

# TRANS-EUROPEAN TRANSPORT NETWORK



TEN-T priority projects



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## TEN-T priority projects



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The European Commission's Directorate-General for Energy and Transport develops and carries out EU policy in these closely-linked areas. The 2001 White Paper, **'European transport policy for 2010: time to decide'** sets out 60 practical measures designed to bring about significant improvements in the quality and efficiency of transport in Europe by 2010, and to break the link between economic growth and growth in the demands on transport systems. Maintaining and strengthening the safety and environmental performance of road and rail transport is a vital component of this overall strategy.

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# Trans-European networks – the way ahead



**F**reedom of movement for people and goods depends not just on the opening of transport markets but also on physical infrastructures. By promoting the construction of infrastructures that cross borders and connect national networks, the trans-European transport network accelerates the establishment of the internal market, links peripheral regions to the heart of the European Union and opens Europe to neighbouring countries.

Following the entry into force of the Maastricht Treaty in 1993, the Commission put forward a comprehensive global framework for the development of trans-European networks. This was the first time since the Roman era that Europe had started to think about transport systems going beyond national frontiers.

The Community guidelines adopted in 1996 involve investments by 2010 estimated at the time to be around EUR 400 000 million. The rail crossings of the Alps, the extension of the high-speed rail network with the recently opened line between Cologne and Frankfurt, the Øresund bridge, opened to service in 2000, the Betuwe railway, the Madrid-Barcelona high-speed rail link, and the Via Egnatia motorway – these are among the major projects supported by Community co-financing through the Cohesion Fund, the European Regional Development Fund, the trans-European networks budget and loans from the European Investment Bank.

Six years on, however, only 20 % of the work has been completed, and much remains to be done. Public investment in transport infrastructure fell from 1.5 % of GDP in the 1980s to less than 1 % in the 1990s, and the resulting delays affect cross-border projects in particular. At the present rate, and without additional financing, a further 20 years will be needed just to complete the work planned for 2010.

At the same time, by 2010 the economic growth rate envisaged by the Lisbon Council is likely to generate increases of 38 % in freight traffic and 24 % in passenger journeys, compared with 1998. As the Commission's September 2001 White Paper on European transport policy for 2010 demonstrates, without a major effort to rebalance traffic growth this means a rise of 50 % in road freight. This growth, and the delays in building the trans-European transport network, demand a new transport policy covering improved regulation of competition, the promotion of intermodal transport and the shift of traffic from the roads, and better targeting of investment.

Community action should supplement national plans, and must be guided by research to identify priorities with a real value to Europe as a whole. The 1994 European Council in Essen initiated this concentration of effort by selecting a first series of priority projects.

With the same objective, in October 2001 the Commission proposed a revision of the guidelines for the trans-European network. This proposal, called for by the Barcelona Council, strengthens the priority given to the first series of projects, takes stock of progress, and responds to new challenges with plans for six new priority projects including deployment of the Galileo satellite system and the crossing of the Pyrenees by rail.





Negotiations for the enlargement of the Union are progressing well, and have made clear the significant transport needs of the applicant countries. Around 20 000 kilometres of roads and 30 000 of railways, as well as sea and airports, will have to be built or improved at a cost of nearly EUR 100 000 million. This work is already receiving Community assistance through the ISPA and PHARE programmes, but bringing the economies of the future Member States into line with those of the present EU will require unprecedented levels of investment. Enlargement will also bring increases in traffic in the current Member States, which therefore need to adjust their own infrastructure priorities.

For these reasons the European Commission will, by the end of 2003, put forward a new proposal to further reform the trans-European network policy. The challenge will be to connect the networks of the applicant countries and to increase the concentration on selected real European priorities such as cross-border projects and the key land and sea routes needed for continent-wide cohesion and an expanded internal market. One of my predecessors, Mr Karel Van Miert, has accepted my request to preside over a High Level Group composed of representatives from the Member States and observers from the future Member States, as well as the European Investment Bank, to examine in detail those projects which deserve a place on an updated list of major priority projects for an enlarged European Union. The Group should give its recommendations to the Commission for the Spring of 2003. The development of the trans-European network will also involve continued cooperation with countries such as Russia, and with those of south-eastern Europe and the Mediterranean region, based on the work of the pan-European conferences.

Reflection on the future of Community financing, and in particular on the budget for trans-European networks, is also needed. The Commission has proposed an increase in the financial contribution from the TEN budget to a maximum of 20 % of the total cost of key projects, under certain conditions. Further questions about the size of the various Community budgets available for transport infrastructures and their coordination after enlargement will also have to be addressed. In this context, the Commission is examining new solutions to facilitate the financing of infrastructure. A key challenge will be to create new mechanisms to allow for additional financing by promoting public-private partnership and raising new revenues that better reflect the costs of all transport modes.

By presenting the main priority projects of the trans-European network currently under construction or study, as identified by the Commission as of today, I hope that this booklet will contribute to the on-going public debate on the future priorities of the trans-European network, and will give readers a better understanding of the potential benefits of the trans-European transport network, as well as the challenges of making it a reality.

Loyola de Palacio  
Vice-president of the European Commission and  
Commissioner for Energy and Transport

# Facts and figures

The trans-European transport network represents an ambitious programme for the construction, modernisation and interconnection of Europe's major transport infrastructures. The very large scale of the required investment, compared with the current volume of Member State and Community funding, makes it necessary to increase the concentration on key priorities and look for new financing to meet the target completion date of 2010.

## The projected size of the trans-European transport network in 2010\*

\* according to Decision 1692/96/CE as amended by Decision 1346/2001/CE

- 75 200 kilometres of roads
- 78 000 kilometres of railways
- 330 airports
- 270 international seaports
- 210 inland ports
- traffic management systems, user information and navigation services

## TEN-T – costs and financing

total estimated costs € 400 000 million (1996 estimate)  
 estimated total funding € 19 000 million per year (average 96/97)

### Community funding in 2000-2006:

trans-European networks budget € 4 200 million  
 Cohesion Fund € 9 000 million  
 Structural Funds € 4–6 000 million  
 annual loans by the European Investment Bank (in 2000) € 6 600 million

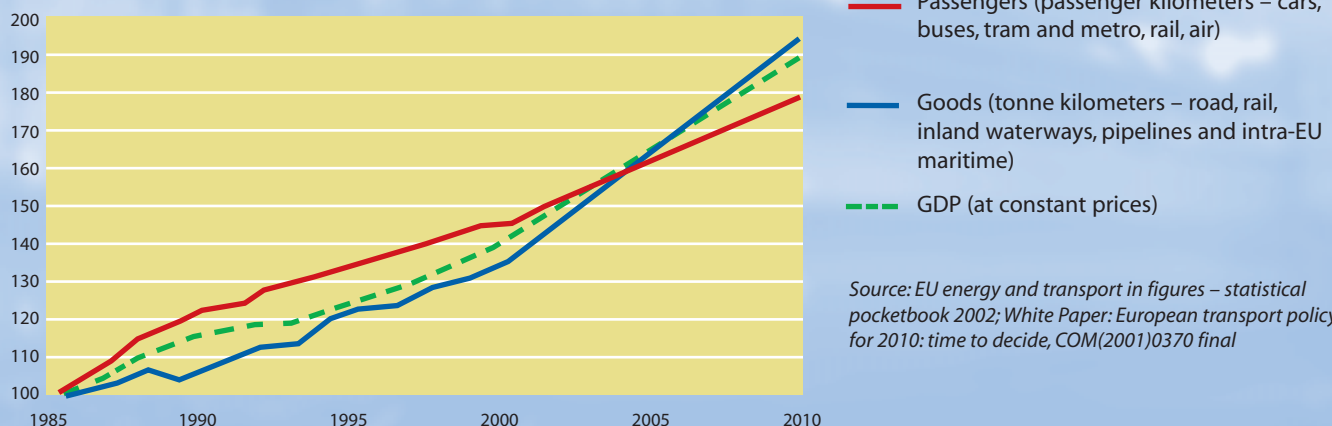
## Transport growth

By 2010, total freight traffic within the EU-15 is expected to grow by 38% compared with 1998 figures, and passenger traffic by 24%. Without a coherent transport policy, most of these increases will be absorbed by the road network, and a significant part of them on the trans-

European network. Targeted investment in infrastructure is essential in order to accommodate transport growth in a manner consistent with economic and environmental sustainability.

### Transport growth in the European Union, 1985–2010

(1985=100; figures for 2001–2010 estimated)



Source: EU energy and transport in figures – statistical pocketbook 2002; White Paper: European transport policy for 2010: time to decide, COM(2001)0370 final





## Priority projects adopted in 1996

1. High-speed train/combined transport north–south
2. High-speed train PBKAL (Paris–Brussels–Cologne–Amsterdam–London)
3. High-speed train south
4. High-speed train east
5. Conventional rail/combined transport: Betuwe line
6. High-speed train/combined transport, France–Italy
7. Greek motorways, Pathe and Via Egnatia
8. Multimodal link Portugal–Spain–Central Europe
9. Conventional rail link Cork–Dublin–Belfast–Larne–Stranraer (*completed*)
10. Malpensa airport, Milan (*completed*)
11. Øresund fixed rail/road link between Denmark and Sweden (*completed*)
12. Nordic triangle rail/road
13. Ireland/United Kingdom/Benelux road link
14. West coast main line (rail)

## Priority projects proposed by the European Commission in 2001 (*new projects and extensions*)

### New projects

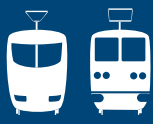
15. Global navigation and positioning satellite system Galileo
16. High-capacity rail link across the Pyrenees
17. Eastern European combined transport/high-speed train
18. Danube river improvement between Vilshofen and Straubing
19. High-speed rail interoperability on the Iberian peninsula
20. Fehmarn Belt: fixed link between Germany and Denmark

### Extensions

1. High-speed train/combined transport north–south (Verona–Naples and Bologna–Milan)
3. High-speed train South (Montpellier–Nîmes)

- █ Adopted Rail Project
- █ Proposed Rail Project
- █ Adopted Road Project
- █ Proposed Road Project
- Rail Network (in 2010)
- Road Network (in 2010)

**PRIORITY PROJECTS** adopted in 1996  
and  
**PRIORITY PROJECTS** proposed by the  
European Commission in 2001



# High-speed train/combined transport north-south

Ongoing improvements to one of Europe's major rail corridors will enable both people and goods to travel much more rapidly between northern Europe and Italy.

## What is the project?

The project will streamline rail journeys along one of Europe's major transport routes, between Berlin and Verona. Increased rail freight capacity in particular will contribute to sustainable development.

Improvements between Berlin and Nuremberg are to be achieved by upgrading and rebuilding 550 kilometres of track, allowing trains to reach speeds of 250 kilometres an hour. The line between Munich and Verona will be similarly improved. Between Innsbruck and the German/Austrian border at Kufstein it will be upgraded to four tracks, while a new 55-kilometre rail tunnel will be built between Austria and Italy, which is expected to considerably increase the speed of the Alpine crossing and the line's freight capacity.



'Rolling road' approaching the Brenner from the North (La Vie du Rail/Régis Chessum)

The project will be complemented by the construction of a new 160-kilometre link between Nuremberg and Munich, due to be completed by 2005.

## What are its expected benefits?

Improvements will cut journey times significantly – by as much as two and a half hours between Berlin and Munich, for example. The additional capacity and improved quality of service will attract new rail traffic, helping to reduce road congestion along this key corridor by shifting freight and passengers to the railway. This is especially important in the ecologically sensitive Alpine region, where heavy road traffic causes serious environmental impacts.

