

Understanding the Policy and Program Structure of National and International Freight Corridor Programs in the European Union



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16. Abstract Growing global competition requires maximizing the efficiency of freight movement on the U.S. transportation network. The Federal Highway Administration, American Association of State Highway and Transportation Officials, and National Cooperative Highway Research Program sponsored a scanning study to learn how the European Union and various member states developed, evolved, and implemented freight transportation corridor programs on national and cross-jurisdictional levels. The scan team learned that European Union transportation policies focus on corridors and on connecting transport chains to and from neighboring countries and overseas, making freight transport more efficient and sustainable. It observed that a unifying vision linking transportation and the economy is a key element of the Trans-European Transport Network. Team recommendations for U.S. implementation include coordinating freight-planning efforts throughout North America, determining low-cost efforts to improve freight transportation, and using private-sector planning resources to aid public-sector planning.					
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International Technology Scanning Program

The International Technology Scanning Program, sponsored by the Federal Highway Administration (FHWA), the American Association of State Highway and Transportation Officials (AASHTO), and the National Cooperative Highway Research Program (NCHRP), evaluates innovative foreign technologies and practices that could significantly benefit U.S. highway transportation systems. This approach allows for advanced technology to be adapted and put into practice much more efficiently without spending scarce research funds to re-create advances already developed by other countries.

FHWA and AASHTO, with recommendations from NCHRP, jointly determine priority topics for teams of U.S. experts to study. Teams in the specific areas being investigated are formed and sent to countries where significant advances and innovations have been made in technology, management practices, organizational structure, program delivery, and financing. Scan teams usually include representatives from FHWA, State departments of transportation, local governments, transportation trade and research groups, the private sector, and academia.

After a scan is completed, team members evaluate findings and develop comprehensive reports, including recommendations for further research and pilot projects to verify the value of adapting innovations for U.S. use. Scan reports, as well as the results of pilot programs and research, are circulated throughout the country to State and local transportation officials and the private sector. Since 1990, more than 85 international scans have been organized on topics such as pavements, bridge construction and maintenance, contracting, intermodal transport, organizational management, winter road maintenance, safety, intelligent transportation systems, planning, and policy.

The International Technology Scanning Program has resulted in significant improvements and savings in road program technologies and practices throughout the United States. In some cases, scan studies have facilitated joint research and technology-sharing projects with international counterparts, further conserving resources and advancing the state of the art. Scan studies have also exposed transportation professionals to remarkable advancements and inspired implementation of hundreds of innovations. The result: large savings of research dollars and time, as well as significant improvements in the Nation's transportation system.

Scan reports can be obtained through FHWA free of charge by e-mailing international@dot.gov. Scan reports are also available electronically and can be accessed on the FHWA Office of International Programs Web site at www.international.fhwa.dot.gov.

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Executive Summary

Introduction

To provide efficient goods movement on the U.S. transportation network, the United States will need to undertake new approaches. An approach advanced by industry groups as a potential path forward for the continued economic prosperity and competitiveness of the United States is a focus on corridor-level thinking. A corridor approach can help focus the Nation's assets and resources on key transportation infrastructure that supports national economic activity.

The European Union (EU) adopted the corridor approach in the mid-1990s and has continually evolved its freight corridor program with the admission of new member states, increased freight volumes, and the changing demands, including environmental sustainability, placed on the transportation network. The EU views this corridor approach as strategically important to its global economic competitiveness. Given EU's experience with this concept, the scanning study was designed to engage the European Commission and key member states in the policy, funding, and programmatic implications of integrating corridors into their transportation planning.

Objectives

The purpose of the scanning study was to learn from the EU and various member states how they developed, evolved, and implemented freight transportation corridor programs on a national and cross-jurisdictional level. The scan identified opportunities for North American freight corridors and developed contacts in other countries that the United States may partner with in the future. The information gathered during the scan will help stakeholders make informed decisions, allow for stronger strategies and approaches, and create better programs.

The project had the following specific goals:

- Identify innovative freight policy issues as they relate to freight corridor programs.
- Understand the institutional, organizational, and administrative structure of freight corridor programs, including the planning, programming, development, and implementation of those programs.
- Understand how specific corridors are selected, including the method used for prioritization.
- Understand how corridor improvements and operations are financed and managed, including cost-benefit analysis, and the benefits of such programs.
- Understand the inner workings of the policies and mechanisms of freight programs, including the leadership required to develop and implement policies.
- Identify how freight corridor policies are translated into program definitions and project delivery.
- Identify how performance standards and measures are developed and managed as they relate to freight corridors' impact on safety, congestion, mobility, reliability, infrastructure condition, air quality, user satisfaction, and emergency response.
- Identify ways to foster international collaboration on freight corridor issues.

Host Country Information

Before the scan team went to Europe, it analyzed information on development of the freight corridor program in Europe to determine which countries to visit. The team decided to visit the European Commission (EC) in Brussels, Belgium, five member countries, and the European Investment Bank (EIB). The EC was chosen because it is the organization that defines transportation policies and works with member countries to develop implementation plans. The team visited the EC at the beginning of the study to gather general information on policies and plans pertaining to freight corridor development and implementation. The team returned to the EC after visiting the member countries to get feedback and more detailed information on specific points that arose in meetings with member country officials. The team visited the EIB to learn about its role in financing transportation infrastructure projects.

The team visited Austria, Germany, Hungary, the Netherlands, and Poland because they have cities that are key nodes on priority multimodal transportation corridors and they represent a mix of EU founding members and members that joined the EU later. The latest expansion of the EU is generating freight

flows to and from the eastern part of the continent, where freight transportation infrastructure is less developed than in the western part. These five countries provide a good mix of countries in different transportation system development stages and geographic locations.¹

The scan team identified five topics of interest to guide the scan:

1. **Policies:** Identify innovative freight policy issues as they relate to freight corridor programs and understand the benefits of such programs.
2. **Planning process:** Identify corridor selection, corridor prioritization, and project selection processes.
3. **Sustainability:** Identify the role that environmental policies play in freight corridor development and implementation.
4. **Funding:** Understand how corridors and specific projects are financed and managed.
5. **Operations:** Identify freight corridor operations strategies.

Summary of Findings

Policies

An integrated transport system requires harmonization of rules and interoperability of networks. Toward this goal, the EC, the EU's executive body, has launched a series of policy initiatives to improve the efficiency of freight transport in Europe. Together, they make freight transport in the EU more efficient and sustainable.

The scanning study had the following findings on policy:

- The Trans-European Transport Network (TEN-T) concept serves as a unifying vision for the EU.
- The TEN-T vision constantly enables long-term planning.
- Each nation viewed transportation infrastructure as a key national asset.

- EU transportation policy brings a comprehensive vision to transportation system development.
- Multiple policies often need to be aligned to achieve desired outcomes.
- Corridor development needs to be grounded in analytics and market fundamentals.
- Core routes or trunk lines need to be integrated with their connections to a larger distribution network. The new TEN-T will be a two-tier corridor network: core and comprehensive.

Planning Process

TEN-T EA assures the technical and financial implementation and management of the TEN-T program. It also manages key transport infrastructure projects in close collaboration with the Directorate-General for Mobility and Transport (DG MOVE). DG MOVE is responsible for the overall policy, programming, and evaluation of the TEN-T program.

The scanning study had the following findings on the planning process:

- The project application process for EU funds is transparent and well defined.
- Planning processes and the level of TEN-T integration into national planning processes in member states vary.
- Alignment of member state and EU priorities is a challenge.

Sustainability

The transport sector poses one of the greatest policy challenges for sustainable development in the EU. Transportation activity is a major user of nonrenewable energy resources. Road transport, the dominant mode of transport, contributes the most to greenhouse gas emissions. To reduce the environmental impact caused by the prevailing trend to use road and air transport and to address increasing congestion problems, the EU wants to promote alternative modes of transport. The EU is also looking at other tools to promote a more sustainable transport policy:

- Promote comodality by reinforcing the position of railways, boosting maritime transport, and reviving the inland waterways transport system.

¹ Although the countries visited do not provide comprehensive perspectives of the EU, they represent a broad perspective and capture broad themes on the interplay between national and EU objectives.

- Develop charges on infrastructure to improve the management of freight transport and reduce transport's environmental impact while generating funds for new infrastructure.
- Promote the use of cleaner cars and fuels.

The scanning study found a strong linkage of transportation policy to environmental, social, and sustainability aspects. However, aligning theory and practice is challenging.

Funding

The largest proportion of funding for transportation infrastructure projects in the EU comes from each country's general revenues. Member states collect direct charges for roadway use, including a mix of taxation instruments (fuel and vehicle taxes) and user charges, to recover infrastructure costs. The most common time-based fee is the Eurovignette.² Other instruments are distance-based tolls levied on individual road sections or the full primary network. Some countries, such as Germany, also collect tolls on heavy vehicles. The EU is working to harmonize tolling systems as well as rates.

The scanning study had the following findings on funding:

- Multiple funding sources are available to meet project needs.
- Multiyear funding is necessary to bring a project to completion.
- Different funding opportunities affect TEN-T implementation; TEN-T funds are available to all members, but Cohesion Funds are available only to eligible member states.
- Tolling policy varies by country.

Project Implementation and Operations

Project implementation. Coordination on cross-border sections is often the most complex aspect of TEN-T projects. It demands active cooperation among a wide range of stakeholders, sometimes using memoranda of understanding or letters of intent. Cross-border projects can also be hampered by the lack of joint traffic forecasts and general project development approaches. This leads to differing investment plans and contradictory timelines, capacity planning,

² A vignette or sticker based on an agreement between several member states that gives access to the network on each other's territory.

alignment, technical and interoperability characteristics, and environmental assessments.

To facilitate the implementation of the projects necessary to advance the 30 priority axes, the EU established and appointed European coordinators to meet with heads of states to resolve significant project advancement issues, such as funding and environmental compliance. The goal of the European coordinators is to accelerate project implementation, especially in cross-border projects.

Operations. The EU has an extensive railway system. There is a strong focus on passenger traffic, but freight transport faces low customer satisfaction and a decrease in rail volumes and market share. The poor interoperability of the freight railway system in Europe is a key problem. The system includes multiple railway operators with different power and signaling systems and even track gauge. It requires technical compatibility of infrastructure, rolling stock, signaling, and other rail systems.

The scanning study had the following findings on operations:

- Greater harmonization of technology and operations is necessary to ensure the success of a European vision.
- Corridor coalitions and project coordinators play an important role in project development.

Conclusions

The scan team analyzed the information gathered during the scan, developed a series of conclusions, and identified the relevance of each conclusion to freight transportation corridor development in the United States. The general conclusions are as follows:

- A unifying vision linking transportation and the economy is a key foundational element of the TEN-T.
- Multijurisdictional transportation planning and implementation will require new management, funding, and coordination strategies.
- Awareness must evolve from an exclusively national and local understanding of freight movement to an international understanding of how freight movement connects to international markets.
- Any movement toward corridor-level thinking in the United States must be grounded in objective, transparent facts and market analysis.

- Benefit-cost analysis is a valuable tool in project selection and policy evaluation.
- Freight policy must align with related policies, such as economic, trade, environmental, and land use policies.
- Stable multiyear funding provides continuity and minimizes delays, particularly on large-scale projects.

Corridor-level thinking and action based on connectivity, access, thorough analysis, and market needs enable multiple parties to transcend differences and connect similarities. This concept was integral to establishing the U.S. Interstate Highway System and is being replicated in nearly all developing and growing economies. This scan studied many of the issues the United States will face if it chooses to integrate corridor-level thinking into improving the performance of the U.S. multimodal transportation network.

Implementation Plan

The scan team developed implementation actions that could improve freight transportation in North America. Specific actions include the following:

- Perform outreach to transportation agency leaders, policymakers, and stakeholder groups.
- Disseminate the scan report and executive summary.
- Better use private-sector planning resources to aid public-sector planning.
- Determine the impacts that occurred when Germany implemented the Toll Collect system for trucks.
- Prepare a supplemental scan report at the conclusion of the EU effort to develop core and comprehensive networks to discuss and evaluate the process and results.
- Develop a list of important national freight corridors and port facilities in the United States.
- Determine if the European process for arranging private freight train slots on the European public rail lines that cross country borders could be a model for developing a system to create a “one-stop shop” for oversize and overweight trucks needing permits from multiple States.
- Coordinate freight planning efforts on the North American continent.
- Develop a discussion paper on how the European model of having coordinators for major cross-border projects could be used in North America to advance multistate or multinational projects.

- Gather more information on the multicriteria analysis the EU uses for its freight corridor effort and assess its applicability for transportation planning (including but not limited to freight planning) in the United States.
- Gather information on the types of PPPs used in Europe. If they are different from the types of PPPs used or being considered in the United States, determine if they could be of use in the United States.
- Determine no- or low-cost efforts that will improve freight transportation in North America.
- Determine if the analysis being conducted in the Netherlands on a new vehicle design that spreads weight differently has potential use in the United States.
- Establish an ongoing relationship with DG MOVE.

Chapter 1: Introduction

Background

From farm to market to today's global supply chains, goods movement underpins the economies of industrialized and developing nations. Transportation networks enable national economies and businesses to link with suppliers, markets, and consumers throughout a nation and the world. It enables them to capitalize on economic and comparative advantages. Maximizing that opportunity and leveraging the U.S. transportation network, American business has fully integrated fluid transportation into its operations. This makes the efficiency of the transportation network essential to American businesses, households, and communities. Safe, swift, and reliable transportation across diverse domestic and international supply chains plays a significant role in maintaining and expanding U.S. economic activity.

The transportation network, an integral component of the U.S. economy, is stressed carrying current volumes. Consensus projections are that as the economy rebounds, freight volumes will begin growing again. Regardless of whether high growth rates return or are replaced by modest growth, the reality is that efficiency of freight movement in America today is challenged by current volumes and global and domestic demands that outpace the capacity of the surface transportation system. The result is decreased performance and reliability, steady erosion of economic competitiveness, and unwanted contributions to safety and environmental problems.

To provide efficient goods movement on the U.S. transportation network, the United States will need new approaches. Corridor-level thinking is an approach advanced by industry groups, including State transportation authorities,³ and legislation proposed in Congress⁴ as a potential path forward for economic

³ Association Stakeholders Call for National Freight Program and Stronger Federal Role, www.intermodal.org/stakeholders_files/documents/PR_FSC_Call_for_National_Freight_Program.pdf.

