


2005 - 2020

PEIT

STRATEGIC INFRASTRUCTURES AND TRANSPORT PLAN

MINISTERIO
DE FOMENTO

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PREAMBLE

This Strategic Infrastructures and Transport Plan (PEIT) approved in a Resolution of the Council of Ministers on 15 July 2005 is the expression of a new infrastructures and transport policy, conceived as an instrument at the service of major economic and social policy objectives. As part of this general approach, the Plan considers infrastructures to be the essential support providing citizens with quality transport services which are above all safe, at the same time as being an effective tool to promoting economic development and social and territorial cohesion, so guaranteeing the best use of their potential in society's service.

The Plan sets out the basic guidelines for action on infrastructures and transport within the State's competence over a medium- and long-term horizon (2005-2020), with the aim of defining an overall and coherent framework to ensure the stability of infrastructure and transport policy. Given their structural nature, the aim is to avoid improvisation in decision-making, so that the PEIT contains general criteria by which to frame any decisions made in this sphere.

For these same reasons, a high level of social consensus was sought for the elaboration or the PEIT, with the greatest possible input and transparency, by creating a specific procedure for participation and debate, which was unquestionably the most comprehensive developed in Spain for a Plan of these characteristics.

In this respect, may I express my thanks to the Autonomous Communities, Local Administrations, business organisations and trade unions, environmental associations and, in general, to all those citizens whose contributions in the form of observations and proposals have ensured that this final document is an improvement on the one proposed initially, thanks to its enrichment through their input.

Thus the PEIT is the upshot of more than a year's hard work and reflection but also of participation and debate open to the whole of society.

The Plan is infused with our concern for sustainable development and by great sensitivity to environmental concerns and criteria. It is no coincidence that the modes of transport most enhanced by the PEIT, such as rail, are precisely those which contribute most to transport sustainability.

I would like in this sense to emphasise that the Government decided to complete an environmental assessment of the PEIT, according to a procedure which meets the criteria and principles of the European Union Directive on the Environmental Assessment of Plans and Programs. This procedure was implemented in coordination between the Ministries of Public Works and Transport and of the Environment, culminating in the joint drafting by both Ministries of the Plan's Environmental Report. This Report confirms the environmental viability of the PEIT, and makes a series of recommendations which are incorporated into this final document. This also implies a significant novelty in infrastructure planning in this country.

PREAMBLE

The Strategic Infrastructures and Transport Plan represents the largest-ever drive to provide infrastructures in Spain, with expenditure of close to 250 billion euros, an annual mean of more than 15.5 Bn €, and average investment of some 1.5% of GDP throughout its effective term.

The backing for rail is one of the Plan's clearest strategic options and it includes as basic lines of action the development of an ambitious High-Performance Network providing balanced cover to the whole country, the promotion of rail transport of goods, with a clear commitment to mixed traffic, and the development of commuter rail transport. Rail accounts for more than 48% of total expenditure under the Plan.

This promotion of rail fits within the framework of an integrated intermodal transport system for both goods and passengers, in which the other modes also play a fundamental role. Thus spending on road, sea and air transport is maintained at levels appropriate to the satisfaction, in conditions of quality and safety, of expected increases in demand, major in some cases, and a proportional contribution to the fulfilment of the Plan's overall objectives.

The PEIT proposes a diversified financing strategy which does maintain a strong budget base, some 60% of the total, while opening up possible use of various sources and instruments for non-budgetary financing, so ensuring the entire Plan's economic-financial viability. Underlying this strategy are the principles of stable investment over time, making the most of public corporations' and bodies' self-financing capacity, and the use of suitable public-private collaboration mechanisms, in line with the Plan's own objectives and strategic options.

The Strategic Infrastructures and Transport Plan constitutes in short a decisive commitment to the future of this country, to its economic development and its competitiveness, its social and territorial cohesion, and the quality of life of its citizens, with a set of measures and actions designed to create a transport system which is more integrated, safer, efficient and respectful of its environment.

Magdalena Álvarez Arza
Minister of Public Works and Transport

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THE PEIT: A COMMITMENT TO PLANNING

With the Strategic Infrastructures and Transport Plan *(Plan Estratégico de Infraestructuras y Transportes,* PEIT), the Ministry of Plublic Works and Transport *(Ministerio de Fomento)* recovers planning as the tool by which to frame its medium-term actions, and takes on a public commitment in the pursuit of the policies for which it is responsible.

Planning delivers the following to those responsible for decision-making, and to society as a whole:

- Adequate decision-making information. Planning allows action to be ordered according to certain criteria and priorities, and points to the consequences for other areas of action, facilitating the political decision-making phase, although never replacing that responsibility.
- A rigorous assessment of real necessities, and efficient allocation of limited resources. A lack of planning leads to an unlimited widening of proposals for action, and forces those responsible for public policies to concentrate on obtaining greater resources rather than on optimising their use.
- Transparent decision-making, widening the involvement in the process not just of the social-professional and financial sectors directly involved, but of the whole of society. Planning is a characteristic of a system of governance based on participation and the willingness of those responsible for public policies to account for their decisions and the results of such decisions to citizens.
- Anticipation of the effects of actions, and so an appropriate early response: synergies with other actions or policies, and corrective and accompanying measures facilitating the attainment of objectives, so that planning becomes an on-going and flexible process.
- Identification and clarification of the bases for coordination with other Administrations, and for monitoring resource allocation and the fulfilment of objectives.
- The creation of a stable framework for transport policy which in turn defines the scenario in which the economic sectors affected are to act.

The following are the most notable elements of the strategic planning dealt with in the PEIT:

- The creation of a coherent planning system for Ministry of Public Works and Transport policy as a whole, from strategic to sector planning, dealing with the planning of both infrastructures and transport services.
- To move forward in a planning system which, based on the objectives set for the transport sector, defines the most suitable future scenario and then identifies the measures and action best leading to that scenario.
- To incorporate social, environmental and territorial objectives on the same footing as their functional and economic counterparts.
- To consider the action which can help to attain the objectives set.
- To seek the active cooperation of the other Administrations to enhance coordination of action and reach the objectives set for the Plan, not just in relation to the actions the Ministry of Public Works and Transport must initiate in each region but also any complementary actions which might be implemented from other spheres in reaching the PEIT's objectives.
- To converge with the planning principles of the countries around us and of the European Union, particularly in the commitment to integrate sustainable development targets into the transport sector and to strengthen the principles underlying the common policy on transport and the Transeuropean networks.

The PEIT thus deals with the planning of all action in the field of infrastructures and transport which are the competence of the Ministry of Public Works and Transport. The plan's design takes account of the necessary cooperation and agreement with other Territorial Administrations.

Because of its nature as a STRATEGIC PLAN with a medium- to long-term horizon, the PEIT is structured as follows:

- It is based on a diagnosis of the present transport system in Spain.
- It defines the Objectives, specifying those already fixed in the Council of Ministers' Resolution of 16 July 2004.
- It proposes various alternatives or scenarios for action.
- It fixes monitoring indicators.
- It sets criteria and guidelines for intervention.
- It fixes short- and medium-term priorities for action.
- It defines future work, drafting the provisions, projects and programs for the Plan's implementation.
- It enhances the system for analysis of the Ministry of Public Works and Transport activities, proposing that feasibility studies be drawn up for new actions, along with statistics and base studies providing backup to future decision-making.
- It creates the economic-financial framework for its implementation.
- It commits itself to a Review in 2008/09, to revise objectives or to include new interventions as a consequence of the studies now set in motion.

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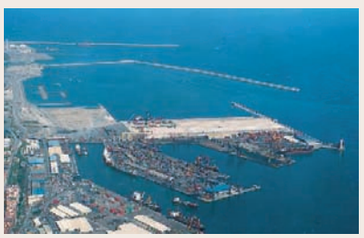
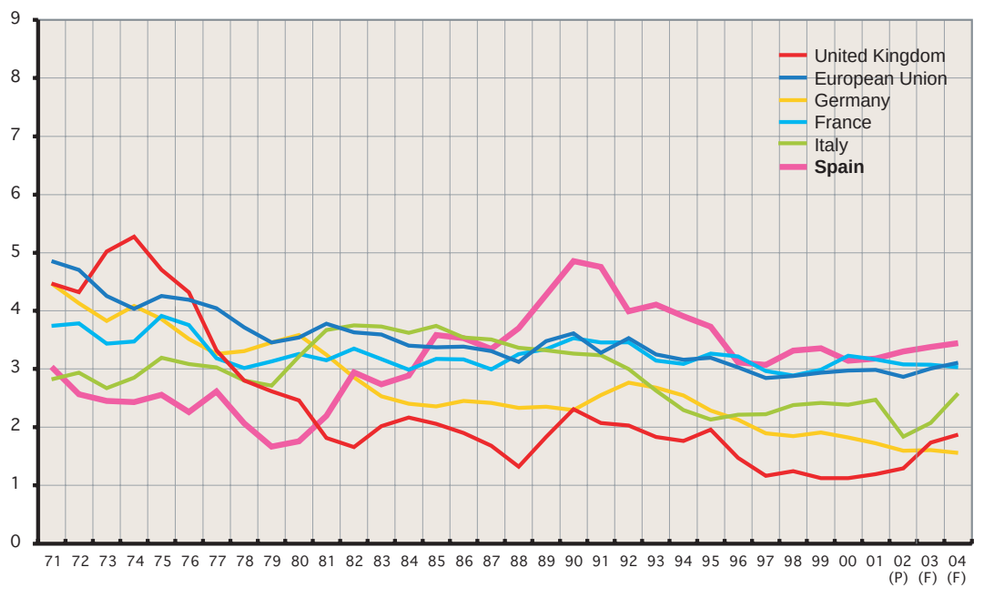


DIAGNOSIS OF THE TRANSPORT SYSTEM: THE NEED FOR A CHANGE OF HEADING

2.1. THE ANALYTICAL FRAMEWORK

Spain has, since the mid-eighties and with the assistance of European funds, undertaken a significant drive to overcome its deficiencies in transport infrastructures. From the end of the eighties and until the mid-nineties it was, with Germany, in first place in the European Union (EU) in the percentage of GDP allocated to investment in transport infrastructures. From the threshold of 0.5-0.6% of GDP in the mid-eighties it has reached values of around 1.7-1.8% of GDP in recent years, with deviations strongly linked to the economic cycle. As a result, investment in transport infrastructures in Spain is today twice the European Union average (between 1.0 and 0.85% of GDP).

FIGURE 1. Trends in public investment by country (% of GDP)



P: Provisional; F: Forecast
Source: Annual Macroeconomic Database. DG ECFIN, European Commission

2.1.1. The transport infrastructure networks

This section summarises the main elements of a diagnosis of State-owned infrastructures: roads, rail, ports and airports.

The existing structural road system on the Spanish mainland (Figure 2) comprises the 24,797 km of the State Highway Network, of which 8,700 kilometres (35%) are dual carriageways (6,698 km) and toll motorways (1,951 km). It must also be remembered that this structuring mainland network also includes about another 2,500 kilometres (2,450 km) of the Autonomous Communities' system of dual carriageways and motorways. An analysis of the features of this network must emphasise the following aspects:

a) The markedly radial nature of the State system of dual carriageways.

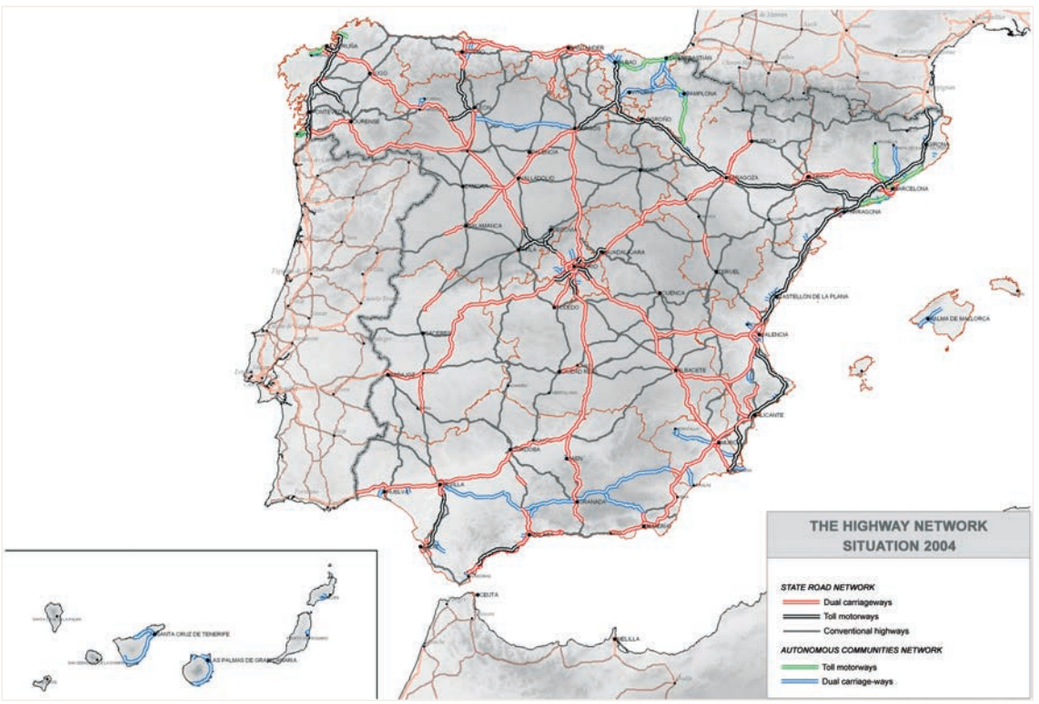
b) A mesh system which has begun to be built, but with discontinuities which have to be connected.

c) Persistently deficient access from certain regions, which must be corrected.

d) The obsolescence and the inadequacy of the security parameters of significant parts of the first-generation dual carriageway network, and of conventional roads, where action is necessary.

e) A generalisation of "standard" solutions which must be made more flexible in order to better adapt each section to the conditions of its surroundings and users' requirements.

FIGURE 2. The highway network: the current situation



The rail network in service is almost 15,000 kilometres long (Figure 3), of which somewhat more than 1,000 kilometres (1,031) represent the high-performance line in UIC gauge running through the peninsula like a large-scale diagonal axis Seville-Madrid-Zaragoza-Lleida/Huesca, but which is as yet incomplete. The two-track electrified system extends over nearly 3,000 kilometres (2,905), while there are 5,494 kilometres of service on a one-track network which is not electrified.

The following are some of the most significant aspects of the current state of the system:

a) Significant differences of both quality and safety levels from one network line to another.

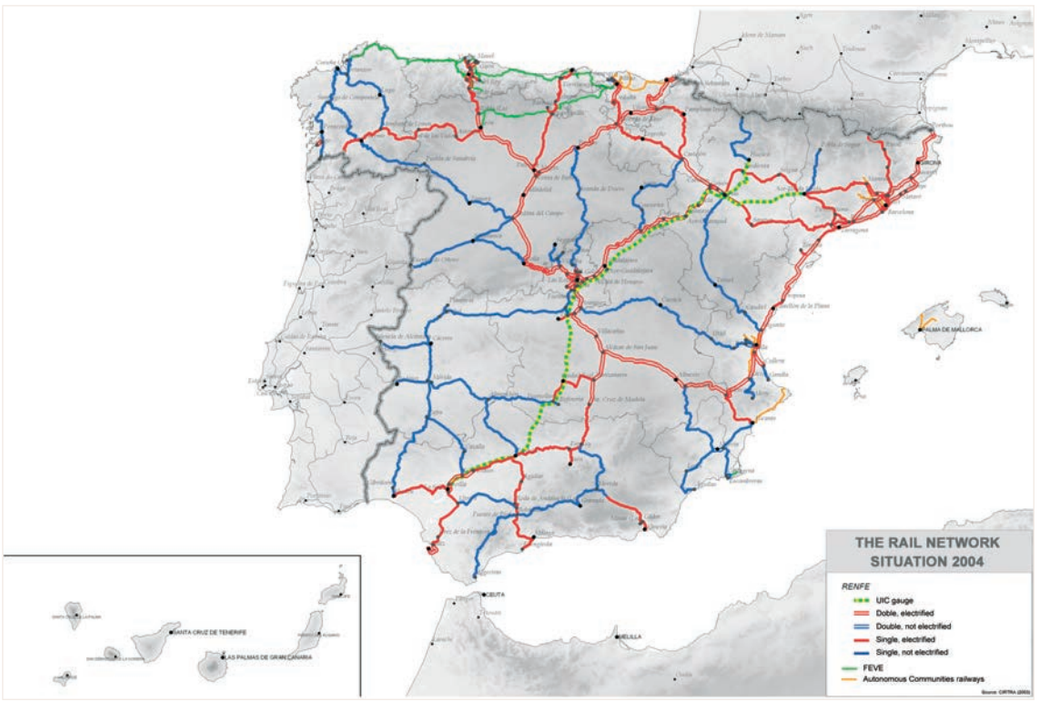
b) The existence of sectors and lines where traffic is light.

c) Difficulties in integrating the network into the international framework *(interoperability),* where the gauge difference is one major conditioning factor, albeit not the only one.

d) The existence of tensions, along with aspects related to suitability, between urban development and the rail networks. In the main urban areas, the major developments in commuter networks and services must be added in.

The network of State Ports of general interest is made up of 28 Port Authorities (Figure 4) which enjoy considerable operational and financial independence, coordinated by the Public Corporation *Puertos del Estado* (EPPE) which was set up in 1992. The port system

FIGURE 3. The rail network: the current situation



comprises the main entry and exit point of this country's imports and exports, accounting for around 70% of the total. The last decade has seen a continuing rise in port traffic which, in 2003, reached a total aggregate volume of 380 million tons. This demand is to some extent concentrated in the largest ports (particularly Algeciras with more than 60 million tons, Barcelona and Valencia, with more than 35 million), although in general each port has its own specific market.

More than the capacity of the maritime infrastructures, the main conditioning factors for the development of port activity are the need to adapt installations and services to the changing circumstances of demand, and the provision of land access (road and rail) which, as suggested with rail, points to the need to deal specifically with a better urban integration of ports.

There are 48 airports of general interest, managed by Aeropuertos Españoles y Navegación Aérea (AENA) including the military air bases open to civilian traffic and the Ceuta heliport, but activity is concentrated in a small number of airports. According to 2003 figures, Madrid-Barajas accounts for almost a quarter of all passenger traffic in Spain (23.3%), and it, Barcelona and Palma de Mallorca airports take more than 50% of all passenger traffic in this country, a figure which is tending to rise. The networked operation of air transport services favours this trend, while making it possible to increase access to air transport by the majority of the population.

Airport infrastructures are the main means of inward and outward access for passenger transport, but air transport is also domestically significant medium- and long-distance and (like sea transport particularly for goods) essential for communications with the territories away from the mainland, and for the links between them.

FIGURE 4. Network of State Ports of general interest

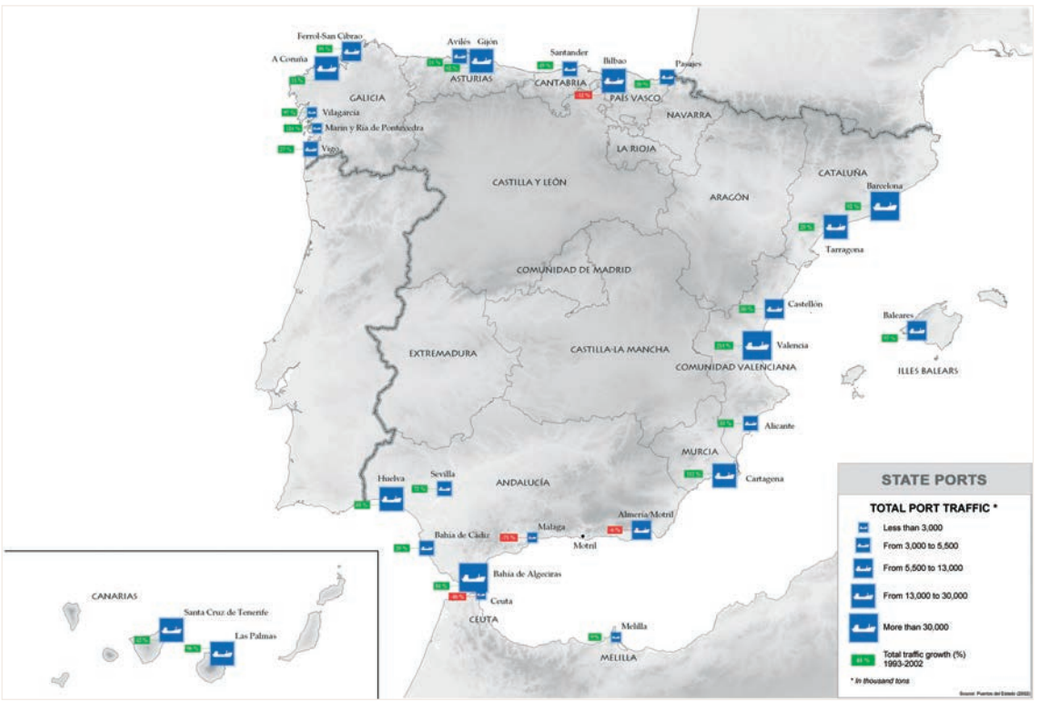
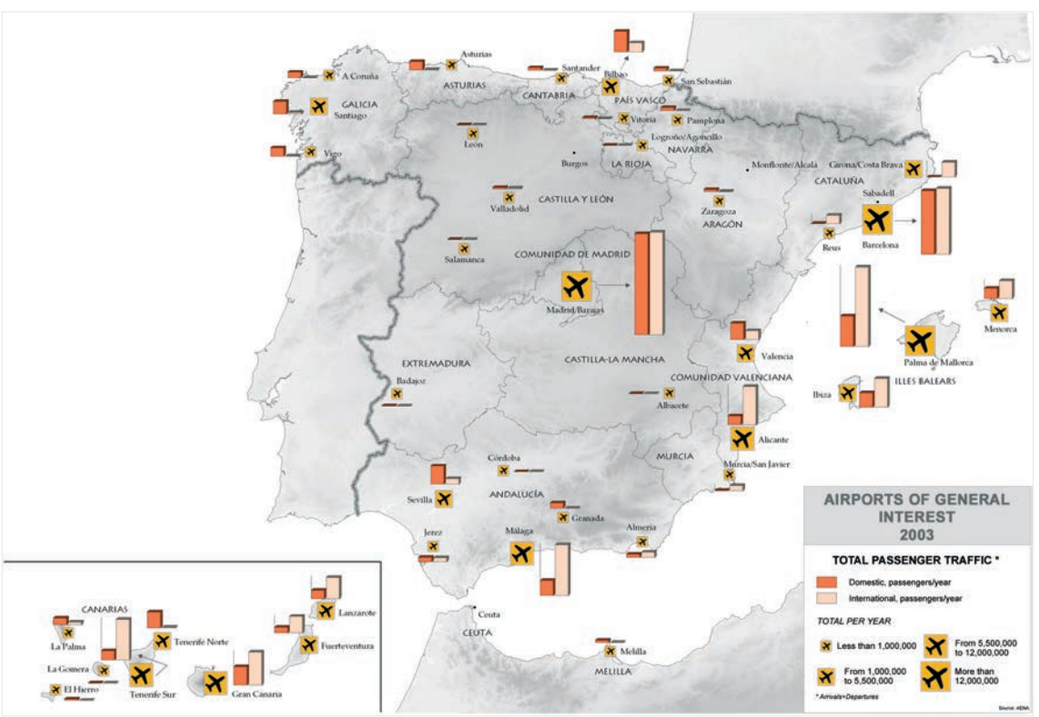


FIGURE 5. Network of airports of general interest



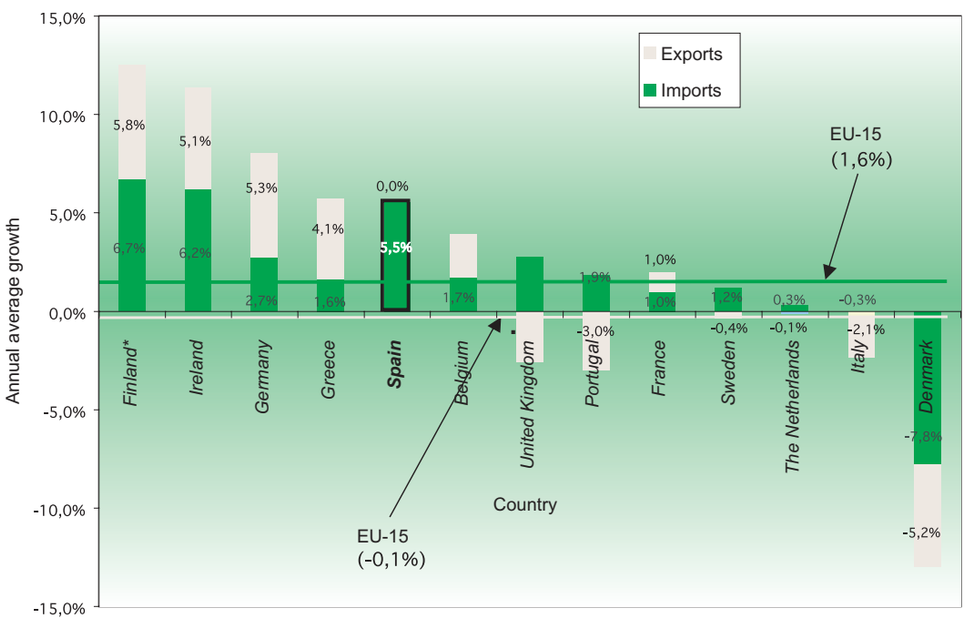
2.1.2. Transport demand and services

Despite the fact that, comparatively speaking, in quantitative terms domestic transport is far more important, the dynamic of the Spanish transport system is greatly influenced by the international context, for two reasons:

- the effect of European integration and world economic trends, which are raising overseas flows very quickly, and
- the existence of a common European frame of reference for transport policies.

International trade guidelines have gone hand-in-hand with a considerable growth of transport flows between Spain and the rest of the world, in both goods and passengers. Between 1993 and 2002, annual average growth in goods transport was 5.5%. Sea was the most-used means of international transport (236 million tons in 2002 and 5% average annual growth), followed well behind by road (with 87 million tons and annual growth of 6%). There are still major expectations of growth, the Spanish economy being relatively closed in comparison with that of most European Union countries. On the other hand, most of these new flows originate in or are destined for other European countries. Between 1997 and 2001, Spanish growth in international sea traffic was one of the largest in Europe, although with a notable imbalance in trends in imports and erxports (Figure 6), and Spain was among the countries with greatest market share in the European Union (Figure 7).

FIGURE 6. Annual average growth 1997-2001 in international sea transport (tons) in the European Union

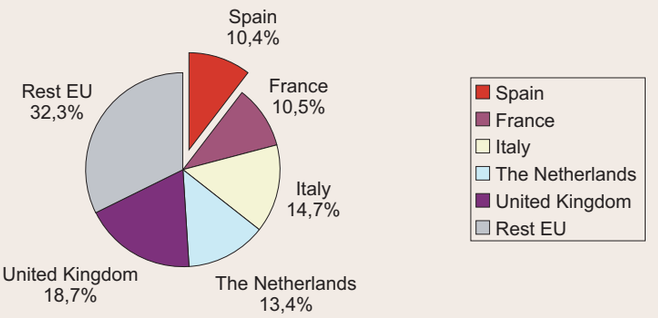


Source: Eurostat

In passenger terms, Spain is a major tourist destination, to which the country's transport system has contributed decisively. Tourists represented 68.5% of all travellers from overseas in 1995, rising to 70.4% in 2003. During that time, the number of passengers entering Spain rose an annual average of 4.4%. In order, the categories used were air (70%

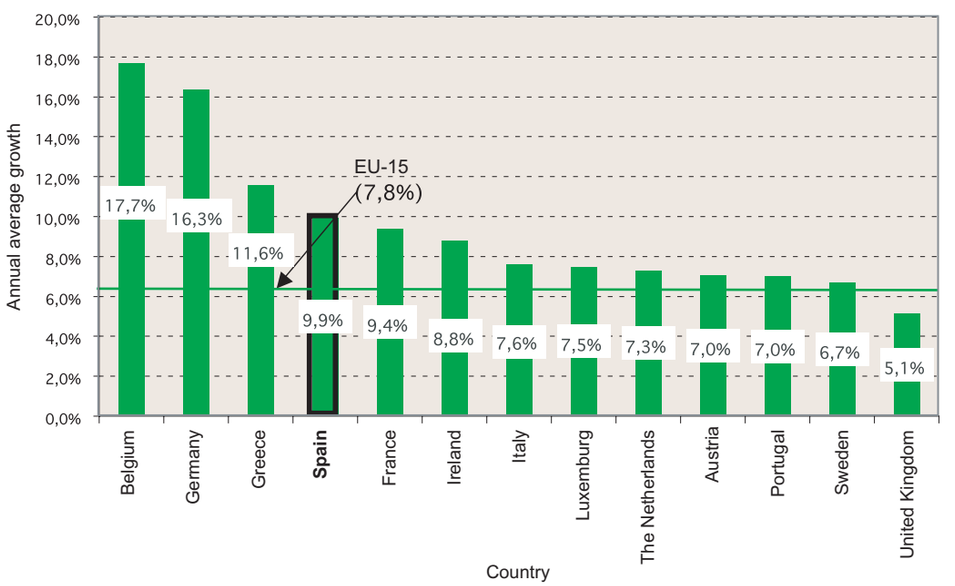
in 2003) and road (23%, mostly in private vehicles). The former experienced strong annual average growth, of 8.8%, slightly above the European average (Figure 8).

FIGURE 7. Spain's market share in European Union international sea transport (arrivals + departures). 2001



Source: Eurostat

FIGURE 8. Annual average growth of international air transport in Europe (Passengers, 1993-2001)



Source: Eurostat

Although at levels well below those of other European countries, international transit traffic has begun to rise significantly in recent years. Added to that originating or with destination in Portugal are the flows between the Maghreb and Europe, where there is also major potential for expansion, in both passengers and goods. Here the PEIT deals with and foments the promotion of the technical studies and work begun by Spain and Morocco in connection with the Fixed-Link project across the Straits of Gibraltar. This is in any event a long-term project, implementation of which may exceed the PEIT horizon.

Spanish transport with the rest of the EU follows lines similar to those of other Member States, influenced by the growing integration of European economies. For international goods transport, movement is by sea or road (50% and 43% respectively). Development of cabotage offsets the scant possibilities for river transport and the extremely limited

advance of rail (4.5% of the modal distribution compared with a European average of 8%). Transport flows run mainly to France, the United Kingdom, Italy and Germany, and the choice of the mode of transport depends to a large extent on the type of merchandise: while rail and sea transport concentrate on a limited number of products –such as some bulk items or motor vehicles– road transport provides a "universal" category.

In passenger transport inside the EU, more than 80% of Spanish international air transport users fly on intra-Community routes (a percentage equalled only by Ireland and Luxemburg), a pointer to the lack of modal alternatives for most displacements within Europe. In terms of the number of travellers originating or with a destination outside the EU, Barajas, with more than 6 million, heads medium-sized European airports such as Milan (Malpensa), Brussels or Copenhagen, although considerably behind the group of most important airports (London-Heathrow, Amsterdam-Schipol, Paris-Charles de Gaulle, Frankfurt and London-Gatwick).

The merit of placing a diagnosis of the Spanish system in the European context is confirmed with analysis of some data on internal transport demand, showing how the findings put forward by the European Commission for the EU as a whole in its 2001 White Paper turn out to be substantially adequate for this country too, despite its peripheral location.

Nationally, road continues to be the only means of transport which is able to meet almost any type of demand, so it is hardly surprising that it accounts for 86% of land transport of goods and 88% of passengers (the sum of the 78% in private vehicles and the 10% covered by group transport by bus). In goods, cabotage is, despite its importance, highly specialised in certain types of cargoes and connections (such as transport with Spain's non-mainland territories). This is similar to the situation of rail which, as already pointed out in dealing with international traffic, is becoming progressively more specialised in certain connections and demands. The dominance of road transport of goods, and its competitiveness in terms of service quality and price is, despite the advances made to enhance the transparency of the market and the business structure, associated with a worrying fragility of the sector, and weakness in its relation with loaders.

For passengers, the importance of air transport for domestic traffic (substantially linked to connections with areas of the country away from the mainland) is reflected in the fact that Barajas is, with a figure similar to that of Paris-Orly, the number one European Union airport in domestic passenger numbers, and Barcelona-El Prat is fourth, not far behind Rome-Fiumicino. Rail transport of passengers rose 30% in 1990-2000, although the annual average distance (traveller-kms per capita and year) by rail remains considerably lower in Spain (510 km) than the European average (810 km), and less half that in France (1,149 km). Use of rail in Spain is clearly concentrated along the trunks which offer high-quality service, such as the high-speed routes or the Mediterranean Corridor.

Urban mobility trends also make clear the relevance of a European diagnosis. Dispersed urban development has multiplied in this country, boosted by substantial improvements to metropolitan route networks (enhanced accesses and new ring-routes) aggravating dependence on the car despite major investments in many cities' public transport systems: private vehicles continue to grow in terms of vehicle-kms travelled and, on many occasions, even in terms of distribution by mode. The flexibility offered by new technologies (e-commerce, urban logistics management) does not appear at present to be translating into reduced transport demand, and even points in many cases in the opposite direction: greater consumption in terms of vehicle-kms.

2.1.3. The strengths and uncertainties of the existing Spanish transport model

It can thus be said as a general balance that the Spanish network is mature, and has virtually converged with Europe in terms of the country's resources in major transport infrastructures, particularly in dual carriageways and motorways. With nearly 18 kilometres of high-capacity routes for every 1,000 km^2 of area, Spain was as early as 2000 at the same level as France, and significantly ahead of the EU-15 average (15.9 km/1,000 km^2). The same can be said of high-speed rail lines (over 250 km/h): with the recent inauguration of the Madrid-Lleida line, only France has longer high-performance rail routes. In terms of numbers of inhabitants, Spain has the second-highest density in Europe of dual carriageways and motorways, exceeded only by Luxemburg. On the other hand, mid-range infrastructures continue to reveal a substantial difference, in particular in rail: 28.3 of conventional rail line for every 1,000 km^2 compared with a Community mean of 48.3 km/1,000 km^2 (Table 1).

TABLE 1. *Length of transport networks: Key Indicators. 2000*

	Rail				High-capacity roads		
	Km	% Electrified	Km/100,000 Inhabitants	Km/1,000 Km^2	Km	Km/100,000 Inhabitants	Km/1,000 Km^2
Belgium	3.471	78	34	113,8	1.702	16,6	55,8
Denmark	2.047	31	38,3	47,5	922	17,3	21,4
Germany	36.652	52	44,6	102,7	11.712	14,3	32,8
Greece	2.299	0	21,8	17,4	707	6,7	5,4
Spain	**14.303**	**54**	**36,2**	**28,3**	**9.049**	**22,9**	**17,9**
France	32.515	43	53,7	59,8	9.766	16,1	18
Ireland	1.919	2	50,7	27,3	103	2,7	1,5
Italy	16.499	66	28,6	54,8	6.478	11,2	21,5
Luxemburg	274	95	62,5	105,4	115	26,2	44,2
The Netherlands	2.802	74	17,6	67,5	2.289	14,4	55,2
Austria	6.281	60	77,5	74,9	633	20,2	19,5
Portugal	2.814	32	28,1	30,6	1.482	14,8	16,1
Finland	5.854	41	113,1	17,3	549	10,6	1,6
Sweden	11.560	75	130,5	25,7	1.506	17	3,3
United Kingdom	17.067	30	28,6	69,9	3.546	5,9	14,5
EU-15	**156.357**	**50**	**41,4**	**48,3**	**51.559**	**13,6**	**15,9**

Source: Eurostat (2003) Panorama of Transport

In relation to demand, infrastructure indicators also point to relatively high resources, particularly in road transport. Spain is in first place in terms of the length of high-capacity routes in relation to passenger kilometres (23.7 km/million traveller-kms), almost twice the European average (12.2). In goods transport, it is in third place with 84.6 km/1,000 ton-kms, albeit well above the European average (52.5). In rail, the length of the network in relation to demand is also significantly higher than the EU average, for both passengers (686 km/1,000 passenger-kms compared with 482) and goods (1,170 km/1,000 ton-kms compared with 612).

This transport system has facilitated Spain's integration into the European economy and has considerably palliated the effects of its peripheral location. It has also allowed the strengthening of certain corridors and city systems (the Atlantic axis, the Mediterranean corridor).

It is also true that, overall, the system has become more centralised, increasing the disparities between areas depending on whether or not they are reached by one of these major infrastructures, and facilitating the concentration and centralisation of economic activity in a reduced number of main centres (according to some studies of the effects of the Madrid-Seville AVE or the Paris-Lyon TGV, weakening areas of less force, to the benefit of those dominating). Such effects have also been noted, to a lesser extent, in the development of the radial structure of the high-capacity routes, or with the organisation of air services into a *hub-feeder* hierarchy. At the same time, these networks prove "impermeable" for a substantial part of the territory, aggravating spatial segregation. In short, while improvements to the transport system through radial structures organised in an extremely hierarchical form have assisted in economic progress and integration into Europe, they have gone hand-in-hand with greater regional disparities which, on the other hand, cannot be attributed exclusively to the transport infrastructures.

Recent years have thus seen major development of the different modes of transport in Spain, but this has happened independently in each, creating a system in which infrastructures and services compete progressively among themselves (and, in the first instance, for the allocation of resources), rather than collaborating to offer better service to users and society. Investment programming has too often ignored the functionality of each action, leading to heterogeneous networks and routes, where sectors with a capacity and performance out of proportion to true demand coexist with others which are obsolete, or out of step with the current requirements of quality and safety parameters.

The level of resources which has been achieved means that transport policy can be tackled from a new perspective: with major defects and bottlenecks overcome, the conditions exist where an attempt can be made to influence negative tendencies and impacts, very like those in the rest of the EU, more than clearly identified in the Community sphere (see the 2001 White Paper, or the Strategy for the Objectives of Sustainable Development in Transport Policy, October 1999): the huge increase in the mobility of persons and goods, particularly in urban and metropolitan areas; imbalances in access to the country as a whole, above all in the non-mainland and cross-border regions; the impact of transport on health and the environment; the volume and source of financial resources destined for infrastructures; and the challenges of a transport system which is increasingly integrated internationally and which demands greater competitiveness in the sector and greater attention to safety.

Transport safety and transport security are a challenge of particular importance in its three dimensions: risk of accident to users and others (including the environment), work risks to workers in the sector and risks to persons, installations and property which may arise from illicit actions of all sorts. More homogeneous action is essential in terms of objectives for the various categories of transport, on the grounds that ambitious objectives must be put in place to enable these risks to society as a whole to be reduced.

2.2. FACTORS CONDITIONING TRANSPORT POLICY

The Spanish transport system is decisively influenced by the principles of the Common Transport Policy. Re-establishing the balance of the types of transport, eliminating bottlenecks, the user as reference in decision-making (safety, quality, charges, ...) and the sustainable management of the process of globalisation in transport are priority questions not just for the actions of the Community institutions but also for all Member States.

Following the Treaty's remit[1], transport must include the principles of sustainable development: the Sectorial Strategy for integration adopted by the Council of Transport Ministers in October 1999, following the directives of the European Council Cardiff Meeting (1998) and the European Strategy for Sustainable Development (the Council of Europe Göteborg meeting, 2001), provides that *"A sustainable transport policy should tackle rising volumes of traffic and levels of congestion, noise and pollution and encourage the use of environment-friendly modes of transport as well as the full internalisation of social and environmental costs. Action is needed to bring about a significant decoupling of transport growth and GDP growth, in particular by a shift from road to rail, water and public passenger transport".*

The *sustainable mobility* strategy undertaken by the EU targets in short the de-coupling of growth in transport from economic growth, the development of alternatives to transport in private vehicles and the road transport of goods, and correct cost-allocation. It also insists on the need for strict monitoring of the sector's environmental performance, consolidating the TERM monitoring system *(Transport and Environment Reporting Mechanism)* and, where possible, fixes quantified objectives in transport policy: for example, in the distribution of goods transport categories (to be the same in 2010 as in 1998) or in road safety (halving the number of road deaths by 2010).

This country's geography and positioning in world trade and its transport flows provide a second point of reference for the PEIT: if in the context of the continent of Europe, Spain's location is peripheral, the same is not the case in the global situation, where this country occupies a key position in international movements of sea transport, and in relations between Europe and North Africa, while in air transport there is by no means negligible potential for it to enhance its position in trans-Atlantic traffic.

Economic growth, social trends and the outlook for territorial development place growing pressure on transport, demanding constant improvements to the quality of services and infrastructures. Increasing population, the development of the tourist sector, the reorganisation of productive processes or peripheral urban sprawl explain the growth of demand, but that growth is also accompanied by a demand for quality which has to be met, while observing three conditioning factors: financial efficiency, the energy framework and environmental compatibility.

The financial framework calls for consistency with the general objectives of budgetary balance, in a context of a significant reduction in European Funds which, for more than ten years, have contributed an average of some 20%-30% of the Ministry of Public Works and Transport infrastructure expenditure. Private enterprise must discover the right channels by which to continue cooperating with the public sector in the provision of infrastructures and services, although the natural concern to attract investment to the sector must respect

[1] Article 6 of the European Community constituent Treaty.

the principles and priorities defined in the PEIT. It is not a question of directing public action to maximise the volume of investments but rather to guarantee the stability and continuity of investment, tempering previous cycles.

The energy framework also imposes some conditions on transport policy, since the sector consumes 36% of the country's final energy resources, most of which comes from oil the main source (99%). A clear aim of Spanish economic policy is the challenge of reducing energy dependence: 77% of the energy consumed in this country is imported, compared with 50% in the EU-15, while net crude imports account for 2.1% of Spanish GDP, against 1% in most European countries. The energy requirements of transport have trebled in the last 30 years, and transport policy must take on a clear commitment to the aim of cutting energy dependence and guaranteeing secure energy supplies for this country, because of their significant weight in the final total of oil product consumption.

Environmental compatibility responds to growing demand and concern of the public and the social agents about sustainable development. This question is particularly sensitive in this country because of the wealth of its natural heritage and the existence of many areas (whether or not protected) which are vulnerable to the environmental impact of transport. Spain has to confront its commitments in the environmental sphere and must in future actively foment the international community's action.

Finally, there has to be a more detailed analysis of the risks of transport to health (air quality, noise, healthy mobility habits ...) and firm action must begin to inform citizens and to promote urgent action plans which provide them with adequate levels of protection and prevention policies.

2.3. DIAGNOSIS: KEY QUESTIONS

2.3.1. Forecast trends in the mobility of persons and goods

Studies of trends based on developments in recent years suggest very significant growth rates in future transport demands in this country, of between 3% and 6% annual average in products and services and between 4.5% and 6% in goods. Variations in the results of these forecasts depend basically on the initial econometric hypotheses and, very substantially, on GDP growth and population tendencies. In any event, this country is above the forecast growth rates for the whole EU-15.

In a scenario of economic growth, it is reasonable to expect a turning point to appear, at which the high elasticity between the demand for transport and economic growth (at present in the region of 1.2-1.5) begins to reduce, as has happened in other developed countries; however, it would be risky to predict an exact time horizon. Other countries' experience does suggest that there is a ceiling: in passenger transport linked it is linked at the very least to the existence of a maximum limit to the time people use to travel and, in goods transport, it derives from evolution towards a more de-materialised economy. Here on this last point, the Spanish economy is at present especially intensive in transport consumption (Figure 9).

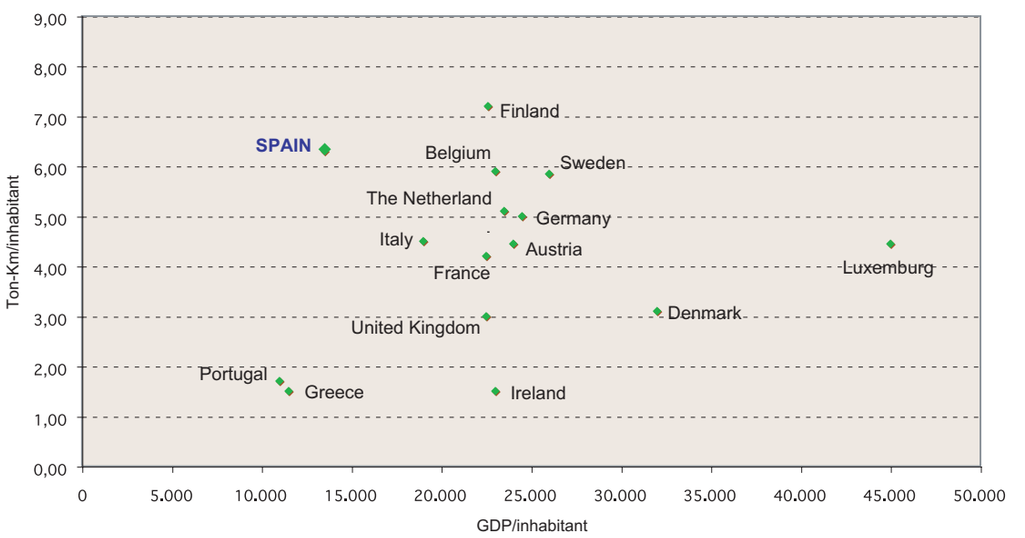
Increased mobility is one of the major challenges to the sustainability of the transport system. Although its negative effects can be mitigated by adequate distribution among the various

categories of transport, and operational and technological improvements in each of them, these palliative actions would seem to be insufficient, given the scale of growth forecast and the strong conditioning factor raised by environmental objectives. Thus the question arises as to the viability of future growth with lower transport demand (the *de-coupling* of economic growth and growth in transport) and the feasibility of promoting it through suitable mobility management measures. This de-coupling can be understood as follows:

- In relative terms, as an active policy to direct the rise in the demand for transport towards categories with less impact.
- In absolute terms, as an active policy which, in addition to the above, reduces the mobility of persons and goods without affecting economic growth or the needs for accessibility and social interaction.

Despite the scepticism dominating some sectors about the possibilities for such de-coupling, an examination of mobility in a number of countries suggests that there is no determining factor governing the degree of mobility linked to a certain degree of development. It is true that there is a relation between the demand for transport and the standard of living, but this relation differs from one country to another, so that states with high income levels may yield per capita levels of demand which are significantly lower than others. On the other hand, because the relative mobility of persons and goods has a physical limit and cannot grow indefinitely, it can be concluded that each situation is more the result of criteria or lifestyle and a degree of organisation of the productive system than of geographical and economic conditioning factors, so that the possibilities for intervention need to be explored.