## What is its current status?

Speeds of up to 200 kilometres per hour are already being achieved on the upgraded line between Berlin and Halle/Leipzig. Work continues on the sections



- rail
- completed
- under construction/upgrading
- under preparation
- proposed extension (completed)
- proposed extension (under construction/upgrading)

Note: The section between Nuremberg and Munich is not part of the Priority Project. See pages 20, 28 & 42 for connecting Priority Projects 6, 10 & 17.

route	type of work	distance (km)	timetable	investment to date (€m)	total investment (€m)
Berlin Lehrter Bahnhof-Berlin/Ludwigsfelde	new section/upgrading	26	1994-2008	1 508	3 143
Berlin/Ludwigsfelde-Halle/Leipzig	upgrading	205	1991-2002	1 502	1 534
Halle/Leipzig-Erfurt	new line	123	1991-2003 <sup>1</sup>	421	2 404
Erfurt-Nuremburg	new line/upgrading	192	1991-2007 <sup>2</sup>	427	3 746
Munich-Kufstein	upgrading	97	1989-2002	31	32
Kufstein-Innsbruck	new line	70	1995-2010 <sup>3</sup>	143	1 901
Innsbruck-Fortezza (Brenner Base tunnel)	new line and tunnel	55	1990-2012 <sup>4</sup>	11	4 302
Fortezza-Verona	new line/upgrading	190	1992-2002	553	700
<b>total:</b>		958		4 596	17 762
<i>new:</i> Verona-Bologna	upgrade – 200 km/h	113	completed in 2006		600
<i>new:</i> Milan-Bologna	new line	200	completed in 2006		5 733
<i>new:</i> Bologna-Florence	new line	79	completed in 2007		4 209
<i>new:</i> Florence-Rome	re-electrification from 3 kV to 25 kV	232	in service		351
<i>new:</i> Rome-Naples	new line	204	completed in 2004		4 984
<b>total extension:</b>		828			15 877 <sup>5</sup>

1. Completion of first phase Leipzig-Gröbern; implementation timetable for second phase (Gröbern-Erfurt) not yet established.

2. Completion of first phase Erfurt-Ilmenau; implementation timetable for second phase (Ilmenau-Nuremberg) not yet established.

3. Completion date concerns sections Wörgl-Baumkirchen.

4. Completion date depends on availability of a special financing scheme.

5. Excluding investment relating to the railway nodes of Florence, Bologna, Rome and Naples.

between Halle/Leipzig and Nuremberg, where a larger proportion of new line construction is required.

Between Munich and Kufstein, minor upgrading works of the existing line are almost completed. Work to upgrade the Kufstein-Innsbruck section to four tracks is scheduled to start in the second half of 2002. Technical studies for the Brenner tunnel are due to be completed by 2006, when a public-private partnership may undertake construction, with a target completion date around 2012.

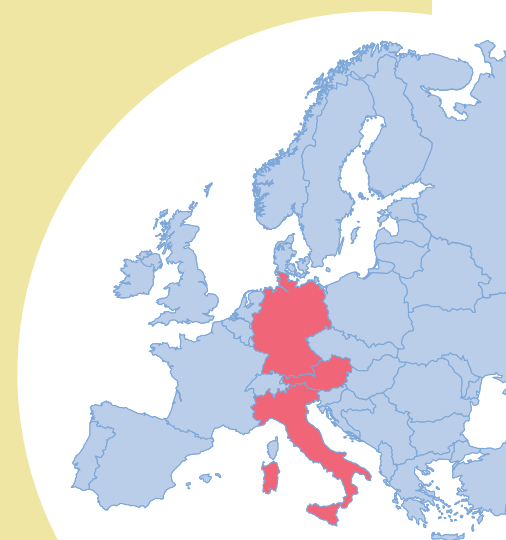
Between the Austrian border and Verona, various sections of the existing line are gradually being upgraded. Several long tunnels have been built to smooth curves and gradients, avoiding previous bottlenecks. Improved signalling and train management systems have significantly increased capacity, in particular for freight or combined transport trains.

EU funding of the project to 2000 totalled around € 260 million.

In 2001, the Commission proposed to extend the priority project from Verona and Milan all the way to Naples. Infrastructure improvements and new construction have begun, and the high-speed line between Rome and Naples is expected to be operational in 2004. Remaining sections will be completed by 2007. By 2010, faster rail travel along these busy routes is expected to lead to the

transfer of around ten million tonnes of long-distance freight from the roads each year, while 30 % growth in passenger traffic will reduce flights between Milan and Rome by 50 %.

Community support of € 258 million for the whole project, including its southern extension, is foreseen in the framework of the TEN Programme 2001-2006.





# High-speed train PBKAL

The construction of a new railway network will soon provide a high-speed alternative to air travel for passengers crossing the heart of Europe.

## What is the project?

Linking a number of capitals and other major cities, Europe's first cross-border high-speed rail project was launched in 1989 with the signature of an agreement between France, Belgium, Germany, the Netherlands and the United Kingdom. It will dramatically reduce rail journey times between these countries, providing travellers with a competitive alternative to air transport.

## What are its expected benefits?





The PBKAL network will be reserved for passenger traffic, offering substantial reductions in journey times between the five countries and attracting passengers away from air travel and the roads. It will also provide improved connections between some of Europe's key airports – Brussels, Frankfurt, Cologne/Bonn, Paris Charles de Gaulle and Amsterdam Schiphol. This will

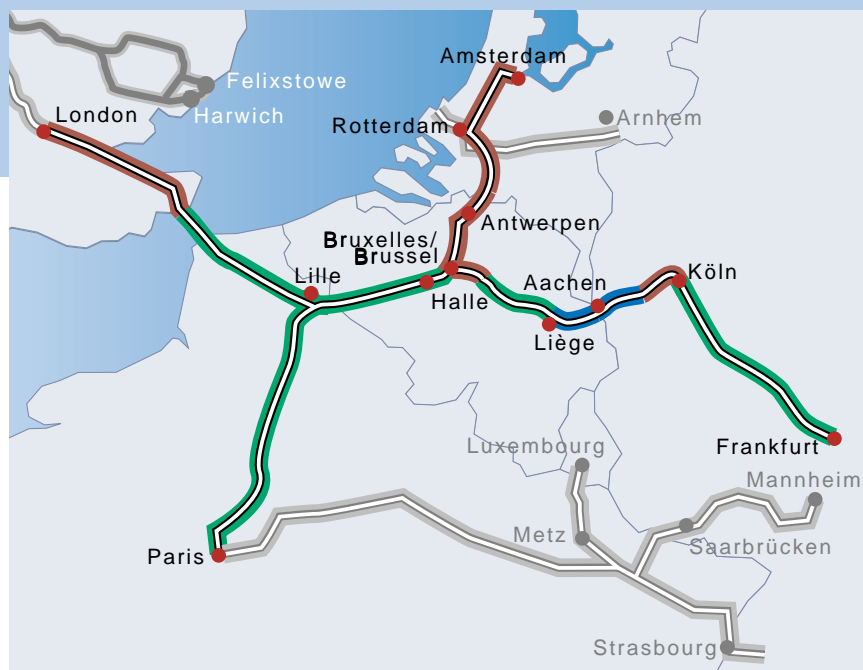
make a significant contribution to the promotion of intermodal air-rail journeys, in line with Community transport policy objectives.

## What is its current status?

Construction of the Dutch line began in 2000, through a public-private partnership. The southern part, from Rotterdam to the Belgian border, is scheduled for completion in 2006, and the northern section, from Amsterdam to Rotterdam, in 2007.

In Germany, a 175-kilometre long, 300 kilometres an hour, dedicated passenger line opened in July 2002, linking Cologne and Frankfurt in an hour and a quarter. A new 250 kilometre an hour double track section from Düren to Cologne should be operational in 2003. Upgrading of the line from the Belgian border to Düren will be completed by 2007.

-  rail
-  completed
-  under construction
-  under preparation



Note: See pages 16, 18, 34 & 36 for connecting Priority Projects 4, 5, 13 & 14.

route	type of work	distance (km)	timetable	investment to date (€m)	total investment (€m)
Belgian/German border-Cologne	new line/upgrading – 250 km/h	69	1990-2007	236	371
Cologne-Frankfurt	new line – 300 km/h	175	1990-2004 <sup>1</sup>	4 975	6 015
London-Channel tunnel rail link	new line – 200 km/h	108	completed in 2007	3 700	8 200
Belgium	new line/upgrading	321	1992-2006	2 204	4 681
Netherlands	new line/upgrading	102	1989-2007		4 039
Paris-Lille-Calais-Channel tunnel	new line	290	completed in 1994		
<b>total:</b>		1 065		11 115 <sup>2</sup>	23 306 <sup>2</sup>

1. Although the Cologne-Frankfurt high-speed line has been in operation since July 2002, work on nodes and access lines will continue until 2004.

2. Excluding the French section.



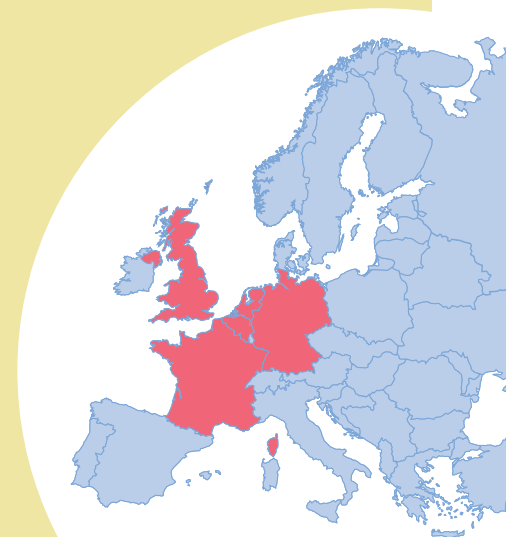
Thalys on high-speed line  
(Roberto Ferravante)

The French sections linking Paris, Lille and Calais and the Channel Tunnel are complete and have been in service since 1993. The high-speed Brussels-Paris line now serves more than six million passengers a year, having attracted very large numbers from road and air, with some flights being taken out of service as a result.

To 2000, the TEN-T budget had contributed € 600 million. Community support of nearly € 300 million is foreseen in the framework of the TEN Programme 2001-2006.

In the United Kingdom, the 108-kilometre Channel Tunnel Rail Link (CTRL) to London is under construction. The section from the Channel Tunnel to north Kent is due to be completed in 2003, with the remainder of the route scheduled to go into service by 2007.

In Belgium, the line from Brussels to the French border came into operation in 1997, with high-speed services now operating to Paris, Amsterdam and through the Channel Tunnel. By the end of 2002, Liège will be connected to Leuven. Upgrading of the Brussels-Leuven line is expected to be finished in 2005, and the high-speed line from Liège to the German border by the end of 2006. Upgrading of the Brussels-Antwerp line is nearly completed. The high-speed line to the Dutch border, including a new tunnel beneath Antwerp, should be finished in 2006.





## High-speed train south

**Two new high-speed rail lines will bring Madrid to within four hours of the French border, slashing current journey times by as much as 60 %.**



*High-speed line Zaragoza–Lleida: Bridge over the Ebro river (GIF)*

### What is the project?

Two new high-speed train lines are being built in northern Spain, dramatically reducing journey times between Madrid and France's south-western and south-eastern coasts, as well as within Spain itself.

