred to as the "Blue Banana") will be possible in the future.

Figure 4-1:
Population along the BAA in NUTS 2 – Regions

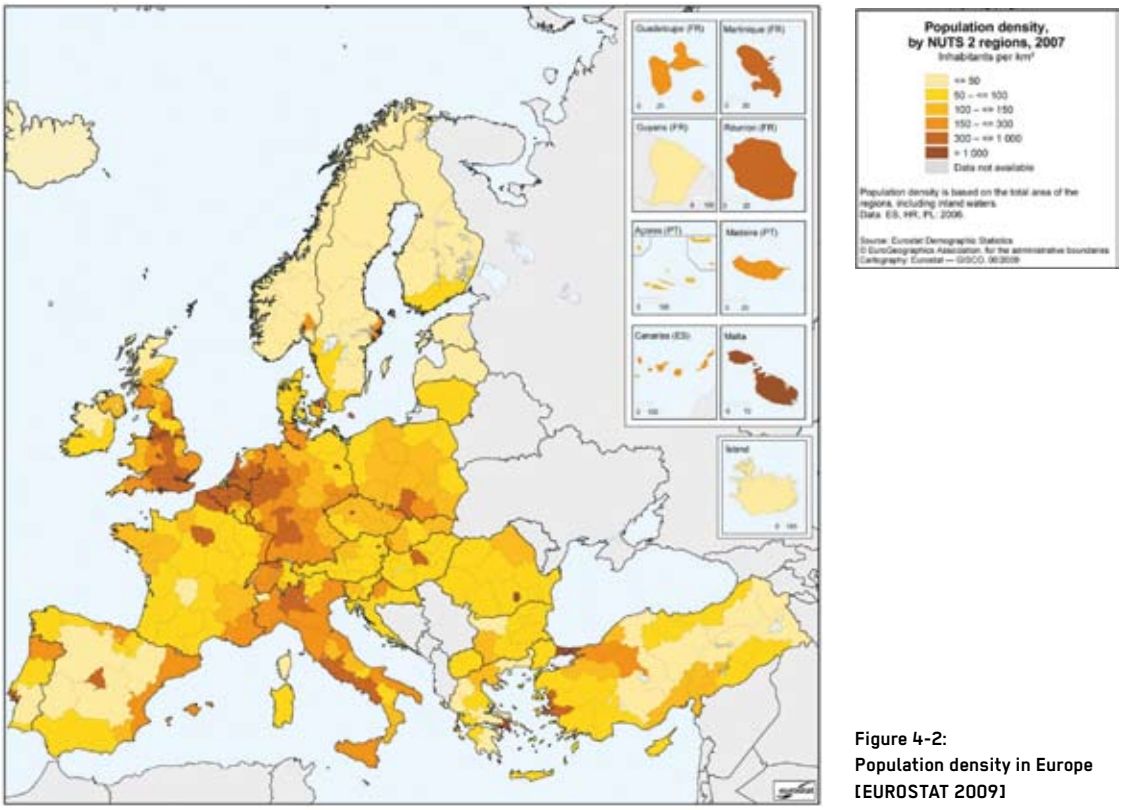


Figure 4-2:
Population density in Europe
[EUROSTAT 2009]

The BAA operating as the major transport corridor significant for **long-distance traffic** between economic areas in **Central and Eastern Europe** and serving the largest industrial areas in Poland and important centres in Eastern Moravia (Ostrava, Olomouc and Brno) and Western Slovakia (Bratislava) could be the backbone of such a "new banana".

It will also improve the international accessibility of Italy, in particular its Adriatic ports, which can expand their range to the hinterland of the Upper Silesian industrial area with about 5 million people and can prepare for a shift in the **intercontinental flow of freight** towards the Mediterranean ports. The BAA will also form the direct **link from Italy to** the land corridors through **Russia**. The accessibility of Venezia as one of Europe's major tourist destinations with approximately 14 million bed nights per year will also be much improved by futher development of the BAA.

The indicated economic area within the extended areas of the former outer borders of the EU along the BAA comprises **a population of over 40 million people** (*Figure 4-1*), without counting those areas which are not located immediately along the corridor but have short access to it, like e.g. Piemonte and Lombardia in Italy or the Baltic states.

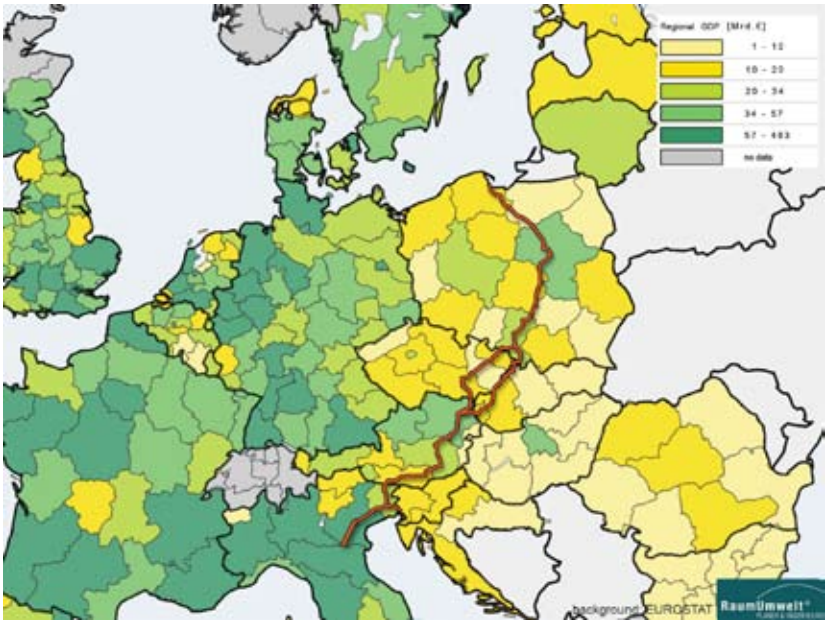


Figure 4-3:
Regional GDP [EUROSTAT 2005, additions by the author]

In the course of the corridor, **very high densities of population** occur, especially in **Poland** (regions of Warszawa and Katowice), **Wien** and **Northern Italy**; therefore the **axis connects very highly populated areas** within the EU. That equals a high potential for demands of public transportation along the Baltic-Adriatic Axis. Thus, the corridor has a high impact on infrastructural development.

The BAA connects regions, in which a high overall gross regional product is generated. Besides the traditionally economically strong regions of Northern Italy and the also very potent area of Wien/Lower Austria, the region of Warszawa is becoming an important economic location within the EU; with this indicator, the Warszawa area is almost **comparable to regions in Germany and France**. The region of Katowice also generates, measured by the value distribution of all EU countries, an average absolute GDP (*Figure 4-3*).

Currently one can perceive a catching-up process in CEE countries, due to substantially higher gross economic expansion rates. The countries alongside the BAA are – compared to European standards – characterized by a **high rate of economic growth** and a stable or slight decrease in population. With annual rates of economic growth between 2 and 4,5 % in the years 2005–2010, Poland, the Czech Republic and Slovakia set important impulses in Europe. [8] This catching-up process takes place in regions that are traversed by the BAA (regions of Warszawa and Katowice in Poland, all regions of the Czech Republic, as well as Western Slovakia).