⁴ House of Representatives' Transportation and Infrastructure (T&I) Committee Blueprint for the Surface Transportation Authorization Act of 2009, http://transportation.house.gov/Media/file/Highways/HPP/OBERST_044_xml.pdf.
S 3629 and HR 5976, The FREIGHT (Focusing Resources, Economic Investment, and Guidance to Help Transportation) Act of 2010, July 22, 2010, <http://lautenberg.senate.gov/newsroom/record.cfm?id=326598>.
HR 6291: Freight FOCUS (Freight is the Future Of Commerce in the United States) Act of 2010, Sept. 30, 2010, http://richardson.house.gov/list/press/ca37_richardson/FreightFocusAct.shtml.

prosperity and competitiveness in the United States. A corridor approach can focus the nation's assets and resources on key transportation infrastructure that supports national economic activity.

The European Union (EU) adopted the corridor approach in the mid-1990s and has continually evolved its freight corridor program with the admission of new member states, increased freight volumes, and changing demands, including environmental sustainability, on the transportation network. The EU views this corridor approach as strategically important to its global economic competitiveness. Given the EU's experience with this concept, this scanning study was designed to engage the European Commission (EC) and key member states in the policy, funding, and programmatic implications of integrating corridors into transportation planning.

Purpose and Objectives

The purpose of the scanning study was to learn from the EU and various member states how they developed, evolved, and implemented freight transportation corridor programs on national and cross-jurisdictional levels. The scan allowed the North American representatives to gain a better understanding of the inner workings of the policies, mechanisms, and programs that national, State, and local governments will need to address if the United States develops a national freight corridor program. The scan identified opportunities for North American freight corridors and developed contacts in other countries that the United States may partner with in the future. The information gathered during the scan will contribute to informed decisions, stronger strategies and approaches, and better programs.

Compared to other scans that are more technical in nature, this one was focused on freight policy at the corridor level. The following were the specific objectives of the scan:

- Identify innovative freight policy issues as they relate to freight corridor programs.
- Understand the institutional, organizational, and administrative structure of freight corridor programs, including the planning, programming, development, and implementation of those programs.

- Understand how specific corridors are selected, including the method used for prioritization.
- Understand how corridor improvements and operations are financed and managed, including cost-benefit analysis, and understand the benefits of such programs.
- Understand the inner workings of the policies and mechanisms of freight programs, including the leadership required to develop and implement policies.
- Identify how freight corridor policies are translated into program definitions and project delivery.
- Identify how performance standards and measures are developed and managed as they relate to freight corridors' impact on safety, congestion, mobility, reliability, infrastructure condition, air quality, user satisfaction, and emergency response.
- Identify ways to foster international collaboration on freight corridor issues.

The scan team identified five topics of interest that were used to guide the scan:

1. **Policies:** Identify innovative freight policy issues as they relate to freight corridor programs and understand the benefits of such programs.
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3. **Sustainability:** Identify the role that environmental policies play in freight corridor development and implementation.
4. **Funding:** Understand how corridors and specific projects are financed and managed.
5. **Operations:** Identify freight corridor operations strategies.

International Technology Scanning Program

To gain a better understanding of how other nations address transportation challenges, the Federal Highway Administration (FHWA), American Association of State Highway and Transportation Officials (AASHTO), and National Cooperative Highway Research Program conduct the International Technology Scanning Program. This program seeks out and evaluates innovative technologies and practices that could improve the performance of the U.S. highway system. The scanning approach enables the U.S. transportation community

to adopt advanced technology much more efficiently without spending scarce research funds to re-create improvements already developed by other countries.

This is the fourth freight-related scan conducted under the International Technology Scanning Program. The main objective of these scans has been to understand how other nations address increased freight flows on their transportation systems. The first scan focused on the EU and investigated the issues, constraints, opportunities, and challenges it faced in developing a policy of open boundaries and the strategies it uses to implement that policy. The report on that scan is *Freight Transportation: The European Market* (FHWA-PL-02-009). The second scan in 2002 investigated the characteristics of trade flows between the United States and Latin American countries. The team studied how the scan countries handle trade-related transportation infrastructure, border crossings, and freight security, and issued a report titled *Freight Transportation: The Latin American Market* (FHWA-PL-03-013). The third scan in 2007 investigated how China provides intermodal access to its new ports and employs investment strategies to foster freight mobility and intermodal connectivity. The report is *Freight Mobility and Intermodal Connectivity in China* (FHWA-PL-08-020).

Scan Team Members

The scan team included representatives of FHWA, AASHTO, the federal transportation agencies of Canada and Mexico, the U.S. Department of Commerce, the I-95 Corridor Coalition, and the private sector. Representatives from Canada and Mexico were invited to participate in the scan because these neighboring countries are engaged in corridor development and are interested in developing freight transportation corridors at the North American level. The U.S. Department of Commerce is collaborating with the U.S. Department of Transportation to support the need for improved transportation infrastructure to support the supply chains integral to U.S. economic activity. The members of the scan team were the following:

- Anthony T. Furst (cochair), FHWA
- Eric G. Madden (cochair), Pennsylvania Department of Transportation (DOT)
- Eduardo Asperó, Mexico Intermodal Transportation Association
- Monica M. Blaney, Transport Canada
- David F. Long, U.S. Department of Commerce International Trade Administration

- Bernardo J. Ortiz, Mexico Ministry of Communications and Transport
- Robert L. Penne, AASHTO
- Ernie B. Perry, Missouri DOT
- Kenneth L. Sweeney, Maine DOT
- B. Renee Sigel, FHWA
- George E. Schoener, I-95 Corridor Coalition
- Spencer L. Stevens, FHWA
- Juan C. Villa (report facilitator), Texas Transportation Institute

Appendix A contains contact and biographical information for the scan team members.



Figure 1. EU international freight corridor program scan team members: (front row, left to right) Spencer Stevens, Renee Sigel, Leo Penne, Monica Blaney, Bernardo Ortiz, (back row, left to right) Ken Sweeney, Ernie Perry, Eduardo Asperó, Juan Villa, Tony Furst, George Schoener, Eric Madden, and David Long.

Host Country Information

Before the scan team went to Europe, it analyzed information on the development of the freight corridor program in Europe to determine which countries to visit. The team decided to visit the EC in Brussels, Belgium, five member countries, and the European Investment Bank (EIB). The EC was chosen because it is the organization that defines transportation policies and works with member countries to develop implementation plans. The team visited the EC at the beginning of the study to gather general information on policies and plans pertaining to freight corridor development and implementation. The team returned to the EC after visiting the member countries to get feedback and more detailed information on specific points that

arose in meetings with member country officials. The team visited the EIB to learn about its role in financing transportation infrastructure projects.

The team visited Austria, Germany, Hungary, the Netherlands, and Poland because they have cities that are key nodes on priority EU multimodal transportation corridors and they represent a mix of EU founding members and members that joined the EU later. The latest expansion of the EU is generating freight flows to and from the eastern part of the continent, where freight transportation infrastructure is less developed than in the western part. These five countries provide a good mix of countries in different transportation system development stages and geographic locations.⁵

Report Organization

The purpose of this report is to provide a summary of the EU experience in planning, programming, developing, and implementing its freight corridor program, as well as to recommend specific implementation actions that could create better freight transportation programs in the United States and North America.

Chapter 2 presents the structure and evolution of the EU freight transportation system and provides a context for understanding the details in later chapters.

Chapters 3 through 8 were organized around the topics of interest the scan team identified:

- Chapter 3 contains information on freight transportation corridor policies in the EU.
- Chapter 4 addresses planning processes at the EU and member country levels.
- Chapter 5 discusses sustainability of freight transportation in the EU.
- Chapter 6 presents the funding structure for freight transportation corridors.
- Chapter 7 includes information on freight corridor operations.
- Chapter 8 provides the scan team's conclusions and implementation plan.

⁵ Although the countries visited do not provide comprehensive perspectives of the EU, they represent a broad perspective and capture broad themes on the interplay between national and EU objectives.

Chapter 2: EU Freight Transportation System Structure

European Union

In 1957, Belgium, France, the Federal Republic of Germany, Italy, Luxembourg, and the Netherlands signed the Treaties of Rome, which created the European Economic Community (EEC). The EEC established a customs union, expanding the earlier cooperation in the European Coal and Steel Community (ECSC). In 1967, the Merger Treaty among the six created a single set of community-wide institutions, collectively referred to as the European Communities.⁶

The first enlargement of the EEC came in 1973 with the admission of Denmark, Ireland, and the United Kingdom. The next enlargement, from nine to 12 members, came with Greece's entry in 1981, followed by Portugal and Spain in 1986. In 1990, after the fall of the Iron Curtain, the German Democratic Republic (the former East Germany) became part of the community as part of a newly reunified Germany.

The European Union was formally established when the Maastricht Treaty came into force in November 1993, and in 1995 Austria, Finland, and Sweden joined the newly established EU. The Norwegian government lost a second national referendum on membership.

In May 2004, eight Central and Eastern European countries (the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, the Slovak Republic, and Slovenia) and the Mediterranean islands of Cyprus and Malta joined the EU, increasing membership to 25. This was the largest single enlargement in terms of people, landmass, and number of countries. Bulgaria and Romania became the EU's newest members in 2007, to yield today's total of 27 member states.

⁶ The ECSC expired in 2002, but the European Atomic Energy Community remains a distinct entity, the only one of the three communities to exist beyond 2009.

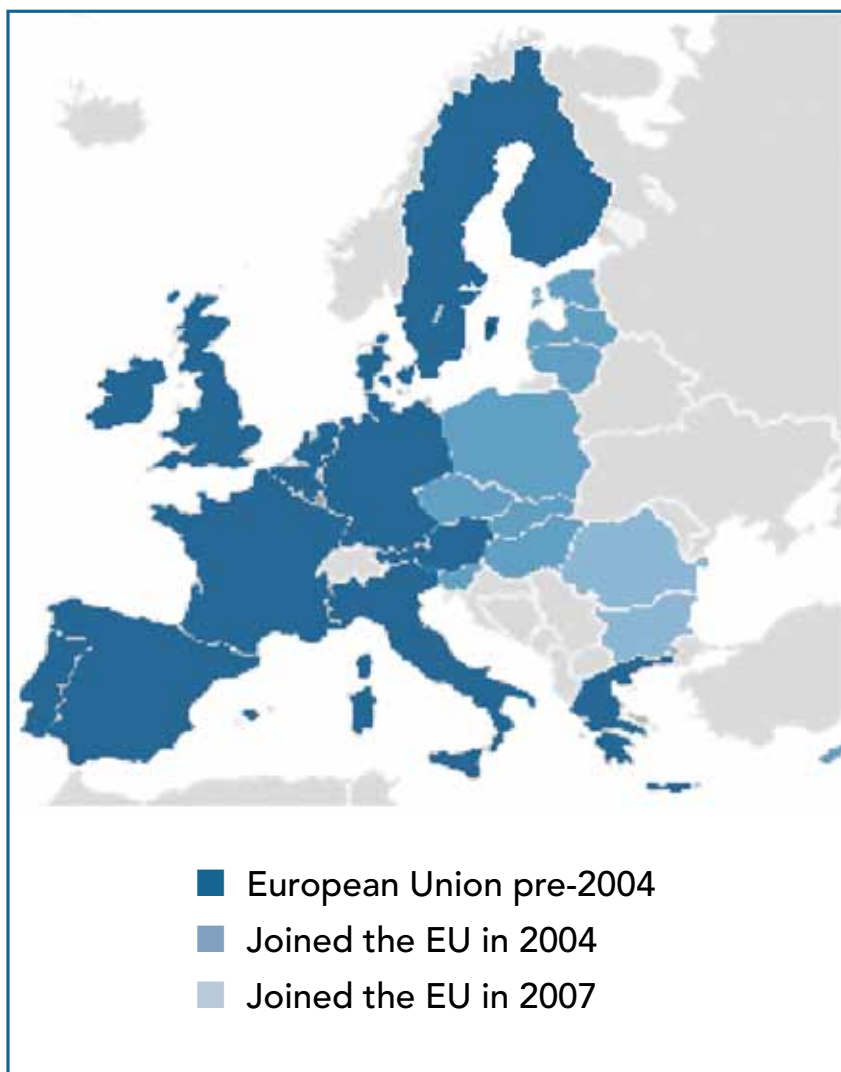


Figure 2. EU's enlargements in the 2000s.

EU is not a federation like the United States, nor is it simply an organization for cooperation between governments, like the United Nations. The countries that make up the EU (its member states) remain independent sovereign nations, but they pool their sovereignty to gain a strength and world influence they could not have on their own.

In practice, pooling sovereignty means that member states delegate some of their decisionmaking powers to shared institutions they have created so that decisions on specific matters of joint interest can be made democratically

at the European level.⁷ The EU's decisionmaking process in general and the codecision procedure in particular involve three main institutions:

- The European Parliament, which represents EU's citizens and is directly elected by them
- The Council of the European Union, which represents individual member states
- The EC, which seeks to represent and uphold the interests of the union as a whole

The EC is the EU's executive body. It drafts proposals for new European laws and manages the day-to-day business of implementing EU policies and spending EU funds. The commission monitors member states' compliance with European treaties and laws.

EU Freight Transportation System

Since the EU was formed, it was recognized that for the common European market to function smoothly an integrated transport system that allows the free movement of goods within EU territory was needed. This was acknowledged as a key element for the economic growth and territorial cohesion of the EU. However, the diversity of transport infrastructure, equipment, and regulation across member states was a barrier to the seamless transport of goods across Europe.

The concept of the Trans-European Transport Network (TEN-T), included in the Maastricht Treaty, made it possible to develop a plan for transport infrastructure at the European level with the help of EU funding. The Maastricht Treaty provided the legal basis for TEN-T, giving the EU the authority to establish guidelines covering priorities, identify projects of common interest, implement measures for interoperability and standardization, and provide support to projects with different financial tools.

During the Corfu European Council of June 1994, the EC agreed on a first list of 11 transportation priority projects. This list not only emphasized the concept of removing cross-border bottlenecks to facilitate traffic flows, but also the tendency of member states to prioritize projects of national importance. During the Essen European Council later that year, the project list was endorsed and extended to 14 projects known as the Essen Projects.