The Atlantic branch runs from Madrid via Vitoria to Dax, where it joins the French rail network. It also connects with the Multimodal Link Portugal-Spain-Central Europe (see Project 8). The Mediterranean branch runs from Madrid via Zaragoza and Barcelona to Perpignan and Montpellier. An extension to Nîmes is proposed, in order to link with France's TGV Méditerranée, from Marseille to Paris. The scheme as a whole represents a major advance in linking Spain to central Europe through the French high-speed railway network.

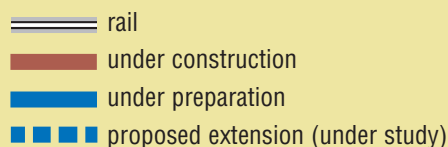
### What are its expected benefits?

For rail passengers, the new high-speed line between Madrid and Barcelona will cut journey times from almost seven hours to just under three. This huge time saving is expected to lead to a fourfold increase in the number of rail passengers on this route, contributing significantly to the sustainable development objective of shifting road and air traffic to more environmentally friendly transport modes.

Improved transport links will provide a substantial boost to economic development in the regions of Spain served by the two branches and their connection to the existing high-speed Madrid-Seville line. In particular, the extension of the European standard gauge to the Spanish network will stimulate international trade by allowing trains for the first time to cross the French border without having to change gauge.

The Mediterranean branch between Barcelona and the French border will carry freight as well as passenger traffic, boosting capacity to 6 million tonnes per year initially, and to as much as 25 million tonnes per year once the high-speed Montpellier-Nîmes link is completed, reducing pressure on the existing conventional line.

route	type of work	distance (km)	timetable	investment to date (€m)	total investment (€m)
Spain, Atlantic branch	new line	580	1991-2007	73	5 482
Spain, Mediterranean branch	new line	719	1991-2007	1 514	8 144
French Atlantic branch	upgraded line	80			
French Mediterranean branch	new/upgraded line	174	completed after 2010	22	989
International section, Perpignan-Figueras	new line	48	completed 2006	6	744
<b>total:</b>		1 601		1 615	15 359
new: Montpellier-Nîmes	new line	50	completed 2012		790
<b>total extension:</b>		50			790



Note: See pages 24 & 40 for connecting Priority Projects 8, 16.

## What is its current status?

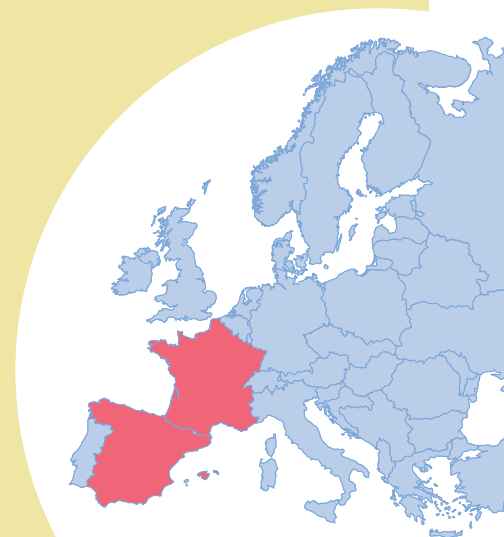
Construction started in 1996 on the middle section of the Spanish Mediterranean branch between Madrid and Lleida. This should be completed in 2002, and Lleida will be linked to Barcelona by 2004. Initial technical studies of the Montpellier-Nîmes extension line have been completed. In 2001, tendering procedures were initiated for concession of the international Perpignan-Figueras section which includes the construction of a 5.4-kilometre tunnel, and the official award is expected by the end of 2002.

Construction work has started in the section Madrid-Valladolid of the Spanish Atlantic branch.

Design work and studies are ongoing from Valladolid to Vitoria, Bilbao and the French border. The French Atlantic branch is still at the early planning stage.

The TEN-T budget has to date contributed around € 82 million to the Spanish sections, and € 18.5 million is earmarked for studies and construction on the French section up to 2006. The cross-border Perpignan-Figueras section, which will take the form of a concession, will benefit from a Community contribution of € 64 million in the period 2001-2006.

Globally, the Community support foreseen in the framework of the TEN Programme 2001-2006 amounts to € 137.9 million. In Spain, the project is also receiving substantial support from the Cohesion Fund.







# High-speed train east

European citizens from west and east alike will benefit from a new high-speed railway link between Germany and France.

## What is the project?

The new 320 kilometre an hour line between Paris, Metz-Luxembourg, Saarbrücken-Mannheim and Strasbourg/Kehl is designed to connect the extensive high-speed rail networks that already exist in France and Germany.

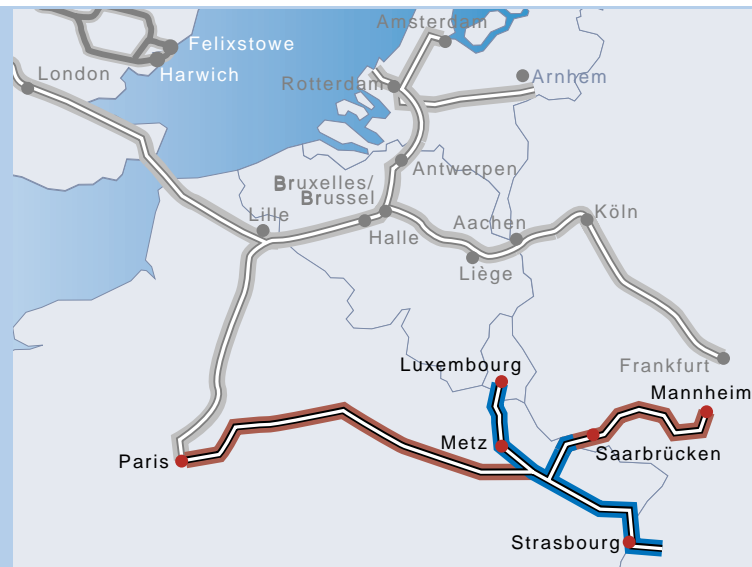
The first 300-kilometre section will run from the Parisian suburbs at Vaires to Baudrecourt near Metz. In a second phase, a 106-kilometre section will be built between Baudrecourt and Vendenheim in the Strasbourg suburbs. The French and German networks will be connected by a new bridge crossing the Rhine between Strasbourg and Kehl. The new line will be complemented by the upgrade of the existing Saarbrücken-Mannheim and Metz-Luxembourg lines.

## What are its expected benefits?

The new line between Paris, Strasbourg and Kehl, and the upgrading of the existing Saarbrücken-Mannheim line, will greatly improve transport links for passengers between France, Germany and Luxembourg. The project also forms the first stage of an east-west corridor linking Europe's major economic centres with the candidate countries of central and eastern Europe.

Completion of the first phase will cut journey times from Paris to Strasbourg to 2 hours 20 minutes, from Paris to Metz and Nancy to 1 hour 30 minutes, from Paris to Reims to 45 minutes, and from Paris to Luxembourg to 2 hours 15 minutes. When the second phase is complete, the journey between Paris and Strasbourg will take just 1 hour 25 minutes.

The new line will help to shift traffic from road and air transport to rail, and should boost economic and regional development.



- rail
- under construction
- under preparation

Note: See pages 12, 18 & 36 for connecting Priority Projects 2, 5 & 14.

route	type of work	distance (km)	timetable	investment to date (€m)	total investment (€m)
Vaires-Baudrecourt	new line	300	completed 2007	180	3 650
Baudrecourt-Vendenheim	new line	106	completed after 2010	0	1 600
German section	upgrade	145	1998-2004	84	463
<b>total:</b>		551		264	5 713

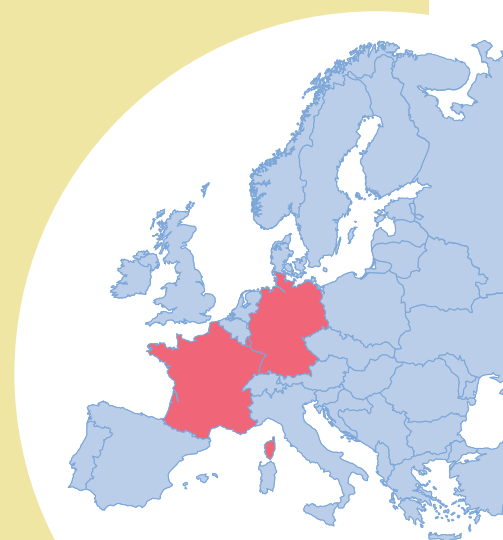
## What is its current status?

In France, construction of the Vaires-Baudrecourt section began in 2002, and the line is expected to open for service in August 2007. The Baudrecourt-Vendenheim section is currently under study and, together with the Strasbourg-Kehl line, is expected to be operational around 2010. Upgrade works between Metz and Luxembourg are at design stage. Community co-financing of studies and preparatory works amounted to € 90 million to the end of 2000, with an additional € 151 million programmed for the period 2001-2006 in the framework of the TEN Programme.

In Germany, upgrading work on the Saarbrücken-Mannheim-Ludwigshafen section, designed to allow the use of 200 kilometre an hour tilting trains, began in 1998 under a financing agreement between Federal State and Deutsche Bahn AG. It is due to be completed in 2004. The TEN-T contribution amounts to € 10 million. For the German section, Community support of € 17 million is programmed in the period 2001-2006 in the framework of the TEN Programme.



Embankment works at Baudrecourt (France)  
(La Vie du Rail/Michel Barberon)





# Conventional rail/combined transport: Betuwe line

**The construction of a dedicated freight railway line across the Netherlands will strengthen the port of Rotterdam's position as one of Europe's key transport and distribution hubs.**

## What is the project?

To facilitate the movement of maritime freight into the heart of Europe, a new 160-kilometre railway is to be built across the Netherlands, linking the busy port of Rotterdam to the existing German rail network at the Dutch/German border.

Around three-quarters of the Betuwe line will be newly constructed, while the remaining section that currently links Maasvlakte to Kijfhoek will be upgraded. Work on this section, known as the Port Railway Line, entails doubling the existing single track and electrifying the line, as well as the construction of a rail bridge and tunnel.

The main section of the Betuwe Line requires construction a new 112-kilometre line from Kijfhoek to the Dutch/German border near Zevenaar. For much of the route it will run alongside the existing A15 motorway.

## What are its expected benefits?

Among the project's many benefits, it will increase the transport options for freight companies wishing to move goods across the Netherlands. Current dependence on the road and inland waterway networks often causes congestion along key routes.

The line will also improve freight links between the Netherlands and the rest of Europe, boosting Rotterdam's development as a major centre for transport, distribution and production. The line has been designed to move up to 74 million tonnes of freight a year, although initially it is only expected to attract half this amount.

By moving freight off the roads, the scheme will also deliver benefits to road users and to the environment. The shift from road to rail will be particularly significant along the A15 line.



*Note: See page 12 for connecting Priority Project 2.*

route	type of work	distance (km)	timetable	investment to date (€m)	total investment (€m)
Port Railway line	upgrade	48	1993-2006		
A15 line	new line	112	1990-2006		
<b>total:</b>		160		2 219	4 546



Container freight at Kijfhoek station (The Netherlands)  
(Ronald Tilleman Fotograf !e)

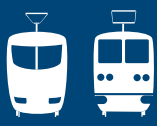
## What is its current status?

Work to upgrade the Port Railway Line started in 1997. The Dintelhaven rail bridge was completed in 1999 and the Botlek tunnel – the first ever bored Dutch rail tunnel – in 2002. The whole line will be fully upgraded, electrified and installed with the latest safety equipment.

