European Commission
Directorate-General Regional Policy

Thematic Evaluation of the Impact of Structural Funds on Transport Infrastructures

Final Report
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1 Introduction

1.1 Background

Oscar Faber were appointed by the European Commission, on 11 May 1999, to lead a multi-national research team in undertaking a Thematic Evaluation of the impact of Structural and Cohesion Fund interventions on transport infrastructures. The overall aims of the study were defined as follows:

- establishment of a review (bilan) of the structural funds interventions in terms of transport infrastructure in the regions and countries concerned;
- analysis of the priorities retained for structural funds interventions in the transport infrastructure sector;
- identification of the relative effectiveness of the interventions in the sector; and
- identification of best practice cases (innovative transport and financial engineering solutions, multi-modal components...) as well as an analysis of their transferability.

The study has examined the impact of Structural and Cohesion Fund transport intervention in the six EU Member States (MS) that account for the majority of Structural Fund Objective 1 funding support, that is, Ireland, Portugal, Spain, Italy and Greece. Germany is a special case, because, although the former GDR qualifies as an Objective 1 region, no funds were allocated to it for transport projects under the current programme. However, the future needs of Germany were analysed in the light of the current national transport programme.

1.2 Evaluation Method

1.2.1 TOR Requirements

The Terms of Reference (TOR) for the study outlined the following seven main areas of work:

(a) a transport policy/strategy review;
(b) a review of the translation of transport strategies into budget allocations, actual expenditure and physical realisation, by country and by mode;
(c) an analysis of the efficiency and effectiveness of transport investments in promoting regional economic development;
(d) an analysis of the financial instruments used to fund the transport infrastructure investment programme;
(e) an assessment of the linkages between TEN and structural fund investments;
(f) a review of the degree to which sustainable transport and environment impact have been addressed in transport strategies; and
1.2 Evaluation Methodology

The Study Procedure is illustrated on Figure 1.1. It shows the three main stages in the Study. These were:

(a) **Consultation and Data Gathering**

The main consultees were the country desk officers of DG REGIO. A questionnaire was devised to assess in overall terms the progress of the Operational Programmes, successes and failures, future priorities and further sources of information. These consultations provided a good understanding of the current programme.

DG TREN was also consulted regarding the conduct of the Study.

Data were collected from Eurostat of two types: socio-economic data and transport network data. These were used to generate indicators of transport provision, which are contained in Appendix A. Data were also collected within each country, predominantly from Government Ministries.

(b) **Analysis: Expenditure Review and Country Analysis**

Planned and actual expenditure were analysed in a number of ways, but the main classifications were by mode of transport, country and funding source. A considerable amount of reconciliation and checking was required in order to obtain consistent, up-to-date results, up until the end of 1999.

Country reports were prepared for each country; these are contained in separate reports. Detailed reports were prepared for Ireland, Spain, Portugal, Italy and Greece, but only a partial analysis was appropriate for Germany, as this country did not receive structural funding in the 1994-1999 programme.

(c) **Horizontal Synthesis**

The Horizontal Synthesis was undertaken at two levels:

- On country-by-country basis, using a common structure for each country; and
- On a total programme basis, using evaluation impacts illustrated by examples from each country.

The Horizontal Synthesis contains indications of future priorities and recommendations for each country. During the course of the Study, an Evaluation Framework was developed. One of our recommendations is that this framework is used in future evaluations of the Operational Programmes so that all projects in each country are analysed on a common basis. It is shown in Appendix B.
1.3 Structural and Cohesion Funds for Transport

1.3.1 Background
Following the reform of Structural Funds in 1988, community support for investment in transport infrastructure increased considerably with the specific aim of stimulating economic development in the lagging regions of the European Union.

The European Regional Development Fund (ERDF), the largest of the Structural Funds, has been the major source of finance for transport infrastructure investment. In 1993 the ERDF was complemented by the Cohesion Fund. The Cohesion Fund provides support for both transport and environmental infrastructure projects. In transport, support is associated with the development of TENs and projects that provide access to TENs.

In the current programming period, 1994-1999, Structural Funds provide 13.7 billion Euros for investment in transport in Objective 1 regions. The Operational Programmes for Transport (OPT) of Member States indicate the expenditure intentions associated with these funds. The allocation between transport modes was as follows:

- motorway/other roads - 56%
- railways - 24%
- ports - 4%
- airports - 5% and
- other transport infrastructure and technical assistance - 11%

Cohesion Funds provide support for the development of TENs in Greece, Ireland, Portugal and Spain. In the period 1993-1999 the transport funding amounts to 5 billion Euros with a breakdown as follows:

- motorway/other roads - 69%
- railways - 23%
- ports - 3% and
- airports - 4-5%

1.3.2 Structural Funds

The European Commission supports the economic and structural development of underdeveloped countries and regions through the use of Structural Funds and Cohesion
Funds. This study is concerned with **Structural Funding** provided through the European Regional Development Fund (ERDF), and specifically funding related to ERDF ‘Objective 1’. Objective 1 is defined as:

**“promoting the economic and structural adjustment of regions whose development is lagging behind”**.

The criterion for the designation of Objective 1 status is that the country or region has a GDP per capita amounting to 75% or less of the community average over the past three years. Objective 1 measures absorb about 60% (nearly 94 billion Euros) of Structural Funds with about 94% of the total funding allocated to the six countries (Germany, Greece, Ireland, Italy, Portugal and Spain) that are the subject of this study.

Financial assistance to Member States is channelled through development programmes in the field of transport. The financing mechanism most commonly used is an Operational Programme. The Operational Programmes for Transport, which may be at a national or regional level, set out integrated packages of measures covering all aspects of transport infrastructure (roads, railways, urban public transport, ports and airports).

There are three important principles that operate to determine the allocation of Structural Funds to specific projects:

- **Partnership** - between the Commission and authorities within each Member State to agree on common objectives and priorities;

- **Additionality** - to ensure that the Community assistance is additional to, rather than a substitute for, funding contributions from Member States; and

- **Subsidiarity** - which basically ensures that decisions regarding the selection of projects for financial support is undertaken at the national, regional or local level.

### 1.3.3 Cohesion Funds

The **Cohesion Fund** was established under the Maastricht Treaty of 1993 and Member States with a Gross National Product below 90% of the Community average are eligible. The current qualifying Member States are Greece, Ireland, Portugal and Spain. The funding is allocated to two types of projects: **environmental projects and transport infrastructure projects**. Transport infrastructure projects, the subject of this study, are associated with either the development of TENs or projects providing access to TENs. Given this linkage with TENs, Cohesion Funding in the field of transport has been primarily linked to national road and rail infrastructure projects.

The quality of projects is intended to be safeguarded by application of the following criteria:
1 Introduction

- medium-term economic and social benefits, in the light of project cost and the cost benefit analysis;
- priorities of the Member States;
- contribution made to Community policies on environment and the TEN;
- compatibility of projects with Community policies and other structural measures; and
- appropriate balance between environment and transport infrastructure.

1.4 Structure of Final Report

The structure of the Final Report is as follows:

Section 2 - Contains the Executive Summary
Section 3 - Contains a Horizontal Synthesis of the Analysis by Country and Theme.
Section 4 - Contains an Analysis of the Impact of the Total Programme
Section 5 - Contains Overall Conclusions

Country Reports - Contain financial and physical progress of the OPT, and a description of the impact of the programme
2 Executive Summary

The Study Objective was to establish a review and analysis of the structural funds for transport in the “Objective 1” regions of the following countries: Spain, Portugal, Ireland, Greece, Italy and Germany.

Specifically, the study included the following components:

- review of the structural and cohesion fund interventions by county, mode and funding source;
- analysis of the effectiveness of these interventions in terms of their impact on the improvements to journey times and capacities and economic development;
- analysis of ‘best practice’; and
- recommendations for future priorities both in general and country-specific terms.

The structural funding is channelled to transport projects in each county by means of the Operational Programme for Transport (OPT). The funding for the OPT comes from four sources:

(a) The Structural Funds to assist economic development in “Objective 1” areas through the Economic Regional Development Fund;

(b) The Cohesion Fund established under the Maastricht Treaty, to assist the physical and economic integration of peripheral countries. Qualifying Member States are Greece, Ireland, Portugal and Spain;

(c) Loans from the European Investment Bank (EIB); and

(d) National Funds: in most cases these should match the Structural Fund contributions but can in special cases contribute up to 75% of project costs.

The total Operational Programme for all countries for the 1994-1999 period amounted to 40.6 billion Euros. The contribution from each funding source was as follows:

<table>
<thead>
<tr>
<th>Funding Source</th>
<th>(Meuros) Planned</th>
<th>(Meuros) Actual to mid 1999</th>
<th>% of Planned</th>
</tr>
</thead>
<tbody>
<tr>
<td>Structural Funds</td>
<td>11010</td>
<td>8059</td>
<td>73</td>
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<td>Cohesion Funds</td>
<td>8370</td>
<td>5166</td>
<td>62</td>
</tr>
<tr>
<td>EIB Loans</td>
<td>7549</td>
<td>7549</td>
<td>100</td>
</tr>
<tr>
<td>National Funds</td>
<td>11065</td>
<td>8102</td>
<td>73</td>
</tr>
<tr>
<td>Other</td>
<td>2632</td>
<td>249</td>
<td>9</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>40626</strong></td>
<td><strong>29125</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>
The allocations to each country were as follows:

<table>
<thead>
<tr>
<th>Country</th>
<th>(Meuros) Planned</th>
<th>Euros/Head</th>
<th>(Meuros) Actual to mid 1999</th>
<th>% of Planned</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spain</td>
<td>15779</td>
<td>684</td>
<td>11505</td>
<td>73</td>
</tr>
<tr>
<td>Portugal</td>
<td>9284</td>
<td>948</td>
<td>8048</td>
<td>87</td>
</tr>
<tr>
<td>Greece</td>
<td>8354</td>
<td>819</td>
<td>4794</td>
<td>57</td>
</tr>
<tr>
<td>Ireland</td>
<td>4500</td>
<td>1278</td>
<td>3415</td>
<td>76</td>
</tr>
<tr>
<td>Italy</td>
<td>2710</td>
<td>141</td>
<td>1363</td>
<td>50</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>40627</strong></td>
<td><strong>508</strong></td>
<td><strong>29125</strong></td>
<td><strong>72</strong></td>
</tr>
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</table>

The allocations to each mode were as follows:

<table>
<thead>
<tr>
<th>Mode</th>
<th>Planned (Meuros)</th>
<th>Actual (Meuros) to mid 1999</th>
<th>% of Planned</th>
</tr>
</thead>
<tbody>
<tr>
<td>Road</td>
<td>22726</td>
<td>18229</td>
<td>80</td>
</tr>
<tr>
<td>Rail</td>
<td>9896</td>
<td>7080</td>
<td>72</td>
</tr>
<tr>
<td>Metro</td>
<td>3217</td>
<td>502</td>
<td>16</td>
</tr>
<tr>
<td>Air</td>
<td>2082</td>
<td>1212</td>
<td>58</td>
</tr>
<tr>
<td>Ports</td>
<td>1795</td>
<td>1410</td>
<td>79</td>
</tr>
<tr>
<td>Other/Mixed Modes</td>
<td>909</td>
<td>692</td>
<td>75</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>40625</strong></td>
<td><strong>29125</strong></td>
<td><strong>72</strong></td>
</tr>
</tbody>
</table>

The actual spending will rise as the 1994-1999 programmes near the end of payment period i.e. the end of 2001. The percentages observed in the last column give, however, a good idea of the speed and type of progress the programmes have shown. In most cases, the progress rate has been satisfactory.

The interventions have been successful in terms of reducing journey times, and improving journey time reliability. In order to convert journey time savings into useable economic benefits, the savings must be significant. For example in Ireland, time savings of between 40 and 70 minutes have been achieved, in Portugal all road journey times have decreased by an estimated 20%, and in Spain journey times on the improved sections of road have improved by between 12% and 20%. One motorway project in Spain, between Madrid and Vigo, achieved time savings of 2hr.30mins on an eight hour journey. Much of the road network has been improved in terms of capacities, that is, vehicles per hour and vehicles per day: the improved roads in Spain and Italy will have capacities of more than double the sections they replace.

Rail journey times have also seen some impressive improvements. For example, rail journey times between Athens-Thessaloniki-Kdomeni have fallen by 1hr.30mins, and similar reductions have been achieved in Portugal on the Lisbon-Faro route (1hr.35mins savings) and on the Lisbon-Vila Formoso route (1hr.20mins saving). The rail projects in
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2 Executive Summary

Portugal have enabled rail freight times to Spain to be reduced by 70%.

Urban transport projects benefit transport in two ways: first by allowing journey time reductions, and secondly by removing cars and reducing emission. As an example, in Athens, it is estimated that the Metro System will reduce journey times by 50%, and reduce toxic emissions by 35%.

Table 2.4 below summarises implementation progress:

<table>
<thead>
<tr>
<th>Target</th>
<th>Achieved</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Road</td>
<td>4918</td>
<td>3414</td>
</tr>
<tr>
<td>Improved Road</td>
<td>5058</td>
<td>4095</td>
</tr>
<tr>
<td>New Rail</td>
<td>1243</td>
<td>663</td>
</tr>
<tr>
<td>Improved Rail</td>
<td>4625</td>
<td>2988</td>
</tr>
<tr>
<td>No. Improved Ports</td>
<td>34</td>
<td>34</td>
</tr>
<tr>
<td>No. Improved Airports</td>
<td>14</td>
<td>14</td>
</tr>
<tr>
<td>Improved Metro</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

The economic benefits of the transport programmes have been significant. Reported economic rates of return in Ireland were 13% - this was a conservative calculation - and 23% in Spain, for road projects. This means that for every 100 Euros invested, in terms of construction and operating costs, the value of journey time savings, vehicle operating cost savings, and safety benefits, was 13 Euros for each year. Thus, the investment effectively paid for itself in eight years.

The employment generation effects were as follows: 1 person year of employment was generated by between 20,000 and 70,000 Euros, with the majority of cases reported as 25,000 Euros. There was evidence to suggest that public transport investment produced more employment than road investment. The total employment figures (direct/indirect) can be estimated at 2.3 million person years.

The estimated employment impacts in each country are summarised below:

<table>
<thead>
<tr>
<th>Country</th>
<th>Investment</th>
<th>Job Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ireland</td>
<td>3415</td>
<td>250187.5</td>
</tr>
<tr>
<td>Portugal</td>
<td>8048</td>
<td>679125</td>
</tr>
<tr>
<td>Spain</td>
<td>11505</td>
<td>840750</td>
</tr>
<tr>
<td>Italy</td>
<td>1363</td>
<td>154312.5</td>
</tr>
<tr>
<td>Greece</td>
<td>4794</td>
<td>383604.2</td>
</tr>
<tr>
<td>Total</td>
<td>29125</td>
<td>2307979</td>
</tr>
</tbody>
</table>

Funding by the PPP route was used successfully in several countries. For example, Portugal makes use of this method for its network of roads that are funded by tolls and “shadow” tolls. Shadow tolls are a charge per vehicle kilometre paid by the government.
It was noticeable that projects were implemented with difficulty where structural funds represented a relatively small part of the total project cost. It seems that where the structural funds comprised a significant proportion of funding, say 25-30% of the project cost, this would assist more rapid implementation. This was also the case when PPP were involved.

As regards general convergence impacts induced by the transport infrastructure investments, the following can be mentioned:

- development of road networks and missing links;
- development of high-speed rail links and substantial electrification investments;
- important interconnections between less developed and developed areas within the objective 1 area or the country in question;
- improvement of airports for ultra-peripheral regions;
- funds representing leverage effects in terms of developing PPPs;
- important employment creation (2.3 million person years for direct and indirect job creation);
- reduced peripherality in more remote regions notably through important time savings;
- lower traffic congestion in more populous, urban areas and generally improved economic opportunities; and
- increased cross border activity.

As regards the future emphasis of the programme, the following points were mentioned most often in the Country evaluations and recommendations:

- completion of the existing programmes, particularly with respect to Greece and Italy;
- there should be an emphasis on integrated transport projects in urban areas, since such projects contribute to social equity and environmental objectives as
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- projects which promote the better management of existing infrastructure, particularly in urban areas, should be a priority;
- rail projects which increase inter-urban capacity, and improve train control systems should be a priority;
- intermodal connections at ports should be encouraged;
- “secondary” connections of regional centres to the TEN should be a priority in the roads sector;
- projects which have a double benefit by helping more than one region, for example connections between Spain and Portugal, or port projects which benefit Italy and Greece, should be supported; and
- Private-Public Partnerships should be considered as a means of delivery in the case of roads, especially crossings and tunnels, airports and seaports, urban public transport, and, in the right circumstances, rail.

When looking at the new programmes for the period 2000-2006, it is clear that transport still represents an important priority (approximately 1/5 of the Structural Funds’ spending). In terms of re-partition of spending between modes, one can observe in accordance with the above evaluation and recommendations, a better equilibrium between modes, even if road infrastructure still remains important for most countries concerned.
3 Horizontal Synthesis by Country

3.1 Ireland

3.1.1 Objectives and Strategies

In Ireland, the core transport infrastructure objectives associated with Structural Fund and Cohesion Fund support are:

- to provide essential infrastructure support for the development of productive sectors;
- to create long term sustainable employment; and
- to develop an efficient and competitive access and inland transport system.

Specific transport strategies, outlined in the Operational Programme for Transport cover:

- investment in national roads and non-national roads;
- mainline rail;
- state airports;
- commercial seaports and regional ports; and
- Dublin Transport Initiative (principally urban public transport and traffic management).

The main emphasis of transport investment was on improving the national primary road network; principally new and improved inter-urban routes linking major urban centres, ports and airports, town bypass schemes and urban relief road schemes. The overall aim of this programme was to produce time savings leading to reduced transport costs and improved productivity.

Mainline rail investment focused on key rail corridors radiating from Dublin. Specific measures included track upgrades, infrastructure works, signalling upgrade and stock replacement. These measures were expected to produce reduced travel times for business and leisure travellers and freight carriage, reduced operating costs and mode shifts to public transport.