FIGURE 9. Goods transport (t/km) according to per capita income



Source: DATAR (2003) La France en Europe: Quelle ambition pour la politique des transports?

2.3.2. Urban mobility

It is a feature of the data available that they are diffuse and heterogeneous. They do however coincide in indicating that motorised urban mobility is growing faster than its inter-urban counterpart. The portion of this travel provided by public transport scarcely holds against the advance of the private vehicle. Non-motorised transport –also described

as *healthy* because of its effects on health– is falling back in the distribution of the transport types. This tendency is especially marked in medium-sized cities and on the peripheries of the large metropolitan areas. It is estimated that close to 40% of transport-generated CO_2 emissions come from urban and metropolitan movements where, within the sector, emissions are rising fastest.

While action is still largely focused on the provision of new public transport infrastructures, it is beginning to move in other directions: 10 years ago, only Madrid had a Transport Authority offering an integrated system of charges, but there are now eight metropolitan areas which, to a greater or lesser extent, have a structure of institutions and charges. The efficacy of such actions is however often counteracted by contradictory measures for traffic management and increased route capacity, or by problems in funding the system. When compared with other European countries, there are few Spanish cities which have medium- or long-term Urban Mobility Plans and, of those in place, few include explicit sustainability objectives.

There has been a considerable financial drive in dealing with the urban transport system; with no specific competences in the field, the contribution of the State Administration (AGE) in its backing for urban and metropolitan public transport –in terms both of investment in infrastructure and of direct input into the system's operation– stands at some 650 million euros a year. In a framework of institutional coordination based on that sustainable mobility planning approach, such contributions could be channelled more efficiently and with better coordination, and be defined in greater proportion to the seriousness of the problems raised. Ministry of Public Works and Transport action in urban areas, in the construction of infrastructures and in the organisation and management of services, could also be more effective in terms of functionality and the contribution to sustainability, within this general framework.

Mobility requirements are not the same in all urban environments, and the response strategies must adjust to each situation. Each type of urban space (metropolitan areas, medium-sized more compact cities, multi-focus or dispersed systems) requires different approaches and priorities, and the combination of the appropriate measures must adapt to the features of each particular case.

2.3.3. Accessibility imbalances, especially in areas away from the mainland, and cross-border regions

On the Spanish mainland, the development of high-performance transport infrastructures has led to an apparent homogenisation in terms of the territory, which conceals appreciable imbalances (Figure 10):

- These high-performance infrastructures are less permeable for the territory as a whole: access is restricted to a few nodes, thus defining a dual territory, and the source of growing tension between the functional access standards of these infrastructures (few links or stations) and local demands.
- It also leads to an undervaluation of infraestructures with lower levels of performance, even where they may be more appropriate to capillary access in that region, and to the local development expectations. The conventional infrastructures are wrongly seen as incompatible with the region's development expectations.

- The infrastructure does not *per se* ensure accessibility: for that, in addition the goods and passenger transport service operators must decide to provide the service effectively, with adequate levels of frequency and quality.

In short, the growing creation in the country as a whole of high-performance infrastructures coexists with the centralised network structure, with problems of *capillarity* or access to these networks outside the access nodes, and the scarcity of services away from the direct connections, so aggravating the difference between those who are or who are not served by the new networks, and preventing the system's efficient hierarchical organisation.

The airport network model, which operates in domestic services on the basis of the connecting point at Barajas, creates an accessibility distribution which clearly differentiates Madrid on the one hand, the large coastal cities on the other, headed by Barcelona, with sufficient critical mass to justify direct services without the airlines going through Barajas, and the rest of the peripheral cities, leaving a significant domestic peninsula vacuum.

These effects are particularly clear in cross-border areas, where development opportunities are intense, and where the infrastructures have traditionally responded to the strict logic of national links, so that resources prove deficient. There is at present a risk of replacing the original logic with others, of international connections based on service to large flows, of an overridingly transit nature, large arteries which have little to do with the dense network and that for mid-range capacity and performance which is characteristic of a cohesively organised territory.

The imbalances in accessibility in areas away from the Spanish mainland are on the other hand the upshot of geographical factors and the resulting dependence on sea and air links for communication, both with the mainland and among these territories themselves, particularly on inter-island routes. This, even more than on the mainland, makes the adequate organisation and management of the transport services the main factor for integration and to minimise the negative effects on accessibility arising from geographical isolation.

2.3.4. The impact of transport on the environment and health

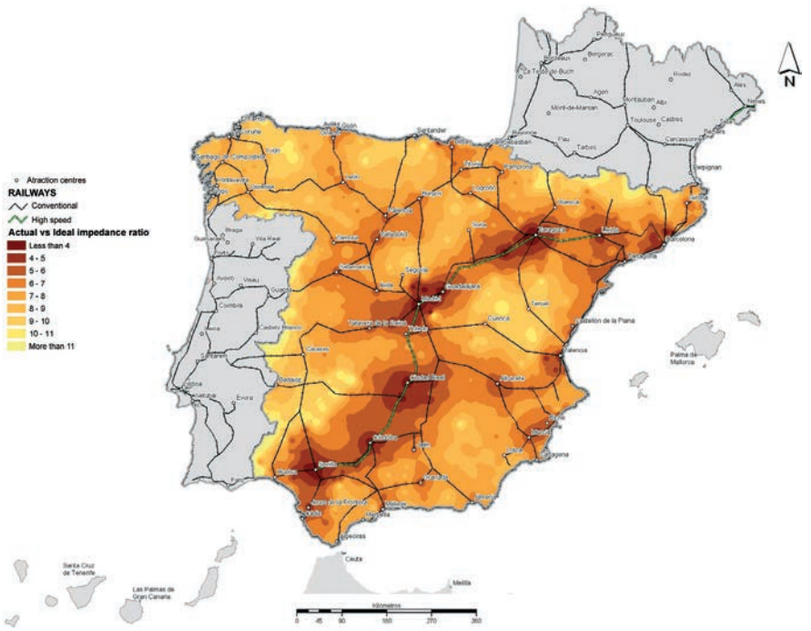
Transport sector emissions, most of which are the result of road transport (both interurban and urban) account for 22.6% of carbon dioxide emissions (CO_2), and 37% of nitrogen oxides (NO_x). The best technological resources mean that a significant reduction can be foreseen in pollutant emissions, specifically in NO_x, to levels which are compatible with the limits in the National Emission Ceilings Directive 2001/81/CE, before the end of the decade. However, technological development cannot correct the increase in CO_2 emissions. Road transport contributes approximately 90% of the transport sector's emissions. Between 1990 and 2001, these emissions rose by 57%, an annual rate of more than 4%, much greater than GDP growth in that period. The Ministry of the Environment estimates that emissions could be 110,000 tons in 2010 and 140,000 tons in 2020 (100% and 155% more than the 1990 figures). Unlike pollutant emissions which are being confronted relatively successfully with technological measures to improve engines and fuels, CO_2 emissions are linked to fossil fuel consumption[2] and require other forms of strategy, associated with energy efficiency and the management of demand.

[2] Hydrocarbon combustion produces approximately 2 kg of CO_2 per litre of petrol or diesel consumed.

FIGURE 10. Land transport accessibility

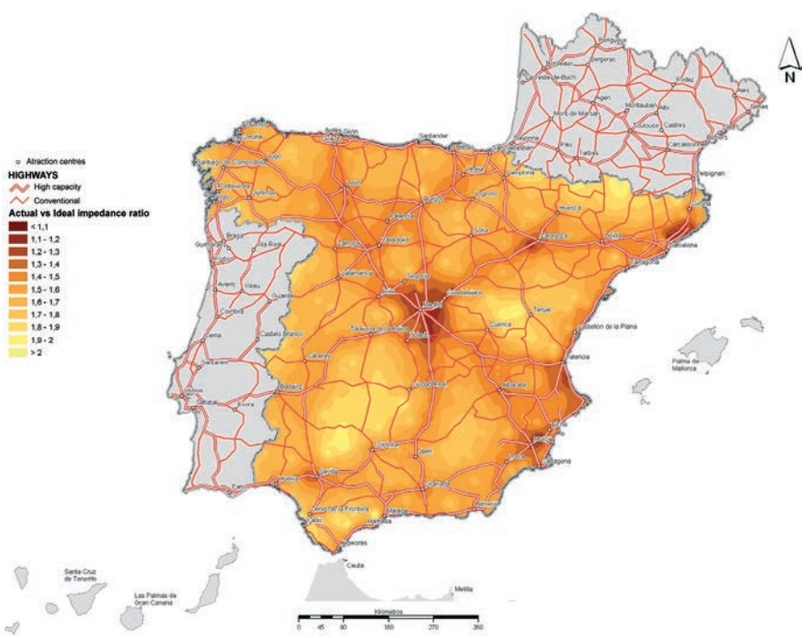
A) RAIL ACCESSIBILITY

The effects of the radial nature of the system and the lack of cross-border permeability become clear particularly in rail. The map shows rail access time, weighted according to the destination locality for each provincial capital, disclosing the marked imbalances between the centre (black, maximum accessibility) and these cross-border areas (yellow, minimum accessibility).



B) ROAD ACCESSIBILITY

Accessibility in the road network is considerably greater and more homogeneous than for rail (the indicator value varies between 1 and 1.5 for provincial capitals, while this value for rail moves between 1 and 5). The radial nature of both networks causes better accessibility concentration in radial corridors.



Pollutant emissions have a notable effect on air quality in cities. The massive introduction of catalysers and leadless petrol has led to a progressive reduction of some contaminant emissions, particularly SO_2, COV, benzene, lead and CO, whose concentrations have dropped in recent years at most metering stations affected by traffic. The same cannot be said in connection with the concentration of particles in suspension of less than 10 microns (PM_{10}), tropospheric ozone, NO_2 and CO_2, where increases have not yet been slowed. At present, virtually all large cities experience periods in which air-quality limits set in the European and national provisions for PM_{10}, NO_2 or ozone are exceeded to a greater or lesser extent. The data offered by the European projects APHEA, APHEIS, and the Spanish EMECAS program, plus information from the WHO point to a high correlation between mortality, morbidity, some cancers, and cardiovascular and respiratory conditions. Specifically, the impact on certain groups at risk or which are especially vulnerable, such as children and the elderly, are clear and hard to avoid.

Traffic noise, above all in urban environments, has increased in this country in recent years. It is considered that 74% of the Spanish population is subjected to high sound levels. The relation between noise and health is clear: nuisance, disrupted communications and increased aggressive conduct, in sleep and rest, in children's development, high blood pressure and influence in cardiovascular disease.

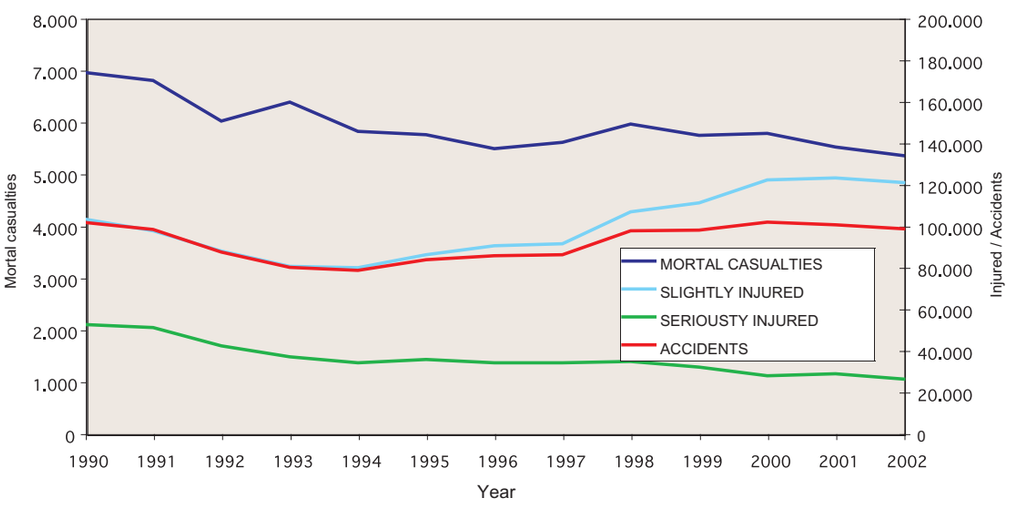
Against the deterioration caused in the environment by the construction of infrastructures, the corrective measures introduced in Environmental Impact Declarations seek to alleviate some of the negative effects, although it is difficult for them to eliminate the progressive occupation of land and its fragmentation, with extremely negative effects on biodiversity. While the rate of territorial fragmentation as a result of infrastructures is lower in Spain (250 km^2) than in the rest of the EU-15 (130 km^2), sight must not however be lost of the large number of environmentally protected areas in this country, which are therefore more vulnerable to any activity which divides them and breaks them up. It is emphasised that Spain has declared 38 Ramsar zones, 70% of which have at least one transport infrastructure less than 5 km from their centre. These figures do not reflect the entire impact of the ecological barrier created by linear infrastructures, in particular high-performance systems or those with high traffic densities. The country's natural wealth and the existence of many spaces which, while not receiving special protection, can be classified as environmentally "sensitive" (coastal zones, mountain massifs, urban areas) create increasing conditioning factors for future development and the concentration of high-performance transport infrastructures.

The safety record of various modes of transport turns out to be very disparate, even in relative terms: throughout the EU[3] (2001) and per thousand passenger-kms, the number of deaths was 0.2 for rail (2.3 with the addition of victims who were not travelling by rail), 0.4 in the air sector and 8.7 on roads. Traffic accidents are the main cause of death in the population aged between 6 and 25. In Spain, the number of deaths in interurban accidents has dropped since 1990, when the figure was 5,936, to the 4,032 recorded in 2003. In the last 7 years, the high annual rate of deaths from road accidents has remained stable. The Spanish accident rate in relation to the vehicle fleet and existing mobility remains high: 14 deaths per thousand traveller-kms.

[3] European Community Commission (2003). *Transport in Figures 2001.*

Overall, environmental and health conditioning factors can do no more than increase over the coming years, in line with the progressive implementation of international commitments and European provisions in the field, and with increasing public awareness of these questions.

FIGURE 11. Trends in the number of road accidents, deaths and injured in Spain since 1990



Source: Ministry of the Environment

2.3.5. Competitiveness in the international context

Expansion in the goods transport sector in the European Union in the last ten years has been accompanied by a degree of *Europeanisation*, which is perhaps more marked in central states rather than in those on the periphery. Road transport of goods has been pioneering, but Spanish carriers are, despite continuing to lead in terms of bilateral exchange (Spain with France, Germany or Italy), hardly present in land cabotage in other EU countries, or in the relations between them. This process is still at an incipient stage in rail: some national companies have established alliances and have applied for the first licences for new operators with an international transport vocation. This tendency is accompanied by the consolidation of a small number of large logistic operators, the first of which, Deutsche Post, posts a business figure virtually twice that of the number two, La Poste; there are no Spanish firms in the list of the 15 top European operators.

The possibilities for national transport operators to *internationalise* and convert to intermodality (not just those attached to the Ministry of Public Works and Transport –*RENFE Operadora* and Post– but also operators carrying goods by road or by sea) are dragged down by an absence of incentives comparable to those in place in other countries, and by the relative lack of an international strategy on the part of the main national operators. There have been no nation-wide initiatives which might, as in other countries, enhance the effects of the European policy of support for intermodality, such as the Marco Polo Program.

This trend is also patent in the field of air transport of passengers, with the consolidation of the three large international alliances which, in turn, dominate the European space. The full potential of the effects of liberalisation have not yet become manifest in terms of the

advent of new operators and increased competition in the European market which can be passed on to consumers, and for the time being affects principally those connections with greatest traffic demand. To a lesser extent, the appearance of international operators is beginning to emerge in the rail sector, with the arrival of the first international high-speed services (Thalys).

While not able to offer the openings inherent to a transit country (market proximity, development as an international logistic platform), Spain's peripheral location has on the other hand allowed greater flexibility and autonomy in the choice of the transport policy model: thus the country has in the past been able to select its priorities to some degree independently of European strategies, for example giving priority development to the high-capacity road network over conventional rail, or creating new airport facilities based even on demand forecasts significantly below those considered in other countries. However, the foreseeable continuation of trends toward economic integration and the likely new increase in intra-European movement associated with EU enlargement make it advisable to align national priorities more unequivocally with those of other Member States and, in particular, Spain's main countries of destination or of necessary transit (France and Germany), to facilitate the access of the European intermodal transport chains which are appearing.

In short, transport trends in Spain are increasingly converging with those of the rest of the EU. Notwithstanding its relative peripheral situation, Spain cannot pursue a transport infrastructures and services policy based solely on domestic considerations. This is not just because of the potential decisiveness to the sector of the Community's regulatory framework, but also because of the consolidation of trans-national operators and the scale of the problems transport raises for sustainable development, which are similar in all countries and which, in many cases, cannot be tackled without convergent response.

2.3.6. Transport costs: charges and taxes

The cost borne by users in travelling or in transporting goods in a given mode depends on a multiplicity of factors such as tax, subsidies, public and private investment, fuel charges, and vehicle or insurance prices. In other words, it is the upshot of a complex set of public and private decisions on regulation, investment and markets. Added to these internal costs are the so-called external costs charges, which are the losses users of one mode of transport cause to others, and which the market cannot assign without prior public regulation, such as accidents, atmospheric pollution, noise, climate change, or congestion. The internal and external costs differ depending on the transport mode, and users may not be able to cover them in full. For example, studies carried out in the EU-15 show that, during recent years, the cost of transport (at constant prices) by private car has been reduced an average of 15%. Every time a user decides to use a particular mode of transport, someone else may be suffering a loss, whether in the tax realm with the costing of infrastructure they do not use, and its maintenance, or related to the environment and health, by meeting external costs arising from noise or from pollution or accidents.

The system for transport charges and taxation must send the right signals in relation to the PEIT's strategic objectives, otherwise it will distort the system's operation. The current tax burden on transport offers no incentive for conduct which is compatible with transport policy, nor does it penalise contrary behaviour; it does not favour increased

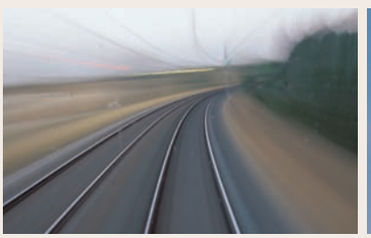
demand for public transport aimed at cutting the accident-rate, congestion and pollution; there are no mechanisms to adequately compensate citizens who suffer loss from accidents and other effects, nor does it ensure an equitable distribution, without regressive impact on income, of the benefits and disadvantages produced by public decisions related to transport.

2.3.7. Action by the institutions

The transport system must be in a position to offer users an integrated service, irrespective of who owns a given infrastructure or service. Institutional cooperation remains very partial, limited to very specific objectives, such as investment in certain infrastructures, coordination in certain regulatory aspects, or the financing of certain services. This type of cooperation, which is effective in that it allows certain actions to be coordinated, makes it difficult to identify objectives, and to plan over a longer time horizon. Actions in a certain territory, and most particularly in urban surroundings, environmentally sensitive areas or corridors with high infrastructure densities, has to be rationalised on the basis of a joint definition by the Administrations involved of objectives which are compatible with the principles of sustainability.

If it is to be effective and stable, institutional action demands an appropriate legal framework which delimits the scope of the cooperation between Administrations. And concerted action means that the Administrations have to go beyond an identification of specific actions, in order to incorporate objectives into their arrangements. The challenge posed to transport by objectives such as those established in the PEIT –of economic efficiency and the social returns from the actions, of social cohesion and territorial equilibrium, and sustainable development, particularly in the realm of climate change– cannot be confronted without creating a system of joint responsibility whereby actions are associated with specific policies which make it possible to achieve all the expected benefits, and which link future investment to the previous fulfilment of those objectives.

3



DEFINING THE PEIT'S OBJECTIVES

3.1. GENERAL OBJECTIVES

The aim in drafting the PEIT is to create a rational and efficient framework for the transport system medium- and long-term. This means that objectives must be specified as precisely as possible for that horizon year, in terms not just of the completion of infrastructures, but above all in the quality of the conditions of mobility set for sustainable development, as established in the Council of Ministers Resolution of 16 July 2004. This resolution structures the targets in the PEIT into four fields: system efficiency, social and territorial cohesion, environmental compatibility and economic development.

A. To enhance the system's efficiency, in terms of the quality of the services actually provided, and to deal with the needs for the mobility of persons and flows of goods in conditions of adequate capacity, quality and safety, and in proportion to the nature of those flows, to these ends:

a) Developing an integrated transport system in a framework of complementarity and coordination between modes of transport and infrastructures and services which fall into the jurisdiction of different Administrations and Bodies.

b) Optimising use of existing infrastructures, using demand management measures.

c) Promoting a policy of conservation and maintenance of infra-structure assets.

B. To enhance social and territorial cohesion by:

a) Ensuring equitable conditions of accessibility throughout the country and, in particular for non-mainland Spain.

b) Identifying the potential beneficiaries of infrastructure and transport policy, avoiding regressive transfers of income.

C. To contribute to the system' general sustainability by compliance with the international commitments in the European environmental provisions, in particular in relation to Greenhouse Gas emissions.

D. To promote economic development and competitiveness, by:

a) Enhancing the role of Spanish urban and metropolitan areas.

b) Reinforcing cross-border links.

c) Fomenting R&D+i programs and technological advances applied to the management and operation of transport infrastructures and services.

These qualitative objectives need to be taken as the basis for the implementation of a series of quantified objectives for the PEIT horizon year and, ultimately, with mid-term references too. The following is an initial quantification of objectives, although with the reservation that, as a first exercise, it will require adjustment in subsequent reviews, taking advantage of the improvements which can be expected in terms of information and know-how on the transport system and its relation to the environment and the territory.

3.2. IMPROVING TRANSPORT SYSTEM EFFICIENCY

Improvements to the efficiency of the system are given form through the following objectives: enhanced transparency and public involvement, greater integration of transport

modes, better-quality services, including adequate conservation systems, optimisation of the use of available infrastructures and services through demand management, and higher safety standards in all transport modes.

Enhanced transparency and public participation. To create formal channels through which to inform society and partners and professionals about transport policy programs and strategic lines, and to foment social debate about these decisions. To encourage public involvement in study of proposals and projects, assigning such involvement a part of the budget for the preparation of studies as from 2008. To establish a set of socially agreed indicators by which to control the implementation of transport policies and of the PEIT, and to provide a base for the Plan's four-year review (2008).

Integration of the transport system. Efficacy in the integration of the transport system needs to be seen in an increase in the relative weight of the modes involved in intermodal transport for the long-distance movement of passengers and goods. In line with the EU's objectives, it is suggested that the distribution of passengers and goods by mode in 2010 be stabilised at least at levels similar to those in 1998, and then to increase the share in overall transport modes of those causing less pollution by 5 percentage points by 2020, for both passengers (rail services and collective transport by road) and for goods (rail and sea services). These objectives will have to be reviewed depending on developments, and the transport sector's compliance with the objectives in the National Greenhouse Gas Allocation Plan.

Transport service quality, safety and security. This incorporates objectives related to safety, congestion, quality of collective transport services, and protection of user rights.

Transport safety and security fall into three fields: firstly, the risk to the user from an accident (operational safety); then the need to safeguard persons, the goods transported and the installations themselves against illegal activities (security); and, finally, the prevention of job-risks. In the area of operational safety, this country takes on the EU objective to improve route safety to 2010 and 2020 horizons, to which transport policy must contribute. In the second case, a "zero risk" policy is proposed, aimed at on-going review of the risks in all modes of transport. Thirdly, it is planned to halve the job-accident rate in the sector within the Plan's horizon.

A reduction in congestion in the transport system (outside urban areas) is given overall form in reduced average travel time and the likelihood of exceeding that mean time in the different transport modes by the 2020 horizon. This objective will be developed and given specific form subsequently in precise parameters in each mode, with the inclusion of an intermediate objective for 2012.

Improvements to long-distant public transport services of passengers on land are specified with the objective of a minimum commercial speed of 80 km/h between source and destination, with maximum 1-hour transfer waiting times by 2012. For its part rail must, within the 2020 horizon, on the routes where it operates, offer commercial speeds at least 25% better than those for private vehicle transport. Finally, a charter of user rights will be approved for passenger transport services for each mode of transport (2008), in line with the initiatives implemented in the air sector, which will eventually be integrated into a single intermodal rights charter (2012).

For goods transport, improvements to services involve an enhanced contractual framework, correcting existing imbalances, leading to the growing convergence of this

framework in the various modes, and clarifying each party's rights and obligations in intermodal services (2012).

There will also be a proposal for defining (2008) and complying with minimum parameters for the quality of services of public interest in non-mainland Spain for the 2012 and 2020 horizons, coordinated with the Autonomous Communities involved.

Maintenance of infrastructures. The elaboration and updating of pilot maintenance models as reference for and aid to the management of the conservation of the system as a whole (2008). Progressively increased budget allocation, to take it to about 2% of the proprietary value of the infrastructures. The introduction of external audit and intermodal comparison systems (2008).

Management of demand. A progressive reduction in the intensity of transport in the economy, to converge with the UE-15 mean value (in terms of ton-kms/GDP) by 2020. From 2012, to stabilise the demand for per capita transport by private vehicle (vehicle-kms/inhabitant) at values similar to those for 2005.

3.3. ENHANCING SOCIAL AND TERRITORIAL COHESION

The cohesion objective takes the form of the following social and territorial targets.

Social cohesion. Guaranteed universal minimum access to public services (education, healthcare, social assistance ...) for all citizens, with particular attention to vulnerable groups (children, the elderly, those with reduced mobility ...). To do this, in cooperation with the Autonomous Communities, a set of "key spaces" (with a 2006 horizon) will be defined where this objective will have to be met as a priority, referring fundamentally to transport nodes and areas of high concentrations of mobility for reasons pertaining to work, leisure, or others. For the 2012 horizon, access to public transport must be ensured for them all, with the whole country reaching the quality conditions defined for public transport services in the Plan by 2020.

A detailed assessment of total costs (including external elements) in each mode of transport and of the part borne by the user, to identify possible effects of regressive income distribution (2008). A model will be drawn up to correct these effects in the transport system as a whole, for application from 2012.

Territorial cohesion. A strengthening of the networks of cities by promoting specific interurban public transport services, and coordinating their management. It is hoped by 2012 to reach a distribution of modes in travel between these cities close to the existing level of motorised urban displacements. Particular attention will be paid to sea and air connecting links, to improve non-mainland Spain's integration into these links.

Transversal movement must have alternative routes and services, bringing to an end the need to pass through the large transport system nodes, and with comparable service standards (2020).

Access by public transport to areas of low population density, and dispersed or isolated centres much reach minimum levels, agreed with the competent local authorities, by the plan's horizon year (2020).

3.4. CONTRIBUTING TO SUSTAINABILITY

Improved environmental performance by the transport sector is articulated in two areas: a reduction of the global impact of transport (mainly with reference to climate change) and the quality of the environment in natural and urban surroundings. On the other hand, in line with the principles of sustainable development, this area also includes the enhanced integration of sustainability targets into decisions on transport policy.

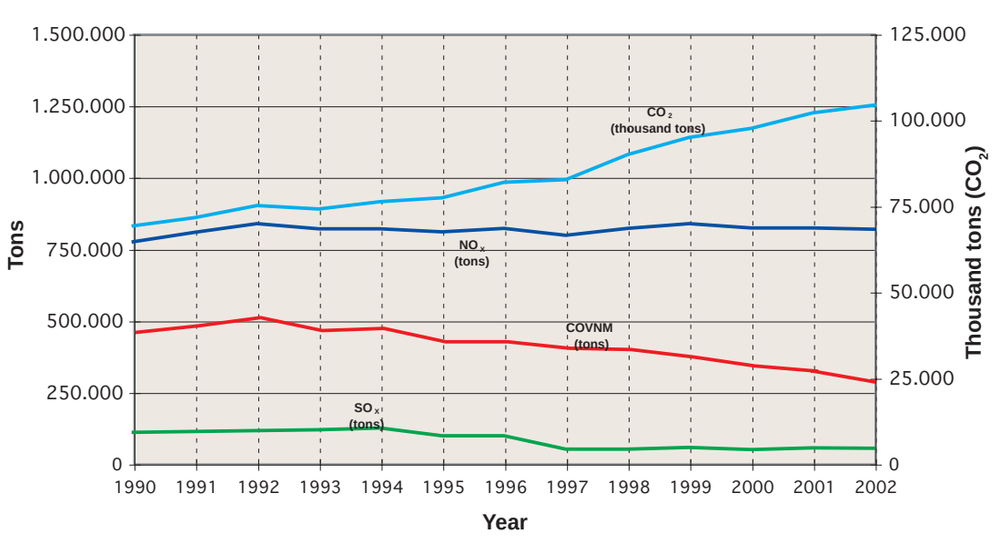
Effects of a global nature. Development in line with the guidelines in the National Plan for the Allocation of Emission Rights: stabilisation of transport emissions in 2005-2007 and, by 2012, to cut emissions to 1998 levels.

Reduction of emissions of nitrogen oxide (NO_x) and other pollutants in the transport sector according to the guidelines in the national program for the progressive reduction of this country's emissions of sulphur dioxide (SO_2), nitrogen oxides (NO_x), volatile organic compounds (VOC) and ammonia (NH_3), bringing their subsequent trends into line with the targets set for Spain in Directive 2001/81/CE on National Emission Ceilings.

Environmental quality. Compliance with European Directives on air quality for 90% of the population (2012), cutting by at least 50% current excesses over the limits on air quality levels in the cities, in relation to pollutants for which transport is the main source. Compliance in the shortest possible term with the international standards on environmental quality, and promotion at the international level of their urgent review (Annex VI of the MARPOL Convention, ICAO Annex 16, vols. 1 and 2 ...). Identification of "sensitive territorial areas" which are particularly vulnerable to the impact of transport (2008) and the elaboration of specific programs for action (2012).

Integration of public policies. To establish the bases for the progressive integration of the targets of territorial planning policies, protection of Nature and of public health into transport policy.

FIGURE 12. Trends in emissions of acidifiers, ozone precursors and greenhouse gases in the transport sector in Spain (1990-2002)



3.5. PROMOTING ECONOMIC DEVELOPMENT AND COMPETITIVENESS

Transport's contribution to economic development and competitiveness takes the form of objectives in three areas: territorial, optimisation of the macroeconomic impact of investment in the sector, and innovation.

Economic and territorial development. To facilitate the inclusion of Spanish urban systems in the European sphere, fomenting improvements to air services between Spanish metropolitan areas and their main destinations in Europe: the relative accessibility indicator (combining services, transfers, prices and travel times) must progressively bring these conditions into line with those in place in the metropolitan areas of Madrid and Barcelona.

This process of European integration is particularly important in the border regions with Portugal and France. 2020 must see guaranteed levels of the transport service between main cities on each side of the border which are similar to those of their domestic counterparts.

Macroeconomic objectives. With its input to the increased efficiency of the system, investment in transport infrastructures has appreciable effects which are also permanent, in enhanced capital stock and the economy's overall productivity. At the scale of investment provided for in the PEIT, detailed in Chapter 8 of this document, net increases can be anticipated (that is with depreciation discounted) in the capital stock of the order of 3.7%, and GDP increases of 1.3%. Such investments also influence growth in aggregate demand, estimated overall for the PEIT horizon at 1.2%, slightly down on that calculated on the supply side. Thus an "overheating" of the economy from the effect of the PEIT is not foreseen long-term. The weight of the transport services sector in the economy, of more than 5% of GDP, is significant, so that the increased involvement of national operators in the European transport market between other countries may act as a vector for the sector's own growth and modernisation. Thus the PEIT sets a 2020 target for the presence of national operators on that market at a quota which is proportional to the country's economic weight, supporting an increased number and activity of intermodal operators (participating in rail, sea and road) to levels similar to the European Union mean.

Innovation. On the one hand, innovation demands increased budget allocations for R&D+i Programs, and for their contents to be more clearly aligned with the priority lines of research in the EU's Framework Program. It is thus proposed to assign 0.5% of the Ministry of Public Works and Transport expenditure to R&D+i (2006), increasing this to 1.5% from 2008. On the other hand, the swift incorporation must be encouraged of the results of research into transport policy, providing incentives to the most active agents through a transport innovation program which funds pilot actions, while respecting the conditions of free competition in the sector.

Energy efficiency. To improve the transport system's efficiency, to significantly cut the Spanish economy's energy dependence. Here the aim is to reduce specific energy consumption per traveller-km and ton-km by at least 20% (2012) compared with 1990, with an additional reduction for the 2020 horizon to 40% of 1990 values. Proposals approved under the Spanish Energy Efficiency Strategy will be implemented, and particularly the use of alternative rather than conventional fuels will be increased in the transport sector, in line with European Union targets.

4



ALTERNATIVES FOR ACTION AND STRATEGIC OPTIONS: THE PEIT 2020 SCENARIO

4.1. DEFINITION OF ALTERNATIVES

The aim of an analysis of scenarios is to establish likely trends in the demand for transport during the period in which the PEIT is in force, and the potential effects of those trends on the environmental, territorial and economic efficiency objectives set in the Plan.

Just two basic scenarios have been defined: the first, described as tendential, assumes a continuation of trends in the demand for transport and in public policies; the second, the environment scenario, aims to optimise the environmental performance of the system, without compromising its functional efficiency. And they provide a third, the PEIT 2020 Scenario, as a process of progressive and realistic approximation to the future environmental situation, whose point of departure draws on guidelines for action that suppose strong endorsement of the purely tendential picture, for both transport demand and for public policies.

In each scenario, the priorities for action are defined for public policies and their likely effects, paying particular attention to the Ministry of Public Works and Transport field of jurisdiction, and identifying barriers and uncertainties as to that scenario's implementation. Finally, the compatibility of each scenario is compared with the PEIT targets set: the system's efficiency, social and territorial cohesion, the environment and economic development, and competitiveness.

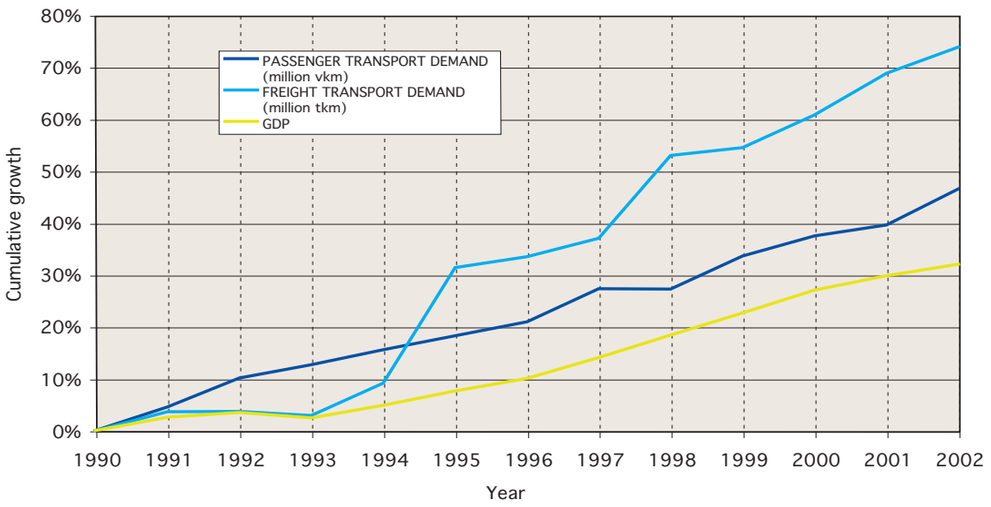
4.1.1. The trend scenario

The purpose of this scenario is to provide continuity for and culminate the trends of public policies of recent years. The following table summarises the main components, effects and uncertainties of this scenario.

THE MAIN COMPONENTS OF THE TREND SCENARIO

PRIORITIES FOR ACTION	IMPACT	BARRIERS AND UNCERTAINTIES
• Homogeneous provision of high-performance infrastructures throughout the country. • Identification of large projects of great "symbolic" effect. • Radial logic in each mode. • Increased transport company competitiveness (sector liberalisation). • Intermodal competition. • Technological improvements to vehicles. • Strict compliance with international obligations. • To stimulate the economy's competitive-ness basically via the construction and transport sectors.	• Infrastructure oversupply. • High and rising investment, maintenance and operating costs. • Enhanced duality and centre-periphery dependence. • Stimulation of transport demand. • Increasing dominance of air transport and the private vehicle for passengers. • Increasing dominance of goods transport by road.	• Economic uncertainty: insufficient resources for investment, and their inefficient use. • Negative environmental effects: land occupancy, fragmentation, emissions. • Negative territorial effects: urban sprawl; increasing centre-periphery duality. • The international competitiveness of local companies to operate elsewhere in Europe (limited intermodal capacity). • Divergence from European policies; growing difficulty in meeting transport policy commitments, particularly in the environment. • Social benefits concentrated in certain groups (users with greater mobility, users of high-quality and higher-cost modes, users of long-distance centre-periphery routes).

FIGURE 13. Trends in transport demand



4.1.2. The environmental scenario

The environmental scenario is designed to optimise the system's environmental performance. Unlike the tendential scenario with its prolongation into the future of the existing transport system, the environmental scenario would, in its formulation in terms of policies and priorities of action, opt for a leading role in fulfilling environmental obligations in the international framework, ultimately fixing more ambitious time schedules and targets than those today accepted in international organisations, and in particular in the European Union, in environment-related matters. It thus means designing and programming a specific process for Spain, a process which is accelerated in comparison with other countries in our social and political context, in essence implying a radical change in the speed of transformation toward a society which is more respectful of the environment. The table below summaries the main components, effects and uncertainties of this scenario.

MAIN COMPONENTS OF THE ENVIRONMENTAL SCENARIO

PRIORITIES FOR ACTION	IMPACT	BARRIERS AND UNCERTAINTIES
• Establishment of emission quotas (control, etc). • Short-term internalisation of all costs by the user. • Action on congestion, via prices. • Investment in infrastructures exclusively in categories whose environmental performance is better. • Lower priority for infrastructure projects than for non-infrastructure alternatives. • Enhanced transport regulation. • The establishment of domestic environmental objectives which are more demanding than international obligations, to provide a "booster" effect internationally.	• Territorial imbalances provoked by the existing infrastructure model. • High costs for the reconversion of the sector. • Major short-term changes in the mobility behaviour of individuals and companies. • High modal transfer. • Capacity to control growth in the demand for transport.	• Economic competitiveness with other countries. • The response of the public and companies to major changes in their lines of mobility. • The functioning of the transport system. • Real capacity to implement and supervise new regulations. • Real capacity to influence in the international realm. • The need for parallel development of complementary measures in other sectors' policies.

4.1.3. The PEIT 2020 scenario

The PEIT 2020 scenario is defined as a progressive and realistic process of approximation to the environmental scenario, in other words to reach the same objectives, to change substantially the transport-environment relation at a rate which, on the one hand, does not place operation of the transport system or the economic system as a whole at risk and, on the other hand, guarantees an on-going reduction of external factors.

It does of course share with the environmental scenario the objective of internalising the costs of the system; the fundamental difference resides in the rate of this internalisation process. The PEIT 2020 scenario seeks to design a medium- and long-term internalisation for costs. The following table sets out the main components, effects and uncertainties of this scenario.

MAIN COMPONENTS OF THE PEIT 2020 SCENARIO

PRIORITIES FOR ACTION	IMPACT	BARRIERS AND UNCERTAINTIES
• Coordination of transport modes. • Medium- and long-term internalising of costs. • Priority for the termination of networks (homogeneity and balance). • Compatibility of conventional and high-capacity infrastructures: assignation according to efficiency (demand). • Support for and stimulation of inter-operator cooperation. • Active promotion of international agreements. • Coordination of transport network owners and operators. • Permanent monitoring of the system. • Backup for innovation in transport. • Coordination with territorial and urban planning and the promotion of "local self-sufficiency" to reduce mobility needs.	• Modest modal change short- and medium-term; effects perceptible only long-term. • Continuing requirements of operator adaptation to new, increasingly demanding conditions: intermodality, environmental efficiency ... • Progressive impact on the demand for transport, perceptible long-term. • Medium-term, to favour the competitiveness of the national economy as a whole and of companies in the European sphere, by incorporating the impacts and total costs of the transport system into their decisions. • To benefit the competitiveness of national operators at the European level, by operating in the framework of similar mobility policies. • Increased innovation in the sector.	• The need for more precise definition of infrastructure priorities. • Greater resistance to change: the need to improve the channels of participation and dialogue. • Difficulties of integration into the new model for operators able to be less flexible in confronting innovation. • Fulfilment of international environmental commitments by their strict deadlines. • The existence of disproportionate local expectations about the development potential linked to large infrastructures.

4.2. THE COMPATIBILITY OF THE SCENARIOS WITH THE PEIT OBJECTIVES

A comparison follows of the compatibility of each of these three scenarios and the objectives fixed for the PEIT: the system's efficiency, social and territorial cohesion, environmental compatibility and economic development, and competitiveness.

- ***Efficiency of the system in terms of quality of service.*** The tendential scenario follows guidelines which, in the past, have permitted this efficiency by concentrating it progressively in a reduced set of modes of transport: the private vehicle for passengers, and the road transport of goods. The future continuation of this scenario will require greater investment, and if the desire is for the other modes to compete with the dominant one, to extend this investment to other types of infrastructures, although without abandoning those in place. The environmental scenario seeks greater efficiency in the

relation between the use of the infrastructures and the flows actually carried, as well as in terms of the use of the resources available in each mode of transport; the problem is that the shift from one situation to the other must be articulated in a way which ensures a smooth transition, without diminishing the efficiency currently achieved: that is the aim of the PEIT 2020 scenario.

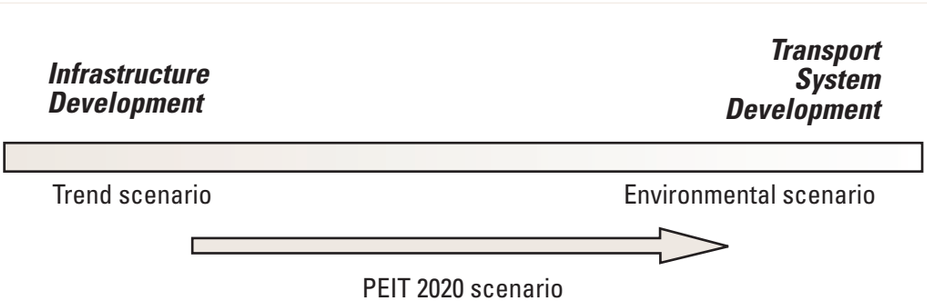
- ***Social and territorial cohesion.*** Social and territorial cohesion goes well beyond the possibilities for action in the field of transport, but mobility policies may prove more or less complementary to other policies which may have more decisive effects. In this sense, the implementation of policies which favour not just transparency of transport costs but also access to non-private modes represents relevant support for social cohesion, facilitating on the one hand accessibility of services and, on the other, pointing to revenue transfers which may occur. On the other hand, while the three scenarios may claim interest in the search for territorial rebalance, the risks that the drive to invest in infrastructures and services is not translated into significant real advantages for territories where the density of occupation and relative level of development is less, are clearly greater in the trend scenario, because it favours the dynamics of concentration, and because its greater emphasis on infrastructures than on services tends to undervalue the specific integration requirements of weaker areas, apart from the fact that most decisions are irreversible and cannot be corrected if results do not come up to expectations.

- ***Environmental compatibility.*** It is in this field where the differences of the three scenarios are more clearly patent. The tendential scenario incorporates environmental objectives subsequently, either with corrective measures, or by placing its confidence in the potential coming input from technological advances, while not discounting the possible application in the future of price mechanisms which may integrate environmental costs. The environmental scenario incorporates these environmental objectives in advance, developing transport policy addressed as a priority to the fulfilment of those objectives, with an outstanding role for the correct imputation of transport costs, including external factors, and not discounting measures to rationalise and limit demand. The PEIT 2020 scenario attains the environmental objectives over a longer term, while seeking not to place their effective attainment in jeopardy.

- ***Economic development and competitiveness.*** While the three scenarios may claim that they deal with and are open to these objectives, there are major differences between them. In the tendential scenario, concern for greater insertion in Europe comes up against a clear lack of alignment of transport policies with those of the EU and a majority of Member States. On the other hand, there is a growing need for financial resources in this scenario, and its efficiency in relation both to the transport system itself and to other public policies is questionable. Finally, attention to R&D+i and the startup of innovative measures in the tendential scenario will, according to past experience, be reduced, and limited largely to contributions which can be made in terms of technological advances which may ensure the medium-term viability of traditional transport policy.

In short, a good part of the PEIT's objectives are incompatible with the tendential scenario on the 2020 horizon. With the environmental scenario there is an accelerated convergence of transport policy with environmental targets, which may possibly introduce significant strains into the system, particularly in relation to its short-term efficiency, and in respect of the expectations for territorial cohesion, which are also objectives fixed for the PEIT. For these reasons, a committed scenario is chosen, PEIT 2020, which facilitates transition from current transport policy to a sustainable and environmentally compatible scenario in the horizon year.

FIGURE 14. The pattern of priorities in the alternative scenarios



4.3. PEIT 2020: STRATEGIC OPTIONS

To achieve the PEIT-2020 scenario, the content of the Plan is based on the following options and criteria for action in the major questions raised today in transport policy:

- ***The level of investment and its financing.*** The alternatives are to choose between a policy for the maximisation of resources used in infrastructures, a policy of rationalisation, at all stages using the resources strictly necessary for the system's correct operation, or a policy of stability, levelling out investment fluctuations, subjecting each action to strict prior evaluation and allowing for medium- and long-term programming. On the other hand, a number of possibilities are opened up to obtain and use the resources: these range from maintaining the current situation (self-financing of infrastructures for modes of transport which collect charges from their users, and budget financing of the rest), to the progressive spread of the self-financing model in each category, while not discarding the introduction of formulas for the transfer of resources between categories in order to develop intermodality and favour those which most benefit the environment. The PEIT 2020 Scenario seeks to stabilise the Ministry of Public Works and Transport investment levels, progressively shifting toward a situation where the entire transport system is self-financed, and to develop formulas for the transfer of resources between modes of transport, provided that this enhances the intermodality of the system as a whole.