Construction of embankments, tunnels and bridges for the A15 line began in 1998. Track-laying is expected to start at the end of 2003, together with electrification and safety equipment installation. The whole line is expected to be complete by 2006.

Community support of € 80 million is foreseen in the framework of the TEN Programme 2001-2006.





# High-speed train/combined transport, France-Italy

**The main routes through Alpine valleys in France and Italy suffer from high road traffic densities and serious pollution. A new high-speed rail link will bring relief to one of Europe's most congested transport corridors.**

## What is the project?

The project will link the French and Italian high-speed rail networks. Designed for both passenger and freight services, it comprises around 750 kilometres of new lines, including a tunnel of approximately 52 kilometres through the Alps – one of the longest in the world. Offering maximum speeds of 300 kilometres an hour, the scheme will also dramatically increase freight traffic capacity.

## What are its expected benefits?

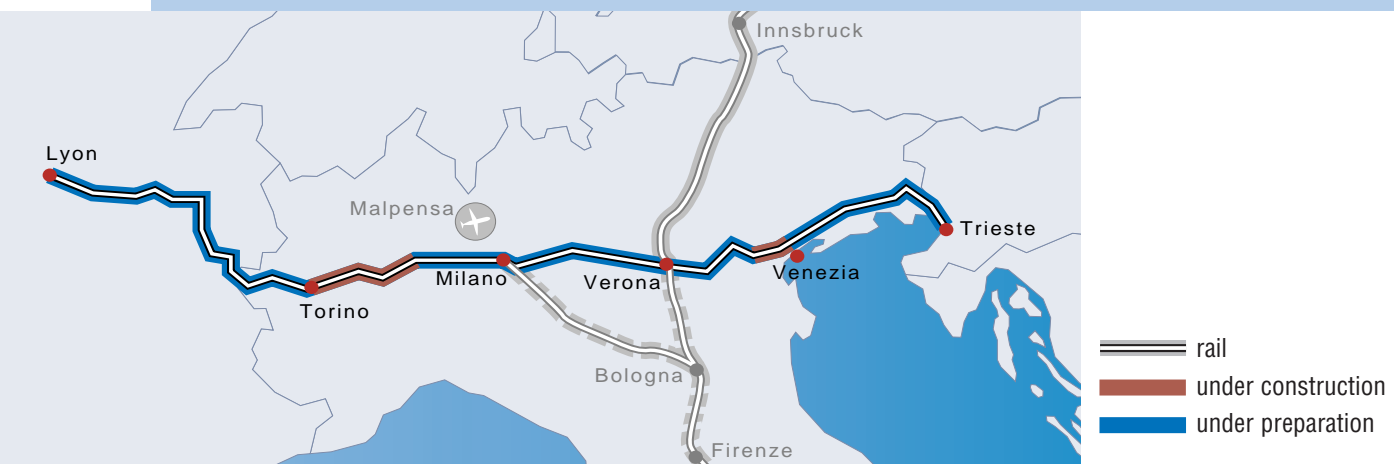
The project will bring very significant reductions in travelling time for both passengers and freight services. The passenger service between Milan and Paris will fall from six hours and 35 minutes to three hours and 40 minutes. Along the entire route, capacity will be more than doubled to accommodate future demand. Increased capacity, and the possibility of higher-quality services offered by the new infrastructure, are expected to enhance rail's competitive position and increase its market share on this route, especially for freight traffic. A 'rolling road' shuttle service for heavy goods vehicle between Aiton and Orbassano is planned, with trials beginning in 2003.

When complete, the route will be able to carry over 40 million tonnes of freight per year, freeing capacity on existing railway lines, which are currently saturated in several sections. The shift of traffic from road to rail will make a significant contribution to reducing the number of trucks crossing the Alps – curbing polluting emissions and alleviating the considerable nuisance they cause local residents.

Looking further ahead, the project serves as the backbone of an Atlantic-Adriatic route, and a platform for its eastward development towards the accession countries.

## What is its current status?

In France, studies for the Lyon-Chambéry section will be completed in 2003, with a contribution of € 12 million from the TEN-T budget. The high-speed line should be completed by 2010, although financing for construction has not yet been secured. The Montmélian-Modane section, including the existing tunnel, is being upgraded to allow 'rolling road' services.



Note: See pages 10 & 28 for connecting Priority Projects 1 & 10.

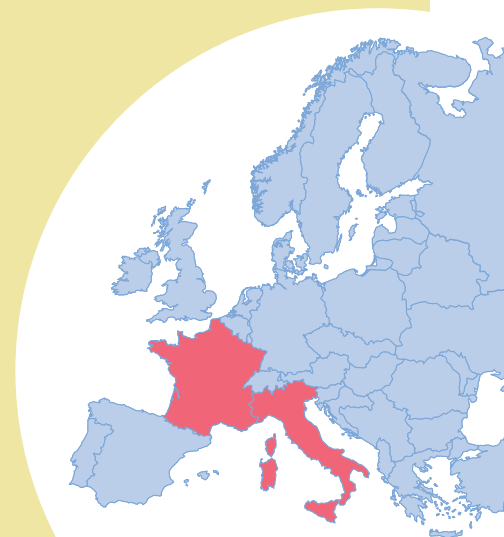
route	type of work	distance (km)	timetable	investment to date (€m)	total investment (€m)
Lyon-Montmélián-Modane (St Jean de Maurienne)	new line (including 3 tunnels) – 300 km/h	140	completed 2010		4 200
International section: St Jean de Maurienne-Bruzolo	1 or 2 tunnels – 300 km/h	70	completed 2012/13	82	5 900
Bruzolo-Turin	new line – 300 km/h	47	completed 2004/08	7	1 350
Turin-Milan	new line – 300 km/h	128	completed 2006/07		4 700
Milan-Verona/Padua	new line – 300 km/h	230	completed 2011	187	7 000
Padua-Mestre	new line – 200 km/h	30	completed 2008		440
Venice-Trieste border	new/upgraded rail track – 300 km/h	125	1998-2010	5	3 000
<b>total:</b>		770		281	26 590



*New railway link Lyon-Turin:  
Access tunnel works at Modane  
(Alain Baron)*

In all the Italian sections, the design phase is nearing completion and construction has either begun or is expected to start during 2002 or 2003, with € 57 million allocated from the TEN-T budget in the period 2001-2006.

Development of the international section is being co-ordinated by a French-Italian Intergovernmental Commission. Following agreement between the two countries in 2001, Réseau Ferré de France and Rete Ferroviaria Italiana have taken equal stakes in *Lyon-Turin Ferroviaria*, a joint venture established to manage the construction phase. Three test bores were cut in 2002, and a fourth is planned in 2003. Construction of the 52 kilometre tunnel should begin in 2005, and is expected to open for service in 2013. As well as technical studies, LTF is examining different options for financing the construction of the cross-border section, including the setting up of a public-private partnership. The current TEN-T contribution for the period 2001-2006 is € 100 million. For the project as a whole, total support amounts to around € 170 million for the same period in the framework of the TEN Programme.





# Greek motorways, Pathe and Via Egnatia

Greece will no longer be isolated from its European neighbours, following completion of this important motorway project.



-  road
-  completed
-  under construction
-  under preparation

## What is the project?

This project involves construction of two new motorways across Greece. The first runs from west to east, and for much of its 780 kilometres, including the branch to Ormenio, follows the route of the via Egnatia, dating from the second century BC. The new four-lane motorway will link the port of Igoumenitsa with Kipi on the Greek/Turkish border.

The second road is an upgrade of the current 800-kilometre Pathe road, which runs from southern Greece to the north, linking Patras to Promahon on the Greek/Bulgarian border. This route will also have four lanes for its entire length, and six near Athens and Thessaloniki.

Considerable efforts were made at design stage to minimise the environmental impacts of construction. The Greek state has also taken steps to attract private investment in the schemes.

route	type of work	distance (km)	timetable	investment to date (€m)	total investment (€m)
Pathe	upgrade and new construction	800	1990-2005	4 654	8 389
Via Egnatia	mainly new construction	780	1990-2005	2 277	4 215
<b>total:</b>		1 580		6 931	12 604



Intersection of Via Egnatia and trans-European axis IX (Egnatia Odos A.E.)

## What are its expected benefits?

Journey times by car within Greece will be dramatically cut by the construction of the roads. It will directly benefit the 70 % of the population that live in the cities along the Pathe/Via Egnatia routes, accelerating economic and regional development.

The project will also provide considerably faster access to neighbouring countries – Albania, FYROM, Bulgaria and Turkey – enhancing Greece's position in the region ahead of EU enlargement. Combined with Via Egnatia's links to five ports, eight airports and nine other major roads, the scheme will boost tourism and trade. The upgrade of the roads to motorway standard is expected to reduce road accidents along these corridors.

## What is its current status?

Currently, 50 % of the Via Egnatia and over 60 % of the Pathe motorway have been completed. The remaining sections are either under construction or at advanced design stage. Both routes will be largely complete by 2005.

Community support of € 30 million is foreseen in the framework of the TEN Programme 2001-2006. The project has also benefited substantially from EU Structural Funds support and from EIB loans.







# Multimodal link Portugal-Spain-Central Europe

**Improving the Iberian peninsula's road, rail, air and maritime infrastructures, and allowing efficient transfer between them, will strengthen its connections with the rest of Europe by reducing the time and cost of passenger and freight journeys.**

## What is the project?

The project will reinforce three multimodal corridors linking Portugal and Spain, helping to connect the two countries with the rest of Europe. It encompasses sub-projects to improve routes across the Spanish/Portuguese border, linking Spanish cities such as Valladolid, Seville and Vigo with Portugal's principal sea and airports, and its large urban centres – Porto and Lisbon in particular. As part of wider infrastructure investments, it complements existing rail, road, maritime and air routes in the west of the Iberian peninsula, and will link the main Portuguese and Spanish sections of the trans-European transport network.