In addition the regions along the BAA show a high potential of sufficiently skilled human resources (cp. university locations, *Figure 4-4*) and therefore fulfil indispensable conditions for increasing growth by improving accessibility.

Given these important assets, the **Baltic-Adriatic Axis** will also **support** these regions, in particular those in the **"new" Member States**, to deploy their potentials, accelerating sustainable economic growth and enhancing social welfare.

Due to the high potential of population, the following trend of the European economy to the east and the available sufficiently skilled human resources along the BAA, there is a high potential, which can be increased by good integration into world markets: the BAA enables an improved interconnectivity, as well as the promotion of trans-regional development from an economic and social point of view.

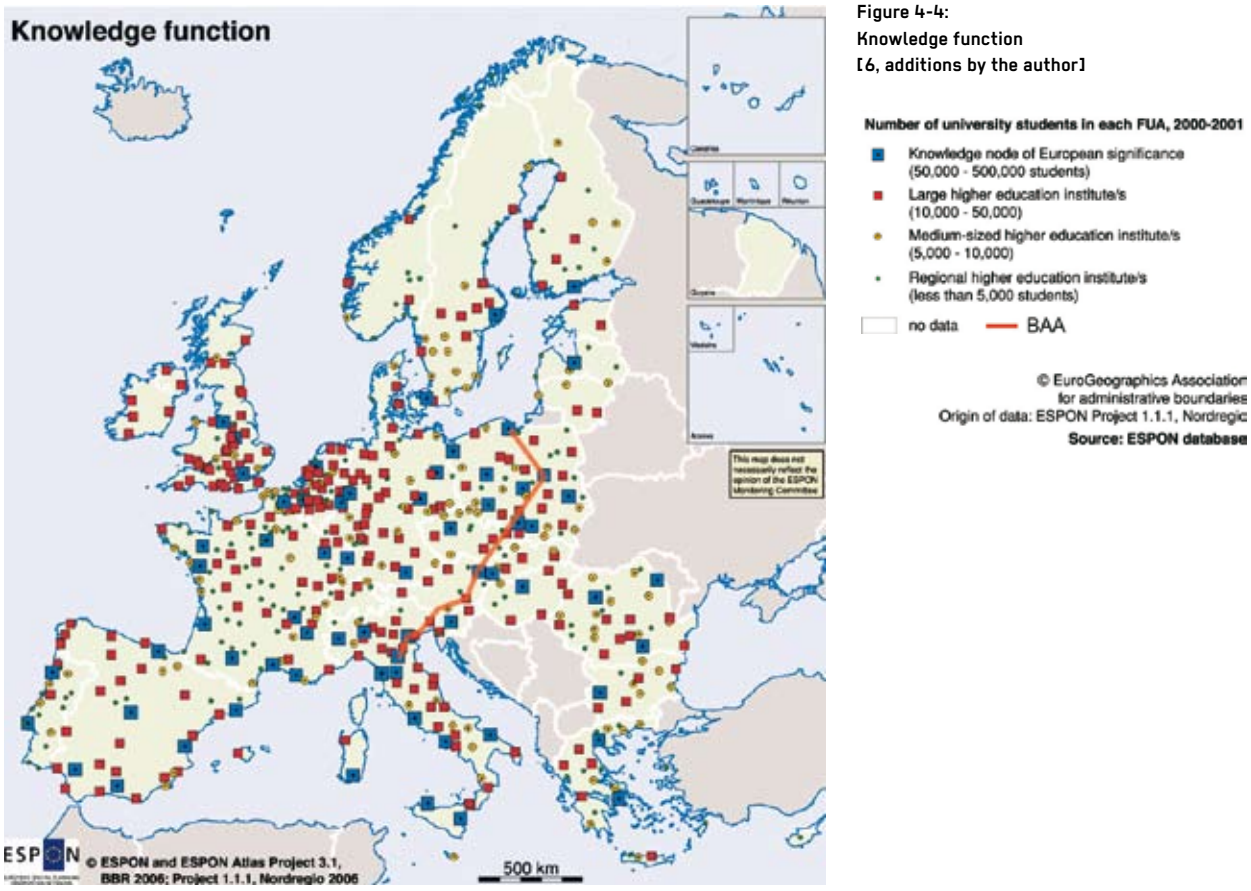


Figure 4-4:
Knowledge function
[6, additions by the author]

Figure 4-5:
Nodes and terminals along the BAA

4.2 NODES AND GATEWAYS OF THE BAA

The BAA enables an improved cross-linkage, as well as the promotion of trans-regional development from an economic and social point of view. The axis encompasses the following economic regions and industrial centres (see *Figure 4-5*):

- the port region Gdańsk
- the greater **area Warszawa**
- **Southern Poland** (especially Silesia and Krakow area) as well as **Moravia** (Ostrava, Olomouc and Brno)
- greater **area of Wien – Bratislava**
- **Southern Austria** (Upper Styria, Graz, Central Carinthian region)
- the Italian regions **Friuli-Venezia Giulia, Veneto** (Trieste, Udine, Venezia) and **Emilia Romagna** (Bologna)

Other important regions and countries like the Baltic countries, the western parts of the Czech Republic, the region of Upper Austria and Slovenia are located within a remote zone of attraction of the BAA.

4.3 THE ROUTING OF THE BALTIC-ADRIATIC AXIS

In the section between Gdańsk and Wien/Bratislava, the routing of the existing TEN-T priority project has been fixed within the **Decision 884/2004-EC**. For the intended extension, the **Letter of Intent** (2006) appoints a routing Bratislava – Wien – Graz – Klagenfurt – Villach – Udine – Trieste/Venezia – Bologna.

This routing was chosen to reflect the actual and the potential transport flows in these relations. Currently transport flows in the Austrian section of this corridor follow the existing infrastructure Wien – (Semmering) – Bruck/Mur – Leoben – (Neumarkter Sattel) – Klagenfurt – Villach, bypassing Graz, which is the second biggest city of Austria with almost 1 million inhabitants including the corresponding surroundings.

The purpose of the Koralm railway line is to avoid upgrading the existing section Bruck/Mur – Leoben – Klagenfurt via the mountainous track of the **Neumarkter Sattel**, which would need a series of partly long tunnels. At the same time the Koralm railway line is including Graz into the BAA and developing this city to a TEN-T railway node which will yield additional benefits for spatial integration and regional development for a part of Austria which has been so far situated at the edges of the network. [2]

Without the Koralm railway line the transport connection Wien – Venezia would continue to be assigned to the existing route via the Neumarkter Sattel in Austria. Given the detour of about 100 km a deviation from Graz to TEN-T PP6 would not be followed by traffic flows. Additionally, merging the transport flows of BAA, TEN-T PP6 and, in one section, also of PETC X would cause capacity problems which cannot be solved within a reasonable planning period. Overall, there will be **no significant competition between BAA and TEN-T PP6** as both axes are focusing on different transport flows. [13]

Furthermore, the new Pontebbana railway line between Tarvisio and Udine, finished in 2000, benefits – as part of the BAA – to the axis.