- ***The quality and accessibility parameters offered by the system.*** In the present situation, road is considered "the universal accessibility mode", and categories of transport which are alternative to the use of private vehicles or the transport of goods by road fail to offer an alternative global offer. This means that it is the infrastructures –particularly road infrastructures– rather than the services offered which citizens take as reference for the standard of quality offered. The alternative is to progressively raise the standard of quality of public services actually offered, making it necessary in turn to set strategies to promote passenger and goods intermodality. The PEIT 2020 Scenario opts for accessibility based on the presence and quality of public services and not just in the provision of infrastructures.

- ***The role of Spain in international and European transport.*** Spain's geographical situation in Europe allows for flexibility when it comes to defining its role in the European and world system, which other countries cannot draw on, either because of their central location (transit countries), or their position away from major international flows. Between promoting this country as a "doorway to Europe" alternative to the major sea and international transport nodes, or the choice of a marginal location which, while

avoiding problems and the impacts of major international transport flows, also means relinquishing opportunities for the development of the logistics sector, a realistic option has to be established which makes it possible for Spain to develop as an international logistic platform compatible with the growth of transport chains which are respectful of the environment. This is the option adopted by the PEIT 2020 Scenario.

- ***Definition of the major axes or corridors within a hierarchical intermodal transport system.*** The objective of territorial rebalancing of the transport system can be tackled through two strategies. The first involves a densification or meshing of each of the modal networks. The second comprises the integrated treatment of all transport networks and services, irrespective of who owns them or of their nodal character. From this latter standpoint, the system's definition is based on the reinforcement of the nodes articulating and connecting the various networks, and the definition of a series of transport corridors channelling the main flows into transport categories which provide alternatives to the private vehicle or the transport of goods by road, avoiding excessive concentration of the radial system. This approach makes it possible to limit requirements in terms of high-capacity infrastructures, and concentrate resources in the territory's capillary accessibility. In this way, zones which are still poorly equipped or which depend excessively on a single mode can be dealt with on a priority basis, along with the border regions, which have to develop their networks independently of the needs and pressures of long-distance transnational flows. The PEIT 2020 Scenario has chosen an intermodal and hierarchical conception of the transport system, offering balanced accessibility throughout the territory, resolving existing bottlenecks.

- ***Cooperation with transport operators.*** In a context of increasing liberalisation, it becomes necessary to consider the role the Administration must play: as a passive regulator, acting at the most in support of agreement initiatives throughout the sector; as an active regulator guaranteeing compliance with the rules in place, and fair competition in all modes, or as a determined promoter of intermodality, favouring the transformation of these agents into genuine logistic operators, the integration and harmonisation of smaller operators in transport chains, and the consolidation of intermodal operators or an enhancement of their role in the European and international scenarios. In the PEIT 2020 Scenario, the authorities develop an active policy to promote the *Europeanisation and intermodality* of our transport operators, in a strategy agreed with the public operators, and a system of incentives and backup to all those involved.

- ***De-coupling and management of transport demand.*** The alternatives range between non-intervention, waiting for the economic, territorial and social guidelines driven if applicable by policies other than those for transport to define trends in the demand for mobility, and intervention which may vary between action in the quest for a relative de-coupling (to promote absorption of the growth in demand by the categories of transport which are the best environmental performers) or an absolute stance (seeking a genuine reduction of the elasticity between economic growth and transport). At the same time, in this latter case, there may be more or less voluntary action, dealing with the guidelines determining the demand for mobility, or directly with the mobility itself. The PEIT 2020 Scenario deals with this question with a prudence arising from the many uncertainties which still exist on this matter, but based on the conclusion that the continuing increase in the intensity of transport in the Spanish economy, perhaps necessary in previous phases in the process of convergence and socio-economic development, now tends to represent a threat to the global sustainability of the model, including from the standpoint of competitiveness and economic efficiency. For this reason, there is a commitment to

explore actively the possibilities for action and, whenever possible, to begin coordination with our European partners in an orderly process able to achieve a progressive decoupling first relatively speaking and, long-term, in absolute terms between economic growth and the transport demand, so progressively enhancing the efficiency of transport use in this country's economy, that is in terms of transport consumption per unit of income generated.

- ***Intervention in urban mobility.*** With the explained importance of the contribution from the State Administration to urban mobility in terms of infrastructures and financial resources, a choice can be made between a continuance of policy, of contribution according to existing availabilities and case-by-case and project-by-project negotiation, or a policy of coordination with other Administrations based on a definition of common targets through Sustainable Mobility Plans (PMS) which are compatible with the PEIT's approaches. In this case, the General State Administration will direct its action according to the attainment of certain sustainability targets by the Authorities with jurisdiction in urban mobility, so facilitating this sector's input in meeting targets such as the reduction of emissions or improved air quality. The PEIT 2020 Scenario foresees enhanced coordination and objective criteria for action in the urban environment which are based on the principles of sustainability.

- ***Definition of the institutional planning and coordination framework.*** While the existing legislative framework includes specific obligations on the public powers in the planning of some transport infrastructures (as in the Roads Act), there are no provisions concerning the framework for overall mobility planning. Some Autonomous Communities are beginning to work along these lines, with the passage and implementation of their own "Mobility Act". This formalises the principles of transparency, participation, management by objectives and inter-institutional cooperation, overcoming the voluntary aspects of the present situation. In a context of progressive European integration of transport policy and an increasing commitment to a system of government open to citizens, the formalisation must be considered of a planning framework, including development, monitoring and review systems, the definition of objectives, or inter-institutional cooperation mechanisms. The PEIT 2020 Scenario involves a formalisation of strategic transport policy planning, within the scope of the competences of the Ministry of Public Works and Transport, by creating the right legislative framework, and fomenting new systems of coordination based on joint responsibility in reaching the Plan's targets.

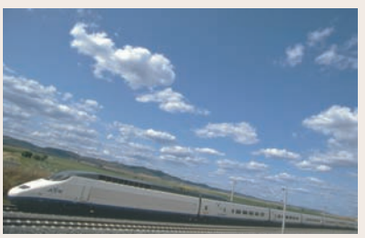
Three time-frames are fixed in achieving this PEIT-2020 Scenario, making it possible to move forward progressively in the compatibility of the transport system with the principles of sustainable development:

- ***2005-2008:*** To complete the infrastructure system, to ensure territorial structuring and, at the same time, to fix the bases for the change. To implement the highest priority actions to ensure the coherence of the networks and optimise the functionality of actions and commitments under way. To begin the development of modal and technical alternatives which make de-coupling possible, and enhanced environmental performance by the sector, deploying the investments and planning activities which are necessary to the development of intermodal integration. To develop appropriate systems and procedures to manage, monitor and assess the Plan's objectives. To begin application of environmental integration measures in infrastructures. To move forward in an understanding of the external factors of transport and the internalisation alternatives, and to start up pilot experiments in demand management.

- ***2009-2012:*** To consolidate trends in modal changes, furthering environmental improvement actions, and pursuing the development of the infrastructure networks to ensure that the system is meshed. To move forward in intermodal integration, developing the infrastructures and services, and putting down the bases to limit the elasticity of transport demand in relation to economic growth. To develop practical use of measures to manage demand and, depending on the results of the previous phase, to begin applying the internalisation instruments. To complete the trunks and corridors which guarantee provision of multimodal alternatives.

- ***2013-2020:*** To complete the process of integration of environmental and sustainable development objectives into the transport sector, to progress in the construction of an integrated transport system, and to implement infrastructure actions which are consistent with that model. To consolidate application of the management and internalisation tools needed to further the dynamics of mode change and to reduce external factors, begun in the previous phase. To move forward, coordinating with the spheres of political decision-making, in the de-coupling of economic growth and transport necessities. To finish planned infrastructure projects in line with the environmental compatibility priorities established in the processes for the updating and review of the Plan.

5



THE GUIDELINES FOR ACTION

5.1. GUIDELINES FOR THE SYSTEM AS A WHOLE

On the basis of the objectives and strategic options defined in the PEIT 2020 Scenario, the Ministry of Public Works and Transport infrastructures and services policy will in the coming years be adjusted to the following guidelines for action.

5.1.1. A unified vision of infrastructures and services: Intermodality

a) The transport system is conceived as a network of networks in terms of both the infrastructures and the services they carry, and requires an intermodal view which must be shared and developed according to the levels of competence and responsibility of each of the players –the Autonomous Communities, Municipalities and Operators– as well as by the Ministry. Integration of the various modes must take account of all areas of action: the physical connection, service coordination, charges, management and planning.

b) This vision which, avoiding the introduction of sudden procedural shifts, allows for continuity with the traditional working procedure according to modal networks, means dealing particularly with the points or nodes where they are located, and provides objective mainstreaming elements around which to define, agree and, where necessary, resolve proposals, initiatives and actions by different players in a homogeneous way.

c) Thus planning, as a coherent meeting point in establishing the current and future form of the system and its operation, must at least define the following aspects:

- The creation of a general scheme of development objectives and policies, fomenting intermodality, defining the basic intermodal network and interchange nodes.
- The conditioning of clearance and funding for modal projects upon the outcome of a meticulous analysis of their efficacy and intermodal efficiency in relation to that general scheme.
- The inclusion and consolidation of this approach as a criterion and universal working procedure on the Transport Sector Conference agenda.
- The provision of the tools required, and most particularly a National Transport Model available to the public and as reference for studies and prospecting.

d) Application of the set of guidelines, and implementation of sector plans and programs must address the progressive application of this strategic principle of intermodality.

e) The Operators, who have the full capacity to make proposals in this area to their monitoring and control bodies and whose proposals will, irrespective of their specific marketing criteria, be assessed in terms of the capacity to coordinate and enhance service levels through intermodality.

5.1.2. Integrated management of the system according safety and security, quality and efficiency criteria

a) User rights need to converge urgently, particularly in the realm of safety. User rights charters will be created, the adaptation will be stimulated of the practices of the safest

sectors to the rest, and effective internalisation systems will be established for the costs of accidents in each mode.

b) Enhanced quality control systems for services and infrastructures, complemented with new tools such as periodic external audits.

c) Standardisation of management procedures in the different transport modes (infrastructures and services), with comparative analysis allowing the incorporation of systems which, in multimodal terms, improve safety and security increase the quality of services and infrastructures, and assign resources more efficiently.

d) The development of systems for multimode evaluation of new actions, integrating socio-economic, territorial and environmental elements, as a backup tool to decision-making, ensuring greater efficiency of investment in new infrastructures and in the maintenance of those in place.

5.1.3. The regulatory framework and cooperation with other Administrations, institutions and social representatives

a) The mechanisms for the planning and design of actions in both transport infrastructures and services must provide consistent standards of transparency, possibilities for public participation, and an evaluation of their effects. With this in mind, the Ministry of Public Works and Transport is to review the existing provisions within its jurisdiction to increase and harmonise levels of public participation and transparency.

b) The functioning of the transport system is influenced by the policies of a variety of Administrations. In turn, many such actions have effects on the territory and on the economic system, where the range of authorities is complex. Thus the Ministry of Public Works and Transport Directive Centres and Enterprises must carefully assess the effects of action to be taken, confirming that they are consistent with the territorial, economic and social objectives of the Administrations involved. As far as possible, such action must form part of a joint strategy or thinking on that local, metropolitan or regional territorial sphere, using suitable coordination procedures.

c) The PEIT's objectives are ambitious, and cannot be attained without the active involvement of other Administrations and the social representatives. A policy is thus required which stimulates and backs up the actions of those agents. Such a policy has to be implemented through pilot programs offering technical and financial support to innovative action which is consistent with the Plan, at the local and regional levels, and by the operators. On the other hand, such action must be able to draw on subsequent evaluation and disclosure procedures which are able to secure maximum effect on the transport system. Pilot programs will be designed so that the Ministry of Public Works and Transport support is granted in conditions of maximum participation and support for excellence.

d) The transport sector must progressively integrate environmental and sustainable development objectives, in line with European commitments. This will be done by enhancing and formalising the mechanisms for coordination and cooperation with other Departments that have jurisdiction in relevant areas related to transport policy, and particularly with the Ministry of the Environment.

e) The international realm and most particularly the European Union significantly condition the transport policy to be implemented in this country. The development will be promoted of an international regulatory framework favouring the PEIT objectives, through an active international transport policy, which identifies the openings available for progress, which assigns the necessary resources, and which implements systematic and coordinated monitoring of initiatives under way, in collaboration with the Autonomous Communities.

5.1.4. Financing the system, and charges

a) Implementation of a Framework Act to Finance the Transport System, favouring investment stability and efficiency, and transparency in the formation of transport charges, so that the costs for the use of the infrastructures are distributed equitably among users and society as a whole, improving the position of the weakest players in the transport market against the activity of dominant agents, and guaranteeing conditions of fair competition between modes and operators.

b) A progressive introduction of pricing principles based on effective use of the infrastructures, the quality of the service and the internalisation of external factors.

c) The incorporation of infrastructures and services operated under concessions into the same general principles of evaluation and management as are implemented for the transport system as a whole. Projects under concessions must undergo the same prior assessments –socio-economic and strategic environmental compatibility– as the other activities carried out by the Ministry of Public Works and Transport; the quality of services provided must at least incorporate the levels fixed in the User Rights Charter for the system overall, and procedures will be put in place to monitor compliance.

d) Preferential use of resources obtained from charges to amortise infrastructures, for maintenance, to improve the whole intermodal transport system, and action to mitigate and correct the impact of transport.

e) The startup of an intermodal rapid-transport passenger system is in the hands of all agents, irrespective of their modal specialisation. Thus the systems for financing intermodal connection requirements will be endowed with contributions from the operators, from all the Public Administrations and, where applicable, from the private sector.

f) The Ministry of Public Works and Transport will, as part of its authorities, promote a review of the taxation of the transport sector, so as to adjust it to the objectives of the PEIT and other government strategies and policies, particularly in the Fight against Climate Change, and Energy Efficiency.

5.1.5. Territorial balance and enhanced accessibility

a) Action in the transport system is conceived in terms of elements at the service of territorial policy objectives, agreed with each of the competent Administrations and based on principles of responsible natural resource management, protection of the historic, natural, cultural and landscape heritage, and active contribution to environmental improvement.

b) The transport system must develop in a balanced fashion, meeting demands for the mobility of passenger and goods while avoiding both bottlenecks and oversupply. The land transport networks must be developed in such a way as to correct the radial systems of the past, establishing connections with the other networks, limiting territorial concentration of high-capacity infrastructures and adjusting services to the intensity of flow.

c) True territorial accessibility is provided by the services, not just by the infrastructures, so that improvements to them must be based on the creation of effective public services for access to nodes in the high-performance networks. This "capillary" access will be promoted by coordinating with the competent Administrations, and by the adaptation of the infrastructures to these needs.

d) Transport in saturated corridors or particularly sensitive zones (metropolitan areas, coastal corridors, mountain massifs) will be dealt with specifically, identifying existing management alternatives and adopting suitable individual plans for the development of the necessary infrastructures, and their funding.

e) Development of cross-border links between Autonomous Communities with land borders and the regions of Portugal and the South of France demands the launch of transport infrastructures and services which are able to channel these economic and cultural relations. The characteristics of the infrastructures and services needed are clearly different from those for international transport, so that they must be developed with specific criteria which avoid their *de facto* transformation into alternative corridors for those large transport flows.

f) Non-mainland Spain, that is the Balearic and Canary archipelagos and the autonomous cities of Ceuta and Melilla, require special consideration to guarantee adequate conditions of mobility for persons and goods, in line with the differing

FIGURE 15. Population densities by municipality

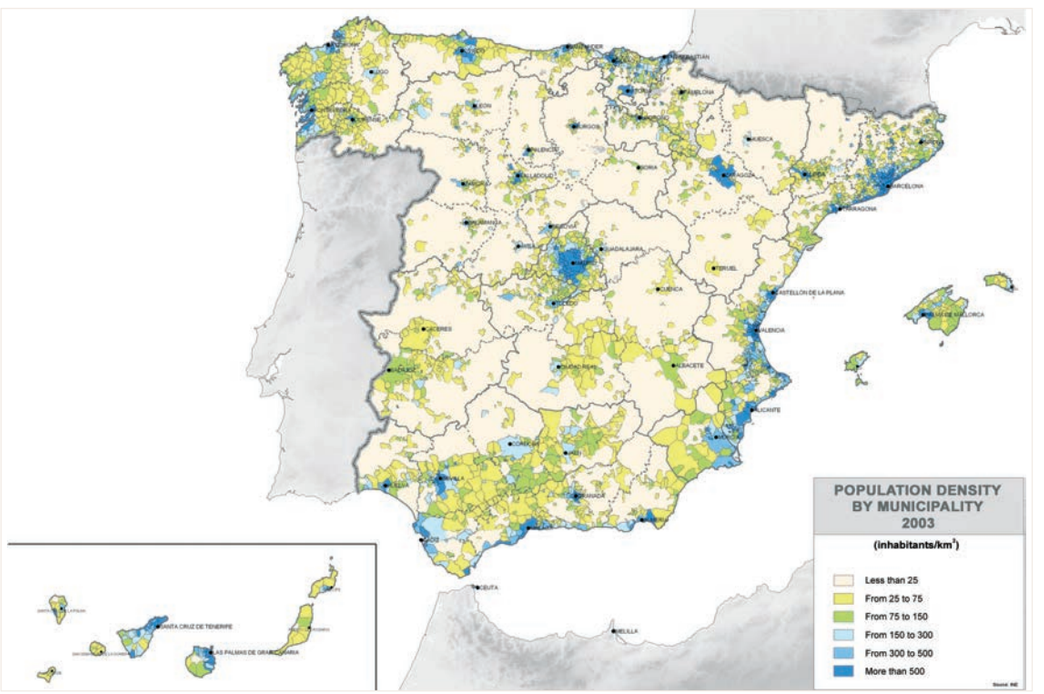
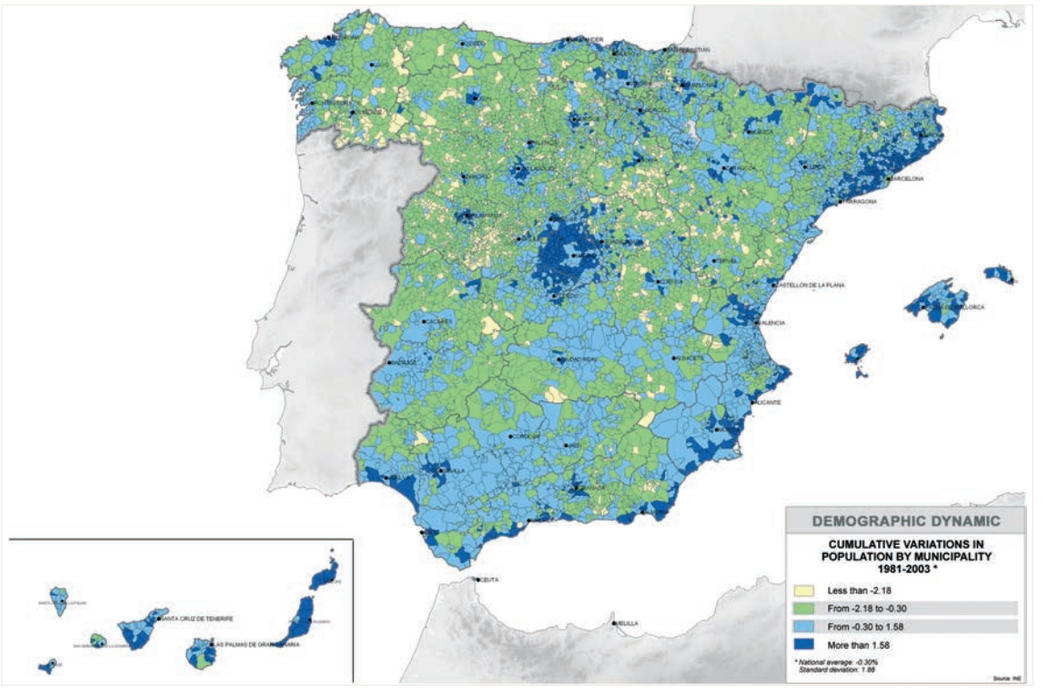


FIGURE 16. The demographic dynamic: variation in density, 1981-2003



features of each of these territories, and the PEIT's principles of efficiency and sustainability. Their port and airport systems have to be modernised, and routes of public interest need to be defined in air or sea transport, coordinating with regional or local transport systems, in each case favouring those alternatives for mobility which are able to better comply with the Plan's principles of efficiency, cohesion and sustainability. Such a policy may, in certain circumstances, be implemented through public contracts which guarantee the transport of citizens and the supply of goods in those regions.

5.1.6. Urban mobility

a) The Ministry of Public Works and Transport will act in the urban realm through cooperation programs with the Autonomous Communities and cities, based on criteria of co-financing, innovation and concurrence.

b) In the specific case of action toward the urban integration of rail, the three Administrations will have to be involved. Each case will require a specific intervention study. The Ministry links the operation to integrate rail to an upgrading of the rail system with a maximum contribution of the resources the operation requires, directly or through its dependent enterprises. Should the remodelling involve city operations and land is obtained for urban use, the public lands arising will also adhere to the Government's housing policy objectives and criteria.

c) The State Administration's participation in joint actions on infrastructures and urban and metropolitan transport programs will be placed in the context of a Sustainable Mobility Plan (PMS) drawn up by the Administrations concerned, in that area of action; in line with the Thematic Strategy the European Union is to develop from 2005, it will

foment the use of public transport and non-motorised modes, while seeking compliance with European directives on the control of greenhouse gas emissions.

d) Experimentally and as an innovation the Ministry of Public Works and Transport will collaborate with the competent Administrations to prepare pilot programs for specific forms of transport (non-motorised, school, delivery of goods) which may provide references for other urban and metropolitan fields, contributing to sustainable mobility.

e) Elaboration of a regulatory framework which is adequate for the financing of transport in cities, based on cooperation with Local and Regional Autonomous Administrations and on the implementation of the objectives set out in the PEIT.

f) The Ministry of Public Works and Transport actions in the urban environment will deal in any case with needs arising from the transfer and superimposition of interurban and urban flows, and the specific demands of urban functions implemented as a consequence of such infrastructures beyond the realm of transport (landscape and urban integration, public space, social equity ...).

5.1.7. Improving the goods transport system and its international insertion

a) Development of alternative transport axes with the rest of Europe by upgrading international rail connections in conditions of interoperability, bringing the rail network for goods into line with international standards, and the progressive launch of the "sea motorways" in cooperation with the European Union and, in particular, with the main countries for the transit, origin and destination of flows, taking account of new opportunities introduced in this respect by the Union's enlargement to the countries of Central and Eastern Europe. Also in the EU realm, the extension will be fomented of these "sea motorways" to Mediterranean countries not in the EU, and in particular, those of the Maghreb.

b) Development of the potential of the area of the Straits of Gibraltar as an international transport node, reinforcing cooperation with the Moroccan authorities and setting up a joint strategy to improve infrastructures and transport services in the area.

c) Development of complementary infrastructures backing up intermodal transport, by enhancing the intermodal capabilities of ports and their rail accesses; consolidation of the intermodal network of logistic platforms and goods centres in cooperation with the other public Administrations, the operators and the private sector.

d) The structuring of the entire logistic system and goods transport around a network of regional nodes fully integrated into the territory and which constitute the centres of logistic articulation of their hinterlands. These nodes take the form of a series of multimodal goods transport corridors, adding alternative transversal trunks to the traditional corridors (radial, the Mediterranean trunk and the Ebro Corridor). The system's international connection will be enhanced with the development of the "sea motorways", the future trans-Pyrenee rail link and the connections with Portugal.

e) Strengthening the international role of the agents in the logistic chain, promoting the consolidation of intermodal logistic operators with capacity to compete at the European and international levels. In particular, the advent of European rail

operators will allow a growing part of the flow of goods to the rest of Europe to be channelled into rail.

f) Enhanced transport quality, particularly improving the control systems in the current regulations (competition, access, the social provisions ...) and, in European terms, promoting new provisions which stimulate the convergence of conditions between modes and the integration of these systems throughout the transport chain.

g) Modernisation and integration of the systems for the monitoring and management of goods flows, by fomenting the tools offered by Intelligent Transport Systems (ITS), ultimately including review of the legal procedures and frameworks.

h) Progressive development of the principle of internalisation of marginal costs by the transport chain and the commissioning of flexible financing systems for infrastructures, so stimulating the integration of modes, making it possible to decant resources from one mode to another, according to strict criteria concerning the promotion of intermodality, while channelling private sector investment pursuant to PEIT principles.

5.1.8. A passenger transport system open to the world

a) Consolidation of the Iberian Peninsula as an international transport node, accentuating the synergies between the large mainland airports and exploiting the advantages of the reserves of capacity in comparison with other major European airports.

b) An efficient passenger transport system demands promotion of better connections between the Spanish metropolitan areas and those in the rest of Europe. The new initiatives for liberalisation in the air sector and the greater involvement of the regional and local Administrations in airport management must be used as instruments for this upgrading of international accessibility.

c) The concentration of the public passenger transport system in too-few nodes may prove inefficient, fragile and offer few or no alternatives to users. An active policy for the development of the other airports and of alternative systems (rail) for shorter-distance services should make it possible, within the PEIT horizon, to avoid excessive concentration of demand at these critical nodes, and moderate their necessities for expansion.

d) An efficient intermodal passenger transport system offers high quality without incurring the costs which might be encountered in dealing with flows often with low demand in direct origin-destination services. Such a system must be developed in cooperation with the operators and with the Authorities involved in each case, taking advantage of experience already consolidated in the urban realm, and the development of the European regulatory framework.

e) The passenger transport provisions must include an increasingly homogeneous definition of user rights throughout the transport chain, following and furthering the model begun by the air sector.

f) Intermodal passenger transport must take in the specificities of the needs of non-mainland Spain. Thus suitable systems will be developed for the integration of national and international sea and air transport into the intermodal transport chain and for convergence between the levels of service offered in the various categories.

5.2. SPECIFIC GUIDELINES FOR THE DEVELOPMENT OF SECTOR POLICIES

5.2.1. Roads

a) Definition of a Basic High-Performance Network coordinated with the Autonomous Communities, including such routes whoever holds title to them. This Basic Network will provide the principles for the prioritisation and coordination of the Ministry of Public Works and Transport actions.

b) Concessions to build new toll motorways will in the first instance be conditional upon attainment of the objectives of territorial cohesion and functionality established in the PEIT and, secondly, on the presence of a non-toll high-capacity route whose lie, design and state of conservation constitutes a genuine alternative to the toll road. When specifically requested by the Territorial Administrations concerned, this second condition may be lifted.

c) On corridors where roads belonging to different bodies coincide, prior compatibility studies will be carried out in cooperation with the Administrations owning each route to define the most suitable development, reducing land occupation and fragmentation and avoiding actions which may raise conflicts or prove redundant.

d) Intervention in the State Roads Network will be oriented toward the consolidation of a meshed network formed by motorways, dual carriageways and conventional roads with advanced design features, providing homogeneous cover in the region. The type of route depends in each case on traffic expectations, and its characteristics (interurban, suburban, bypass or urban, the relation between passengers and goods) must be such as to offer a consistent level of service throughout an entire circuit, and its design must be compatible with eventual adaptation to a higher level, by phases, when demand justifies this.

e) Action in the conventional network will aim to progressively attain conditions of quality of service adequate to the zone, to the demand characteristics and to local needs. The future upgrading program will identify urgent action for the improvement of sections whose parameters are clearly inadequate and where there is no medium-term planning for a new route, and will suggest the development of a system of “green roads” from trunks running through areas of high environmental value, and where there are alternative high-capacity routes and light or moderate traffic levels.

f) Construction of new town bypasses will be preferentially directed at routes with significant traffic volumes (more than 4,000 vehicles/day) or which suffer from road safety difficulties generated by geometric characteristics which are not adequate to the route of which they form a part.

On routes with traffic in excess of 8,000 vehicles/day, where a significant number of sections run through localities, there is generalised building construction close to the road, and a predominance of disruptive traffic (distance origin-to-destination of under 75 km), attempts will be made, rather than to build a number of bypasses, to design an infrastructure which channels long- and middle-distance traffic, assigning title to the old route to the Territorial Administration concerned.

In localities on a route which, according to the Plan's objectives, may be for a dual carriageway or a road with elevated geometric characteristics, the study of the new route will be brought forward so as to prioritise sectors which may serve as town bypasses for the through-routes where the difficulties are most intense. A ring road will be proposed only where it is not possible to use the new route as a bypass, it is not programmed short- or medium-term, and there is a high level of conflict.

g) Existing through-roads in the State Highway Network (RCE) will be upgraded to make their urban character compatible with the vehicle traffic running through those centres. Particular care will be taken with the design of measures intended to improve safety conditions for drivers and pedestrians.

h) On state sectors or trunks which have lost their long-distance function and where there are a number of difficult town bottlenecks which it would be difficult to resolve using state network design characteristics, a solution appropriate to the problems will be proposed, giving priority to capacity and safety over speed, with more urban characteristics.

i) Construction of town bypasses, and work on through-routes and special sectors must be coordinated with the Local or Autonomous Regional Administrations, as applicable, to arrange transfer of ownership of those sectors, depending on their urban or suburban functionality.

j) New trunk routes in urban or bypass situations must first consider their functional necessity against the risks of promoting urban sprawl. With that in mind, coordination will be sought with other Administrations, and in particular with the Local Authorities.

k) The programming of urban projects must be channelled through adequate cooperation mechanisms with the Administrations which have the authority for transport and territorial planning in that area, in line with urban mobility guidelines. Such action must systematically incorporate measures fomenting mobility other than by private vehicle, such as bus and BUS/HOV lanes, deterrent parking or bicycle and pedestrian routes. Any measure to increase general traffic capacity must be duly justified in terms of its compatibility with the PEIT-2020 objectives on urban mobility.

l) Upgrading of existing network conditions to appropriate parameters, including replacement of infrastructure components. With this in mind, it is planned to increase the budgetary allocation to 2% of the assets value, and to use other financing systems provided for in our contracting regime. Management procedures will also be developed which allow for on-going monitoring of the state of the road components, the scheduling of actions, and an assessment of the efficiency of expenditure. The Ministry of Public Works and Transport may also commission external audits for independent evaluation.

m) Action to deal with sectors where accidents are concentrated, and preventive activities to secure the Community and PEIT objective of cutting the accident rate. This objective will include the introduction of road safety audits for projects as well as for the network in service.

n) The development of advanced systems (ITS) of traffic management, and incidents occurring on the roads, with the launch of Control and incident management Centres. These Centres will be run jointly with the Directorate-General of Traffic in the Ministry of the Interior (the DGT) and the Autonomous Communities.

o) The progressive introduction of new user services based on the deployment of ITS in the network, in coordination with the DGT and the Autonomous Communities.

p) Installation of a system of fixed or dynamic weighbridges on the highway network for overweight controls, in coordination with the DGT and other competent Administrations.

q) To deal with the foreseeable demand for public road transport services, along with the remaining modes and with the networks of other Administrations, to provide adequate safety conditions and service levels.

r) The development of intermodality in passenger and goods transport, creating suitable access to modal interchange nodes and, along with the route networks of other Administrations, ensuring accessibility to the territory as a whole.

5.2.2. Rail

a) Consolidation of the new rail model inspired by the European Union's rail reform, in the framework of a policy of clear support for upgrading rail transport. The new model involves the separation of the infrastructure and service managements, the creation of a system of licences for rail companies, an opening up of access to national and international transport for new rail operators, the strengthening of the rail administration and the creation of an authority to regulate the sector's activity.

b) Promotion of a central role for rail in the intermodal system for the transport of passengers and goods on trunks and corridors with high demand.

c) Along with public transport by road, rail will also assist in accessibility throughout the country, with regional transport services adapted to the characteristics of each area (population density, mobility, activities ...) in line with the priorities and the allocation of resources by the competent Territorial Administrations.

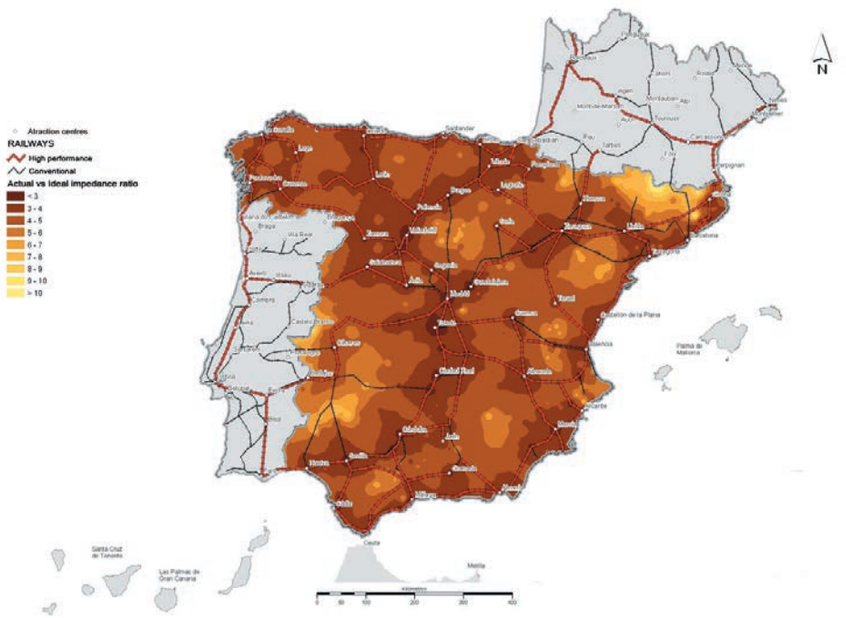
d) The creation of a high-performance network in line with Community Directive 96/48/CE on the interoperability of European high-speed rail, transferred into the domestic provisions in Royal Decree No. 1191/2000. The network is to be designed basically for mixed traffic, including cross-border rail links. Particular attention will be paid to improving transversal links with potentially high traffic, and to situations of inadequate regional accessibility. On routes where traffic volumes and characteristics require, the new infrastructures will be exclusively for passenger traffic.

e) To set a target for a reduction in total travel times for all interurban links, to be reached in stages according to the planned development of the network. The use of variable-gauge resources, combined with the enhancement of adequate connections between high-speed rail, regional rail and bus services, will make it possible to extend the territorial range of time-cutting induced by infrastructure investment implemented in each phase of the Plan. The resulting times must, within the Plan's horizon, place rail in a competitive position in relation to air transport in links using the high-speed trunk routes for distances of less than 700 km. On other routes, the reference for improved travel times will be that for private vehicle transport over distances of more than 300 km.

FIGURE 17. Changes to territorial accessibility arising from the actions in the plan

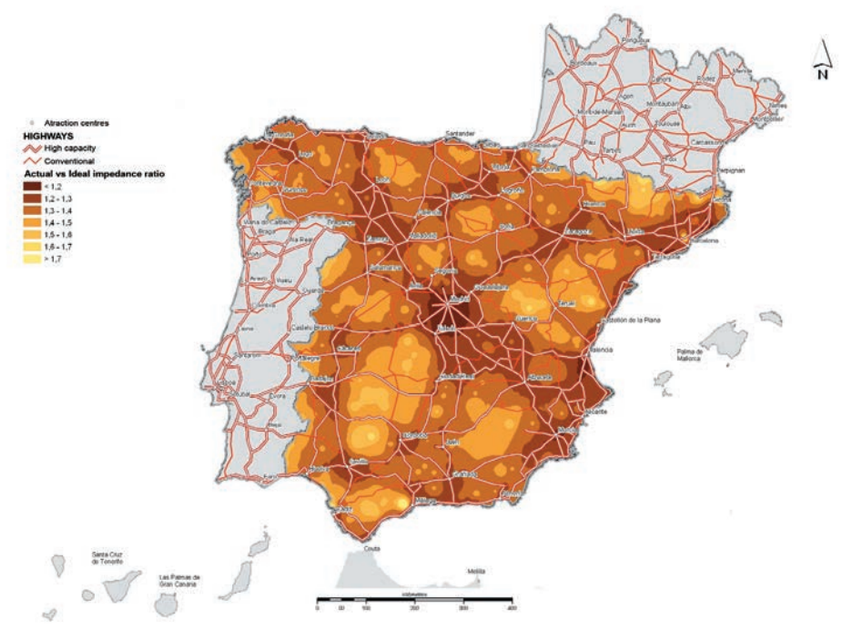
A) RAIL ACCESSIBILITY

The resulting improvement is generalised and very significant both quantitatively, with an index of more than 50% in a large part of the territory, and qualitatively, the improvements extending to virtually all areas.



B) ROAD ACCESSIBILITY

Although the starting point for roads is much less unbalanced, here too the improvement arising from the proposals in the Plan can be seen. The disparities from one territory to the other are reduced notably, the greatest advances being secured precisely in those areas with less accessibility.



f) A strategy to enhance the involvement of rail transport in the movement of medium- and long-distance cargo, by improving the levels of quality offered by rail, according to the cargo market demand. Here, rail will be promoted in new fields of goods transport, facilitating access by new rail operators and encouraging cooperation between the rail operators and other national and overseas modes, with the active participation of loaders from the industrial sector and from services. Backing for the activities of rail operators to improve their introduction into the multimode logistic chains.

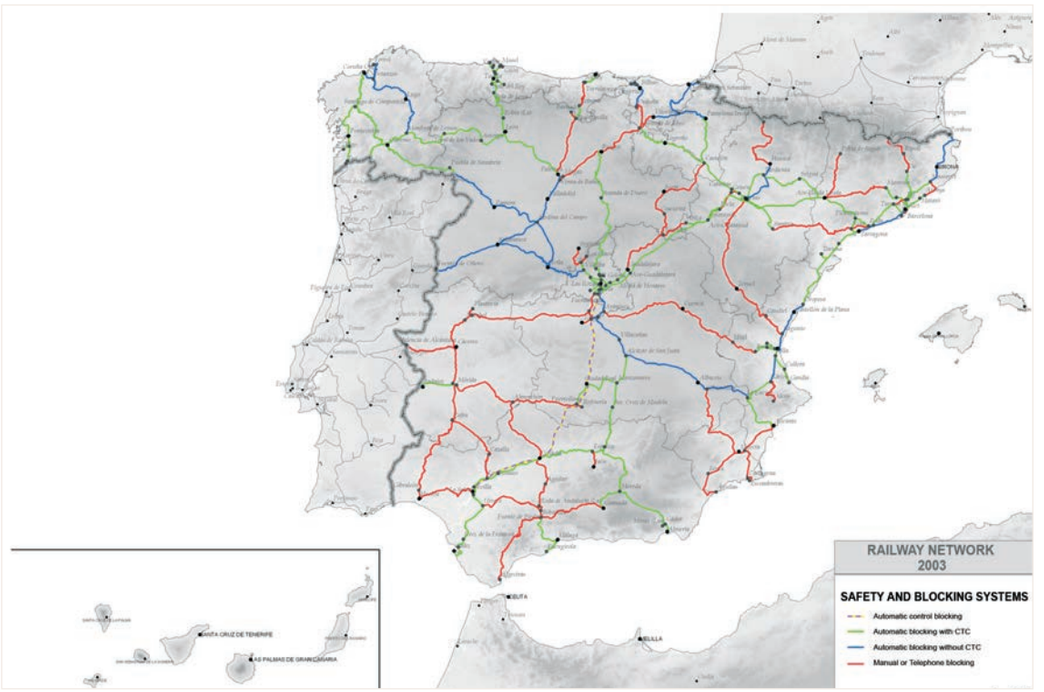
g) Definition of a rail goods transport network which meets the requirements of European Directive 2001/16/CE on the interoperability of the conventional rail system, including linear infrastructures and installations, which will provide sufficient capacity in the most important corridors, separated as far as possible from commuter services in large metropolitan areas, and with good accessibility to the nodes and logistic platforms and to the European rail network. In the framework of the intermodal goods plan, a network will be set up of logistic rail nodes to promote intermodality with sea and road transport.

h) Definition of a clear gauge-conversion strategy for the conventional network, consistent with the development of rail structure and with the aim of ensuring that interoperability with the European system. Integration of gauge-change action into the strategy for developing European rail network interoperability, considering other systems and subsystems for equipment, installations and operating regimes.

i) Maintenance of high safety standards in rail transport throughout the process of migration toward a European safety system, setting up a national authority in the field as part of the European safety agency. Review of the procedures for the investigation of rail accidents, to make them equivalent to those in other modes, such as air.

FIGURE 18. Average daily trains in the RENFE (Spanish Rail) Network

FIGURE 19. The Spanish rail network. Safety and blocking systems



j) Priority attention to maintenance of the rail system, improving its management by providing the necessary resources, assessed in terms of safety and efficiency criteria, and the introduction of an up-to-date system of integrated and preventive maintenance.

k) To guarantee adequate levels of network safety by means of proper conservation and modernisation, and to ensure that this is maintained over time. In the short term, to correct the existing decapitalisation of the conventional network, a number of programs will be started for priority action in matters of conservation, and the elimination of level crossings and the upgrading of their safety standards.

l) Definition of major projects in the urban field to enhance the incorporation of rail into its surroundings. These actions will be associated with the large investments in the rail network, retaining the central location of stations, ensuring the continuity of the public system for the transport of passengers, with the functional separation of goods traffic. With this in mind, adequate accesses to rail from public transport will be created in cities, and suitable connections will be developed with other major passenger interchange facilities such as airports and bus stations.

m) The commuter networks will be completed in the large metropolitan areas and large cities, and priority attention will be given to the modernisation of rolling stock. There will be progressive advances in the functional specialisation of networks destined for commuter and goods traffic in the large metropolitan areas. Finally, in the institutional realm, greater involvement in their management by the Autonomous Communities and Transport Authorities concerned will be promoted.

n) Definition of a new framework for the development of regional rail services, based on coordination between the operators and the Autonomous Communities involved, and between these services and their long-distance counterparts in terms of timetables and charges.

o) Establishment of intermediate temporal horizons for the development of the network and the patterns of services, drawing up sector rail plans every eight years to ensure the complete functionality of the action undertaken and of the network as a whole, and which allows operators to define their strategies.

p) Closed, unused lines will be analysed with a view to placing a value on these public assets according to their potentialities.

5.2.3. Sea transport and ports

a) In the planning and management of the port system, to maintain criteria of profitability, so that each port generates the resources necessary to attain its economic-financial equilibrium, including compensation for the possible provision of services of public interest.

b) To stimulate progressive specialisation, and cooperation between ports, and the strengthening of the mechanisms for cooperation with other European ports, aimed at ensuring a good positioning of the main Spanish ports in the processes of concentration and hierarchical organisation under way in Europe.

c) To develop ports as a key element of intermodality, favouring the integration of the main ports into the large international transport chains and the new "sea motorways".

d) Development of short sea shipping, at the national and European levels, by developing specific infrastructures and management systems.

e) Suitable development of land access to ports (rail, road and pipelines) and, in particular, by rail to ports with higher traffic and an intermodal vocation, using *ad hoc* management and joint-financing systems, open to private sector participation.

f) To stimulate free competition in the provision of port services where the demand is sufficient, including access services from the land side, with the development of specific monitoring observatories, and creating adequate systems to supervise compliance with the legislation in place.

g) The introduction of complementary uses in ports will be conditioned by the functionality of the port uses themselves and, where applicable, will be developed in cooperation with the autonomous and local Administrations from a standpoint of their consistency with local urban planning strategies.

h) Development of tools and measures to upgrade and modernise the merchant fleet, playing particular attention to safety and the environmental component of sea transport.

i) Improved navigational safety, with the introduction of new systems to monitor and control sea traffic.

5.2.4. Air transport

a) To order the airport system, submitting any declaration of a new airport of general interest to a detailed prior review of its compatibility with the PEIT objectives.

b) To move forward in the planning and management of the airport system according to criteria of profitability so that, progressively, each airport is able to generate the resources necessary to attain its economic-financial equilibrium, including possible compensation for the provision of services of public interest.

c) Reinforcement of safety inspections by the aeronautical authorities, and of airport security conditions and controls.

d) Enhanced airport operability with the installation of precision approach systems or raising the category of existing systems when a 5% increase in operability is considered possible.

e) Improved service quality not just for aircraft (parking, fingers, maintenance zones and hangars, etc.) but also for passengers (terminal areas, check-in desks, attention for persons of reduced capacity, shopping areas, etc.) and for airlines (space for offices and passenger services, aeronautical development zones, etc.).

f) Environmental sustainability, with particular concern for noise and how it is dealt with.

g) To open up airport management to the participation of regional and local authorities and other institutions.

h) A committed use of charges policy as a management tool to optimise revenues and improve the service offer.

i) To promote the progressive specialisation of Spanish airports, exploiting the comparative advantages in each case. The airports at Barajas (Madrid) and El Prat (Barcelona) must together develop their world traffic potential, as gateways to Europe providing alternatives to the other large European airports, most of which suffer from serious congestion problems. The remaining Spanish airports, particularly those in the larger metropolitan areas and cities, must foment their role in services within Europe, making the most of the opportunities offered by the new liberalising drive in the sector.

j) To set up mechanisms to correct over-centralisation, particularly at Barajas, which may exhaust its new capacity in the medium term, either by developing demand management strategies throughout the airport system, or by cooperating with other modes of passenger transport, particularly medium-distance rail.

k) To promote the incorporation of the airports into the intermodal system of public transport by means of adequate access, specific infrastructures to facilitate interchange, and public transport services which ensure effective connection with the main urban centres within an airport's area of influence and with the passenger transport nodes in the area (rail and bus stations).

l) To adjust future development proposals for facilities intermodally, so as not to program actions exclusively according to the prospects for growth in air transport demand, tuning them to action in the other modes of transport, especially for shorter-distance services.

m) To enhance the insertion of the airport system into the intermodal goods transport chain, promoting coordination with other modes, particularly at the airports which are specialising in this activity.

n) To encourage air navigation systems to adapt to demand, in line with international policies and guidelines (the ICAO, the European Union, EUROCONTROL) to meet present and future air transport requirements.

o) To promote the international expansion of Spanish air navigation equipment, services and systems as part of the European Union's Initiative to create a Single European Sky and its associated strategic programs, such as SESAM, enhancing the current technological leadership in these areas, to this end fomenting Spanish participation in technological innovation programs like EGNOS or Galileo (satellite navigation) and expert air traffic control systems.

5.2.5. Transport operators

a) To develop suitable technical conditions for intermodality, encouraging the technical harmonisation of combined transport, in line with initiatives undertaken by the European Union.

b) Particularly in the EU, to promote social and fiscal harmonisation of the various forms of transport, facilitating cooperation between them and setting up systems of balanced competition.

c) Backup for existing operators to expand into other modes of transport, as well as cooperation among modal operators, aimed at promoting intermodal goods and passenger transport.

d) The creation of a specific program for backup to the development of intermodal chains making it possible to fund the initial startup phases of new services, as a complement to the European Marco Polo program.

e) To encourage operators in the use of tools for management and operational assistance made available by the new technologies (ITS).

f) Development of a regulatory framework which is progressively made more uniform among the various modes of transport, facilitating the introduction of intermodal transport contracts (goods) and integrated ticketing systems (passengers).