## What are its expected benefits?

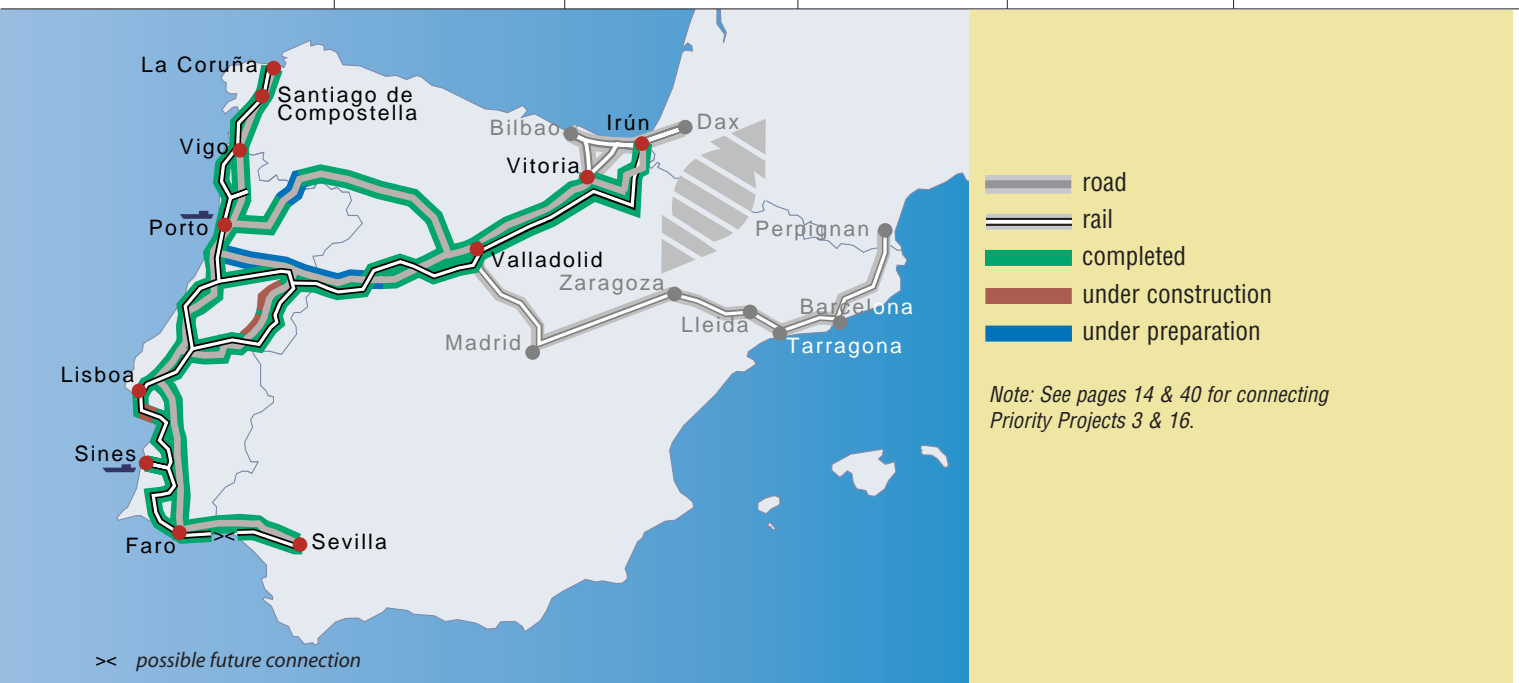
The project makes an important contribution to continuing efforts to improve links between the centre of the European Union and its peripheral regions, and will strengthen the Iberian peninsula's position as a western European gateway.

Specifically, it will facilitate links between the peninsula and western and south-western France. Road freight currently accounts for 97 % of trade flows between these two regions. The TEN-T project will allow dramatic improvements, significantly reducing journey times and increasing safety, especially for international traffic. By expanding rail transport capacity it will increase rail's share of intra-Community freight transport along these corridors, contributing to environmental sustainability. Directly and indirectly, the project will also stimulate job creation in the regions affected.



*Port of Lisbon: Alcântara container terminal (IMP/Rui Baptista)*

route	rail (€m)	road (€m)	airports (€m)	ports (€m)	total (€m)
Lisbon-La Coruña: • Portuguese section • Spanish section	617 283	542 234			
Lisbon-Irún: • Portuguese section • Spanish section	1 192 187	849 791			
Lisbon-Seville • Portuguese section • Spanish section	0 0	346 201			
total Portugal	1 809	1 737	206	764	4 516
total Spain	470	1 226	0	0	1 696
<b>total:</b>	<b>2 279</b>	<b>2 963</b>	<b>206</b>	<b>764</b>	<b>6 212</b>



## What is its current status?

In the Portuguese section, in addition to a number of road, rail and port studies, between 1998 and 2001, electrification, track doubling and other upgrading work was carried out on the Minho, Norte, Beira Alta, Beira Baixa and Algarve railway lines. The Porto-Vigo motorway is completed, and the Lisbon-Faro-Seville one opened to traffic in 2002. The next few years will see development works at Porto and Faro airports, and the construction of Lisbon's new airport at Ota.

In the Spanish section, between 1997 and 2001 studies were carried out for eastern and northern rail corridors, and the Valladolid-Salamanca and Benavente-Verin sections of the Irún-Lisbon/Porto road link were completed.

TEN-T funding to date totals around € 30 million. Community support of € 12 million is foreseen in the framework of the TEN Programme 2001-2006. The project's various sections have also received substantial support from EU Structural Funds.





# Conventional rail link Cork-Dublin-Belfast-Larne-Stranraer

**The improvement of Ireland's major north-south railway line has cut journey times and is helping to reduce congestion in and around the island's major cities.**

## What is the project?

This project is upgrading an existing rail link between Ireland's three largest cities – Cork and Dublin in the Republic, and Belfast in Northern Ireland – and connecting them to the rest of Europe via the ferry between Larne and the Scottish port of Stranraer. The 502-kilometre route was upgraded for both freight and 200 kilometre an hour passenger services. An improved Londonderry-Belfast line feeds the main rail link.

## What are its expected benefits?

The scheme is designed to increase the speed and frequency of both passenger and freight services, contributing to the shift of traffic from the roads, especially for cross-border trips. With journey times reduced to 1 hour 40 minutes and nine departures per day in each direction, the service between Dublin and Belfast has already proved popular.

The reopening of the improved line from Belfast to Londonderry has cut the time of the direct service by over 40 minutes, as well as speeding up services to intermediate stations. These improvements are expected to make the railway more attractive to commuters, easing road traffic congestion on the main routes into Belfast.



*Iarnród Éireann diesel unit at Dromin junction  
(Iarnród Éireann, Irish Rail)*

route	type of work	distance (km)	timetable	investment to date (€m)	total investment (€m)
UK sections (excluding Belfast-Larne)	upgraded		1989-2001	119	119
Republic of Ireland sections	upgraded		1989-2001	238	238
<b>total:</b>		502		357	357



 rail  
 completed

*Note: See page 34 for connecting Priority Project 13.*

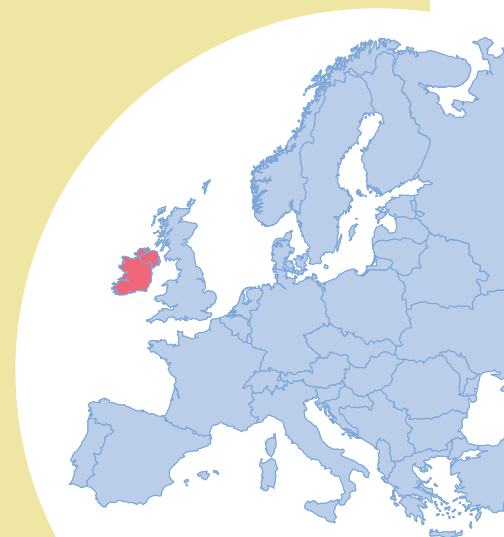
## What is its current status?

The Cork-Dublin line was completed in 1996, and the Dublin-Belfast section in August 1999. A new fast rail service was launched in October 1997 and is now well established.

On the Belfast-Londonderry route, the Antrim-Bleach Green section was reopened in June 2001, following the relaying of 21 kilometres of track and three kilometres of double track.

The Belfast-Larne section of the scheme has not yet been upgraded, although possible options are still under consideration.

The total cost is estimated at nearly € 360 million, and the project has benefited substantially from EU Structural Funds support.





## Malpensa airport (Milan)

**As part of the trans-European transport network, new investment has brought relief to this congested international hub by increasing capacity to meet rapid traffic growth.**

### What is the project?

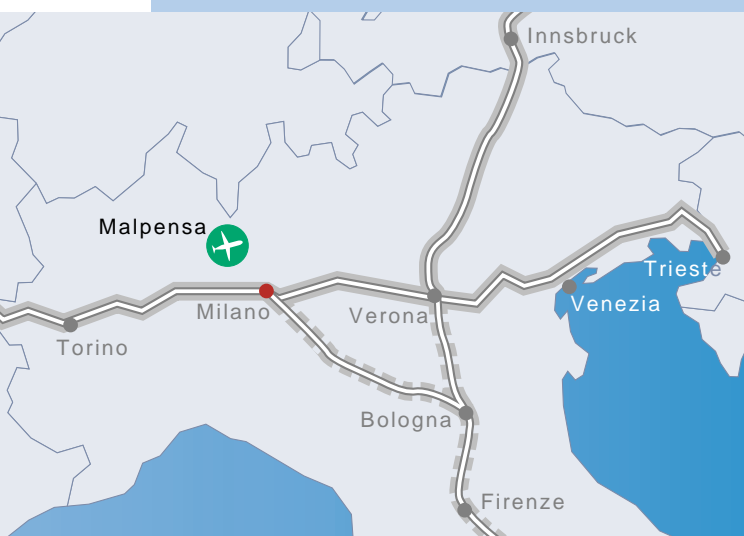
The project comprised the upgrade of the runway capacity, a brand new passenger terminal (Terminal 1), a new aircraft parking area or 'apron', and a cargo centre.

The airport now has two passenger terminals and two 3 920-metre runways, long enough for the largest commercial jets. Two new cargo buildings cover an area of 45 000 square metres. They are equipped with a highly automated system for handling containers which can service up to 50 trucks at once.

### What are its expected benefits?

Strategically located in Italy's Lombardy region, which with 720 000 businesses is the third most dense business area in Europe, Malpensa airport is among Europe's largest and most important transport infrastructures. Spanning an area of over 2.5 million square metres, the airport itself employs some 15 000 people. Ninety-five carriers currently fly from Malpensa to 180 destinations worldwide. In 2001, the airport handled 19 million passengers and 235 000 aircraft movements. Malpensa also ranks seventh among Europe's major cargo airports.

This major investment project has equipped the airport to cope with increasing levels of passenger demand, and contributed to the intra-European air service infrastructure needed to cope with the expected growth in air freight. It has facilitated links between the commercially important Lombardy region and the rest of Europe, and streamlines trade within Europe's 'Schengen' zone of easy cross-border travel, which Italy joined in 1990.



 completed

*Note: See pages 10 & 20 for connecting Priority Projects 1 & 6.*

route	type of work	distance (km)	timetable	investment to date (€m)	total investment (€m)
Malpensa Airport	extension/new facilities		1995-2001	945	945
<b>total:</b>				945	945



*Aerial view of Malpensa airport, terminal 1, the central satellite, in the foreground (Giorgio Furla-Foto & Grafia-Milan)*

## What is its current status?

The Malpensa Airport project was completed in 2001.

Suburban rail links with Milan have been operational since 2000. Following completion of the TEN-T project, development at Malpensa is continuing. Further investment will be made over the next two years to build a third passenger satellite, completing Terminal 1, and in the construction of new aircraft maintenance hangars. The luggage-handling centre will also be upgraded. The feasibility of a new hotel, a business centre, and a third runway which would reduce environmental and noise impact on nearby communities, is currently being studied.

The financial plan for Malpensa airport comprises state grants, loans from the European Investment Bank and other financial institutions, and resources from S.E.A. S.p.A., the concessionaire for the Milan airport system. From 1995 to date, the Community has granted around € 26.8 million from the TEN-T budget in the form of interest rebates to support the project.





# Fixed rail/road link between Denmark and Sweden

The completion of the Øresund bridge is both a powerful symbol and a practical aid to the further development of one of Europe's most productive and prosperous regions.



Øresund bridge

## What is the project?

The Øresund bridge creates a direct road and rail link across the Danish straits from Copenhagen in Denmark to Malmö in Sweden, with a four-lane motorway running above a double-track railway. The new fixed link consists of a four-kilometre tunnel under the sea, a four kilometre long artificial island, and a 7.5-kilometre bridge – the world's longest cable-stayed bridge for road and heavy rail.

The project also involved the construction of major new access routes from the two countries' road and rail networks, and a new railway station at Copenhagen airport.

## What are its expected benefits?

The fixed link has massively reduced the time, and greatly improved the safety, of road and rail travel between Sweden and Denmark. It makes possible the integrated development of the Copenhagen and Skane areas as a single, cross-border region.