Within the category ‘Other/Multi-Modal’ the Dublin Transport Initiative forms the main element of expenditure. The aim of the initiative is to improve the transport system in Dublin in order to promote economic development and regeneration. The initiative incorporates a mixture of public transport investment and urban demand management measures.
Table 3.1.1: Ireland - Summary of Transport Indicators at OPT Start

<table>
<thead>
<tr>
<th></th>
<th>Objective 1 Regions</th>
<th>All Country</th>
<th>EC12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motorway Provision</td>
<td>0.0046</td>
<td>0.0046</td>
<td>0.045</td>
</tr>
<tr>
<td>Other Roads</td>
<td>5.813</td>
<td>5.813</td>
<td>3.17</td>
</tr>
<tr>
<td>Rail Lines</td>
<td>0.124</td>
<td>0.124</td>
<td>0.149</td>
</tr>
<tr>
<td>Double Track Rail</td>
<td>0.0331</td>
<td>0.0331</td>
<td>0.061</td>
</tr>
<tr>
<td>Electrified Rail Lines</td>
<td>0.0032</td>
<td>0.0032</td>
<td>0.067</td>
</tr>
<tr>
<td>Air Passengers</td>
<td>2.352</td>
<td>2.352</td>
<td>1.547</td>
</tr>
<tr>
<td>Maritime Freight</td>
<td>8.788</td>
<td>8.788</td>
<td>12.370</td>
</tr>
</tbody>
</table>

Note: Indicator is defined as the square root of (length of route/1000 inhabitants) * (length of route/km²), thus it combines the demand element, largely determined by population, and the geographical dispersion of population centres.

The emphasis on road building was justified because Ireland’s stock of motorway standard roads was extremely low compared to the community average. For example, the indicator which combines length of motorway per km² and per 1000 persons, shows that Ireland had, in 1994, a provision one-tenth that of the EC12.

Overall rail provision in Ireland in 1994 was close to the EC12 average, although the amount of double track line was only just over half the EC12 average, indicating that capacity improvements were justified.

Ireland had a substantial airport improvement programme, in line with the fact that it is an island on the geographical periphery of the Union. Air passengers per 1000 populations in Ireland are well above the EC12 average, reflecting the country’s geographical situation.

The significant planned investment in the Dublin Transport Initiative, where the majority of the funding was allocated to a new Metro system, was welcome. Urban public transport improvements satisfy both economic criteria, in that good journey time savings are provided and benefits are concentrated where the expenditure takes place, and social equity criteria, since a Metro system is available for non-car owners and car owners alike.

3.1.2 Expenditure - Planned and Actual

Table 3.1.2 summarises the Planned Operational Programme for Transport.

<table>
<thead>
<tr>
<th></th>
<th>Structural %</th>
<th>Cohesion %</th>
<th>National %</th>
<th>EIB Loan/Other %</th>
<th>Total %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Road</td>
<td>708 29%</td>
<td>560 27%</td>
<td>1620 44%</td>
<td>190 9%</td>
<td>3078 100%</td>
</tr>
<tr>
<td>Rail</td>
<td>56 11%</td>
<td>141 41%</td>
<td>189 48%</td>
<td>67 20%</td>
<td>453 100%</td>
</tr>
<tr>
<td>Port</td>
<td>39 39%</td>
<td>41 35%</td>
<td>80 26%</td>
<td>11 9%</td>
<td>171 100%</td>
</tr>
</tbody>
</table>
Planned expenditure was dominated by the road programme, which at 3078 Meuros constituted 68% of the total expenditure. The rail programme was modest, at a planned 453 Meuros it made up only 10% of the programme. Contributions from the Structural and Cohesion Funds together made up 49% of the planned expenditure, contributing 973 Meuros (22%) and 745 Meuros (17%) respectively. National Funds made the largest contribution to planned expenditure of any of the Objective 1 and Cohesion countries, at 56% of the total programme cost.

Table 3.1.3 below provides a summary of transport infrastructure expenditure to date.

### Table 3.1.3: Ireland - Actual Expenditure Allocations by Mode of Transport/Fund Source

<table>
<thead>
<tr>
<th>Mode of Transport</th>
<th>Structural CF</th>
<th>Cohesion</th>
<th>National</th>
<th>EIB Loans/Other</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Road</td>
<td>866</td>
<td>637</td>
<td>701</td>
<td>190</td>
<td>2394</td>
</tr>
<tr>
<td>Rail</td>
<td>85</td>
<td>146</td>
<td>81</td>
<td>67</td>
<td>379</td>
</tr>
<tr>
<td>Ports</td>
<td>68</td>
<td>50</td>
<td>10</td>
<td>11</td>
<td>139</td>
</tr>
<tr>
<td>Airports</td>
<td>27</td>
<td>3</td>
<td>236</td>
<td>16</td>
<td>282</td>
</tr>
<tr>
<td>DTI/PT</td>
<td>95</td>
<td>0</td>
<td>120</td>
<td>0</td>
<td>215</td>
</tr>
<tr>
<td>TA</td>
<td>6</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td>Total</td>
<td>1147</td>
<td>836</td>
<td>1148</td>
<td>284</td>
<td>3415</td>
</tr>
</tbody>
</table>

Remarkably, actual expenditure from the Structural and Cohesion Funds exceeded the planned expenditure from these sources. This apparent overspend was concentrated in the roads sector, where actual expenditure in these funds exceeded the planned expenditure by 18%. The spend from National Funds on the Road Programme, by contrast, was much lower than planned at 701 Meuros, only 43% of that allocated. However, it should be noted that much of the National Funds were added to the original programme. Overall, actual expenditure on the Irish OPT was 76% of that planned.

The project that made least progress in financial terms was Dublin metro, where expenditure was only half of that planned.

### 3.1.3 Performance of the Operational Programme

The overall scale of the OPT has increased from the level anticipated in 1994. In the revised programme, the proportion of expenditure on public transport is lower than was first anticipated. The level of funding allocated in the revised expenditure plan to both national primary roads and non-national roads has increased significantly.

The programme was generally well focussed and effectively implemented. The objectives set for the OPT were fully compatible with those in the National Development Plan.

Despite the delay in implementing some key road projects, upgrading of the National...
Primary Route network is on target. Journey time savings on these routes are also close to target. Progress in relation to National Secondary roads has been less impressive. The most notable failure of the programme was the postponement of the commencement of construction of the light rail system for Dublin. This was due to problems in obtaining the necessary permissions for land acquisition.

There is evidence that the economic return on the investments of the OPT has been substantial. For example, investment in the primary road network is estimated to have produced a rate of return of at least 13%.

The Government has been active in pursuing sustainable development policies relating to transport and land use. Sustainable development has become a significant element influencing transport policy. However, while the OPT has increased the focus on public transport investment, the fact that targets have not been reached in this regard has reduced somewhat the contribution of the programme to sustainable development objectives.

Management of the OPT has been supported by a strong Technical Assistance Programme (TAP) and external evaluation procedure.

3.1.4 Indication of Future Priorities

The continuing strong growth in the economy and continuing lack of capacity on transport infrastructure means that there will be a need for significant additional resources to be devoted to transport within the context of the next national plan.

The economic and policy environment within which this expenditure will take place has changed. First, given the reduction in unemployment levels and the emergence of labour and skill shortages, job creation is no longer the primary focus of policy. The emphasis in this regard is now on increasing the supply of labour generally and also increasing the availability of high quality jobs. This suggests that transport investments in the future should be focussed more on the labour rather than product markets than previously.

Secondly, there is increasing concern about the regional balance of economic activity and the dominance of Dublin. While this has not yet resulted in an overt Government regional policy, several studies have suggested the development of growth centres throughout the country which would act as counterweights to Dublin.

Both of the above factors suggest that greater emphasis should be placed on the sub-regional investment programme over the next planning period. The improvement of local transport infrastructure associated with major growth centres outside the Dublin area would contribute to the development of these centres through impacts on both the product and labour markets. In particular, adequate local transport links will help attract inward investment to these locations and enlarge labour catchments. A key policy consideration in this regard is whether transport investment should be seen as a means of stimulating the sub regions. That is, should the scale of investment be greater than would be dictated by economic growth trends?

It is also important that any reallocation of expenditure should be focussed on major
growth centres rather than local development generally. There is an urgent need to articulate regional policy, so as to guide transport investment in this regard.

This refocusing of expenditure should not be at the expense of investment in the Dublin region where there is now a substantial deficit particularly in public transport investment.

3.1.5 Recommendations

This section sets out the recommendations for the future Operational Programmes for Transport.

Future Policy Emphasis

**Recommendation 1**

Transport investments should, in the future, be focused to a greater extent on labour rather than product markets.

Recent economic growth has been high and unemployment levels have reduced. Concern has turned towards the need to ensure adequate supply of labour with appropriate skills. This implies that future transport plans should give due regard to investments that give rise to improved labour force access.

**Recommendation 2**

Future transport investment plans should place greater emphasis on the sub-regional investment programme, particularly the improvement of local transport infrastructure associated with major growth centres outside the Dublin area.

There are concerns about the regional balance of economic activity; specifically the increasing dominance of Dublin. Improved local transport links will help to encourage inward investment in sub-regional centres and enlarge labour catchments.

**Recommendation 3**

Any reallocation towards sub-regional investment programmes should focus on major growth centres rather than local development generally.

There is an urgent need to further articulate regional policy so as to guide transport investment towards the specific needs of the major growth centres.

Infrastructure Shortfalls

**Recommendation 4**

The refocusing of expenditure should not be at the expense of investment in the Dublin region. Substantial further investment is required to overcome the deficit in transport system capacity.

The continuing rapid economic growth in the Dublin region has contributed to a widening gap between transport demand and capacity. This has been compounded by shortfalls in planned public transport expenditure, partly due to delays in initiating the
construction of the LUAS (light rail system).

**Recommendation 5**
The completion of the upgrading of the four key strategic road corridors, within the National Route Network, should remain as a priority.

Progress on the upgrading of strategic routes has been close to the targets outlined in the original programme but over 40% of the route length remains to be completed.

**Infrastructure Management and Sustainability**

**Recommendation 6**
As the implementation of new transport infrastructure progresses towards targets the emphasis should shift towards measures that seek to make better use of existing and improved infrastructures.

Significant progress has been made in the Dublin area in the implementation of demand management measures, with a recently increased focus on public investment allied to measures to restrain the use of private vehicles.

**Recommendation 7**
Future transport investments should continue to be planned within a coherent sustainable development strategy. The strategy should extend beyond the confines of transport infrastructure to embrace the wider principles of sustainable mobility.

Sustainable mobility objectives were a major feature of the 1994-1999 OPT. The Government has been actively pursuing new planning, regulation and fiscal initiatives that seek to ameliorate the adverse impacts of increasing transport demand.

**Procurement**

**Recommendation 8**
The efficiency of the implementation of the roads projects should be improved through the development of revised procurement procedures.

The road development programme has been subject to both delay and cost overruns. This has been attributed in part to the use of traditional public sector procurement procedures with public authorities managing planning and design stages. The current approach has been reviewed and steps are being taken to shorten the period between initial project planning and construction.

**Recommendation 9**
The potential benefits of greater private sector involvement (such as Public Private Partnership) in transport infrastructure development should be investigated.

The Government has recently announced a pilot PPP programme, including road schemes and elements of the Dublin light rail system.
3.2 Portugal

3.2.1 Objectives and Strategies

The main objectives of the Regional Development Plan, 1994-1999, for Portugal were:

- to improve the integration of Objective 1 regions with the wider European context;
- to support intermodal schemes and improved access to rail freight facilities;
- to improve the capacity of overland transport infrastructure with improved access to ports; and
- to relieve congestion in the metropolitan areas of Porto and Lisbon.

The Operational Programme for Transport comprises three main elements: major road infrastructure projects, rail network improvements and the upgrading of port infrastructure.

The main emphasis of the transport infrastructure investment programme has been on inter-urban and peri-urban road schemes. It should be noted that a large element of the ‘Other/Multi-Modal’ category identified above can be attributed to the development of ring road systems for Lisbon and Porto, so they were not multi-modal projects in the conventional sense.

Investment in railways has been directed at the modernisation of inter-urban passenger services and railway stations and the expansion of the urban light rail system in Lisbon. Port infrastructure projects have focussed on modernisation, increasing port capacity and improved access.

The OPT for Portugal has significant elements of Road, Rail, Seaports and Airports. The transport provision indicators for Portugal at the start of the programme were as follows:

<table>
<thead>
<tr>
<th>Table 3.2.1: Portugal - Summary of Transport Indicators at OPT Start</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objective 1 Regions</td>
</tr>
<tr>
<td>---------------------</td>
</tr>
<tr>
<td>Motorway Provision</td>
</tr>
<tr>
<td>Other Roads</td>
</tr>
<tr>
<td>Rail Lines</td>
</tr>
<tr>
<td>Double Track Rail</td>
</tr>
<tr>
<td>Electrified Rail Lines</td>
</tr>
<tr>
<td>Air Passengers</td>
</tr>
<tr>
<td>Maritime Freight</td>
</tr>
</tbody>
</table>

Note: Indicator is defined as the square root of (length of route/1000 inhabitants) * (length of route/km²). Thus it combines the demand element, largely determined by population, and the geographical dispersion of population centres.

The indicators show that Portugal was significantly under-provided for in:
• Motorway Provision - about 40% of the EC12 average;
• Rail Lines - about 60% in overall terms, but more importantly, only 25% of high capacity double track lines, and one-third electrified, of the EC12 average;
• Air Passengers - considering Portugal’s isolated position, air travel is relatively undeveloped; and
• Maritime Freight - again, Portugal has less maritime freight than might be expected, possibly because it does not have a convenient outlet to the Mediterranean for trade with France, Spain, Italy and Greece.

Thus there was some justification for the significant investment planned in all these sectors in the Operational Programme.

3.2.2 Expenditure – Planned and Actual

Table 3.2.2 provides a summary of the original expenditure allocations of the 1994-1999 OPT in Portugal.

<table>
<thead>
<tr>
<th>Mode</th>
<th>Structural %</th>
<th>Cohesion %</th>
<th>National %</th>
<th>EIB %</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Road</td>
<td>485</td>
<td>11</td>
<td>961</td>
<td>21</td>
<td>4545</td>
</tr>
<tr>
<td>Rail</td>
<td>352</td>
<td>12</td>
<td>334</td>
<td>12</td>
<td>2892</td>
</tr>
<tr>
<td>Seaports</td>
<td>339</td>
<td>45</td>
<td>122</td>
<td>16</td>
<td>749</td>
</tr>
<tr>
<td>Airports</td>
<td>0</td>
<td>0</td>
<td>160</td>
<td>35</td>
<td>463</td>
</tr>
<tr>
<td>Other</td>
<td>168</td>
<td>26</td>
<td>210</td>
<td>33</td>
<td>636</td>
</tr>
<tr>
<td>Total</td>
<td>1344</td>
<td>14</td>
<td>1787</td>
<td>19</td>
<td>9285</td>
</tr>
</tbody>
</table>

The unusual feature of the OPT for Portugal was the heavy involvement of the EIB, which contributed nearly half of the funding.

Table 3.2.3 sets out actual expenditure up to mid-1999.

<table>
<thead>
<tr>
<th>Mode</th>
<th>Structural %</th>
<th>Cohesion %</th>
<th>National %</th>
<th>EIB %</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Road</td>
<td>567</td>
<td>14</td>
<td>629</td>
<td>15</td>
<td>4080</td>
</tr>
<tr>
<td>Rail</td>
<td>325</td>
<td>12</td>
<td>175</td>
<td>7</td>
<td>2653</td>
</tr>
<tr>
<td>Seaports</td>
<td>281</td>
<td>45</td>
<td>90</td>
<td>14</td>
<td>627</td>
</tr>
<tr>
<td>Airports</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>193</td>
</tr>
<tr>
<td>Other</td>
<td>157</td>
<td>32</td>
<td>83</td>
<td>17</td>
<td>495</td>
</tr>
<tr>
<td>Total</td>
<td>1330</td>
<td>17</td>
<td>977</td>
<td>12</td>
<td>8048</td>
</tr>
</tbody>
</table>

Again, actual expenditure emphasises the contribution that the EIB has made to the Operational Programme in Portugal, especially in the field of Rail, where it contributed 69% of expenditure, and for airports, where all the expenditure came from the EIB.
Table 3.2.4 Summarises Planned and Actual expenditure in Portugal.

Table 3.2.4: Portugal - Summary of Planned and Actual Expenditure

<table>
<thead>
<tr>
<th>Mode</th>
<th>Planned</th>
<th>Actual</th>
<th>%</th>
<th>Source</th>
<th>Planned</th>
<th>Actual</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Road</td>
<td>4545</td>
<td>4080</td>
<td>90</td>
<td>Structural</td>
<td>1344</td>
<td>1330</td>
<td>99</td>
</tr>
<tr>
<td>Rail</td>
<td>2892</td>
<td>2653</td>
<td>92</td>
<td>Cohesion</td>
<td>1787</td>
<td>977</td>
<td>55</td>
</tr>
<tr>
<td>Seaports</td>
<td>749</td>
<td>627</td>
<td>84</td>
<td>National</td>
<td>1946</td>
<td>1532</td>
<td>79</td>
</tr>
<tr>
<td>Airports</td>
<td>463</td>
<td>193</td>
<td>42</td>
<td>EIB</td>
<td>4208</td>
<td>4208</td>
<td>100</td>
</tr>
<tr>
<td>Other</td>
<td>636</td>
<td>495</td>
<td>79</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>9285</td>
<td>8048</td>
<td>87</td>
<td></td>
<td>9285</td>
<td>8047</td>
<td>87</td>
</tr>
</tbody>
</table>

All the modal programmes in Portugal have progressed well with expenditure of 80-90% of the original allocations, with the exception of the Airports programme. With regard to the funding sources, the Structural, National and EIB funds were well-utilised, but only 55% of the anticipated Cohesion funds were used.

3.2.3 Performance of the Operational Programme

The table below provides a summary of transport infrastructure expenditure to mid-1999 and the associated physical progress.