The direct, short alignment of the BAA is also necessary to secure the competitiveness of rail against road, as the motorways follow the most direct routing as well.

4.4 MULTIMODALITY AND INTERCONNECTIVITY

Nodes and terminals play an important role in the transport system: They allow access to modes of transport, the connection of their different links and the alternation between them. Because of these diverse possibilities to interconnect, **highly efficient networks** are created, which are manifested by multifarious connection options and attractive offers for customers.

The **BAA as a high-performing north-south connection** presently links with the high-demanded east-west connection, which establishes the advantages of networks. This is especially true for the eastern expanded areas with high growth rates.


Photo Credit: ISOCHROM.COM

The BAA provides the interconnection of numerous crossing axes in its course. That leads to a considerable improvement of multimodality and interconnectivity in the transport system, long-distance connections, regional and local traffic in core areas and generally better conditions regarding location.

4.5 PROVIDING INTERCONNECTIVITY WITHIN THE TEN-T CORE NETWORK


Photo Credit: ISOCHROM.COM

The corridor section already declared as TEN-T PP23 runs from the **Polish Baltic port of Gdańsk** (and Gdynia) through the eastern branch of Corridor VI via Warszawa to **Katowice**. In Warszawa the corridor connects with the Pan-European Corridor II Berlin – Warszawa – Minsk – Moskwa and in Katowice with the Pan-European Corridor III Dresden – Katowice – Lvov – Kiev. (Given their evident importance, both of these corridors may be expected to be part of the Core Network.) These two transverse axes are continued in the Trans-Siberian Railway as far as Central Asia, Eastern Asia and China. The corridor furthermore connects with the Rail Baltica to Tallinn and Helsinki.

South from **Katowice to Wien** the corridor follows the Pan-European Corridor VI (and partly) IV via Ostrava to Brno, Otrokovice, Břeclav and further via the North Railway to Wien. Here it intersects the Danube corridor (waterway, corridor VII, TEN-T PP18) and the TEN-T PP17 (Paris – Strasbourg – Stuttgart – München – Salzburg – Linz – Wien – Bratislava). A new main railway station – Hauptbahnhof Wien – will support the target of interconnectivity in the future.

The eastern branch of the corridor correlates from its branch-off south of Katowice until Žilina with the **Pan-European Corridor VI**, from Žilina on it follows a branch of the Pan-European Corridor V, which connects, coming from **L'viv** und Košice in the East, via **Žilina** with **Bratislava**. Here, it is connected with Pan-European Corridor IV, the TEN-T PP17 and to the Danube waterway.

From **Wien** on towards the south the BAA runs along the Southern Railway to **Wiener Neustadt**, where there is a cross connection to the Raaberbahn (GySEV) via Sopron to Győr. From Wiener Neustadt the corridor leads over the Semmering into Upper Styria to Bruck/Mur and on to Graz, and following the Koralm railway line, which is currently under construction, on to the **Klagenfurt and Villach region**.

Between Bruck/Mur, Graz and Werndorf south of Graz the BAA overlaps with the Pyhrn Axis or Corridor Xa in the direction Maribor, Ljubljana and Zagreb, whose importance is limited by the existing detour between Maribor and Zagreb. On the other hand there is a connection to the Styrian Eastern Railway, whose relevance in long-distance traffic is marginal, due to a significant overall detour on its course to **Szombathely**, its design parameters, in particular where crossing hilly areas, and the capacity utilization by regional traffic.

In Villach the Pan-European Corridor X (Tauern Axis) crosses, which connects Salzburg via Villach with Ljubljana and Zagreb and further with South-Eastern Europe. Therefore **Villach** is – besides Wien and in the future Graz – an important railway traffic node that serves as a hub for international freight traffic on rail.

In the southwest of Villach the BAA crosses the border to Italy at Tarvisio, where the corridor proceeds via Udine (with one branch going to Trieste) – Venezia – Padova to Bologna. In the region of Udine – Venezia – Padova the BAA meets the TEN-T PP6 (Lyon – Torino – Venezia – Trieste – Ljubljana – Budapest – Ukrainian border).

Concluding the BAA builds networks within the Core Network of the EU.

4.6 LINKS AND STATE OF IMPLEMENTATION AND THEIR ADVANTAGES

The BAA is the most appropriate rail connection from Poland to Italy. It provides the intra-European connection into Central Europe in an efficient constellation:

- Shortest way by rail from Slovakia and most of the Czech Republic to the Baltic ports Gdańsk and Gdynia and the Adriatic ports in Italy.
- Competitiveness: no detours, comparable to the existing or planned shortest motorways on the TEN-T PP25 or existing motorways in the Czech Republic, Austria and Italy.
- Connecting all intermodal or multimodal nodes from Poland to Italy.
- Running projects along the whole axis in all member countries.

The major current infrastructural bottlenecks are on Austrian territory, which will be removed by the Semmering base tunnel and the Koralm railway line towards a high performance railway infrastructure for freight and passenger flows.

Figure 4-6 illustrates the present railway infrastructure:

Figure 4-6:
The BAA today with the main bottlenecks in Austria

5
STEPS TO THE BAA

5.1 PLANS AND PROJECTS

To achieve the basic objectives of the EU, there is a special need of a north-south running axis for high-speed heavy freight transport and passenger services. Concerning **growth and cohesion goals**, studies show that growth targets are best met by substantially improving accessibility if the opened up regions show a high potential for economic development. The potential for economic development has already been shown in *Chapter 4.1*.

Figure 5-1:
Future performance of railway infrastructure

In the course of TEN-T PP23 further measures and projects are being implemented. *Figure 5-1* shows the railway infrastructure after the implementation of the projects.

POLAND

→ Construction of a feeder line to the **port of Gdańsk**, where a new container and ferry terminal with an anticipated capacity of 1 million 20-foot-units (ISO) and 1,5 million annual travellers is in planning.

→ The section of **line from Gdańsk to Warszawa** is currently under construction. That includes bringing the energy supply and the **train line system up to a modern standard** (ERTMS – European Train Management System).

→ The 293 km long **Centralna Magistrala Kolejowa** (CMK, section Warszawa – Grodzisk Mazowiecki – Katowice) already constitutes Poland's most efficient rail connection. There are further plans for development in this section however, to allow top speeds of 200 km/h in average.

→ The **cross-border corridor sections** between Poland and the Czech Republic/Slovakia, which currently constitute bottlenecks in the corridor, shall be upgraded by the year 2015 (interoperability).

CZECH REPUBLIC

→ The **railway infrastructure** in the Czech Republic has been enhanced by 2004 between Petrovice on the Polish – Czech border and Přerov as between Brno and the Czech – Austrian border to allow top speeds of 160 km/h. Some few terrains only allow 120–140 km/h.

