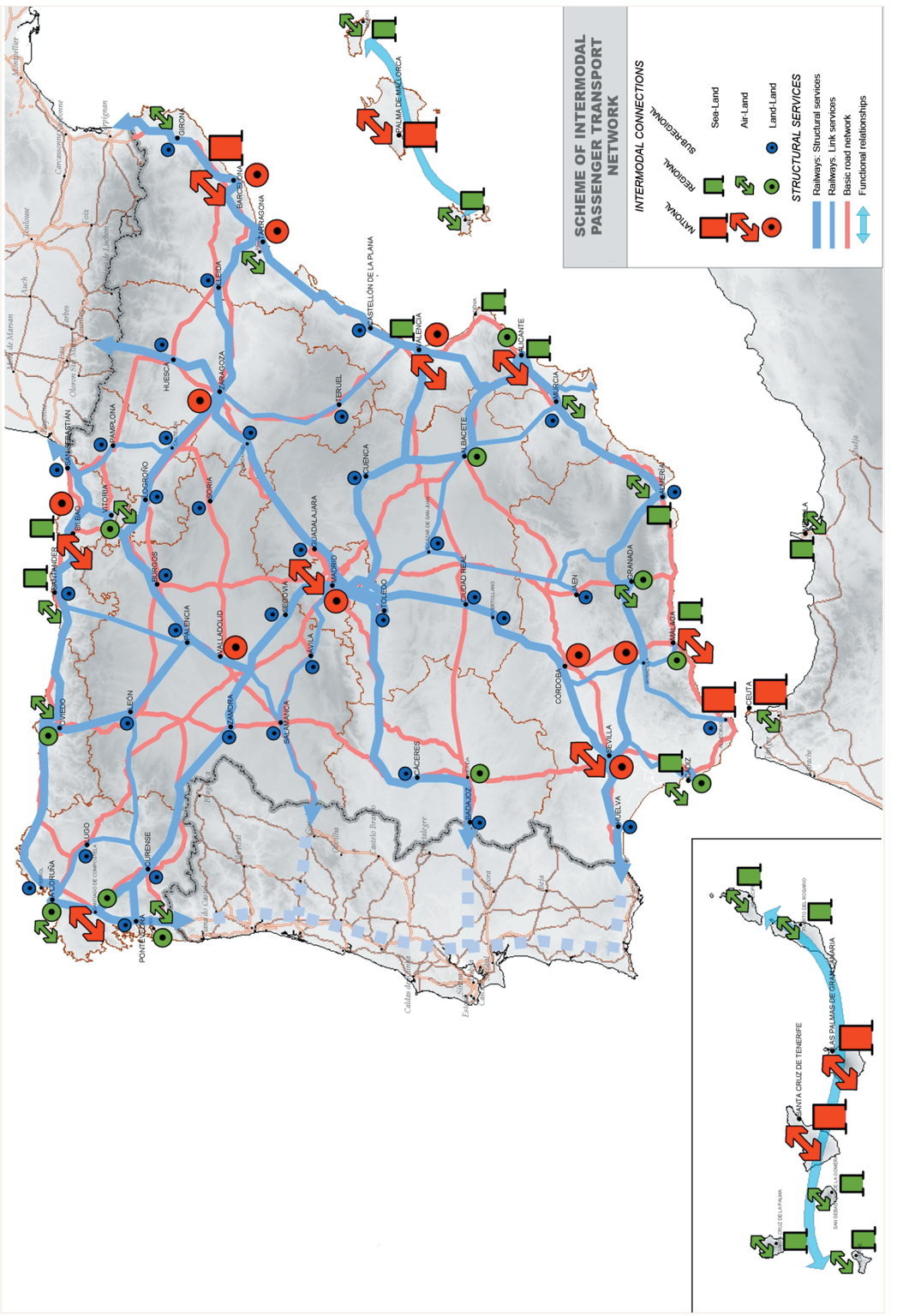
FIGURE 33. Scheme of intermodal passenger transport networks



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.

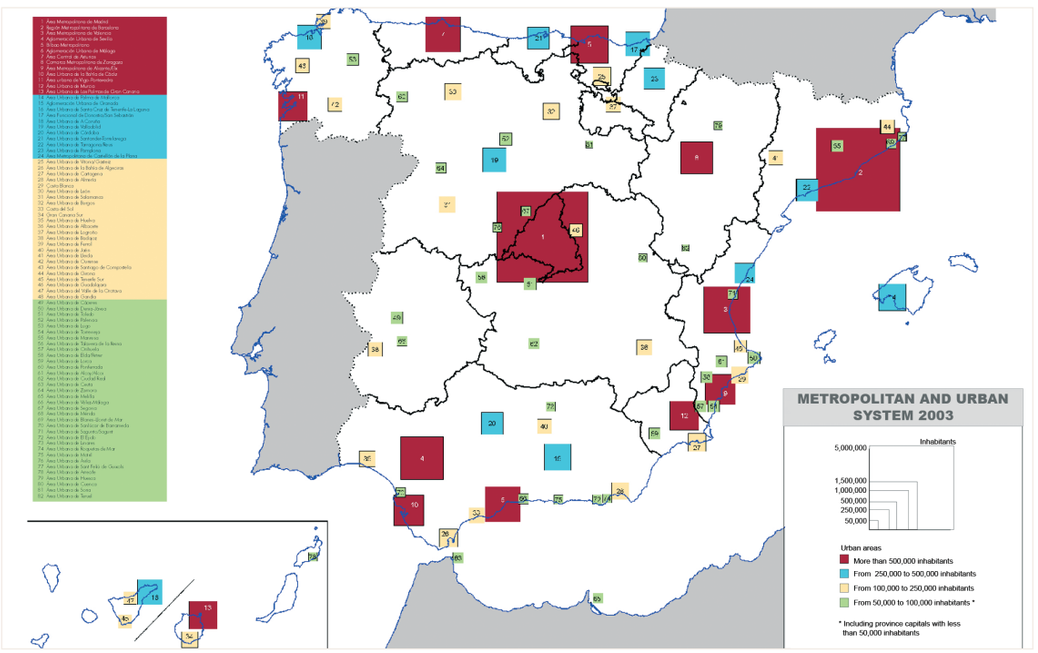
That will be assisted by the linking of acceptance and any financing of proposals to its intermodal effectiveness, through Prior Compatibility Studies put in place for the action to be taken during the PEIT effective term. In this sense, development of a global tool such as the National Transport Model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