Table 3.2.5: Portugal - Implementation of the Operation Programme

<table>
<thead>
<tr>
<th></th>
<th>Target</th>
<th>Achieved</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Road</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Motorway (km)</td>
<td>500</td>
<td>356.8</td>
<td>71.4</td>
</tr>
<tr>
<td>Total road network including motorways (km)</td>
<td>1150</td>
<td>1225</td>
<td>106%</td>
</tr>
<tr>
<td>Trans-European road network complete</td>
<td>100%</td>
<td>-</td>
<td>70.5%</td>
</tr>
<tr>
<td>Cost (Meuro)</td>
<td>1627</td>
<td>1723</td>
<td></td>
</tr>
<tr>
<td>Railway</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Journey time from Lisbon to Porto (value in 1993: 3h)</td>
<td>2h 15m (-45m)</td>
<td>3h 12m (+12m)</td>
<td>0</td>
</tr>
<tr>
<td>Journey time from Lisbon to Vila Formoso (value in 1993:6h 30m)</td>
<td>4h 30 m (-2h)</td>
<td>5h 10m (-1h20m)</td>
<td>67</td>
</tr>
<tr>
<td>Journey time from Lisbon to Algarve - Faro (value in 1993: 4h 50m)</td>
<td>2h40 m (-2h10m)</td>
<td>3h 15m (-1h 35m)</td>
<td>73</td>
</tr>
<tr>
<td>Rail Modal Split (Tkm in %)</td>
<td>60%</td>
<td>14.3%</td>
<td>0</td>
</tr>
<tr>
<td>Railway network with speed over 140km/h (%)</td>
<td>40%</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Cost (Meuro)</td>
<td>424</td>
<td>290</td>
<td>68</td>
</tr>
<tr>
<td>Ports</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Increase in Containerised Freight Traffic</td>
<td>8.35%</td>
<td>6.76%</td>
<td>78</td>
</tr>
<tr>
<td>Freight Transport Volume in Secondary Ports (Mtonnes)</td>
<td>4.5</td>
<td>4.73</td>
<td>105</td>
</tr>
<tr>
<td>No. of berths RO/RO</td>
<td>8</td>
<td>8</td>
<td>100</td>
</tr>
<tr>
<td>No. of berths for containers</td>
<td>16</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Cost (Meuro)</td>
<td>181</td>
<td>166</td>
<td>92</td>
</tr>
</tbody>
</table>
The main transport priority has been to guarantee the integration into the Trans European Networks. Given the peripheral location of this country, the shortage of suitable connections with Europe has restricted the efficiency of the transport system. The OPT has been designed to tackle this issue, with very positive results.

Within the current OPT some key actions have been completed and the road network has been substantially improved. Vehicle operating costs and travel times have been significantly reduced. For example it is estimated that average journey times by road are 20% less than prior to the OPT. Even though not all the rail projects have been completed, the reduced journey times of 1hr.20mins and 1hr.35mins are significant.

Three key actions; namely the axis Valença-Vila Real de San Antonio towards the North of Spain, the completion of the link Lisbon-Madrid by motorway and the axis Lisbon-Valladolid, have helped to reduce the overland isolation that Portugal has suffered in the past.

Furthermore, the improvement of the complementary network, facilitating the linking of different regions with the main transport corridors will support the development of their economic potential. Trade and Tourism are the key factors in stimulating a more balanced territorial development in Portuguese Objective 1 regions.

During the winter 95/96 the hard climatic conditions in the continent brought about many delays in the execution of the works. However these delays were recovered during the year 1996, with high levels of execution achieved, and the OPT caught up with the planning outlined in the CSF, finishing most of the projects on schedule.

Another priority has been the decongestion of the metropolitan areas of Lisbon and Porto. The situation before the current OPT took effect was chaotic, and currently it has been significantly alleviated. The actions carried out within the metropolitan areas of Lisbon and Porto, especially those related to the urban renovation, suffered great delays. The execution of these sub-programmes were slow due to the difficulties associated with the expropriations of land ownership.

With regard to the actions planned for railways, the OPT aimed to revitalise the main corridors connecting the country with the rest of Europe. The actions focused mainly on the Line North and the Line of Beira Alta, involving works such as increase to the number of tracks, electrification and new signalisation, with the aim of achieving higher network speeds. Unfortunately the results attained are less than anticipated. The travel times are in some cases far from optimal, such as the line Madrid-Lisbon line which can take more than ten hours for a 600km journey with just one train per day.

The geographical location of Portugal, and the relative shortage of overland transport connecting with Europe, justify the important role that Maritime transport has played within the OPT. The actions undertaken have provided the commercial ports with modern facilities and with a high level of specialisation in different kinds of freight. This policy, of focusing the actions on ports with greatest potential, will allow them to compete with the closest Spanish Ports. However future improvements may be best achieved by strengthening intermodality.
3.2.4 Indication of Future Priorities

Portuguese transport infrastructure developments are clearly linked closely to those of Spain, as traffic from Portugal must first transit through Spain. Historically, the Spanish and the Portuguese economies developed separately, but in the last years it has become apparent that mutual benefits are obtained from co-operation between both countries.

Trans-frontier mobility and the inter-connectivity of the Iberian Peninsular networks is still a key priority, where which, despite of the great advances achieved has a long way to go.

Road congestion in the main corridors needs to be further reduced. Despite the significant OPT investment on them, the new motorways have also stimulated the rapid increase in traffic volumes. It is necessary to carry on with the actions in the complementary network in order to upgrade them enough to cope with the future demand.

There are still some sparsely populated inland sub-regions with low levels of accessibility, where the population has been decreasing in the last years. To get more balanced economic development it will be necessary to improve the connections with these areas and support the development of intermediate cities.

Portugal has the opportunity to learn from the mistakes of the more developed Member States in the Community. Many Member States continue to experience growing problems of congestion and pollution despite high levels of investment in road infrastructure. In these countries, the traffic has tended to grow to fill up all the extra capacity made available. To avoid the same situation in Portugal, it is important to channel substantial future investments into the support of alternative modes, in particular the railway network.

Currently, the rail service along the main corridors is poor, despite a potentially high demand. Speed, reliability and frequency of passenger transport is generally low. Railway is currently a long way from being capable of competing with road transport, but nevertheless will be required to play an essential role in the future. It will be necessary to increase the actions within this mode of transport.

Improved intermodal connections between ports, roads and rail, and between road and rail, is also an essential aspect in providing an effective integrated transport system. Unfortunately, hitherto this issue has not been given sufficient emphasis due to the institutional fragmentation of modal responsibilities. In the future more integrated transport planning with better co-ordination between the agents involved in the different modes of transport should be a prerequisite to future investments which aim to achieve integrated and sustainable mobility.

Special factors in Portugal

In the forthcoming CSF there are a number of aspects that should be addressed along with the investment in new infrastructures:
Traffic management throughout Portugal needs to be significantly upgraded. The safety record is very poor, and the severity rate much higher than the European average. In 1998 there were 28.2 road fatalities per billion vehicle kilometres, compared with 16.7 in the EU15 and 8.1 in the United Kingdom. The circulation is highly unbalanced and in some areas minor investments could have a huge impact on the congestion, for example intelligent use of tolls, Urban Transport Control Systems, new roundabouts.

Now that the trunk road network has been significantly improved, the standard of service on the complementary network and the more local roads, particularly those linking to the main corridors already developed, must be upgraded to an acceptable level. Otherwise the benefits obtained in the travel times due to the new motorways could be negated by delays at the beginning and end of the journey.

The metropolitan areas of Lisbon and Porto have consumed a significant proportion of the investments under the current CSF. The actions undertaken must be considered in the context of an overall urban and suburban development plan. This plan has involved co-ordinating investments between 15 and 20 different authorities. In the future, apart from improving this co-ordination, emphasis should be on interconnection between modes, co-ordinated traffic management policies and actions consistent with long-term objectives for territorial development.

The regulations governing the transport sector in Portugal and the institutional environment for the operators providing transport services should also be upgraded in accordance with the European policy. Management support and training actions could offer good value in improving the efficiency of existing infrastructure provision.

3.2.5 Recommendations

<table>
<thead>
<tr>
<th><strong>Recommendation 1</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>The improvement of cross-border connections between Portugal and Spain should remain as a high priority.</td>
</tr>
</tbody>
</table>

Although substantial improvements have been made to three strategic overland road corridors further investment is required to improve the inter-connectivity of the Iberian peninsular networks.

<table>
<thead>
<tr>
<th><strong>Recommendation 2</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Future investment plans should place greater emphasis on improving the accessibility of the inland sub-regions.</td>
</tr>
</tbody>
</table>

Economic development in Portugal has been focused on the littoral, particularly within and around the metropolitan areas of Lisbon and Porto. There has been a steady population drift from the interior to the littoral and there are concerns regarding the balance of economic development and the need to support the growth of other cities. Both trade and tourism are seen as key factors in stimulating a more balanced territorial development.
Thematic Study of Transport: Method and Synthesis

3 Horizontal Synthesis by Country

Recommendation 3
Future investment plans should place greater emphasis on the development of the inter-urban rail system.

Infrastructure Shortfalls

Recommendation 4
As part of the upgrading of the rail network future investment plans should take account of the potential to better integrate the road and rail networks.

Rail infrastructure investments undertaken within the 1994-1999 OPT have produced very substantial improvements in rail freight travel times. However, the rail system currently fails to provide an effective alternative to road despite potentially high levels of demand in the major inter-urban travel corridors.

Recommendation 5
There is considerable scope for the further improvement of intermodal connections between ports and the road and rail systems.

Significant progress has been made in the modernisation and specialisation of port infrastructure, thereby providing increased capacity and competitiveness. However, further investment is required to improve access to the commercial ports.

Recommendation 6
Future road investment plans should incorporate a shift in emphasis towards the improvement of the secondary road system.

The benefits achieved through the improvement of the strategic (IP) road network could be eroded by the poor travel conditions on the secondary feeder road system.

Infrastructure Management and Sustainability

Recommendation 7
Substantial economic benefits have been achieved through the upgrading of the inter-urban road system, but significant additional benefits could be gained from the better management of the improved infrastructure – particularly to improve safety and environmental conditions.

The safety record of the Portuguese road system is poor and traffic congestion arises in many cases from inadequate traffic management rather than a lack of infrastructure capacity. Significant additional benefits could, therefore, be achieved from the introduction of relatively low cost traffic, safety and environmental management schemes.
Recommendation 8
The further development of sustainable mobility strategies, in the metropolitan areas of Lisbon and Porto, should be encouraged. Following the completion of major infrastructure projects the emphasis should turn towards improved traffic management, better integration of transport modes and non-infrastructure measures.

Traffic congestion and pollution levels in the major metropolitan areas are significantly greater than in other areas of Portugal. Future transport strategies should extend beyond infrastructure solutions to embrace wider urban demand management initiatives such as planning controls, parking management, urban traffic control and the increased use of fiscal instruments that seek to ensure that the external costs of transport use are properly reflected in prices.

Recommendation 9
The selective application of private finance initiatives for the implementation of road infrastructure, through both toll and ‘shadow’ toll concessions, should continue as a means of reducing the burden of funding from the public sector.

The recent development of a private finance programme in Portugal has provided an important new impetus in the implementation of strategic road improvements.
3.3 Spain

3.3.1 Objectives and Strategies

The economic development objectives of Structural Fund and Cohesion Fund transport infrastructure interventions are described in the Regional Development Plan, 1994-1999. The core objectives are:

- to make the most of existing territorial potentialities;
- to increase the industrial productive competitiveness with the European Market;
- to promote the Tertiary Sector; and
- to provide a suitable welfare level for the whole population, independent of location.

Specific transport infrastructure measures, outlined in the Operational Programme for Transport, fall into four main categories:

- road infrastructure;
- rail infrastructure;
- maritime transport; and
- air transport.

The main emphasis of the transport infrastructure programme is for the development of motorway and high capacity roads that integrate Objective 1 regions and improve accessibility to major economic centres in the rest of Europe. The measures aim to address both the low quality of infrastructure and deficiencies in road networks in relation to population and surface area.

The investment in rail infrastructure aim to address problems of poor quality (relative to developed area of the EU) and the need to better integrate three large rail sub-systems with different gauges.

Cohesion Fund interventions have provided significant support to the development of the Madrid-Barcelona high speed line, the Madrid-Lleida TGV line and tram access to Barajas Airport (Madrid).

Improvements in port infrastructure are aimed at increasing capacity and improving intermodality for both road and rail freight.

Recent growth in air traffic, due to increased tourism and the growth of major urban centres, has given rise to measures to improve accessibility to airports, improve interconnectivity with other modes and increase environmental protection.
The indicators for transport provision at the start of the OPT were as follows:

**Table 3.3.1: Spain - Summary of Transport Indicators at OPT Start**

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Objective 1 Regions</th>
<th>All Country</th>
<th>EC 12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motorway Provision</td>
<td>0.044</td>
<td>0.046</td>
<td>0.045</td>
</tr>
<tr>
<td>Other Roads</td>
<td>1.28</td>
<td>1.16</td>
<td>3.17</td>
</tr>
<tr>
<td>Rail Lines</td>
<td>0.095</td>
<td>0.090</td>
<td>0.149</td>
</tr>
<tr>
<td>Double Track Rail</td>
<td>0.020</td>
<td>0.0235</td>
<td>0.061</td>
</tr>
<tr>
<td>Electrified Rail Lines</td>
<td>0.044</td>
<td>0.050</td>
<td>0.067</td>
</tr>
</tbody>
</table>

Note: Indicator is defined as the square root of (length of route/1000 inhabitants) * (length of route/km²). Thus it combines the demand element, largely determined by population, and the geographical dispersion of population centres.

Thus the motorway provision, by this indicator, is similar to the EC12 average. The indicator takes account of both land area (where Spain scores poorly), and population, where Spain’s provision per unit population is high. Spain does have other characteristics: first, the population is quite dispersed, requiring longer length road to connect the regions; secondly, the provision of all roads is below average; it does not have a large stock of good quality primary routes; and thirdly, there is the need to connect overland with Portugal.

**3.3.2 Expenditure - Planned and Actual**

**Table 3.3.2: Spain - Original Expenditure Allocations by Mode of Transport/Fund Source**

<table>
<thead>
<tr>
<th>Mode</th>
<th>Structural</th>
<th>%</th>
<th>Cohesion</th>
<th>%</th>
<th>National</th>
<th>%</th>
<th>EIB</th>
<th>%</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Road</td>
<td>4998</td>
<td>43</td>
<td>2231</td>
<td>19</td>
<td>3038</td>
<td>26</td>
<td>1290</td>
<td>11</td>
<td>11557</td>
</tr>
<tr>
<td>Rail</td>
<td>547</td>
<td>18</td>
<td>1457</td>
<td>48</td>
<td>694</td>
<td>23</td>
<td>365</td>
<td>12</td>
<td>3063</td>
</tr>
<tr>
<td>Seaports</td>
<td>314</td>
<td>55</td>
<td>25</td>
<td>4</td>
<td>214</td>
<td>37</td>
<td>21</td>
<td>4</td>
<td>575</td>
</tr>
<tr>
<td>Airports</td>
<td>222</td>
<td>39</td>
<td>0</td>
<td>0</td>
<td>149</td>
<td>26</td>
<td>3</td>
<td>1</td>
<td>374</td>
</tr>
<tr>
<td>Other</td>
<td>28</td>
<td>13</td>
<td>142</td>
<td>68</td>
<td>40</td>
<td>19</td>
<td>0</td>
<td>0</td>
<td>210</td>
</tr>
<tr>
<td>Total</td>
<td>6109</td>
<td>39</td>
<td>3855</td>
<td>24</td>
<td>4135</td>
<td>26</td>
<td>1679</td>
<td>11</td>
<td>15779</td>
</tr>
</tbody>
</table>

The Spanish OPT constituted 39% of all the OPT programme. Spain had, at the start of the current programme, 29% of the total Objective 1 population, and 43% of the land area.

The Spanish programme was dominated by road and rail expenditure, which accounted for 73% and 19% respectively of the total programme. In fact, expenditure on roads in Spain accounted for over 50% of the total OPT for all eligible countries.

The Structural and Cohesion funds had slightly different roles in Spain. The principal contribution of the Structural funds was to road development, whereas a higher proportion of Cohesion funding was allocated to railways. In fact, the Cohesion Fund was planned to contribute nearly half of railway expenditure. Spanish State funding contributed amount one-quarter of the total programme: again road (73%) and rail...
(17%) were the main beneficiaries.

Table 3.3.3 sets out actual expenditure up to mid-1999.

<table>
<thead>
<tr>
<th>Mode</th>
<th>Structural</th>
<th>Cohesion</th>
<th>National</th>
<th>EIB</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Road</td>
<td>3544</td>
<td>1821</td>
<td>2194</td>
<td>1290</td>
<td>8849</td>
</tr>
<tr>
<td>Rail</td>
<td>356</td>
<td>797</td>
<td>384</td>
<td>365</td>
<td>1902</td>
</tr>
<tr>
<td>Seaports</td>
<td>240</td>
<td>13</td>
<td>162</td>
<td>21</td>
<td>436</td>
</tr>
<tr>
<td>Airports</td>
<td>128</td>
<td>0</td>
<td>52</td>
<td>3</td>
<td>183</td>
</tr>
<tr>
<td>Other</td>
<td>30</td>
<td>74</td>
<td>31</td>
<td>0</td>
<td>135</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>4298</strong></td>
<td><strong>2705</strong></td>
<td><strong>2823</strong></td>
<td><strong>1679</strong></td>
<td><strong>11505</strong></td>
</tr>
</tbody>
</table>

Table 3.3.4 summarises the progress of the Spanish programme.

<table>
<thead>
<tr>
<th>Mode</th>
<th>Planned</th>
<th>Actual</th>
<th>% Source</th>
<th>Planned</th>
<th>Actual</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Road</td>
<td>11557</td>
<td>8849</td>
<td>Structural</td>
<td>6109</td>
<td>4298</td>
<td>70</td>
</tr>
<tr>
<td>Rail</td>
<td>3063</td>
<td>1902</td>
<td>Cohesion</td>
<td>3855</td>
<td>2705</td>
<td>70</td>
</tr>
<tr>
<td>Seaports</td>
<td>575</td>
<td>436</td>
<td>National</td>
<td>4135</td>
<td>2823</td>
<td>68</td>
</tr>
<tr>
<td>Airports</td>
<td>374</td>
<td>183</td>
<td>EIB</td>
<td>1679</td>
<td>1679</td>
<td>100</td>
</tr>
<tr>
<td>Other</td>
<td>210</td>
<td>135</td>
<td>64</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>15779</strong></td>
<td><strong>11505</strong></td>
<td><strong>73</strong></td>
<td><strong>15778</strong></td>
<td><strong>11505</strong></td>
<td><strong>73</strong></td>
</tr>
</tbody>
</table>

Of the principal areas of expenditure, the road building programme has been implemented most successfully, with an actual/planned percentage of 77%. Road expenditure in Spain accounted for 59% of all road expenditure in Objective 1 regions. Rail spending has been rather slower, at 62% of planned. As regards the funding sources, the Structural, Cohesion and Spanish National funding has all been in proportion to the total spending. As usual, the EIB loans have been fully drawn down.