→ The **direct connection between Přerov – Břeclav** has been modernized. The level of development in this part of the route is already very far along and currently performs the function of the BAA (until the completion of the incorporation of Brno) in this section.

Further developments of the axis in a multimodal perspective include the connection to the cargo airport in Přerov, the incorporation of the logistic terminal in Otrokovice and the link with the east-west transborder expressway R49 between Zlin and Trenčin Regions.

→ The further development of the section **Přerov – Brno** (BAA and part of TEN-T PP23) before 2012 shall make top average speeds of 200 km/h possible.

→ **Further projects** include the adaptation of railway junctions (Přerov, Břeclav, Ostrava and Brno), which are partially completed and partially under construction.

The extension of the line between Přerov and Brno in combination with the construction of the Brno Main Railway Station plays a main role in this enterprise.

SLOVAKIA

→ The electrification of all railway lines of the BAA was completed around 3 years ago. Currently they are running at speeds between 70 and 80 km/h. In the section Nové Mesto nad Váhom – Bratislava the rail network already fulfils the standards of a modern high-performance railway line.

AUSTRIA

The Austrian section of the BAA is currently undergoing considerable revaluation by the realization of, inter alia, following projects:

→ **Hauptbahnhof Wien**
→ **Semmering base tunnel**
→ **Koralm railway line**

These projects will be covered in detail in *chapter 6*.

ITALY

→ The section **Tarvisio Boscoverde – Udine** already has the characteristics of a sophisticated high-performance line.

→ Between **Udine and Venezia**, one can also classify the current railway connection as high-performing. Generally the enhancement requirements here are low.

→ Between **Venezia and Trieste** the construction of a high-performance line is planed in the course of the TEN-T PP6, north of the current route and with a connection to Udine and therefore a linkage to the BAA.

→ The Italian part of the BAA is the section that requires the least development in total.

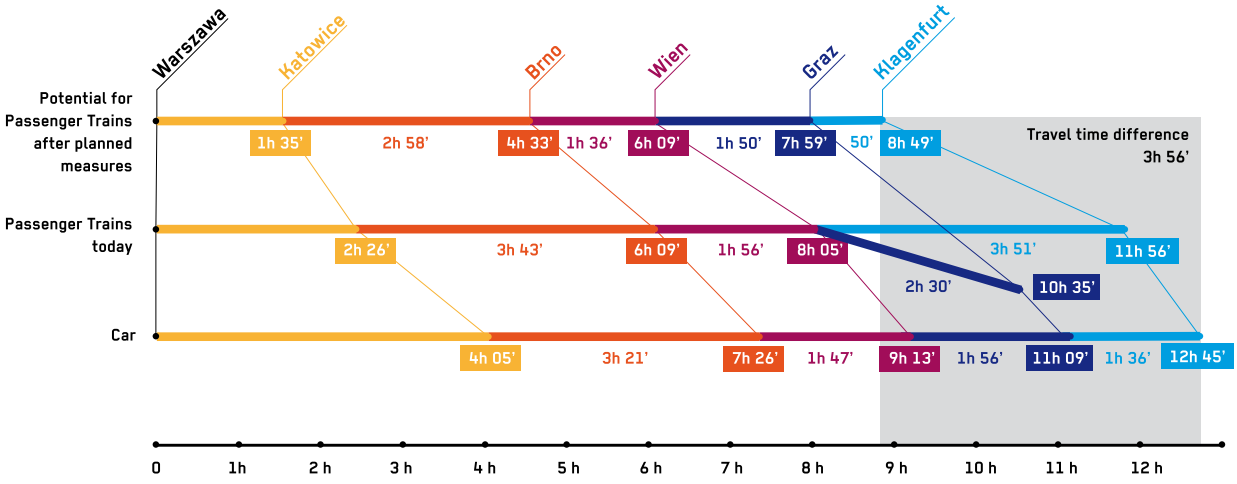
5.2 A HIGH-PERFORMANCE NORTH-SOUTH RAIL CONNECTION

The performance of the BAA is measured by travel times: The railway presently has the fasted travel time on several connections in the core area of the BAA. *Figure 5-2* illustrates the **travel time** from Warszawa (railway station) to Klagenfurt (railway station) by car and by train.[1] The travel times on rail are listed for present day and the future, after the realization of the projects mentioned in *chapter 5.1*.

Therefore the journey from Warszawa to Wien is already an hour shorter by train than by car, to Klagenfurt only 30 min because of the bottlenecks in the Austrian network. With the planned extensions and improvements the travel times on rail will considerably decrease even more. There are further possibilities of shortening travel times, so that the rail will be able to **compete with air traffic** in the journey Warszawa – Wien. Railway traffic therefore determines accessibility conditions on this axis.

1 The travel times by train are calculated for each line section. Continuous train connections (e.g. between Warszawa and Wien) run on other, partly more direct connections (e.g. large-scale bypass of Brno); therefore there can be differences between these travel times and the sum of the travel times calculated section-wise.

Figure 5-2:
Travel time from Waszawa to selected cities along the BAA in hours [Basler + Partner]



If improvement of accessibility is supposed to lead to development, these improvements have to equally be attained on rail. It has also been established that the economic areas along the axis have a high potential for economic development and need efficient access to world markets. This will be provided by the measures for future railway development that are currently in planning.

To help reach the goals set by the European Union there is dire need of a north-south axis for heavy-weight freight transport and fast and efficient passenger services.

6

BAA IN AUSTRIA: FROM BOTTLENECK TO EU CORE NETWORK

6.1 AUSTRIA: A HUB FOR A FUTURE TEN IN CENTRAL AND EASTERN EUROPE

Austria's location makes it an important hub to connect Northern and Southern Europe as well as Western European core-countries and the new Member States, candidate states and third countries in Eastern Europe.

The execution of Austria's traffic functions is exposed to unique conditions:

→ The Alps concentrate transport flows, on the one hand over the few Alp-crossing routes and on the other, on the Danube Axis, a natural transport route.

→ These few routes are of high national and international significance; due to its geographical location, Austria has a comparably high density of international traffic routes. (This is also reflected in Austria's EU Accession Treaty.)

→ The **crossing of the Alps** requires elaborate technical constructions on one hand, but on the other traffic has been a strain on the ecologically sensitive Alpine region's environment and its population.

In this context Austria has long promoted the modal shift from road to rail, which has big economic and environmental advantages, especially in the crossing of the Alps. The goals of modal shifting were initially established in the Integrated Transport Concept of 1991. In the General Transport Plan of 2002 the important routes were defined as national axes. These national axes in turn are embedded in the system of TEN-T priority projects and pan-European corridors on a European level (see *Figure 6-1*).

6.2 RAIL INFRASTRUCTURE IN AUSTRIA: CURRENT STATUS, RUNNING PROJECTS AND PLANNING

Currently, along the BAA the Austrian railway infrastructure has an unfavourable configuration which is not in line with the spatial distribution of the population in this area, and in some sections there are several quality gaps and poor design parameters. On the one hand, this is due to **difficult topographical conditions**. A further reason lies in the fact that the focus of investments so far has been on other Austrian axes, such as the Danube Axis (TEN-T PP17).