With a population of 2.3 million and a GDP among the highest in Europe, the region is expected to benefit considerably from improved passenger and freight connections with the surrounding Baltic countries and with European transport networks. In particular, the Øresund link extends the St Petersburg-Helsinki-Stockholm-Copenhagen corridor (*see also Project 12*).




route	type of work	distance (km)	timetable	investment to date (€m)	total investment (€m)
Øresund fixed link	tunnel, island and bridge	15.5	completed 2000	2 740	2 740
Danish access routes	new motorway and rail	27	completed 1999	946	946
Swedish access routes	new motorway, rail, etc.	10	completed 2001	472	472
<b>total:</b>		52.5		4 158	4 158

## What is its current status?

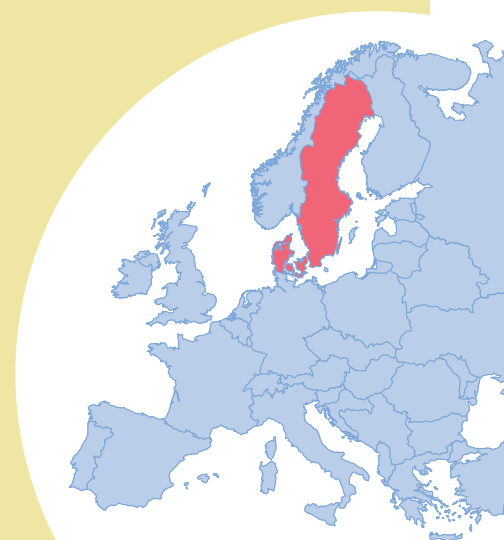
The Øresund link went into service on schedule in July 2000. In its second year of operation, road traffic across the link has increased by 20 %. There is already evidence that this improved access to markets and to skilled personnel is encouraging major companies to relocate to the region, and assisting the growth of high-tech firms such as those in the Medical Valley region north of Copenhagen.

TEN-T support in the period 1995-2001 was € 127 million.



-  road
-  rail
-  completed

*Note: See page 32 for connecting Priority Project 12.*







## Nordic triangle (rail/road)

Rail, road and maritime infrastructure across the Nordic countries will see vast improvements thanks to this ongoing project.

### What is the project?

The multimodal Nordic Triangle scheme is upgrading road, rail and maritime infrastructures in Sweden and Finland to improve freight and passenger transport between the Øresund fixed link (see Project 11), Stockholm, Oslo, Turku, Helsinki and the Finnish-Russian border.



A highway in winter

### What are its expected benefits?

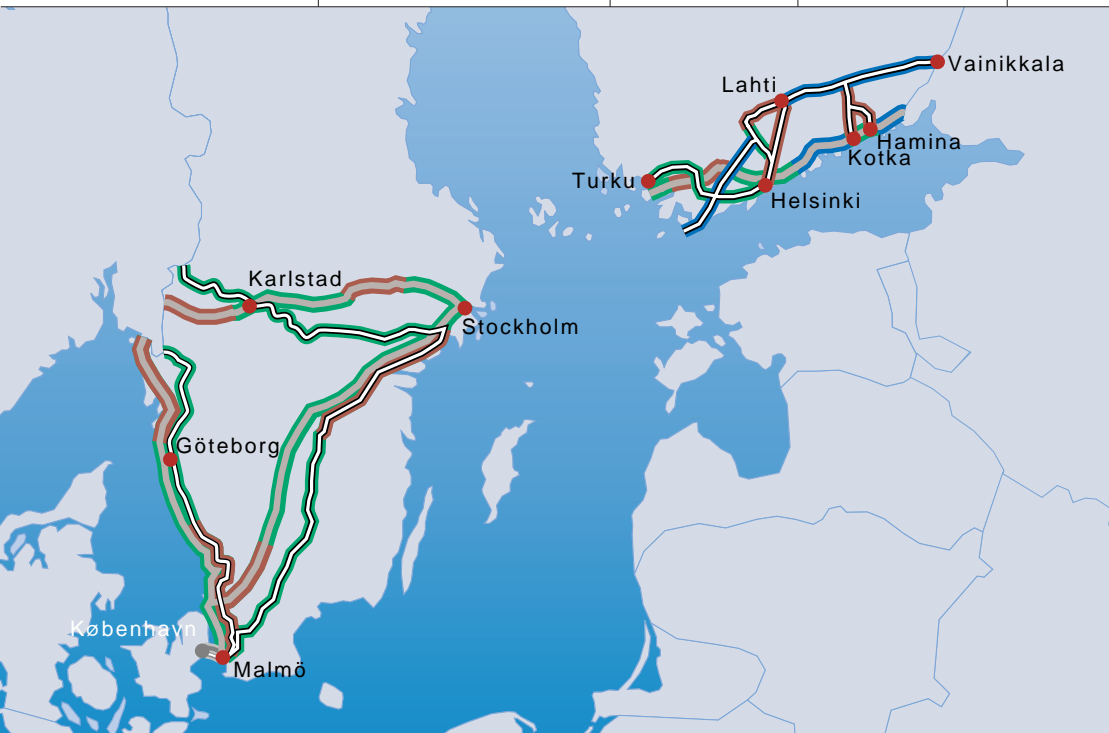
In conjunction with a parallel Russian improvement programme, the upgrading of the Finnish rail corridor to 200 kilometres an hour will cut journey times between Helsinki and St Petersburg by nearly 50 %, to just three hours. Similar upgrading work has already improved journey times on the Turku-Helsinki section, attracting increased numbers of passengers. Progressive upgrading to motorway standard of the two-lane E18 road from Turku to Hamina in the south-east will similarly reduce journey times – in particular, by relieving congestion around Turku and Helsinki and elsewhere along the route. In Sweden, rail journeys from Stockholm to Malmö will be cut to under four hours and between Gothenburg and Oslo, where tilting trains will be used, from four hours to two hours and 20 minutes.






Improvements to roads in Sweden and Finland, as well as to the ferry link across the Gulf of Bothnia, will significantly boost safety standards along these routes.

### What is its current status?

Upgrading of the Turku-Helsinki main rail line, as well as of urban lines from Helsinki to Leppävaara and Tikkurila, was completed in 2000. Work on the section from Helsinki to the Finnish-Russian border will be completed by 2006. Two sections of the E18 motorway were completed in 2001, with the remaining stretches due for completion by 2008. Development of traffic management and safety systems, ferries and ice-breakers for the Turku-Stockholm maritime link are ongoing.

route	type of work	distance (km)	timetable	investment to date (€m)	total investment (€m)
road (Finnish section)	upgrade to motorway	1 100	by 2008	216	1 150
rail (Finnish section)	rail upgrade		by 2010	309	1 640
road (Swedish section)	upgrade to motorway	1 400	1995-2010	1 011	1 984
rail (Swedish section)	rail upgrade		1995-2010	562	1 125
Malmö Citytunneln	new line	17	1998-2008	125	1 067
<b>total:</b>		2 517		2 223	6 966

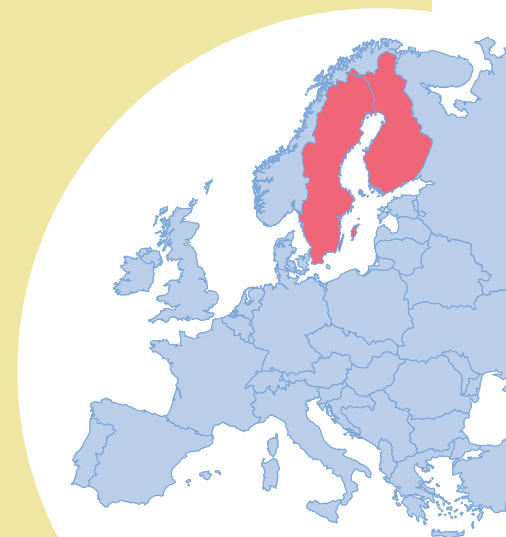


-  road
-  rail
-  completed
-  under construction
-  under preparation

*Note: See page 30 for connecting Priority Project 11.*

The main rail line from Malmö to Stockholm has been upgraded to 200 kilometres per hour as far as Norrköping. New lines allowing speeds of up to 300 kilometres per hour will be built in especially busy sections. The Stockholm-Oslo line has been upgraded to the Norwegian border. Most of the Swedish west coast main-line from Malmö to Gothenburg has been expanded to double track, mainly along a new route. Double-tracking to permit speeds of up to 200 kilometres an hour is also under way on the rail line between Gothenburg and the Norwegian border. The E4, E6 and E18 roads have now largely been upgraded to motorway standard. The remaining sections include a planned new 21-kilometre bypass around Markaryd. A new underground passenger rail link – Citytunneln – is planned beneath Malmö. Work is scheduled to start in 2003, with the link becoming operational by 2008.

The total investment is estimated at more than € 7 billion. Community support of € 85.5 million is foreseen in the framework of the TEN Programme 2001-2006.





# Ireland/United Kingdom/Benelux road link

Roads in northern and southern Ireland, Scotland, Wales and England are being upgraded to speed transport between Ireland and mainland Europe.

## What is the project?

This project will improve road transport between Cork, Dublin and Belfast, complementing the development of Ireland's main west coast rail line (see Project 9). It will also provide upgraded links to mainland Europe via ferry links to Scotland and Wales, the A14 and M6 roads across England, and the ferry ports of Felixstowe and Harwich. The 1 500-kilometre route includes a mixture of new roads, mainly in the Republic of Ireland, and the upgrading of existing roads to motorway, expressway, dual-carriageway and high-quality single-carriageway, depending on traffic densities.

## What are its expected benefits?

The project will significantly shorten journey times for passengers and freight between Ireland and the ports of Belgium and the Netherlands, contributing to the economic and social cohesion of one of Europe's peripheral regions. As well as improving safety, it will help to ease congestion on these routes by relieving current traffic bottlenecks.

- road
- completed
- under construction/upgrading
- under preparation



Note: See pages 26 & 36 for connecting Priority Projects 9 & 14.

route	type of work	distance (km)	timetable	investment to date (€m)	total investment (€m)
UK sections	new and upgraded roads	1 150	1992-2012	194	1 349
Republic of Ireland sections	new and upgraded roads	380	1989-2006	440	2 316
<b>total:</b>		1 530		634	3 665



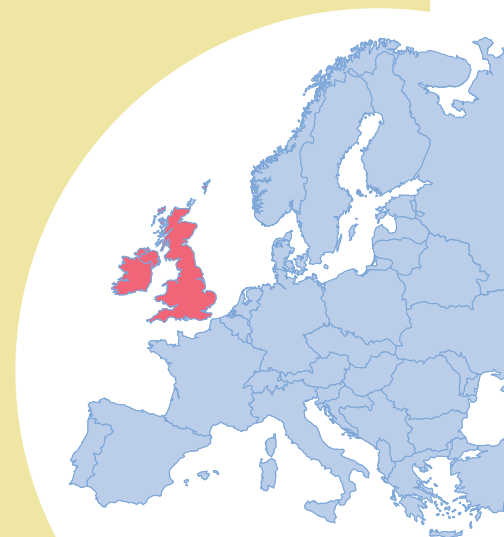
Trucks loading onto a ferry at Felixstowe, terminus of the road link to the Benelux countries (Hutchison Ports (UK) Ltd)

## What is its current status?

In England, construction of the A14 road linking the A1 and M6 has been undertaken, and improvements to six further sections are planned but are subject to the outcomes of studies. In Wales, improvements to the A55 were completed in 2001, together with upgrading of the A40 from Carmarthen to St Clears, with work on the A40 from St Clears to Haverfordwest due to start in 2008. Upgrading on the A465 began in 2002 and is due for completion in 2004, with improvements to six other sections to follow. Work to improve the A75 through Dumfries and Galloway in Scotland is ongoing. In Northern Ireland, the widening of three sections totalling 24 kilometres, and the improvement of several junctions, is expected to be completed by 2007. Further widening schemes are likely to be approved during 2002.