3.3.3 Performance of the Operational Programme

Table 3.3.5 provides a summary of the progress in implementing transport infrastructure projects in Spain under the OPT.

<table>
<thead>
<tr>
<th>Mode</th>
<th>Target</th>
<th>Achieved</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Road km/100k²</td>
<td>318</td>
<td>322</td>
<td>101</td>
</tr>
<tr>
<td>km/1000,000 hab</td>
<td>530</td>
<td>528</td>
<td>100</td>
</tr>
<tr>
<td>Cost (Meuro)</td>
<td>10,267</td>
<td>7,559</td>
<td>74</td>
</tr>
</tbody>
</table>
The targets for the development of the national road system have been achieved and even slightly exceeded. In the railway sector the actions for the modernisation of infrastructure, aimed at increasing speeds and safety, have made significant progress.

The programmed measures for ports, to increase capacity and service quality, have been successful in increasing freight movements.

National air traffic has grown in Spain during the period of the Operational Programme both for passengers and freight. This is not solely attributable to the investments within the CSF, but also to the economic growth of the country and the growth of the tourism sector.

The contribution of the current CSF to the development of transport infrastructure is founded on the strategic position of Spain. The OPT has supported the construction of key projects within the transport network. These interventions have been effective in bridging the gap between the lagging regions and the most developed, and although there are still shortages in the network, priorities for the next OPT, the inter-regional links within the main transport corridors have been substantially improved.

In most cases, the actions undertaken within the current OPT complete previous actions, strengthening the efficiency of the whole network and increasing the benefits obtained from economic activities. The strategic nature of the completed measures has not only been in accordance with the principles of the Trans European Network policies, but has also contributed to improving the accessibility to the regions thereby producing a more balanced regional transport infrastructure endowment.

The assessment carried out in this study of the results and impacts of these actions, faced the normal problems within this field. It is relatively easy to produce physical indices, as well as some indices of a more technical nature. The information collated by the different agents responsible for the management of these projects is satisfactory in this regard.

The road provision in Spain, when measured purely as road length per square kilometre, is
low. For example, by this measure Spain’s objective regions have an index of 0.31 compared with 1.90 for Germany, 1.47 for France and 1.58 for the UK. The source for these data is the Public Works Ministry. The conclusion that Spain’s non-motorway road network still requires development is supported by the indicators in Table 3.3.1, which combines road density and population density.

With regard to road transport in the OPT the expected outcomes were to achieve travel time savings, bringing about reductions in travel costs and increasing the competitiveness of the different industries, as well as the number of accidents. In some cases the travel time saving by road and the improvement in the security conditions have been dramatic, for example, Madrid and Vigo via the Rias Baixas Motorway, has reduced from eight to five and a half hours. This motorway along with the N-VI Benavente-La Coruña (1377 Meuros) has the highest budget with a total cost of 958 Meuros.

The evidence from ex-post studies indicate significant economic benefits from the road construction programme, with typical benefit/cost ratios of nearly three, and internal rates of return of over 20%. Thus, although transport investment has been biased in favour of roads in Spain, the projects have been speedily implemented and have produced significant economic benefits.

The current Community Support Framework has achieved an enormous advance in road transport, with consequent improvement in the private transport mobility. On the contrary, if we did the same exercise with railway transport we could see that there are some situations which remain exactly the same. That is the case, for example, with the Line Madrid-La Coruña, which is still using the same infrastructure, rolling stock and quality service as ten years ago, taking more than ten hours to cover a distance of six hundred and fifty kilometres.

The main expected outcomes in railway transport were to provide a high quality service and improve the accessibility to the freight producer centres. Although there have been important investments in the railway network, especially in the High Speed Line Madrid-Barcelona, still under construction, and the upgrading of the line Madrid-Valencia (speed up to 200/220 Km/h), the outcomes have not been significant yet at a global level. Of the lines mentioned above, plus the High Speed Line Madrid-Seville, the quality of the service is still under the European average and the communications by rail with the West/NortheWest of the Peninsula, and the West-East movements are deficient.

Regarding the situation in the metropolitan areas the construction of new ring roads and link roads have slightly mitigated the traffic congestion but there are still bottlenecks in some corridors, specially on coastal routes during the peak periods. Meanwhile the potential of local and regional trains has not been as exploited as it could have been.

For all these reasons it seems appropriate to change the emphasis of new strategies towards encouraging the use of public transport and supporting combined transport.

In respect to the maritime transport, the main OPT expected outcome was to improve the freight loading and unloading systems and the service quality. This objective has clearly been achieved, and now the Spanish Ports are in a better position to deal with future demands.
Finally, with regard to air transport the expected outcome were to satisfy the foreseen demand and to improve the quality of the service. The investment on this mode of transport is far behind the investments made on road or railway, and in spite of the improvements obtained, specially in the upgrading of the passenger terminals, there are still bottlenecks in air traffic and capacity problems to face the future demand.

In the case of Madrid airport the problems go beyond what it is strictly a transportation question, implying conflicts between National and local authorities.

3.3.4 Indication of Future Priorities

The main regions in Spain with great potential for future development are the following:

- Northwest of Spain: the corridor Vigo-Santiago-La Coruña joined by the A-9 Motorway;
- Eastern Mediterranean Region: Barcelona-Valencia joined by the A-7 Motorway;
- Ebro Valley corridor: Barcelona-Zaragoza-La Rigoja-Basque Country joined by the A-68 Motorway; and

The regions still not consolidated but with great potentialities, which could be developed with the support of new transport infrastructures are the following:

- North-South of Spain (Asturias-Andalucia): the Oviedo-Zamora-Salamanca-Cáceres-Sevilla corridor. The N-630 Road should be converted into Motorway; and
- Cantabrian corridor: Santander-Oviedo-La Coruña. This corridor should also be joined by Motorway.

Road Priorities:

- Conversion of N-630 into Motorway. This new axis North-South would allow the development of regions such as Extremadura, to obtain a more Net-Like Network; and
- Completion of the Cantabrian Motorway: Santander-Oviedo-La Coruña. This new corridor would remarkably improve the accessibility of the North of Spain to Europe.

Railway Priorities:

- Completion of the High Speed Line Madrid-Barcelona, currently under
construction;

• High Speed Line Madrid-Valencia;

• New Line Madrid-Valladolid through Segovia upgraded up to 200 Km/h; and

• Upgrading of the Lines Valladolid-Palencia-Ponferrada/Vitoria.

Special Factors in Spain

Planning and Construction. It is acknowledged that there has already been a significant effort put into the planning and construction phases of the transport network and infrastructure both at national and regional level. The results obtained so far are satisfactory, but although there have been advances, there is still a long way to go in order to reach the European Union transport standards. A number of key projects, already embodied in both Regional and Nationals Plans, remain to be completed in the forthcoming OPT.

Exploitation and Maintenance. Following construction, policies for management and maintenance will be required in order to maximise the benefits of the new investment. The efficient exploitation of new or improved infrastructure will help to achieve the desired levels of development included in the Regional Development Plan.

Integration of Programmes. The new regulations for Structural Funds open the possibility of implementing integrated Operational Programmes, financed by more than one Fund. Therefore, a change in the management direction of future OPT will have to focus on compatibility between all the interested parties and institutions involved at national level.

There is a real need for better co-ordination between ERDF and Cohesion Fund procedures. To date, both funds have been managed separately, with a Subdirectorate General for each one, although dependent on the same Ministry. Some transport infrastructures considered in the RDP and the OP of Objective 1 Regions as priority actions, and thus eligible for ERDF funding, are also within the TEN in Spain, and therefore eligible for Cohesion funding as well. However in the last CSF, and due to the recently revised regulations of both funds, ERDF and Cohesion Fund have independently been managed. A co-ordination effort is recommended at national and regional level to re-organise and co-ordinate the complex Spanish Administration in order to facilitate the decision making process for the Operational Programme for Transport.

Priorities for future OPT should be to make full use of the recently funded infrastructure, to complete the missing links in the existing network, and to keep the same level of standards and budget margins for planning and construction of new links. These priorities will require a series of institutional changes based on the rearrangement of the public administration to foster co-operation derived from the new compatibility between ERDF and Cohesion Funding.

Institutional. The overlapping of various institutions involved in the OPT adds to the difficulty of planning and implementing OPT schemes. The participation of four administrations (local, provincial, regional and national) in the decision making process provokes disagreement as, quite often the most efficient solutions are not clearly defined. Secondly the different agents create a complex national/regional network of
participants who share and divide responsibility on the decision making process and financial control.

**Access to databases.** There are considerable difficulties concerning access to data and information related to the Spanish Operational Programme for Transport. Institutional improvements are required in order to clarify the accessibility procedures for agents involved in the process. This should aim to improve co-ordination and national organisational duties.

As far as we are aware, no projects in Spain have been funded using the PPP route.

### 3.3.5 Recommendations

The *generic themes* for Spain are as follows:

<table>
<thead>
<tr>
<th>Recommendation 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>The programme should now concentrate on rail improvements, since this sector is relatively under provided for.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Recommendation 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>The road programme should continue, with emphasis being placed on regional roads and regional connections to the TEN.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Recommendation 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whilst the implementation process appears to be very efficient in Spain, the planning process through the four “layers” of government may need streamlining to ensure all parties take ownership of projects.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Recommendation 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intermodal projects, particularly freight, for example, at ports between rail and sea should be supported.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Recommendation 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consideration should be given to intra-regional projects, particularly in the urban centres, to promote local economic development.</td>
</tr>
</tbody>
</table>

**Specific recommendations:**

<table>
<thead>
<tr>
<th>Recommendation 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rail: the Madrid – Barcelona high speed line, currently under construction and part-funded by the Cohesion Fund should be completed.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Recommendation 7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rail: The new line between Madrid and Valladolid through Segovia in the corridor to Galicia to be upgraded to 200 km/h operation.</td>
</tr>
</tbody>
</table>
Recommendation 8
Rail: In the Madrid - Galicia corridor, upgrading of the lines from Valladolid onwards to Palencia and Ponferrada/Vitoria.

Recommendation 9
Roads: Upgrading of the N-630 road in the Asturias - Andalucia corridor, from Oviedo - Zamora - Salamanca - Cáceres - Sevilla. This is an application of a regional and inter-regional route which would have benefits in promoting both intra- and inter-regional development.

Recommendation 10
Roads: Completion of the Cantabrian Motorway along the North Coast in the Santander - Oviedo - La Coruña corridor, linking these regions to the rest of the EU via France. This route could be considered for PPP funding.
3.4 Italy

3.4.1 Objectives and Strategies

The Operational Programme for Transport in Italy sets out the following three key objectives:

• the provision of essential infrastructural support for the development of productive sectors;
• the creation of long-term sustainable employment;
• improved integration of networks to promote intermodality; and
• Specific transport infrastructure measures include: improvements to strategic highway corridors, railway upgrading to remove bottlenecks, increase capacity and improve intermodality and airport improvements to increase capacity and safety.

The table below summarises the original Operational Programme for Transport, 1994-1999, expenditure intentions.

Road network interventions have focused on; upgrading existing roads to promote better accessibility to peripheral regions; safety improvement; and improved integration with other modes (ports and airports).

The rail improvement programme aims to: remove bottlenecks; improve intermodality; and promote modal competition, through the double tracking and upgrading of main inter-urban routes. Airport infrastructure measures are aimed at reducing traffic congestion and improving safety through improvements to existing runways.

The transport indicators for Italy at the start of the current Operational Programme were as follows:

<table>
<thead>
<tr>
<th>Table 3.4.1: Italy - Summary of Transport Indicators at OPT Start</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Objective 1 Regions</strong></td>
</tr>
<tr>
<td><strong>Motorway Provision</strong></td>
</tr>
<tr>
<td><strong>Other Roads</strong></td>
</tr>
<tr>
<td><strong>Rail Lines</strong></td>
</tr>
<tr>
<td><strong>Double Track Rail</strong></td>
</tr>
<tr>
<td><strong>Electrified Rail Lines</strong></td>
</tr>
</tbody>
</table>

Note: Indicator is defined as the square root of (length of route/1000 inhabitants) * (length of route/km²). Thus it combines the demand element, largely determined by population, and the geographical dispersion of population centres.

The Operational Programme for Italy was unusual in that it was principally aimed at rail improvements. In fact, the OPT for Italy was consistent with the needs of the Objective 1 regions. The indicators show that motorway provision was only slightly below that of the EC12 as a whole (0.036 compared with 0.045). Similarly, overall rail provision was similar in
the Objective 1 regions compared with Italy as a whole and the EC12
(0.111/0.123/0.149), but the amount of double track railway was much less in the
Objective 1 regions (0.025/0.046/0.061). The amount of double track railway is
particularly important, because doubled lines have more than twice the capacity of
single-track lines. This is because single lines have the additional constraint that a train in
one direction must clear the single section before a train in the opposite direction can
pass through. This imposes severe timetabling constraints for passenger trains. There may
also be increases in speed available because doubling often allows some re-alignment
of tracks to take place.

The OPT contained schemes for increasing rail capacity, particularly doubling existing
single lines and improving the capacity of other lines by introducing better train control
systems. The rail projects were a mix of improvements and new lines for urban railways,
where there is a clear link with regional and sub-regional economic development, and
improvements to inter-urban routes, where reduction of peripherality and increased inter-
regional accessibility can also be achieved.

The indicators in Table 3.4.1 show that Motorway and Other Road provision in Objective 1
regions was deficient, but not seriously so. Therefore, the road projects in the Operational
Programme were primarily concerned with increasing capacity on existing roads through
widening rather than building roads in new corridors. Again this is consistent with the
needs of the Objective 1 regions in Italy, and also with the objectives of the General
Transport Plan. This is especially true of the road improvements on the islands of Sicily and
Sardinia, where the main projects concerned the widening of the main spine roads from
2x1 lane highways to 2x2 lane highways. Some consideration was given in the road
programme to international links to Greece through better communication to the ports
of Brindisi and Oranto on the southeast coast of Italy, so that there was an economic
development benefit to two Objective 1 countries in the programme.

In conclusion, the OPT for Italy was complementary to the needs of the Objective 1
Regions and contained the right balance of rail and road projects bearing in mind the
needs of the Objective 1 regions of Italy.

### 3.4.2 Expenditure - Planned and Actual

<table>
<thead>
<tr>
<th>Mode</th>
<th>Structural</th>
<th>Other (PPP)</th>
<th>National</th>
<th>EIB</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Road</td>
<td>249</td>
<td>0</td>
<td>0</td>
<td>249</td>
<td>498</td>
</tr>
<tr>
<td>Rail</td>
<td>791</td>
<td>0</td>
<td>0</td>
<td>1191</td>
<td>1982</td>
</tr>
<tr>
<td>Seaports</td>
<td>40</td>
<td>80</td>
<td>67</td>
<td>0</td>
<td>120</td>
</tr>
<tr>
<td>Airports</td>
<td>55</td>
<td>0</td>
<td>0</td>
<td>55</td>
<td>110</td>
</tr>
<tr>
<td>Other</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1135</strong></td>
<td><strong>80</strong></td>
<td><strong>3</strong></td>
<td><strong>1495</strong></td>
<td><strong>2710</strong></td>
</tr>
</tbody>
</table>

The most striking feature of the Italian OPT is its modesty. Of course, Italy does not qualify
for Cohesion funding, which reduces the potential total funding. However, if the
Cohesion funds are subtracted from the total external funding, the Italian programme
represents contribution of 63 Euros/head compared with 337 – 566 Euros/head for the
other countries.
As already noted, the Italian programme is heavily biased towards rail, which constituted 73% of planned expenditure.

Table 3.4.3: Italy - Actual Expenditure Allocations by Mode of Transport/Fund Source

<table>
<thead>
<tr>
<th>Mode</th>
<th>Structural %</th>
<th>Other %</th>
<th>National %</th>
<th>EIB %</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Road</td>
<td>61</td>
<td>50</td>
<td>0</td>
<td>61</td>
<td>122</td>
</tr>
<tr>
<td>Rail</td>
<td>442</td>
<td>40</td>
<td>665</td>
<td>60</td>
<td>1107</td>
</tr>
<tr>
<td>Seaports</td>
<td>42</td>
<td>34</td>
<td>83</td>
<td>66</td>
<td>125</td>
</tr>
<tr>
<td>Airports</td>
<td>4</td>
<td>50</td>
<td>0</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>Other</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>549</td>
<td>40</td>
<td>83</td>
<td>730</td>
<td>1362</td>
</tr>
</tbody>
</table>

Table 3.4.4 summarises the progress of the Italian programme.

Table 3.4.4: Italy - Summary of Planned and Actual Expenditure

<table>
<thead>
<tr>
<th>Model</th>
<th>Planned</th>
<th>Actual</th>
<th>% Source</th>
<th>Planned</th>
<th>Actual</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Road</td>
<td>498</td>
<td>123</td>
<td>25</td>
<td>1135</td>
<td>549</td>
<td>48</td>
</tr>
<tr>
<td>Rail</td>
<td>1982</td>
<td>1108</td>
<td>56</td>
<td>Cohesion</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Seaports</td>
<td>120</td>
<td>125</td>
<td>104</td>
<td>National</td>
<td>1495</td>
<td>730</td>
</tr>
<tr>
<td>Airports</td>
<td>110</td>
<td>8</td>
<td>73</td>
<td>EIB</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Other (PPP)</td>
<td>0</td>
<td>0</td>
<td>Other</td>
<td>80</td>
<td>83</td>
<td>104</td>
</tr>
<tr>
<td>Total</td>
<td>2710</td>
<td>1364</td>
<td>Total</td>
<td>2710</td>
<td>1362</td>
<td>52</td>
</tr>
</tbody>
</table>

The rail programme in Italy was implemented more successfully than the road programme, again in contrast to the OPT as a whole, where road projects had a greater degree of realisation than rail projects.