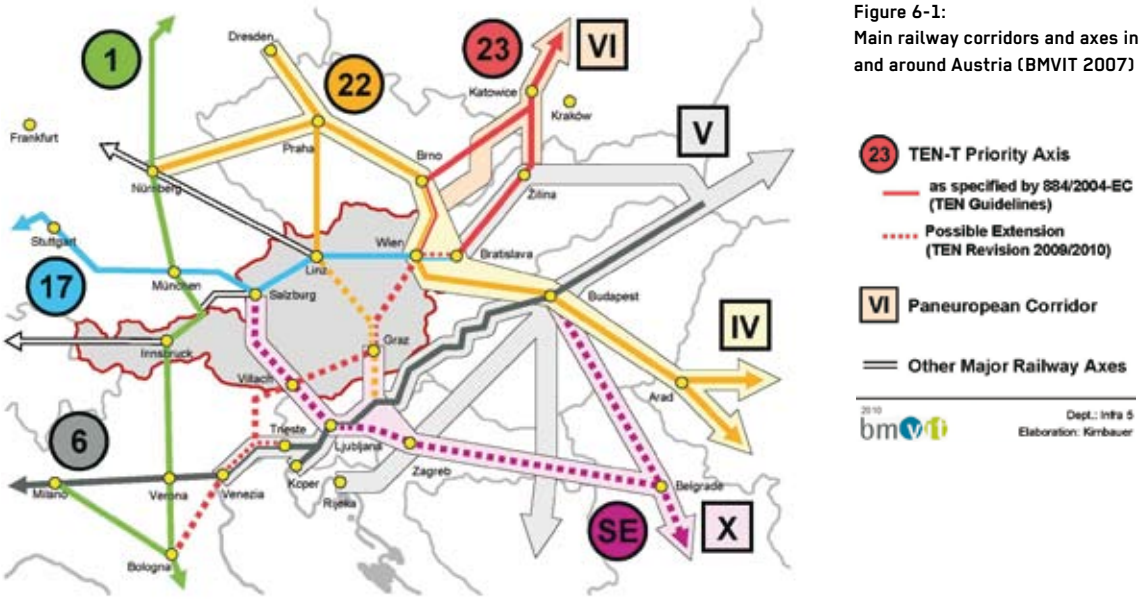


Figure 6-1:
Main railway corridors and axes in and around Austria (BMVIT 2007)

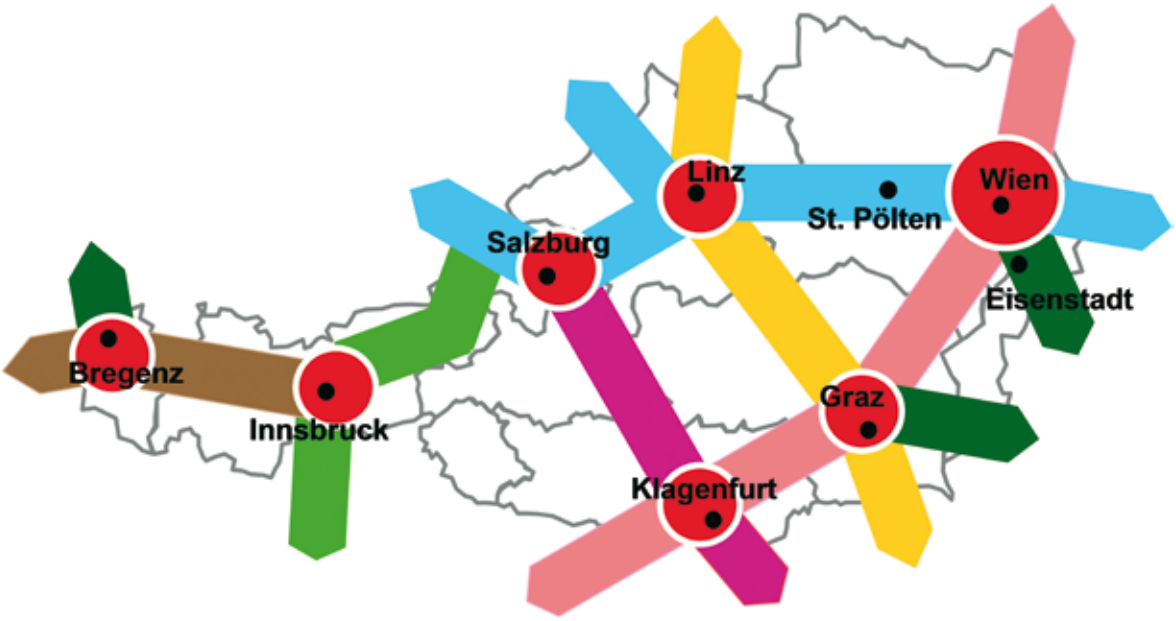


Figure 6-2:
General Transport Plan Austria 2002
(BMVIT 2002)

Therefore, traffic infrastructure in the Austrian part of the BAA is in parts marked by antiquated and insufficient railway infrastructure and a big quality advance of road traffic.

To eliminate the deficits in the field of rail infrastructure in the Austrian part of the BAA, there are several planning projects and construction projects especially along the Southern Railway, to enable a consistently fast and high-grade long-distance connection on rail. These projects can be distinguished as key projects and supplemental projects.

→ The three key projects in the Austrian part of the BAA are the three major projects that will contribute essentially to the improvement of general conditions and accessibility by railway: **Hauptbahnhof Wien**, the **new Semmering base tunnel** and the **Koralm railway line**.

→ Supplemental projects include all projects designed for the adaptation of existing railway connections in the Austrian part of the BAA. Those are mainly extension measures. The improvement and extension of inter-axial nodes (with the exception of Hauptbahnhof Wien) also fall into this category.

The main projects in detail have following traffic relevant functions; they consist of major new constructions and require high investments:

→ Together with the Lainz tunnel, the Hauptbahnhof Wien will directly connect the rail systems of the Western and Southern Railway in the area of the former South Railway Station. Axis-crossing traffic will therefore be much more efficient in the future.

→ The **Semmering base tunnel** from Gloggnitz to Mürzzuschlag will achieve a considerable reduction of travel time in passenger traffic and the abolition of tonnage and clearance gauge limitations on the existing mountain route. The railway traffic connection will be more attractive and energy consumption, especially in freight traffic, optimized.

→ The **Koralm railway line** is the biggest project in the development of the Austrian section of the BAA. The connection of the central regions of Graz and Klagenfurt by railway is currently only possible via Bruck/Mur and the Neumarkter Sattel. The Koralm railway line will close the existing railway gap between the two important Austrian central regions of **Graz** and **Klagenfurt/Villach** (Carinthian central region). This high-performance, level by-pass of the mountainous section of the Neumarkter Sattel, which is another obstacle along the existing rail axis, will integrate Graz into the BAA and transform this second biggest city of Austria into a TEN-T railway node.