5.2.6. R&D+i

a) To guarantee the stability of resources assigned to R&D+i programs in the transport field, bringing them progressively toward about 1.5% of the Ministry of Public Works and Transport annual investment.

b) To integrate all the aid for research in the National R&D Program, structuring the Program contents as a complement to the EU's Framework Program.

c) To facilitate use by the sector of the results of research, paying increased attention to actions for the dissemination of R&D projects, and a specific program for their exploitation and disclosure.

d) To review the systems for the selection of priority lines, evaluation of proposals, the monitoring of R&D projects, and a final assessment of results, to enhance the coherence of the process and the fulfilment of this program's objectives.

e) To structure transport research by developing a state network of research centres, promoted by the Centre for Studies and Experimentation in Public Works (CEDEX), facilitating cooperation and mobility among centres, the growth of research teams with greater reach, and supporting the active involvement of these centres in the European and international scientific community.

f) To create a new line of investment for "innovation in transport", making it possible to promote the application of novel measures and research on a pilot basis in the transport system. This line will include actions like the startup of a "state strategy to promote healthy means of transport" (bicycle and walking) or encouraging measures for the management of demand in a variety of fields.

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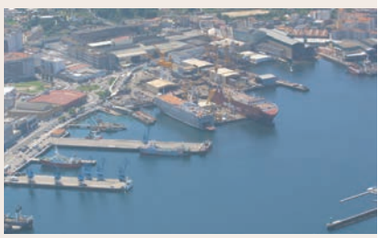


SECTOR PRIORITIES AND FIELDS OF ACTION

6.1. THE DEGREE OF DEFINITION OF THE ACTIONS IN THE PEIT

The following pages describe the main actions foreseen during the planning period covered by the PEIT (2005-2020). These actions are structured into three phases, following the pattern for the definition of the PEIT 2020 scenario (Section 4.3).

Naturally, the extent to which these actions are defined varies. In general, the prior studies have already been completed on those planned for the period 2005-2008 and, in some cases, the designs have been prepared and some work actually begun. There has been a socio-economic, environmental and territorial evaluation of most of them, making it possible to confirm the degree of priority for that action. Because there were Ministry of Public Works and Transport activities spread over a wide area, under way or in an advanced stage of study before the PEIT was drafted, the choice of projects has also sought to ensure the greatest possible functionality for the system as a whole by 2008.

On the other hand, subsequent actions will benefit from longer deadlines for their study, and will draw on more comprehensive tools for analysis and valuation. Thus the inclusion of actions as from 2009 must be understood in terms of a commitment to make a thorough study of each, so that its contribution to the PEIT targets can been evaluated, and its interest and level of priority for that period can be defined. The PEIT review planned for 2008-2009 will make it possible to specify the actions which are to be taken in the following four-year term.

In any event, the Plan takes on the commitments acquired by the government in parliament (e.g. the "Galicia Plan") and in bilateral agreements with neighbouring countries, the Autonomous Communities and Local Corporations, and in the State's backing for actions with repercussions in tourist areas, along with those of a cultural and sporting nature where there is an international projection, planned in various Spanish cities in the coming years. This commitment is independent of the extent to which the activities established in this document are defined and for which, because of their strategic nature, it is not possible to define in detail all the action to be taken, which will be dealt with subsequently, in sector or intermodal plans or through the regional coordination provided for in the PEIT.

These actions are grouped below according to the structure set out, combining modal divisions with others of a transversal nature:

- Transport safety
- The road transport system
- The rail system
- Sea transport and ports
- Air transport
- The intermodal goods system
- The intermodal passenger system
- Urban transport
- Innovation in transport

6.2. TRANSPORT SAFETY AND SECURITY

There are three facets of safety and security in transport: in the first place, the risk to the user of being involved in an accident; secondly, the need to protect persons, the goods transported and the installations themselves, from illicit action; and finally, the prevention of job-risks.

These three facets are dealt with independently in each mode of transport. In many cases, safety demands arise from international commitments or agreements. Moreover, jurisdiction in the safety field affects various Ministerial Departments, where the appropriate coordination mechanisms will be set up. This independence must however be compatible with the aim of offering more consistent safety conditions from one transport mode to another, and the reinforcement of cooperation among specialists, so that risk-assessment systems and the planning of actions may benefit from the experience of modes offering higher levels of safety in the three facets referred to.

To these ends, each Ministry of Public Works and Transport Directive Centre and Public Enterprise will provide information on its activities in the safety field as part of the biennial monitoring report on the PEIT, and a mechanism will be established for cooperation in the area of safety in transport, for periodic review of that information.

The creation of a Transport Safety and Quality Agency is intended to provide a specific body which will facilitate more integrated safety policies in the various modes, fomenting research and studies in the field, and favouring increasing autonomy in the analysis and evaluation of safety in each transport mode in the Centres and Public Enterprises responsible for the management of infrastructures and of services.

6.3. THE ROAD TRANSPORT SYSTEM

6.3.1. Priorities

Road transport system priorities for the period 2005-2008 seek to improve and standardise the conditions of service throughout the network in terms of safety and conservation, to rationalise the network by structuring it, to finish high-capacity routes which have been begun, to set objective criteria for the selection of investments, and to launch a system of additional user services, coordinated with other competent Administrations, and deploying the possibilities of ITS (see table).

Road transport system priorities. 2005-2008

Safety and Conservation

- To contribute through transport policy to the Community objective of reducing the accident rate by 2010, and maintaining the same approach for the period 2010-2020.
- To adequately conserve existing routes, bringing investment in conservation up to 2% of the network's value.
- To provide users with an adequate level of service in the use of the infrastructure, to be explicitly defined in each four-year term, and which enhances the network's safety, reliability and efficacy.
- To pursue these activities at the lowest possible overall cost, aiming to reduce as far as possible not just the financial charges but also, and most especially, the accident and environmental costs.
- To modernise management as an essential measure for optimising fulfilment of the previous objectives.
- To obtain consistent parameters in the dual carriageway network (first-generation dual carriageways).

The structuring and development of the network

- An agreed definition of a new basic system for the Network of High-Performance Roads which includes the main routes in the State Network (of more than 15,000 km) and the Autonomous Community networks, as a base for the future definition of coordinated actions, superseding the radial structure.
- Completion of high-performance routes currently under construction, or those where programming is advanced, and with high or medium demand (Average Daily Intensity>10,000 vehicles /day).

- Programming of actions on long-distance routes which might, initially, be conventional roads, with controlled access and safe design, allowing for dualling when justified by demand. Priority will be given in this type of action to transverse trunks.
- Feasibility studies for new connections proposed by the PEIT.
- Coordination with other Administrations for assignment of title to sections of roads which may be considered to have fallen outside the State Roads Network for various reasons (construction of bypasses, the presence of parallel high-capacity routes, etc.).
- Updating of the network inventory.
- Upgrading: Design of a program for the construction of town bypasses and for minimum standards to be attained throughout the State Roads Network, acting on those with greatest priority.
- Actions in the framework of the Concessions Act: projects will be conditional upon a prior analysis of their economic-financial feasibility and their compatibility with PEIT objectives.
- Review and updating of project standards to assess requirements and, where applicable, to include specifically the needs for non-motorised mobility, public transport, etc.

Operation and user service

- Definition of the concept of territorial traffic-management centres and for dealing with incidents, in cooperation with the Directorate-General of Traffic (DGT) and the Autonomous Communities. Introduction on a pilot basis in large metropolitan areas and in a network's main corridors.
- Definition of a strategy for deployment of ITS and associated services for road users. Implementation of a pilot program of action.
- Development of a clear public information system, up-to-date and easy to consult, including questions such as the state of the roads; of public transport services; of new actions submitted or which are open for public debate ...

From 2009, priorities will aim at enhancing levels of quality in the Basic High-Performance Network, through full cover of the coordinated network management system, the introduction in the Basic High-Performance Network of systems to control user service, including on-board information and multimode action in congested sections of the Basic Network, systematically analysing alternatives to the enlargement of capacity. On the other hand, the Sector Plan must be fully implemented, particularly in relation to the upgrading program (construction of town bypasses to avoid conflicting through-routes, and improved conditions on other through-routes, securing minimum parameters throughout the network). Finally, a review must begin of road transport taxation, and the development of a legal framework for an alternative system allowing for the introduction of charge-systems linked to real use of the network on the part of the various Administrations holding title to the route networks.

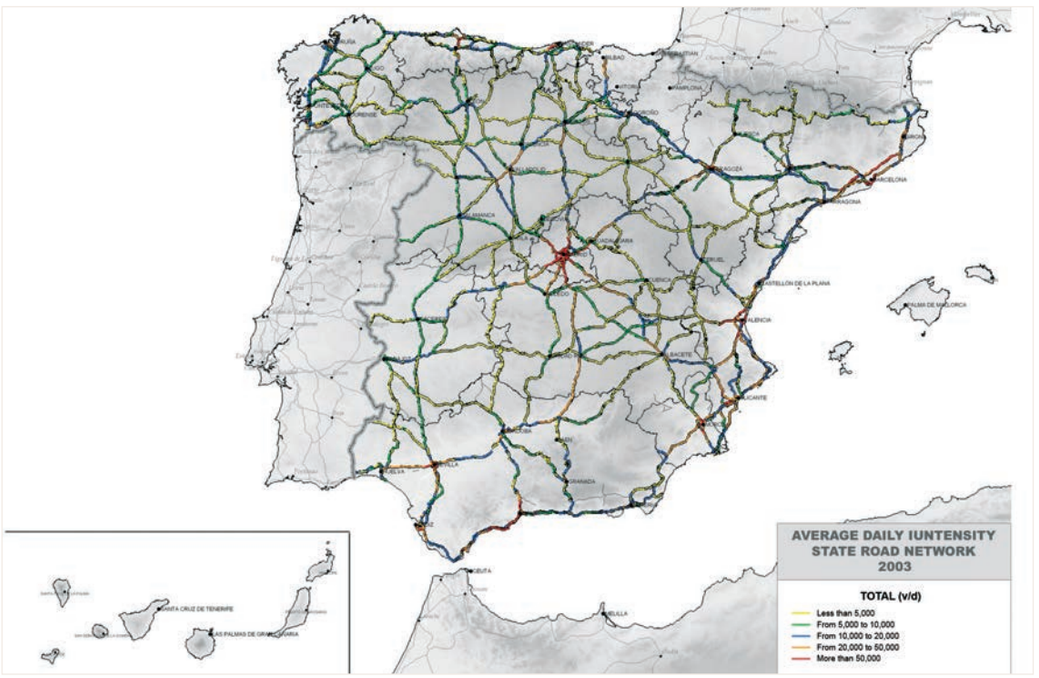
It is likely that priorities will be progressively focused on making the services offered by ITS system available throughout the network, on the doubling of interurban routes where there was action in previous periods under the Plan and which were provided for doubling in the second phase, and on the progressive introduction of the new system of taxation and charges for the use of the infrastructure by the various user groups.

6.3.2. The structure of Planning in the Road Sector

Sector road planning is structured through three differentiated plans, although mechanisms must be set up to coordinate them all during design, implement-ation and review:

- The Roads Sector Plan.
- The Road Transport Sector Plan.

FIGURE 20. Average daily intensities on the State Roads Network (2003)



- The National Plan for Deployment of Intelligent Transport Systems (ITS).

The Roads Sector Plan (2005-2012) will be drawn up within a year following the date of approval of the PEIT, and developed on the basis of the guidelines fixed in Chapter 5, of the elements described in this section, and of the current legislation, in particular the Roads Act and Directive 2001/42/EC on the Strategic Environmental Assessment of Plans and Programs. This Sectorial Plan contemplates two main lines of action:

- Interurban actions, including in turn:
  - — Action on the State's Basic High-Performance Network, including that for the creation of high-performance intercity routes, and cross-border connections.
  - — Upgrading (including that of town through-routes and bypasses). Upgrading will be proposed on routes not demanding conversion to dual carriageways within the PEIT's time horizon, but where upgrading is considered necessary as a result either of the planned level of service mid-term, or of the application of territorial criteria. The startup is also proposed of actions on town through-routes and bypasses aimed at resolving through-route tensions and creating improvements to safety and traffic conditions, generating significant social benefit. Finally as part of this program, there is to be a set of actions known as "green roads" concentrating on trunks through areas of great environmental value, and designed to contribute to the local development of the natural zone into which they are embedded.
- Conservation and exploitation, including:
  - — Action on safety, conservation and exploitation, designed to fulfil the targets set in this field by the PEIT, and where modernisation of management is seen as an indispensable element:
    - – To halve the accident rate by 2010;

  - To adequately conserve the existing body of routes, aiming for a target of 2% investment of the network's asset value;
  - Provision to users of a service level in line with the use of the infrastructure, improving the network's safety, reliability and efficacy;
  - To attain all these objectives at the least possible total cost, as far as possible reducing economic, accident and environmental costs;
- Action to integrate the infrastructures into their surroundings, such as improvements to the route and facilities, noise protection, paths for fauna and transversal permeability, and planting on the margins.

All the actions will be programmed according to two time horizons, according to the priorities already set out: the 2005-2008 horizon, and that for 2009-2012, with an intermediate review in 2009. The final period of the PEIT (2013-2020) will be implemented through a new Sector Plan. A description of the main lines of these actions follows.

Action on the Ministry of Public Works and Transport route network in urban and metropolitan areas, to be defined preferentially in the context of the Sustainable Mobility Plans, explained in Chapter 6.9 of this document, and of understandings with the Territorial Authorities. This action, and its scheduling, will be integrated into the framework of the Roads Sector Plan.

6.3.2.1. Obtaining basic data for the Sector Plan

Monitoring of the PEIT, and the drafting of the Roads Sector Plan demand enhanced base data on the roads network, and trends in terms both of traffic and of infrastructure. Thus the Sector Plan must include initiatives such as the following:

- Reorganisation of metering stations
- Development of a new computerised traffic operational system
- Development of an automatic system for the classification and weighing of vehicles at the 250 permanent stations
- Development of vehicle classification systems at the remaining 200 stationary points
- To convert all cover stations to stationary installations
- An inventory of geometric characteristics and facilities
- An aerial inventory
- The route infrastructure construction processes and materials
- To obtain new route facility systems and materials (signalling, beacons and vehicle retention elements)
- Specialised technical monitoring of the road network in service.

Similarly, drafting of the Sector Plan will require significant improvements to basic data on the environmental effects of road infrastructures in connection with the natural values of the territories into which they are embedded. The results obtained from actions under the Sector Plan in this field will eventually be integrated into the tools for the observation and monitoring of the PEIT, described in another chapter of this document.

All the actions referred to may be included in national R&D programs, or may be the subject of specific action under the Sector Plan.

FIGURE 21. The Roads Network. Actions under the PEIT

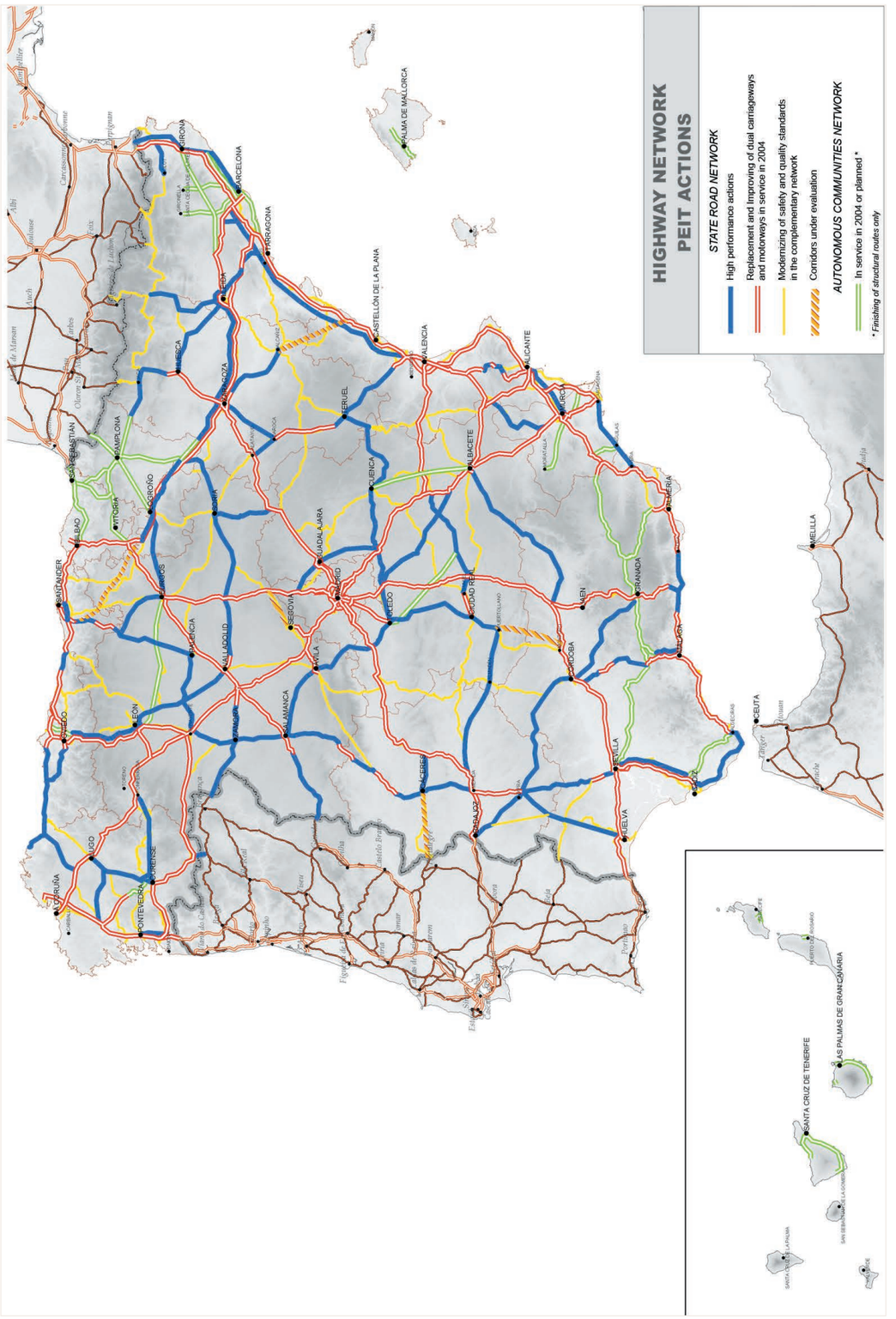
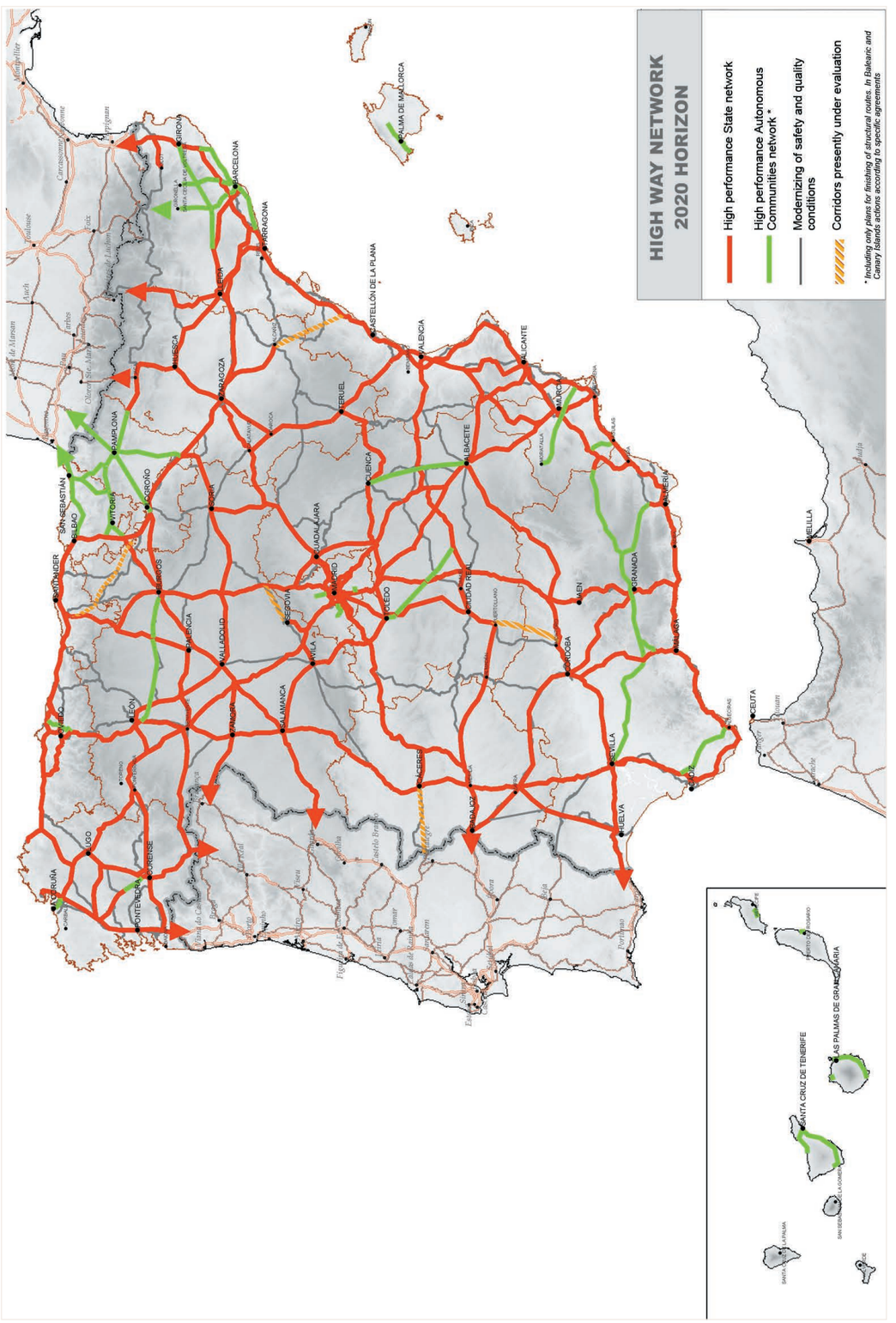


FIGURE 22. The 2020 Roads Network



6.3.2.2. The State High-Performance Roads Network

The high-performance road network will be made up of high-capacity routes (dual carriageways or motorways), where safety standards are high, and with the progressive implementation of advanced management and user services systems.

These actions are at various stages of study. According to the present situation and available forecasts, the following will be defined:

a) Action at points which will come into service or be at a very advanced stage of development within the horizon of the Plan's first phase (2008), most of them routes which are already considerably matured in terms of planning and construction.

b) Action on those where studies have been completed, and which even have been submitted to public discussion, or for which preliminary evaluation already completed points to a medium level of priority. The precise programming of this action will depend on the results of prior compatibility studies.

c) Action on the Spanish road network away from the mainland (the Balearic and Canary Islands), until now linked to specific Agreements, will be placed in future in intermodal arrangements based on an integrated vision of each transport system, so that resources can be channelled toward the specific requirements of those areas in terms of both infrastructures and transport services. The Roads Sector Plan thus incorporates no specific actions on route infrastructure in these regions.

Action on the State's high-performance road network is dealt with in a framework which considers all infrastructures of this type held by any Administration; the appropriate action in each case, and its funding, are in principle in the hands of the Administration with that competence. This makes it necessary to define the functional Basic Network, brought up in the section on highway guidelines (5.2.1).

Action coming within the 2005-2008 horizon in the State Roads Network must concentrate on the many routes still under construction, and create a more balanced and functional network structure in the medium term.

6.3.2.3. Upgrades, town through-routes and bypasses

The proposed action involves the improvement of the existing pavement throughout the whole, although road doubling is not in principle considered necessary within the PEIT time horizon. Town bypasses, or the upgrading of through-routes, control of accesses and the user assistance systems on these routes will be completed in integrated form.

In general, town bypasses are not just supposed to complete long-haul routes, but also to eliminate through-routes where traffic conditions are problematic, in accordance with the guidelines in section 5.2.1.

The development is also proposed of a system of trunks to be called "green roads", through areas of high environmental value, with alternative high-capacity routes, and where the aim is to maintain moderate traffic levels in all of them, while offering users a travel experience which emphasises the area's natural and cultural values. Accordingly, the conditioning of these trunks will prioritise the criteria of integration with the landscape, safety, heavy-traffic restrictions and the establishment of a set of traveller services (rest areas, information on the settings, parallel routes for pedestrians and bicycles). Because these trunks may provide a tool which contributes significantly to the local development of the area where they are embedded, the coordination of such actions with other Administrations will be encouraged.

6.3.2.4. Safety, maintenance and exploitation

This heading deals with five programs for action which, in turn, include different types of sub-programs, shown in summary form on the following table.

ROAD CONSERVATION AND EXPLOITATION PROGRAMS	
PROGRAM	**ACTIONS**
MAINTENANCE AND SERVICES	Maintenance: integrated conservation Maintenance: Direct management Service Maintenance Horizontal signalling Others
REPLACEMENT AND UPGRADING	Pavements Through-routes Vertical signalling Earthworks and foundations
ROAD SAFETY	Treatment of areas where accidents are concentrated (TCA) Preventive Road safety audits
EXPLOITATION	Information and control Use and protection Access control and reorganisation Service areas Rest areas Weigh stations Tourism signalling Implantation of ITS Complementary and environmental actions Controls on Toll Motorway operation Tunnels Others
UPGRADING OF FIRST-GENERATION DUAL CARRIAGEWAYS	Enhanced road safety, pavement renewal, and equipping

Action corresponding to the Conservation and Services Program are currently under way throughout the dual carriageway and non-toll motorway system and on a substantial part of all conventional highways, under Integrated Conservation Contracts. The Sector Plan will have to review indicators of the state of the components and the standard of quality of the services used under those contracts, and possible improvements required to be made to the system.

Network sectors where there is no integrated conservation contract are dealt with directly. The Sector Plan must include procedures for the optimisation of this management.

The aim of the Replacement and Upgrading Program is to restore the characteristics of highway facilities which have completed or are nearing the end of their useful lives to their initial state. The Sector Plan must analyse and revise the systems for the identification and scheduling of actions, depending on the need to upgrade their structural and functional features, and of the most adequate indicators, based on the experience of the Directorate-General of Roads. This program's actions include the following:

- pavement rehabilitation needed on nearly 20,000 km of the Network, and a campaign of preventive action on the rest, throughout the eight years covered by the Plan;
- scheduled through-route work, for structural reinforcement or functional upgrading, or to improve durability;
- Earthwork, including the rehabilitation and upgrading of clearing slopes and embankments, their containment elements (rockfill, walls, ...) and improvements to drainage associated with their stability;
- updating and replacement of vertical signalling which has deteriorated with the passage of time.

Under the Road Safety Program, the Sector Plan will have to review the concept of sectors where accidents are concentrated (TCA)[4]. Road Safety Program actions include dealing with all such sections currently listed (807) and those detected in the future (estimated at 250 a year) and the implementation of all the preventive actions in the inventories. Road safety audits will also be introduced for existing routes, and projects must include a road safety supplement.

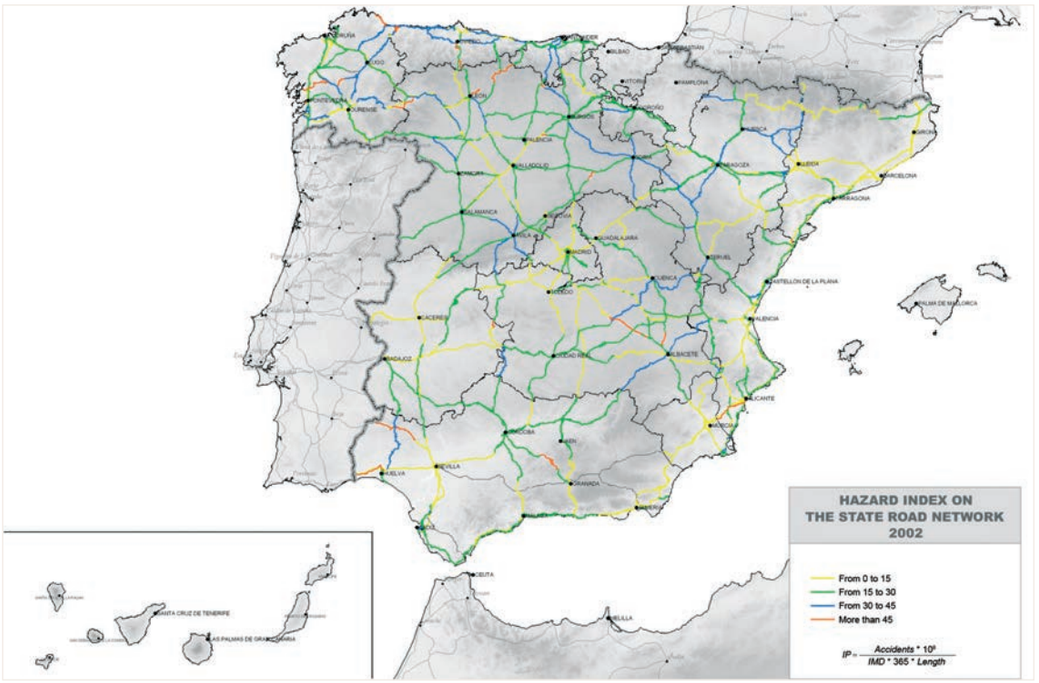
The Exploitation Program has grouped action on user information, that for the protection and control of the existing stock of roads, rest and service areas, weight controls, and tunnel facilities. In relation to ITS and user information services, this program will implement the terms of the National Plan for ITS Deployment.

The Program to Upgrade First-Generation Dual Carriageways aims to enhance the conditions of these infrastructures which, at the time, were built largely by duplicating existing routes. Because of increased traffic and traffic speeds and the number of accidents on these roads, work has become necessary to improve and upgrade them, to bring them into line with new safety demands and, as far as possible, with recently-published rules and recommendations on roads. With the available resources, it would take about 8 years to deal with all expenditure demands, so that it would seem to be necessary to seek a formula which makes it possible to move the financing of these necessities forward as much as possible. The following are the objectives on these routes:

- To deal with all sectors where a concentration of accidents has been noted, and all the existing route deficiencies.
- To improve road layout and links, to secure conditions of safety and ease of use similar to those of the latest-generation dual carriageways.
- To provide them with the necessary service routes to control accesses.
- To restore the pavement and through-routes to their initial condition.
- To replace, update and complete fittings.

[4] *Tramos de Concentración de Accidentes*. Network sectors where the accident risk is significantly higher than the average on sectors of similar characteristics, and where action to improve the infrastructure might foreseeably lead to an effective reduction in the accident rate.

FIGURE 23. The Hazard index on the State Roads Network 2002



6.3.2.5. Territorial, landscape and environmental integration

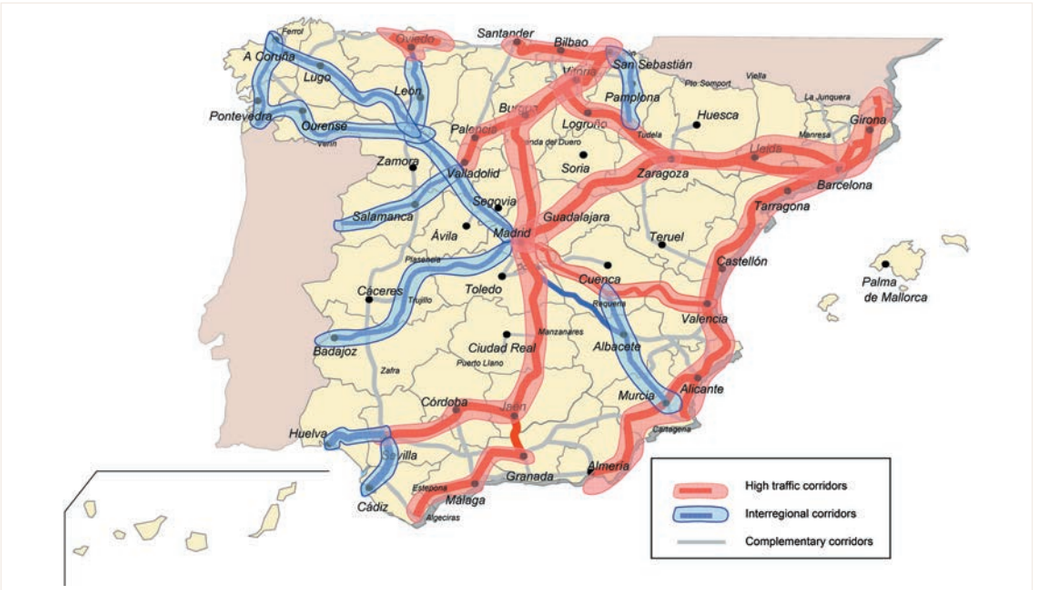
This refers to noise protection measures, routes for fauna, transversal permeability and shoulder planting. Such actions can be valued as a percentage of the total cost of work which must be done, but the Sector Plan must establish general criteria for their systematic inclusion, and review the guidelines applied at present.

6.3.3. The Road Transport Sector Plan

Actions in regulating road transport services will be implemented in a review of the specific provisions and their enforcement, coordinated with the Autonomous Communities and in cooperation with the operators. The Intermodal Passenger and Goods Transport Plans must provide the framework of reference for such action, throughout the effective term of the PEIT. However, the following can be indicated as actions to be undertaken immediately:

- Amendment of the Land Transport Act Regulations.
- Reinforcement of controls on compliance with driving times and rest periods for drivers working in road transport, with the introduction of the digital tachometer.
- Development of a new training framework for road transport entrepreneurs and employees.
- Improved road transport safety conditions.
- A program to improve job health conditions and job-risk prevention in the road transport sector.
- To promote the input from road transport toward enhancing the environment, and more efficient energy use.
- Development and updating of the PETRA and PLATA plans.

FIGURE 24. Main corridors for the transport of goods by road



- To maintain the unity of the road transport market.
- Renewal of general-use concessions for regular, permanent passenger transport.
- Definition of the rights and obligations of users of regular road transport passenger services.

6.3.3.1. Amendment of the Regulations to the Land Transport Act

The purpose is to adapt the Regulations to the changes made to these provisions in Act No. 29/2003 of 8 October on improving competition and safety conditions in the road transport market, and to modify those aspects pointed to by the practice of recent years.

The intention is to develop the efficiency of the transport system by:

- Improving transport safety conditions (with a new system of penalties).
- Guaranteeing that the same conditions for competition will be maintained in the market for all companies (the possibility of taking action against conduct which alters those conditions).
- Creating more operative procedures and tools for the creation and allocation of regular passenger transport services.
- Introducing new planning standards into the sector.
- Backing a policy of infrastructure conservation, more efficiently penalising excess weight in goods transport vehicles.

6.3.3.2. Introduction of the digital tachometer

To improve controls on compliance with the European provisions in place on driving times and rest for the drivers of road transport vehicles (EEC Regulation No. 3820/1985), it has been agreed to progressively replace the mechanical tachometer by its digital counterpart.

This new control will significantly reduce the potential for fraud, and will help to improve controls both on the road and within companies, which will in turn lead to improved safety conditions for this activity and clearer company competition on the market, by allowing enhanced supervision of drivers' compliance with mandatory driving and rest times.

This measure will make it possible to proceed against actions arising from such breaches, which alter the conditions of competition among companies.

6.3.3.3. Development of a new training framework for road transport entrepreneurs and employees

Improved training standards for road transport entrepreneurs and employees are an indispensable requisite for the modernisation of the sector as a whole. On the other hand, the gradual introduction from 2006 of the demands contained in Directive No. 2003/59/CE on training for professional drivers will multiply the training requirements of this group.

To meet this challenge, measures of the following type must be fomented:

- Support for the creation of an entity specialised in road transport training.
- Development of a plan for official and vocational training in road transport.
- An increase medium- and long-term in the sums allocated to the training assistance plan.

Training for road transport professionals is essential to creating a more competitive and modern sector, and for the adequate development and modernisation of companies. It will also contribute to the progressive introduction of new technologies in road transport.

6.3.3.4. Improved road transport safety conditions

While jurisdiction in road safety is entrusted to the Ministry of the Interior, the Ministry of Public Works and Transport has, as regulator of the activity, to play a relevant role in increasing road transport safety, with the implementation of measures which contribute indirectly to attaining this objective (among others the introduction of the digital tachometer, support for modernisation of the fleet, assistance for aged drivers to leave the profession). Similarly, the action of the road transport Inspection Services proves of great importance in the pursuit of conduct and actions in the market which contribute to a deterioration of safety conditions such as excess driving times, manipulation of speed-limiting mechanisms, excess weight in goods transport, or breach of safety conditions in the transport of school pupils and minors.

The aim is to improve road transport efficiency and increase safety levels for those involved in the activity. This action must be placed within the sphere of the future Transport Safety and Quality Agency.

6.3.3.5. A program to improve job health conditions and job-risk prevention in the road transport sector

Associations representing road transport enterprises and the sector employees' unions agree that the perspective on job-health conditions is negative, mainly for drivers, as a result of the pursuit of transport activities. There has not until now been any study of

sufficient depth making it possible to evaluate the repercussions of professional driving on those involved, whether employees or autonomous entrepreneurs, and on those aspects of road transport activity offering particularly intense risk and which thus need to be the subject of preventive action.

Consequently, a program has to be drawn up to improve job-health conditions and job-risk prevention in this activity, based on a prior analysis of the present situation which defines those aspects most affecting professionals' health.

Likewise, it is considered necessary to continue with the plan for assistance to older road transport entrepreneurs land employees to leave the profession.

Such action aims to improve the efficiency of the system and increase service quality levels, promoting economic development and competitiveness.

6.3.3.6. To promote contribution from road transport toward enhancing the environment, and more efficient energy use

Development of a transport system which is sustainable in environmental and energy terms must be able to draw on the active collaboration of road transport which, compared with other modes, takes up very significant quotas.

It will be possible to attain this objective only by promoting a set of measures –in the context of the Intermodal Plans already referred to– and in coordination with the actions of other Departments in their jurisdictions, for example in the policy to improve energy efficiency. Among such measures, the following can be mentioned:

- Support for the renewal of the road transport fleet.
- Support for intermodal and combined transport.
- Support for the adoption of new technologies by road transport companies.
- Support for interurban public transport by bus, rather than in private vehicles.
- Efficient driving-training programs for professional drivers, and information on the acquisition of transport vehicles.

The main purpose of the action is to reduce the environmental impact of road transport, and foment more rational energy use.

6.3.3.7. Development and updating of the PETRA and PLATA plans

The Strategic Goods Transport Plan (PETRA) and the Plan of Action for Transport by Bus (PLATA) contemplate a broad range of measures whose ultimate aim is to modernise and increase the efficiency of road transport enterprises. Implementation of the measures referred to, grouped into projects which are themselves arranged into strategic lines of action, is in the hands of those formulating and approving the plans, i.e. the Ministry of Public Works and Transport, the associations forming part of the National Road Transport Committee, and the trade unions.

Consequently, the Ministry of Public Works and Transport will continue to develop the promised measures, particularly concerning company concentration and a better-functioning market. It is however necessary to review the content of both plans for the future (the initial time horizons were 2006 for the PETRA and 2008 for the PLATA), with the

same approach of cooperation between Administrations and operators, while placing this review in the framework of the new Intermodal Goods and Passenger Transport Plans. This is designed to ensure the efficiency of road transport and so of the whole transport system, and to attain a higher degree of competitiveness among road transport companies, including in their strategic lines those for the internationalisation of Spanish companies and the incorporation of new technologies by all those involved in this activity.

6.3.3.8. Maintaining a unified road transport market

The distribution of powers between the State and the Autonomous Communities set out in the Spanish Constitution and its enabling provisions gives the State exclusive competence for road transport between more than one Autonomous Community, while the Communities themselves are responsible for road transport which does not go beyond their individual territories. This criterion, which has been interpreted and qualified by several Constitutional Court decisions, might lead to the fragmentation of the transport market if each Autonomous Community regulates activity in the pursuit of its own faculties. However, both the consensus secured for passage of the Land Transport Act, Act No. 16/1987, and the approval of Organic Act No. 5/1987 delegating State powers to the Autonomous Communities in the field of road transport, and the coordination work done since the mid-eighties have meant that, except in questions of minor importance, national legislation is applied throughout the country.

Uniformity in the conditions of access to the market, the existence of identical criteria for the pursuit of the activity, recognition of authorisations throughout the country, and unified management and inspection guarantee that road transport is operated adequately in Spain. Coordination of all the public Administrations with competence must however be improved, and the current system of delegation of authorities completed.

6.3.3.9. Renewal of general-use concessions for regular, permanent passenger transport

The interurban network for road transport of passengers, including services within the jurisdiction of the General State Administration and those of the Autonomous Communities, is by far the largest transport network in place in Spain, meeting the mobility requirements of a large number of citizens, particularly in areas beyond the reach of the alternative modes, air and especially rail.

The General State Administration holds 111 concessions covering virtually the whole of mainland Spain. Until now, there have been no terminations as a result of the end of the period of concessions granted within the Ministry's competence; that will start in 2007 and ends in 2018. The Intermodal Passenger Transport Plan and the Road Transport Sector Plan must each incorporate the terms for the renewal of these concessions into their ambits, in line with the PEIT objectives.

The renewal of concessions will facilitate improvement to the conditions of quality in these services, greater coordination between the State network and the Autonomous Communities' networks, and the modernisation of the system 0f concessions as a whole. On the other hand, suitable coordination between the State Administration and the Autonomous Communities during this process will allow greater harmonisation of the conditions of accessibility to public transport throughout the country. Here it should not be

forgotten that the concession system is based on a principle of solidarity whereby the most profitable traffic subsidises non-profitable routes.

6.3.3.10. Definition of the rights and obligations of users of regular road transport passenger services

Increased quality of regular services for the transport of passengers by road makes it necessary to define users' rights and obligations unequivocally, to make them clearly aware of the conditions in which they can use these services, following the line already initiated by other modes, and in the context of a wish to converge with them.

Thus the following measures, provided for in the Land Transport Act, will be put into practice.

- Approval of the General Contracting Conditions for bus transport.
- Publication of a catalogue of the rights and obligations of those using these services.

6.3.4. User information services

Actions related to user information services will be defined in a National Plan for the Deployment of Intelligent Transport Systems, covering all modes of transport. This Plan is to address the development of a national ITS architecture.

In the field of road transport, coordination of the various areas of competence must be resolved with the creation of territorial management centres involving both the Directorate-General of Traffic and the Ministry of Public Works and Transport, and the establishment of a Highway ITS Coordinating Commission for the following purposes:

- to generate a planning protocol for road installations which includes not just technical analyses but also a cost/benefit study whose results will be made public, so that citizens can learn of and understand the utility and benefit of these facilities.
- standardisation of systems being installed now and those already in place, with the passage of the necessary regulations.
- the creation of compulsory methodologies for contracting with the various Administrations, based on consultancy by qualified bodies (research centres, university groups of acknowledged standing, specialised consultants) for the process of technical approval of projects.

In the field of road transport services, ITS deployment represents a significant occasion to improve operator and user information systems, and a basic tool to enhance coordination of these services and other modes of transport.

6.4. THE RAIL SYSTEM

6.4.1. Priorities

The aim of the activity in the rail system is to convert it progressively into the central element for the structuring of intermodal transport services for both passengers and goods.

This principle makes it necessary to focus action in corridors where demand and potential is greatest so that, in coordination with regional rail and bus services, countrywide accessibility can be improved.

Thus action on the 2005-2008 horizon (see table) is concentrated on the completion of the corridors currently under construction, with substantial effort in the coordination of traveller services and timetables; action in the conventional network to improve the operating conditions of rail goods services, to facilitate interchange with road and sea transport, to make interoperability with the French system possible, and to consolidate the new institutional framework of the relation between the Infrastructure Administrator (ADIF) and the operators (initially just *RENFE Operadora*), in conditions which favour the development of rail.

Rail transport system priorities. 2005-2008

- As part of the Rail Transport Sector Plan, long-term definition of the rail network (horizon, 2020).
- Completion of high-performance trunks where construction is currently at an advanced stage.
- Improvements to the conventional network, and preparation for its progressive conversion to UIC gauge: beginning in the North-east quadrant.
- Development and review of the system of charges for use of the infrastructure.
- Introduction of competition: national and international goods traffic.
- Program of support for the development of combined transport, paying particular attention to international services.
- Optimisation of border goods facilities, compatible with the interoperability horizon.
- The structuring of logistic rail nodes with the relocation of congested nodes (Madrid and Barcelona) outside each consolidated metropolitan area, and hierarchical arrangement of the system, favouring the development of nodes with the greatest potential, supported by terminals with medium activity and potential.
- The implementation of an extraordinary maintenance program and a plan to eliminate and to enhance safety at level crossings.
- Feasibility studies on the new connections proposed in the PEIT.
- Feasibility studies for the introduction of new rail lines and services in corridors where existing lines have been closed to traffic such as, among others, the Ruta de la Plata or Valladolid-Soria.
- Delimitation of needs for action on regional lines and services.
- Consolidation of the new institutional framework. Of particular importance will be the establishment of the royalty for the use of the infrastructure, which will have to take account of the existing situation in other transport modes, the short- and medium-term stability of the system, and the objectives fixed in the PEIT for rail.

Action from 2009 and until the PEIT horizon is aimed at improved passenger and goods services, with the progressive extension of the high-performance network, and interoperability with the French system. The following will be the priority objectives during this phase:

- Full interoperability with the French system at the frontier (including goods traffic).
- Completion of the gauge-conversion process in the Northeast quadrant, and its continuation in the rest of the network.
- The commissioning of new high-performance trunks as established in the Sector Plan.

- Consolidation of the international role of rail operators in goods transport.
- Possible introduction of competition in rail passenger transport.
- The attainment throughout the rail system of adequate conditions of service and interoperability (compliance with the European Technical Specifications for Interoperability (TSIs) for high-speed and conventional rail and, as applicable, with other international parameters).
- The availability of direct intercity rail services, cutting the needs to change, as rail demand rises.

Action from 2013 will be defined according to the results from the previous period in terms of trends in rail's modal share of passenger and goods transport. If expectations are fulfilled for the development of rail-based intermodal transport, the last period of the Plan may have to deal with:

- The construction of a new trans-Pyrenee rail corridor specialising in goods transport.
- The development of new transversal trunks, meshing the network.
- Completion of the process to introduce interoperability in most of the domestic network.