For both road and rail projects in Italy, implementation has been much slower than the average for all countries. In all countries, actual expenditure on rail projects amounted to 67% of that planned, compared with 56% in Italy, and for road projects, 75% for all countries compared with 25% in Italy. By contrast, the Port of Gioia Tauro project, which was not even in the original OPT, was funded in 1996/1997 and completed by the end of 1999.

Are there reasons for the slow implementation of these projects, especially the road projects, and the rapid implementation of the port project? First, the port project was financed by means of a PPP. Secondly, the finance for the road programme was largely dependent on State funding; the OPT consisted of only about 6-7% of the total project cost, so that the implementation of these projects depended largely on State finance. Thirdly, for rail projects, the Structural Funds contribution was about 40%.

Thus it would appear that the larger the financial interest of the EC in a project, the more likely it is to be completed sooner rather than later. Secondly, a major self-contained
3.4.3 Performance of the Operational Programme

For some Road measures physical progress can be assessed on the basis of the length of stretches of road constructed. The two measures for which an analysis of the current state is available (Measure 1.1 Messina-Palermo and Measure 1.2 Salerno-Reggio-Calabria) report that works on Structural Funds were started in 1998 and completion is expected in Autumn 2000: an estimated physical progress of approximately 50%.

With regard to air transport progress has been made in the upgrading of runways at Bari and Palermo airports. Improvements to the airport buildings in Cagliari and Olbia are planned as part of a significant revision to the OP (100 MEuros added in 1998).

Information about rail projects is very poor though the advanced level of expenditure indicates that the physical progress of works is likely the highest among the different Operational Programmes (more than 50% of the works should be considered as completed).

3.4.4 Indication of Future Priorities

The Operational Programme 1994-1999 that was analysed in this Study found its inspiration in the planning documents as the former General Transport Plan, the development plans of FS and the Investment Plan of ANAS (the National Institute for Roads). The OP it was used to accelerate and to promote the implementation of measures which already had a long planning history behind them.

The major impact of the interventions described above has been to complete the main backbone of the network and the achievement of a higher level of service (capacity and average speed).

The further development of the network that will be included in the next CSF 2000-2006 should still give priority to development of the primary network, complementing the TEN but at a somewhat lower level. The previous approach was for the development of the network in a hierarchical sequence, resulting to some extent in a lack of a real network approach. Integration, particularly between road and rail and between seaports and road/rail, is seen as a priority for the future programme.

The first report in connection with the next CSF for years 2000-2006, highlights the importance of having a coherent approach between the projects funded through EU and the overall National Transport Policy guidelines that are summarised in the New General Transport Plan.
The New General Transport Plan, embodies some important new topics. The most significant are:

- to pay more attention to integration between different modes, to underline the importance of a network approach with hierarchic level for roads, railways, ports, interports;
- to reach the highest level of accessibility in the regions concerned in order to promote the development of economic activities, the basic goal of the Community Support Framework; and
- to promote a concrete development, with long term effects, but respecting as well the criteria of environmental sustainability.

The future priorities in Italy can be described as further infrastructure needs or, from a wider point of view, in terms of improvement of the operational procedures for carrying out the Operational Programmes. The planning procedure combines the infrastructure interventions proposed by the Regions with the new CSF for years 2000-2006. To produce the Regional view is mainly oriented towards interventions at a local level, while proposals from National Central Government Ministries are mainly focusing on the integration of the main networks. The CSF 2000-2006 should contain further improvements of the network, implemented more efficiently and according to programme.

Improvements should encompass:

- **road network**: capacity of road network should be increased mainly by means of improvement of existing roads;
- **rail network**: the main north-south corridors on the East and on the West coast are still priorities, but so are transversal connections;
- **integrated network**: by strengthening the network of multi-modal centres; and
- **airports system**: should be upgraded by means of faster connections with city centres and by supporting the carrying of goods by air.

The improvement of the procedures of application of the Operational Programme will be achieved by means of:

- integrated plan of regional and multi-regional programmes and choices;
- support to the realisation of feasibility studies in order to provide useful tools for the assessment of projects;
- promotion of Public Private Partnership;
- simplification of the carrying out procedures: approval of plans, activation time
etc.; and

- strengthening of the monitoring activity and of the ex-ante and ex-post assessment.

3.4.5 Recommendations

**Recommendation 1**
Priority must be given to the completion of existing projects, particularly those in the road programme, before significant new projects are commenced.

**Recommendation 2**
Project Financing: there is scope in Italy for greater use of the PPP route, especially for roads, ports and urban transport systems. The institutional infrastructure is in place, and there is already a tradition of motorway tolls in Italy. In these cases Structural funds would play the role of “priming” the project rather than making a significant overall contribution to project finance, perhaps in the form of feasibility studies which included a financial appraisal, to make the project ready for a PPP investment.

**Recommendation 3**
The road programme should concentrate on widening in existing road corridors, and provide a mix of intra-regional and inter-regional projects. The Salerno – Reggio di Calabria motorway upgrading should be considered as a PPP project.

**Recommendation 4**
The rail programme should continue to support projects which increase the capacity of the system by increasing the amount of doubled track, and introducing modern train control systems. More projects should serve an intermodal function. Institutional reform of the Southern Italian Railways would increase the cost-effectiveness and efficiency of the system.

**Recommendation 5**
Urban projects can successfully reinforce the economic role of regional centres. Improved urban transport for the major cities in the region such as Napoli and Bari would bring good economic and environmental returns.
3.5 Greece

3.5.1 Objectives and Strategies

The core objectives of transport infrastructure improvements in Greece are to:

- reduce peripherality by developing improved land, sea and air links to the rest of the EU;
- develop integrated multi-modal transport corridors along the northern Mediterranean;
- reduce travel times for land transport on the Greek mainland;
- improve accessibility to the islands; and
- combat congestion in the main urban centres.

Specific transport infrastructure measures benefiting from community support are divided into three main sub-programmes; roads/port/airports, rail transport and urban development.

Road infrastructure improvements focus on two main motorway corridors; the Patras- Athens-Thessaloniki corridor (Pathe route) and the Igoumenitsa-Thessaloniki-Kipi corridor (via Egnatia route). Port and airport projects are directed at the modernisation of both internal and international terminals. The new Athens International Airport at Spata is one the 14 ‘Essen’ priority TEN projects. Rail infrastructure improvements include; modernisation of inter-urban lines, new rolling stock and a new link to the port of Kavala. The urban development programme is concerned with the construction of two metro routes in Athens.

Projects currently under construction in Greece include:

- Pathe motorway;
- Via Egnatia motorway;
- Athens-Thessaloniki high speed rail line;
- Pireus-Athens-Thessaloniki rail electrification;
- Athens-Patras high speed rail line; and
- rail signalling schemes.
The transport indicators for Greece at the start of the current Operational Programme were as follows:

| Table 3.5.1: Greece - Summary of Transport Indicators at Programme Start |
|-------------------------|--------------------------|-----------------------|-----------------|
|                        | Greece | EC 12 |                      |
|                        | Objective 1 Regions | All Country |                  |
| Motorway Provision     | 0.0104 | 0.0104 | 0.045               |
| Other Roads            | 1.09   | 1.09   | 3.17                |
| Rail Lines             | 0.068  | 0.068  | 0.149               |
| Double Track Rail      | 0.0068 | 0.0068 | 0.061               |
| Electrified Rail Lines | no data* | no data* | 0.067             |
| Airports (no./1000 pop.) | 0.00343 | 0.00343 | 0.00071          |

Note: Indicator is defined as the square root of (length of route/1000 inhabitants) * (length of route/km²), except for airports which is as stated. Thus it combines the demand element, largely determined by population, and the geographical dispersion of population centres.

*Eurostat contains no data for Greece for electrified rail lines in 1994.

The important features of the transport indicators for Greece are as follows:

- The low level of roads provision in general and motorways;

- The extremely low level of both railway lines and, especially, double track rail lines which form only 10% of the network; as we have noted elsewhere, double track operation gives more than double the capacity of single track operation and gives far greater flexibility of operation. The amount of double track railway is particularly important, because doubled lines have more than twice the capacity of single-track lines. This is because single lines have the additional constraint that a train in one direction must clear the single section before a train in the opposite direction can pass through. This imposes severe timetabling constraints for passenger trains. There may also be increases in speed available because doubling often allows some realignment of tracks to take place; and

- The large number of airports, which is due to the difficult terrain within Greece, the number of islands, and the isolation of Greece from the rest of the EU – land routes are via the Republic of Macedonia/Serbia or Bulgaria/Serbia.

### 3.5.2 Expenditure - Planned and Actual

<p>| Table 3.5.2: Greece - Original Expenditure Allocations by Mode of Transport/Fund Source |
|---------------------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|</p>
<table>
<thead>
<tr>
<th>Mode</th>
<th>Structural</th>
<th>%</th>
<th>Cohesion</th>
<th>%</th>
<th>National</th>
<th>%</th>
<th>BB</th>
<th>%</th>
<th>Other</th>
<th>%</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Road</td>
<td>713</td>
<td>23</td>
<td>275</td>
<td>9</td>
<td>501</td>
<td>16</td>
<td>655</td>
<td>21</td>
<td>905</td>
<td>30</td>
<td>3049</td>
</tr>
<tr>
<td>Rail</td>
<td>736</td>
<td>49</td>
<td>599</td>
<td>40</td>
<td>24</td>
<td>2</td>
<td>54</td>
<td>4</td>
<td>93</td>
<td>6</td>
<td>1507</td>
</tr>
<tr>
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<td>0</td>
<td>43</td>
<td>24</td>
<td>138</td>
<td>76</td>
<td>180</td>
</tr>
</tbody>
</table>
The projects within the OPT for Greece in the current programme were reasonably consistent with the country’s transport needs. The rail expenditure was a higher proportion of the total OPT budget than the road expenditure, although the need for rail improvements is high. However, it must be acknowledged that doubling rail lines in a country like Greece is difficult due to topographical features, and it is quite possible that there are few rail projects at a sufficiently advanced stage of preparation to be allocated funds.

The low level of seaport projects in the programme also seems inconsistent with Greece’s location, and should be addressed in the next programme.

Table 3.5.3 shows the actual expenditure in Greece.

Table 3.5.3: Greece - Actual Expenditure Allocations by Mode of Transport/Fund Source

<table>
<thead>
<tr>
<th>Mode</th>
<th>Structural</th>
<th>%</th>
<th>Cohesion</th>
<th>%</th>
<th>National</th>
<th>%</th>
<th>BB</th>
<th>%</th>
<th>Other</th>
<th>%</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Road</td>
<td>291</td>
<td>10</td>
<td>161</td>
<td>4</td>
<td>1677</td>
<td>44</td>
<td>655</td>
<td>17</td>
<td>0</td>
<td>0</td>
<td>2784</td>
</tr>
<tr>
<td>Rail</td>
<td>444</td>
<td>43</td>
<td>486</td>
<td>47</td>
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<td>655</td>
<td>5</td>
<td>45</td>
<td>4</td>
<td>1038</td>
</tr>
<tr>
<td>Seaports</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>43</td>
<td>52</td>
<td>40</td>
<td>48</td>
<td>83</td>
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<td>Airports</td>
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<td>0</td>
<td>0</td>
<td>465</td>
<td>85</td>
<td>81</td>
<td>15</td>
<td>546</td>
</tr>
<tr>
<td>Metro</td>
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<td>0</td>
<td>0</td>
<td>182</td>
<td>63</td>
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<td>0</td>
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<tr>
<td>Other</td>
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<td>0</td>
<td>0</td>
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<td>56</td>
<td>100</td>
<td>0</td>
<td>0</td>
<td>56</td>
</tr>
<tr>
<td>Total</td>
<td>735</td>
<td>15</td>
<td>647</td>
<td>13</td>
<td>1868</td>
<td>39</td>
<td>1378</td>
<td>29</td>
<td>166</td>
<td>3</td>
<td>4794</td>
</tr>
</tbody>
</table>

Table 3.5.4 summarises the progress of the Greek programme.

Table 3.5.4 Greece - Summary of Planned and Actual Expenditure to end 1998

<table>
<thead>
<tr>
<th>Mode</th>
<th>Planned</th>
<th>Actual</th>
<th>%</th>
<th>Source</th>
<th>Planned</th>
<th>Actual</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Road</td>
<td>3049</td>
<td>2784</td>
<td>91</td>
<td>Structural</td>
<td>1449</td>
<td>735</td>
<td>15</td>
</tr>
<tr>
<td>Rail</td>
<td>1507</td>
<td>1038</td>
<td>69</td>
<td>Cohesion</td>
<td>1982</td>
<td>647</td>
<td>13</td>
</tr>
<tr>
<td>Seaports</td>
<td>180</td>
<td>83</td>
<td>46</td>
<td>National</td>
<td>993</td>
<td>1868</td>
<td>39</td>
</tr>
<tr>
<td>Airports</td>
<td>777</td>
<td>546</td>
<td>70</td>
<td>EIB</td>
<td>1378</td>
<td>1378</td>
<td>29</td>
</tr>
<tr>
<td>Metro</td>
<td>2785</td>
<td>287</td>
<td>10</td>
<td>Other</td>
<td>2552</td>
<td>166</td>
<td>3</td>
</tr>
<tr>
<td>Other</td>
<td>56</td>
<td>56</td>
<td>100</td>
<td>Total</td>
<td>8354</td>
<td>4794</td>
<td>57</td>
</tr>
</tbody>
</table>

Despite the utilisation of PPP in the roads programme, the completion of the PATHE and Via Egnatia motorway systems has not been consistent with the expenditure of funds. We have not been able to undertake a detailed and independent review of the institutional factors in Greece, but clearly there must be a further improvement in project preparation procedures in order to speed up implementation of major projects.

3.5.3 Performance of the Operational Programme
As far as we have been able to ascertain, the roads intended to be funded in the OPT for Greece were completed to about 30%, whereas expenditure has been 90%. We have not been able to fully resolve the reasons for the discrepancy, but clearly there is a significant mis-match between expenditure on roads and physical progress.

With regard to implementation of the rail programme, physical implementation appears to be around one-quarter of the total, whereas expenditure has been about 70% of that allocated. Again, we have not been able to resolve the reasons for this gap.

The Athens International Airport at Spata has been a success. Physical progress has kept pace with expenditure for this project which is one of the 14 “Essen” TEN priority projects.

3.5.4 Recommendations

The generic themes for Greece are as follows:

<table>
<thead>
<tr>
<th>Recommendation 1</th>
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<tbody>
<tr>
<td>Current major projects in the road, rail and metro programmes should be completed before large new projects are introduced to the programme.</td>
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<table>
<thead>
<tr>
<th>Recommendation 2</th>
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<tbody>
<tr>
<td>Investment in ports, and links to ports, particularly rail if practicable, should be a priority, especially to the Ionian Islands and Italy.</td>
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<thead>
<tr>
<th>Recommendation 3</th>
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<tbody>
<tr>
<td>Urban projects, such as the Metro projects in Athens and Thessaloniki, should be priorities as they assist regional development, shorten journey times, increase employment opportunities, and reduce pollution.</td>
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<tr>
<th>Recommendation 4</th>
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<tr>
<td>Inter-urban rail and inter-modal freight projects should be a priority.</td>
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</table>

Specific recommendations for Greece are:

<table>
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<th>Recommendation 5</th>
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<tbody>
<tr>
<td>Construction of the extensions to the Athens metro (which are mainly surface and therefore easier to build).</td>
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<th>Recommendation 6</th>
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<tr>
<td>Port re-development at Patras, Thessaloniki and Igoumenitsa (the latter connects with Otranto and Brindisi in Italy) and access improvements.</td>
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<th>Recommendation 7</th>
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<tr>
<td>Construction of Thessaloniki Metro – construction is about to start.</td>
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<th>Recommendation 8</th>
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<tr>
<td>Complete the missing links in the PATHE and Via Egnatia motorways, provided that the current programme is completed.</td>
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</table>
3.6 Germany

Since Germany has not received any structural funding, for transport under the 1994-1999 OPT, we have undertaken two tasks:

- First, an assessment of existing transport problems which are hindering economic growth; and
- Second, an assessment of future priorities.

3.6.1 Existing Problems

(a) Poor accessibility

The eastern German region is the eastern border of the EU. Deliveries and services have a stronger connection to the EU than Poland, Russia or the Czech Republic. Therefore, the current geographical border location is a disadvantage in comparison to regions such as the Koln-Aachen region. In addition, it is insufficiently connected to the rest of the German network (e.g., Uckermark Region in N.E. Germany on the Polish border, Lausitz in middle-east Germany).

(b) Lack of coherent networks

The current transport networks suffer from a lack of connectivity and significant bottlenecks. For example, the rail connection Leipzig - Nuremberg, travel time Berlin-Nuremberg in 1990: 7 hr 50 mins, after the extension 2 hr 40 mins. The tracks go through the mountainous area and former border between Bayern and Thuringen. The standards of the railway are, in part, those from before 1933. These two factors lead in particular on this route to very bad connections that are well below typical EU standards e.g., lack of highway connection between Leipzig/Halle and Magdeburg. These are two large cities and industrial centres that up to now are connected by a federal road that also goes through several other cities. At present, a detour on the Berlin Ring takes less time than the direct way. The development draws the traffic from the federal roads onto the Autobahn. The Autobahns A9, A10, A2 and A14 share the traffic.

There is also a problem of poor integration between modes. There are only a limited number of railroad, rail-airport, road-airport connections. Those that do exist do not meet the required standards.