⁷ Europa, European Union Institutions and Other Bodies, http://europa.eu/institutions/index_en.htm.

In 1996, the EC initiated the Transport Infrastructure Needs Assessment (TINA) project with the aim of stimulating development of a multimodal transport network in EU accession candidate countries and defining the future Trans-European transport infrastructure network in the expanded EU. At the end of 1999, the TINA project was completed, and the final document estimated the necessary investments from 1998 to 2006 at about €87 billion.

With the imminent enlargement of the EU in 2003, the TEN-T policy was reviewed to cover the new member states. The result of the new policy was a set of 30 priority axes and projects, covering high-speed and conventional railways, road motorways, the "Motorways of the Sea," multimodal corridors, airports, inland waterways, and the Galileo navigation system.⁸ Figure 3 presents the 30 priority projects. These 30 projects are not construction projects, but road, railway, inland waterway, air, and multimodal corridors or axes.

The rationale behind creating an effective TEN-T is that it benefits all European citizens by allowing more efficient and environmentally friendly transport, while reinforcing economic and social cohesion across the continent. The European Council created the Directorate General for Energy and Transport (DG TREN), which is responsible for overseeing the TEN-T program. In 2006, the EC and DG TREN established the TEN-T Executive Agency (EA) to manage all projects that are part of the TEN-T program. In 2010 the DG TREN was split between energy and transport, with the transport function taking on the acronym DG MOVE (Directorate-General for Mobility and Transport). Figure 4 presents the relationship and functions of DG MOVE and TEN-T EA.

While DG MOVE ultimately decides which infrastructure projects are included in TEN-T and provides some funding for each project, it is ultimately up to individual national governments to fund a majority of the work done in their countries.

The relationship and coordination between member states and the TEN-T EA vary by country. For instance, in Hungary the Transport Ministry Managing Authority delegated its operational tasks to the Coordination Center for Transport

⁸ The Galileo program is Europe's initiative for a state-of-the art global satellite navigation system.

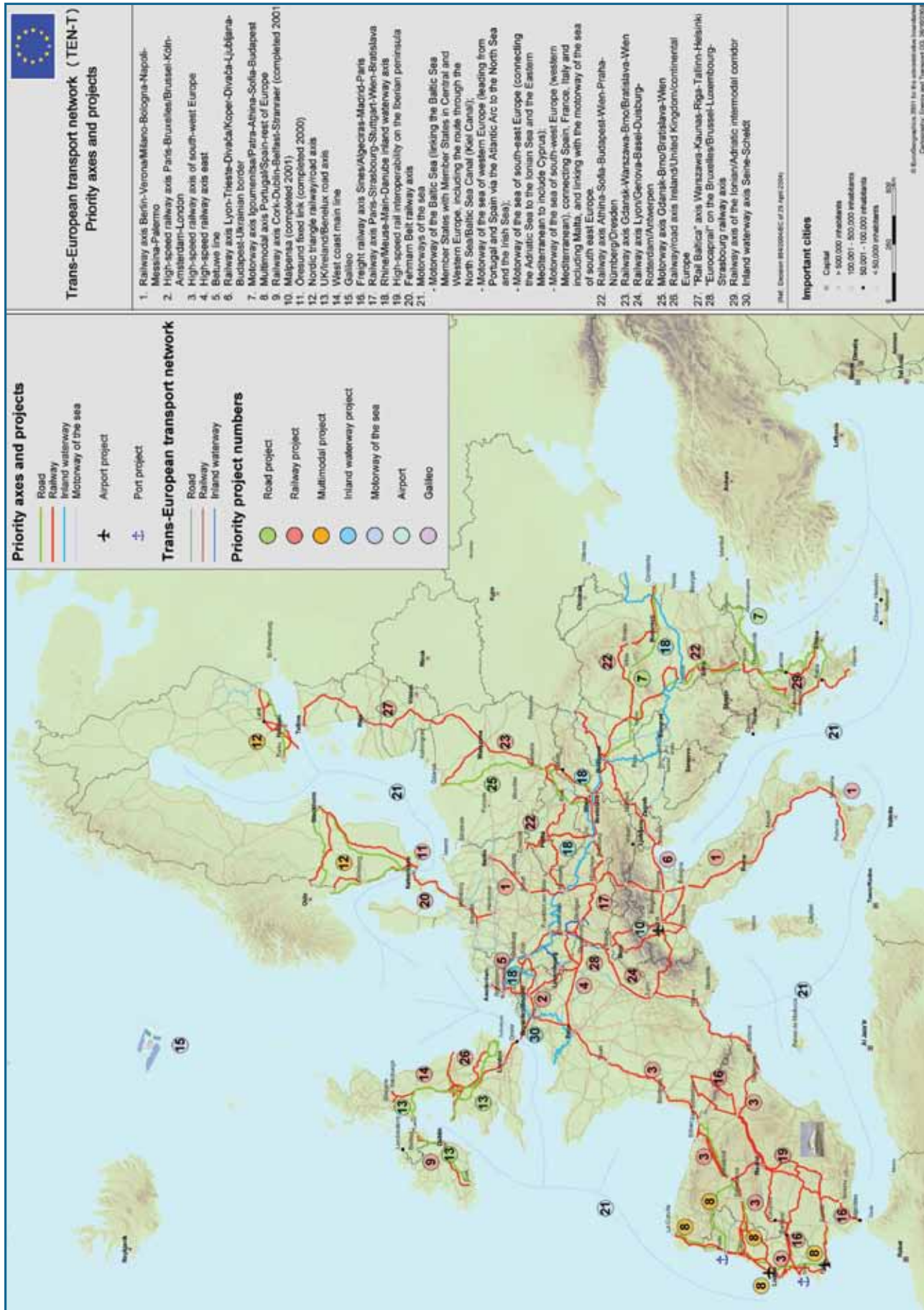


Figure 3. Trans-European Transport Network 30 priority axes and projects.

European Commission (DG MOVE): defines the policy	TEN-T EA: turns the policy into action
<ul style="list-style-type: none"> ■ Makes political decisions on the TEN-T program ■ Defines strategy, objectives, and priority areas of action ■ Makes the final financing decisions ■ Monitors and supervises the TEN-T EA 	<ul style="list-style-type: none"> ■ Implements the TEN-T program on behalf of the European Commission and under its responsibility ■ Efficiently manages the entire project life cycle, including the following: <ul style="list-style-type: none"> ■ Organizing calls and evaluations ■ Giving support to member states ■ Prepares financing decisions ■ Provides key feedback to the European Commission

Figure 4. DG MOVE and TEN-T EA functions.

Development, which manages the operational tasks related to TEN-T. Activities include the following:

- Management and supervision of ongoing projects
- Payments and financial issues
- Fund management and budgetary cases
- Contract management and problem solving
- Closing tasks and solving auditing requirements

Chapter 3: EU Freight Transportation Corridor Policies

The transport of freight, from raw materials to finished goods, is essential to economic activity and to the quality of life in the EU. It makes division of labor possible, allows economies of scale, and mobilizes comparative advantages. Effective transportation policy is fundamental to freight transport and key to European competitiveness.

Well-organized freight transport contributes to sustainable, energy-efficient operations and will strengthen cohesion by enabling businesses across the EU, including the peripheral regions, to have better access and draw more benefits from the internal market.⁹

Developing the EU's freight policies offers numerous challenges and opportunities:

Challenges

- Congestion in some parts of the European transport system negatively affects costs and time of transport and increases fuel consumption.
- Freight transport needs to further reduce its pollutant emissions and noise for the EU to meet its climate change targets.
- Freight transport is highly dependent on fossil fuels, a large proportion of which are imported.
- Transport safety and security need to be further enhanced.
- There are signs that transport and logistics-related industry sectors are having difficulty attracting qualified staff.

Opportunities

- The heterogeneity of the EU has increased with successive enlargements, and the new continental market requires swift implementation of updated logistics techniques and best practices across the union.

- Freight transport logistics has become an increasingly integrated and concentrated global market in which several European companies have established themselves as world leaders.
- The prospects of enhancing trade relations with countries outside the EU are relevant.
- Accelerated progress in information and communication technologies is revolutionizing the way freight transport logistics can be organized.

For the common European market to function smoothly, there is a need for an integrated transport system that allows the free movement of goods within EU territory. This is vital for economic growth and for territorial cohesion.

An integrated transport system clearly calls for harmonization of rules and interoperability of networks.

To address these challenges and capitalize on these opportunities, the European Commission is simultaneously launching a series of policy initiatives: the Freight Logistics Action Plan, the Communication on a Freight-Oriented Rail Network, and the Communication on an Integrated Maritime Policy for the European Union. These policy initiatives reinforce each other and constitute a policy agenda to improve the efficiency of freight transport in Europe. Together, they will make freight transport in the EU more efficient and sustainable. A common approach is being implemented with these characteristics:

- A focus on corridors and connecting the transport chains to and from neighboring countries and overseas
- Promotion of innovative technologies and practices in infrastructure, means of transport (such as vehicles, wagons (railcars) and vessels), and freight management
- Simplification and facilitation of freight transport chains and related administrative procedures

⁹The EU's freight transport agenda: Boosting the efficiency, integration, and sustainability of freight transport in Europe, COM(2007)606.

- Improvement of the quality of transportation services offered

Freight Corridor Policy

The TEN-T Guidelines are the EU's instrument for policy definition and network planning. Projects in the guidelines are of common interest and can be defined through their location on outline plans and/or through their characteristics. The guidelines, adopted in 1996 and amended in 2004, include two planning layers:

- A comprehensive network layer (outline plans for rail, road, inland waterway, combined transport, airport, and port networks)
- A second layer of priority axes on which certain sections are marked as 30 priority projects (i.e., selected projects of common interest)¹⁰

In 2009, the EC began a review of the TEN-T policy by publishing a green paper (CEC 2009d). A main objective of the review is to define how to shape the future multimodal network and ensure timely completion, with network planning as a key issue.

Some member countries argue that the priority project approach fails to capture additional network benefits. Therefore, one proposal is to evolve toward a priority network approach that would allow more systematic incorporation of the nodes, ports, and airports as the network's entry points and the main intermodal connection points that underpin strong network integration. Other recent developments in the TEN-T area focus on plans for linking TEN-T to neighboring countries outside the EU.

During the public consultation process on the green paper, more than 300 stakeholders expressed their views, most of them advocating the idea of an integral policy review. Stakeholders supported the commission's main directions for future policy development:

- Meet new political challenges, such as globalization, climate change, technological innovation, and social developments.

- Conduct a critical review of the TEN-T planning concept to strengthen its union dimension.
- Ensure a strong link between TEN-T and transport policy to facilitate efficient, safe, high-quality services across the transport modes.
- Strengthen the instruments to support completion of the network within the agreed timescale.

Key messages from stakeholders on the general policy framework included low carbon transport, territorial cohesion, and the need for a planning tool and not just a funding instrument. On TEN-T management and implementation, the consultation stressed the idea of maintaining continuity while ensuring greater commitment and effectiveness from all involved.

The planning structure and integration of transport and TEN-T policy area captured from the stakeholders call for defining a clear methodology and making connecting neighboring and third countries an important element. Of the planning options presented, stakeholders preferred the one with a dual transportation layer that includes a comprehensive network and core network.

Findings on Policy

The Trans-European Network concept serves as a unifying vision for the EU.

The discussions the scan team had with member state representatives clearly indicated that they understood and believed in the vision the EU adopted for the Trans-European Networks concept. This concept includes pan-European coordination of transportation, telecommunications, and energy. The scan team discussed the TEN-T with the member states and the EC. The TEN-T is undergoing a comprehensive review to place it on a firm market-based, analytic foundation. This is being done to improve the network and is a major undertaking for the EC and member states, a testament to the validity and member state buy-in of the overarching vision.

The long-term vision of the TEN-T is constant.

Although the EC and member states routinely experience leadership changes and successive EC presidents advance individual initiatives, the core policies of the TEN-T vision are steady. That the constancy of the long-term multimodal network vision has not caved to political pressures is a key attribute that helps attract private funding for transportation projects.

¹⁰ Commission Staff Working Document, TEN-T Policy Review—background papers, Brussels, Nov. 5, 2010, SEC(2010) 613 final, http://ec.europa.eu/transport/infrastructure/tent_policy_review/doc/1_en_document_travail_service_part1_v1.pdf.

Transportation infrastructure is a key national asset.

Each member state the scan team met with valued high-quality infrastructure as a key national asset and the TEN-T concept as a mechanism to increase EU competitiveness in a global market.

The strategic vision integrates transportation policy.

As reflected in the TEN-T approach, EU transportation policy brings a comprehensive vision to transportation development. The transportation policy is founded on three overarching objectives:

- Connectivity and access
- Economic development and commerce
- Environment and sustainability

Policy coordination affects outcomes.

Linking policies can bring greater efficiencies, but the lack of coherence can complicate implementation. Coherence, or the lack thereof, ultimately affects the outcomes and business practices of member states and their private sector partners.

For example, when Germany wanted to implement a cost recovery tolling system for its freeways, it integrated the truck's emission signature into the tolling scheme, coordinating sustainability and financing policy. As a result, the system now in place, Germany Toll Collect, generates annual revenues of €4.4 billion that are dedicated to transportation infrastructure (as opposed to fuel taxes, which go into the general fund). Because of its linkage of toll amounts to emissions—a 500-kilometer (km) trip costs €70 with newer, cleaner engines and €140 with older, dirtier engines—it has been instrumental in driving the fleet overhaul to cleaner engines. In just 5 years, the cleanest emission trucks rose from just 0.2 percent of trucks paying tolls to 56.7 percent.

In contrast, the EU has an expressed desire to move cargo from trucks to rail or water transport as a way of reducing energy consumption, emissions, and congestion. However, advancing this desire in the current policy framework that prioritizes passenger traffic on the EU rail system presents a range of challenges. As a result, freight rail works in the margins of the rail system and the volume of road transport stays stable.

A focused corridor-level system is needed.

The EU clearly recognized the need for a transcontinental freight network that is multimodal (water, rail, and highway). Member

states support EU efforts to identify the network because they understand the economic necessity of efficiently moving goods throughout the EU and globally.