Eventual introduction of new lines in corridors where existing lines were closed to traffic will, as a general criterion, depend on feasibility studies and the consequent process of agreement and coordination with the Autonomous Community or Communities involved.

A similar process will apply in assessment and coordination on lines which may, as a result of the new actions, lose their functionality as part of the State network.

6.4.2. The Structure of the Rail Transport Sector Plan

In line with the previously outlined priorities, the Rail Transport Sector Plan will be drawn up within a year of the date of approval of the PEIT, and will be structured as follows:

- High-performance corridors.
- Interoperability with the conventional network.
- Safety and maintenance (level crossings and other actions).
- The environmental integration of rail.
- Rail services and operators.

Action on Commuter Services and the integration of rail into the cities will be dealt with preferentially in the framework of the Sustainable Mobility Plans explained in Chapter 6.9 of this document, and agreements concluded in this area with the Regional Administrations. They will be programmed as part of the Rail Transport Sector Plan.

6.4.2.1. High-performance corridors

Three situations are considered:

- New trunk lines and sectors exclusively for passenger services.
- Lines and sections on routes varying substantially from existing ones, for mixed traffic (passengers and goods).

- Terminal sections, where the traffic is significantly less than in the other two cases, for mixed traffic.

The first of these refers essentially to sections or lines which exceed a given traffic threshold in the year they come into service, ensuring the greatest possible social returns and territorial impact, with greater time-saving to the destinations served. These lines clearly make the future pattern of the rail network rigid, using parameters which do not allow mixed traffic, so that the conventional network has to be used for goods, with the risk of a possible under-utilisation of the two networks and of increased administrative costs for the infrastructure this involves.

The second case relates to lines with medium traffic, the prolongation of trunk lines, structural transversal axes and cross-border links, designed in principle for mixed traffic, since the potential of the corridors they serve does not seem at present to allow them to specialise in passengers, with the resulting duplication of the network. In any event, the final design will depend on the balance between the increased cost of construction of the mixed system and the advantages of a concentration of traffic and enhanced occupancy, plus the addition of a future option to close the conventional line, or to operate the two lines on a specialised basis. Such actions would come in a second phase of programming, except where the existing line is being used substantially.

In such cases, and particularly on lines with greater traffic, such as the Mediterranean corridor or Valladolid-Burgos-Vitoria, among others, the mixed traffic design provided for in the PEIT has to be understood as applying to the entire ambit of the corridor and not just of the specific line so that, if the traffic, functionality and service conditions allow, parallel specialised lines could be created on part or all of these axes.

The third case concerns sections or lines usually at the termination of routes, with less passenger traffic and some goods traffic. The aim is to renew these sections entirely, to increase speed, safety and service quality, seeking full interoperability in the medium term with the rest of the European network. The systematic introduction is therefore proposed of the multilateral sleeper on Iberian-gauge lines, to prepare for the gauge changeover.

Action might continue subsequently (twin track, bypasses, ...) once the trends in the system as a result of the improvements introduced on sections with greater traffic and the sustainability of the network pattern become evident. There may be regional reasons on some particular sections with these characteristics to bring these larger-scale projects forward, to substantially enhance the intermodal system's access to that area.

6.4.2.2. The interoperability of the conventional system

Directives 96/48/CE and 2001/16/CE related in turn to the interoperability of the trans-European high-speed system and to conventional rail establish the conditions for interoperability, not just for infrastructures but also for rolling stock.

These Community Directives define interoperability as the capacity of the Trans-European Rail System –high-speed and conventional– to allow the secure and uninterrupted movement of trains in compliance with their specific performances, eliminating the major disparities in the regulatory, technical and operational spheres which are currently a substantial hindrance to the free cross-border movement of trains.

FIGURE 25. The rail network. Actions under the PEIT

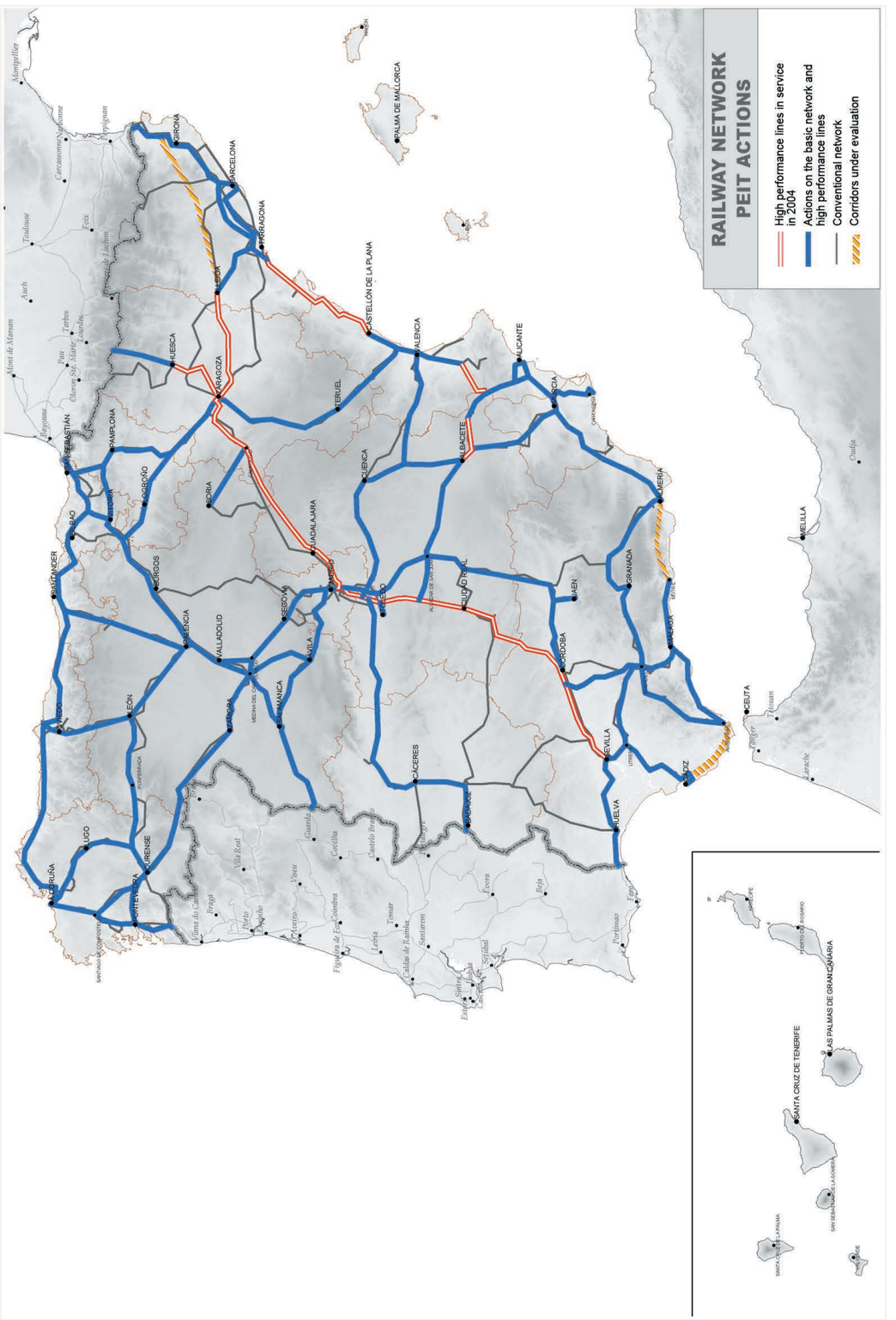
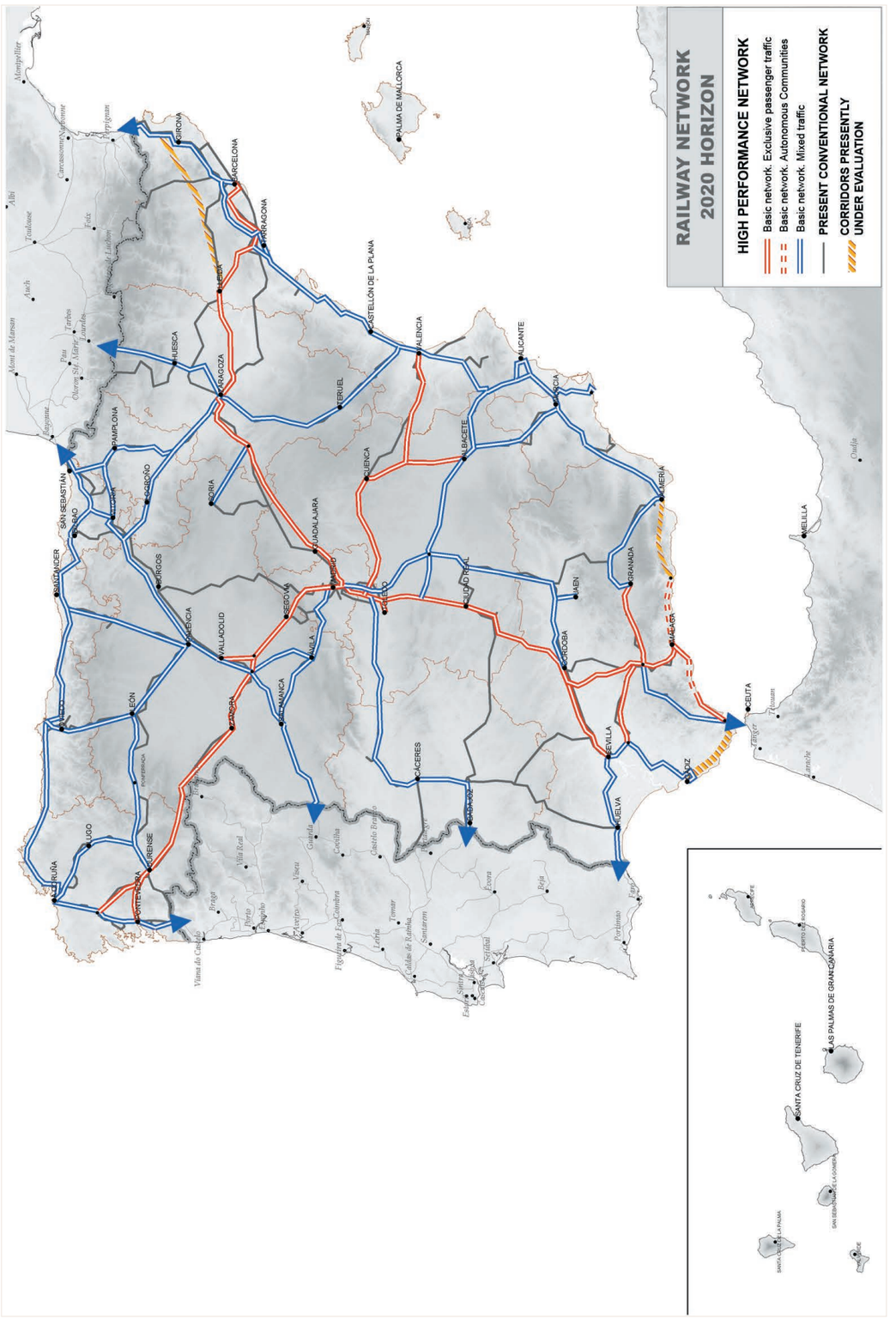


FIGURE 26. The rail network. The 2020 horizon



The Directives are articulated in the so-called Technical Specifications for Interoperability (TSI), standards and specifications related to infrastructure, electrification, control and signalling, rolling stock, maintenance and exploitation. These Specifications have already been adopted for the high-speed system, and it is planned to apply them to conventional rail from 2005.

It has been the custom to describe the different gauge in most of the Spanish network from that in many other countries as the only existing problem of interoperability. It is undoubtedly the most important such problem, but it is not the only one. The European States' rail systems have very different technical and operational characteristics, many of them incompatible: signalling systems (of which there are more than 15), electrification specifications, material specifications and operating conditions.

Spain's drive to incorporate the conditions of interoperability foresees the gradual but coordinated introduction of UIC gauge into the country's network, with due provision for the compatibility of traffic on existing and new lines. It also provides for the incorporation of the European signalling system (ERTMS) on new lines, and the adoption of operating standards and protocols in coordination with the countries around us. At the same time, the inclusion of interoperability requirements has to respect the conditions of the existing rail system, so that operations both there and on new lines allow for the greatest compatibility between them, making it possible to take enhanced quality of service and the time-saving obtained with the new lines to most of the country.

Correct European network integration must be based on the addition to the European rail system of a coherent and functional mesh operating at different speeds and with different parameters, but competitively, connecting the Autonomous Communities among themselves and to the European system. In other words, to give internal coherence to the domestic rail system so that it can contribute to the development of the European network, at the same time as more effectively and efficiently satisfying its basic function in the Spanish transport system.

6.4.2.3. Maintenance of the conventional network

The quality demands society places on public rail services require radical changes to the technologies supporting the rail assets in operation. Thus, in the context of the PEIT, ADIF has begun preparing a maintenance plan for its conventional network, medium-term, for action on track, infrastructure, electrification, signalling and telecommunications.

The proposals are divided into four types of action:

- Urgent action, whose impact will be immediate in improvements to safety and reliability and which can be implemented short-term, although some will remain in place throughout the Plan's 8-year term.
- Specific action designed to avoid the functional deterioration of installations awaiting technological modernisation or integrated actions.
- thorough action, defined by the necessity or otherwise for track renewal. If affirmative, the section to be renewed will incorporate the measures necessary to form a fully modernised route.
- Technological modernisation, including specific modernisation procedures due to obsolescence.

6.4.2.4. Eliminating level crossings or improving their safety

All the world's rail systems share the problem of level crossings. Countries with very advanced rail and road networks still however have a high number of level crossings. The average distance between level crossings is just 1.3 km in the United States, 2 km in the United Kingdom, or 1.7 km in France, compared with 3 km in Spain. This country is therefore in a comparatively good position in comparison with others, although continuing accidents (some 30 per annum) mean that stronger action is required.

Expenditure must be aimed above all at level crossings affecting public routes currently in service; others, still in place, are on private routes, and require different treatment, since most of them are conditional on authorisations.

It must be kept firmly in mind that level crossings fall within the competence of two Administrations, that owning the railway (the Ministry of Public Works and Transport) and the owner of the path, street or road (for the most part Municipal Authorities, province *Diputaciones* and Autonomous Communities), which have to agree on a decision to eliminate a level crossing, requiring coordinated action by the Administrations concerned, and including drafting of a specific project which takes up the proposals and arguments submitted by the locality affected.

In such situations, it becomes advisable in addition to eliminating level crossings to take other complementary action to enhance safety at existing crossings, while they await their removal. This can achieve appreciable safety improvements in the short and medium terms.

6.4.2.5. The environmental integration of rail

This program must include action on landscape integration, a reduction of the barrier effect and fragmentation, and controls on emissions or noise from rail traffic. On the other hand, the rail heritage offers many openings, for the development of "green ways" in the proximity of some lines, or for the recovery and upgrading of line infrastructures not in use.

On this last point, action has to be linked to similar projects in other networks (roads) being implemented by other Departments (the Ministry of the Environment) and other Administrations. The Ministry of Public Works and Transport must propose new upgrading and recovery methodologies, draft plans for the use of the infrastructures and the planning of their environmental surroundings, and for the development of a coherent network throughout the territory. Operation and conservation of this network will be managed through concessions to local corporations, public or private entities, or foundations. As an estimate, it is calculated that the PEIT will assign 1% of its expenditure on transport infrastructures to this type of action.

6.4.3. Rail services and operators

The progressive liberalisation of rail services for passenger and goods is an opportunity and a basic point of reference for the PEIT, of particular importance given the relevance assigned to rail in the development of intermodality.

The Ministry of Public Works and Transport draws on two components which are key to promoting the revitalisation of rail: the provisions enabling the Rail Sector Act, Act No.

39/2003, and the policy of the public operators, particularly *RENFE Operadora*. It is essential to define a stable relation frame between the Administration and the public rail operator which facilitates *RENFE Operadora*'s adaptation to the new situation (demand requirements, the new institutional framework and the commissioning of new infrastructures) and facilitates the role which *RENFE Operadora* can play at this new stage in energising rail services. Stocks will be concluded with the State Administration, with the necessary tools, making it possible to promote innovation and the modernisation of Program-Contracts, improvements to management systems and training, the adaptation of human resources to the new technological situation, and competition. Aspects such as significant improvements to service quality, linked to the multiple actions proposed in rail infrastructure (with the use of adequate rolling stock during this phase of thorough reform of the rail system), or the definition of service standards and services of general interest, must find the channels for their clarification in these Program-Contracts.

Consistent with the guidelines in Section 5.2.2, the activity of *RENFE Operadora* must be directed toward meeting the demand for the mobility of persons and goods as a defining element in the intermodal chain of public transport services. Three clearly differentiated types of demand must be distinguished in passenger transport: long-distance, regional and metropolitan. Rail services must therefore be oriented in each case in terms of models which are differentiated, although complementary:

- Long distance: the creation of high-frequency services in the high-performance corridors, coordinating timetables and facilitating interchange with other rail services and with road transport.
- Regional: coordination with long-distance services (timetable and pricing coordination to facilitate interchange), the search for complementarity with public passenger transport services by road, and the structuring of services in line with the Autonomous Communities' strategies.
- Goods: concentrating intermodal transport services on trunks where demand is greatest (the central corridor, the Ebro and the Mediterranean) boosting international activity, with complementary strategic partners from among operators in other countries.
- Commuter: progressive integration in metropolitan public transport services, centred on corridors where demand is strong and which require high frequency. These services are discussed in the section on urban mobility.

For its part, FEVE's strategy must focus on metropolitan mobility in the centres where it is already providing service. Other services (regional and goods) must adapt to the development of the high-speed network provided for in the Rail Transport Sector Plan.

6.4.3.1. Long-distance

Long-distance includes services with very different characteristics:

- Intercity services, with travelling times of about 2-3 hours, and a high frequency.
- Transversal services, generally with high travel times, a marked seasonal component and a varied offer: night services, international, etc.
- Radial services, carried progressively on the high-performance routes and which, from the operators' standpoint, demand the creation of adequate transition strategies as new infrastructures come on stream.

The operators' strategy will probably be aimed at classifying and standardising the offer, seeking complementarity between high-speed and regional services (ultimately establishing interchanges to optimise total travel time) and with support from road

transport services, the identification of unprofitable services, and the quest by new operators for new openings or market niches.

The good image of the high-speed services is a major attraction for rail operators compared with existing transport modes (air and private vehicle), which may serve as a catalyst for the overall long-distance rail offer.

6.4.3.2. Regional

These services start from a position of weakness: they are very unevenly distributed, their social and political standing is low, service quality is poor (reliability and the train fleet) and demand is stagnating. However, because of their development in other countries as well as of some positive experiences in Spain, the demand for these services is growing, and will be driven in the future by the new relation which may come into being between *RENFE Operadora* and the Autonomous Communities, and by the openings for optimisation of supply with the use of rolling stock better adapted in terms of costs and operability to this service's requirements. Such an outlook points to a growth scenario of some 30% in passengers transported during the first phase of the PEIT.

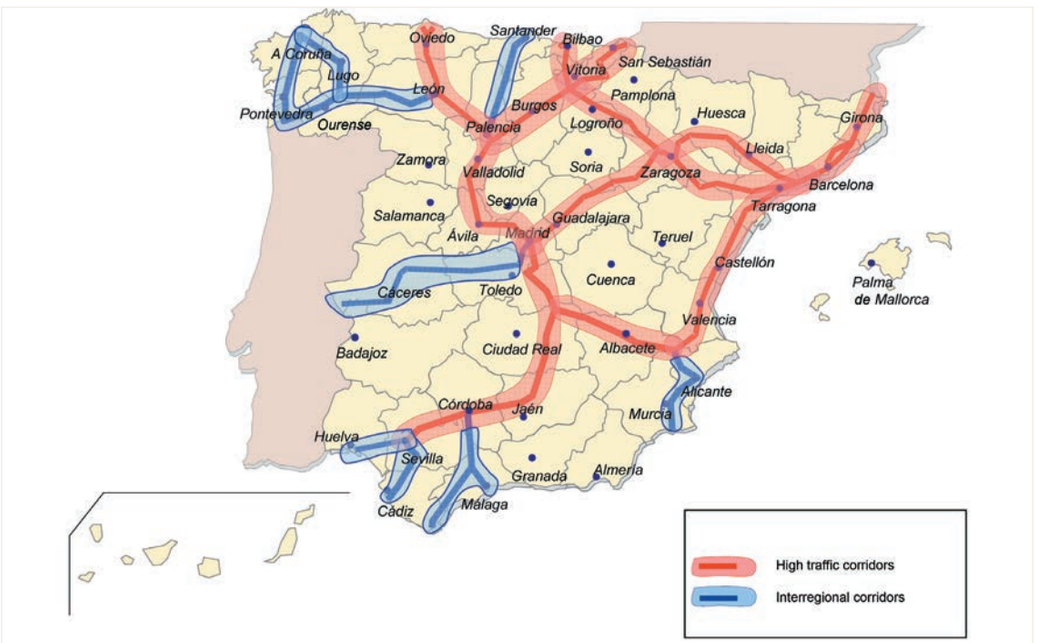
Operators' priorities must address the following:

- Renewed rolling stock, with the acquisition of more efficient models.
- The creation of specific strategies with the Autonomous Communities to identify the services to be provided.
- The integration of regional services with the other public passenger transport networks.

6.4.3.3. Goods

Here, the point of departure is one of declining offer in terms of both quality and market share, and a weak social and commercial image. Available infrastructures and resources prove inadequate: slack presence in ports, maximum gradients, station lengths, sectors not electrified, sidings, etc.

FIGURE 27. The main corridors for rail transport of goods



The growth of the rail offer in this sector is concentrated on lines with the greatest flows and, in most cases, linked to the development of intermodal chains. Rail operator strategy must therefore target logistic marketing, enhancing productivity (including adjustments to the offer and a review of commercial strategies) and radical advances in quality (speed, punctuality, processing at terminals, ...).

RENFE Operadora must play a fundamental role in the development of these services in the new liberalised framework: along with its transport offer, it must design a traction strategy which enables the offer to be extended to new demands by others. The interoperability of the Spanish and French systems is crucial to the development of an international strategy by this country's rail operators, including marketing alliances, or the development of international services. Another element of the greatest significance is the relation established between rail operators and terminals (logistic centres, ports, ...).

6.5. SEA TRANSPORT

6.5.1. Priorities

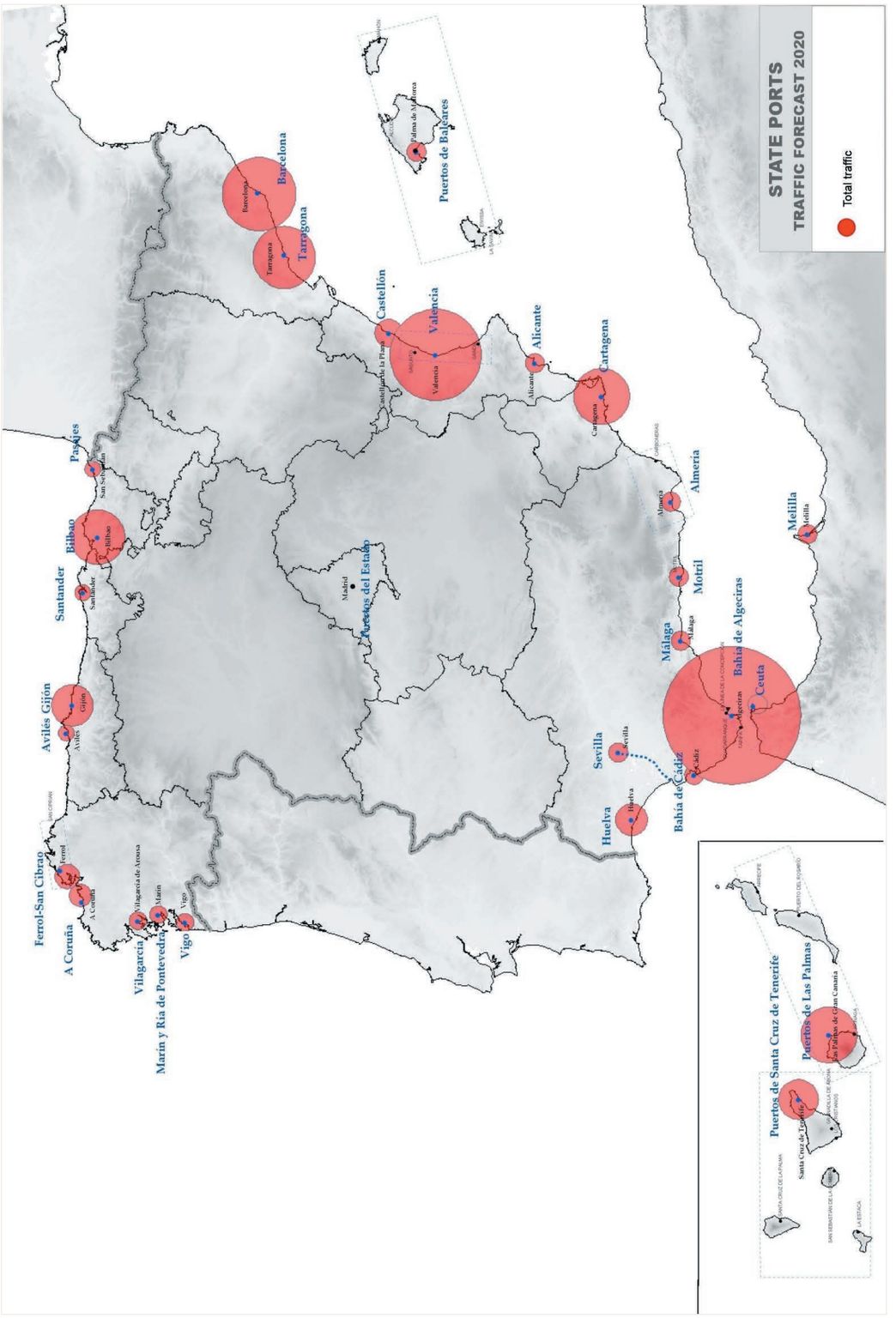
Sea transport priorities are directed in a first phase of the PEIT to the consolidation of ports as intermodal modes of reference, backing up the progressive deployment of the intermodal goods network and securing safer sea transport services which are respectful of the environment (see Table).

Sea transport system priorities. 2005-2008

- To promote the safety and environmental efficiency of sea transport with a more active presence in the international realm (the IMO and the EU) and the development of inspection, security and rescue services.
- To foment the functional structuring of logistic port nodes and integrate them into the intermodal transport system in a balanced framework of port-to-port cooperation and jurisdiction, taking account of ports' current dimensions and potential, their radius of geographical influence in the foreland and hinterland, and traffic strategies (specialisation and diversification) and functional development (hub, gateway or import/export) in relation to current and forecast market trends.
- Review of the port regulations, principally concerning economic-financial aspects, public planning and management, and the provision of port services, in this last case taking account of the recently-initiated process of review of the EU provisions (the new ports package).
- The implementation of effective solutions to eliminate obstacles and promote the development of short sea shipping and the Sea Motorways.
- Substantial improvements and, where necessary, new action on rail access to ports with significant traffic potentially transferable to rail, according to type of merchandise, volumes, distances and the development priorities of the intermodal goods system.
- Priority programs on land access to ports using *ad hoc* coordination and financing procedures.
- The development of ITS in coordination with the other modes.

These actions will in turn make it possible from 2009 to progressively consolidate intermodal transport services. The port authorities will have to act as reference agents for the development of intermodal logistic facilities not just in port service areas but also inland, participating actively in coordinating administrations for the progressive consolidation of the link represented by rail in the intermodal chain.

FIGURE 28. State Ports. 2020 traffic forecast



6.5.2. Structure of the Sea Transport and Ports Sector Plan

The fundamental advance in sea transport in the last decade has been the consolidation of a new management system. The State Ports and Merchant Marine Act, Act No. 27/92, modernised the regulatory framework of sea transport and port management in Spain, with the reform of the maritime administration, creating for example Civilian Maritime Headquarters, *SASEMAR* (the Sea Rescue and Safety Corporation), or the Special Register of Ships and Shipping Companies, and a structure of port authorities with a high degree of management autonomy, governed by the principle of financial self-sufficiency. The 1997 Amendment of the 1992 Act enhanced the Port Authorities' functional and management independence, and regulated the Autonomous Communities' participation in the structure and organisation of ports of general interest.

The next State initiative, at the end of 2003, addressed liberalisation of port services and a modification to the financial organisation of ports of general interest. Act No. 48/2003, of 26 November, sought to promote and raise the involvement of private initiative in the financing, construction and operation of port facilities and in the provision of port services. The fact is that this liberalisation has not yet taken place, and the features and trends in the port system suggest that it will still be necessary to wait some time to see to what extent that becomes a reality.

The Act also provides for a strategic framework for the system of ports of general interest, to be drawn up by *Puertos del Estado* (the State Ports Corporation) with the participation of the Port Authorities, who will refer it to the Ministry of Public Works and Transport for approval. To facilitate the compatibility of this strategic framework with the PEIT objectives, and to recover a comprehensive vision of the port system and sea transport services, the strategic framework will be revised, as part of the Sea Transport and Ports Sector Plan to be drawn up within a year of approval of the PEIT.

As part of the action to be taken on port infrastructures, ports are understood as nodes integrated into the transport and logistic system so that, as with the airports, their development is linked to the transport modes they connect: land and sea. Thus the Sea Transport and Ports Sector Plan must address both actions in the ports themselves and those on the transport and logistic networks in their environs. The Port Authorities will, as part of their planning faculties, develop their Master Plans and Corporate Plans, to be coordinated by *Puertos del Estado*.

Likewise, actions aimed at developing systems to monitor and control maritime traffic, rescue and safety, as well as to protect the marine environment and fight pollution, are not infrastructure-related but are strategically fundamental in that they serve as targets for the security and sustainability of the transport system.

Finally, the Sea Transport and Ports Sector Plan structures five areas of action:

- Action on port infrastructures, based on review of the strategic framework for the port system, and directed toward improving the competitiveness of the system of ports of general interest.
- Sea Motorways: action targeting the development of short sea shipping.
- Land accesses: designed to upgrade land access to ports.

- Non-infrastructure actions: subdivided into four groups, these seek to provide an appropriate regulatory and management framework with which to meet the Sector Plan objectives, particularly in connection with the mainstreaming priorities of improved safety and the sustainability of the transport system:
  - — Regulatory developments.
  - — Local and national integration of the port nodes.
  - — Marine Safety and Rescue Services.
  - — Protection of the marine environment, and the fight against pollution.
- Sea transport services: action aimed at normalising and facilitating the development of services provided by sea transport system operators.

6.5.3. Port infrastructures

The Sector Plan's actions on port infrastructures target investment to ensure on the one hand that forecast demand is met and, on the other, the safety of services. Thus each Port Authority's spending must guarantee the twin targets of security (protective work) and capacity (terminals and their subsystems).

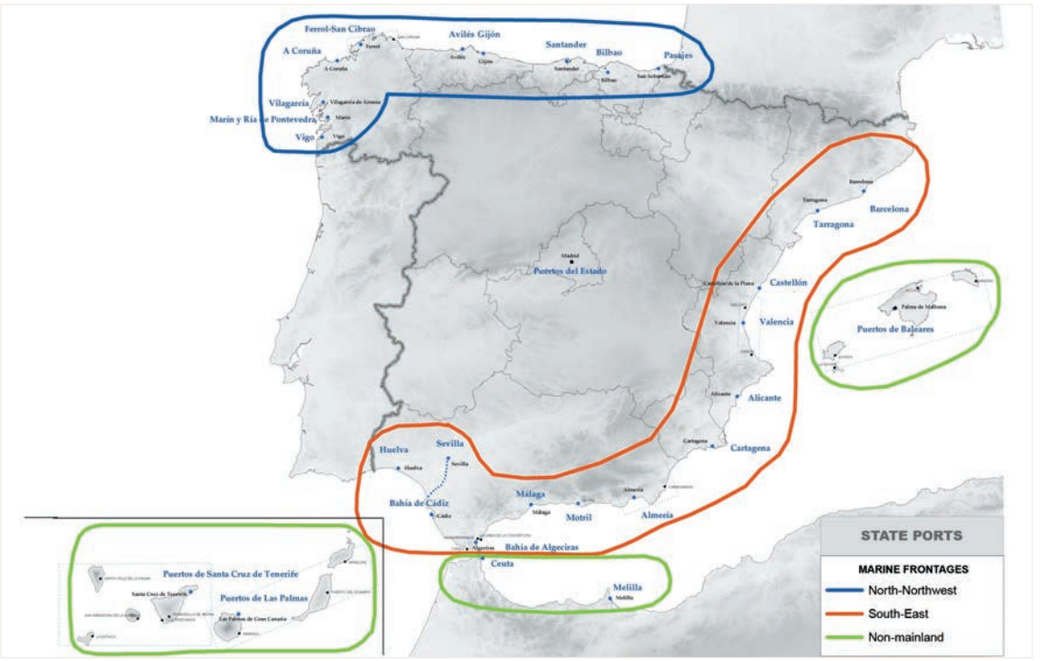
Based on an analysis by *Puertos del Estado* of forecast port traffic demand within the PEIT horizon, ports' physical development requirements have been defined, the main reference indicators being land and water areas, and berthing lengths. Table 2 summarises the projection to 2020 in traffic trends and these infrastructure indicators, distributed according to marine frontages. The forecasts are also given for investment needs.

TABLE 2. *Forecasts for traffic and the development of the port system 2005-2020*

Marine Frontages	Total Investment (Mn€ 2004)	Traffic 2020 (Mt)	Traffic increase (Mt)	Increase Berth length (m)	Increase Land area (ha)	Increase Protected water area (ha)
NORTH-NORWEST	5,821	155.6	54.6	18,627	657	810
SOUTH-EAST	12,888	444.0	191.0	34,626	1,259	1,962
NON-PENINSULAR	3,771	101.1	44.1	8,623	287	300
TOTAL	**22,480**	**700.7**	**289.7**	**61,876**	**2,203**	**3,072**
CURRENT SITUATION (2004)			410.4	198,220	3,941	18,360
% GROWTH			**71%**	**31%**	**56%**	**17%**

In line with these forecasts, the Sector Plan will define the framework by which to plan the development of each port, which is in the hands of each Port Authority. The Plan will also create mechanisms to aid in the selection of investments, and minimum requisites the port system as a whole must offer agents in the intermodal chain for international, European and domestic transport.

FIGURE 29. Marine frontages



6.5.4. Sea Motorways

In the field of goods transport, the boosting of short sea shipping in Europe targets a number of objectives:

a) To restore the balance of the participation of transport modes on European and Mediterranean routes, in line with the general objective of sustainable mobility governing the Common Transport Policy.

b) To help to resolve road transport congestion on the main trunks carrying commercial links to the rest of Europe and, in particular, points through the Pyrenees, currently covered by 70 million tons aboard trucks, a volume which has grown at an annual rate of 8% since 1986.

c) To promote the use of sea transport as an option complementing road, creating competitive transport alternatives to the "door-to-door" service currently offered by road.

To achieve this, the Sector Plan will include a program to promote short sea shipping, coordinated between *Puertos del Estado* and the Directorate-General of the Merchant Marine, taking in the design and introduction of specific measures to overcome current obstacles in this area, and to develop the sea motorways.

If this plan is correctly implemented, it will result in savings in times and costs arising from improved long-haul services, plus those generated by the potential decongestion of the interurban network with the increased level of service on the main road communication trunks. It will be possible moreover to limit the environmental effects of current land transport congestion, and make the most of enhanced energy efficiency and emissions in sea transport.

Development of the Sea Motorways must be considered a further element in the development of an intra-European intermodal transport system. This makes it necessary to supplement infrastructure and regulation needs with the requirements of backup for the startup and consolidation of new services: aid for ship financing, initial startup of lines, coordination with rail or road transport services, etc. Such support may originate in European programs (Marco Polo II) or equivalent national programs for the promotion of intermodality, designed and applied in a way which avoids distortions in the conditions of competition, or the consolidation of inefficient practices.

The establishment of the appropriate financial backup framework to allow short sea shipping to develop with guarantees of quality, security, territorial integration and respect for the principles of free competition is fundamental in facilitating the integration of maritime cabotage into the intermodal transport chains, stimulating the creation of new, competitive line services, and improvements to those already in place.

In this field, it is proposed to develop a plan for economic and financial measures to back the sector, fundamentally designed to encourage the renewal and modernisation of the fleet sailing under the Spanish flag. The measures in this plan will ultimately improve the quality and safety of the fleet, by adapting the existing system whereby State surety is granted for investments in the acquisition of vessels by shipping companies domiciled in Spain.

6.5.5. Land access

The intrinsically intermodal nature of ports (land-sea) makes it necessary to prepare a program of land accesses to ports, many of which are a bottleneck in the formation of the intermodal chain, not having developed in step with the growth in demand, as has occurred in general on the sea transport side.

The program of accesses has to be developed in coordination between the port systems (*Puertos del Estado* and the Port Authorities), the Directorates-General of Roads and Rail in the Ministry of Public Works and Transport, and Local Authorities, so that the Intermodal Goods Transport Plan is its most appropriate sphere. It represents the design and scheduling of priority action on infrastructures for land accesses to ports, with the twin social and environmental effect of reducing the impact of urban congestion in the main coastal cities. The program must include proposals concerning different possible management and financing systems for these projects, in line with the multiple functions these accesses can fulfil, and their urban problems.

As a second strategic action in this area, it is proposed to develop a framework for the provision of rail services in a new scenario for the rail system, where the ports are linked to inland terminals or dry ports, coordinated at different levels (technical, economic and legal) among the Port Authorities, the Rail Infrastructure Administrator (ADIF) and the rail operators. The objective would be to improve sea-rail intermodality, optimising the potential of the port-focused intermodal chain along with the Land Access Program.

This second action would have the effect of cutting times and costs generated by the exploitation of rail economies of scale.

6.5.6. Non-infrastructure actions

Here, among actions under the Sea Transport and Ports Sector Plan, the following may be highlighted:

a) Regulatory developments

b) Local and national integration of the port nodes

c) Marine Safety and Rescue Services

d) Protection of the marine environment and the fight against pollution

Regulatory development

The development proposed in way the ports are regulated seeks to enhance the competitiveness of the system and of the port communities, and reinforce ports' logistic function. Thus the criteria of financial return in the provision of services will be reinforced, and better controls put in place on the levels of quality offered, and effects on users and the environment. The hope is to establish the following:

- A framework of charges for the port system which, while respecting the conditions of rates as charges for services, does guarantee the duality of financial self-sufficiency/competitiveness, in line with each Port Authority's short-, medium- and long-term strategy.
- A flexible and integrated framework for the port community which lifts the quality/cost ratio in the provision of port services, paying particular attention to loading/unloading, enhancing inter-operator competition.

The following regulatory steps will be taken in the field of transport by sea:

- The urgent incorporation into the Spanish legal regime of the Community Directives affecting marine security, and those referring to the training of mariners, to European Commission inspection procedures in the field of marine protection, and the forthcoming package of maritime safety measures ("Erika-III").
- Amendment and adaptation of Act No. 48/2003 on the Financial Regime and provision of services in Ports of general interest, with the necessary political consensus.
- Amendment of Royal Decree No. 1466/1997 of 19 September on Cabotage and routes of Public Interest.
- Modification of the current provisions on recreational vessels dealing with qualifications, registration and flagging procedures, vessel safety (Royal Decree No. 297/1998) and their navigation on Spanish coasts (the National Sea Rescue Commission).
- Involvement in movement to promulgate a Marine Navigation Act.
- Revision of the provisions on training in the sector (professional marine qualifications and training courses; marine headquarters; radio-communications).

The local and national integration of the port nodes

As part of the drive underlying the PEIT to promote the design of a nationwide logistic network, it is intended to develop inland rail terminals and dry ports which are fully connected with the seaports and the Logistic Activity Zones (ZALs) which concentrate port logistic activity in a nearby space reserved for these purposes.

Improvements in the provision of value-added goods services will mean cost-cutting, while the concentration of currently dispersed activities will lead to a reduction of the environmental effects which are associated with the heavy-vehicle distribution of goods by road.

This action will take place within the scope of the Intermodal Goods Transport Plan.

Continuing preferential attention must be paid to projects for integrating ports and cities, with the coordinated participation of the Port Authorities, Municipalities and other bodies affected. Such integration sets the target of continuing to promote ports as the economic driving force behind the areas they serve, compatible with the development of cities toward coasts, and culminating in more efficient territorial planning, the decongestion of urban routes in densely populated areas, and savings in financial and environmental costs.

Marine Security and Rescue Services

At the international level, the Sector Plan will define the strategy to promote active involvement in the International Maritime Organisation and in Community maritime policy, contributing to the introduction of new provisions which guarantee higher safety levels in traffic (especially off the coasts of Spain), improving the existing system for the control of vessels in transit, the prevention of maritime accidents, and intensifying ship inspections. The Sector Plan will review the protocols on sea rescue, and create mechanisms for their permanent monitoring, coordination, harmonisation and updating, and design a joint proposal with Morocco to be translated into a maritime security plan for the Straits of Gibraltar. The AIS system (Automatic Identification of Ships) will be set up along the whole Spanish coast.

Nationally, the Sector Plan will launch a program for the inspection of ships flying the Spanish flag, to improve the conditions of vessels subject to the requirements of the Paris Memorandum, with the aim of getting on to the IMO's so-called "White List".

The Plan will also set precise objectives to improve salvage services, through measures like the creation of special groups to assess emergencies and for rapid intervention, the provision and startup of logistic bases with the necessary resources for rescue and anti-pollution operations; the renewal and updating of electronic equipment in the Centres for Marine Rescue Coordination and the Monitoring of Sea Traffic; to increase and renew the salvage fleet, high-speed launches and tugs, and to provide medium- and long-range fixed-wing aircraft and helicopters for adequate cover of the Rescue Zone and to improve response times; development of a suitable computer support to handle SASEMAR's activity, and training programs and awareness campaigns specifically targeting the sectors affected.

Safety demands require the Sector Plan to also deal with: reform of the Standing Commission for the Investigation of Maritime Accidents, for it to regularly issue reports, statistics and recommendations designed to avoid repetition of the incidents analysed; boosting and review of the operability of the professional bodies connected with maritime safety; and improvements to the National Plan for Human Rescue at Sea.

Protection of the marine environment, and the fight against pollution

The Sector Plan will, among other initiatives, contain a strategy to promote the following multilateral questions: revision of Annex VI of the MARPOL Convention, and the delimitation of the waters of Galicia and the Canary Islands as Maritime Zones of Special Sensitivity (ZMES).

Nationally, the actions the Sector Plan will consider refer to progressive improvements to resources, such as the supply of fixed-wing aircraft for control and surveillance work, and

teams to fight marine pollution (including enhanced functionality of the competent professional bodies), the development and implementation of advanced technological systems to detect and monitor contaminating substances at sea, for the monitoring and the development of marine currents and swell, and the preparation and implementation of a Program of Contingencies and for the Fight against Marine Pollution.

Finally and where applicable, these actions will be coordinated with those addressed to the passage of specific legislation on the marine environment which the Ministry of the Environment may propose.

6.6. AIR TRANSPORT

6.6.1. Priorities

The priorities defined by the PEIT (see table) aim at the progressive enhancement of the sustainability and the environmental performance of air transport, its progressive integration with the other forms of transport, and to facilitate the incorporation of the airport system into its local context.

Air transport system priorities. 2005-2008

- To enhance the safety and conditions of civil aviation and in airports.
- To improve airport operability with the installation of air navigation aid systems.
- To improve the quality of services to aircraft (parking, fingers, maintenance zones and hangars, etc.), to passengers (terminal areas, check-in counters, facilities for persons of reduced capacity, commercial zones etc.), and to the airlines (spaces for offices and passenger services, aeronautical development zones, etc.)
- Environmental sustainability, with particular attention to noise and its treatment.
- Consolidation of a multipolar node system ("hubs") (based initially at Barcelona-El Prat and Madrid-Barajas) to avoid problems of congestion caused by over-concentration.
- The development of intermodality (land accesses) using *ad hoc* coordination and financing systems with the participation of all those involved.
- Optimisation of the airport system through the concept of "airports of general interest" and the creation of cooperation mechanisms among them and with the country's remaining airports.
- Airport charge systems linked to aircraft environmental performance.
- In coordination with other EU countries internationally (ICAO) or at the European level, to move forward in the introduction of tax on aviation fuel.
- To foment liberalisation and the entry of new operators (new European Commission initiatives in air transport), with priority for European services.
- Air cargo: to structure the logistic airport nodes based on the development of Air Cargo Centres in addition to that already in existence at Madrid-Barajas (Barcelona and Vitoria) and backed up by complementary nodes: nearby airports, airport activity parks and air cargo terminals. The air cargo system must allow for the development of competitive services integrated into the intermodal goods transport system.
- To open airport management to regional and local Administrations, and other bodies. In particular, to implement regulations which facilitate the implementation of the competences conferred to the Autonomous Communities on airports and their involvement in airport management, and to adjust the technical specifications for airport construction to the international provisions.
- Review and updating of Master Plans, based on the guidelines in the future Air Transport Sector Plan.
- Stimulation of competition in the provision of services in this sector, in particular promoting the operation of low-cost companies on intra-European services and long-haul domestic routes (more than 700 km).

The objectives from 2009 aim at the progressive integration of air transport into the intermodal passenger and goods system and to ensure the long-term compatibility of air transport with the environmental targets fixed for the transport sector. To this end, the airport and air navigation infrastructures provided for in the Air Transport Sector Plan and each airport's Master Plan will be built, taking account of the associated analyses of financial profitability and environmental compatibility.

6.6.2. Structure of the Air Transport Sector Plan

The Spanish air transport sector is at a stage where it is maturing rapidly, with average annual growth in passenger traffic of some 5.5%. This strong growth, combined with consideration of its fundamental role for long-range transport (60% of passengers at Spanish airports travel outside the country), particularly given Spain's peripheral position in the European context, is the cause underlying the appearance of an increasing number of initiatives for the creation of airports, promoted by individuals, Local Bodies or the Autonomous Communities, whose characteristics distinguish them from the airports of general interest.

Such initiatives raise a practical legal-administrative problem, because the existing regulatory framework does not take such a development into account. This would seem to make it necessary to fix rules which, in general terms, regulate the creation and operation of this type of infrastructure, so as to fix the guidelines for administrative action and avoid disparate responses to similar situations, or unnecessary conflicts with the applicants.

