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Transport

Final Report

July 2003

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[1] A joint venture between COWI, BCEOM and SYSTRA;

[2] Albania, Bosnia and Herzegovina, Croatia, Serbia and Montenegro, the former Yugoslav republic of Macedonia and UNMIK (Kosovo under international administration as per UNSCR 1244 of 10 June 1999);

[3] Chaired by EuropeAid, the ISG associates the major IFI's (Council of Europe Development Bank, European Bank for Reconstruction and Development, European Investment Bank and the World Bank), the EC Directorate General External Relations, the EC Directorate General Transport and Energy and the Stability Pact.

REBIS transport
Joint Venture

European Commission

Regional Balkans Infrastructure Study - Transport

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High-level summary

The REBIS study - funded by the EU Commission and focusing on the development of a multi-modal Core Transport Network for the Balkan region, similar to the Trans-European Networks of the European Union - concluded the following:

- The long-term (2004-2015) investments required to develop a regional Core Network for roads to acceptable standards are around EUR 4 billion. This investment will be possible with dedicated efforts by the countries and support by international donors and financing institutions. Prospects for privately financed and operated roads (BOT) are limited, and the development of the Core Network should not rely on such mechanisms;

- The long-term (2004-2015) investments required to develop a regional Core Network for railways to acceptable standards - even at a reduced level - are around EUR 12 billion. Considering their severe financial problems the railway companies must accelerate reforms and focus on selected markets and services where rail transport can contribute effectively to the transport system;

- As a first important step towards meeting the demands of the Core Network, a short-term investment plan of EUR 3.8 billion is proposed - to be implemented during the period 2004-09. This excludes required investments in the Danube River. The implementation of this plan will require dedicated efforts by the countries and support by international donors and financing institutions;

- The development of the proposed Core Network requires regional co-operation. It is recommended that the countries establish a joint Steering Committee and Secretariat to monitor the development of the Core Network.

0 Summary

The Regional Balkans Infrastructure Project, Transport - in the following referred to as REBIS - commenced in June 2002. The project is financed by the EU Commission and covers the Balkan countries of Albania, Bosnia and Herzegovina, Croatia, FYRO Macedonia and Serbia and Montenegro, including Kosovo which is under international administration in line with UNSCR 1244 of 10 June 1999. REBIS aims to assist these countries in developing coherent strategies for transport infrastructure development. It focuses in particular on the development of a regional Core Network and on the identification of projects suitable for international co-financing.

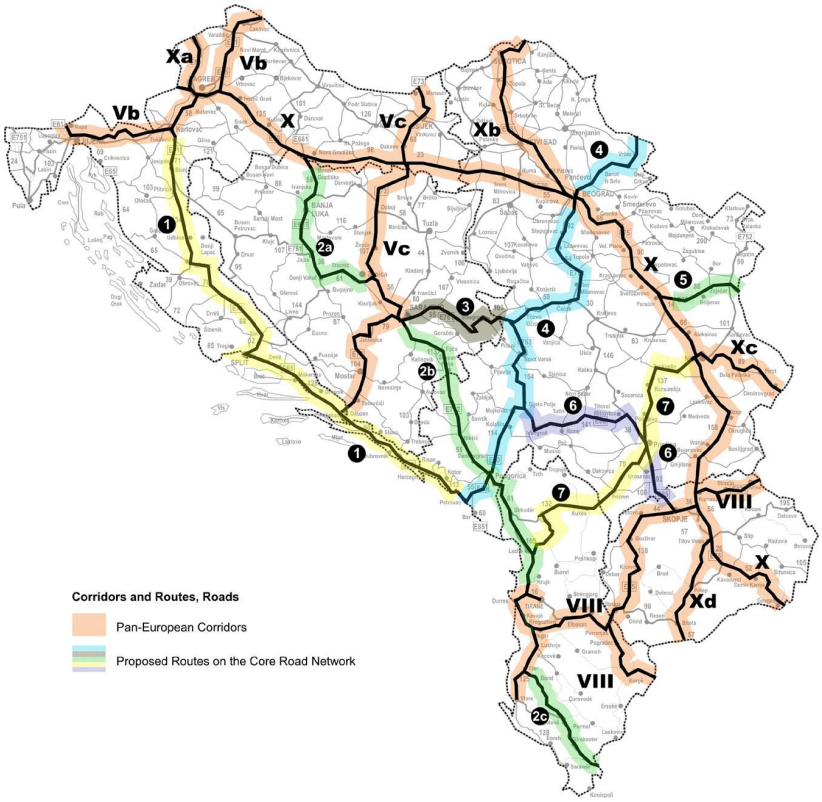
The development of a regional Core Network requires the involvement of a range of stakeholders, and the project organisation was designed accordingly. Permanent project offices were set up in the five capitals of Tirana, Sarajevo, Zagreb, Skopje and Belgrade, and close liaison was established with national authorities. The project was supervised by the Infrastructure Steering Group (ISG) which holds representatives from the European Commission and the relevant IFIs of the region. Involvement of the stakeholders was also promoted through high level meetings and a regional seminar with representatives from the countries, the EU Commission and the ISG.