While all member states endorsed and embraced the TEN-T concept, the original application of the TEN-T lacked the analytic and market-driven underpinning now desired. The original TEN-T implementation leaned toward a more individual project-based application and lost some of its corridor-based origins. Implementing connected projects in multiple states would be better served with a fresh look at the market, particularly with the 2004 expansion of the EU. Consequently the EU is revising the TEN-T based on an approach grounded in market fundamentals and analytics.

The new TEN-T will be a two-tier corridor network: core and comprehensive.

A **comprehensive network** would connect all member states' transportation networks to the core network. It would be a bottom-up approach performed primarily by the member states and used to serve them and regional interests.

Using the concept of a comprehensive network enables every member state to see itself in a larger system. There is a need to identify the criteria that can be used across all member states to determine inclusion in the comprehensive network.

The comprehensive network will include road, rail, inland waterways, ports, and airports and will include upgrading the existing network through the following:

- Upgrading of maps according to progress of implementation since the last revision
- Addition of missing links to close gaps, mainly in new member states
- Removal of dead ends or isolated links if not specifically justified
- Further discussion on ports and airports

Proposals for the comprehensive network will come mainly from member states, taking into account that the core network will be a subset of the comprehensive network. The comprehensive network may form the foundation for other important EU policy considerations, such as cohesion policy, and regional funds. Figure 5 (see next page) presents the roadway Trans-European Transport Network Outline Plan to the year 2020.



Figure 5. Trans-European road comprehensive network.

The **core network** will be anchored on key nodes—population centers and freight generators (e.g., maritime ports, border crossings) and the links that connect them. This concept could be advanced without defining physical corridors (e.g., a particular roadway or rail line), but by identifying that a linkage between two nodes is a key conduit for people and/or goods without defining specific modal infrastructure. This will allow flexibility at the member state level, but will most assuredly require coordination across multiple nodes and modes. This approach enables clustering ports that are in proximity as a single node on the core network and corridors that could encompass more than one mode (highway and rail).

The core network (a subset of the comprehensive network) will be determined using a top-down approach anchored by the following principles:

- Ground the corridor identification in market fundamentals, solid analytics, and hard facts.
- Correspond to the long-term needs of the EU and remain stable over a reasonably long period.
- Be multimodal and coherent, benefiting all or large regions of the EU.
- Be made up of nodes and links of high strategic importance and include the main ports and airports (gateways).
- Reflect the main long-distance and international traffic flows (existing and potential).
- Be linked to infrastructures beyond EU member states.
- Harmonize the system across technology and operations.
- Make the best use of existing infrastructure.
- Expand the transportation system only where necessary.
- Include the “Motorways of the Sea.”
- Include supplementary infrastructure measures.
- Allow investment needs and projects to be derived top-down.

The market-based approach will rely on a benefit-cost analysis that will be modified into a multicriteria analysis process to enable inclusion of societal goals. How each criterion will be weighed has not been defined. Resolution of the criteria and the weighting is key to obtaining buy-in.

A key issue raised in discussions on this approach was how to balance the established trunk lines that have volume concentrations, economies of scale, and channelization of flows and move current economic volumes on existing infrastructure with the need for flexibility, redundancy, and new growth patterns to new and emerging markets.

EU funding will focus on the core network, and many member states see identifying and resolving critical bottlenecks as an important output of the process used to establish a core network. Planning the core network will be based on main nodes that will serve as vertices or cornerstones that will define the network polygon, with intra- and intermodal interfaces. The nodes will be the following:

- Cities:
 - Member state capitals
 - Other big cities (e.g., mega-cities, city clusters)
- Gateway ports, port clusters, roll on-roll off (RoRo) ports, and Motorways of the Sea ports:
 - Main entrance and connection points for freight
 - Linkage of relevant passenger ferries
 - Main nodes when not part of main city nodes
- Hub airports:
 - Main entrance points for passengers (and air cargo)
 - Connected with rail network (local and regional access), with high-speed rail replacing short-distance flights
 - As parts of city nodes in all cases, with no main nodes on their own

Figure 6 (see next page) shows member state capitals, candidate countries, and port clusters—RoRo logistics centers and Motorways of the Sea ports.

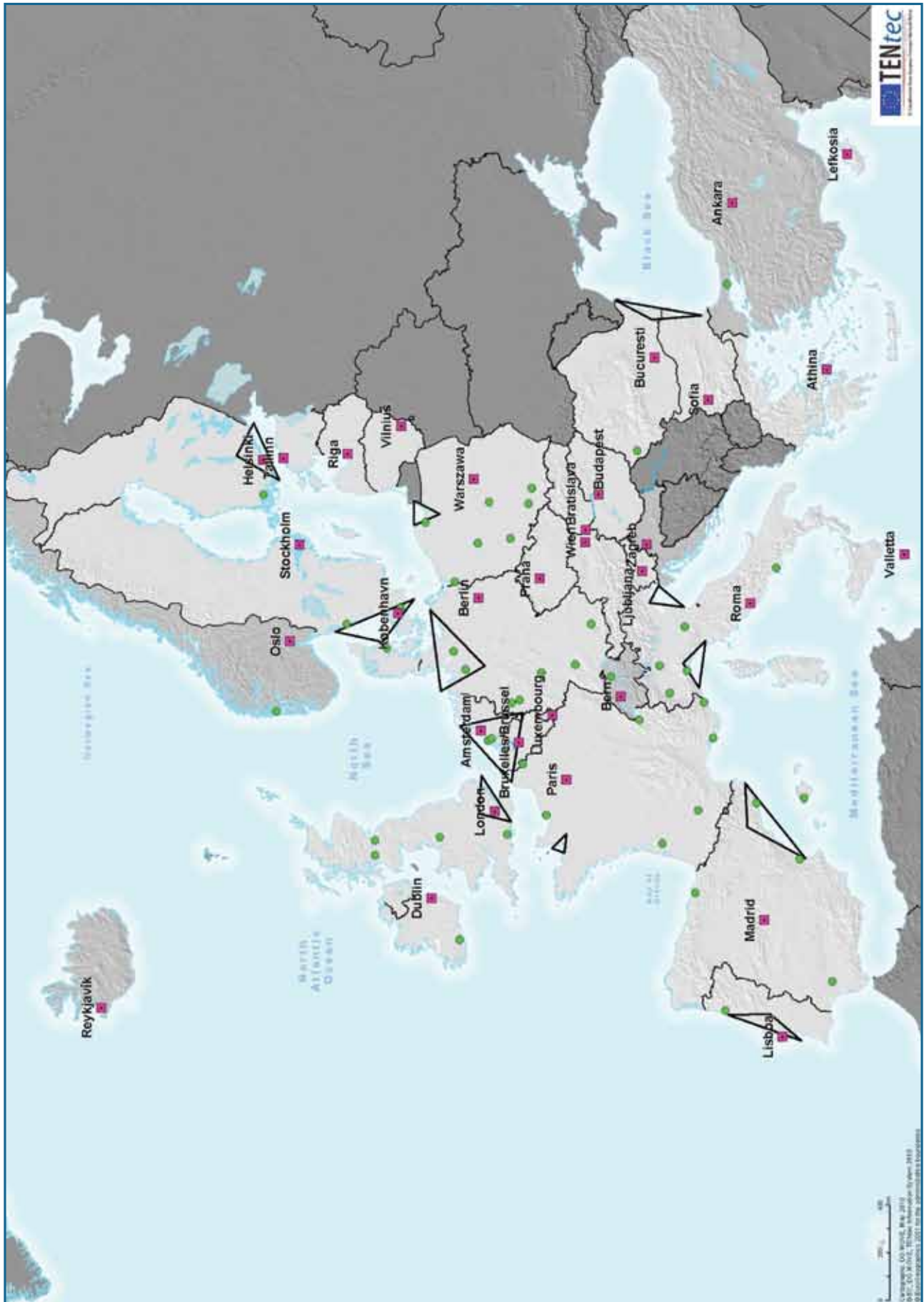


Figure 6. Core network possible city nodes and port clusters.

Chapter 4: Planning Processes

TEN-T EA assures the technical and financial implementation and management of the TEN-T program.¹¹ In 2008, the mandate establishing this independent agency was extended until December 31, 2015.¹²

TEN-T EA manages key transport infrastructure projects from the 2000–2006 and 2007–2013 financial perspectives in collaboration with its parent, DG MOVE, which remains responsible for the overall policy, programming, and evaluation of the TEN-T program. TEN-T EA operates as an intermediary between the EC and EU member states. TEN-T EA goals include the following:

- Simplify administrative procedures.
- Reduce payment delays and reaction time on requests.
- Use new project management techniques and information technology tools (i.e., geographic information system, statistical data).
- Increase the types of services available and target information flow to project promoters, member states, and the commission.
- Focus on public-private partnerships.
- Improve the visibility of EU support to infrastructure projects through dissemination activities.

Planning the TEN-T network created a European multimodal planning process for infrastructure development, which had not existed in all member states. In practice, however, planning the network has essentially meant combining significant parts of national networks for different modes and connecting them at national borders. While certainly appropriate in the early days of TEN-T policy, this approach became progressively weaker with each enlargement.

¹¹ Europa, Agencies of the European Union, http://europa.eu/agencies/executive_agencies/ten-t/index_en.htm.

¹² Trans-European Transport Network Executive Agency, History and Legal Framework, http://tentea.ec.europa.eu/en/about_us/mission__introduction/history__legal_framework.htm.

Member states' sovereign responsibility in infrastructure planning and implementation on their territories, including the question of how national planning can be combined with European-level planning that takes account of objectives outside each member state's perspective, becomes more relevant as the EU expands and networks become increasingly complex.¹³ The scan team observed different perspectives from countries that joined the EU at its inception and countries that joined recently.

Key Findings on Planning

The project application process is transparent and well defined.

TEN-T EA is responsible for coordinating and managing the project application and review process for TEN-T projects to assure transparency and accountability.

TEN-T EA evaluates and selects projects that request EU funding, and it reviews the projects against a clearly defined and well-vetted set of criteria. The selection process is supported by independent external experts, whose role is to ensure that only the highest quality proposals that best meet the award criteria described in the relevant work program and call for proposal are selected for funding.

Proposals that meet the eligibility criteria specified for a call are evaluated on the basis of the criteria defined in the work program and call for proposals. Essentially, these relate to the following:

- Relevance to the TEN-T priorities and policy objectives
- Maturity
- Impact—particularly on the environment
- Quality—completeness, clarity, soundness, and coherence

¹³ Position paper of the European Transport Coordinators on the Future of TEN-T Policy, Oct. 6, 2009, http://ec.europa.eu/transport/infrastructure/european_coordinators/doc/2009_10_06_position_paper_coordinators_future_tent_en.pdf.

The selection process also includes an independent observer, who provides advice and recommendations to the agency on the following:

- Conduct and fairness of all phases of the evaluation
- Ways experts assess the evaluation
- Any improvements that could be put into practice immediately or in the future

The independent observer may not express views on the proposals under assessment or the experts' opinions on the proposals. The agency invites successful applicants to enter into negotiations. If agreement is reached, individual commission decisions are established to support individual projects.

Planning processes at member states vary.

Many of the states visited had detailed project prioritization and selection criteria that relied on data to assist in the selection of the most effective transportation projects. These processes take the TEN-T into consideration at varying levels, mostly as a function of the level of funding available from the EU in either TEN-T funds or Cohesion Funds.

For example, Hungary, which joined the EU in 2004, has a favorable geographic location in relation to missing sections

of the European transportation network. Objectives of road sector development in Hungary, based on the Unified Transport Development Strategy, include the following:

- Create missing international and national road connections and raise the standards of the services provided by existing ones.
- Raise the standards of the services provided by road network links of regional functions and expand capacities to eliminate bottlenecks.
- Strengthen the underlying structure of main and secondary roads, including road reconstruction and improvement.

The EU transportation policy guidelines serve as input to the Hungarian transportation policy and development plan. Figure 7 shows the Hungarian process for developing the expressway network.

Germany provided the most detailed explanation of its focus on scenario planning and evaluation based on accessibility, safety, environment, and investment cost. The process of developing a plan may take 5 years. Germany is developing the new Federal Transport Infrastructure Plan that will be finalized in 2015, and a new project evaluation methodology and new forecasts. Its

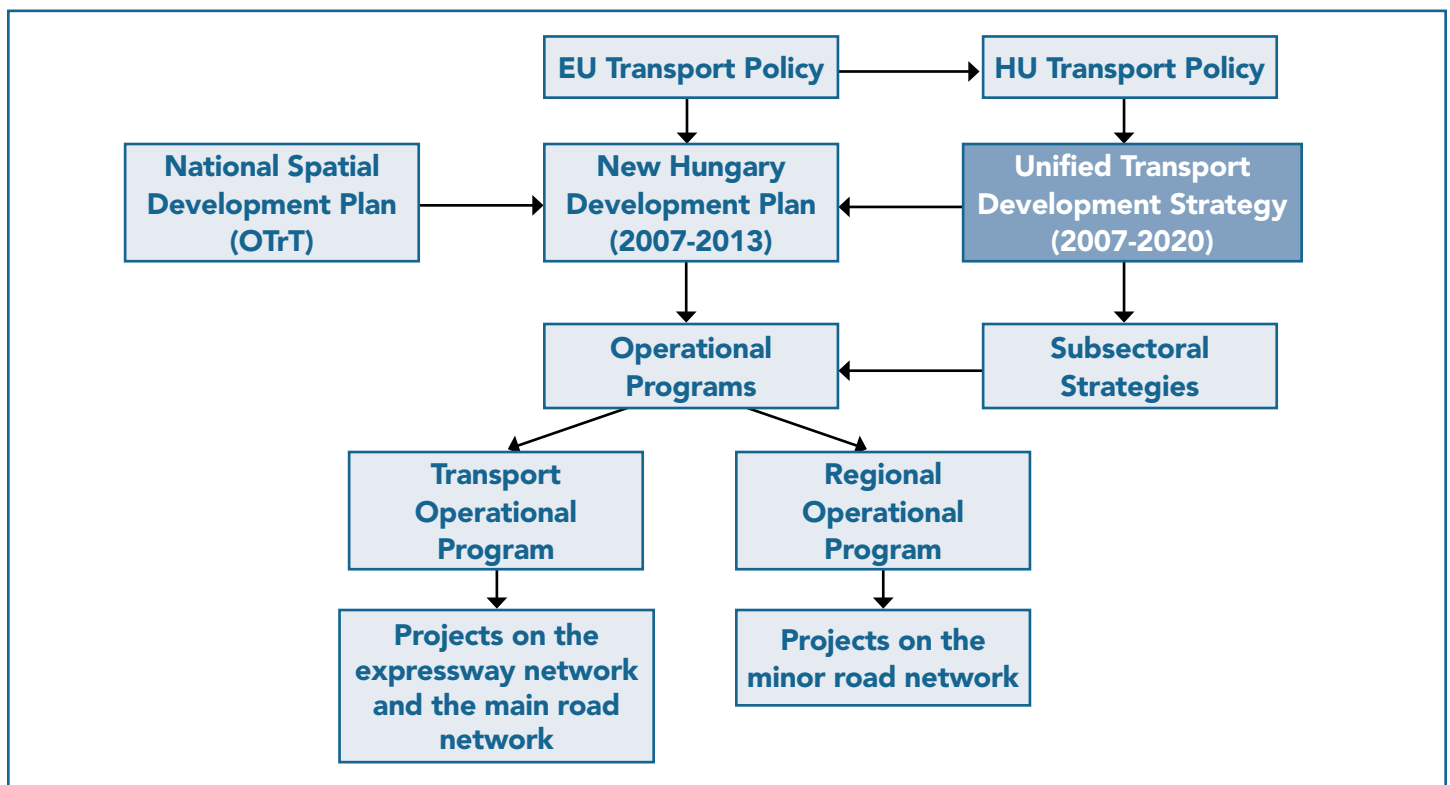


Figure 7. Development process for Hungarian expressway network.