Moreover, in reappraising the content of some of the current provisions, these initiatives concerning non-State airports have made clear the need to regulate the procedure for the approval of such facilities, because the existing provisions are based on an assumption that commercial airports are publicly owned.

Airports play a fundamental role in their interaction with society, so that the characteristics of each are adjusted to the needs of the society served. On the other hand, the air transport system has developed significantly in recent years, highlighted by an increasingly marked policy of commercial alliances among the traditional airlines, and the advent of the phenomenon of low-cost carriers.

Airlines have had to redefine their strategies and adapt their policies to cut costs. This new strategy has led to mergers and alliances with other companies, aimed at seeking economies of scale and synergies in the various parts of their activity. In addition, in this scenario new competitors have arisen which are obtaining significant market shares at highly competitive prices: these are the low-cost carriers. Their advent has meant the opening up of new routes and, with that, mobility possibilities for persons who, until now, had not considered using air transport.

This means that strategies aimed at optimising use of airport capacity must take account not just of the society served by these facilities, but also the present and future scenario in which the air transport sector is to develop.

The 48 existing Spanish airports (including the military air bases open to civilian traffic and the heliport in Ceuta) which are run by the Ministry of Public Works and Transport through AENA (Spanish Airports and Air Navigation) are shown in Figure 5 in Chapter Two above. Within this network, the opening of the airports at Burgos and Monflorite-Alcalá (Huesca) is pending[5].

In 2020, the Spanish airport network will comprise public airports and others run by private enterprise. Those in the public system may be owned by the General State Administration or the Territorial Authorities. The forms of participation of the various Administrations and institutions in the management of the public airports will be defined.

The incorporation of new airports into the public system will be conditional on the completion of studies of their socio-economic benefits and the environmental compatibility, and will particularly be carried out in a context of coordination among the various Administrations.

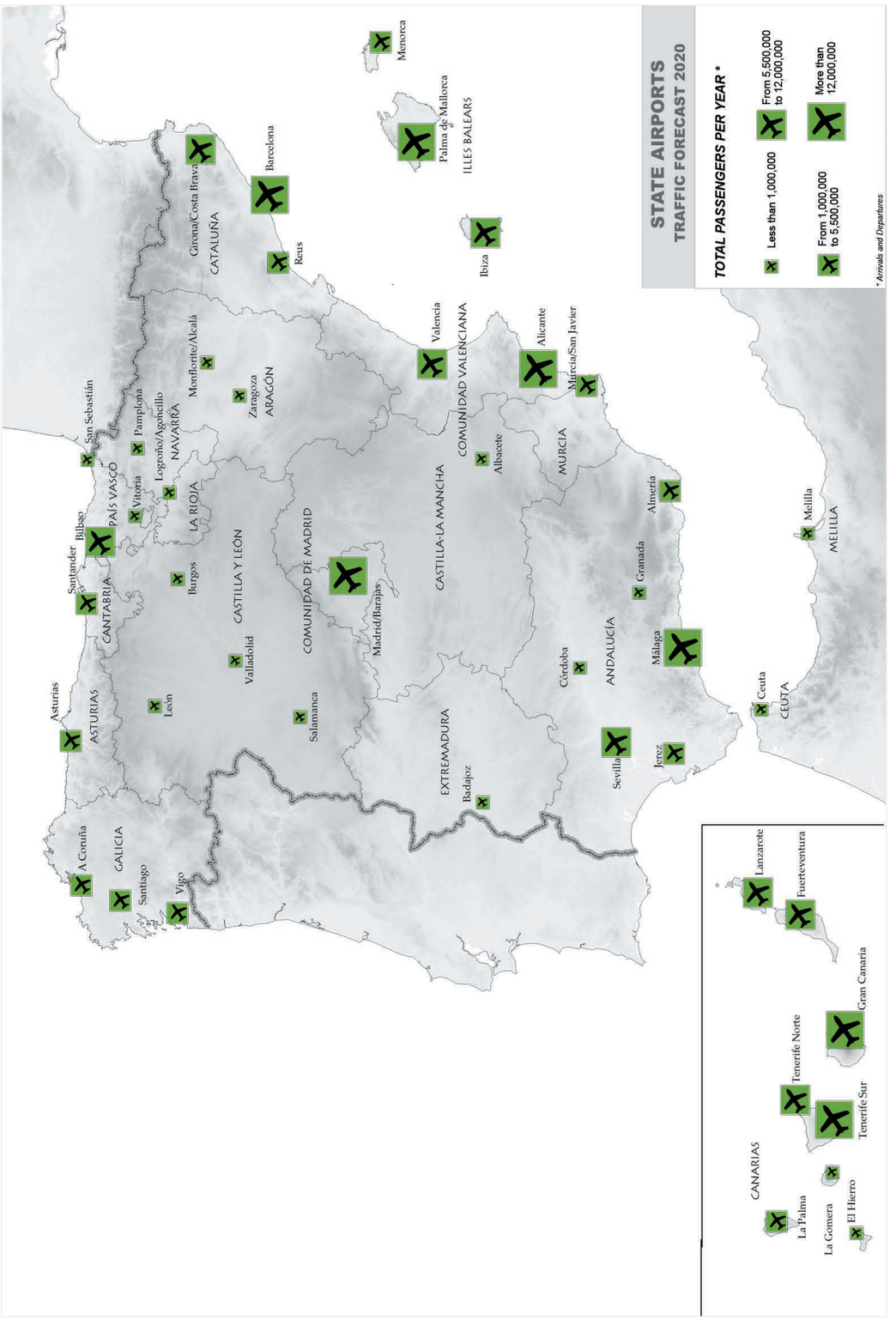
In a framework where sustainable development is the basis for attaining the remaining targets set, the Air Transport Sector Plan will develop strategies for the types of traffic likely to occur at the network's various airports:

- Hub & spoke traffic.
- Point-to-point traffic.
- Tourist and business traffic.
- Cargo traffic.

The Air Transport Sector Plan, to be prepared within a year following the approval of the PEIT, will set the guidelines for the review and updating of the Master Plans, which will define the State Network airport activities designed to ensure that airport infrastructures are appropriate to the demand forecast for the 2020 horizon, with suitable standards of quality, safety and operability, in the context of sustainable economic, social and environmental development. The Sector Plan will also include other actions aimed at providing airports with greater operational capability, maintaining high standards of operational safety or by allowing the demand met to differ from existing levels, so assigning greater growth potential to some airports in markets still in the process of maturing.

[5] Outside the State system, the private airports in the Region of Murcia, Castellón and Ciudad Real (Don Quixote) are at different stages of formalities, planning or construction.

FIGURE 30. state airports. 2020 traffic forecast



6.6.3. Infrastructure actions

Table 3 shows the main actions designed to provide sufficient capacity to airport facilities to meet the demand foreseen within the PEIT horizon (estimated at 311 million passengers a year compared with the 165 million registered in 2004), and to fulfil the necessary operational, safety and security conditions, ordered according to objectives. These actions extend to all the airports in the State network.

TABLE 3. *Main actions on infraestructure, and investment in the state airports system*

AREA OF ACTION	OBJECTIVE	PLANNED INVESTMENT Mn€	% OF TOTAL
MANOEUVRING AREA (Runways, taxiways, parking aprons, ...)	To adapt flight field capacity to forecast air traffic demand.	2,150	13.69%
TERMINAL AREA (Passenger and cargo terminal buildings, technical blocks, ancillary buildings, ...)	To adapt capacity to forecast demand and improve the quality of services provided to passengers, luggage and cargo in airport terminal areas.	5,760	36.69%
SAFETY AND SECURITY (S.E.I. Systems and infrastructures /Fire-extinction, safety zones, hold baggage inspection systems, X-ray equipment, access control, etc.)	To enhance safety and security (aeronautical operations, protection of persons and property; job-risk prevention).	1,444	9.20%
AIR NAVIGATION SYSTEMS (Air traffic control systems, navigation aids, communications system, radar, ...)	To improve air traffic navigation and control, contributing integration into the Single European Sky.	1,780	11.34%
MAINTENANCE AND CONSERVATION (Backup and minor investments for replacement and maintenance of infrastructure)	To improve maintenance and conservation of aeronautical infrastructures.	1,179	7.51%
INTERMODALITY, THE ENVIRONMENT, EXPROPRIATIONS ETC. (Vehicle access and parking, urban development, environmental action, expropriations, etc.: computer systems and telecommunication networks, ...)	To increase the intermodality and sustainable development of air transport, facilitating the integration and sustainability of the total transport system.	3,387	21.57%
	TOTAL	**15,700**	**100%**

6.6.4. Land accesses

Land access to airport facilities is dealt with in terms of coordination among all the Administrations, bodies and agents involved, to meet the functional requirements of access, to enhance air transport's connectedness to other modes of urban and interurban transport, to ensure the best possible integration of these infrastructures into their urban or extra-urban surroundings, and to create a balanced framework for the financing and management of the action taken.

6.6.5. Non-infrastructure actions

As actions not involving infrastructure in the air transport field, the Sector Plan must consider at least the following:

- Development of a policy of sustainable air operations from the standpoint of management of situations involving noise.
- To open airport management to participation by regional Administrations and local bodies.
- To regulate use of the State's airport powers, and their relation to and coordination with the competences conferred to the Autonomous Communities.
- A progressive approach of airport charges to the real cost of the services provided. The aim on the one hand is to recover the differential which has arisen in recent years between real inflation, the real costs incurred and the rise in rates and, on the other hand, to charge for the new services according to their true cost base.
- Total recovery of the costs of Air Navigation services. A balance has to be reached between the revenues from Air Navigation and the costs caused in providing its services, by setting charges at the necessary level, or through the necessary alternative arrangements and mechanisms.
- Definition of the new model for the operation and management of non-commercial aeronautical activities, with the general aim of improving AENA's non-aeronautics income, so increasing its contribution to the compensation of the investment drive. To attain this objective, commercial strategies are being implemented which involve the design and management of new models for the exploitation of resources in the set of business lines which make up this area of AENA's activity.
- A thorough review of airport regulations. The existing Air Navigation Act dates from 1960, and has undergone a number of modifications and complements, but continues to be based on an outdated political-administrative structure. Likewise, the lack of provisions on procedures for the creation, classification and opening of new airports, and the demands placed on their owners and operators is a further basic fault in the body of regulations on air transport infrastructures. Mention may also be made of the lack of technical provisions on airport construction and certification, and the need to properly regulate the effects on third parties arising from airport operation, including in particular noise impact. Review of airport regulations must also deal with the system for the provision of air services other than those for air transit and control. There is therefore a clear need for an Airports Act which contemplates all these aspects and provides their subsequent regulation.
- A definition of the financial system for the operation of non-State airports of general interest, regulation of the regime of charges for services provided by the State and, in particular, those related to the air navigation system.

6.6.6. Air navigation

Although there is no provision for the Sector Plan to include large-scale infrastructure actions in the existing network of air navigation facilities and traffic control systems, the maintenance of their operating conditions must be guaranteed, adapted to a context of continual technological development, and conditioned by the need to coordinate actions of an intrinsically transnational nature arising from the introduction of the Single European Sky. In this sense, the following are the main strategic actions the Sector Plan must consider:

- Application of regulations already approved by the European Union or to be approved in the future on the Single European Sky, and promotion of future initiatives arising in this field. A strengthening of Spanish involvement in the international realm so that decisions on the design, organisation and structures of European air space and the management of traffic and the interoperability of systems take account of countries on the periphery of the continent, eliminating bottlenecks influencing traffic flows toward this country.
- To promote initiatives with neighbouring European States for the design of the functional airspace blocks Spanish airspace is to be divided into and to participate in. The drive for technical cooperation will also continue with our neighbouring African States, which may influence the encouragement of South Atlantic air traffic flows through the Canary Islands.
- To boost national involvement in the European System of Radionavigation by Satellite and its operation, for a proper placement in the operation and provision of satellite navigation services begun with participation in the EGNOS program and continuing with involvement in the GALILEO concession process.
- Europe-wide promotion of use of a single system for the processing of flight plans based on the work done by AENA to improve the interoperability of the European air traffic management system, one of the essential objectives of the Single European Sky initiative.
- The operational and technical adaptation of the Spanish Air Navigation system to the Eurocontrol Safety Regulatory Requirement (ESARR), enhancing its capacity and safety.
- Reduced air navigation costs, increasing productivity to levels similar to the European average. Promotion of the passage of the EUROCONTROL safety regulations. Liberalisation of access to the profession of air traffic controller, and the emission of qualifications and rates.
- Further cooperation, studies and analysis with the Ministry of Defence in a broader application of the notion of “Flexible use of airspace” and its adaptation to the objectives of the Single Sky initiative.
- The introduction of alternative systems for the management of air transit which are better matched to the volume of traffic and the safety required for air traffic control at some airports and control towers (Aerodrome Flight Information Service - AFIS - Systems).
- Modernisation of air navigation in accordance with EUROCONTROL guidelines (the ATM2000+ strategy, with a 2020 horizon).
- Liberalisation of international air transport. Within the EU, to promote the urgent conclusion of a Convention on air transport between the European Union and the United States, following the guidelines of the Community initiative for a Common Transatlantic

Aviation Area. Also to promote the negotiation of a similar concept for the liberalisation of air transport between the European Union and the States of Central and South America, to foment this country's air traffic with those regions.

- The creation of an air transport observatory to provide certified data on levels of services and costs, for decision-making in this field. This observatory would allow operators' activities to be monitored, particularly on links or in areas where the number of operators is limited.
- The new demands arising under the recent Air Safety Act, (No. 23/2003), and from the Single Sky initiative with the creation of National Supervisory Authorities, plus new International Civil Aviation Organisation requirements all demand that the safety oversight function in Civil Aviation be enhanced and upgraded. That will require a thorough revision of the Directorate-General of Civil Aviation's existing legal-administrative framework, to provide the Aeronautical Authorities with the human resources needed to effectively carry out their regulatory and supervisory tasks in a sector as dynamic and competitive as this.
- The creation of a strategy to foment the involvement of "Low Cost" carriers particularly in the market within Europe, with flexible airport charges and handling service costs.
- To promote the objectives and challenges raised by the European Commission in its document "EUROPEAN AERONAUTICS: A VISION FOR 2020", especially in areas such as safety, service quality or environmental sustainability.

6.7. INTERMODAL GOODS TRANSPORT

6.7.1. Priorities

Intermodal transport is conceived as a component to rationalise and enhance the quality of goods transport, based on greater cooperation among all modes of transport, and a key point for improving costs in the logistic chain, influencing the final price of goods on the destination markets. This aspect is particularly critical in the international sphere, because globalisation and the new world economy demand constant improvements to logistic processes.

Coordination between Administrations and between them and the operators is fundamental, because of the current distribution of faculties and the realities of goods transport. Coordination in the area of goods intermodality refers not just to the modes of transport but to inter-administrative competences. The former contains a technical component linked to action in the territories of different Administrations, and may refer equally to a logistic node or to a territory of more or less extension. The second aspect affects the competences for the regulation of transport services, and will require increased cooperation, particularly in corridors with greater potential for the development of intermodality.

The ideal development of intermodal goods transport requires sufficient infrastructures in each of the modes involved but also imposes some demands of its own on the infrastructures, and calls for specific platforms where modal interchange takes place. It also requires particular services from the operators in the intermodal network, and for the handling of these cargoes. This makes it necessary to create an Intermodal Goods Plan dealing simultaneously with the following aspects:

- Infrastructure actions: nodes and corridors.
- The framework for the provision of services.

The priorities of the Intermodal Goods Plan focus in the period 2005-2008 on enhancing the efficiency of existing facilities, structuring the system by inter-mode connections, and the upgrading of some key nodes and, above all, on encouraging new operators through suitable regulation, accompanied by specific backup programs. These priorities are specified in the table.

Intermodal goods transport priorities. 2005-2008

- To foment the territorial structuring of intermodality-based national and international logistic nodes, coordinated with regional and local Administrations (the areas of Madrid, Barcelona, the Basque Country, Valencia, Zaragoza, Algeciras and Seville).
- Development of a network of regional intermodal platforms inserted into the main areas of production and consumption in the Autonomous Communities.
- The enhancement of port intermodality with the development of Logistic Activity Zones at ports with potential to operate as national/international hubs, complemented by medium-traffic ports.
- Reinforcement of rail access to ports taking account, from the initial stages of the new zones of port activity, of the conditioning factors raised by rail.
- Integration of the goods rail network into land logistic platforms developed or planned.
- Development of intermodality in air cargo, through Air Cargo Centres (Madrid, Barcelona, Vitoria) and other airport infrastructures specialised in cargo.
- Startup of a specific program promoting intermodality, in coordination with the EU's Marco Polo II program.
- Backing for new operators.
- To promote the launch of experiments in urban and inverse logistics (linked to waste management).

The priorities from 2009 are likely to target decongestion of the main nodes (Barcelona and Madrid), greater attention to the specific needs of urban logistics (requiring the prior creation of a suitable coordination framework) and progressive development of national operators in the European context. The last of these is in turn linked to increasing the capacity of rail links with France, with the promotion of the central trans-Pyrenee intermodal connection, putting down the bases for the inauguration of the new tunnel set for the year of the PEIT's horizon. Increasing backing will also be needed for operators, to introduce new intermodal transport techniques, or for them to internationalise.

Longer-term, there must be conditions for the startup of active goods traffic management measures, favouring the most sustainable modes in areas of greater environmental vulnerability, with the provision of fully competitive alternatives.

6.7.2. The structure of the Intermodal Goods Transport Plan

The Intermodal Goods Plan must be completed within a year of the PEIT's approval, and will include the following aspects:

- The structure of an intermodal network in Spain: basic definition of the system of hierarchical modal and intermodal goods corridors and logistic nodes connected to the international corridors.

- National and international intermodal corridors: their definition, the priorities of intervention and the main actions to improve infrastructures.
- The intermodal network nodes: their hierarchical organisation and multimode and logistic functions.
- Port intermodality: rail access, terminals and logistic activities zones.
- Rail node intermodality: functionality, road and rail access and logistic integration.
- Airport intermodality: air cargo centres and cargo facilities, and integration into the logistic environment.
- Route nodes: functions and centres.
- Non-infrastructure actions: for rail competitiveness and backup to get cargo off the roads, training, new technologies and promotion of short sea shipping traffic.
- Territorial intermodality coordination plans: intermodal plans at a regional or local level.

The map in Figure 31 shows a prospective scheme for this structure of trunks and nodes, based fundamentally on the present situation and action under way. It thus has no prescriptive force: any necessary decisions will in any case be taken as part of the Intermodal Goods Transport Plan.

That Intermodal Plan will on the other hand deal with these matters in terms of the territorial coordination of intermodality, and so include the following:

- Coordination of transport infrastructure policy and services.
- European and supranational coordination.
- Coordinated territorial policies and action (the state, the autonomous communities and local authorities).
- Programs of coordinated action at logistic nodes and in goods transport.
- Coordinated public and private action.
- Regulatory action and that in the institutional framework.

6.7.3. The structure of an intermodal network in Spain: corridors and nodes

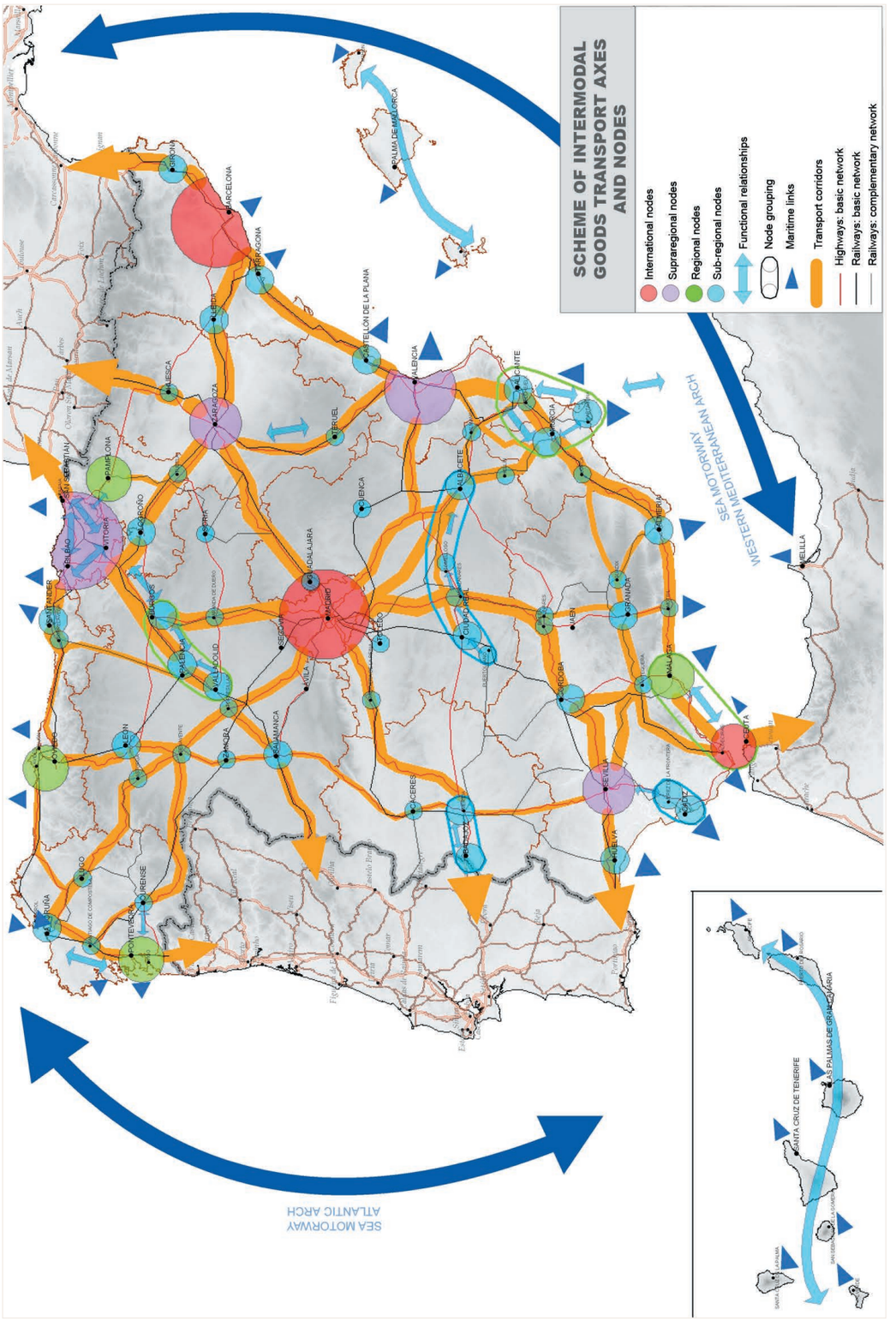
The intermodal network is structured on international and national nodes, most of which offer all forms of transport, connected by both rail trunks and high-capacity roads. In rail terms, these nodes have adequate facilities, and the network joining these points must have a capacity for goods trains at least 600 m long, as is habitual in the rest of Europe.

6.7.4. National and international intermodal corridors: the main actions

The main national combined traffic corridors are on the Mediterranean Axis, the Central Corridor (Asturias-Madrid, Basque Country-Madrid and from here to Andalusia) and the Ebro Axis. Traffic levels are also significant in the Madrid-Levante Corridor.

The importance must be highlighted of the traffic at the border crossings at Irún and Portbou, and in Badajoz, at somewhat lower traffic levels.

FIGURE 31. Intermodal goods transport axes and nodes



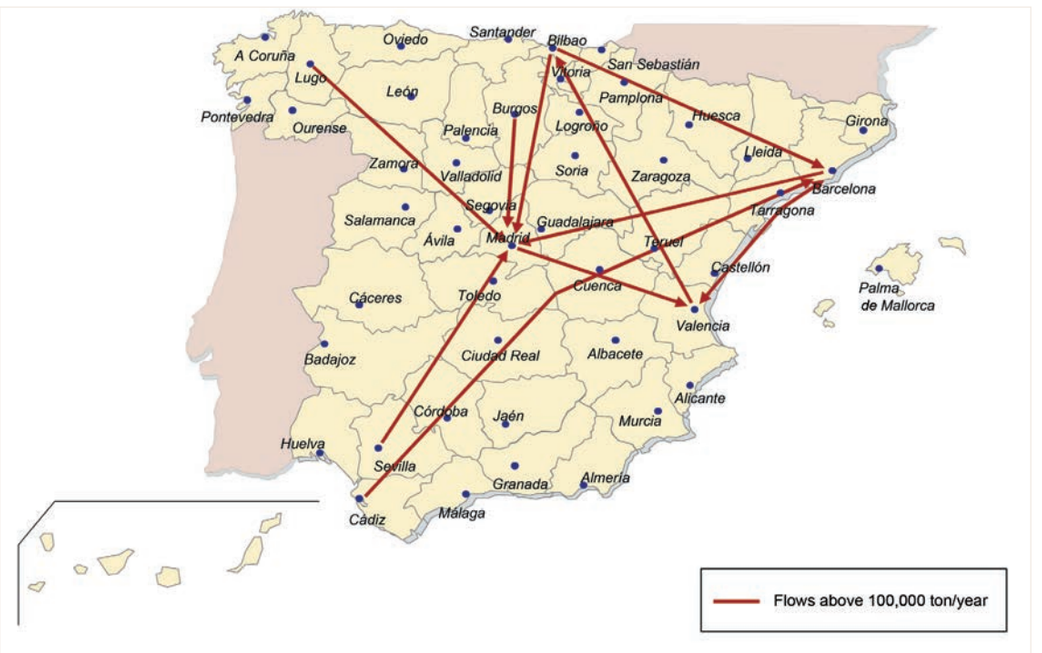
Other corridors of great importance because of their goods traffic by rail are the connections with Galicia and the Galicia coastal axis, the Madrid-Badajoz-Portugal axis, the access to Cantabria, and the Andalusian corridors to Cádiz, Huelva, Algeciras and Málaga.

The priority actions in these corridors are the creation or consolidation of logistic platforms linked to existing and planned combined-transport rail terminals in the main intermodal transport corridors.

The system's insertion into the international corridors requires completion of the main international connections (Portbou, Irún and Badajoz), so that interoperability with the French and Portuguese systems is essential, and including a shift to UIC gauge at the first two and, at the third, in coordination with Portugal.

It will be a priority to invest in the creation of logistic interchange facilities using both gauges, located between the conventional network and the new one, and the boosting of the central Pyrenees link, guaranteeing the corridor's continuity with the rest of the Community rail system.

FIGURE 32. Main combined transport flows (national, 2002)



6.7.5. Intermodal network nodes

Nodes are critical points for the functioning of the transport system, whose efficiency depends on the role they play.

This is particularly decisive in the case of the goods transport system and logistics. The nodes are influenced by the various aspects of the system's three key factors: capacity, time/deadlines and quality.

The goods transport nodes are points of fracture for cargo or for traction, where a substantial part of the chains' total costs are concentrated, and decisive in the system's

"overall logistics bill". These fracturing processes represent quantitative leaps in cost and time in the goods flowchart.

Intermodality is decisive in the structuring of the nodes:

- Sea-land intermodality: the correct organisation of road and rail accesses to ports, integration of terminals, and the promotion of Port Logistic Activities Zones.
- Air-land intermodality: promotion of Air Cargo Centres and Airport Logistic Centres.
- Rail-road intermodality: the creation of the right network of rail nodes, and road access to stations, and the concentration of logistics platforms integrated into rail terminals.

Node potential should not in any way be limited to the processes for intermodality or change of mode, but must extend to multimodality in its entirety, that is, the availability of a range of modes and options for the channelling of goods by the end loaders (logistic operators or industrial enterprises) in a given field, so that multiple options are available depending on the type of cargo and the logistic urgency. This multimodality is a decisive factor for the range and level of quality of a given logistic node, conditioning as it does a substantial part of the logistic, entrepreneurial and productive functions located at and associated with that node.

The transport nodes are also configured as areas of potential economic development linked to the introduction of infrastructures and activities of an economic nature, and their impact in job-creation, investment, increased productivity or the diversification of the economic fabric.

The future logistic and goods transport system is structured around a hierarchical network of multimode nodes (at the international, national or supra-regional and regional levels). These form a principal part of the system of cities, they are completely integrated into the territory, and they constitute centres of logistic articulation with their hinterlands.

To deal with the territory as a whole, this network is complemented with a series of nodes which will need strengthening and consolidation, right now of more reduced scope, such as those located on the transverse Castilla La Mancha axis or the Extremadura axis, and others of a local nature in the main goods transport corridors, whose operability will thus be enhanced.

This system supports not just the structure of the traditional corridors (radiating from the centre, the Mediterranean trunk, the Ebro corridor), but also some alternative transversal routes, and particularly the Valencia-Zaragoza-central trans-Pyrenees corridor, and the transverse Castilla La Mancha axis.

Cross-border logistic links will also be enhanced, not just the trans-Pyrenees route (the Atlantic, Mediterranean and Central corridors) but also the connection with Portugal (the Atlantic axis, the Valladolid-Portugal corridor (the N-620 highway), the axis with Lisbon and Sines, the Sevilla-Huelva-Algarve axis).

6.7.6. Port intermodality

Structuring of the port logistic nodes must take two aspects into account: on the one hand, the importance of the port node (internationally, supra-regionally or regionally)

and, on the other hand, its logistic potential, linked to existing or planned Port Logistic Activities Zones.

Most ports share the problems of land access, because of surrounding urban growth. There are in fact currently problems in rail connections to the majority of ports. Rail accesses are subject to particularly intense pressure which has to be dealt with as part of urban planning so as to make transport requirements compatible with the current situation, and to prevent problems from becoming more acute in the future.

These matters are considered in greater detail in Section 6.5 on sea transport and ports.

The Logistic Activities Zones (ZALs) are an element of great importance in the intermodal transport chain, and are configured as territorial nodes which generate economic activity linked both to transport and logistics and to productive activities. Only the ZAL at the port of Barcelona is currently in operation, but there are plans for such zones at most Spanish ports, at various stages of development and which must be fomented.

6.7.7. Rail node intermodality

Because of the significant growth in combined transport in recent years, this has been converted from an aspect of residual capacity to situations of saturation at some existing terminals, particularly in the areas of Catalonia and Madrid.

This situation had already arisen elsewhere in Europe, and the spectacular growth in traffic foreseen by the rail operators (trebling the physical units transported in the period 1990-2005) will not be able to be dealt with overall, partly because the necessary infrastructures are not available.

In the sense, the concept of the "terminal" has evolved, and it is now widely accepted that, without adequate terminals, growth in combined transport will not be possible, the terminal being a key facility where the transport is organised, and which has extended its function to the current conception, where it is a centre for mode interchange and logistics involving multiple activities, whose synergies enhance its capacity to generate transport, and able to carry on logistic activities of great added value.

In parallel there is at this time a liberalisation process under way in Europe which, as it moves forward, makes evident the need for clear structures to manage Combined Transport terminals, which guarantee that all operators are treated equally, and for transparency of rates and the conditions in which they are applied, along with the provision of consistent, certified services in all terminals.

The proposal on logistic rail nodes developed in the future Intermodal Plan can be structured by organising existing terminals into a hierarchy in three large groups, complemented by new areas with development potential. Those highest in the hierarchy would be terminals like Madrid, Barcelona (both with saturation problems), Bilbao, Valencia-Silla, Irún or Portbou.

The future of the border rail installations at Irún-Hendaya and Portbou-Cerbère requires specific analysis of the future scenarios in the context of the introduction of the UIC gauge into the Spanish network, and its connection with the French system. The design of future border facilities must be coordinated with the French authorities.

6.7.8. Airport intermodality

The objective is to structure the airport logistic nodes around the Air Cargo Centres, integrating them into the intermodal system, to secure more competitive air cargo services.

The Intermodal Plan's proposal for Logistic Airport nodes can be structured into three large groups:

- Air Cargo Centres (mainland or regional nodes): logistic parks specialising in air cargo.
- Airport Activities Parks: installations for air cargo and other logistic and service activities.
- Air Cargo Terminals at airports with less traffic.

The Plan must take account of airports which might draw cargo away from the large Air Cargo Centres.

6.7.9. Highway nodes

The Mediterranean Axis, the central Axis, the Ebro Axis, and those from Madrid-Barcelona-French border and Madrid-Levante are the trunk routes with the most intense traffic in goods transport by road, followed by the corridors to Galicia and the connections with Portugal (see Figure 24).

The road logistic nodes can be structured into two large groups: intermodal logistic nodes and road transport centres, in operation and those planned or possible.

Intermodal logistic nodes are those where two or more modes of transport converge, and their organisation must make the most of their multimode conditions to develop logistic infrastructures as backup to economic activity. The following can be identified as international or supra-regional intermodal nodes: the Area of Madrid, the Area of Barcelona/Catalonia, the Area of the Basque Country, and Valencia, Zaragoza, Algeciras and Seville.

The aim of the road transport centres is to provide service not just to through traffic but also to transport and logistics companies. They are located on the main corridors for the road transport of goods and, as a priority, at nodes where several of these corridors converge.

6.7.10. Non-infrastructure actions

This section includes the policies and services related to intermodal transport and the progressive incorporation of environmental criteria and principles of sustainable development into logistics activity.

For transport-related policies and services, the following can be mentioned in the short term:

- Domestic rail competition: the success of the development of intermodality demands an ambitious program of support to new intermodal transport operators.

- Actions to foment the shift of cargo to rail, aimed at achieving a new modal equilibrium of greater economic and environmental efficiency. These actions must be aimed particularly at enhancing the conditions for change in road operators according to the possibilities for cooperation with the rail operator, and the availability of and access to rail infrastructures permitted under the new rail legislation.
- These actions will also include support to existing goods operators, including the rail operators, to make them genuine Europe-wide logistic operators, promoting policies for alliances, the sector's technological development and the interoperability of goods traffic in areas such as traction and the regulation of services, personnel authorisations, operational regulations and training.
- Technological programs for collaboration between operators and as backing for training in new intermodal transport techniques.
- Collaboration with regional and local public institutions to reinforce and promote intermodal logistic infrastructures.
- Flexible processing/operation at ports for short sea shipping traffic.

And, medium- and long-term:

- Support for new rail operators.
- To intensify policies backing understanding and collaboration among rail, road and short sea shipping transport operators, focused basically in the areas for the commercialisation of services.
- Support for the generalised introduction in the sector of new techniques, technologies and thinking.
- The integration of environmental variables from the very outset of planning must cover not just the activities of the Administration but also those of the operators themselves, with the inclusion here of environmental targets. It will be essential to this process to fix design and operational criteria which as far as possible minimise the negative impact on the surroundings, and foment the launch of practices in areas like urban and inverse logistics.

6.8. INTERMODAL PASSENGER TRANSPORT

6.8.1. Priorities

The backup to passenger mobility is formed by the system made up of networks, nodes and services. The interchanges are the system's universal joints, enabling interchange between its services or different modes of transport.

The development of intermodality in passenger transport is structured through an Intermodal Passenger Plan to be drawn up within a year following the approval of the PEIT, and which will define the strategy for attaining the objectives set out below.

During the first phase (2005-2008) the objective is focused on establishing the bases for the intermodal passenger system, through timetable coordination and the physical integration of the transport modes. The improvements foreseen in the rail system will also make it possible to consolidate this coordination so that it does not become an element of divergence in the system.

Service coordination and, in particular, the fomenting of services for passenger transport by road feeding into the system's nodal points (airports, railway stations …) may require a specific revision of the existing legislative framework, and the creation of appropriate mechanisms to facilitate its introduction and guarantee its quality and coordination with other existing connections.

Intermodal passenger transport priorities. 2005-2008

- Review of the framework of concessions for road transport of passengers, introducing systems to stimulate competition and quality: evaluation and monitoring of service quality, promoting the reduction of concession terms to 6-10 years as a reference, although it may be necessary to fix longer terms in some conditions of low demand, or others.
- To locate Long-Distance, Regional and Commuter rail services in the same station.
- To stimulate construction of intermodal intercity rail/bus stations, mainly in medium-sized cities, and enhanced pedestrian connection between railway and bus stations where they are located close together.
- To promote "shuttle" bus services between population centres of a certain size and airports and stations with High-Performance services.
- To enhance the connection of rail (regional or long-distance) and rural transport services. – Coordination of Long-Distance and Regional rail service timetables to enhance the distribution function of these services, mainly in areas where those regional rail services are widely used.

From 2009, the priorities are addressed to integrating the airport system into the intermodal network, and to implement multi-mode ticketing and charging systems.

6.8.2. The structure of the Intermodal Passenger Transport Plan

The Intermodal Passenger Transport Plan is designed to progressively create a strategic network of passenger transport services based on the infrastructures developed under the various mode plans, the interchange nodes, regulations to stimulate service coordination and integration, and a series of incentives and initiatives to promote intermodality.

The map in Figure 33 sets out a forecast for this system of trunks and nodes, based fundamentally on the present situation and actions in progress. It thus has no prescriptive force: any necessary decisions will in any case be taken as part of the Intermodal Passenger Transport Plan.

In the first place, this intermodal Plan must set objectives in terms of the service levels which must be met. As basic reference parameters, these service levels can take the minimum number of daily services, the maximum number of changes required, and the maximum waiting time at each interchange. These parameters will have different values depending on the importance of the links, or the presence of single-mode alternatives.

The Intermodal Passenger Transport Plan is structured into the following sections:

- Backup tools to the Plan.
- Objectives: Service levels.
- The interchange network.
- The regulatory measures and those to promote intermodality.

6.8.2.1. The reference framework and the tools

During the first period (2005-2008) the various tools needed to apply and monitor the intermodality strategy will be fine-tuned: an inventory will be prepared of existing interchanges, as the basis for the definition of the whole network and as master plan for mode interchange points, and the network of interchanges will be classified and defined according to their efficacy.

During this period, a national transport model must be developed which contains the existing nodes and networks and their relation with the territory, along with demand flows, as the basis for an overall diagnosis of the transport system from the standpoint of the interchanges, their situation, needs and priorities.

6.8.2.2. Objectives: intermodal service levels

Definition of general objectives for the transport system explicitly involving intermodality, and their consistency with the objectives of the modal networks, will translate into a minimum set of parameters which guarantee that aim.

These objectives will take account of the three basics aspects of essential mobility (connectivity, accessibility and appropriateness) and, for the different types of relation, will establish a table of reference of daily services, the maximum number of changes and the time taken to do that as a fraction of total travel time.

To correctly define these objectives in useful terms, and based on the existing situation, a twin progression will be put in place, gradually increasing the number of interchanges dealt with, and the connections which are situated at a better service level.

This definition of objectives cannot and must not be seen as differing from the specific objectives of each modal network. Thus their operators will identify real or desirable interchange points, will evaluate the networks' operation, and will formulate sector proposals which are consistent with them.

The twin progression in terms of cover and quality of essential supply will be set out in the Interchange Program, according to its priorities.

6.8.2.3. The Interchange Network

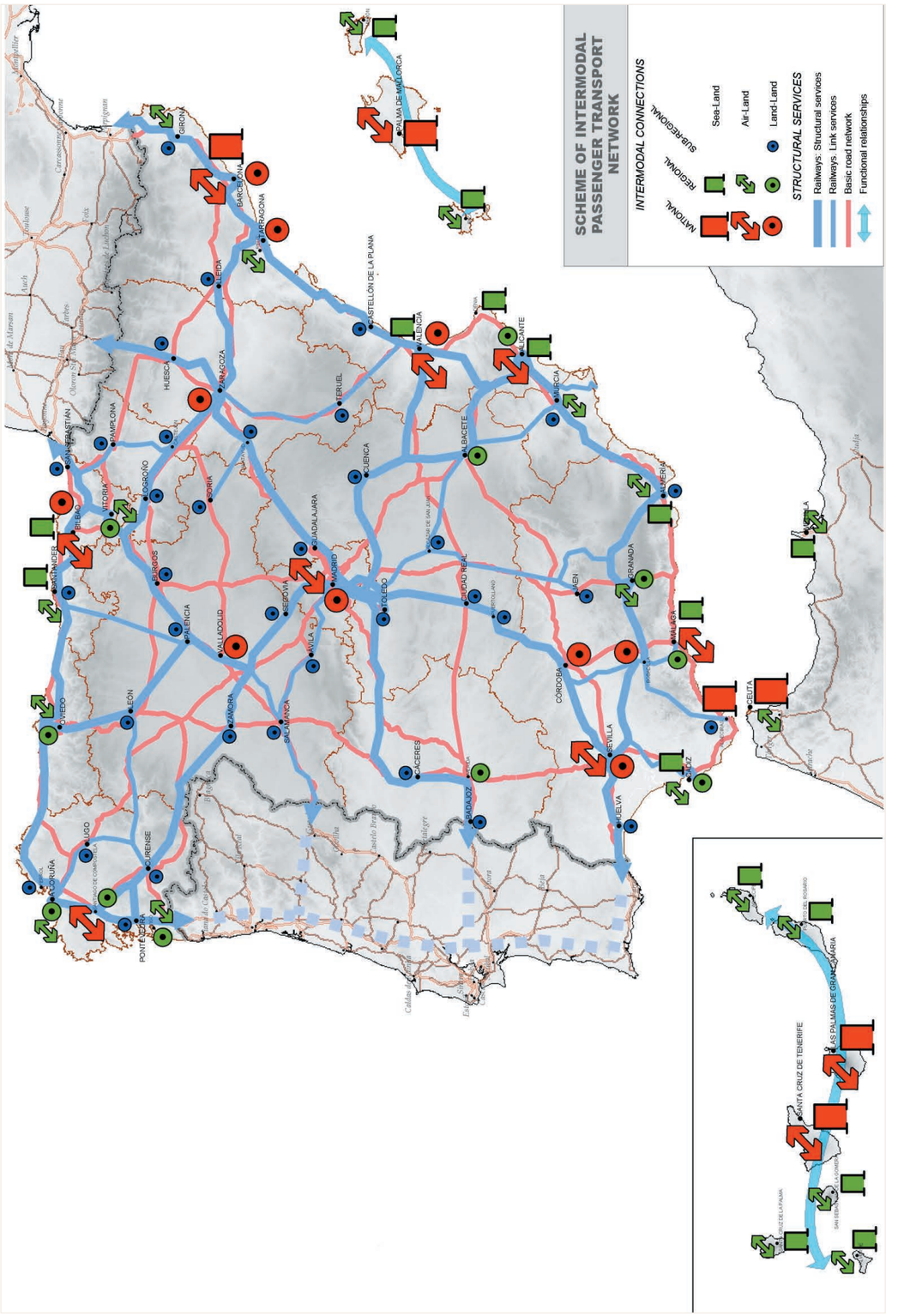
The priorities in the development of the Interchange Network will be matched and refined so that the territorial benefits are generated in a balanced and equitable way. On the other hand, Autonomous Administrations are authorised to provide some of these nodes, e.g. inter-city bus stations. Hence the significance of their consideration in the appropriate processes of participation and coordination assumed by the Ministry of Public Works and Transport.

The network will be formed on the basis of the definition of the types of interchange, and their levels, but action at all levels has to be balanced so that localities or areas of limited demographic density are incorporated into the intermodal system from the outset.

The modal operators and the associated supervising authorities must set out the specific proposals for their incorporation into the Interchange Program consistently with the development of their specific networks, and for their inclusion in each statement of investment.

Therefore, for each interchange project, the agent or operator responsible will be defined, and the modes involved will be urge to agree on their schemes for the infrastructure and services.

FIGURE 33. Scheme of intermodal passenger transport networks



6.8.2.4. Promoting intermodality

The initiation of an intermodal planning system for passenger transport services agreed among the Administrations must, in the medium term, be able to produce significant improvements by which to avoid the construction of redundant infrastructures, excess capacity and the associated costs of construction and operation. In the field of services, it is hoped to start adequate information and management tools and to reinforce a dynamic of cooperation among operators benefiting the objectives of quality and of services, in parameters such as frequency or interchanges.

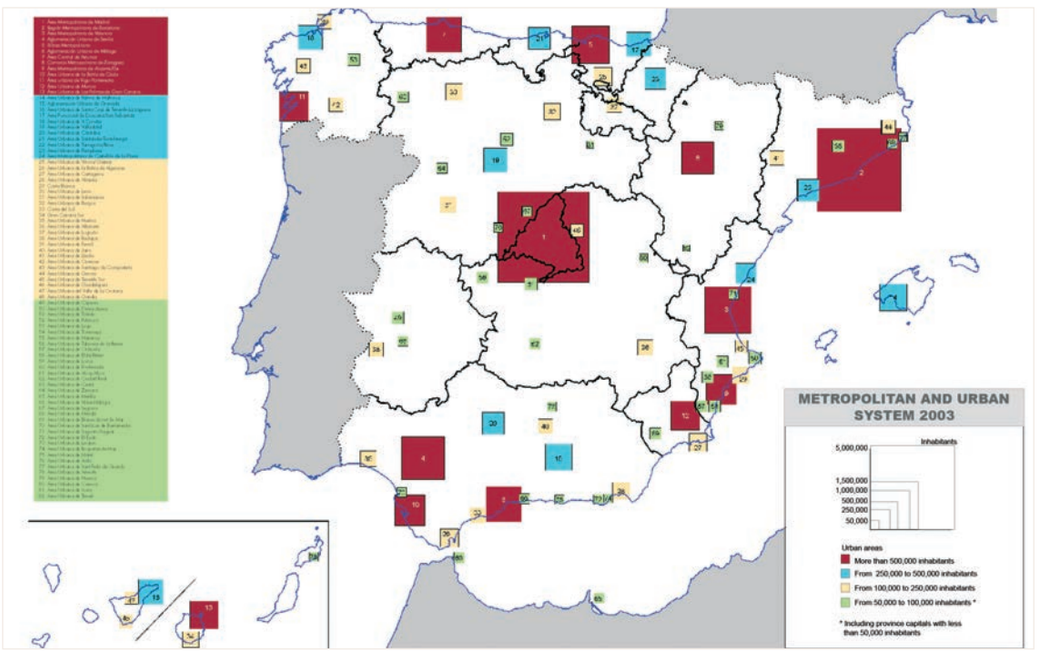
That will be assisted by the linking of acceptance and any financing of proposals to its intermodal effectiveness, through Prior Compatibility Studies put in place for the action to be taken during the PEIT effective term. In this sense, development of a global tool such as the National Transport Model represents unquestionable progress toward the optimisation of the action of the competent institutions and the operators.