→ Besides this there are several **supplemental projects** in planning or currently being realized along the Austrian section of the BAA, which enhance the continuity and capacity of the axis (Marchegg branch, Pottendorf line, Mürzzuschlag – Bruck/Mur, Bruck/Mur – Graz, Villach junction).

→ There is **no capacity bottleneck between Klagenfurt and Villach**, once the Koralm railway line is effective, and travelling time corresponds with needs of an integrated timetable.

Due to the complete new orientation of regional structures and improved accessibility involved, the realization of the previously introduced Austrian railway projects will massively upgrade its centres and the southern regions.

6.3 ENHANCING THE OVERALL EFFECTIVENESS OF BAA

An essential prerequisite for regional growth processes is the presence of high-level and supra-regional transport infrastructure that ensures the accessibility of a region or agglomeration. The development of traffic infrastructure as a measure for enhancing accessibility of a region results in the shortening of transportation times and costs, from or to

locations within a region. In particular the following effects of the BAA will cause increased productivity and consequently the opening up of market potentials:

- **Overlapping connections of landlocked regions** to Baltic and Adriatic ports.
- **Efficient hinterland transport** from Adriatic ports to the north especially the region of Southern Poland.
- **Easy access for inland transport** from Russia/Asia to north-south distribution.

Only the projects Semmering base tunnel, Koralm railway line and Hauptbahnhof Wien provide a short, efficient and fast connection for freight trains and passenger services. Through the realization of these projects the removal of bottlenecks in Austria is planned by 2020 to 2025.

The further development of the Austrian part of the BAA will entail extensive positive economical effects on all levels, from regional to European, which is underlined by several studies. [4] All projects are authorized, approval procedures are in process or the projects are already under construction.

Figure 6-3:
Construction works Koralm railway line, Weitendorf – Wettmannstätten (ÖBB-Infrastruktur AG 2010)

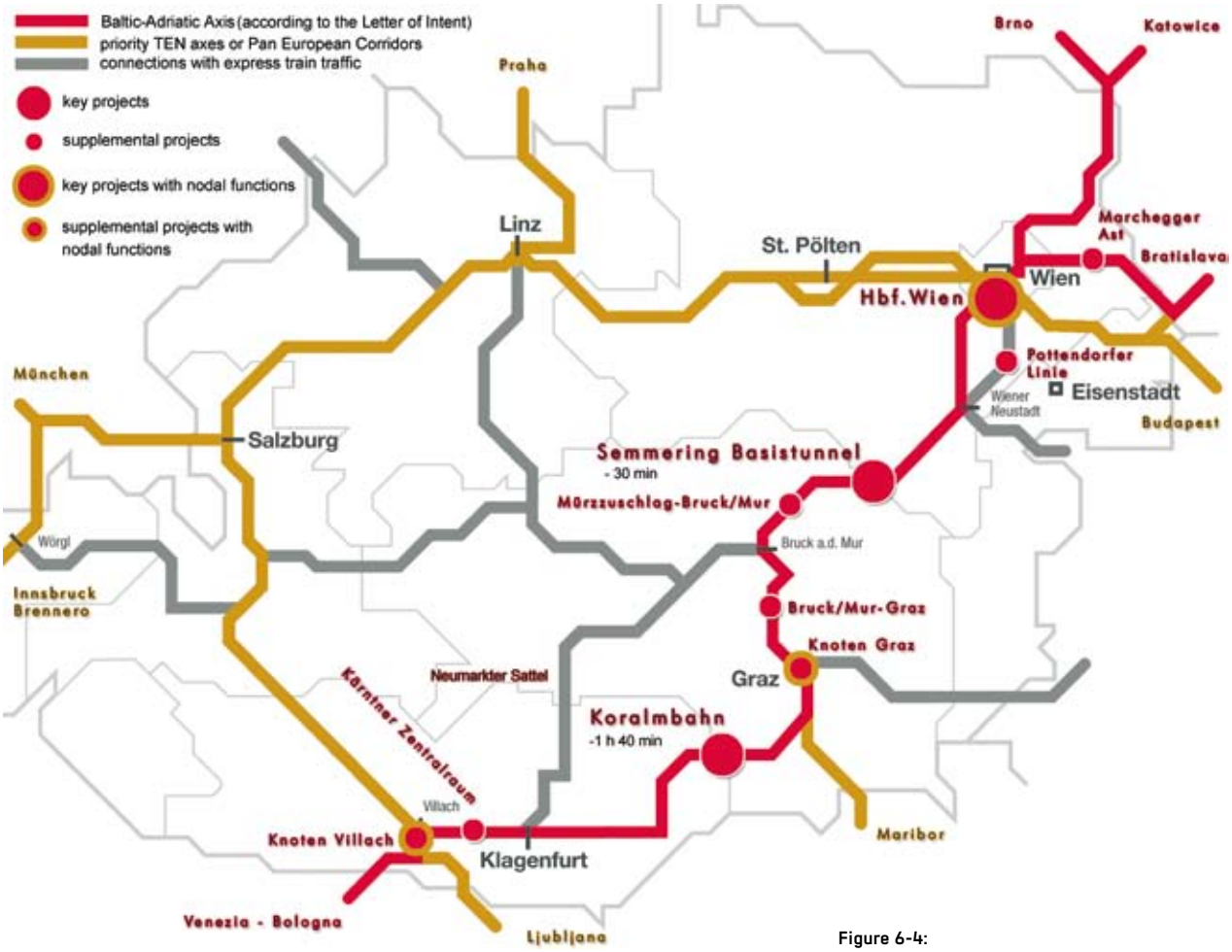


Figure 6-4:
Developments in Austria along the BAA [ÖBB-Infrastruktur AG 2008, additions by the author]

It is crucial that the axis should run through economic areas that already have high location potential and increasing economic power. The hereby obtained more efficient utilization of known potentials of carriers and the accompanying modal shifts furthermore lead to a better fulfilment of environmental goals and more traffic security.

7
SUMMARY AND CONCLUSION

The strengthening of the European internal market and its global competitiveness are two primary goals of EU policies as well as essentially contributing to the promotion of territorial, economic and social cohesion. At the same time, challenges of climate change, pollution and the preservation of protected areas are increasing in importance, especially in regard to infrastructural (traffic) development. In all this the railway plays an essential role.

Against the backdrop of these general goals and challenges, the future TEN-T Core Network should also be designed to contribute to the attainment and sustainment of economic, environmental and social goals.

For the implementation of the TEN-T Core Network, the EU employed expert groups and developed a methodology with principles and criteria to base the definition of the Core Network on. The Core Network shall comprise following elements:

- Nodes with connections within and between different modes of transport,
- high-performance links between nodes, and
- linkages to transport systems of third countries and the rest of the world.

Regarding the design of the future Core Network, the European Union is concentrating, amongst others, on the principles of multimodality, interconnectivity and interoperability, sustainability as well as quality and security of transport infrastructure.