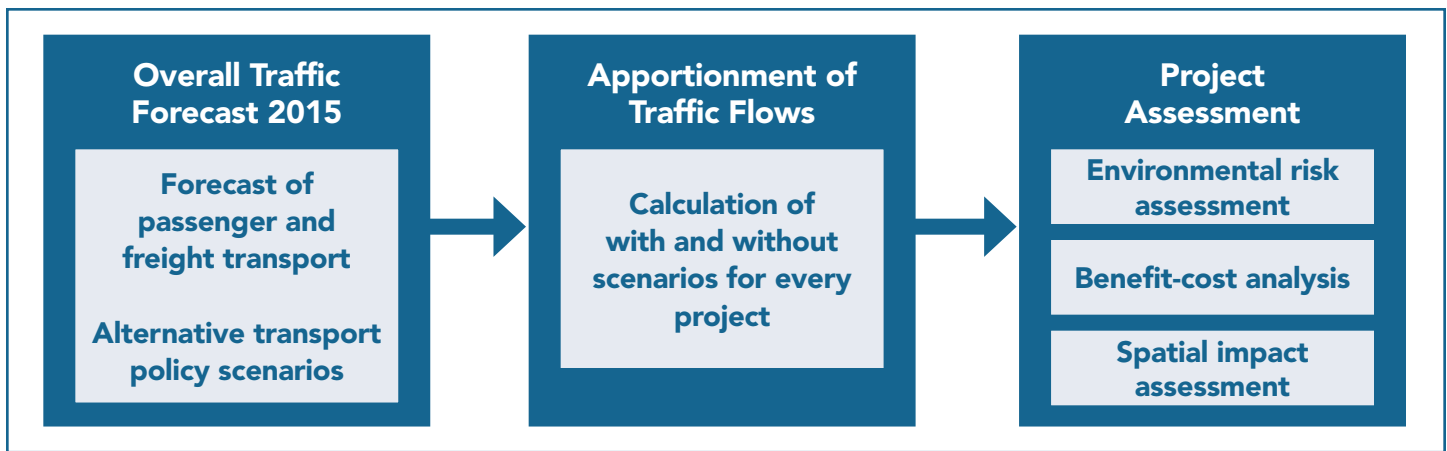


Figure 8. Components of the evaluation process of the German Federal Transport Infrastructure Plan.

priorities are to maintain existing infrastructure first, upgrade congested links (“debottlenecking”) second, and add new physical capacity last. Figure 8 shows the main components of the evaluation process.

In December 2010, the German Ministry of Transport, Building, and Urban Development published the *Freight Transport and Logistics Action Plan—Logistics Initiative for Germany*. The plan realigns the German government’s Freight Transport and Logistics Master Plan, which was prepared in the last parliamentary term, to address current challenges. This plan sets the stage for a sustainable and efficient logistics and freight transport system in Germany.

Aligning member state priorities and EU priorities is a challenge.

EU founding member states need to balance constructing new infrastructure for economic development and maintaining existing infrastructure. As is the case in the United States and Germany, the priority is to maintain existing infrastructure, and that continues to consume large amounts of available funding. Member states that joined in 2004 or 2007 are focused on network expansion, particularly their road networks. They are concerned that once the network is constructed all maintenance funding will be the responsibility of member states with no EU support (mirroring the concern of many States in the United States), and their ability to price their networks are subject to EU constraints on tolling amounts that are in place to maintain some degree of uniformity across the EU.

The EU has an established policy position to shift freight from road to rail or water. The new member states have extensive rail networks, but they are not in good repair. Representatives of two new member states said their priority is to expand their

road networks because that is what their populations demand as they begin to enjoy the benefits of a rising economy. This comes at the cost of not putting available transportation dollars into their rail systems and highlights the challenges of harmonizing EU and national priorities and realizing the EU policy goal of shifting freight transport from road to rail or water.

EU financial support targeted key sections of the priority axes that include cross-border sections or major bottlenecks with cross-border implications. Cross-border sections are eligible for an up to 30 percent match from TEN-T funds, while projects in member states can receive, at most, a 20 percent match. Founding member states acknowledge the importance of resolving cross-border bottlenecks, but point out that bottlenecks within member states can be just as restrictive to network or corridor flow as those at the border. Several member states suggested that more funding, or comparable match rates, be used to incentivize repair of bottlenecks anywhere along the axes, including within states, not just at border crossings or projects with cross-border implications. This would bring EU and national priorities into better alignment.

The scan team discussed the following transportation issues with the EC and member states:

- Corridor 1, Berlin-Verona/Milano-Bologna-Napoli-Messina-Palermo (figure 9, see next page), is a focus of the EU. This corridor runs through Austria and requires the construction of an €8 billion tunnel through the Alps. From a national perspective, this has limited value to Austria and poses some environmental challenges for the country. TEN-T funding for the tunnel is limited, with the bulk of the cost borne by Austria. Aligning the

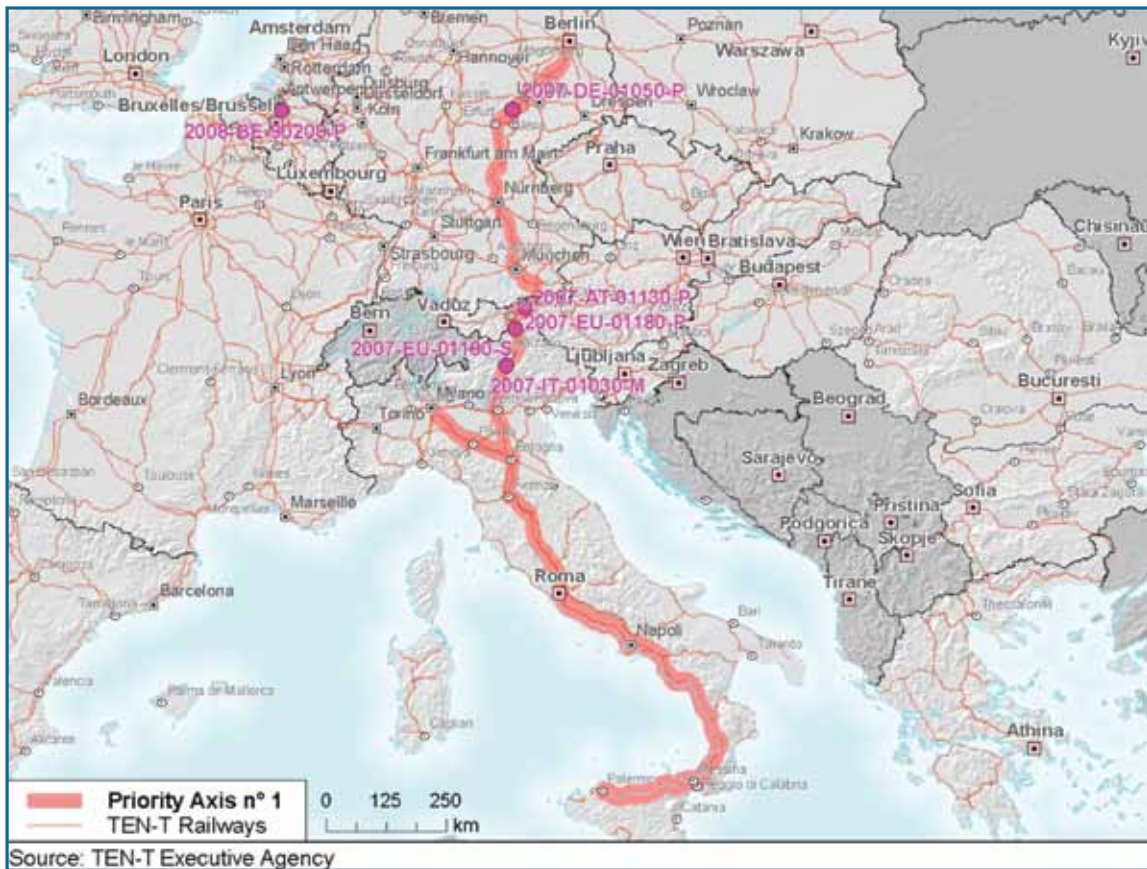


Figure 9. Corridor 1: Berlin-Verona/Milano-Bologna-Napoli-Messina-Palermo.



Figure 10. Hungarian long-term development plan of the expressway network (2034).

priorities and funding commensurate with those priorities and with each jurisdiction's benefits and costs continues to be a challenge and a lesson for North America.

- Hungary has a radial road network with Budapest as the hub. The Hungarian government wants to integrate that radial network with ring roads between the spokes to improve national connectivity (figure 10). The EU priority is to improve the capacity of the spokes to the borders to improve EU connectivity, and this is where the EU Cohesion Funds can be used. From the perspective of the Hungarian population, both the spokes and the radial ring roads are equally important in the long term.
- Poland is aligning a good deal of its transportation infrastructure eastward and southward because many of those countries were and still are important trading partners. Other new member states are also aware of the trading advantages and opportunities they have with the Commonwealth of Independent States.¹⁴ This alignment establishes EU connectivity with their trading partners to the east and serves not only the EU, but the member states (figure 11).
- For many founding member states, the level of TEN-T funding for EU priorities is such that it does not factor heavily into their national transportation plans. In Germany, for example, EU funding amounts to potentially 2 percent of its annual transportation budget. Since TEN-T fund is competitive, even that small percentage cannot be counted on as a stable source of funds. Consequently, national priorities take precedence.



Figure 11. Polish east and south corridor connections.

¹⁴ The Commonwealth of Independent States is a regional organization whose participating countries are former Soviet Republics, formed during the breakup of the Soviet Union.

Chapter 5: Sustainability of Freight Transportation

In 2001, the EC presented a 10-year strategy on sustainability in the transport sector. The strategy focused predominantly on balancing different modes of transport, harmonizing legislation in specific sectors, and enhancing transport safety. But an enlarged EU, under pressure from accelerating globalization, high oil prices, and transport-targeted terrorist attacks, is looking at adapting its initial strategy.

Because of its potentially detrimental impact on the environment and public health, the transport sector poses one of the greatest policy challenges for sustainable development in the EU. Transportation activity is a major user of nonrenewable energy resources. In the EU, the transport sector is responsible for 31 percent of energy consumption.

Road transport is the dominant mode of transport in the EU and contributes the most to greenhouse gas emissions, accounting for about 84 percent of CO₂ emissions from transportation.

To reduce the environmental impact caused by the prevailing trend to use road and air transport and to address increasing congestion problems, the EU wants to promote alternative modes of transport. The 2001 *White Paper on Transport*¹⁵ set 2010 as the deadline for restoring the balance between road and other transport modes to the 1998 level, but with the continued rise in road transport, the EC is looking at other tools to promote a more sustainable transport policy.

Some proposed measures on freight transportation include the following:

- **Promote comodality.** The EU wants to achieve better integration of different transport modes into efficient logistics chains to allow an optimized use of all modes that will reduce congestion. An important part of this program will be enhancing technical harmonization and interoperability across systems by reinforcing the position of railways, boosting maritime transport, and reviving the inland waterways transport system.

- **Develop infrastructure charging.** Charges on infrastructure aim to improve the management of freight transport and reduce transport's environmental impact while generating funds for investing in new infrastructure. The EC is also preparing a model for calculating and internalizing external costs that will apply to all modes of transport.
- **Promote the use of cleaner cars and fuels.** Cars represent 10 percent of all EU CO₂ emissions. Until now, the commission's strategy for reducing CO₂ emissions has been based mainly on voluntary commitments from the car industry, but the target of limiting CO₂ emissions from passenger cars to 120 grams per kilometer by 2010 is still far off. In February 2007, the commission proposed introducing binding targets.

Inland Waterways

Even though inland waterway transport is energy efficient and quiet and takes up little space, the capacity of the inland waterways in the EU is considerably underused in terms of infrastructure and vessels. The inland waterway system could handle much greater volumes of traffic, but is unable to do so, according to the EC, because national infrastructure investment policies give priority to other transport modes without maintaining the inland waterways and eliminating network bottlenecks.¹⁶

In addition to investment issues, the use of the water for transportation purposes must compete with other uses, such as human consumption and agricultural demand. To address these issues, the EU developed **N**avigation and **I**nland **W**aterway **A**ction and **D**evelopment in **E**urope (NAIADES). The NAIADES program focuses on five strategic interdependent areas for a comprehensive inland waterway transport policy: market, fleet, jobs and skills, image, and infrastructure. It includes recommendations for actions between 2006 and 2013 by the EC, member states, and other parties.

In the market area, the plan calls for expanding services to offer reliable door-to-door inland navigation services integrating

¹⁵ EuroActiv, *White Paper on Transport*, www.euractiv.com/en/transport/white-paper-transport/article-129628.

¹⁶ Transport Policy for the European Union (2001), *White Paper—European Transport Policy for 2010: Time to Decide*.

inland navigation in the transport logistics chains. The plan is also trying to attract new markets by encouraging cooperation with freight forwarders, the shipping industry, and ports.