6.9. URBAN AND METROPOLITAN TRANSPORT

6.9.1. Priorities

The involvement of the State Administration and in particular of the Ministry of Public Works and Transport in the cities is critical to the PEIT. A good part of the demand and the negative effects of transport are concentrated in the cities. Objectives such as emission reduction, improved efficiency and service quality, and the enhancement of social and territorial cohesion can be attained only if a committed strategy is adopted in the urban areas (Figure 34) where most of Spain's population lives.

FIGURE 34. Metropolitan areas



The Ministry of Public Works and Transport is actively present in the urban field, in terms both of regulation and in physical action. Although without an explicit strategy, its decisions in fact do condition the development of the urban transport system and of the city itself: actions in ports, airports, accesses and ring-routes and rail infrastructures represent large investments and define opportunities or threats for city models promoted by local authorities. There are in fact frequent links between the Territorial Administrations and the Department concerning demands and specific projects in the urban field. Although less important in financial terms, the urban transport subsidies through the Ministry of the Economy and Finance and the basic transport regulations are of decisive influence on urban and metropolitan public transport systems, which are a key to the development of sustainable urban mobility.

The PEIT aims to recover a framework for integrated State Administration intervention in cities, in coordination with the other Administrations, already begun in the first half of the nineties and which arises today with even greater necessity given the scale and urgency of the challenges facing the urban environment. These circumstances are much like those of other European cities, to which the EU has reacted recently. The Commission's Communication "Toward a Thematic Strategy on the Urban Environment" (COM(2004)60, of 11 February 2004) explains the need for concerted action to improve the environmental conditions of European cities, and points to transport as one of the fields of priority action. The Ministry of Public Works and Transport activity must be placed in this framework, in four basic fields:

- The incorporation of the Ministry's work into a framework of reflection coordinated with the Local and Autonomous Administrations, via the preparation of Sustainable Mobility Plans (PMS).
- Reform of the mechanisms for the design of infrastructure actions in cities, principally those involving road and rail.
- Advances in the integration of urban and metropolitan transport systems.
- Optimisation of public action in cities in urban renewal operations involving publicly-owned land and infrastructures within the Ministry of Public Works and Transport field.

6.9.2. The framework for action: Sustainable Mobility Plans

The Ministry of Public Works and Transport work in urban areas has in general been approached more or less in isolated form, without reflection in concert with the other Administrations about the cities. The PEIT proposes an integrated definition of these actions, to avoid the proliferation of independent initiatives by sector. With this in mind, the Ministry will promoted a Sustainable Mobility Plan in each urban or metropolitan area as a framework for the work of the various Administrations and, in particular, of the State Administration, and will urgently fix its own guidelines for the definition of its priorities in the coordinated drafting of those Plans for synchronization. On the other hand, these Sustainable Mobility Plans are a recommendation of the European Union as part of the implementation of its Environmental Action Program.

The preparation of these Sustainable Mobility Plans, and coordination and the compatibility of the Ministry's actions with Autonomous Community and Municipal territorial planning requires the creation of fluid mechanisms for cooperation which, moreover, amount to an opportunity to stimulate a framework of transparency and participation in policies of greatest proximity to the public. Such mechanisms are especially necessary for the

identification and development of particular projects affecting state-owned infrastructures and which, because of their significance to a city, cannot be handled as if they were mere transport projects.

The complexity of transport systems in large metropolitan areas and their repercussions on the PEIT objectives requires a special drive toward the urgent development of Sustainable Mobility Plans so that action can be rationalised in a coordinated way, to review the framework for financing, to enhance the procedures for public participation, and create a stable framework by which to publicise mobility management measures. The Ministry of Public Works and Transport will urgently initiate contacts with remaining Administrations, along with the studies needed to clear the way for passage of coordinated Sustainable Mobility Plans, within a year of approval of the PEIT.

As a priority, the Ministry considers it necessary for these plans to be agreed among the main Spanish cities for which instruments are already in place for cooperation in this area, through accords, Program-Contracts, or transport consortiums, particularly in Madrid (where the new infrastructures planned ahead of the 2012 Olympics have to be integrated into its Sustainable Mobility Plan), in Barcelona (where the new ring-roads required must also be incorporated into the plan), and in the country's other metropolitan areas.

6.9.3. Integration of the transport infrastructures

The Ministry of Public Works and Transport has to respond to an ever-increasing level of demand for the insertion of its transport infrastructures into the urban surroundings. There are a number of facets to such insertion:

- The infrastructure's functionality and, if applicable, its relation to the urban transport system.
- Its contribution to a city or metropolitan area model, generally developed in Urban or Territorial Plans.
- The infrastructure's "physical" relation with its immediate surroundings and its potential contribution to the degradation or regeneration of the urban space.

Action in infrastructure, generally dealt with in an intensely sectorial approach must, as far as possible, be considered as part of a city and mobility model agreed on with the other Administrations. Collaboration Agreements would be the appropriate tool by which to channel these complex projects, not limited to creating commitments and schedules for implementation and financing of action, but fomenting that shared city model following joint reflection and a detailed assessment of the compatibility of the action to be taken with the principles of sustainable urban mobility. For its part, the financing of these actions must be fairly distributed among Administrations and any other agents which may be involved, or which benefit from them.

Activities in the road and rail network belonging to the Ministry of Public Works and Transport affect a number of cities and have a great impact on their future urban development, so that a more detailed specification follows of the lines of action which will be pursued.

6.9.3.1. The State's urban and metropolitan road network

In many cities, the Ministry of Public Works and Transport urban road system is, despite accounting for a reduced percentage of the total, decisive in terms of mobility patterns and

modal share. The metropolitan area is often organised around such a network, and in some cases phenomena of urban extension and sprawl have occured.

Unlike the situation at the beginning of the nineties, it can now be said that, in general terms, there is not a generalised deficiency in high-capacity urban routes, but rather the need to identify and resolve specific problems. Congestion on the urban routes in the State Road Network must not be resolved with general actions to increase capacity and create new circuits, but by the promotion of non-motorised means of transport, public transport and high-occupancy vehicles. The existing and additional capacity which may be obtained must target these modes of transport as a priority.

Action on urban routes creates a new public space, whose value must be enhanced. The fact is that this often becomes a degraded urban or extra-urban space. Thus a program is established to bring existing State Road sectors in urban situations (accesses, ring-roads and through-routes) into line with the conditions of their surroundings. This adjustment is particularly urgent in the case of through-routes, because of its effect on safety and, particularly in small centres, because it offers a considerable opportunity to enhance the public space; it will therefore be implemented without necessarily being linked to other procedures such as eventual transfer of title, or construction of a bypass.

The appropriateness of the creation of new bypasses by the Ministry of Public Works and Transport must always be analysed carefully. It undoubtedly seems reasonable for routes converging on a city to be interlinked. It is however questionable whether the process should be continued to create more new ring-roads, ever further out and, if so, that they should necessarily be built by the Ministry. These new routes favour urban sprawl and private vehicle use and, in many cases, are related to urban development strategies rather than to the network's operational requirements. Therefore, while actions pending in centres still without a ring-road will be completed, new ring-roads or outer circles where there is already a ring-road in service will have to be dealt with by the Administrations to assess their appropriateness, ownership, planning, financing and construction, if possible in the framework of the associated Mobility Plan. The Ministry of Public Works and Transport will embark on this reflection as a step prior to decisions on proposed routes of this type, in an initial or study phase, or which may arise in the future, seeking the broadest possible social consensus.

Action on the existing Ministry of Public Works and Transport road system will, as a priority, be directed in accordance with the guidelines established in Chapter 5 to improving collective transport: Bus or BUS-HOV platforms, the construction of deterrent parking facilities, and public transport stops.

Finally, the creation must be fomented of integrated management systems for the whole network of metropolitan routes, with the establishment of specific Consortiums, or the assignment of these authorities to the Transport Consortiums.

6.9.3.2. Action on the arterial rail network, and the stations

The development of Spanish cities and the rail system has generated growing tensions, not just in terms of safety, but also in the quality of the urban environment.

Rail has undergone a modernisation process which, in the future, will reinforce its role in metropolitan and medium- and long-distance transport. This is an opportunity to recover

rail and particularly stations as a focus of urban attention and centrality. On the other hand, rail modernisation has rendered obsolete installations unnecessary; they had responded to now outdated forms of exploitation and, given their privileged location and size, open up possibilities for major urban operations.

In this situation, there are increasingly generalised proposals to enhance rail's integration into most Spanish cities, in terms of a broad range of technical operational possibilities, of complexities, cost and with varied urban and rail implications: from placement underground to gradient modification, realignment of terminal stations, or line diversions. At the opposite extreme, possible actions take the form of specific solutions: the lease of unused railway land, the construction and upgrading of crossings, the building of border roads, the covering of trenches, or installation of acoustic barriers or enclosures.

The operations for rail-city integration represent an opportunity for cities and for the rail system: for the former because it allows actions in areas which are, in general, very central and, for the latter, because they allow rail to be incorporated into the urban and metropolitan mobility fabric, enhancing intermodality and attractiveness for users.

Thus these operations must be inserted into a city model which is shared by the competent Administrations. The Ministry of Public Works and Transport undertakes to collaborate actively with other Administrations in these operations, in the capacity which makes it responsible for the rail infrastructures, with the aim of finding attractive solutions for the future of the city which are efficient for the transport system's intermodality, and balanced in terms of the financing by each of the parties involved. The urban focus and management must be the main tool for the integration of rail facilities, or of future urban developments around them.

It is evident that it must be possible to finance the solutions suggested for integration as part of this plan of action, and in proportion with the objectives set. Hence the importance in this type of operation of coordination and collaboration among the Administrations involved, not just to agree on the solution to be adopted, but also to work in implementing it by joining their various areas of competence.

Depending on its complexity, a study of the operation may require various joint working groups, taking in not merely rail and urban aspects, but also the multiple facets linked to urban renewal projects, in order to collaborate in the design of the final solution, in both technical terms and in relation to future management and financing.

The formulas for formalisation and management are varied, depending on the aims and on the complexity of the operation. In the simplest models, the Agreement itself may specify the division of action into the parts to be implemented directly by each Administration according to its competences, and charged to its budget. Other operations may involve the incorporation of a non-State Limited Company, working on an outsourcing basis, for urban renewal operations.

In any event, the Ministry's general criterion is to provide projects (directly or through the rail institutions attached to the Ministry) with the investment necessary to meet the targets in its rail planning, along with the land it owns and which is not needed for exploitation under the new arrangements. These resources must also contribute to the objectives of the Government's housing policy.

6.9.4. The integration of the urban and metropolitan urban transport systems

Integration of the urban and metropolitan transport systems will be a central element of the Sustainable Mobility Plan, where the Ministry of Public Works and Transport contribution may be particularly significant.

In terms of the Ministry's competences, the integration of the public transport system represents the following:

- Identification of the role each transport mode must fulfil in the city. From this standpoint, in the largest metropolitan areas, Commuter Services must form the backbone to the whole system, specialising in flows with the greatest demand, and enhancing their connectivity with the other transport modes. Whether through its operators *RENFE Operadora* and FEVE, or as the holder of title to the rail infrastructure, the Ministry of Public Works and Transport must be actively involved in the integration process (timetables, charges, interchanges, service quality ...) along with the public transport Authorities and the other operators.
- Creation of an efficient framework for the management and financing of the public transport system, linked to the targets set in the associated Sustainable Mobility Plan, so that the resources provided by the General State Administration are distributed in a way which favours those cities best meeting the objectives defined by the Plan (air quality, emissions, mode distribution ...) while establishing homogeneous criteria for each city category (large metropolitan areas, medium-sized cities ...).
- An on-going drive for innovation, evaluation and improvement, stimulated through the Transport Innovation Program dealt with in Section 6.10.3.

6.9.4.1. Commuter rail

Commuter rail services start from a favourable position in this country's large metropolitan areas: they are sufficiently established, their social valuation is significant, they are reliable, the rolling stock is adequate, and they are efficient. There is however also some unequal cover in terms of population density, distances and the structure of the networks themselves –historically highly conditioned by existing routes. Metropolitan expansion and the growing need for efficient public transport systems points to potential for major growth in these services, albeit always focused on those high-demand corridors.

It is foreseeable that within the PEIT horizon there will be a new Commuter services management model as part of metropolitan transport systems, more integrated (like that of other public transport operators) into the structures of the Metropolitan Transport Authorities or Consortiums, a new sort of relation with the Autonomous Communities, and progressive specialisation of Commuter infrastructures away from the rest of the railway network.

Future action must be formulated within the framework of the Mobility Plans of the metropolitan areas affected. Short-term, major developments are planned in Madrid, Barcelona, Valencia and Cádiz, among others. The introduction of commuter services must also be considered in large metropolitan areas such as Zaragoza where they have not yet arrived.

In a subsequent phase, actions will begin for the structuring and meshing of the networks where demand is greatest, correcting their radial nature. This must aim to overcome the traditional structure inherited, not well adjusted to deal with real demands, and to concentrate on corridors with greatest demand: elsewhere, other systems (train-tram, metro, light metro ...) may prove more efficient, and easier to integrate into the urban surroundings.

6.9.4.2. Improving urban mobility management and the financing framework

While respecting the existing framework of competences, a stable base has to be established for the management and financing of urban mobility during the first phase of

the PEIT which makes it possible to maintain an active commitment of participation and support for the General State Administration in resolving problems of urban and metropolitan mobility. This stable framework will be fixed in provisions of suitable rank, and which include:

- More flexible fiscal tools for local authorities, of a voluntary nature, linked to urban mobility, based either on those in place (review of current traffic tax) or on new categories.
- Definition of the framework for the allocation of State Administration contributions to metropolitan and local authorities to finance and upgrade public transport systems.
- To foment Program-Contracts as the framework for the pursuit of public transport companies' activities, being a particularly efficient tool for the improvement of service quality and the management of urban transport companies in the large cities.
- To enable greater input from those beneficiaries of urban infrastructures who, although not direct users, secure obvious advantages from their existence.

6.9.4.3. Coordinated Operations

Some city actions can be classified as "singular" considering the following:

- The complexity of the urban fabric in which the action is taken.
- The potential importance of the action, given its location, functionality, potential for urban renewal, to the future urban development of a city …
- The capacity to mobilise public and private players and investment.
- The potential to significantly enhance the position of the city where the action takes place nationally, in Europe or worldwide.
- Its capacity for "pull", or its correlation with other urban policies of a social, economic or environment nature, as part of "urban renewal" processes.

The involvement of the State Administration in conceiving and implementing such action is justified by the need to enhance the unified nature of public action, emphasising its interest as a "State Operation", and to enhance the efficacy of progress on projects which are in general extremely complex, long-term and costly. The viability of such operations will require the creation of a coordinated management body which is able to act sufficiently quickly and flexibly, not just in the purely property sphere but also in the implementation of the various associated sector programs. Past experience shows that major city transport infrastructures are one of the components of this action: hence the need for the Ministry of Public Works and Transport to act specifically in these cases, to overcome an excessively sectorial or functional approach to its intervention.

6.10. TRANSPORT INNOVATION

6.10.1. Priorities

There are three areas of action in the field of transport innovation:

- Research and Development (R&D) and Research, Development and Innovation (R&D+i), as part of associated National R&D Programs.
- Pilot programs in which the Ministry of Public Works and Transport offers financial and technical backing for action in certain priority fields which may have significant effects for demonstration and dissemination.

- Drafting and startup of specific projects in areas not covered by the sector plans, and where significant deficiencies are noted in the transport system, such as in non-motorised mobility.

For the period 2005-2008, the main lines of these actions are addressed to consolidating a suitable framework for innovation in transport via the following:

- Creation of a specific transport R&D management system, framed within the National R&D Plan, through an Integrated Management Unit for Research in Transport in the Centre for Studies and Experimentation in Public Works (CEDEX).
- Design of a strategy to foment non-motorised modes.
- Pilot programs for the study and launch of measures to handle demand, develop an integrated system of information and management in interurban and metropolitan public transport, the adoption of standardised ticketing systems in the different urban areas, standardised collection and processing of basic transport data, or the development of urban transport systems on a reserved platform, among others.
- The creation of tools facilitating management of the PEIT, and the identification of future priority lines for innovation, such as the observatory to monitor the transport system, and the national demand forecast model.

6.10.2. Program of research, development and innovation in transport

6.10.2.1. Objectives

Technological development is a powerful tool for enhancing the efficiency of all economic activity and to strengthen the competitiveness of agents operating in the markets where such activities are carried on. Technological capacity determines the prosperity of nations far more than the abundance and quality of the classic factors of production.

The transport sector has remained relatively on one side of the usual notion of sector technological development. Action by the sector Ministry (Public Works and Transport) in these fields, which is indispensable, was initially non-existent and then very timorous. It was however clear that the ministerial departments with general powers in the field of research lacked by definition the technical resources necessary to identify in detail the projects of greatest utility for innovation in Spanish transport, and the budgetary means to promote them. There was in the past a degree of coordination in some areas of transport-related research, specifically in relation to the Information Society and Intelligent Transport Systems, limited to announcements from the Ministry of Public Works and Transport, and the "PROFIT" actions of the Ministry of Science and Technology.

While some industries which should strictly be classified as "ancillary to transport" (motor vehicles, aeronautics ...) have focused technology on a large scale, in the transport sector, considered a service provider system, there has been a considerable lacuna in the area of technological activity and qualification. Even in the most developed countries, it not easy at present to physically identify the «technological transport system» i.e. the inter-related constellation of centres for research and technological development, whether of the State, or academic, professional or entrepreneurial, which is where the technological advances of such an important sector are bred.

This situation is also seen in the consideration usually given the transport sector in technological development planning. Where national R&D+i plans or programs incorporate

a section or area dedicated generically to "transport", the budget allocation is usually of little substance compared with what goes to the chain of industrial sectors supplying material elements for the provision of transport services. On the other hand, the varied productive and technological activities which, one way or another, converge in the final production of transport, come under the authorities of various departments or administrative areas, most of which do not include guarantee of the social availability of efficient transport services among their objectives or responsibilities.

The transport sector's R&D+i policy must be based on an acknowledgement that it is possible to correct the essential problem of the dislocation of the transport sector, which weighs heavy upon the sector's efficiency. The panorama of its technological research and development system is no more than one further consequence of that fundamental problem, and can be corrected only by resolving its causal factors.

The design of the new Strategic Infrastructures and Transport Plan is therefore the occasion for dealing with these deficiencies, by assigning close to 1.5% of expenditure to the promotion of R&D+i in the sector, and setting up an adequate administrative structure for the management of these actions to aid research, and the coordination and dissemination of results, via an Integrated Management Unit for Transport Research in the CEDEX.

This line of thinking brings up the establishment of R&D+i priorities in the transport sector, to be implemented via four-year Transport R&D+i Sector Programs which are in line with national research plans and integrated into them. The current outlook of the National R&D Plan for the transport sector does, up to a point, coincide with the approaches described above, or at least does not contradict them. However, both the structuring of the many planned activities, and the orientation proposed for some of them specifically, do diverge from the integrated perspective of the "transport system" advocated here.

Based on the slant already referred to of the current National Plan, the possibility arises of fixing certain complementary priorities, along with R&D+i management systems in the transport sector, which will help to strengthen the structuring and integration of the sectors' drive, particularly in areas which prove to be of greater interest for sector policy at the national level.

The aspects of efficiency and the optimisation of transport infrastructures and services are those which, at this time, require more attention, since they are less decisively dealt with in the current National Plan. The impact and improvement of the environmental compatibility of transport are particularly taken into account, above all in the field of biodiversity and the territorial integration of infrastructures; as to improved efficiency and energy consumption in transport, and the reduction of pollutant emissions –subjects of unquestionable importance in transport planning– this sector program will seek maximum complementarities with other sections of the National R&D+i Plan, where these factors are dealt with very broadly and in great detail. Beyond that, it should be pointed out that the best contribution the transport sector can make to environmental equilibrium is in the optimisation of use of its existing infrastructures and in enhancing the efficiency and competitiveness of the services offered by transport modes whose environmental impact is less.

6.10.2.2. Management of the transport sector R&D+i program

Configuration of the management, following the pattern of the National R&D Plan, seeks to overcome the weaknesses pointed out above, and enhance the links between research and the transport policy objectives defined in the PEIT.

The Sector R&D+i Program is four-yearly, and the first will be defined in 2005, taking in the period 2005-2008, and applied first in 2006. The lines of research initially proposed will be set out in the sector program, and then every four years.

The monitoring system will have to be strengthened and, in each project, provide for an assessment of the end report presented. This concluding evaluation must analyse the degree to which objectives set were attained, the disclosure of the final results, and the interest of proposed future lines of research.

Management of the Sector Program will be charged to the funds assigned to it and will include specific studies making it possible to identify new needs, offer backup to all the projects in progress and facilitate the relation between research teams and the publication of results, through activities like the drafting of prospective sector studies, demonstration projects, national and international disclosure of results, and coordination with the European Union's Framework Program for R&D.

6.10.2.3. Indicative classification of areas of the Transport Sector R&D+i Program

Throughout the many projects which have gone into the preparation of the transport chapters in National R&D+i Plans, a number of classifications have been created, for operational ends, for activities in transport sector innovation, research and technological development. The classification used here is not just in line with PEIT priorities, but also fits reasonably into the structure of the chapter on transport in the National Plan itself.

Definition of the lines of action in R&D+i for the Strategic Infrastructures and Transport Plan (PEIT) have in the first instance dealt with transport research from an integrated viewpoint, not dividing subjects up according to the different modes of transport (road, rail, sea, air) or the areas of jurisdiction of various bodies (the Ministry of Public Works and Transport, the Ministry of the Interior, the Autonomous Communities).

The following lines of research were grouped into four headings or main chapters:

A. Enhanced transport safety

B. Increased transport system efficiency

C. New infrastructure and vehicle technologies

D. An enhanced socio-economic and institutional environment

Safe transport is one of the PEIT's main priorities, and research must include not just accident prevention (active safety) but also the alleviation of the consequences (passive safety). Moreover, a further two sections are established to deal with the specificities of goods transport and studies of road accidents, by far the most dangerous mode and requiring the development of different sets of measures to cut the accident rate.

Increased transport efficiency and integrated management of the system mean dealing with the development of services in this sector from a standpoint of the enhanced productivity and competitiveness of this activity. Thus four divisions have been drawn, referring to the following: transport service management; traffic management (not just road, but including rail and air traffic); intermodal transport and, finally, transport planning studies, which are fundamental to ensuring an optimal allocation of resources and the long-term reorganisation of the sector.

The lines of work in the new technologies are designed to enhance the efficiency of the production (planning and construction) and the operation (upgrading and maintenance) of transport infrastructures. This point does not include innovations in the various types of transport vehicles or in fuels, since this aspect fits adequately into the R&D+i activities of other industrial sectors.

Finally, the relation between transport activities and the environment are dealt with, whether the socio-economic, legal or institutional aspects. Society has been discovering that increased mobility has brought the consequences of negative effects on the environment, cities, regions or resources. In response to these problems, a set of lines of research have been brought together which fit within the areas dealing with external transport elements, the financial and economic aspects of transport, and the regulatory framework, all of great influence in the practical pursuit of the activity of this sector. A section on environmental studies has not been considered necessary, since these lines are dealt with in other National Plan programs, and this would produce duplication. In any event, the final definition of the lines will be set in the Sector R&D+i Program.

A ENHANCED TRANSPORT SAFETY

A.1 ACCIDENT PREVENTION
- Secure infrastructure design
- Automatic infringement control systems
- Vulnerable user protection
- Enhanced conventional rail network safety
- Harmonisation of the man-machine interface
- Safety-enhancing equipment, devices and systems
- Tunnel security
- Emergency situation protocols; simulator use

A.2 REDUCED ACCIDENT DAMAGE
- Accident notification and location systems
- Rescue and evacuation systems
- Passive security systems in infrastructures and vehicles
- Risk-reduction in infrastructure construction and maintenance

A.3 GOODS TRANSPORT SAFETY
- Intermodal transport safety
- Special transport
- Transport of dangerous goods
- Enhanced maritime safety on vessels, and land backup

A.4 ROUTE ACCIDENT STUDIES
- Data Base design, management and updating
- Study of Safety-Speed relations
- Simulation of accidents and their effects
- Studies of user behaviour and its modification
- Route Safety cost-efficiency analysis and audits

B EFFICIENCY AND INTEGRATED MANAGEMENT OF THE TRANSPORT SYSTEM

B.1 TRANSPORT SERVICE MANAGEMENT
- Fleet management and logistic applications
- Transport centre management
- Reservation systems and availability of resources, and their opening up to users
- Electronic exchange of information and management data
- Transport system dynamic simulation models
- Geographical data and vehicle location systems
- New IT-based products and services

B.2 TRAFFIC MANAGEMENT
- Information systems for operators, drivers and users
- Computerised systems and expert traffic management and regulation systems
- Interoperability of European high-speed rail systems (the European rail traffic management system - ERTMS)

- Development (international) of new air traffic management procedures, and their associated technologies and regulations, to increase European air space capacity
- Automatic vehicle guidance
- Vehicle-infrastructure and vehicle-vehicle communication and control systems
- Vehicle positioning, navigation and monitoring systems
- Development of automatic guidance systems for takeoff, landing and ground taxiing, in all weather conditions
- Automatic incident detection systems
- Traffic data base applications and their management
- Application of the Galileo System to traffic management
- Electronic toll-collection

B.3 INTERMODAL TRANSPORT

- Intermodal interface systems
- Intermodal terminal management
- Intermodal coordination of high-speed transport, focused particularly on airports
- Small high-speed interchanges
- Rolling stock for bimodal or multimode systems
- Multimode goods transport
- Development of telematic and control systems for intelligent traffic distribution in different modes of transport
- Development of more effective cargo-handling procedures/facilities in ports
- Automatic goods identification systems.

B.4 TRANSPORT PLANNING STUDIES

- Infrastructure Planning and Programming techniques
- Information systems: Data recovery, creation and management of data- and metadata bases
- Statistical procedures for data analysis and extrapolation
- Traffic prediction methods
- Studies of the mobility of persons and goods
- New procedures for the evaluation of actions

C NEW TECHNOLOGIES

C.1 DESIGN AND CONSTRUCTION PHASE

- Calculating systems, tools and models
- New infrastructure construction designs and systems
- Waste and recycled material use in infrastructure construction
- Full- or reduced-scale experimentation

C.2 OPERATING PHASE

- Infrastructure maintenance, conservation and repair
- New techniques for the inspection and auscultation of ways, structures and works
- Development of in-service performance models, and performance-based specifications (functional requisites).
- Life-cycle-based analysis and design methods.
- IT systems, and expert systems for infrastructure management
- Sea traffic control systems in high-density areas.
- Adjustment to new risk-assessment standards, environmental conformity and the functionality of existing infrastructures

C.3 SINGULAR INFRASTRUCTURES

- Specific high-speed rail technologies
- Port terminals and services for short haul and small cargos
- Analysis and management of natural risks and disasters in infrastructures
- Rail interoperability

D AN ENHANCED SOCIO-ECONOMIC AND INSTITUTIONAL ENVIRONMENT FOR TRANSPORT

D.1 STUDIES OF FACTORS EXTERNAL TO TRANSPORT

- Urban effects: noise, congestion, spatial segregation
- Territorial effects: territorial fragmentation, the landscape integration of infrastructures, conservation of biodiversity.
- Global effects: carbon emissions, other pollutants, the greenhouse effect
- External social factors: accident costs, mobility discrimination.
- Protecting the cultural heritage.

D.2 ECONOMIC STUDIES

- Economic analysis: costs, rates, prices and efficiency
- Financing systems: public, private and mixed models
- Equal competition conditions

- Transport infrastructure socio-economic impact studies
- Studies of costs arising from infrastructure failure

D.3 REGULATION

- Development and updating of the legal framework
- Deregulation and privatisation.
- Creation and development of the Rail Regulator
- Assimilation of new technologies in the legislation
- Effects of Community Transport Policy

6.10.3. Pilot programs for innovation in transport

Pilot programs for innovation in transport are intended to support the Public Administrations in their areas of competence, and all transport sector agents in the launch of novel measures, mainly in handling transport demand.

Following the ample experience of other countries around us, and in the EU, pilot programs are set up with the following framework:

- Competitive programs, with the selection for financing by the Ministry of Public Works and Transport of the best-quality proposals in terms of their innovation, technical rigor, the active inclusion of all those affected, and their prospects for success.
- A firm implementation commitment from the competent authorities.
- Partial financing of the proposal by the Ministry of Public Works and Transport, limited to project cost overruns caused by the inclusion of innovative elements.
- Evaluation, monitoring and publication of projects by the Ministry of Public Works and Transport, through the Integrated Management Unit for Transport Research.

The program's content will be defined in 2005, and first calls will be made charged to the 2006 budgets, following which the calls will be annual. The priorities for action for the four years from 2005 to 2008 are, consistent with the PEIT objectives, focused on the introduction of measures for demand management in urban and metropolitan situations. Many of these measures are identified in other Administration documents, for example the Spanish Energy Efficiency Strategy, and refer to:

- The introduction of company mobility plans in work and study centres.
- Measures to improve existing public transport services (quality contracts in urban and interurban bus services).
- Charge-based measures to manage urban traffic and pollution (city tolls, negotiable traffic permits ...).
- Customised marketing of public and non-motorised modes of transport.
- Enhanced processes of public participation in transport.
- Plans for the reduction of mobility needs (neighbourhood design, use of new technologies to cut travel, etc.).
- Plans to optimise logistics in companies to reduce the need for transport, and use of more sustainable modes.

6.10.4. Plan for the promotion of non-motorised transport

This plan aims to promote the easy, safe and attractive use of non-motorised transport as a substantial part of an integral mobility policy. Although it is clear that responsibilities for promoting this form of transport are spread through the various territorial areas of the

public administrations, some matters do more specifically concern the central authorities:

a) To contribute to promotion and study of action in this area by local and regional administrations, and to foment the monitoring and evaluation of results.

b) To ensure the necessary coordination between actions by different ministerial departments directly or indirectly affecting the use of non-motorised transport, with the aim of improving the conditions of such use.

c) To create and develop links in this field with other European countries, where the situation in general is more advanced in terms of cycle mobility, so as to move forward in the standardisation of shared road-sign and infrastructure standards, and the exchange of experiences.

d) To ensure the development and diffusion of technical bases and recommendations in the design of the route fabric, the backup infrastructures and promotional policies.

The plan is designed on the basis of one specific strategy to promote the bicycle and another for walking, the drafting of which will draw on the social and institutional agents concerned, the guidelines for which are set out below.

6.10.4.1. Main lines of the strategy to promote the bicycle

To improve cycle route safety

The perceived risk –often overestimated compared with the reality– of the conditions of the route network is the greatest obstacle to increased bicycle use. One of the main strategies for improving route safety for cyclists involves increasing the numbers of those using this form of transport, recovering it as a normal means of movement, and accepting that bicycle travel is a right. This will be done by promoting actions like the following:

- To modify the procedures for registration and analysis of accident and mobility data, to understand better the processes leading to accidents. To create a new view of road education which goes beyond traffic and reduces the socially acceptable risk level, and to avoid measures which, intended to improve the cycle accident rate, actually penalise bicycle use.
- To change the design of motor vehicles to adapt them to coexist better with cyclists, and to promote the development of criteria for the manufacture and certification of safe bicycles.
- To adapt the regulations to favour conduct, medium- and long-term, which is more appropriate for more vulnerable means of transport.
- To create cycle networks made up of routes reserved for cyclists, or easy and safe alternative routes for them, and to moderate traffic to facilitate bicycle use in cities and on other than the top-flight interurban routes.

To guarantee the intermodality of bicycle use

Only door-to-door transport systems can overcome society's excessive dependence on the motor car. To ensure mobility, the components in the transport chain have to be connected. This means facilitating internal and external access to collective transport facilities and trains, to improve the possibilities to carry cycles in urban and interurban public transport, to set up services there for cycle rental (or public cycles) and to initiate campaigns fomenting the combined use of the bicycle and public transport.

Creation of a Basic Network of Cycle Routes

In cooperation with the Autonomous Communities, a Basic Network will be set up of cycle routes linking the existing dispersed and unconnected thoroughfares, and creating continuous cycle infrastructures, so that they are no longer of limited use and utility, exclusively leisure-related, and can become a genuine territorial infrastructure.

Financial assistance for cycle route infrastructures

The creation of specific bicycle infrastructures is often one of the actions which has to be undertaken to guarantee safe and simple conditions for travel by this means. The Ministry of Public Works and Transport will undertake technical work backing up the creation, upgrading or maintenance of bicycle routes (particularly to create accesses to urban centres, interurban connection sectors, and collective transport stations).

Legislative measures

In collaboration with the competent Authorities, the Ministry of Public Works and Transport will study and foment modifications to the legal framework for urban development, which will require any new residential construction to include cycle parking areas, and for new construction, for non-residential use, to have spaces for cycle parking which are accessible from the outside. Certification will also be encouraged of bicycles marketed in this country, which will be required to have the necessary safety elements and adequate anti-theft devices.

Promoting cycling

Within its area of jurisdiction, and in cooperation with other Institutions and Bodies, the Ministry of Public Works and Transport will promote a number of actions, together with citizens' groups operating in favour of the bicycle, to promote, study and advise on cyclist mobility, offering recommendations for action, preparing materials and reference guides or publishing maps of routes suitable for cycling. The adoption will also be supported of exemplary measures, for example bicycle use as part of the Mobility Plans to be established in the Central Administration, a generalised introduction of the safe «school way» around educational centres, or publicity for the personal and social benefits of the bicycle, combating its image as a "dangerous" vehicle.

6.10.4.2. Main lines of the strategy promoting walking

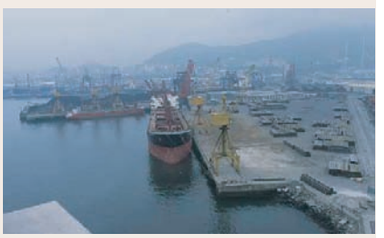
Within its area of jurisdiction, and in cooperation with other competent Institutions and Bodies, the Ministry of Public Works and Transport will develop a strategy to promote walking, according to the following criteria:

- To adopt new attitudes as a counterweight to the dominant thinking based on the movement of certain types of vehicle. Children, the elderly, the disabled and pedestrians in general must be the measure of the urban space. They are not obstacles, but rather the basis of its regulation.
- To reduce risks: to create models of mobility and conduct which reduce risks to pedestrians.
- To reduce the damage caused by human error. To reduce the speed and number of displacements which may cause more acute damage.
- To increase responsibility for damage from the most dangerous elements.
- To refocus the Road Safety, Insurance and Civil Liability legislation to create a regime more favourable to pedestrians.

- Vehicle manufacture. Within the European Union, to promote developments in the provisions on vehicle certification to favour designs which are less harmful to pedestrians when hit.

This should all translated into the systematic incorporation of the viewpoint and needs of pedestrians into the approach to and implementation of Ministry of Public Works and Transport action. In particular, the creation, management and maintenance of infrastructures must consider pedestrians' conditions of comfort and safety, pointing to new ways of approaching them, particularly in urban environments.

7



STARTUP, MONITORING AND REVIEW OF THE PEIT

Approval of the PEIT does not bring the Ministry of Public Works and Transport planning process to an end, but rather marks a point of departure: as a Strategic Plan, it fixes criteria and guidelines, requires the drafting of rules, plans and programs at various levels in the implementation of the Plan, and establishes indicators by which to attain the PEIT's objectives.

Likewise, as a medium- to long-term plan, for its on-going monitoring it requires a formula for action and to deal with decision-making procedures within the Ministry's directive centres and public corporations, regulated structuring of coordination with other territorial Administrations in matters within shared jurisdictions and, finally, provision for review of the PEIT at the end of the first four years of its effective term.

The following is a description of the mechanisms for the development and monitoring of the PEIT, in a framework of participation and transparency, which are the references for coordinated planning.

7.1. PEIT IMPLEMENTATION PLANS

Subsequent implementation of the PEIT is structured into a set of sector, intermodal or territorial coordination plans with 4 to 8 year horizons, which are dealt with in Chapter 6. These plans will be brought into play by the various Directive Centres and Public Corporations attached to the Ministry of Public Works and Transport, according to objectives and guidelines fixed in the PEIT, and each must adjust to the demands of the applicable provisions, including their Strategic Environmental Assessment pursuant to Directive 2001/42/CE. Once the PEIT is approved, the following sector plans will be drafted:

- The Roads Sector Plan, coordinated by the Directorate-General of Roads.
- The Road Transport Sector Plan, coordinated by the Directorate-General of Road Transport.
- The Rail Transport Sector Plan, coordinated by the Directorate-General of Rail, with the collaboration of ADIF, *RENFE Operadora* and FEVE.
- The Sea Transport and Ports Sector Plan, coordinated by the Public Corporation *Puertos del Estado* and the Directorate-General of Merchant Marine.
- The Air Transport Sector Plan, coordinated by the Directorate-General of Civil Aviation and AENA.
- The Goods Transport System Intermodal Plan, coordinated by the Directorate-General of Territorial Planning and Coordination.
- The Passenger Transport System Intermodal Plan, coordinated by the Directorate-General of Territorial Planning and Coordination.
- The National Plan for the Deployment of Intelligent Transport Systems (ITS), coordinated by the Transport Prospecting and Studies Centre in the General Secretariat of Transport.
- The Strategy for the Promotion of Healthy Modes (bicycle and walking), coordinated by the Directorate-General of Territorial Planning and Coordination.
- The Transport Innovation Program, coordinated by the Directorate-General of Territorial Planning and Coordination and the CEDEX.
- The R&D+i Program, coordinated by the CEDEX.

On the other hand, the effectiveness in time of the guidelines and criteria established in the PEIT demands the adoption of a series of "shock" programs for the urgent resolution of certain deficiencies in the transport system in very specific areas, referred to in Chapter 6 above.

7.2. THE PEIT IMPLEMENTATION REGULATIONS

The PEIT proposes passage of a series of legal provisions, of varied rank, as already explained earlier in this document:

- The Transport Financing and the Charging Systems Framework Act.
- The Urban and Metropolitan Transport Financing Act.
- The Airports and Air Navigation Act.
- Review of the legislative framework for sea transport: Act No. 48/2003, Act No. 27/1992, and Royal Decree No. 1446/1992.
- Amendment of the Land Transport Act.
- Implementation of the Rail Sector Act, Act No. 39/2003, in regulations.

These provisions will be drafted during the current parliament.

7.3. GUIDELINES FOR URBAN AND METROPOLITAN ACTION

The greatest volumes of population journeys and of economic activity are concentrated in urban and metropolitan areas, where traffic congestion is greatest, and where a very significant proportion of pollutant and greenhouse gas emissions are produced. On the other hand, the Autonomous and Local Administrations hold most of the infrastructure and transport faculties in urban areas.

To contribute to the sustainable mobility objectives fixed in the PEIT and to set the criteria for the intervention of the State Administration and its contributions to city transport, the Directorate-General of Territorial Planning and Coordination will design guidelines for Action in Urban and Metropolitan Areas, for coordination with other ministerial departments and the competent Administrations.

Within the context of those guidelines, the Ministry of Public Works and Transport will propose that Autonomous Communities and Local Authorities draw up specific Sustainable Mobility Plans for each urban or metropolitan area, which require inter-administration support and coordination, to tackle transport problems from an integrated standpoint and in line with the objectives fixed in the PEIT.

Likewise, in collaboration with the IDAE (the Energy Diversification and Saving Institute), as part of the Spanish Energy Efficiency Strategy and in coordination with the other regional Administrations involved, pilot programs are to be implemented for sustainable urban mobility, innovative measures in both motorised and non-motorised transport, intermodality, enhanced transport management systems, and integrated urban actions.

7.4. COORDINATING TOOLS

7.4.1. The Framework document for coordinating the transport system with each Autonomous Community

In terms of the existing distribution of competences on infrastructures and transport, it is considered of the greatest importance in meeting PEIT objectives that framework

agreements should be concluded between the Ministry of Public Works and Transport and the Autonomous Communities, to coordinate actions and programs, according to principles of joint responsibility and collaboration among Administrations. Such framework agreements may lead to the signing of specific sector arrangements between the two Administrations or, if applicable, with the Local Administrations affected.

In matters which have to be dealt with among the contents of each framework agreement, emphasis must be on action in urban and metropolitan areas, in line with considerations previously defined, an analysis of the functionality of the route networks and their allocation in terms of jurisdiction, the logistic nodes and modal integration, the transport system's general operation and, where applicable, urban integration and connections with State ports of general interest. Other questions of interest for coordination are the involvement of Autonomous Communities and Local Administrations in airport management, and coordination of the framework for the provision of public road transport services for passengers.

Given the specificity and individuality of each of their territories, there must be express reference to the creation of these framework agreements with the Autonomous Communities in the Balearic and Canary Islands and the Autonomous Cities of Ceuta and Melilla. The general criterion for the conclusion of these agreements will be that of an intermodal and integrated approach to infrastructures and services.

7.4.2. The bases for agreements with operators (passengers and goods)

These bases, specified as part of the Intermodal Plans for passengers and goods, must leave room for the conclusion of voluntary agreements with the passenger and goods transport operators which stimulate intermodality: among others, timetable coordination, integrated charges, service quality, and simplified procedures.

7.4.3. The Mobility Forum

The Ministry of Public Works and Transport does have tools for the channelling of dialogue with representatives from a variety of sectors, but they are not suitable for dealing with the transport system as a whole. On the other hand, existing instruments target the professional sectors directly involved. The importance the PEIT assigns to matters such as transport quality or user behaviour makes it advisable to create an advisory and consultative body, of a more horizontal and integrating nature.

At this Forum, whose main role will be to analyse and offer input to transport policy planning and policy initiatives, there will be a proportional representation of business sectors (infrastructures, transport facilities and services), the trade unions, technicians and professionals, and the social players (consumers, social and environment NGOs, etc.) with an interest in public action on infrastructures and transport.

7.5. THE INTEGRATION OF ENVIRONMENTAL CRITERIA INTO PLANS, PROGRAMS AND ACTIVITIES FOR THE PEIT'S IMPLEMENTATION

7.5.1. Environmental Report: Recommendations

In the terms of the 16 July 2004 Resolution of the Council of Ministers, the Strategic Infrastructures and Transport Plan is to be the subject of an Environmental Sustainability Report.

This Resolution was passed as part of the process to be followed in the coordination between the Ministry of the Environment and the Ministry of Public Works and Transport, pursuant to the criteria in the Community Directive No. 2001/42/CE on the assessment of the environmental impact of certain plans and programs.

As a final part of the assessment process followed, the related Environmental Report has been drawn up, jointly by the Ministry of Public Works and Transport as the plan's promoter and the Ministry of the Environment as the environmental authority, and forming part of the PEIT file and documentation. The Report concludes by specifying the following Recommendations, for incorporation into the Plan's provisions and for its implementation:

- To modify the content of the so-called "PEIT 2020 scenario" to incorporate mechanisms making it possible from the outset (phase I) to consolidate progress in the environmental objectives.
- To incorporate environmental integration measures for existing infrastructures as part of the conservation and upgrading programs provided for in the PEIT, beginning their application from Phase I (2005-2008).
- To develop more advanced methodologies for the socio-economic and environmental assessment of action, mainly in the area of infrastructures, which are valid for all transport modes, for their application as part of the "compatibility studies" included in the PEIT.
- In coordination with sector plans for the PEIT's implementation and so that the results can be integrated into their Environmental Assessment procedures, to carry out a comprehensive study of the effects on the Natura 2000 Network and Marine Biodiversity. The study must take account of the overall effects of occupancy and fragmentation arising from action on land transport infrastructures, and identify the limits on the occupation and fragmentation of those spaces.
- In prior studies of actions which may involve considerable effects on these spaces, to incorporate the related criteria of compatibility with those limits.
- In collaboration with other Ministerial Departments which have authorities in such matters, to draw up an Urban Mobility Strategy, including a study for the drafting, if appropriate, of any necessary basic legislation on mobility.
- To launch the PEIT monitoring system, so that the necessary adjustments can be incorporated at later stages of its implementation, in order to approach the environmental objectives, and dealing with the following as priorities:
  - The drafting of the necessary studies for the exact determination of the impact of actions in infrastructures and transport on such matters as emissions, noise, and water and soil pollution, and on the appropriate measures to limit these impacts, to fix suitable guidelines for the inclusion of such measures in the corresponding planning phases.
  - The incorporation of the environmental aspects referred to in this Report (socio-economic effects, external costs, effects on fauna, fragmentation and occupation of the territory, especially of the Natura 2000 Network, emissions), with a view to establishing quantified objectives and specific time horizons for the control of the associated impacts, and the development of suitable technical tools to monitor and predict these effects.
  - Within two years, to complete an analysis by sector of the interaction of the PEIT with energy and fuel, economic, industrial, commercial, social, planning, tax and other policies, to define recommendations for coordination with those sectors.

- For the Ministry of Public Works and Transport to participate actively in the framework of the policy to combat climate change, with measures related to greenhouse gas emissions, so guaranteeing the PEIT's contribution to the National Allocation Plan. In particular, the plans implementing the PEIT must fix greenhouse gas emission targets which are in line with Spain's commitments in this field. In coordination with other Government initiatives, such as the Spanish Energy Efficiency Strategy, and other Ministerial Departments, to participate in defining and applying the necessary measures.
- Within two years, to design appropriate control procedures and systems for the progressive integration of environmental objectives into the Ministry of Public Works and Transport management, fulfilling PEIT provisions on strengthening the institutional decision-making system.
- To define the makeup and functions of the Transport Forum, and its role in monitoring the PEIT.
- In connection with R&D+i activities provided for in the PEIT, the priority lines must include progress forward in energy efficiency and the use of waste and recycled materials in infrastructure construction. There must be a furtherance of coordination between R&D+i programs fomented by the Ministry of Public Works and Transport and those within the jurisdictions of other Departments (Industry, Energy, Environment, Territory, etc.) to promote the sustainability of the transport system.

7.5.2. Environmental management of infrastructures and transport

The environment management system is probably one area of particular urgency, the set of procedures which in practice incorporate environmental objectives into the cycle of planning, design, construction and operation of infrastructures, and developing the regulatory framework for transport.