The following *Table 7-1* examines and explains if and how the BAA meets the requirements as an element of the future Core Network, the general goals of the EU described in *chapter 3*, as well as the principles and criteria of the structure of the Core Network.

The general goals, principles and criteria in column one are explained in *chapter 3*. Column two and three explain why the BAA supports these goals, principles and criteria.

GENERAL GOALS / PRINCIPLES OF NETWORK DESIGN / CRITERIA (*see chapter 3*)	fulfilled / not fulfilled	ASSESSMENT BAA EXPLANATION
Territorial, economic and social cohesion Geographical or spatial aspects		Connection of regions within the EU with high economic potential (40 million inhabitants) and sufficiently skilled human resources from Warszawa (Poland) to Northern Italy Access to world markets: potential long-distance and cross-border transport flows to the neighbouring countries through Adriatic ports and existing connection to the land bridge to Russia and Asia
Multimodality, including intermodal links and facilities for co-modal and/or combined transport Interconnectivity and network optimisation Interoperability and improved efficiency of all modes of transport		BAA builds networks: multiple nodes, ports, terminals and gateways High amount of connections to other links, modes of transport and networks
Sustainability, including through CO_2 savings due to infrastructure measures Attention to climate change-proofing of infrastructure		In the long run the railway has the highest potential to decarbonise long-distance traffic. Low exploitation of landscapes due to tunnels
A focus on quality of transport infrastructure External and global trade flows		External and global trade flows: The BAA connects regions with potential to the Adriatic ports and therefore to world markets. The Sławków terminal has a link to the broad gauge and so a connection to the land bridge to Russia and Asia. Internal market and international trade: The BAA connects highly populated regions within the EU.
Passenger and freight flows and costumers' needs Removal of bottlenecks Reduction of travelling times and improvement in punctuality and reliability		The BAA reduces travel times and creates capacities for reliable transportation. The planned investments will speed up the growth determining modes of transport on this axis and set important impulses. Main bottlenecks in Poland, the Czech Republic and Italy have already been removed. Existing bottlenecks in Austria still have to be removed.
Safety and security of transport infrastructure		Increased security due to a reduction of dependence on oil producing countries The railway has the lowest accident rate of all modes of transport. A promotion of railway transports and an increased modal split in favour of the railway support traffic safety.
Application of advances technologies and ITS Traffic Management logistics, co-modal services		The equipment with ERTMS (European Rail Traffic Management System) on many sections of the line, also being part of the designated Freight Corridor Axis
Minimisation of investment, maintenance and operational costs, while nevertheless meeting the criteria above in a balanced way		Mostly flat rail lines outside of Austria Considering the construction of a completely new crossing of the Alps, these are comparatively reasonable investments, particularly as one eliminates the maintenance costs of existing railway lines. BAA consistently uses past and current investments in TEN-T PP23.

Table 7-1:
Fulfilment of the goals and principles of the TEN-T Core Network

THE BAA: CONNECTING THE RIGHT NODES ON THE RIGHT AXIS

The BAA is the only axis in this part of the EU that combines – especially after finishing the projects in Austria – the effects of a modern, fast and attractive system for passenger and freight traffic. In some sections, e.g. between Warszawa and Katowice, it is already faster than the road, thanks to previous investments.

The BAA interlinks the right nodes:

→ **Routing:** Extending the TEN-T PP23 towards the south-west, the BAA is a short, direct axis, basically following the existing traffic flows between Poland, the Czech Republic, Slovakia, Austria and Italy in the most direct way along existing infrastructure or that is currently in the process of being implemented, well connected with other important axes of the TEN-T Network and relevant intermodal nodes.

→ **Intermodality and Interconnectivity:** There are several nodes and gateways along this axis with high economic potential that improve intermodality and interconnectivity in the north-south direction. The BAA connects ports in the north and south, the motorways of the sea, inland waterways and enhances network effects with a number of other transport corridors. It is linked to the broad gauge railway system. In Italy it supports the links to the high speed network in east-westerly direction towards Milano/Torino and France and the North-South-Axis of TEN-T PP1.

→ **Sustainability and efficiency:** Upgrading the existing rail axis, in particular its Austrian section will provide short and attractive travelling and transport times and improve accessibility of landlocked regions on both sides of the former "Iron Curtain". This will both enhance economic performance and induce a significant shift to rail, supporting efficient co-modal transport chains and decarbonisation. In the long run, it will contribute to reducing dependences on fossil fuels.


Photo Credit: ÖBB/Robert Deopito

With further designated projects, the railway is the most growth determining mode of transport and should be expanded accordingly. Thereby the rail line along the BAA performs an important function in the course of multimodality, enhancing efficient and sustainable co-modal transport. Any further potential improvements beyond the proposed measures can be realized at presumably low investments, due to favourable topographical conditions.

THE BAA: "EUROPEAN ADDED VALUE"


Photo Credit: Kommerz

Raising the existing **standard of today's infrastructure** by quality improvements and removal of bottlenecks, especially in Austria, to reduce travelling times for passengers and goods between ports at two seas and regions formerly separated by the "Iron Curtain", the BAA fulfils the goals of the EU for nodes and lines being a future element of a TEN-T Core Network in a unique manner:

➔ **Connecting regions within the EU** with high economic potential: approximately 40 million residents from Gdynia/Gdańsk (Pomorskie Region), Warszawa (Poland), the Upper Silesia and Moravia area, the European metropolitan area Wien/Bratislava and the industrial clusters of Styria (Graz), Carinthia (Klagenfurt) and Northern Italy.

Connecting "old" and "new" EU Member States, the BAA also contributes to spatial integration and territorial, economic and social cohesion across former borderlines.

➔ Giving EU regions in Central and Eastern Europe with high economic potential **access to world markets** and thus realizing their potential: connecting existing and potential long-distance and cross-border transport flows to neighbouring countries (especially Scandinavia, Mediterranean area) as well as to future freight flows from/to Russia and Asia.

In the course of the "**tilting of European economy towards east**" the BAA opens up the potentials of the traditional industrial areas of Upper Silesia and Northern Moravia. With local know-how and several research and university facilities, this potential is constantly being increased.

Improving accessibility on promising transport routes for the future is essential for raising this potential of sufficiently skilled human resources.

➔ **Ecological issues/sustainability**: Reducing climate relevant gas emissions owing to the future characteristics of this axis (modal shift). Wherever possible, existing lines will be used for upgrading infrastructure towards a high-performance north-south axis by removing operational key bottlenecks on rail.

BAA, the Baltic-Adriatic Railway Axis meets the requirements to become part of the future European Core Network.

BIBLIOGRAPHY AND NOTES

[1] Adelsberger, Helmut (2007): *Absichtserklärung zum Baltisch-Adriatischen Korridor. Eisenbahn Österreich*, Heft 3, Wien, Luzern.

[2] Adelsberger, Helmut; Eicher, Harald (2008): *The Koralm Line as a Part of Wider European Railway Connections – Integrated in the Baltic-Adriatic Axis*. In: *Geomechanik und Tunnelbau (Geomechanics and Tunnelling) of Austrian Society for Geomechanics*, vol. 1, book No 4, August 2008. Berlin.