In the image area, the plan recognizes that the inland navigation sector has not kept pace with logistics and technological performance, so inland navigation as a successful business partner needs to be promoted. This is a joint responsibility of the industry, politicians, and administrations at national and European levels.

Even though the larger part of the 36,000 km (22,500 miles) of the waterway network has ample free capacities, several bottlenecks caused by limited draught, bridge clearance, and lock dimensions hinder its full use and reduce the competitiveness of the inland waterway system. The infrastructure area of the plan calls for improving and maintaining waterway infrastructures and transshipment facilities and implementing the River Information Services to support the planning and management of traffic and transport operations.¹⁷

Key Findings on Sustainability

Transportation policy has a strong linkage to environmental, social, and sustainability aspects.

The EU and the member states have a strong environmental ethic. Collectively, they appear to support not only meeting environmental regulations, but exceeding them. In their view, global warming is a serious threat to their economic well-being and they are taking concrete steps, such as enacting tolling and taxes that take into account environmental performance. “Decarbonization” was a term member state representatives repeated often.

The freight system vision of the EU fully supports this view and has environmental sustainability as one of its underlying tenets. In all the countries the scan team visited, this theme was evident.

¹⁷ Communication from the Commission on the Promotion of Inland Waterway Transport “NAIADES” — *An Integrated European Action Programme for Inland Waterway Transport*, (SEC(2006) 34).



Figure 12. Danube inland waterway system.

Aligning theory and practice is always a challenge.

Good alignment:

- Germany’s Toll Collect system links toll amounts to emissions, so a 500-km trip costs €70 with newer, cleaner truck engines and €140 with older, dirtier engines. This linkage has been instrumental in driving the truck fleet overhaul to cleaner engines. In just 5 years, the cleanest emission trucks rose from just 0.2 percent of trucks paying tolls to 56.7 percent.
- The Port of Rotterdam is expanding by 2,000 hectares, of which 1,000 will be available for land lease. New terminal leases require outbound cargo to have a mode split of 35 percent truck, 45 percent barge, and 20 percent rail—a requirement from the Netherlands Environmental Agency to gain environmental clearances

for port expansion. As existing terminal leases are up for renewal, this modal split will be part of negotiations.

Challenging alignment:

- The European Commission has a policy position to move cargo from trucks to rail or water transport as a way to reduce energy consumption, emissions, and congestion. However, this is an endeavor with considerable challenges:
 - Passenger traffic is prioritized on the EU rail system. As noted in this report, a number of operational and infrastructure impediments (e.g., gauge, electrification, and signalization) need to be addressed before freight rail can realistically absorb sufficient volume to realize the desired modal shift from road to rail. As a result, freight rail continues to work in the margins of Europe's rail system.
 - Many of the newly admitted member states have extensive rail networks. These networks are not in good repair, but the infrastructure is in place. Before they joined the EU, their economies were based more on commodities and manufacturing that used rail transportation. Their road networks were not well developed because the price of cars and fuel was beyond what many could afford. Their economic status changed on accession, and their populations now wish to expand the road networks and increase their mobility. This expansion comes at the expense of an extensive rail network that remains in a state of disrepair.

Chapter 6: Funding Structure

The largest proportion of funding for transportation infrastructure projects in the EU comes from each country's general revenues. Some countries, such as Germany, have additional revenues from tolls on heavy vehicles. In Germany, tolling on heavy vehicles generated €3.6 billion in 2009.¹⁸

Funding of TEN-T projects draws mostly from the national budgets of member states (€196 billion in 2007–2013), while the EU contribution is provided through the TEN-T program (€8 billion) and the Cohesion and Structural Funds (€47 billion). (See “Cohesion Fund for Transportation Projects.”)

The dedicated budget for TEN-T projects has been growing, but it is still a small portion of the overall cost. The cost of the 30 priority axes is about €250 billion, while the TEN-T budget has grown as follows:

- 1995–1999: €1.875 billion
- 2000–2006: €4.16 billion
- 2007–2013: €8 billion

Different rules apply to different instruments. Funding under the Cohesion and Structural Funds can go up to 85 percent in eligible member states (cohesion countries). It is capped at 30 percent for TEN-T program infrastructure works involving cross-border sections and 50 percent for studies.

The TEN-T program is under direct management, which means the EC selects projects to support in line with TEN-T policy priorities. The Cohesion and Structural Funds are under shared management, which means member states choose the transport projects to finance after the commission agrees to the overall budget of a given program.

EU funding support includes mainly grants (TEN-T program, Cohesion and Structural Funds) or loans and guarantees from the EIB and is expected to amount to about 36 percent of total TEN-T costs for 2007–2013 (figure 13 on page 31). The proportion of national funding for TEN-T projects and the

relatively low rate of community cofinancing available outside cohesion countries has often resulted in stronger national priority-setting than EU priority-setting.

The EIB has increased its lending activity to TEN-T projects from €7.9 billion in 2007 to €10.7 billion in 2010. In addition to EIB loans for TEN-T projects, the EIB participates in several joint initiatives with the EC, contributing not only funding, but also knowledge and best-practice sharing, marketing, and administrative support.

Public-Private Partnerships

Public-private partnership (PPP) arrangements have increased recently for key transport infrastructure in the EU. The constraints on public budgets in the aftermath of the financial crisis have emphasized the reality that public authorities are not in a position to provide for constantly growing infrastructure needs. Consequently, many governments pursue the use of alternative models, characterized by increasing private sector participation, to leverage the comparative advantage of the private sector to implement infrastructure projects that otherwise would be unaffordable.

However, PPP arrangements are complex and more difficult to set up than traditionally procured projects. Key to successful PPPs are appropriate design output specifications and risk allocation to give private partners the opportunity to generate profit in line with their allocated risks.

Lack of a balanced funding strategy at the EU level, encompassing both member state and community contribution and integrating fully private sources, is a major impediment to the completion of the TEN-T network. This situation must be compared with investment needs, which remain considerable. It was estimated that completing 50,000 km of road axes and 50,000 km of freight and passenger rail axes will cost about €10 billion a year for 25 years.¹⁹

Private sector financing is quite developed in Europe and has long been used for infrastructure projects on the TEN-T. PPPs

¹⁸ “Financing of Transport Infrastructure in Germany,” presentation by Julia Paul, Division UI21, Federal Ministry of Transport, Building, and Urban Affairs, September 2010.

¹⁹ *Traffic Flow: Scenario, Traffic Forecast, and Analysis of Traffic on the TEN-T, Taking Into Consideration the External Dimension of the Union, Final Report*, December 2009, http://ec.europa.eu/transport/wcm/infrastucture/studies/2009_12_ten_connect_final_report.pdf.

Cohesion Fund for Transportation Projects

What is the Cohesion Fund?

The Cohesion Fund is a structural instrument that helps member states reduce economic and social disparities and stabilize their economies. Since 1994, the Cohesion Fund has financed up to 85 percent of eligible expenditure of major projects involving the environment and transport infrastructure. This strengthens cohesion and solidarity in the EU.

Who is eligible?

A member state is eligible for Cohesion Funds if it has the following:

- Per capita gross national product, measured in purchasing power parities, of less than 90 percent of the EU average
- A program leading to fulfillment of the conditions of economic convergence in Article 104c of the treaty establishing the European Community (avoidance of excessive government deficits)

All new member states (Bulgaria, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Romania, Slovakia, and Slovenia), as well as Greece and Portugal, qualify for the Cohesion Fund. Spain is also eligible for the Cohesion Fund, but on a transitional basis (so-called “phasing out”).

Cohesion Fund support is conditional. Funding granted to a member state can be suspended if the country fails to comply with its convergence program for economic and monetary union (stability and growth pact), such as running an excessive public deficit. Until the deficit has been brought back under control, no new projects might be approved.

Projects establishing or developing transport infrastructure identified in the TEN-T guidelines are eligible for the Cohesion Fund. There must be an appropriate funding balance between transport infrastructure projects and environmental projects.

How are Cohesion Fund projects managed?

Member states submit applications for financing to the European Commission, which generally decides on funding within 3 months. The proposals must include key elements explaining what is proposed and why, the feasibility and financing of the project, and the impact it will have in socioeconomic and environmental terms. All projects must comply with community legislation in force, in particular rules on competition, the environment, and public procurement.

The total EU assistance rate cannot exceed 85 percent of public or equivalent expenditure and depends on the type of operation to be carried out. For projects that generate revenue, the support is calculated taking into account the forecasted revenue.

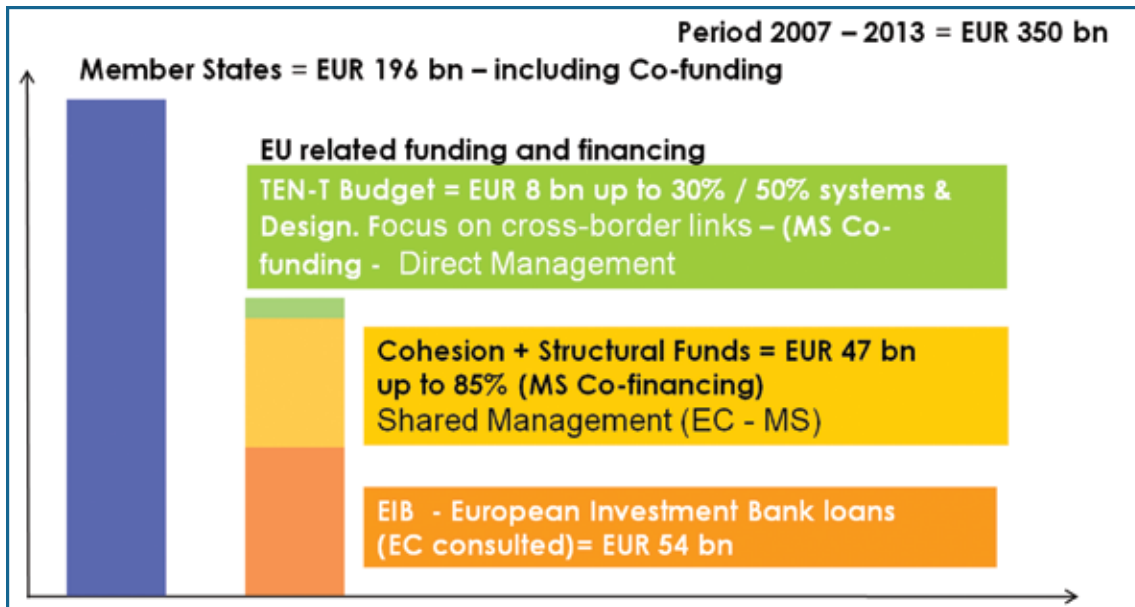


Figure 13. TEN-T funding and financing framework (2007–2013).

have been tested in many forms and shapes since the late 1980s, and the European PPP Expertise Centre (EPEC) was formed as a joint initiative of the EIB, European Commission, EU member states, and candidate countries. EPEC's mission is to strengthen the ability of the public sector to engage in PPP transactions by helping members share experience, expertise, analysis, and good practices.²⁰

Road Charging

In 2008, the EU developed a proposal to establish a model for assessing the external costs of transport, such as pollution and congestion, to serve as the basis for calculating infrastructure user charges.²¹ The goal of the proposal is to set transport prices correctly so they better reflect the costs of the actual use of vehicles, trains, planes, or ships in terms of pollution, congestion, and climate change.

Given the road sector contribution on traffic and emission, the proposal calls for charging tolls that vary according to the distance traveled, the location, and the time of use in proportion to the external costs caused by vehicles. The proposal's objective is to encourage member states to implement differentiated charging to improve the efficiency and environmental performance of road freight transport. It seeks to amend the 1999 directive to establish a framework that enables member states to calculate and vary tolls based on the costs of traffic-

²⁰ European PPP Expertise Centre, www.eib.org/epec/index.htm.

²¹ Proposal for a Directive of the European Parliament and of the Council amending Directive 1999/62/EC on the charging of heavy goods vehicles for the use of certain infrastructures (SEC(2008) 2208) (SEC(2008) 2209).

based pollution and congestion in a way that is compatible with the internal market.

EU member states use several approaches to levy road freight transport, including a mix of taxation instruments (fuel and vehicle taxes) and user charges to recover infrastructure costs. The most common time-based fee is the Eurovignette.²² Other instruments are typical tolls based on distance levied on individual road sections or the full primary network.

EU has a cap on toll fees for all member states, unless a state can directly substantiate a higher toll based on the cost of facility maintenance and operation. EU is also working to harmonize tolling systems as well as the rates—Global Positioning System, sticker (vignette), radio frequency identification, etc. The European Electronic Toll Service is being developed with the anticipation that it will eventually enable road users to easily pay tolls through one system throughout the EU.

Germany introduced a distance-based toll for all trucks of 12 tons gross vehicle weight and above to redistribute these costs to all users—from inside and outside Germany. Toll Collect is the company that, acting on behalf of the Federal Republic of Germany, developed and operates the toll system capable of calculating and collecting road use charges based on the distance traveled. The system uses a global navigation satellite system.²³

²² A vignette or sticker based on an agreement between several member states that gives access to the network on each other's territory.

²³ Detailed information is at www.toll-collect.de/frontend/HomepageVP.do;jsessionid=43AAD1D5F10F0DA4CC2D64D39FE7F7E2.app02.

Key Findings on Funding

Multiple funding sources are available to meet project needs.

Many projects have financial plans that are made up of multiple sources and partnerships among government, private, and quasigovernmental entities (government-owned companies) and that represent a mix of grants, bonds, loans, user fees (tolls), and taxes.

Capitalization via the states was used to start the EIB, but it has since significantly expanded to the point that EU member states no longer contribute to its capitalization or administration; it is a self-sustaining entity. It now provides a flexible and useful approach to funding corridor development. As a policy bank, it incorporates societal goals into its project-selection criteria (e.g., all highway projects EIB funds must have a road safety audit) while maintaining a hard-nosed analytical rigor in its project review. EIB retains its own staff of professionals to perform project reviews.

EIB is the foremost funder of PPPs in the EU. It is limited to funding no more than 50 percent of a public or private sector project. When EIB is engaged in a private sector project, the private sector must be willing to assume the risk in two of three risk areas: revenue, construction, and maintenance.

Multiyear funding is necessary to bring a project to completion.