The need to respond to the requirements of Directive 2001/42/CE on Strategic Environment Assessment, and comply with the Plan's environmental objectives means that specific guidelines should be drawn up for all the Ministry of Public Works and Transport bodies and directive centres. To those ends, it may be particularly useful to follow formalised mechanisms such as Standard ISO 14001 on the Environmental Management System to facilitate the effective implementation of the system, cooperation among Directive Centres and revision of results. Review and improvement of the environmental management system affects at least the following questions:

- The extent of the notion of "environment": the environment's role in the Directive Centre's management and direction, the resources assigned to deal with environmental matters, and how these matters are incorporated into the organisation.
- How environmental questions are taken into account in documents on transport policy or strategy in each centre's area of jurisdiction.
- What are the environmental impacts facing each directive centre's activity, and what are the procedures for identifying them.
- How legal obligations in the environment field are identified and taken into account.
- What monitoring is done on action, including the correction and enhancement mechanisms to be put in place.
- How the rest of the Ministry of Public Works and Transport, the Administrations and the public in general are informed of environmental questions.

7.5.3. "Cascade evaluation" of actions

The backbone to the integration of environmental aspects lies in an approach which creates a direct link between Plan-Programs-Projects, based on cascade assessment.

The phases at which decisions are reached under Transport Sector Programs create a "list of projects" which must be assessed in environmental terms to define their priority and feasibility from a sustainable standpoint. On the other hand, priorities fixed in implementing actions may modify Plans and Programs and affect their level of sustainability. This procedure, of on-going comparison of programs and actions, is known as cascade evaluation.

A fundamental requisite for such cascade evaluation is a fluid and effective coordination of all those responsible for projects, the Plan and Sector Programs, and subsequently, when it comes to project-by-project analysis.

7.5.4. Coordination tools

The following is provided for in moving forward in the objectives proposed to integrate environmental criteria into Ministry of Public Works and Transport action under the PEIT:

a) Creation of an Environmental Monitoring Commission in the Ministry, which may draw on outside experts to analyse and assess specific questions, with the basic role of evaluating and detecting possible environmental conflicts in a phase, at the earliest possible time as an activity matures.

b) In cooperation with the Ministry of the Environment, the creation of a suitable monitoring mechanism similar to that put in place by the European Union following approval in 1999 of its Integration Strategy, in the form of a Mobility Observatory to monitor the transport sector's sustainability objectives.

In the short term, included among priority action to be implemented in the framework of these monitoring and coordination instruments, the need must be highlighted to overcome specific gaps in information which may have come to light as the PEIT was being written, and to improve the data available about some key questions to the environmental integration of action on infrastructures and transport. This will be achieved through the rapid startup of the associated tasks and studies, considering the following fields among others: effects on biodiversity and the fragmentation of natural spaces; the impact in terms of noise, waste and soil and water pollution; and an assessment of social and environmental factors external to transport.

7.6. INTERNAL MONITORING OF THE PEIT

The implementation of the PEIT guidelines by the Ministry of Public Works and Transport Directive Centres demands an upgrading of existing structures and procedures, to facilitate the effective integration of these guidelines into the daily practice of these Centres.

With this aim, in 2005 an evaluation must be made of each Directive Centre's management systems, considering the extent to which the existing structure is in line with the strategy the PEIT seeks to develop, and proposing recommendations to better it.

In any event, it will be important to strengthen the cooperation formalised to one degree or another among the Directive Centres, and the exchange of information on management experience, to set up periodic review systems, the introduction of pilot projects as the channel for innovating management, and the launch of procedures to monitor and evaluate those projects.

7.6.1. The Monitoring Commission

As an initial measure, a Monitoring Commission is set up for the PEIT, inside the Ministry of Public Works and Transport, to be coordinated by the Directorate-General of Territorial Planning and Coordination, comprising representatives from all the Ministry's Directive Centres and Public Corporations, and with the following aims:

a) To act as the coordinating body implementing and monitoring the PEIT.

b) To strengthen the managing personnel's identification with PEIT objectives.

c) To adjust the documentation and technical recommendations to the PEIT objectives.

d) To consolidate a technical team specialised in the implications of sustainable development in transport policy and intermodality criteria.

At the same time, an internal "project coordinator" will be created for particular or concomitant activities requiring special coordination within the Ministry of Public Works and Transport because of their territorial effects (action in an environmentally fragile area or corridor), they touch various Directive Centres (multimodal actions) or come within complex urban environments.

Every two years, the Directorate-General of Territorial Planning and Coordination will, with the backing of the PEIT Monitoring Commission, draw up a report on the monitoring of the Plan.

7.6.2. Systematised evaluation of proposals

Identification of action while the PEIT was being drafted was implemented in a process of cooperation among the competent Directive Centres and the Directorate-General of Territorial Planning and Coordination. This exercise must be continued and enhanced in future, to perfect existing tools for analysing actions.

As a point of departure, there must be a homogeneous framework for prior assessment of all the modes of transport, referring both to infrastructures and to other types of actions. This methodology must include guidelines for the evaluation of external factors, and the effects of any action on the environment and on territorial development.

Such prior evaluation does not substitute for the cost-benefit analysis each Directive Centre usually performs on its projects. It merely adds a preliminary assessment, strategic in nature, about the action's compatibility with PEIT objectives, its expected benefits and the possible existence of conflicts when implemented.

Inevitably, in the future, proposals will arise from various agents for new actions. These should not be discarded merely because they are not in the PEIT. However, such proposals should not be studied without some sort of prior analysis whereby those promoting them

are able demonstrate a project's desirability and its contribution to attaining the PEIT objectives, and for the Ministry of Public Works and Transport to reach a well-informed decision on the matter. Such a decision may include not just infraestructure actions but also other solutions such as transfer of title, operational changes, etc.

There are three elements necessary to this procedure: firstly, the minimum information to be demanded from the promoters about their proposal, so that it can be evaluated, then an Advance Compatibility Study, already mentioned, by the promoters, by the Directorate-General of Territorial Planning and Coordination or by the Directive Centre, depending on the content, and finally a Compatibility Report from the Directorate-General of Territorial Planning and Coordination which, following the model of analysis used for PEIT actions, will consider its compatibility with the PEIT via three fundamental elements:

- The socio-economic benefits and costs.
- Environmental compatibility.
- The expected territorial effects.

The data prepared by these means will provide backup to those responsible for making decisions about going ahead with the studies, through the Directive Centre concerned and with a suitable degree of priority, or to decline the proposal.

7.7. THE INFORMATION SYSTEM BACKING DECISION-MAKING

The Directorate-General of Territorial Planning and Coordination will progressively build up a Geographical Information System (GIS) to gather the basic geo-referenced statistical information for monitoring the PEIT, and the relevant data backing up decision-making on new actions.

Short-term, the following must be done:

a) The preparation of a national mobility survey of persons, according to Eurostat criteria in the field, five-yearly, thus beginning with the Movilia 2005 survey.

b) Revision of the goods transport data available.

c) In collaboration with the CEDEX, the construction of a model for passenger and goods transport demand, using the guidelines applied in many countries around us in Europe. The national transport demand model will be public, and open to all agents concerned.

7.8. REVISION AND ADAPTATION OF THE PEIT

The PEIT's design as a medium- and long-term strategic planning instrument does not mean it is closed and rigid, but rather a proposed framework which is conditioned on the one hand by the precision which must arise from the planning through which it is implemented and, on the other, by the dynamic affecting the territory, society, economy, mobility, intermodality or the sustainability criteria.

It may in this sense be found either that new actions will have to be considered which are not dealt with in the PEIT, or that those already established should be brought forward or delayed, or even eliminated should that be suggested by trends over time in any of the factors conditioning transport and its infrastructures.

Therefore, while the PEIT is designed to a 2020 time horizon, it is felt that it should be reviewed initially at the end of the first four-year term following its approval, that is to a 2008-09 horizon, following monitoring and assessment of action during that first phase, with the aim of tuning its objectives, guidelines and actions according to the targets defined, trends in the economy and the financing framework, and new European directives and Spanish regulations.

8

THE PEIT'S ECONOMIC AND FINANCIAL FRAMEWORK

8.1. FROM PEIT OBJECTIVES TO THE ECONOMIC FRAMEWORK

The PEIT objectives and guidelines provide the economic and financial framework to reconcile the following needs:

a) To sustain an adequate rate of investment, at all times taking account of the basic balances of the Spanish economy (including public finances) and its future competitiveness, and the relation between the requirements for investment in innovation and in fixed capital. Recent studies in this field have shown that the accumulated marginal productivity of public capital is nearly 1.5, in other words a one euro increase in public capital translates long-term into a GDP increase of almost 1.5 euros.

b) To focus efforts in those transport modes, such as rail, whose development will facilitate it possible to reconcile the aims of meeting increasing demand for mobility and sustainable development in transport, also guaranteeing high standards of quality and safety.

c) In parallel, to develop the infrastructure networks, and the appropriate regulation of transport services, including their financing requirements.

d) In financing terms, user-payment not just of the costs of infrastructures but also external costs generated by transport is seen, according to European Union indications, as the fundamental financial instrument to regulate transport demand and to ensure that the resources required are not an unsustainable burden on the public budget, especially in financing new international connections among European Union countries. It may be that a system whereby the transport user pays all associated costs will need a long transition period, but the line to be pursued should be set out in the coming years.

e) On the other hand, scenarios for the financing of infrastructures must take account of growing maintenance costs, which have been rather relegated in recent years, but which are nonetheless fundamental in a country where a high level of infrastructures is already provided. Such an enhanced assignment of resources to these items must, particularly in relation to the road network, lead to a reorganisation of the infrastructure management model. The creation of the State Highways Agency will include maintenance of the road network among its other tasks.

f) Likewise, as has been reiterated throughout this document, safety is one of the major concerns of policy on transport and its infrastructures; it is thus proposed to set up a Transport Safety and Quality Agency, where efforts will be directed toward improving safety conditions, and monitoring the service quality indicators and the state of the infrastructures.

8.2. FINANCING SOURCES

In Spain, revenues from the budgets of the various Administrations and their subsequent assignation to fund infrastructures continue according to the principle of the single fund: taxes are not specific in their application in the financing of budget items, and what is collected by the public coffers is placed in a single or common fund which the State or the Administration concerned distributes to its activities, without reference to the source or origin. This principle has shifted only very recently, with the introduction of the special

hydrocarbon surcharge to help finance the healthcare system. Thus, in general, in the long run it is taxpayers who are funding infrastructures.

The growing need for resources to finance infrastructures has, for some years now, led to thinking about the possibility of using certain specific tax categories, particularly related to road use:

- A charge for infrastructure use, on automobiles and heavy vehicles.
- Soft tolls on dual carriageways where there is a free alternative route.
- Special levies on those benefiting directly from road projects.

The following are some of the sources of financing, briefly summarised, classified into two groups, budget and off-budget financing, linked to the ultimate source of the funds, i.e. whether it is the taxpayer who finally pays for the infrastructure (budget financing) or the user and/or direct beneficiary who does so (off-budget financing).

8.2.1. Budget financing

Direct investment

This is the traditional budget investment (charged to taxpayers) where the infrastructure is paid for with public funds from the public department with competence for that particular mode of transport. Such activities are paid for in work certifications, entered entirely as public expenditure –which may be a deficit, so increasing public debt– in the financial period when the work is done.

Deferred investment

Budgetary mechanisms for deferred investment include:

- Total payment: The investment is met from public funds and charged to the Budget, and differs from direct investment in that the total cost of the infrastructure is paid when delivered. The value of the work is calculated as public expenditure at the time when the Public Administration's payment commitment arises (the principle of accrual).
- Shadow toll: Investment financed by the private sector with a Public Administration commitment to pay during a given term, through charges agreed according to public use of the infrastructure. The Administration's periodic payments for each budget period are calculated as public accounted expenditure during that term.
- Infrastructure management service: for an existing infrastructure, a contract is concluded to provide services to users. Charged to the General State Budget, the Administration periodically pays sums as accounted public expenditure for each budget period. Moreover, the party providing the service undertakes in advance to make the appropriate investments in the infrastructure.

Indirect investment

- Capital transfers: The State charges to the Budget a capital transfer to an investor (an Autonomous Community, Municipality, Public Corporation or Holding Company). The capital transfer is accounted as public expenditure at the time when the payment commitment arises. The item which is the future target of the investment accumulates to the investor's assets.

- Capital contributions: Capital flows from budgets to Public entities which have their own management capacity. These bodies (Public Corporations, Autonomous Bodies, State Corporations or Consortiums) are able to generate resources so that there are prospects that the contributions will be recovered. For this reason, these contributions are treated as financial investments and are not considered public expenditure. And because these entities generate their own resources and are able to go into debt, they have some self-financing capacity (off-budget financing).
- Participative Credits: Through a capital contribution, the State finances a company which invests in infrastructure. Such a contribution must be essential to the viability of a project which is unable to attract the necessary resources on the financial market. These are State financial investments which are not accounted as public expenditure.

European funds

Flows from the European Union are not granted solely to Public Administrations, but also to other public institutions or to the private sector. Aid from European Funds for transport infrastructures has been applied as follows:

- To the Public Administrations, incorporated into the General State Budget and that of the remaining Administrations.
- To public or private entrepreneurial investors, for example in certain port and airport projects.

Other budgetary financing mechanisms

Some systems for the collection of taxes or charges from users can also be treated in part as *budgetary* financing mechanisms, whether for the use of the infrastructure as in the case of levies for the road transport of goods, or using concepts similar to the Vehicle purchasing or circulation taxes, whereby the funds collected using these systems are incorporated into the general tax flow according to the single-fund principle already referred to. If however they are applied directly to sector activities, this is treated as *off-budget* financing.

8.2.2. Off-budget financing

This concept refers to a set of tools or mechanisms for providing infrastructures with financing entirely or at least in large part from the private financial market. This relates basically to systems whereby the resources are generated from charges on the infrastructure user.

Public works concessions: The State awards a concession contract to operate an infrastructure. For its part, in addition to this right, the private agent takes on an obligation to complete an investment program. Thus the remuneration comes from the collection of charges agreed with the infrastructure user who, ultimately, bears the cost of the investment.

Public Entities, Public Corporations, Autonomous Bodies, State Corporations, Consortiums and Mixed Corporations: Entities created *ad hoc* by the State or by it and private agents for a particular purpose (construction and/or operation of an infrastructure) and a given period. The State's interest in these corporations is treated as a financial investment and is not computed as public expenditure.

A public domain concession: Similar to the public work concession, whereby the State awards the right to operate or use a public asset. A private agent's investments in the public domain revert to the Administration free of liens and encumbrances when the concession ends.

Crossed financing formulas: This makes it possible to finance one public project with resources generated by the operation of another, both being part of a contract between the State and a private agent. In such cases, the resources can be structured in a charge to the user, or with a shadow toll (taxpayers) so that referral must be to the model selected in calculating the effects in terms of public expenditure.

8.2.3. Public-Private Partnerships (PPP)

Partnership between the public and private sectors is designed to reconcile the need for infrastructure investment with the requirement to maintain budgetary discipline. The European Union not long ago took the first steps to elucidate this question, and facilitate such operations.

Eurostat has recently clarified the rules on the book-keeping treatment in national accounts of contracts signed by public bodies acting in collaboration with private entities. It is a condition, if such investments are to remain off-budget and not be computed as public expenditure, that the private partner assume both the construction risk and the so-called demand risk.

8.2.4. The ultimate source of financial resources: Toward the principle of charging

With budgetary financing and subject to the single fund principle of de-coupling, it has been taxpayers who, ultimately, have to a great extent taken up the cost of infrastructures, sharing in their payment to the same degree as those using or benefiting from them.

Awareness of the existence of costs (external costs) generated by the infrastructure's users, plus the needs to finance them, have aroused interest in the development of charging policies. In the environmental sphere, such a policy is expressed most graphically by the principle of "the polluter pays".

Unlike the model in most countries, initiatives arise which evade the principle of single fund, so that part or all of the tax on fuel and vehicles goes to the financing and upgrading of infrastructures in that area, as highlighted above, usually through a special fund whether or not assigned to public Administration budgets.

8.3. TRANSPORT INFRASTRUCTURE INVESTMENT IN RECENT YEARS

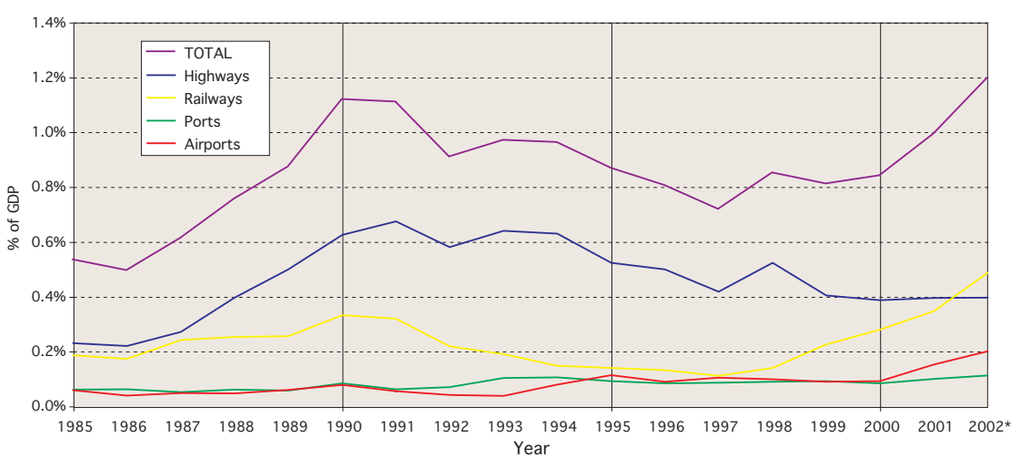
Since the second half of the eighties, major investment has taken place aimed at overcoming the country's shortfall in transport infrastructures and to position it better to face the challenges of competitiveness generated by European Union membership (Figure 35).

From 1992, infrastructure investment began to drop in GDP terms, because of the policy of containment of public spending which defined the strict budgetary criteria imposed by the European Union on Member States wishing to join the first phase of Monetary Union.

Thus the search began for possible alternatives to conventional budget financing. Recent years have seen the implementation of financing systems and formulas complementing traditional budget resources. Notable among these is Public Entity financing, particularly in rail, through the Rail Infrastructure Manager (GIF)[6] and the introduction in road and rail of the system of deferred disbursement, with total payment of the price, also known as the "German method".

In accordance with the theoretical classification of the sources of financing explained in this chapter, an analysis follows of the way the financing of future investment is distributed, depending on whether originating in Budgets (the General State Budget and European Union Funds) or Off-budget.

FIGURE 35. Trends in state investment in transport infrastructures (% of GDP). 1985-2002



8.3.1. Budgetary financing

Budgets have been and continue to be the major source of financing, although as bodies have been set up and as they have begun to attain self-financing capacity from their own revenues and indebtedness, the burden on the Budget has dropped.

At present, virtually just road and rail resort to this source of financing; the former basically through the Directorate-General of Roads, along with private participation through concessions, and the latter through the Directorate-General of Rail and, partially, through the Public Corporations ADIF, *RENFE Operadora* and FEVE, according to their self-financing

[6] Set up in 1997, it has now disappeared in that form, and has been integrated into Administrador de Infraestructura Ferroviaria (ADIF) which began operations on 1 January 2005.

capacity, including their debt potential. There has however been private involvement in this mode in recent years with the concession of the Figueras-Perpignan sector.

In rail, GIF has been receiving capital input from the State through the Budget, allowing for financing charged to indebtedness without affecting the public deficit in accounting terms. Similarly, the public entities *RENFE Operadora* and FEVE are not self-sufficient, and receive funds from the State through the Budget in the form of contributions or capital transfers.

Thus for 2000-2003, the capital input to GIF accounted for 30% of rail investment funding, 20% in 2004 and 28% in 2005 according to General State Budget figures (PGE).

A good part of the financing in the last four years (some 20% of total investment) comes from European funds (the European Regional Development Fund -FEDER-, Cohesion Funds, Aid to the Transeuropean Transport Networks, the European Economic Space and specific European Commission initiatives); the most important of these have been the Cohesion and FEDER Funds.

Such Funds are assigned to General State Administration projects (the Ministries of the Environment, of Development, and others) as well as to those of other Public Administrations (autonomous and local) and of bodies and enterprises linked to any of these Administrations.

In the 2000-2006 funding schedule Spain is assigned between 61 and 63.5% of the total Cohesion Funds amounting to 18 billion euros (at 1999 prices). This represents approximately 11.16 billion euros, roughly half of which go to transport infrastructures. Under the FEDER in the same period, this country will receive about 30 billion euros, about a third of which will be used for transport infrastructure projects; Resources granted to the Ministry of Public Works and Transport amount to 6.8 Bn €.

8.3.2. Off-budget financing

The capacity for indebtedness of Public Enterprises and Entities attached to the Ministry is a key when it comes to allowing infrastructure financing. Of these institutions, it is worth distinguishing those which are completely self-sufficient from those which, in the meantime, are not.

On the one hand, AENA and *Puertos del Estado*, set up in 1992 and 1993 respectively, finance most of their investments with revenues from their activity collected as charges from their users, although they do maintain a minority channel of financing from European funds. However, the lively investment rate has been obtained through a high level of indebtedness, principally for airports, where in 2003 AENA's indebtedness (short- and long-term) reached 99% of its equity capital.

RENFE Operadora and FEVE receive funds from the State in the form of capital transfers specified in the Budget, in addition to any European funds that may come in. In this sense, they have a channel of budgetary financing. For its part GIF has been receiving European funds and capital input from the State. Revenues from a royalty for use of rail infrastructures will allow ADIF in the future to use the financial market to implement some of its investment (off-budget financing).

Public Enterprises and Entities can turn to indebtedness to the extent that their financial situation permits. Notable here is AENA which has used this procedure to fund a

substantial part of its investments, around 60% in recent years. The debt potential of these institutions within the PEIT horizon may be conditioned by their current indebtedness levels.

Table 4 shows the ratio of indebtedness and the debt/investment ratio of various public entities for each year 2000-2003.

TABLE 4. *Public entities' percentage of indebtedness 2000-2003*

PUBLIC ENTITY INDEBTEDNESS	2000	2001	2002	2003
Debt/equity ratio				
AENA	19	32	56	99
Puertos del Estado	9	11	12	12
GIF	6	10	12	*14*
RENFE	294	298	291	*313*
FEVE	95	133	178	194
Debt/investment ratio				
AENA	14	44	26	65
Puertos del Estado	11	14	11	21
GIF	1	0	0	*9*
RENFE	100	202	128	*138*
FEVE	0	104	47	53

Data in italics refer to 2004 State Budget closure estimates
Source: Closed data from the Balance Sheet and Financing Table of each entity in the General State Budget (2000-2005)

Finally, part of the financing comes from private initiative. The importance of this source of finance has grown during the last decade, to 15.2% in the 2000-2003 period. This growth has been due to the high level of port concessions, virtually equal since 2000 to the rate of investment of the public institution *Puertos del Estado*, to the higher use since 2001 of this financing source for roads, and the launch of the first rail sector concession, in 2004 for the Figueras-Perpignan sector.

8.4. CONDITIONING FACTORS FOR INVESTING IN AND FINANCING OF PEIT INFRASTRUCTURES

8.4.1. Budgetary discipline in the framework of the Stability and Growth Pact

The fundamental aim of the Stability and Growth Pact is to ensure the budgetary discipline of the countries which go into the third phase of Economic and Monetary Union, to uphold the commitment to cut the public deficit pursuant to the Maastricht convergence criteria. The main feature or conditioning factor lies in countries' undertaking short-term to keep the public deficit at less than 3% of GDP and, medium- and long-term, to hold public deficit close to equilibrium or in surplus.

The fact that France and Germany, the two countries of greatest economic and political weight in the Union have for several years breached that Pact, has meant that its validity has had to be reconsidered, leading to its reform or "evolution", with the modification not of the Pact itself but of the mechanisms for its application.

Within this framework, the Stability and Growth Pact and the Budget Stability Act may undergo changes within the Plan's horizon, and that may at some stage affect planned investment levels and the weight of possible sources for their financing.

8.4.2. European Funds

European Funds which have until now borne a substantial part of investment will undergo changes in the new European framework with the Union enlarged to 25 members.

While sums received by the EU-15 Member States from the Community budget are not affected in 2000-2006 by new States' membership, the amount and spread of Funds for the next period, 2007-2013, is at the negotiation stage, and the final results are hard to predict accurately. In any event, with European Union enlargement, Spain both nationally and regionally enhances its positive position relative to the Community mean in terms of per capita product.

It is in principle anticipated that a possible cut in European funds can be offset by a corresponding increase in the assignment of resources in General State Budgets, with the requisite that the existing budgetary stability commitment is fulfilled, which may ultimately demand an increase in off-budget financing sources if investment levels are to be maintained.

8.4.3. Legislative change

The new rail model

The enactment of the Rail Sector Act, on 1 January 2005, has altered the present situation in this sector, implying on the one hand that the State takes on the maintenance of the conventional rail network, which it owns, and which had been in the hands of RENFE, funded through State capital transfers. On the other hand, the Public Corporations *RENFE Operadora* and ADIF have been set up, to take over among other things the functions of the former GIF.

In this new structure, the Ministry of Public Works and Transport and ADIF undertake infrastructure investment, each in its field, while most of *RENFE Operadora*'s investment is in rolling stock and its own installations.

The greater volume of rail infrastructure among State Assets, and this Plan's conservation and safety guidelines mean a change in the budget items allocated for the maintenance of that infrastructure, which is taken up directly by the Ministry of Public Works and Transport in RENFE's place, the effect of this already being felt in the 2005 Budget.

In the framework of this change of model, in 2004 the State assumed most of RENFE's debt (5.429 billion €) which, by December 2003, amounted to 7.255 billion euros.

Public-private participation in Infrastructures

The Models for Public-Private Financing of Infrastructures, while not absolutely novel, have become particularly relevant in recent decades, both inside and outside the Community, generally matched with the common denominator of budget limitations and the growing need for more and better infrastructures.

The same has happened in public-private partnership in Spain, with a substantial increase in the last decade in the amount of infrastructure built with financial input from private resources. This formula has been most applied in Spain in the construction of dual carriageways, motorways and ports.

The preferred formula so far has been the *concession regime*, as part of the *purely contractual* formulas referred to in the Green Book on Public Private Collaboration, and Community Law in the field of public contracting and concessions (COM (2004) 327).

The feature of this model is the strong link between the private partner and the end user: the private party rather than the public sector provides a service to the population, but under the public sector's control. Likewise, the contractor's remuneration has basically taken the following form:

- paid by the service users (tolls), and levies
- subsidies granted by the public authorities.

There is a legal framework in Spain, Act No. 13/2003 of 23 May, regulating contracts for the concession of public works, which is broader than the one described in that it refers to the following:

- Infrastructures in general: roads, rail, ports and airports.
- Tolls paid directly by users.
- A shadow toll paid by the Administration (art. 246.4 of the Public Administration Contracts Act). The Administration can pay for the project according to its use, and in the manner provided for in the particular administrative specifications.
- Soft tolls, a mixture of direct tolls and subsidies.
- Other contributions from the Administration (Article 224.3 of the Public Administration Contracts Act) which, while generically limited to the existence of "reasons of economic or social benefit, or the presence of special demands arising from the public purpose or general interest of the project covered by the concession", may take the form of: joint financing of the project with monetary or non-monetary contributions, subsidies or loans with or without interest, or participative loans, provided that the principle is always applied of the concession holder's assumption of the risk.
- The operation of commercial areas (Article 246.5 of the Act) as an activity complementary to public projects, subject to the principle of unified management and control by the Public Administration granting the concession, and run together with the project by the concession-holder, directly or through third parties in the terms established in the specifications.

Investment needs arising to cover programs currently in progress plus those arising in the future from the application of the PEIT mean that adequate use must be made of the potential of these models for public-private partnership.

8.4.4. The Role of the Public Entities

Puertos del Estado and AENA continue to invest in infrastructures in the same way as they have been doing until now, financing them with their own revenues from the collection of charges for the use of their infrastructures and, where necessary, resorting to debt.

AENA's current accounting situation and its high indebtedness ratios, the result of heavy spending on the enlargement of Madrid-Barajas and Barcelona airports, will force it to cut its high investment rate in coming years, and which will be able to change direction only in the second half of the effective term of the PEIT. In any event, the aim of financial self-sufficiency also continues to be irrevocable for AENA.

On the other hand, it is planned for ADIF to implement a significant level of rail investment, minimising the impact on the General State Budget with sources of financing and formulas for public-private participation which prove adequate.

RENFE Operadora investments from 2005 will be limited to rolling stock and the company's own installations, while FEVE investments, which are comparatively lower, will continue at a rate similar to the present one, with the inclusion of the criteria for action previously indicated in this Plan.

8.5. AN ECONOMIC ESTIMATE OF PEIT ACTIONS

Table 5 sets out the estimated investment volume for transport infrastructure projects in the various modes contained in the Strategic Plan, and is the result of individualised assessment by the General Directorates, Entities and Enterprises responsible for each planned project, an aggregate valuation whose financing viability has been compared in overall terms, taking account of its relation with the Spanish economy's accumulated GDP during the term of the PEIT. The planned volume of investment is clearly much more accurate in the short-term, with the figures based on studies and projects. Moving forward in the Plan's horizon, the lack of definition is greater, in terms of both the action to be taken and of its scope (which will depend among other factors on the outcome of planning and prior studies carried out in due course). Thus levels of investment will be specified later, in the related Sector Plans.

This assessment includes non-infrastructure projects which are basic to the PEIT proposals for enhanced transport services, and which must therefore be taken into account in the framework of the Plan.

8.6. THE PEIT FINANCING STRATEGY

In the light of the considerations and investments arising from the actions set out in the previous paragraphs, the following is a set of strategies for financing the PEIT.

- An attempt will be made to ensure that investment remains stable, with improved investment possibilities which prove to be compatible with budget stability, using the potential for increased public revenues arising from the greater productivity of economic factors.
- Budget financing will continue to be the main source for financing transport infrastructures, of the order of 60% of investment in the Plan's horizon (Table 6). These

TABLE 5. *An economic estimate of PEIT projects, 2005-2020*

ACTION	AMOUNT (millons of euros)	% OF TOTAL
Rail transport, except urban projects	**108,760**	**43.70**
High-performance	83,450	33.53
Maintenance and upgrading of the conventional network	18,000	7.23
Elimination and upgrading of level crossings	3,560	1.43
Rolling stock	3,750	1.51
Road transport, except urban projects	**62,785**	**25.23**
High-capacity routes	32,105	12.90
Upgrading and improvements	7,500	3.01
Maintenance and operation	22,580	9.07
Road transport services	600	0.24
Air transport	**15,700**	**6.31**
Safety and Manoeuvring Area	2,150	0.86
Terminals	5,760	2.31
Security and Air Navigation	3,224	1.30
Intermodality, Environment, etc.	3,387	1.36
Maintenance	1,179	0.47
Sea transport and ports	**23,460**	**9.43**
Port infrastructures and installations	22,480	9.03
Sea rescue, safety and the environment	980	0.39
Intermodal goods and passenger transport (1)	**3,620**	**1.45**
Backup to the network of nodes and intermodal platforms	1,200	0.48
Land access to ports	1,220	0.49
Program to promote goods intermodality	400	0.16
Program to promote passenger intermodality	800	0.32
Urban and metropolitan transport	**32,527**	**13.07**
Roads	4,077	1.64
Urban integration of rail	2,400	0.96
Rail commuter services, including rolling stock	10,050	4.04
Backup to public transport and interchanges (2)	16,000	6.43
Research, development and innovation	**2,040**	**0.82**
Transport R&D+i program	1,610	0.65
Pilot actions for innovation in transport	230	0.09
Program to foment innovation in transport	200	0.08
TOTAL PLANNED PEIT ACTIONS	**248.892**	**100,00**

Notes:
(1) Support for the network of passenger interchanges, in urban actions.
(2) Includes Ministry of Finance subsidies for infrastructures and services.

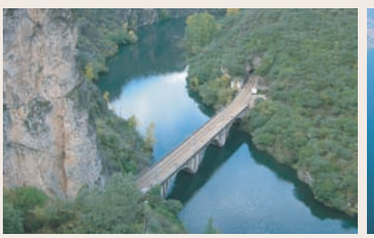
resources will be channelled through both the Ministry of Public Works and Transport Directorates and the public entity *Administrador de Infraestructura Ferroviaria* (ADIF).

- Proportional use will be made of direct and deferred investment systems, to meet the deadlines for implementing the Plan's actions, holding to the commitments of budget stability and reduced public-account deficit.
- In the context of rail sector liberalisation, the introduction of the levy for the use of rail infrastructure will mean the self-financing of part of the investments assigned to ADIF.

- The Public Corporations AENA and *Puertos del Estado* will be financially self-sufficient, and will hardly require budget resources for investment in these transport modes.
- It is planned to increase private sector participation with the use of Public-Private Partnership formulas. An increase is foreseen in private financing, to close to 20% of total investment. The system most used will be the concession of public projects in ports (with an estimated approximate volume of 50% of total planned investment), in roads according to the criteria established in Section 5.2 (approximately 25% of investments in new infrastructures) and, to a lesser extent, in rail. This will be done by fomenting collaboration between the public and private sectors to optimise the viability of projects using this management pattern, in line with European Union recommendations.
- The active participation of the Autonomous Communities and Local Institutions will be drawn on in financing coordinated action.

TABLE 6. *Sources of PEIT investment financing*

TYPE OF INVESTMENT	SOURCE OF FINANCING		% OF TOTAL INVESTMENT
	Budget	Off-Budget	
Roads	75.0%	25.0%	26.81%
Rail	81.4%	18.6%	48.00%
Airports	2.2%	97.8%	6.50%
Ports	9.7%	90.3%	9.72%
Others	27.7%	72.3%	8.97%
TOTAL	**59.5%**	**40.5%**	**100.0%**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GLOSSARY

GLOSSARY

This glossary is designed to explain the meaning of the terms and abbreviations used in the Strategic Infrastructures and Transport Plan (the PEIT). It does not seek to provide an academic or regulatory definition of those terms, but to clarify the meaning and interpretation of their use in the Plan.

- **Accessibility / Accesibilidad**

  The quality of access to a place, i.e. the capacity or greater or lesser facility for reaching it.

  Accessibility is a basic variable in the planning of transport infrastructures. A number of indicators have been developed to measure it, to assess the effects of actions under a given plan on pre-existing levels of accessibility.

  The accessibility analyses carried out for the PEIT use the so-called "network efficiency indicator" which measures the relation between the accessibility conditions provided by infrastructure networks and the theoretical ideal maximum accessibility.

- **ADIF**

  Rail Infrastructure Administrator. (Administrador de Infraestructuras Ferroviarias).

- **AENA**

  Spanish Airports and Air Navigation. (Aeropuertos Españoles y Navegación Aérea).

- **AFIS**

  Aerodrome Flight Information Service.

- **AGE**

  The National State Administration (Administración General del Estado).

- **AIS / SIA**

  The Automatic Identification System for Ships.

- **APHEA**

  Air Pollution and Health: a European Assessment (European Research Project).

- **APHEIS**

  Air Pollution and Health: a European Information System.

- **The ATM 2000 + Strategy / Estrategia ATM 2000 +**

  An air traffic management strategy (ATM) agreed by the European countries belonging to the European Civil Aviation Conference (ECAC).

- **AVE**

  Spanish High-Speed Rail (Tren de Alta Velocidad Española).

- **BUS/HOV / BUS/VAO**

  A route or lane reserved for public transport or high-occupancy vehicles.

- **Cabotage (land) / Cabotaje terrestre**

  Domestic (inland) transport in a country other than that of the carrier providing it. In the EU, land cabotage was completely liberalised under Community provisions from 1998.

- **Cabotage (sea) / Cabotaje marítimo**

  Domestic navigation between ports in one country. Domestic sea traffic in one country. By extension, *short sea shipping.*

- **CCAA**

  Comunidades Autónomas - the Autonomous Communities.

- **CEDEX**

  Centro de Estudios y Experimentación de Obras Públicas, Centre for Studies and Experimentation in Public Works, a body in the Ministry of Public Works and Transport.

- **CO**

  Carbon monoxide.

- **CO_2**

  Carbon dioxide.

- **Combined transport / Transporte combinado**

  Where there is a single contract with the loader or user, this transport is actually provided by a number of successive carriers in one or more modes of transport, usually with unit loading methods, most usually containers.

- **COV**

  Volatile Organic Compounds (VOC).

- **DATAR**

  Delegation for Territorial Planning and Regional Action (French State Administration).

- **DG ECFIN**

  The European Commission's Directorate-General of Economic and Financial Affairs.

- **DGT**

  Dirección General de Tráfico - the Directorate-General of Traffic (Spain).

- **EGNOS**

  European Geostationary Navigation Overlay Service, an experimental satellite navigation system, and a forerunner to *GALILEO*.

- **EMECAS**

  Estudio Multicentro sobre Contaminación Atmosférica y Salud - the Multicentre Study of Atmospheric Pollution and Health (Research Project).

- **EPPE**

  Ente Público Puertos del Estado - State Ports Public Corporation.

- **ERDF / FEDER**

  European Regional Development Fund.

- **ERTMS**

  European Rail Traffic Management System.

- **ESARR**

  EUROCONTROL Safety Regulatory Requirement, a European air safety standard.

- **EU / UE**

  The European Union.

- **EUROCONTROL**

  European Agency for the Safety of Air Navigation.

- **EUROSTAT**

  The Statistical Office of the European Communities.

- **Exclusive traffic (rail lines) / Tráfico exclusivo**

  A term applied to high-speed lines designed exclusively for passenger traffic.

  These passenger-only lines admit high maximum gradients, preventing in practice from their use by goods trains.

- **FEVE**

  Spanish Narrow Gauge Rail Network.

- **GALILEO**

  The European Union satellite navigation system.

- **Gateway**

  A point of modal interchange or transit (in the same mode) in a transport chain. A means of access: an entrance.

- **GDP / PIB**

  Gross domestic product.

- **GEI**

  Greenhouse gases.

- **GIF**

  Gestor de Infraestructuras Ferroviarias - Rail Infrastructure Manager.

- **Handling**

  Ground assistance service for aircraft, passengers and cargo.

- **High-capacity / Alta capacidad**

  A term used for roads. The name of high- (or large) capacity route is given to roads with separate roadbeds and at least two lanes of traffic in each direction, such as dual carriageways or motorways.

- **High performance / Altas prestaciones**

  This concept is used in the *PEIT* to reflect the integrated criterion of quality of design, functionality and high service level of the main land transport infrastructures, in both rail and road networks.

  The PEIT's high-performance road network comprises dual carriageways or motorways.

  The PEIT high-performance rail network is made up of:

  - high-speed lines,
  - electrified twin track,

- UIC gauge and
- is, in general, able to channel mixed passenger and goods traffic, although some lines are provided exclusively for passenger traffic.

Transitionally, some high-speed rail network lines may maintain the Iberian gauge.

- **High-speed / Alta velocidad**

  A rail term. In the European Union, high-speed lines are those which meet the requisites of Directive 96/48 of 23 July 1996 on the interoperability of the trans-European high-speed rail system.

- **Hinterland and Foreland**

  Hinterland is the name commonly given to a port's land area of influence, that is the area of land used by the port for the entry and exit of its products and as the centre of its maritime activities; the foreland is the area of maritime and foreign influence whose trade with the nation or country is channelled through that port.

- **Hub and feeder**

  A hub is the point where various branches of a network converge. In air and sea transport, hubs are the airports and ports where an airline or shipper focuses its activity. Feeders are the branches running from or into a hub, for the supply and distribution of traffic channelled through it.

- **ICAO / OACI**

  The International Civil Aviation Organisation.

- **IDAE**

  Instituto para la Diversificación y Ahorro de la Energy - The Energy Diversification and Saving Institute (State Spanish Administration).

- **IMD**

  Average daily intensity (vehicle road traffic). Intensidad Media diaria.

- **IMO / OMI**

  The International Maritime Organisation.

- **Interoperability / Interoperabilidad**

  Directives 96/48/CE and 2001/16/CE dealing in turn with the interoperability of the trans-European high-speed rail system and of conventional rail, define the conditions of interoperability.

  It is defined by those Community Directives as the capacity of the trans-European Rail System –high-speed and conventional– to allow the safe and uninterrupted movement of trains, meeting the specified levels of performance and eliminating major regulatory, technical and operational differences currently substantially impeding free cross-border movement of trains.

- **ISO**

  The European Standardisation Organisation.

- **ITS**

  Intelligent Transport Systems.

- **LCAP**

  The Public Administration Contracts Act (Ley de Contratos de las Administraciones Públicas).

- **Logistics / Logística**

  In business terms, logistics are all the activities (storage, transport, stock control, preparation of orders, etc.) which facilitate the flow of materials, from suppliers (in raw material state) to the end consumer (as finished products ready for consumption), as well as information flows, aimed at an adequate level of service to the client at a reasonable price. It is a system for the organisation and control of the flow of raw materials and semi- or fully-elaborated products, enabling demand to be met according to the amounts required, at the right time, where necessary and at minimum cost.

  Transport is one of logistic's main activities, given what it represents in terms of costs (more than fifty percent of the logistic cost) and its implications for the quality of the service to the customer.

- **MARPOL**

  An International Convention of the IMO –the *International Maritime Organisation*– to prevent pollution from ships.

- **Mixed traffic (rail lines) / Tráfico Mixto**

  A term applied to high-speed lines designed to channel passenger and goods traffic.

  Mixed traffic lines are subject to more demanding geometric parameters than those for exclusive traffic, related essentially to the smaller gradients permitted. This represents an additional investment over-cost, compensated by the line's enhanced functionality.

  Lines designed for mixed traffic may also operate with exclusively passenger traffic if the demand requires.

- **Mobility / Movilidad**

  The mobile quality of an object (goods) or a person. Used in transport virtually as a synonym for the use of or demand for different categories of transport (motorised or not, private or public, etc.).

- **Modal change / Cambio modal**

  Modification of the *modal distribution* of transport demand, promoted mainly by public policies to optimise the system's global efficiency and control the increased socio-economic and environmental impact of transport.

- **Modal distribution / Distribución modal**

  The share of each mode of transport, in absolute figures or as a percentage of total demand for passenger or goods transport.

- **National transport (demand) model / Modelo nacional de (demanda de) transporte**

  A scientific-technical tool to predict transport demand and the use of transport infrastructures and services, with the potential to evaluate alternative future development scenarios.

- **NH_3**

  Ammonia.

- **NO_2**

  Nitrogen dioxide.

- **NO_x**

  Nitrogen oxides.

- **PEIT**

  The Strategic Infrastructures and Transport Plan. (In Spanish Plan Estratégico de Infraestructuras y Transporte).

- **PETRA**

  Strategic Goods Transport Plan.

- **PGE**

  General State Budget - (Presupuestos Generales del Estado).

- **PLATA**

  Bus Transport Plan of Action.

- **PM_{10}**

  Particles of less than 10 microns in diameter.

- **PMS**

  Sustainable Mobility Plans.

- **PPP / APP**

  Public-Private Partnership (Asociación Público-Privada).

- **PROFIT**

  A Program to foment technical research, of the Spanish Ministry of Industry, Tourism and Trade.

- **Rail completion sections / Tramos de cierre ferroviarios**

  Transversal or meshed sections providing continuity for rail *trunk* sections or *routes*.

- **Rail gauge / Ancho de vía**

  The distance between the insides of railway tracks. The most widespread gauge is the so-called *international gauge* or *IUC* (1.435 m); some countries such as Spain and Portugal (1.676 m) or Russia and Finland (1.524 m) have broader gauges. Where the gauge is 1 m or less, it is called "narrow gauge".

- **R&D / I+D**

  Research and Development.

- **R&D+i / I+D+i**

  Research, Development and Innovation.

- **RCE**

  The Spanish State Roads Network (Red de Carreteras del Estado).

- **RD**

  Royal Decree.

- **RENFE**

  Red Nacional de los Ferrocarriles Españoles - the Spanish National Rail Network.

- **Reserved platform / Plataforma reservada**

  For use by just one mode of transport. The expression is normally used for "bus-only" lanes or high occupancy car and bus lanes (*BUS-HOV* lanes) and for light metro or tram lines.

- **SASEMAR**

  Sociedad de Salvamento y Seguridad Marítima (the Marine Rescue and Safety Corporation).

- **Sea motorways / Autopistas del Mar**

  A concept minted in the Community to identify high-quality intra-European sea links, with regular, frequent and fast transport services, and including the appropriate land facilities and services, designed to promote the sea transport mode as an efficient and environmentally more favourable alternative, particularly compared with transport on saturated road networks.

- **SEI**

  Airport rescue and fire-extinction service.

- **SESAM (SESAME)**

  Single European Sky Implementation Programme, a technological development program for the operability of the *Single European Sky* initiative.

- **Short Sea Shipping**

  According to the European Commission, *navegación marítima de corta distancia* or short sea shipping is the sea transport of goods and passengers between ports located in Europe or between such ports and those in non-European countries on the shores of closed seas around Europe.

- **Single European Sky / Cielo Unico Europeo**

  A European initiative for the integrated management of European air traffic, standardising national systems to enhance European air space security and optimise its capacity.

- **SO_2**

  Sulphur dioxide.

- **Sustainable Development / Desarrollo sostenible**

  According to the United Nations' Brundtland Report, this is development which meets the needs of present generations without compromising the possibilities for future generations to meet theirs. It implies a balance of the three main dimensions or planes of development: economic, social and environmental compatibility.

- **Sustainable mobility (Plans) / Mobilidad sostenible (Planes de)**

  Sustainable mobility (see *mobility* and *sustainable development*) refers to mobility which minimises negative impacts, particularly on the environment.

  Sustainable mobility plans are planning and management tools designed to promote and foment sustainable mobility, particularly by encouraging public transport and non-motorised mobility, which can be coordinated with other policies and actions affecting mobility requirements.

- **TCA**

  A section where accidents are concentrated. (Tramo de concentración de accidentes)

- **TERM**

  Transport and Environment Reporting Mechanism set up by the EU from 1998.

- **TGV**

  Train à Grande Vitesse - French, high-speed train.

- **Trunk rail routes / Itinerarios troncales ferroviarios**

  Rail lines or parts thereof which serve multiple origin-destination links. The provision of high-performance facilities has the effect of providing benefits to larger numbers of users and territorial areas.

- **TSI / ETI**

  Technical Specifications for Interoperabilidad (Especificaciones técnicas de interoperabilidad) for both high-speed and conventional rail in the EU.

- **UIC**

  The International Union of Railways.

- **USA / EE.UU**

  United States.

- **WHO / OMS**

  The World Health Organisation.

- **ZAL**

  Logistic Activities Zone. (Zona de Actividades Logísticas).

- **ZMES**

  Especially Sensitive Marine Zones. (Zonas Marinas de Especial Sensibilidad).