[3] Amt der Ktn. Landesregierung, dept. 7 Wirtschaftsrecht und Infrastruktur (2007): *Das Forschungsprojekt IMONODE 2003 – 2006. INTERREG III B*. In: *Schriftenreihe der Verkehrsplanung in Kärnten*, book No 5, Klagenfurt.

[4] Bruns, Cerwenka, Chaumet, Haller: *Berücksichtigung von erreichbarkeitsbedingten Veränderungen der Wertschöpfung in Kosten-Nutzen-Analysen*, Band 30 der IVS-Schriften der TU Wien, Wien, 2008.

[5] Ernst Basler + Partner AG: *Trend-Report – Zukunftstrends zu Gesellschaft, Wirtschaft, Politik, Umwelt und Technik*, Zürich, September 28th 2009

[6] ESPON (2006): *ESPON ATLAS. Mapping the structure of the European territory*. October 2006

[7] European Commission (2004): Decision No 884/2004/EC.

[8] European Commission, EUROSTAT, OECD, May 2010

[9] Industriellenvereinigung Wien und Niederösterreich (2009): *connecting markets. connecting continents, connecting people: der Logistikhub Twin City Wien – Bratislava*. January 2009

[10] Kendall, Gary (2008): *Plugged in. The end of the Oil Age*. Brussels

[11] Press release European Union, Brussels/Graz 10/7/2009.

[12] Progtrans (2008): *Ost-West-Güterverkehre 2030. Analysen, Prognosen und verkehrspolitische Herausforderungen für Deutschland und ausgewählte europäische Länder.* ifmo-studien. Institut für Mobilitätsforschung (ed.). Basel.

[13] RaumUmwelt Planungs-GmbH (2002): *Motivenbericht Koralmbahn – Darstellung der verkehrlichen sowie regionalwirtschaftlichen Bedeutung der Koralmbahn*. periodical *Forschungsarbeiten aus dem Verkehrswesen*, BMVIT (ed.), Wien

[14] RaumUmwelt Planungs-GmbH (2010): *Der Baltisch-Adriatische Korridor im europäischen Eisenbahnnetz und seine Umsetzung in Österreich*. Materialienband. By order of BMVIT and ÖBB. Sept. 2010, previously unreleased

[15] Rodrigue, Jean-Paul (2010): *Maritime Transportation: Drivers for the Shipping and Port Industries*. Forum Paper 2010-2, International Transport Forum 2010, Transport and Innovation – Unleashing the Potential. www.internationaltransportforum.org/Pub/pdf/10FP02.pdf (August 2010)

[16] TEN-T Policy Review – Expert Group 1 "Methodology or TEN-T Planning": *Proposal on TEN-T Network Planning*, Final Document 2010

Further studies:

Bökemann, Dieter (2001): *Arbeitspaket „NO-S" zum österreichischen Bundesverkehrswegeplan – Sonderauswertung Koralmbahn*; i.A. der Eisenbahn-Hochleistungsstrecken AG (HL-AG), Institut für Stadt- und Regionalforschung (SRF), TU Wien.

Bökemann, Dieter; Kramar, Hans (2000): *Österreichischer Bundesverkehrswegeplan, Arbeitspaket NO-S, Auswirkungen von Verkehrsinfrastrukturmaßnahmen auf die regionale Standortqualität. Endbericht. Im Auftrag des BM für Wissenschaft und Verkehr*. Wien.

Eicher, Harald (2006): *Kärnten und die Baltisch-Adriatische Verkehrsachse*. In: *Schriftenreihe der Verkehrsplanung in Kärnten*, book No 4. Klagenfurt.

IHS, Joanneum Research, WIFO (2009): *Volkswirtschaftliche Bewertung des Rahmenplans 2009 –2014*.

Österreichisches Institut für Raumplanung (1997): *Aufbereitung von Entscheidungskriterien für die Untersuchungsbereiche im Netzentwurf zum Masterplan 1996/97*. Studie im Rahmen des Bundesverkehrswegeplans – Arbeitspakt N1. Erstellt im Auftrag des Bundesministeriums für Wissenschaft und Verkehr, Abt II/A/1. Wien.

[ÖROK] Österreichische Raumordnungskonferenz (ed. 1999): *Transeuropäische Netze und regionale Auswirkungen auf Österreich*. Gutachten des Österreichischen Instituts für Raumplanung (ÖIR). ÖROK Schriftenreihe No 147. Wien.

[ÖROK] Österreichische Raumordnungskonferenz (ed. 2000): *Transeuropäische Netze und regionale Auswirkungen auf Österreich – Ergänzungsstudie*. Gutachten des Österreichischen Instituts für Raumplanung (ÖIR). ÖROK Schriftenreihe No 154. Wien.

TINA VIENNA Urban Technologies and Strategies (2009): *From Poland to "Po Land" – the Baltic-Adriatic Corridor.* www.tinavienna.at/index.php?p_id=1251653004&last_id=1251653004&l_id=en&s_id=6f364b118be61eed6d09688892d8736a (August 2010)

LETTER OF INTENT 2006

The Ministers of Transport and Infrastructure of the adjacent states of the TEN-T PP23, Poland, the Czech Republic, Slovakia, Austria and furthermore Italy, signed the "Letter of Intent" for the realization of the Baltic-Adriatic Axis on October 12, 2006 in Luxembourg. These states advocate the extension of the TEN-T PP23 from Wien / Bratislava via Graz – Klagenfurt – Villach – Udine to Trieste and to Venezia – Bologna. The main goal is a high-quality and highly efficient rail infrastructure to meet the needs of a growing economy in these regions.

Letter of Intent

on the Development of the Baltic-Adriatic Transport Corridor including the extension of the existing Pan-European Transport Corridor VI Gdansk – Warszawa – Katowice – Zilina with branches to Poznań and Breclav/Brno, to Bratislava/Wien – Graz – Klagenfurt – Udine – Trieste/Venezia – Bologna

Signed in Luxemburg, October 12, 2006

For the Republic of Austria:

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the Vice-Chancellor and Minister for Transport, Innovation and Technology

For the Czech Republic:

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the Minister of Transport

For the Republic of Italy:

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the Minister of Transport

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the Minister of Infrastructure

For the Republic of Poland:

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the Minister of Transport

For the Slovak Republic:

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the Minister of Transport, Post and Telecommunication

ALLIANCE OF 14 REGIONS 2009

The Alliance of 14 regions and the Declaration on the extension of the TEN-T PP23 of October 6, 2009 in Brussels are the most recent activities to support the "consequent and immediate realization of the Baltic-Adriatic Corridor", Gdańsk/Gdynia – Brno – Wien/Bratislava – Venezia – Bologna/Ravenna. The Declaration is motivated by the wish for improvement of transport infrastructure as a prerequisite for the economy as well as traffic safety and the consolidation of the new Europe.