Multiyear funding provides continuity and expectations of project completion while minimizing delays in planning and implementation because of funding insecurity. However, many states have annual budgets and do not have a dedicated funding source for transportation projects; together these can hamper long-term investments. European fuel taxes are high, but unlike the U.S. model of directing fuel taxes to the Highway Trust Fund, the taxes go into the general fund where transport must compete with other societal demands.

Different funding opportunities reflect TEN-T implementation.

Two funds are available to EU members to implement TEN-T:

- TEN-T funds are available to all members, are competitive EU-wide, and are used mostly by the founding member states. These funds amount to mere fractions of the founding member states' transportation

budgets and are not sufficient to tip the scale between EU and national priorities.

- Cohesion Funds are available only to eligible EU member states (see “Cohesion Fund for Transportation Projects”), but EU must approve their use. These funds represent a substantial share of eligible member states' transportation budgets and are sufficient to help shape the transportation budgets and projects in these states.

Tolling policy varies by country.

Regardless of EU efforts to harmonize tolling technologies or tolling amounts noted in this report, EU countries have different perspectives on tolling:

- Hungary is solidly on board with the user-pays principle and wants to increase tolls across the board on all vehicles using the main elements of the transportation network. The revenues in the vignette toll system are constrained by the EU tolling cap, which is one reason Hungary wants to launch a distance-related toll system.
- Germany has a policy to “facilitate rather than prevent mobility.” This translates into a policy of no urban charging (e.g., cordon pricing), no passenger tolls, and no increase in the heavy goods vehicle (HGV) tolls collected through its Toll Collect system. It is, however, considering expanding the network on which HGV tolls are charged.

Chapter 7: Freight Corridor Implementation and Operations

Project Coordination

Project implementation at the national level has relatively few issues, but coordination on cross-border sections is often the most complex aspect of TEN-T projects. It demands active cooperation among a wide range of stakeholders. Memoranda of understanding or letters of intent have been used for the Munich-Salzburg and Vienna-Bratislava cross-border sections and between the Baltic States and Poland, as well as for the six freight corridors with priority for deploying European rail traffic management system (ERTMS).

The other key issue with cross-border projects is the lack of joint traffic forecasts and general project development approaches. This leads to differing investment plans and contradictory timelines, capacity planning, alignment, technical and interoperability characteristics, and environmental assessments.

To facilitate the implementation of the projects necessary to advance the 30 priority axes, the EU established and appointed European coordinators in 2005 to cover priority projects 1, 3, 6, 17, 21, 18, and 30, as well as ERTMS. Typically, these coordinators are political appointees who are well-known former politicians who can work with heads of states to resolve significant project advancement issues, such as funding and environmental compliance. The goal of the European coordinators is to accelerate project implementation, especially in cross-border projects. The coordinators have developed a comprehensive project approach for the priority projects they routinely monitor, indicating which conditions should logically be met for EU cofunding.

European Rail Operations

Several issues in the European railway system have led to low customer satisfaction for freight moves and a decrease in rail volumes and market share, which creates a risk of freight traffic losing critical mass. There is a strong focus on passenger traffic, both in management and infrastructure investments.

The interoperability of the railway system in Europe is difficult because of the multiple railway operators with different power and signaling systems and even track gauge. The system requires technical compatibility of infrastructure,

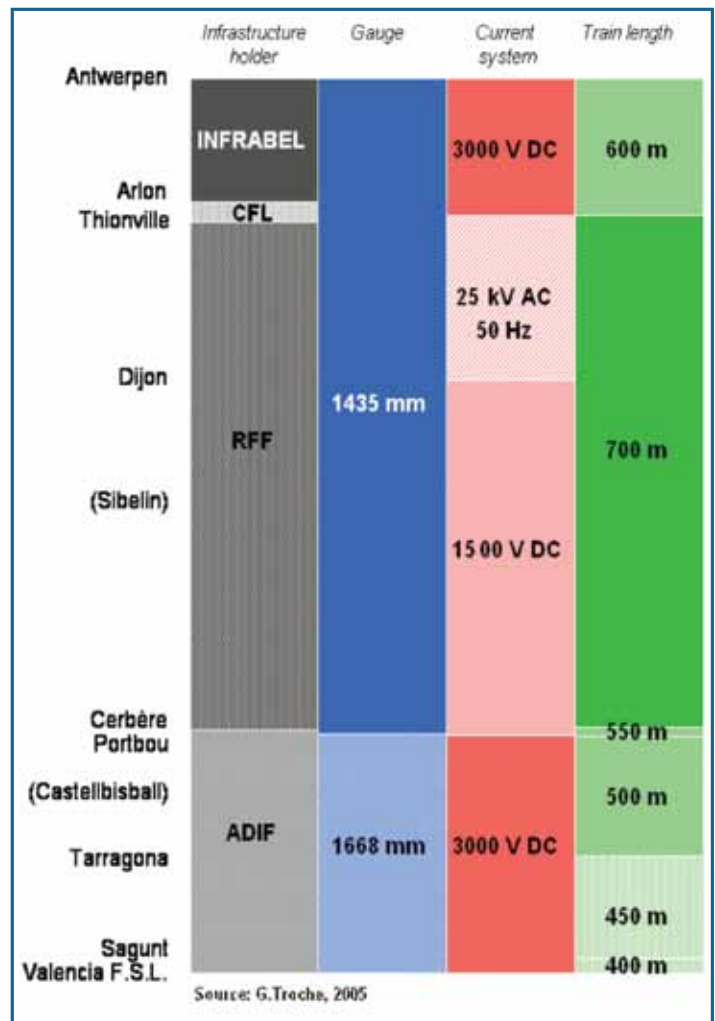


Figure 14. Antwerp-Valencia rail line characteristics.

rolling stock, signaling, and other rail systems, as well as less complex procedures for approving rolling stock for use across the European rail network. Figure 14 illustrates these issues in the Trans-European rail line between Antwerp and Valencia.

The ERTMS project was set up to create a unique signaling and communication standard throughout Europe, and in 2009 the EC adopted a European Deployment Plan for ERTMS that provides for the progressive deployment of ERTMS along the main European rail routes. Technical specifications for interoperability were developed by the European Association for Railway Interoperability, representing infrastructure managers, railway companies, and industry.

Key Findings on Operations

Greater harmonization of technology and operations is necessary to ensure success of a national vision.

- Roadway interoperability is not an issue with physical infrastructure in the EU or North America, but both regions are dealing with issues related to tolling, including the various methods of collecting the tolls (electronic versus vignette), the toll rates, and emphasis. Germany, for example, emphasizes heavy trucks and emissions penalties, while Hungary is considering tolling passenger cars along with freight.
- The EU fully recognizes the need to make its rail system interoperable. It has been successful in some areas of high-speed passenger movement on individual alignments, but on the freight rail side it faces substantial obstacles of electrification, gauge, signalization, and credentialing. It will take a substantial effort to bring these centuries-old systems into alignment. The EU is making headway on establishing a methodology, called one-stop, for coordinating freight rail moves between countries.

Corridor coalitions and project coordinators play an important role in project development.

Establishment of the EU corridors and corridor coordinators, along with the success of early efforts among France, Portugal, and Spain in coordinating corridor and project activities, suggests that there is value in developing corridor coalitions and leadership to ensure a common vision and organizational momentum over the long term. There is also a need for corridor leadership that can bridge local needs and EU policy. Austria, Germany, and Italy have recognized the value of informal working relationships in coordinating projects that have mutual benefits. Member states have also found value in the EU coordinators, a role they see as one of diplomacy and facilitation. EC representatives indicated that coordinators have been responsible for moving stalled projects, but that not all projects need or require a coordinator.

Chapter 8: Conclusions and Implementation Plan

Conclusions

The scan team analyzed the information gathered during the scan, developed a series of conclusions, and identified the relevance of each conclusion to freight transportation corridor development in the United States.

Importance of a unifying vision linking transportation and the economy

From the beginning, EU member states have considered transportation infrastructure both an important element of advancing European unity and a critical factor in allowing a unified Europe to compete in the international marketplace.

EU expansion has brought additional challenges because the development of transportation infrastructure varies widely among member states. Nevertheless, the strategic vision of a unified EU with strong transportation infrastructure that promotes sustainable, environmentally sound economic growth, increased trade, and global competitiveness continues to be an essential motivation and component of EU policy.

The United States is familiar with the concept of a unifying vision, clear focus, and pursuit of a national interest to advance transportation projects that support the U.S. economy. It was pursuit of a common vision and a national interest that advanced transportation projects such as the canals, locks and dams, and transcontinental railroads of the 19th century and the Panama Canal, Interstate Highway System, and St. Lawrence Seaway of the 20th century. Those successful transportation investments were transformative. They unleashed the competitive capacity of the Nation by creating new economic opportunities that led to new industries and settlement patterns. They provided the solid underpinning for the rise of the American industrial economy, American prosperity, and America as a global power.

Today's challenge to develop transportation systems capable of sustaining sophisticated supply chains that serve international and domestic markets is no less challenging and would be well served by a similarly clear focus.

Challenges of multijurisdictional transportation planning and implementation

The EU experience offers rich lessons on the challenges of coordinating transportation planning across the most complex jurisdictional boundaries. Each EU member state has its own sovereign priorities and transportation planning processes, making the coordination of multistate transportation infrastructure development and operations a challenge. Aligning priorities and funding for transportation infrastructure that spans several countries requires innovative approaches and the proper balance of funding commensurate with those interests. The EU is implementing processes that require high-level project coordinators to streamline the implementation of transportation infrastructure projects that cross borders. The approach focuses on multimodal connectivity rather than individual transportation sectors.

A lesson for the United States is that freight projects that serve multijurisdictional purposes will likely require new management, funding, and coordination strategies to ensure effective corridor development.

Operationally, the differences in specifications in the rail system in the EU make seamless freight rail transportation challenging. Track gauge, power, and signaling systems are not completely standardized throughout the system, which hinders efficient operation. EU standardization efforts are being implemented through the ERTMS.

The United States should work with both Canada and Mexico to ensure that the railroads that serve the North American continent do not encounter these infrastructure- or operation-related impediments.

Evolution from exclusively national and local to international understanding

Transportation planning processes in each member state are being modified to include a broader international perspective beyond that inherent in the EU alone. Project assessment

techniques are being modified at both the EU and country levels to take into consideration the linkages to neighboring countries outside the EU. Direct and transit relationships with Russia, the Far East, and North Africa now figure prominently in EU transportation planning processes.

A lesson for the United States is to continue to promote the awareness of the extent and impact of domestic and international supply chains on U.S. transportation networks, and to continue to provide data and information on national goods movement that informs State and Federal decisionmaking.

Creation of a foundation for fact-based policy decisions

EU experience with corridor planning processes over the past 5 to 10 years has led European planners to seek improvements in the quality and application of market and traffic data used in their work. Transportation infrastructure planning processes are being modified in consultation with member states to expand the use of market information and other hard data to identify and define transportation networks (core and comprehensive) in ways that are less theoretical and closer to actual or projected established demand. TEN-T implementation was leaning toward a more project-based, idealized approach and was losing some of its corridor-based origins linked to current and historical traffic patterns and investments. Implementing connected projects in multiple states would be better served with a fresh look at the market, particularly with EU expansion. As a result, the EU is revising the TEN-T program based on an approach grounded in market fundamentals and analytics.

Of relevance to the United States is that any movement toward corridor-level thinking must be grounded in objective, transparent facts and market analysis.

Alignment of benefits and costs

The European Union is investing considerable effort in evaluating projects, taxation rates, and transport fees to balance the benefits of efficient freight movement with its costs to society. This balancing includes using sophisticated benefit-cost analyses, implementing pollution-influenced truck tolls, and developing multivariable project-selection criteria. These efforts are intended to align freight projects and freight investments with the cost that freight movement creates for society.

The United States should evaluate these practices to improve project selection and policy evaluation methods.

Alignment of policies

The alignment of policies across the EU has understandably not been an easy task. The EU has as a goal, for example, the diversion of cargo from trucks to rail or water transport as a way to reduce energy consumption, emissions, and congestion. However, for policy reasons related in part to environmental considerations, passenger traffic is prioritized on the EU rail system, which to some extent impedes reliable freight movement. Another area of policy alignment that draws attention is the expansion of the transportation network as a whole and the choice of investments. Based on the demands of their populations, many new member states wish to expand their road network. In some cases, this comes at the expense of an extensive rail network in a state of disrepair.

A lesson for the United States is that freight policy needs to be developed in conjunction with related policies, such as economic, trade, environmental, or land use. Freight operations are heavily influenced by these other factors and must be considered in estimating the effectiveness of freight policies.

Reinforcing the value of stable multiyear funding

Multiyear funding provides continuity and expectations of project completion while minimizing delays in planning and implementation because of funding insecurity. Newly admitted member states that receive a larger proportion of funding from the EU for transportation infrastructure projects benefit from multiyear funding. However, many founding member states have annual budgets that can hamper long-term investments.

The United States already knows this lesson and in 1991 shifted its transportation funding to a multiyear (6-year) cycle. It should not have to learn this lesson again.

The scanning study reinforced in team members' minds that the concept of corridor-level thinking and action based on connectivity, access, thorough analysis, and market needs transcends differences and emphasizes similarities. This concept was integral to the establishment of the U.S. Interstate Highway System, and it is being replicated in nearly all developing and growing economies. This study highlighted the value of and many of the issues involved in evolving and refocusing the U.S. multimodal transportation network toward this concept.

Recommended Implementation Actions

The scan team used the key findings described in this report to develop implementation actions that could improve freight transportation in North America.

The team is formulating a comprehensive implementation plan as the United States moves ahead in developing a national freight policy and a network of freight corridors. The specific actions the scan team identified include the following:

- Perform outreach to transportation agency leaders, policymakers, and stakeholder groups.
- Disseminate a scan report and executive summary.
- Better use private sector planning resources to aid public sector planning.
- Determine the impacts that occurred when Germany implemented the Toll Collect system for trucks.
- Prepare a supplemental scan report at the conclusion of the EU effort to develop core and comprehensive networks to discuss and evaluate the process and results.
- Develop a list of important national freight corridors and port facilities in the United States.
- Determine if the European process for arranging private freight train slots on the European public rail lines that cross country borders could be a model for developing a system to create a “one-stop shop” for oversize and overweight trucks needing permits from multiple States.
- Coordinate freight planning efforts on the North American continent.
- Develop a discussion paper on the how the European model of having coordinators for major cross-border projects could be used in North America to advance multistate or multinational projects.
- Gather more information on the multicriteria analysis the EU uses for its freight corridor effort and assess its applicability for transportation planning (including but not limited to freight planning) in the United States.
- Gather information on the types of PPPs used in Europe. If they are different from the types of PPPs used or being considered in the United States, determine if they could be of use in the United States.
- Determine no- or low-cost efforts to improve freight transportation in North America.
- Determine if analysis being conducted in the Netherlands on a new vehicle design that spreads weight differently has potential use in the United States.
- Establish an ongoing relationship with DG MOVE.