(c) Inadequate capacity

Due to insufficient capacity on Autobahns, cars and lorries often take detours that again result in capacity overloads in the cities near the Autobahn, due to the lack of sufficient alternative roads. When the Autobahn is expanded from four lanes to six, this is reversed and the traffic is reduced on the federal and secondary roads because the Autobahn connection becomes more appealing for short distances as well. Some of the federal roads that feed into the Autobahns are then expanded from two lanes to four (e.g., B96).
3.6.2 Indication of Future Priorities

The following is a list of the projects rated with the highest priority by the BVWP:

**New construction of Autobahns and roads handling long distance traffic**
(Ostsee autobahn A20 VDE 10, Autobahn Gottingen-Halle A38 VDE 13, Magdeburg Halle A14, Kassel-Eisenach A44 VDE 15, Erfurt-Schweinfurt A71 VDE 16). In all of these cases the traffic on the federal roads would be reduced. In the Baltic Sea region, the roads that go through the cities and towns are relieved of transit traffic. The quality of living in these areas increases substantially.

**Higher capacity roads** from four lanes to six (Hannover-Berlin A2 VDE 11, Berlin Nurnberg A9 VDE 12). A2 and A9 are very important inner German axes that are also an important part of the trans-European network. Through the new position of Berlin in unified Germany, the level of traffic in the west German and southern German regions has increased and will continue to increase. This increasing demand should also be reflected in infrastructure development.

**New construction of by-passes on federal roads** (e.g. B96 between Berlin and Stralsund, B7 by-pass Weimer). The B96 is the larger long distance connection from Berlin between the Autobahn Berlin-Hamburg/Rostock and Berlin/Stettin (Poland). This stretch regularly has bottlenecks, in particular for recreational traffic that could be relieved through the construction of a by-pass.

**New rail capacity** in particular passenger and goods transport network connections and **rail modernisation** (improvements to 160 km/h (Berlin-Hamburg, Lubeck-Rostock-Stralsund) or 200 km/h (Berlin-Magdeburg-Braunschweig) or up to inter city express standards e.g. Inter City Express Berlin-Hannover, Berlin-Numberg). According to the German norms for railroads, routes that have limited grade crossings, have limited speed limits that are not allowed to exceed 160 km/h. For speed limits over 160 km/h it is necessary to build tracks without crossings. In the framework of the decision making process regarding the stretch Lubeck-Rostock-Stralsund, results showed that a maximum speed of 160 km/h is sufficient. For the stretch Berlin-Hamburg, a high speed limit would be desirable. However, the discussion on the Transrapid has not yet reached a final decision on the construction standard. At first the VDE selected the slower version. The route Berlin-Magdeburg-Hannover is relieved by the ICE-route Berlin-Hannover. However, it is still necessary to achieve a high standard of connection from the large city of Magdeburg to the Deutschen Bahn network.

**Intermodal facilities** are currently being build at the GVZ (commercial centre) Grobbeeren near Berlin, Halle-Leipzig. In this centre, it is planned to provide facilities to connect road systems. In addition the transhipment of the goods for the city is to be targeted and carried out in small units. These centres and the accompanying logistics are in the development phase. They are meant to help reduce the emissions produced by commercial transport in the long term.

**New/Improved airports** A stated goal of the regional governments of Berlin and
Brandenburg is the construction of a new airport in Berlin-Schonefeld with rail and road connections. The development plans of the airport in Schonefeld have not yet been finally completed at the moment. This airport is planned to replace the inner city airports Tempelhof and Tegel. However, there are some in the political arena that would like to retain these airports. It is not possible at present to predict the turnout of the plans for the Schonefeld airport at present. The expansion of the Leipzig airport for the economic region of Saxony is also under discussion.

A priority list has also been developed for short distance traffic in the municipalities. At a certain priority level the expansion of the S-Bahn or tram system or the purchase of vehicles is supported according to the Gemeindeverkehrsfinanzierungsgesetz.

**Urban transport schemes** (e.g. metro: the old S-Bahn is planned to serve as the backbone of short-distance-traffic for commuters to larger cities in certain regions. It is planned to provide the S-Bahns with their own tracks on the property of the railway system in order to ensure effective operation. The tram systems that are still in operation in all cities are to be replaced with modern low-floor trams.

BM BF (Bundesministerium fur Bildung und Forschung) is a research programme around within mobility in conurbation’s that aims to examine alternative traffic management systems. These systems are supposed to use the new opportunities available through Internet and vehicle navigation systems.

### 3.6.3 Recommendations

**Policy Emphasis**

**Recommendation 1**

The future transport investment programme in the Objective 1 areas of Germany will need to take account of the needs for improved local accessibility to centres of commercial activity and the increasing strategic importance of the region for both north-south connections to other EU regions and east-west connections to accession country markets.

The regional development objectives for the New German Lander need to be supported by transport infrastructure improvements at a local, inter-regional and international level. This will require a package of measures that aim to complete missing infrastructure links, improve the capacity of existing links and improve the inter-connectivity between transport modes.

**Recommendation 2**

The completion of missing links in the strategic (autobahn) road network is a particular priority.

The current highway networks currently contain significant gaps, that is, an important economic centres are not connected by motorway standard routes. Specific priority projects are:

VDE 10: Lübeck – Stettin (A20, Ostseeautobahn)
VDE 11: Hannover - Berlin (A2), Berliner Ring (A10)
VDE 12: Berlin - Nürnberg (A9)
VDE 13: Göttingen - Halle (A14,A9)
VDE 14: Magdeburg-Halle (A14)
VDE 15: Kassel - Eisenach - Gőrlitz (A44/A4)
VDE 16: Erfurt - Schweinfurt (A81)

The new autobahns will produce significant ‘knock on’ accessibility benefits by relieving federal routes, serving major towns that currently carry large volumes of transit traffic.

### Recommendation 3
The existing rail network is in need of modernisation and capacity improvement.

The rail system suffers from low travel speeds. A specific problem is the numerous at road crossings which limit the speeds of services. Additional infrastructure is required to create a grade-separated system that is capable of speeds of 160 kph or greater. Priority rail upgrading schemes include:

VDE 1: Lübeck/Hagenow-Land - Rostock - Stralsund
VDE 2: Hamburg - Büchen - Berlin
VDE 3: Uelzen - Salzwedel - Stendal
VDE 4: Hannover - Stendal - Berlin
VDE 5: Helmstedt - Magdeburg - Berlin
VDE 6: Eichenberg - Halle
VDE 7: Bebra - Erfurt
VDE 8: Nürnberg - Erfurt - Halle/Leipzig - Berlin
VDE 9: Leipzig - Dresden

### Recommendation 4
Significant travel time benefits could be achieved by relieving a number of specific bottlenecks on the federal road (Bundesstrasse) system.

These improvements would particularly benefit internal circulation of traffic within the Objective 1 region. A typical example is the B96 federal route between Berlin and Strausser where localised capacity improvements, such as town by passes, are required to reduce traffic delays.

### Recommendation 5
The further development of improved road freight logistics systems will help to increase the efficiency of freight operators and reduce environmental impact.

New freight centres are in the development phase, the first under construction at Grabbeeren near Berlin. These aim to provide more efficient freight connections and breakbulk operations that help reduce environmental impact of freight movements within built up areas.
Recommendation 6
The improvement in the quality and capacity of air transport are important in supporting the development of the commercial sector in Objective 1 regions.

Plans to improve air transport facilities include a proposed new airport in Berlin-Schonefeld, which would increase capacity and facilitate connections with road and rail networks. The proposals are currently subject to political debate.

Recommendation 7
The importance of good accessibility to product and labour should not be overlooked. The current priority is to modernise the tram systems (S-Babtie) in the larger cities.

Research is currently being undertaken to examine further opportunities for sustainable mobility in urban areas.
4 Total Programme Impact Analysis

4.1 Introduction

This section draws together the statistical information on transport infrastructure expenditure in individual countries to produce a series of cross-country and cross-mode comparative tables. The purpose of this comparison is to identify variations in spending patterns within the Objective 1 regions that benefit from EC funding interventions. The expenditure comparisons refer to total OPT expenditure, that is the sum of EC funding, national funding and other funding sources, such as EIB loans.

This chapter describes the impact of the operational programme in the following areas:

(a) An Analysis of Expenditure, actual and planned, for the whole programme, by mode of transport, and country. This will highlight significant differences between allocations in each country and between the modes, and which programmes had been implemented most successfully in financial terms;

(b) An assessment of the Methodological Issues arising from the evaluation; that is, recommendations regarding the way the OPT are formulated and evaluated in the future;

(c) An assessment of the Policies pursued in the country programmes, particularly the mix of transport modes supported by commission funds, compared with the most relevant of Community transport policies;

(d) An assessment of to what extent the programme paid attention to Environmental Impact and Sustainability;

(e) The impact of the programme on Access and Cohesion;

(f) An assessment of the programme’s impact on Economic Development; and

(g) An analysis of the Institutional Issues which have arisen in programme implementation.

4.2 Analysis of Expenditure

This section draws together the statistical information on transport infrastructure expenditure in individual countries to produce a series of cross-country and cross-mode comparative tables. The purpose of this comparison is to identify variations in spending patterns within the Objective 1 regions that benefit from EC funding interventions. The expenditure comparisons refer to total OPT expenditure, that is the sum of EC funding, national funding and other funding sources (such as EIB loans).

The analysis was structured in the following way:

- All Countries: Planned and Actual Expenditure by Mode;
Planned and Actual Expenditure by Mode and Country;

Planned and Actual Expenditure by Mode and Funding Source; and

Planned and Actual Expenditure by Country and Mode.

It should be noted that all actual expenditures in the following analyses are to mid 1999. The actual expenditure tables are important as they give good information on the pace and type of progress. It is possible to ascertain which types of project are easier to develop/implement and what is a reasonable programme size for each country and mode.

4.2.1 All Countries: Planned and Actual Expenditure (to mid 1999) by Mode

The total expenditure allocated for the 1994-1999 Operational Programmes for all countries was 40.6 billion Euros. The total spent was 29.1 billion Euros, or some 72% of that allocated, up to mid 1999. The expenditures are shown on Figures 4.2.1(Planned Operational Programme Expenditure by Mode) and 4.2.2 (Actual Operational Programme Expenditure by Mode).

The major allocations were to Road (57%) and Rail (24%), which reflects the most important inter-urban means of travel within the EU. These allocations were intended to address the deficiencies within the physical provision of these modes in the Objective 1 countries and regions. The allocations to urban transport systems, that is Metro projects, and intermodal projects was low, at 8% and 2% respectively. The reasons for the relatively low allocation to urban transport systems is that these have traditionally been the responsibility of regional and local authorities rather than National Ministries, through which Structural Funds are usually administered.

Urban public transport systems have three advantages: first, they may be used by all travellers, and not just car-owners, and thus serve a social equity objective as well as transport objectives; second, the benefits tend to be concentrated in the area where the investment takes place; by contrast, in Italy for example, it was estimated that over half of the economic benefits were generated outside of the Objective 1 regions for the rail and road programmes; and thirdly, investment in urban public transport tends to reduce car traffic and emissions in areas where people live and work, contributing to environmental objectives.

With regard to actual expenditures, expenditure on road projects, at 63% of the total, was higher than that in the planned profile (57%). This means that road projects, particularly inter-urban projects, are relatively easy to implement compared to other forms of transport. Generally speaking, there is much experience in National Ministries and capacities in the contracting industries to implement such projects. Often, there are many road projects which have been planned and designed, but not implemented because of a lack of National Funds, which can be readily built when funding, such as structural funds, does become available. Actual spending on rail projects contributed about the same proportion (24%) as that planned.

Progress on implementing Metro projects has been slow. This reflects the greater physical difficulties of planning, design and construction in an urban environment. In Athens, a
main source of delay was the difficulty in obtaining permissions to appropriate land.

4.2.2 Planned and Actual Expenditure by Mode and Country

Data for the comparison between planned and actual expenditure by mode and country is shown in Figure 4.2.3 ( Comparison of Planned and Actual Expenditure by Mode and Country), Figure 4.2.4 ( Planned Operational Programme Expenditure by Mode and Country) and Figure 4.2.5 ( Actual Operational Programme Expenditure by Mode and Country).

The main features of this comparison are as follows:

(a) **Road:** the actual expenditure was between 77% and 91% of planned expenditure, with the exception of Italy, where it was only 25% of a much smaller programme than in the other countries. This was because the contribution of structural funds was less than 10% to the total projects, and therefore implementation depended largely on the availability of Italian National funds. This shows that project implementation is more effective when the Structural funds form a significant proportion of total project cost.

With respect to expenditure between countries, the road sector was dominated by the Spanish and Portuguese programmes which between them accounted for over 70% of both planned and actual expenditure.

(b) **Rail:** Again, actual expenditure was a high proportion of allocated funds – between 69% and 92%, apart from Italy, where only 56% of allocated funds were spent.

With regard to expenditure on rail projects between countries, those with the largest programmed spend were Spain (31% of the total rail programme for all countries), Portugal (29% of the total programme), and Italy (20% of the total programme). Actual spending was largely in line with planned expenditure.

(c) **Metro:** progress here has been slow in both Dublin (Ireland) and Athens (Greece), where actual expenditure was 50% and 10% respectively of that planned. The problem in Greece was obtaining permissions for land purchases.

(d) **Airports:** the proportion of planned expenditure actually spent varied considerably in this sector, with percentage spends varying between Italy (7%) and Ireland (79%). In the case of Italy, the reason was that 90% of the funding was only agreed at the end of 1998, and there are no reasons to believe that the projects will not be speedily concluded.

(e) **Ports:** Planned port expenditure was largely completed, with actual spends in the range 81% to 104% apart from Greece, where the actual spend was 46%. A success story here was the Port of Gioia Tauro in Italy which was funded in 1996/7 and completed by 1999. It was a PPP project.

(f) **Integrated Transport:** The major parts of this relatively small programme, which are in Portugal and Spain, have been completed to the extent of 78% and 64%
respectively.

4.2.3 Planned and Actual Expenditure by Mode and Funding Source

The data for this comparison are show on Figure 4.2.6 (Planned Operational Programme Expenditure: Country Overview) and Figure 4.2.7 (Actual Operational Programme Expenditure to 1999: Country Overview).

The main features of this comparison are as follows:

(a) **Structural Funding.** A total of 11010 Meuros was allocated in the 1994-1999 OPT, of which 8053 Meuros (73%) was actually spent. The majority of Structural funds were allocated to road projects (65% of the total), and this is reflected in the actual spending, where 66% of total expenditure went on road projects. Rail projects accounted for a further 23% of allocated Structural Funds, but actual spend on rail projects was a lower proportion of the total at 21%.

Portugal had the highest actual spend - virtually 100% - of its structural fund allocations, while Greece had by far the lowest, where only 50% of its allocation has been spent.

(b) **Cohesion Funding.** A total of 8370 Meuros was allocated by the Cohesion Fund in the 1994-1999 OPT. The main allocations were to Road projects - 48% - and Rail projects – 30%. Interestingly, there was also a substantial allocation of 1108 Meuros from this source to a purely urban transport project, namely the Athens Metro. Because of delays in implementing this project, no Cohesion Funds were actually disbursed to it by mid 1999.

Of the 8370 Meuros allocated, 5166 Meuros (62%) was actually spent. Ireland actually spent more than its allocated funding - 836 Meuros as opposed to 745 Meuros, in contrast to Greece, which spent only 33% of its 1982 Meuros allocation, largely because of the zero spend on Athens metro.

(c) **EIB loans.** These accounted for 7549 Meuros of allocated funds, that is 19% of the overall OPT allocation. The allocations to the different modes again reflected the overall pattern, with the largest allocation to road projects (56%) and rail projects (31%). However, this fund did support airport projects to a greater extent than the other funding sources, where 9% of its total was allocated to airports, as opposed to only 3% of structural funds and 2% of cohesion funds. The main beneficiary of airport funding was Spata Airport in Greece.

These funds were totally drawn down in the course of the OPT in line with their projected allocations.

(d) **National Funds.** National Funds were anticipated to contribute 11065 Meuros, that is 27% to projects that benefited from structural funds. The modal allocation mirrored that of the EU-sourced funds, with road projects accounting for 58% of the total allocations and rail projects 22%. The actual spending from National Funds amounted to 8102 Meuros, that is 73% of that allocated.
Whilst the total National Funding was the same as Structural Fund allocations, there were variations within countries. For example, in Ireland, Italy and Portugal national allocations exceeded Structural Funds, while in Spain and Greece, the National Funds allocations were less than the Structural Funds. With regard to actual spending, the same pattern was evident, although in Ireland’s case National Funding and Structural Funding were exactly matched.

4.2.4 Planned and Actual Operational Programme Expenditure by Country and Mode

The data for this comparison are shown on Figure 4.2.8 (Planned Operational Programme Expenditure by Country and Mode) and Figure 4.2.9 (Actual Operational Programme Expenditure by Country and Mode).

The main features of this comparison are as follows:

(a) **Spain.** Spain’s OPT was dominated by Road projects, which accounted for 11557 Meuros – 73% of its total programme allocation of 15779 Meuros. This was the largest national programme, accounting for 39% of the total OPT. Spain’s road programme alone was significantly larger than any of the other countries’ total programme. Rail projects in Spain accounted for a further 19% of the planned OPT.

Actual spending in Spain amounted to 11505 Meuros, that is 73% of the planned expenditure. Road projects were implemented rather more successfully in financial terms than rail projects: 77% of planned road expenditure was actually spent, compared with 62% of planned rail expenditure.

(b) **Portugal.** Portugal’s OPT, at 9285 Meuros, was the second largest National OPT, and formed 23% of the total programme. The road programme formed 51% of planned expenditure. The Portuguese rail programme was the largest, at 2653 Meuros, that is 33% of the national programme. The ports programme in Portugal was also the largest, at 627 Meuros it formed 8% of the national programme.

In financial terms, the Portuguese programme was the most successfully implemented, with actual spending amounting to 87% of that planned. All the modal elements of the programme had completion rates of between 78% and 92% apart from the relatively small airports programme, where only 42% of the planned expenditure was actually spent.

(c) **Greece.** Greece’s planned OPT was the third largest and amounted to 8354 Meuros, that is 21% of the total for all countries. The composition of Greece’s programme was considerably different to those of other countries, in that 33% of the programme’s expenditure was allocated to an urban public transport project, namely Athens Metro. The other major components were roads (33%), rail (18%) and air (9%).

Actual expenditure was relatively low at 57% of that planned, although there were considerable variations between modes. For example, 91% of the planned expenditure on roads was actually spent, 70% of the airports allocation, and 69% of the rail allocation, but only 10% of the Metro allocation illustrating the
considerable variation of implementation success between modes.