In the Republic of Ireland, preparations are under way for construction of the new sections of the M/N1 from Dundalk to Newry and Newry to the border. A tender will be awarded in 2004 for scheme completion by 2006. The Dunleer-Dundalk section of the M1 opened in January 2001 and construction work on three other sections is at an advanced stage and will be completed by 2003. The Dundalk western bypass is at tender stage. Work is also well underway on the M7 Kildare bypass, due for completion in 2004. The M7 Monasterevin bypass is at tender stage. Work has also started on the N8 Cork-Dublin road south of Portlaoise, due for completion in 2003. The N8 Cashel bypass is currently at tender stage, and other sections are at planning stage.

Community support of € 30.8 million is foreseen in the framework of the TEN Programme 2001-2006. In eligible regions the project also benefits from EU Structural Funds support.





## West coast main line (rail)

Improved network capacity and high-speed performance for both passenger and freight services in the Union's north-western regions will strengthen cross-border connections and trade.



- ==== rail
- under construction/upgrading

Note: See pages 26 & 34 for connecting Priority Projects 9 & 13.

### What is the project?

This project will renew and upgrade Britain's main west coast railway line, which runs from Glasgow through Liverpool and Manchester to Birmingham and London, covering a total distance of 850 kilometres. The improved line will connect to the Channel Tunnel Rail Link in London, providing a high-speed service all the way from Scotland to continental Europe. Passenger services will be able to achieve maximum speeds of 200 kilometres an hour.

### What are its expected benefits?

The scheme will allow shorter journey times for passengers and freight travelling between Northern Ireland, Scotland and the north of England and France, Belgium, the Netherlands and Germany. Improved speed and convenience are expected to attract new users on these international routes, helping to shift traffic from the roads.

route	type of work	distance (km)	timetable	investment to date (€m)	total investment (€m)
West coast main line	rail upgrade – 200 km/h	850	1994-2007	2 154	7 700
<b>total:</b>		850		2 154	7 700

## What is its current status?

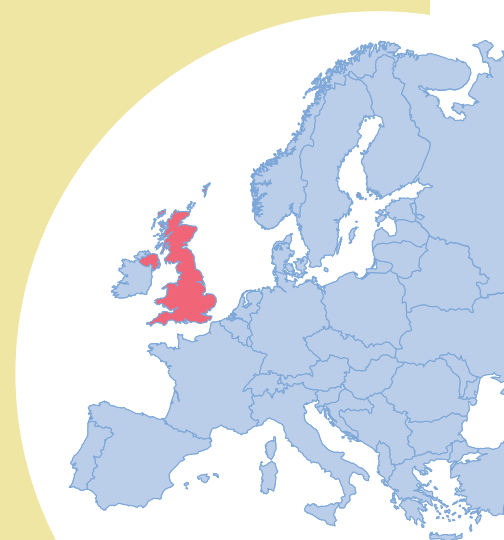
Work on the project began in 1994, and extensive renewal and enhancement works have already been completed. In London, track and signalling systems have been rebuilt between Euston and Wembley, while track replacement and overhead electrification is currently being carried out on the section between London and Crewe.

Remaining project objectives are currently under review by the United Kingdom's Strategic Rail Authority, and 200 kilometre per hour services are scheduled for introduction in 2003. The project as a whole is due to be completed in 2007.

Community support of € 44 million is foreseen in the framework of the TEN Programme 2001-2006.



*Train leaving Birmingham New Street station  
(La Vie du Rail/Christophe Recoura)*





# Global navigation and positioning satellite system Galileo

**European satellite navigation technology will bring low-cost position and timing services of unparalleled accuracy and reliability to all sectors of society.**

## What is the project?

Galileo is Europe's initiative to create a global satellite navigation system offering precise position and timing services for commercial and personal users anywhere in the world, using a small and inexpensive receiver. When fully deployed, the system will consist of an array of 30 satellites, together with associated infrastructure on the ground and newly developed applications and services.

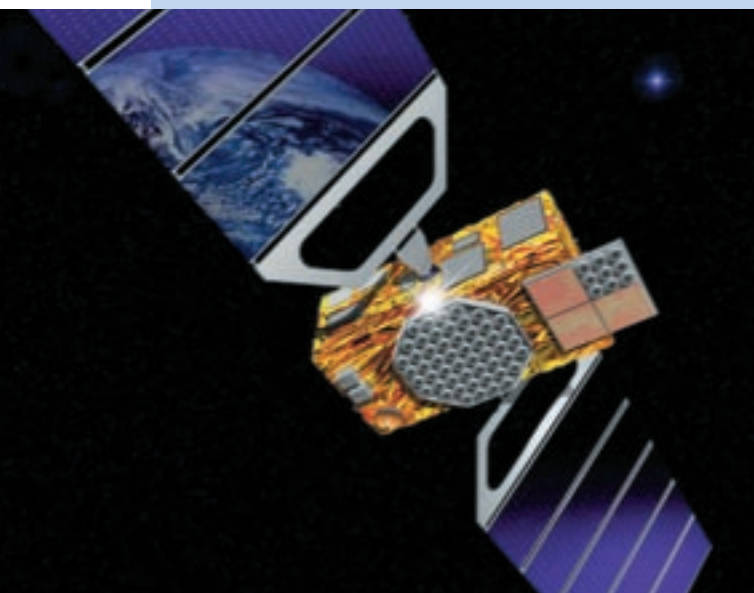
## What are its expected benefits?

Galileo will make Europe independent in a technological field of strategic importance.

Cost-benefit analyses carried out for the Commission estimate that Europe's share of the global market for satellite navigation products and services may be worth as much as € 9 billion each year from 2015 as a result of using Galileo, and that up to 140 000 new jobs could be created. A wealth of promising applications are already emerging, especially in the fields of transport. The Galileo system is designed to respond to the specific needs of every transport domain, including aviation, maritime transport, and road and rail transport – even pedestrians will benefit. But Galileo will also benefit other professional and personal activities, from civil engineering, social and emergency services to agriculture and fisheries, banking and finance, environmental protection and civil protection.

From the user's perspective, Galileo will offer the advantages of complete reliability and unprecedented accuracy. It will allow goods, vehicles and people to be located with approximately ten times greater accuracy than GPS, to within a few metres. And unlike GPS, the continuity of its signal will be guaranteed.

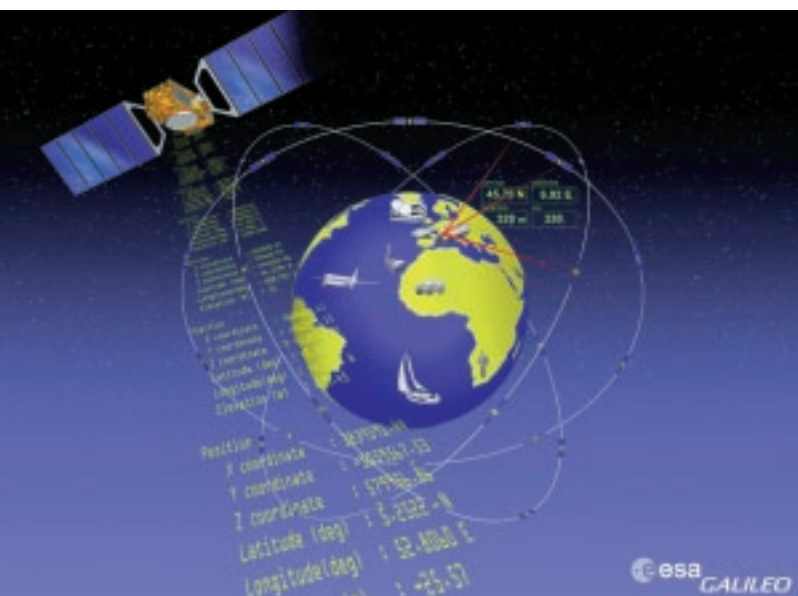
Galileo has been designed specifically for civilian use worldwide, and will provide both a freely available signal and ones restricted to specific groups such as commercial service providers, safety-of-life applications such as aviation, and government users.



*Artist's impression of Galileo satellite  
(ESA/J.Huart)*

route	type of work	distance (km)	timetable	investment to date (€m)	Community support <sup>1</sup> (€m)
Galileo, phase 1	development and validation		2002-2005	100	550
Galileo, phase 2	deployment		2006-2007		

1. TEN budget.



Artist's impression of Galileo satellite (ESA/J.Huart)

## What is its current status?

A Galileo Joint Undertaking is being set up, managed by the European Commission and the European Space Agency (ESA) and open to private sector participation. It will oversee the technical work carried out in the development phase (2002-2005), prepare the market for Galileo applications and services, and launch the selection procedure for the future commercial operator of Galileo services.

The European Union and ESA will co-finance the development phase at a cost of € 1.1 billion, while the Sixth Research Framework Programme will invest a further € 100 million in the development of applications. Community support of € 550 million is foreseen in the framework of the TEN Programme 2001-2006. The ensuing deployment and operation of Galileo will involve significant private sector investment through a public-private partnership scheme.





# High-capacity rail link across the Pyrenees

**A high-capacity line linking the French and Spanish rail networks will significantly increase rail's share of international freight on this crowded route, improving connections between southern and northern Europe.**

## What is the project?

This scheme involves the construction of a new high-capacity rail link across the Pyrenees, connecting the French and Spanish networks. The route, intended for freight, will include European-gauge lines and will require the construction of a long distance tunnel. Several routes from Zaragoza to the French network are under consideration.

## What are its expected benefits?

The project will complete a major south-west European trade route linking Portugal and Spain with the rest of Europe.

By 1998, annual freight traffic across the Pyrenees between Spain and the rest of Europe had reached 144 million tonnes. Of this, 53 % was by road and only 3 % by rail, with the remainder using short sea shipping. Road traffic was growing at an astonishing rate of more than 10 % per year, with 15 000 heavy goods vehicles crossing the Pyrenees every day. By 2020, overall traffic flows are expected to more than double.

In the medium term, completion of the 'High-speed train south' project (see Project 3) and improvements of the existing lines and terminals at Hendaye and Irún, as well as the development of short sea shipping, will provide road freight users with alternatives. However, in the long term additional rail freight capacity will be needed. The construction of this new line will enable rail to achieve a 30 % share of the land transport market in the Pyrenees – still less than its share of 35-40 % in the Alps.



— rail  
■ ■ ■ ■ under study

Note: See pages 14 & 24 for connecting Priority Projects 3 & 8.

route	type of work	distance (km)	timetable	investment to date (€m)	total investment (€m)
trans-Pyrenean rail link	new line	150	2002-2020		5 000 <sup>1</sup>
<b>total:</b>		150			5 000

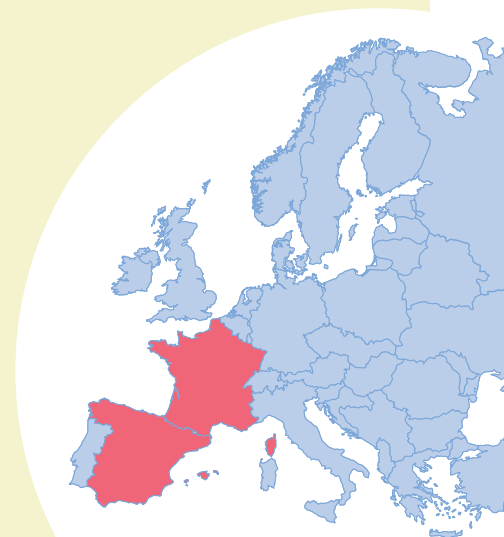
1. Estimation depending on the route chosen.