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Biographical Information

Anthony T. Furst (*FHWA cochair*) is the director of the Federal Highway Administration (FHWA) Office of Freight Management and Operations. He directs a multilevel staff that develops FHWA freight policy, provides data analysis and decision-support tools for transportation professionals, evaluates freight projects, develops and promulgates professional capacity-building programs and training for freight professionals, provides truck size and weight program guidance and interpretation, and evaluates and promotes freight technology development for national and international deployment. Before joining FHWA in 2003, Furst held a range of positions in the U.S. Department of Transportation (U.S. DOT) Maritime Administration and U.S. Secretary of Transportation's Office of Intermodalism. He was the branch chief of the Transportation Security Administration's Maritime Infrastructure Security Branch. Furst retired from the U.S. Coast Guard in 2000. He is a graduate of Florida State University and has a master's in business administration from the University of Washington.

Eric G. Madden (*AASHTO cochair*) is deputy secretary for aviation and rail freight for the Pennsylvania Department of Transportation in Harrisburg, PA. Madden oversees and administers Federal and State financial and technical programs for 133 public-use airports and heliports and more than 65 railroad companies and businesses. In addition to administering more than \$75 million annually in grants, his offices provide licensing, inspection, planning, and environmental assistance. He has a bachelor's degree in Russian language and literature from the University of Maryland. Madden is cochair of the Delaware Valley Goods Movement Task Force and the South Central Pennsylvania Goods Movement Forum and is a member of the Transportation Research Board's (TRB) Strategic Highway Research Program Expert Task Group for Integrating Freight Considerations into Collaborative Decision Making for Additions to Highway Capacity.

Juan C. Villa (*report facilitator*) is manager of the Economics, Trade, and Logistics Program at the Texas Transportation Institute (TTI), part of the Texas A&M University System. His research emphasis includes international trade and transportation, development of performance measures at land ports of entry, and freight corridor planning and development. Before joining TTI in 2001, he was the managing director of an international transportation and logistics consulting firm in Mexico City. Villa is a graduate of the Monterrey Institute of Technology in Monterrey, Mexico,

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Eduardo Asperó has been chief executive officer of Stacktrain Mexico, an agent of Pacer Stacktrain USA, since 2000. He is also president of Mexico Intermodal Transportation Association (AMTI). In this position, Asperó has presented several proposals to Mexico's government to simplify and facilitate intermodal operation in Mexico's customs, ports, and railroad operations. He participated in activities related to international affairs for merchant marine and port administration for the Ministry of Communications and Transport from 1979 to 1989. Asperó was also CEO of the Company Port Services of Quintana Roo, S.A. de C.V. from 1989 to 1993, and national coordinator of Integral Port Administrations (Port Authorities) from 1995 to 1999, where he coordinated the privatization process of port services and terminals. Asperó has a degree in international relations from the National University of Mexico and diplomas from the French Agency for Industrial and Technical Cooperation in maritime law, port planning, multimodal transportation, and port administration. He is vice president of the Mexican Association of Importers and Exporters.

Monica M. Blaney is a senior policy advisor for the Continental Gateway and Systems Analysis branch of the Strategic Policy Directorate at Transport Canada in Ottawa, Canada. Blaney is responsible for the transportation infrastructure and freight systems analyses of the Asia-Pacific Gateway and Corridor Initiative and the Western Canadian Freight Transportation System in Canada's National Gateway and Corridor framework. She is also responsible for coordinating transportation data collaboration efforts with FHWA. Blaney has served with Transport Canada for the past 2 years and has more than 23 years of experience in transportation analysis, planning, and operations in the private and public sectors. She has bachelor's degrees in statistics and agriculture from the University of Manitoba. She is working on a master of business administration degree in maritime logistics and business through the Australian Maritime College, an affiliate of the University of Tasmania. She serves on a National Sciences Academy research panel and cochairs the Data Subcommittee for the Canada-United States Transportation Border Working Group.

David F. Long is the director of the Office of Service Industries in the U.S. Department of Commerce. He manages a group that follows a broad portfolio of service sectors in the U.S. economy, with a strong emphasis on supply chain and logistics, and contributes industry and policy expertise to support trade negotiations in services and other efforts to enhance U.S. economic competitiveness. Long leads the department's supply chain infrastructure competitiveness initiative, a logistics-focused program to enhance U.S. competitiveness developed in collaboration with the U.S. DOT. In addition to his more than 15 years of senior-level commercial and policy experience in international telecommunications services, Long was a telecommunications trade negotiator with the U.S. Trade Representative from 1991 to 1994. Long is a graduate of Michigan State University. He has a master's degree in international relations from John Hopkins University's Nitze School of Advanced International Studies and a master of business administration degree from Georgetown University.

Bernardo J. Ortiz is the strategic projects coordinator for the infrastructure undersecretary of the Ministry of Communications and Transport in Mexico. He is responsible for the planning, development, and implementation of strategic projects for infrastructure modernization and improvement in Mexico. These projects include developing a national program for infrastructure and transport, a logistical infrastructure plan, and other projects related to the integration of road infrastructure planning, management, and operation nationwide. Ortiz has a bachelor's degree in civil engineering from the Universidad de las Américas-Puebla and a master's degree in transportation from the Massachusetts Institute of Technology. He is the Mexican representative to the B1 Technical Committee on Good Governance of Road Administrations of the World Road Association and vice-treasurer of AMIVTAC (Mexican Road Engineering Association).

Robert L. Penne is program director for intermodal and industry activities for the American Association of State Highway and Transportation Officials (AASHTO). He is responsible for issues involving freight transportation by all modes—rail, truck, aviation, ports, and waterways—and for liaison with industries with significant interests in freight movement and transportation infrastructure. Penne also shares responsibility for developing and communicating the case for the economic benefits of transportation and demonstrating the linkage between transportation and economic development. He has developed and carried out programs for advocacy, policy development, and research in areas such as transportation, economic development, urban development, environmental

protection, public finance, training, and tourism and has written and edited books, reports, and articles on these subjects. For 8 years, he initiated and chaired the Transportation Working Group of the Governors' Washington Representatives, which supported the advocacy of governors for increased transportation investment, and for the Intermodal Surface Transportation Efficiency Act and Transportation Equity Act for the 21st Century authorizations. Penne is a graduate of Seattle University and the University of Washington with degrees in political science. He served as an adjunct faculty member at the University of Maryland Baltimore County.

Dr. Ernest B. Perry is the administrator of freight development at the Missouri Department of Transportation in Jefferson City, MO. He is responsible for developing a freight program that works across all modes of transportation to support efficient freight movement and increased modal connectivity and seeks opportunities with the private sector to expand freight services and facilities in the State. He is working on projects to reestablish freight traffic on the Missouri River, develop dedicated truck lanes on a major interstate, and increase speed and reliability on a shared-use passenger-freight rail corridor. Perry has served with the Missouri Department of Transportation for 15 years, working in environmental clearance, social science, economics and policy research, and freight development. He is a graduate of the University of Missouri–Columbia and earned a Ph.D. in 2003. He serves on three cooperative freight research panels and participates in AASHTO technical and policy freight activities.

George E. Schoener is the executive director of the I-95 Corridor Coalition. Schoener is responsible for directing multimodal transportation programs in the most heavily traveled corridor in the United States, with emphasis on providing safe and efficient freight operations throughout the corridor. The I-95 Corridor Coalition is a partnership of State departments of transportation, regional and local transportation agencies, toll authorities, and related organizations, including port, transit, and rail organizations, from Maine to Florida, with affiliate members in Canada. Before becoming executive director, Schoener worked for the U.S. DOT and FHWA for 33 years. He served as the deputy assistant secretary for transportation policy, directing the administration's legislation for authorizing the Federal surface transportation program, and developing a national freight transportation framework. Schoener is a graduate of the University of Minnesota with a degree in civil engineering and has a master's degree in transportation engineering from Pennsylvania State University. He serves on the Strategic

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B. Renee Sigel is division administrator of the FHWA Pennsylvania Division. She heads an office of 40 professionals that oversees an approximately \$1.4 billion Federal-aid highway program in Pennsylvania. Under Sigel's leadership, FHWA has worked with the Pennsylvania Department of Transportation on numerous initiatives to improve transportation system safety and the project delivery process. She serves on the FHWA Freight Council. Sigel began working for FHWA in 1991 as an environmental protection specialist. Since then, Sigel has held several FHWA positions, including planning and environment team leader in Maryland, transportation planner and quality coordinator for Federal Lands Highway in Colorado, transportation liaison for the 2002 Winter Olympics in Utah, and assistant division administrator in Idaho. She serves on the board of the American Society of Highway Engineers–Harrisburg Section and is a member of the Women's Transportation Seminar.

Spencer L. Stevens is a transportation planner for the FHWA Office of Planning in Washington, DC. Stevens leads the freight planning research effort as part of FHWA's Surface Transportation Environment and Planning Cooperative Research Program. His research emphasis includes the relationship between land use and goods movement, improved methods for estimating freight trips in the planning process, and the consideration of multimodal freight investment tradeoffs. Stevens has served FHWA for more than 20 years in various offices across the country. Before joining the Office of Planning in 2006, he was the planning team leader in FHWA's Pennsylvania Division. Stevens has a bachelor's degree in civil engineering from the University of New Hampshire. He serves on several FHWA technical committees.

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Appendix C: Amplifying Questions

Corridor—Project Selection

1. How did the European Union (EU) or individual countries coordinate, plan, prioritize, and fund cross-border and multinational freight infrastructure improvement before the Trans-European Transport Network (TEN-T)?
2. How do you define a corridor (geography, multimodal, function, etc.)?
3. What factors go into establishing the TEN-T corridors? What data (type, frequency, cost), analysis, future projections, or performance measures (off and on network) are considered? What role does modal share play? If modal tradeoffs must be made, what factors go into the decision?
4. What role, if any, does the private sector play in corridor or project selection?
5. What other economic and transportation goals or factors influence corridor or project selection?
6. How were the initial TEN-T freight corridors selected?
7. Were the TEN-T freight corridors confined to EU states?
8. What is the role of the EU and the member countries in TEN-T project selection?

Corridor—Project Prioritization

9. What data were used to prioritize the initial TEN-T corridors?
10. Do you have a performance management program that continues to collect these same data after improvements are made? If so, has performance improved?
11. How are investment priorities established?
12. Does funding follow corridor prioritization (i.e., is there different funding for projects along prioritized corridors as opposed to others)?
13. What is the match ratio for the EU and member country?

Corridor—Project Implementation

Funding

14. Who contributes to the costs of corridor improvements and how are costs assigned or shared?
15. What part of the TEN-T is expected to be funded and operated by the European Commission (EC)? National government? By private companies?
16. Does the EC or national government have a dedicated capital budget for TEN-T transportation investments or are investments by the government treated as part of the general budget? Is funding prioritized for TEN-T corridors?
17. Is the planning and funding completely mode neutral, or are modal targets set (e.g., 10 percent waterborne traffic, 40 percent highway, 40 percent rail, 10 percent air, etc.)?

Performance Measures

18. Who collects data on the performance of the TEN-T? What performance measures are used and how are data collected? Is there dedicated funding to collect these data? If so, what are the budget levels for what data at both the EC and national levels?
19. How do the EC and member states develop forecasts of projected freight flows?
20. Are there agreed-on metrics across the EU for the TEN-T?

Institutional Arrangements

21. Describe the institutional arrangements, relationships, and functions between the EC and member states and between member states for the TEN-T, including planning, development, investments and funding, construction, and operation and maintenance. Are the institutional arrangements binding?
22. Please briefly describe the relationships among the central government, provincial government, local government, and private sector as it relates to the TEN-T.

23. To what extent has the private sector participated in public transportation infrastructure investment? Are public-private partnerships and partnering agreements used to fund transportation infrastructure, particularly financial equity arrangements? Is the private sector engaged in strategic or tactical dialogue?
24. How are regulatory functions distributed between the EC and the member states (e.g., commercial motor vehicle dimensions, driver requirements, etc.)?
25. How is the dialogue on TEN-T framed—structured, facilitated, managed, directional, or iterative? Is this a top-down or bottom-up approach?

Environmental

26. How are environmental considerations (air, water, etc.) accounted for in your TEN-T corridors? Do all EU members have the same or similar environmental regulations?
27. Has any analysis been performed on the greenhouse gas-reduction aspects of modal split on the TEN-T corridors?
28. How are you advancing energy and environmental issues related to transportation?
29. How does the EC integrate transportation policy with trade and energy policies? What role does freight play in trade, energy, and transportation policies?

Planning

30. How often are the TEN-T corridors reevaluated based past, current, or projected freight and passenger flows?
31. How far out does each country plan for long-term infrastructure needs (10 years, 20 years, more)? Do all EU members have the same planning horizon? Use the same data projections?
32. How are new corridor segments added? Deleted?
33. Is there a widespread understanding of the importance of freight transportation and support for major freight infrastructure projects at all levels of government?
34. What are the most challenging issues the EU faces on the movement of freight? What do you think will be the most challenging issues in the future (for example, 10 years from now)?

Operational Characteristics

35. Were bottlenecks on the freight network mainly because of infrastructure capacity or border-crossing (paperwork) delays?
36. What type of freight movement is TEN-T attempting to facilitate? Is there a distinction between or bias toward domestic or international?
37. What investments are the EC and member states making in technology advances to address future challenges in freight transportation? Are they focused on the TEN-T corridors?
38. The United States is embarking on a high-speed passenger rail effort. The high-speed bullet trains with their own track aside, what lessons can be learned from Europe's experience of operating passenger and freight trains on the same tracks? What tradeoffs have you made?

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