(d) **Ireland.** Ireland’s programme was, in total, 4500 Meuros, that is 11% of the overall programme. Ireland’s programme was predominantly allocated to roads, with 68% of total expenditure allocated to this part of the programme. Rail and Dublin Metro each formed a further 10% of planned expenditure, and air 8%.

Actual expenditure amounted to 3415 Meuros, that is, 76% of the allocation. The programmes within each mode showed similar, high rates of actual spend – between 78% and 83% of that planned – apart from Dublin Metro, where actual spend was only 50% of that planned.

(e) **Italy.** Italy’s OPT was significantly less than that of other countries, at a planned 2710 Meuros, or 7% of the total for all countries. It was also different in that the majority of expenditure was directed towards rail (73%), and only 18% to road projects.

Actual expenditure in Italy was only 50% of that planned. Rail projects spent 1108 Meuros, that is 56% of the planned 1982 Meuros, and road projects only 25% of that planned. The reasons for this low spend seem to be predominantly the fact that structural contributions formed only a small part of the total project expenditure.

### 4.3 Sectoral Impact Analysis

This section summarises the issues that have implications for the 1994-1999 operational programme as a whole, and will have application in all future programmes. They are grouped together under the following headings:

- **Methodological Issues:** that is recommendations regarding the way the OPT are formulated and evaluated in the future;
- **Transport Strategy:** that is the contents of the strategy in terms types of project and policy objectives;
- **Environment and Sustainability:** these issues will be at top of the forthcoming transport policy agenda in the European Union and will need special attention in the next programmes;
- **Institutional Issues:** this section will examine the experience of implementing the 1994-1999 programme to identify common themes, including funding issues such as the role of Private Public Partnerships (PPP).

#### 4.3.1 Methodological Issues

The following common themes arose from the evaluation:

(a) **Use of Indicators**
Indicators are somewhat coarse, and should not be the sole arbiter of whether investment is appropriate by the Commission. But what it does mean is that the Commission should seek additional grounds for, say, motorway improvements in Germany or Spain, where provisions is close to the EU average, other than a mere comparative lack of such facilities.

We recommend the use of indicators which utilise land area, population and a measure of comparative wealth, since the latter is the main driver of transport demand and consumption of goods. For example, one would expect developing economies in say, the Accession Countries to have a lower need for high capacity infrastructure than in a more developed country of similar area and population.

The indicators should be applied with common sense. For example, islands or peninsulas will have high air passenger and maritime freight indicators: in this case Ireland, Portugal, Spain and Greece should be compared with each other rather with the EU as a whole.

Relying on indicators for investment decisions requires that transport and socio-economic data is kept up to date.

(b) Use of Evaluation Framework

The evaluation framework would provide a common basis for comparing the impacts of the programme as a whole and individual projects within the programme. The framework is intended to measure, either qualitatively or quantitatively, the extent to which the programme or projects achieves its objectives in the following categories:

- **Overall strategy:** how are the schemes in the programme formulated to meet Structural and Cohesion Fund objectives?
- **Physical progress:** how has actual implementation measured up to the plan?
- **Economic evaluation** (transport-related): what Net Present Value (NPV) or Economic Internal Rate of Return (EIRR) is achieved by major projects?
- **Operational assessment:** how well do the projects perform in improving levels of service, reducing journey times, increasing capacity and levels of usage?
- **Regional economic development:** an assessment of additional employment created, direct and indirect, inward investment, other measures of economic welfare;
- **Environmental impact:** summary of the environmental impacts of the programme and individual projects;
- **Sustainability assessment:** does the programme promote energy efficiency, clean vehicles/modes, social equity, non-mechanised modes of travel, safe and secure travel?
- **Integration:** does the programme promote integration between modes of travel, rail interoperability and cross border travel?
- **Institutional arrangements:** is the organisation for planning and implementing projects efficient in terms of National and local responsibilities, and responsibilities between different Ministries and Departments?

This framework, shown in Annex B, would facilitate the horizontal comparisons of projects, and the comparison between expectation and reality in the ex-ante and ex-post evaluations. If evaluation methods develop during the currency of the programme, then
the framework could be improved, but always in an upwardly compatible manner.

If quantitative results are not available, then judgement supported by a reasoned justification should be provided.

(c) Economic and Regional Development Impacts

There are clearly genuine difficulties here. The estimates of employment generated rely more on economic principles, albeit sound ones, than observed facts. This is because it is very difficult to isolate the specific impacts of transport infrastructure from all the other influences at a local, regional, national and international level. A further problem is that economic impacts are not contained within the region where the investment was made, so that the impacts are very broad but very shallow.

Assessing the ex-post impact of the transport programme will have to be made by reference to factors such as local land and rental prices, development pressures, completion of houses, industrial, retail and commercial premises in the vicinity of the transport project. If transport infrastructure provision really does influence local economies in a real way, these are the types of indicator which would reveal changes induced by such provision. These measures give an indication of the actual differences that transport infrastructure makes to local economies, in a way that macro-measurements at regional or national level tend to disguise.

4.3.2 Transport Strategy

(a) Policy Objectives

All five of the countries concerned in this analysis have pursued mixed infrastructure development strategies that combine elements of road, rail, airport, port and urban transport strategies.

Overall, the focus of expenditure during the programme period has been towards road infrastructure development (accounting for 64% of actual OPT spending) although the balance of spending does vary considerably between countries. For example, in Spain, road spending accounted for 77% of total spend, whereas in Italy, rail infrastructure accounted for 73% of planned and 81% of actual expenditure.

The focus on road infrastructure is viewed by national administrations as appropriate due to the need to bring the basic level of infrastructure provision closer to EU ‘norm’. There are many references to the need to fill gaps in the existing road primary road networks and to the need to complete major schemes that have been subject to delay or cost overrun.

There is some evidence of a change in strategy emphasis in terms of the types of schemes that are currently demanding priority attention. The initial emphasis was clearly towards ‘primary’ route or inter-urban schemes forming the ‘backbone’ of the national networks, that either connect urban centres or improve access to remote Objective 1 areas. Two different types of road infrastructure are now becoming more prominent, specifically:
secondary road network (for example in Ireland, Italy, Portugal) that serves as a feeder system to the primary road network; and

peri-urban road schemes which aim to relieve congestion in major cities (e.g. Lisbon, Dublin).

In Ireland and Portugal this shift of emphasis seems to be synonymous with rapid economic development, reduction in unemployment levels and therefore a new focus on labour supply rather than job creation. Indeed there are concerns that the recent high economic growth levels achieved in major economic centres, such as Dublin and Lisbon, could be rapidly compromised by rising congestion. The strategies employed in the 1994-1999 OPTs do contain schemes that aim to address the urban congestion issue, such as the Atiko Metro in Athens and the ring road systems of Lisbon and Porto. In Ireland, Dublin is notable for the development of the Dublin Transport Initiative (DTI). The DTI is a comprehensive transport management strategy that combines elements of infrastructure to improvement (roads and public transport systems) with elements of demand management (parking charges, controlled parking zones, bus priority system etc.). This move from new infrastructure provision towards the better management of infrastructure represents an interesting trend that may well be of relevance to the future direction of funding in Objective 1 regions.

The OPT and the specific measures must be consistent with EU transport policy. This has been apparent to some extent in the existing programme, but some important changes of direction have been made since the current programmes were drawn up in the early 1990s. The CSF does give the Commission an excellent opportunity to influence Member States’ transport policies to be compatible with EU policies. For example, among the most important are: environmental impact assessments, which should be carried out for individual transport projects, and a strategic environmental assessment made for the modal programmes; projects should explicitly contribute to air quality targets; the programmes should demonstrate that they are in harmony with “Fair and Efficient Pricing”; and projects which contribute to increasing combined transport and intermodality should be included in the programmes.

The main EU policies which should be implemented in future OPT are as follows:

| Table 4.3.1: Summary of EU Transport Policies Relevant to Structural Funding |
|-------------------------------|------------------|
| **Policy Area**               | **Recommendation** |
|                               |                  |

57
<table>
<thead>
<tr>
<th><strong>Thematic Study of Transport: Method and Synthesis</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>4 Total Programme Impact Analysis</strong></td>
</tr>
<tr>
<td><strong>Environmental Impact Assessments</strong></td>
</tr>
<tr>
<td><strong>Air Quality Directive for SO2 and Nox</strong></td>
</tr>
<tr>
<td><strong>Air Quality draft Directive for Benzene and Carbon Monoxide</strong></td>
</tr>
<tr>
<td><strong>Fair and Efficient Pricing</strong></td>
</tr>
<tr>
<td><strong>Maritime Safety</strong></td>
</tr>
<tr>
<td><strong>Road Safety</strong></td>
</tr>
<tr>
<td><strong>Port Reception Facilities to deal with Ship Generated Waste</strong></td>
</tr>
<tr>
<td><strong>Transport TEN</strong></td>
</tr>
<tr>
<td><strong>Combined Transport and Intermodality</strong></td>
</tr>
</tbody>
</table>

(b) **Integration and Intermodality**

The review of the OPTs demonstrated that projects tended to be implemented on a modal basis, reflecting the institutional structure of the Ministries in each country. This has in some cases led to unfortunate consequences: in Portugal, rail freight has more than halved, while at the same time Structural Funds have contributed to a major road building programme. It is possible that there is a similar trend in Spain, and in Greece rail freight now plays an insignificant role in internal freight transport. Our recommendation here is:
Each project assesses carefully the role of each mode in the transport corridor and makes an explicit assessment of the impact on competing modes, especially of road projects on rail transport. Further, we recommend that in corridors where both road and rail improvements are planned, the Structural Funds are directed towards the rail project as a priority Urban Transport Projects.

Investment in urban public transport projects encourage intra-regional development and are an effective way of increasing employment opportunities for all residents: as such they serve transport, employment and social equity objectives. The most effective projects for large cities are public transport projects such as Athens and Thessaloniki Metros and Luas in Ireland. Such systems provide guaranteed short journey times, relieve traffic congestion and reduce emissions. They can also be implemented in conjunction with traffic management projects, and stations can be nodal points for commercial development. Our recommendation in this area is:

From the country analyses we conclude that urban projects supported by the Structural Funds concentrate on Public Transport projects, especially those operating on segregated systems, such as rail-based systems (tram and metro) and Guided Busways. These should be implemented in conjunction with traffic management projects. Other Road and Rail Projects.

The analysis showed that inter urban road and rail projects showed good economic returns, since journey time savings per journey were high, and therefore could be converted into real economic gain. The benefits of such investment can be twofold if such projects also perform a sub-regional role.

Road investment should be concentrated on routes which form part of an inter-city network, but which also contribute to local accessibility at a sub-regional level.

### 4.3.3 Environmental Impact and Sustainability

These issues will form the agenda for tomorrow and therefore greater attention will need to be paid to these issues in the forthcoming OPT.

The evaluation reports reveal a general sensitivity within Member States to the principles of sustainable mobility and the need to minimise environmental impact. In some cases, for example in Greece, projects had been halted because of environmental impact concerns. There are a number of examples of schemes where environmental concerns have resulted in substantial modifications to designs to avoid impact (e.g. tunnels on the PATHE motorway in Greece).

In most cases major infrastructure projects are subject to environmental impact assessments (EIA) during the procedures for selecting schemes and in designing mitigation measures. The EC directive 85/337 is mandatory for only certain types of transport project: our view is that an Environmental Impact Assessment (EIA) should be done for all Structural Fund projects.

The evaluations identify two distinct type of environmental impact; firstly the direct, specific impacts of infrastructure construction and, secondly the indirect impacts arising from increased transport use, such as, air pollution and noise. Air pollution is singled out...
as a particular concern in major urban areas such as Athens, Dublin and Lisbon. These concerns highlight the potential ‘downside’ of successful economic development strategies and point towards a need to ensure that environmental concerns are given appropriate consideration alongside economic development priorities.

In terms of general CO₂ emissions, the trends in the countries studied do not vary from the general emissions increase trend in the EU 15 countries. The cohesion countries have, however, a faster growth of emissions in the period 1994-1999 than the other EU countries (some have a decrease such as Sweden and the UK). It should be noted, however, that all of the cohesion countries, when measuring tonnes/person, show figures that are between 20-45% lower than the EU average. In terms of CO₂ emissions by transport measured in million tonnes of crude oil equivalents (Mtoe), the picture is much the same with an increase of emissions as follows:

**Table 4.3.2: Emissions by Country**

<table>
<thead>
<tr>
<th>Country</th>
<th>1993 (Mtoe)</th>
<th>1996 (Mtoe)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spain</td>
<td>72</td>
<td>82</td>
</tr>
<tr>
<td>Portugal</td>
<td>13</td>
<td>15</td>
</tr>
<tr>
<td>Italy (all country)</td>
<td>106</td>
<td>110</td>
</tr>
<tr>
<td>Ireland</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>Greece</td>
<td>19</td>
<td>19</td>
</tr>
</tbody>
</table>

As comparisons, the figures for Germany in 1996 were 181, for the Netherlands 38 and for Sweden and Belgium 22 and 26 respectively.

When measuring the final energy consumption by transport as measured also in million tonnes of crude oil equivalent, Spain doubled its consumption from 17.7 million tonnes in 1985 to 33.7 million tonnes in 1997. This is a similar consumption to that of the Netherlands (25.6). Portugal, Greece and Ireland all showed similar developments and have a final energy consumption from transport of 5.2 million tonnes, 9.8 million tonnes and 3.1 million tonnes respectively in 1997. As a comparison Sweden, Denmark and Finland have, in the same year, figures that show 9.0, 6.2 and 7.6 million tonnes consumed respectively.

There is a further issue here concerning evaluation at a programme level, using a so-called Strategic Environmental assessment (SEA). At the moment, local, project-by-project EIA are carried out fairly late in the planning process and often deal with mitigation or comparative assessments of alternative routes. In 1996 the Commission proposed SEA for among others, transport corridors, but no Directive was agreed. However, the OPT are an excellent example of where an overall SEA could apply.

As noted above, there is evidence that environmental concerns are now receiving greater priority in the formulation of urban transport strategies. The evaluations of Ireland and Greece have noted the introduction of a range of national government initiatives directed towards principles of sustainable mobility. These initiatives contain a raft of infrastructure and non-infrastructure measures that aim to reduce the adverse environmental impacts of transport and promote a more efficient transport system. Examples of supporting government policies have been used as part of sustainable transport strategies are outlined below.
(a) **Ireland**

- Planning guidelines that encourage the concentration of development in public transport corridors;
- development guidelines to promote higher density of development;
- vehicle testing regimes – to improve safety and emissions;
- scrappage schemes – to replace older elements of the vehicle stock;
- purchase taxes designed to encourage the purchase of smaller engines; and
- studies into the potential application of the ‘polluters pays’ principle.

(b) **Greece**

- noise monitoring and reduction strategies;
- improved vehicle emission testing;
- urban ‘green areas’ policy; and
- development of co-ordinated mass transit systems.

These examples could be used to form the basis of ‘best practice’ guidelines to support the next funding round. The exchange of information on the feasibility and effectiveness of these supporting transport policies would potentially be very helpful in encouraging the wider adoption of principles of sustainable mobility.

### 4.3.4 Impacts on Access and Cohesion

In all five countries analysed the transport infrastructure developments were seen as providing major improvements to both internal and international accessibility.

Evidence of substantial reductions in travel times are identified in the country evaluation reports. For example:

- **In Greece** the completion of improvements to the Athens – Thessaloniki – rail route is expected to produce travel time saving in excess of 1 hour;
- **In Ireland** national primary road measures are estimated to produce annual travel time savings of over £40m (IRE);
- **In Portugal** it has been estimated that new road infrastructures have reduced average travel times by about 20% and rail schemes in northern Portugal have
reduced freight transit times by over 70%; and

- In Spain the conversion of over 1300km of dual carriageway roads and motorway standards has produced travel time saving of about 20% and the upgrading of over 2300km of dual carriageway route have produced travel time savings of over 10%.

The direct impacts of infrastructure improvements are not restricted to travel time improvements. The analysis illustrates that:

- **Road** improvements can bring important safety benefits – particularly the construction of segregated dual carriageways that significantly reduce the incidence of accident fatalities;

- **Road** improvements are also seen to bring important reliability benefits – a feature that is not always evident as an accessibility benefits but one that can significantly improve the attractiveness of an area for inward investment;

- **Rail**: upgrading rail infrastructure the quality of service (interchanges and rolling stock) is regarded as an important factor – particularly to enable competition with the benefits afforded by modernised road systems;

- **Air**: in a number of countries (e.g. Greece, Italy, Portugal) air transport improvements are directed predominantly at the expansion of capacity – particularly to handle seasonal tourist demands; and

- **Port** infrastructure improvements, such as those in Portugal and Italy are predominantly aimed at providing modernised infrastructure, capable of handling Ro-Ro and container traffic and thus enabling more effective competition with ports outside Objective 1 regions.

### 4.3.5 Economic Development Impacts

**Context of the Evaluation**

The countries of the European Union support the economic and structural development of under-developed countries and regions by means of the Structural Funds, of which the main element is ERDF, and the Cohesion Funds. The ERDF has four objectives, of which “Objective 1” is the particular concern of this Study.

**Objective 1** is:

“Promoting the economic development and structural adjustment of regions whose development is lagging behind the European Union’s average.”

The criterion for designation as an “Objective 1” region is that GDP per capita had amounted to 75% or less of the community average over a three year period. The Structural Funds constitute about one-third of the Community budget.
The regulations stipulate that the ERDF should provide support for:

- Productive investment;
- The creation or modernisation of infrastructure which contributes to the development or conversion of the regions concerned;
- Measures to exploit the potential for internally generated development of the regions concerned; and
- Investment in the fields of education and health in Objective 1 regions.

Thus, it is extremely important to note that the task of the ERDF is not specifically transport related: transport development is a means of delivering the wider objectives of the Fund. The real value of ERDF funding in the transport sector is therefore to be assessed in terms of the economic development of the assisted regions.

The Cohesion Fund was established with somewhat narrower objectives than the other funds. It is directed to states, not regions, and as well as having an economic development perspective there is an economic and monetary convergence dimension to the fund. Member States whose GNP per head is below 90% of the community average and who follow an economic convergence programme are eligible for assistance.