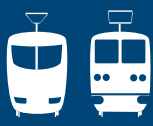


Railway yard at Playa-Aundi (Irun station)  
(SNCF Centre audiovisuel)

## What is its current status?

Initial studies and detailed road and rail cross-border surveys were carried out in 1999 with the support of the European Commission. At the joint ministerial summit of July 2001, the French and Spanish ministers agreed to examine in detail the establishment of an international work structure to launch and supervise co-ordinated socio-economic studies to establish the project's scale and time frame. Joint working groups have recently begun this process.





# East European combined transport/high-speed train

Improved rail links between the Union and the candidate countries of central and eastern Europe are needed to keep increased international freight traffic off the roads.



ICE high-speed train  
(Roberto Ferravante)

## What is the project?

The goal of the project is to develop the east-west rail route between Stuttgart and Vienna, a significant part of which goes through the Danube corridors. It will involve the construction or upgrading of 780 kilometres of track for high-speed passenger trains and freight transport – with parallel high-speed and conventional tracks for much of the distance.

## What are its expected benefits?

Further development of the east-west trans-European transport axes linking the European Union and the candidate countries of central and eastern Europe will be critical for successful EU enlargement. Cross-border trade is already generating significant volumes of long-distance freight traffic. Today, over 60 % of rail traffic in the Austrian section of the project is international, and volumes will grow further following enlargement.

This project will establish an eastern connection for future lines to Budapest and Bratislava. When linked to the 'High-speed train east' route (see *Project 4*), it will complete a high-capacity, high-speed trans-European rail corridor stretching from Paris to Vienna. It will improve access to and from the many conurbations along its route and help to shift traffic towards more environmental friendly transport modes. It has been estimated, for example, that on the Austrian section the scheme, combined with other railway infrastructure projects and the introduction of road charging, would reduce the increase in CO<sub>2</sub> emissions between 1990 and 2010 from 57 % to 9 %.

route	type of work	distance (km)	timetable	investment to date (€m)	total investment (€m)
Stuttgart-Ulm-Augsburg	new line/upgrading	166			2 748
Augsburg-Munich	upgrading	62	1998-2004		525
Munich-Freilassing	upgrading	141			824
Salzburg-Attnang-Puchheim	upgrading	67			1 611
Attnang-Puchheim-St. Pölten	upgrading	186	1990-2012		3 230
St. Pölten-Vienna (including Lainzer tunnel)	new line	50	1990-2010		1 855
<b>total:</b>		672			10 793

## What is its current status?

In Germany, works are on-going between Augsburg and Mehring, with financial support planned in the framework of the TEN Programme until 2006. Studies to reduce the bottleneck between Stuttgart and Ulm are also underway. In Austria, works are progressing on several sections, with the Wagram node and the Enns bypass given particular attention in the Programme. Other sections have already benefited from Community support in the last few years.



-  rail
-  under construction
-  under preparation

Note: See pages 10 & 44 for connecting Priority Projects 1 & 18.



# Danube river improvement between Vilshofen and Straubing

Improvements to the Danube's navigability will relieve a serious bottleneck, encouraging a shift of freight traffic from road to waterways along an increasingly congested route.



■ ■ ■ ■ under study

*Note: See pages 10 & 42 for connecting Priority Projects 1 & 17.*

## What is the project?

The project aims to improve the navigability of the Danube in Germany, relieving a major bottleneck in the trans-European waterways network and allowing boats to make a continuous journey from the North Sea to the Black Sea. Work covers the 70-kilometre section between Vilshofen and Straubing, where the loaded draught is currently inadequate.

## What are its expected benefits?

Removing this bottleneck on the Rhine-Main-Danube link is likely to lead to a shift of goods traffic from roads to waterways. Once completed, and depending on the technical option chosen, the Vilshofen-Straubing section could carry as much as 8 million tonnes of traffic each year. Moving freight off the roads is especially crucial along the Danube corridor, which is increasingly congested due to rapid increases in traffic volumes, which are expected to continue following enlargement.

By facilitating the development of inland shipping on a major east-west axis, the project will contribute to sustainable transport and to the integration of a number of central and eastern European countries. It will be carried out in strict accordance with community environmental legislation.

route	type of work	distance (km)	timetable	investment to date (€m)	total investment (€m)
Straubing-Vilshofen	upgrade of waterway	70			700 <sup>1</sup>
<b>total:</b>		70			700

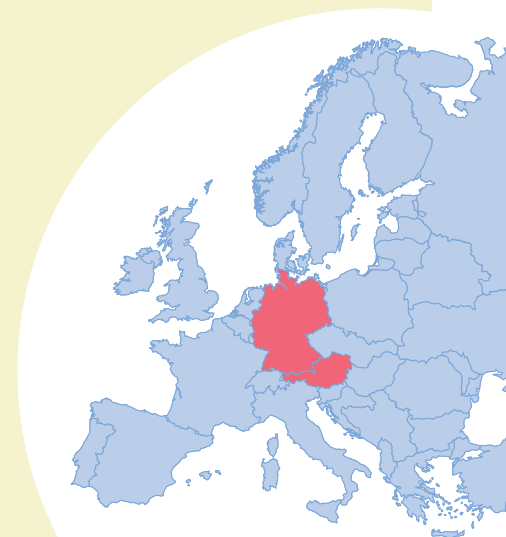
1. Estimation depending on the technical solutions adopted



Confluence of the Isar and the Danube near Deggendorf (RMD Wasserstraßen GmbH)

## What is its current status?

Studies of different options are being carried out to identify technical solutions that will minimise environmental impacts, especially on natural habitats.





# High-speed rail interoperability on the Iberian peninsula

The application of new construction and equipment technologies will make possible the integration of Spain and Portugal into a fully interoperable trans-European rail network.

## What is the project?

The difference in gauges between the rail networks of the Iberian peninsula and the rest of the European Union has been a major obstacle to the efficient operation of Europe's rail transport system. This project involves the construction of new lines and the installation of polyvalent sleepers, third tracks or axle-gauge changeover stations on the high-speed rail network of Spain and Portugal in order to make it fully interoperable with the rest of the trans-European rail network.

## What are its expected benefits?

Prioritising interoperability on the high-speed rail network will help to channel investment by the countries concerned towards technologies that ensure interoperability, progressively reducing the additional costs imposed by gauge differences.

By significantly enhancing their rail links, interoperability will improve communications between Spain and Portugal and the rest of Europe. On the routes served by the high-speed network, it should help rail to win market share from air and road transport on congested routes. The construction of new lines will free capacity on existing lines for more freight traffic.



*Talgo XXI at Burgos  
(Pablo Gadea Garzón)*

*Trial line: Deviation of national gauge line  
(GIF)*

*Trial line: Equipment for changing gauges  
(GIF)*

*Túnel del aire – province of Córdoba  
(Renfe/MAN)*



— — — — lines selected for high-speed rail interoperability

## What is its current status?

Several new high-speed lines with European gauge standards are already under construction in Spain, including the ones between Madrid and Barcelona (*see Project 3*), Córdoba and Málaga and between Zaragoza and Huesca. Pilot tests of a third rail on a 15-kilometre stretch of track at Medina del Campo has demonstrated that this technique allows speeds of up to 250 kilometre an hour. Further work will be carried out in the framework of Spanish and Portuguese plans for high-speed lines.

The final cost of high-speed rail interoperability on the Iberian peninsula will depend on the technical solutions taken for each line.







# Fehmarn belt: fixed link between Germany and Denmark

The Baltic Sea region will see a boost in passenger and freight traffic thanks to this new project currently under investigation.



*Artist's impression of the bridge option for Fehmarn Belt link (Sund & Bælt Holding A/S)*

## What is the project?

This project will involve the construction of a bridge, a tunnel, or both to form a fixed road and rail link spanning the 19-kilometre-wide Fehmarn Strait between Germany and Denmark, on the same route as the recently completed Øresund link between Denmark and Sweden (see Project 11).

## What are its expected benefits?

The Fehmarn crossing is a key element in the completion of the main north-south route connecting central Europe and the Nordic countries. Once completed, it will attract passenger and freight traffic estimated at 2.8 million vehicles and 30 200 trains a year, helping to relieve congestion on the Great Belt route across Denmark.

The project is expected to stimulate economic development in the Baltic Sea region of Denmark and Germany, creating a cross-border area of economic development similar to that around Øresund.




route	type of work	distance (km)	timetable	investment to date (€m)	total investment (€m)
Fehmarn Strait	road and rail bridge and/or tunnel	19	operational 2013		2 900-4 400 <sup>1</sup>
<b>total:</b>		19			2 900-4 400

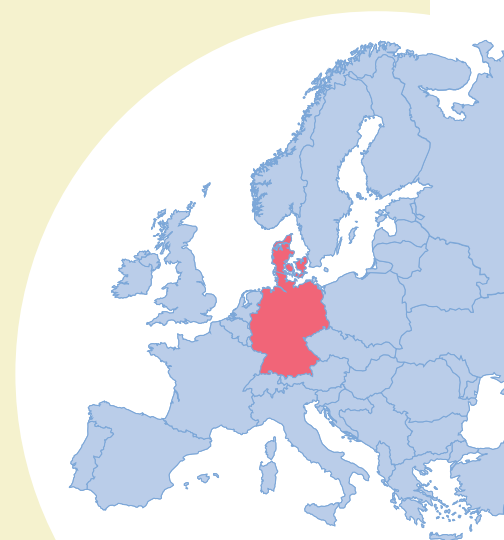
1. Estimation depending on the technical solution adopted.

## What is its current status?

A series of joint Danish-German studies was completed before 2002. An Enquiry of Commercial Interest was completed in June 2002 to determine the extent to which the private sector could supplement public financing of the link, which should be open to traffic in 2013. The total cost will depend on the technical solution adopted, and this has not yet been chosen.



-  road
-  rail
-  under study



## Further information

Click here...

- Further information about the **trans-European transport network** (TEN-T) is available at: <http://www.europa.eu.int/comm/transport/themes/network/english/hp-en/aatransen.htm>
- The White Paper, '**European transport policy for 2010: time to decide**' can be downloaded from: [http://www.europa.eu.int/comm/energy\\_transport/en/lb\\_en.html](http://www.europa.eu.int/comm/energy_transport/en/lb_en.html)
- The European Commission's **maritime transport homepage** is at: [http://www.europa.eu.int/comm/transport/themes/maritime/english/mt\\_en.html](http://www.europa.eu.int/comm/transport/themes/maritime/english/mt_en.html)
- The **latest available statistics** on European transport are available at: [http://www.europa.eu.int/comm/energy\\_transport/etif/index.html](http://www.europa.eu.int/comm/energy_transport/etif/index.html)
- Further information about the new '**Marco Polo**' programme for freight intermodality can be found at: [http://www.europa.eu.int/comm/transport/themes/land/english/lt\\_28\\_en.html](http://www.europa.eu.int/comm/transport/themes/land/english/lt_28_en.html)
- Further information about EU framework programme **transport research** is available at: <http://europa.eu.int/comm/transport/extra/home.html>

European Commission

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