Cohesion funding is available for two types of project:

- **Environmental Projects**, that is projects which help to achieve the objectives of the Community’s environmental policy; and

- **Transport infrastructure projects**, that is projects which establish or develop transport infrastructure within the TEN, or projects providing access to the TEN.

The reasons for re-iterating these points are to emphasise the fact that the evaluation of the transport projects must be made in economic terms. The problem is that it has proved extraordinarily difficult to isolate the impacts of the transport programme from all the other influences on regional and economic development at a regional or national level. The principal problem lies in determining what might have been without the Structural and Cohesion Funds, that is establishing a baseline situation against which the impact of the Structural Funds could be measured. The second problem is in identifying which part of any changes observed can be attributable solely to the transport elements of the Operational Programmes. Further, the nature of transport projects is such that benefits do not arise pro-rata with completion rates. Often the benefits are only realised when the project is fully opened.

For these reasons the evaluations of the economic impacts of the Structural Fund interventions have had to rely on ex-ante modelled values. The advantages of this approach are that models can isolate the impacts of the transport infrastructure elements of any package, and, if properly specified, can identify the differences between countries and between investment in different modes of transport. For the most part therefore, the results presented in this report are derived from ex-ante analyses.
Investment in physical transport infrastructure can affect the economy through two different channels:

- Through the demand for goods and services in building, operating and maintaining the infrastructure – the **demand-side** impacts;
- Through the effects on the competitiveness of the economy of the provision of infrastructure – the **supply-side** impacts; and
- Impacts can be both direct and indirect.

The **direct effect** of transport investment is increased employment within the construction sector as output within that sector increases. The demand for materials and machinery increases also, increasing imports. The indirect effects of this are increased spending on goods and services due to increased incomes and prices adjusting to the changes in demand.

The spending of money generates demand side effects within the economy through the purchase of goods and services. This impact is generally substantially larger than the supply side effects, but of course only lasts while the expenditure continues, for example, during the course of road construction. The long-term impact of the investment will ultimately be determined by the potential output of the economy. Clearly the direct employment and economic benefits of investment depend on:

- amount of “new” money invested, which, if contributions from national funds are excluded, amounts to 21000 Meuros;
- labour intensity of the sector in which the investment is made; and
- unemployment rate.

In broad terms, the investment of the Structural Funds in transport projects has been beneficial. The investment by the European Commission in the Structural Funds clearly represents additional investment as far as the recipient countries are concerned, although at a pan-European level it could be argued that the funds are re-allocations of investment that would have been made in the donor countries, and do not therefore represent truly new investment. Construction is quite a labour intensive sector of the economy, and therefore investment in transport construction is an effective way of boosting demand side employment effects in the short term. In addition, the assisted regions generally have both low employment rates and high unemployment rates, so in theory at least new transport construction should assist in increasing the number of people in work.

The more important long-term effects of infrastructure investment in transport can be expected on the supply side of the economy, improving the efficiency of both the product and labour markets. These can potentially occur through the following mechanisms:

- In the **product market**, time and money cost savings deriving from improved
infrastructural investment generate cost efficiencies for industry. This increases competitiveness and profitability, encouraging growth and investment; and

- In the **labour market**, shorter commuting times and reduced journey costs expand labour catchment areas by encouraging workers to consider jobs at locations more distant from their homes. Firms can therefore draw on labour from wider catchment areas with positive impacts on productive efficiency.

It is worth noting that a “traditional” economic evaluation of a transport project attempts to quantify the supply side benefits to the economy, albeit in an aggregated form. The assumed mechanism is that travel time savings to travellers on business can be productively used, and that savings in vehicle operating costs again will feed through to improvements in the product and labour markets. In well-developed transport systems there is some doubt as to whether all of the estimated savings will actually be realisable in practice. This is because transport investments in well-developed networks tend to deliver only small savings in time per journey, and there is evidence to show that small time savings are not always convertible into productive use. In economic evaluations, constant values of time are used, regardless of the size of the average time saved per journey. This means that an aggregated time saving of 1000 minutes will be valued in the same way, whether it is composed of 1000 journeys with a one minute saving each, or 20 journeys with a saving of 50 minutes each. In practice, of course, the time savings in the second case are much more likely to be convertible to productive purposes.

| In this context, the noteworthy aspect of the structural Funds interventions is that the average journey time savings are large. For example, travel time savings of up to 90 minutes were reported in Greece, 60 minutes in Portugal for passenger journeys, and three days for rail freight. Athens metro will more than halve passenger journey times. In these circumstances, the estimated supply-side benefits are far more likely to be realised in practice in the Objective 1 regions and countries than for transport investments in developed networks where additional savings per journey are much smaller. |

With respect to modes of travel, a significant volume of investment has been directed towards interurban road and rail projects, and urban public transport projects. These projects are less likely to generate sufficient volumes of new traffic that will undermine economic benefits to existing traffic. This is especially true of public transport investment, where journey times are generally unaffected by passenger loadings until severe overcrowding occurs. This is not the case for urban road projects, where the release of suppressed demand can lead to the virtual wiping out of benefits to existing travellers. This means that the most beneficial form of investment in congested urban areas will often be public transport projects such as new or rehabilitated metro and tram systems.

Economic impact can also be measured in cross-border trade. Even if it is difficult, not to say impossible, to distract the effects of transport infrastructure investment from general economic trends, it would seem reasonable to assume that improved accessibility has assisted in the development of these economies. The figures for the countries studied show that exported goods by cohesion countries to the rest of the EU have increased from 11% of their combined GDP to 15% from 1987-1997. Export of services showed the same pattern and rose from 1.5% to over 5.5% in the same period. In real terms, as GDP in itself rose, the exports of the cohesion countries to the rest of the EU has nearly doubled in the period 1987-1997.
4.3.6 Impact on Gross Domestic Product and Employment

Evaluation Information Supplied

We have collated a significant amount of evaluation data. Figure 4.3.1 summarises the type of information supplied for each country.

The cross-comparisons between different types of investment are made at the following levels:

(a) Regional GDP

We have included this measure because the fundamental objective of the Structural Funds is to increase GDP/head. There will be some form of relationship between transport infrastructure projects and GDP/head, although it is impossible to directly relate cause and effect in this case. However, one would anticipate finding a strong positive relationship between transportation investment and regional GDP, and such a relationship would provide some qualitative evidence for the effectiveness of the CSF programmes.

Estimates of the impact of the CSF and OP have been made for Spain, Portugal and Ireland. The implementation of the CSF by the medium of the Regional Development Plans (RDP) has coincided with significant increases in GDP in the assisted areas. For example, between 1992 and 1998 GDP in the Objective 1 regions of Spain increased by between 4% and 5% per annum, approximately double the national increase.

In Portugal, GDP increased by 23% during the currency of the DP (1994-1998), of which 3.7% was attributable to the RPD. It is estimated that the assisted measures in the RDP contributed an extra 0.5% per annum to GDP due to demand side effects.

In Ireland, the contribution of CSF road projects was estimated to be an additional 0.5% per annum due to demand side effects, and 0.2% per annum in the long term due to supply-side impacts.

Of course, transport infrastructure is a significant part of the CSF – 25% in the case of Spain and 13% in the case of Portugal – so it is reasonable to conclude that the transport investments played their part in the realisation of the increase in GDP/head in the Objective 1 regions. The allocation of CSF funding coincided with a recovery in GDP, so there are strong indications that there is of a causal link between the two.

In Italy, the OP is relatively small and it is difficult to discern an impact of the Objective 1 regions. In fact, over the period 1990-1996, the latest for which regional GDP are available, suggest that the south of Italy has fallen behind relative to the Centre and North East. It is impossible to say whether this relative decline would have been worse without the CSF.

In Greece, of course, the whole country has objective 1 status. Here, GDP increased by 16% over the period 1994-1999 and it is estimated that the CSF contributed 0.83% p/a, or 4.2% over the whole period.
It is impossible to isolate the effects of the transport programme alone in these countries, but the transport investment has clearly paid its part.

(b) Employment produced by the transport programme or CSF programme as a whole for each country

This will indicate the effectiveness of unit investment in the different countries. Differences between countries in the terms of the investment required to produce one employment unit will be due to differences in employment rates and starting GDP/head.

There were wide variations reported in the employment generated by transport improvements. In all cases, only demand-side impacts in terms of additional employment have been assessed, although in the case of Ireland, a monetary value was calculated for the supply-side impact of the Road Programme using conventional cost-benefit techniques.

In Spain, the employment generated by transport projects is estimated to be one unit (person year) per 24000 Euros, with the ratio of direct to indirect employment being 3.3:1. This means that for every one work unit generated directly in construction and operation of the infrastructure itself, a further 3.3 work units were generated in service industries through the purchase of additional goods and services.

Similar results were reported for Portugal, where it was estimated that 21400 Euros were required to generate one work unit.

In Ireland, the roads programme was estimated to produce 15 work units per 1 Meuros invested, or a rate of 67000 Euros per unit. This is a similar figure to that estimated for the road element in the Italian programme, where 72000 Euros were required to generate one work unit.

In Greece, the total employment generated by the road, air, port, railway and Athens Metro projects is estimated to be 56000 units.

In countries where some regions are designated Objective 1 and others are not, it is difficult to “contain” the employment benefits, especially for transport infrastructure projects which usually do not respect regional boundaries. In this respect, an interesting result was obtained from the Italian Rail programme where of the 98000 work units estimated to have been generated in total, just over 60% fell into non-objective 1 regions. This is a very important point to bear in mind, since construction companies are generally national and even international in character, and the specialist labour required for certain tasks may well not be available locally. With regard to the supply effects, a significant proportion of these may well occur outside of assisted regions, since many journeys will cross regional boundaries.

With regard to supply-side effects, the only information quoted was in Ireland, where a conservative estimate of these effects was an annual benefit of 134000 Euros per 1 Meuros invested was calculated, equivalent to a first year rate of return of 13.4%. This was for the Roads programme.
Using the data provided for the employment impacts in various countries, and calculating uniform rates for employment generated, it is possible to produce estimates for the total employment impact of the whole programme. The assumptions used are as follows:

- **Euro/work unit (=one person year of direct employment)**
  - road projects: 40000 Euros
  - rail and metro projects: 20000 Euros
  - airports and seaports: 40000 Euros
  - other and mixed modes: 30000 Euros
- Ratio of indirect to direct employment: 1.5:1

Applying these assumptions to actual expenditure by mode of transport in each country, we obtain the estimates shown in Table 4.3.3 below:

<table>
<thead>
<tr>
<th>Mode</th>
<th>Ireland Job Units</th>
<th>Portugal Job Units</th>
<th>Spain Job Units</th>
<th>Italy Job Units</th>
<th>Greece Job Units</th>
<th>Total Job Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Road Investment</td>
<td>2394</td>
<td>4080</td>
<td>8849</td>
<td>122</td>
<td>2784</td>
<td>18229</td>
</tr>
<tr>
<td></td>
<td>149625</td>
<td>255000</td>
<td>553063</td>
<td>7625</td>
<td>174000</td>
<td>1139313</td>
</tr>
<tr>
<td>Rail Investment</td>
<td>379</td>
<td>2653</td>
<td>1902</td>
<td>1107</td>
<td>1038</td>
<td>7079</td>
</tr>
<tr>
<td></td>
<td>47375</td>
<td>331625</td>
<td>237750</td>
<td>138375</td>
<td>129750</td>
<td>884875</td>
</tr>
<tr>
<td>Seaports Investment</td>
<td>139</td>
<td>627</td>
<td>436</td>
<td>125</td>
<td>83</td>
<td>1410</td>
</tr>
<tr>
<td></td>
<td>8688</td>
<td>39188</td>
<td>27250</td>
<td>7813</td>
<td>5188</td>
<td>88125</td>
</tr>
<tr>
<td>Airports Investment</td>
<td>282</td>
<td>193</td>
<td>183</td>
<td>8</td>
<td>546</td>
<td>1212</td>
</tr>
<tr>
<td></td>
<td>17625</td>
<td>12063</td>
<td>11438</td>
<td>500</td>
<td>34125</td>
<td>75750</td>
</tr>
<tr>
<td>Metro Investment</td>
<td>215</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>287</td>
<td>502</td>
</tr>
<tr>
<td></td>
<td>26875</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>35875</td>
<td>62750</td>
</tr>
<tr>
<td>Other Investment</td>
<td>0</td>
<td>495</td>
<td>135</td>
<td>0</td>
<td>56</td>
<td>686</td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>41250</td>
<td>11250</td>
<td>0</td>
<td>4667</td>
<td>57167</td>
</tr>
</tbody>
</table>
The total number of project related job opportunities created by the 1994-1999 programme is estimated to be over 900000 person years in direct employment, with a further 1400000 person years in indirect employment, giving a total of 2300000 person years. This is the demand-side employment impact only: further jobs will be produced in the long term by supply-side effects.

We must emphasise that these are estimates only, which rely on the assumptions above. These are not measurements, but rely on typical estimates of the impact of construction projects. The overall totals are more reliable than the individual mode and country totals.

(c) Employment produced by Mode of Transport

Is there any evidence that different modes of transport generate significantly different rates of employment per Euro invested? The evidence is patchy. It was estimated that the construction of the N-632 in Spain generated one work unit per 33000 Euros, about 40% more than the average for all transport projects. Similarly in Italy, the investment required to generate one work unit in a road project was about 3.5 times that for the rail schemes. On the basis of this limited evidence it is difficult to be certain that a real difference exists. Further disaggregation of the data would be required to confirm these indications.
5 Conclusions

5.1 Economic Impact Issues

These are the conclusions we can draw in this area:

Due to the nature of isolating the effects of transport infrastructure investment, there is a lack of good ex-post evaluation data available. We recommend that in future, projects are subject to both an ex-ante and ex-post evaluation using the framework developed as part of this project.

The nature and type of the transport infrastructure improvements in the Operational Programmes are such that the long term, supply-side benefits will be realisable in practice. Time savings are significant, and capacities adequate in the medium to long term. Public transport projects such as Athens Metro are suitable for urban areas on economic, as well as environmental, grounds. Investments in Objective 1 areas are more likely to realise economic benefits than investments in well-developed networks.

Increases in GDP at regional and national levels coincided with the CSF and consequent Regional Development Plans. It is impossible to say what proportion of the GDP increases were attributable to the transport element of the programmes, but since construction is relatively labour intensive, there is a strong case for suggesting that transport infrastructure plays a pro-rata role in short-term GDP increases.

Transport infrastructure investment is estimated to generate 1 work unit per 20000 – 70000 Euros, with more cases being reported in the 25000 area. These are the demand side impacts. Direct effects are given as between 40% and 75% of the total employment. These additional jobs will not necessarily be created in the assisted regions: in Italy it was calculated that 60% of these jobs were created in non-objective 1 regions.

There is evidence that public transport investment creates more jobs per unit of investment than road projects, but this aspect needs further analysis before firm conclusions can be made.

5.2 Institutional Issues

(a) Financial Instruments

Various EC communications (e.g. com (98) 806 ‘Cohesion and Transport’) have identified the potential efficiency gains of introducing a greater element of private sector finance into the process of transport infrastructure provision. Private sector involvement can help to reduce the pressure on public sector budgets and introduce a greater degree of market discipline which can help to speed up the delivery of projects. Private sector involvement may, however, depend on the ability to generate revenue streams (e.g. through road tolls). This can be difficult in Objective 1 regions where incomes are well below to EU average and hence the ability to generate user payments is low. Nevertheless the country evaluations have revealed a number of interesting cases in which private sector funding is making an important contribution toward infrastructures development. For example:
5 Conclusions

• In Portugal the government has successfully attracted the private sector into the provision of road infrastructure through the one of both privately run toll road schemes and ‘shadow’ toll schemes;

• In Italy the construction of the port of Gioia Tauro benefits from public and private funding. Government and EU interventions helped to provide port structures and inland connections whilst the private sector provided handling systems, information/communication systems and other supporting services;

• In Ireland research has been undertaken to examine the potential for rolling the national road network. The Government has now adopted a pilot programme of PPP projects involving road and light rail schemes; and

• In Greece private sector participation has been a feature of several projects including; the Rio-Antirion Bridge and Spata Airport. Further, the port authority has been converted into a corporation (SA) with the aim of developing PPP future schemes.

In summary, the experience of PPP is mixed. In purely intra-regional projects, which are primarily designed to reduce costs to the productive sectors of the economy, charging an economic rate for time and cost savings will negate cost reductions to industry. On the other hand, participation by the private sector with a financial motive has produced results. Our recommendations in this area are set out below.

We recommend that PPP is used in cases where the infrastructure is operated by the private sector or by public authorities acting as private companies. This applies most naturally to airports and seaports.

For roads, we recommend that PPP is used for circumstances where there is a natural barrier to be crossed, where the charge is for an obvious piece of physical infrastructure, and there are no issues of traffic diversion. Good examples are the Tagus Crossing, Antirion Crossing and Messina Straits. For motorways the situation is less clear-cut, but on balance we recommend that PPP is used for Cohesion projects where flows are inter-regional and international in nature.

For rail, unless services are privatised to some extent, PPP is extremely difficult to implement and inappropriate.

For urban projects such as Metro systems, PPP is possible, providing integration with other forms of public transport is not compromised.

(b) Intra-Government Organisation

Overall, there seemed to be a negative correlation between speed of implementation and the number of ministries involved in the recipient countries. For example, Portugal has a streamlined administration (only one ministry is involved) and its OPT was rapidly implemented. There is also a trade-off between speed of implementation and consultation and discussion with regional authorities. We hesitate to make recommendations regarding the internal structure of European Countries, except in regard to one matter. The number of documents and institutions contacted by our country representatives bears witness to the difficulty of ascertaining progress in the
implementation of the OPT.

The only recommendation that we make here is that monitoring of the Transport Programme progress is the responsibility of a single body in each country which coordinates and collates information. The precedent for this is the Monitoring Committee in Ireland.

One other conclusion we can make is that where Structural Funding formed only a small proportion of total project expenditure (the remainder being state-funded), project implementation was slow. By contrast, where Structural Funding formed a significant part of project expenditure, implementation was much faster.

We recommend that Structural Funds form a significant part (say 30%) of supported projects, or, if this is inappropriate, the projects have a guarantee from the recipient state that its funds will be made available.