0.1 The Core Network and its status

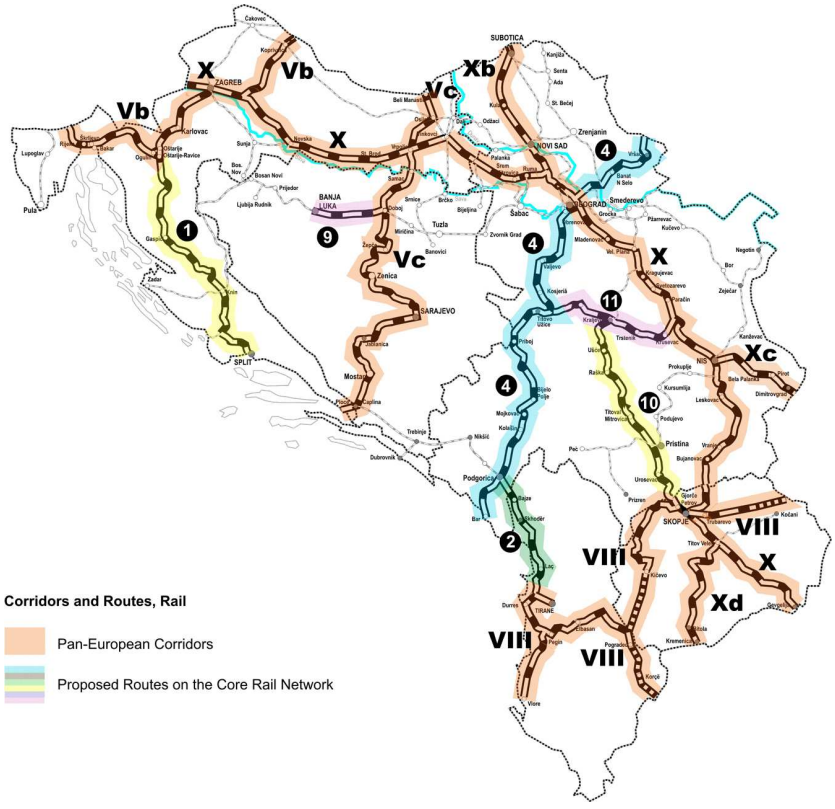
REBIS focuses on the development of regional transport infrastructure which interlinks the countries of the region and links them to the rest of Europe.

As a first step, a Core Network of regional importance was therefore proposed, based on a Strategic Network previously established by the EU Commission. It includes the main corridors and routes between the five capitals of the region and the cities of Banja Luka, Podgorica and Pristina. It also links these cities to the capitals of the neighbouring countries and connects to the strategic ports at the Adriatic Sea. The network includes the river Danube, the ports of Durres, Rijeka, Split, Dubrovnik, Ploce, Bar and Vlore and the airports of the five capitals and of Banja Luka, Split, Dubrovnik, Nis, Pristina and Podgorica.

For presentation purposes, the road and rail links of the Core Network have been divided into corridors and routes as shown overleaf.



Core Network, roads.



Core network, railways.

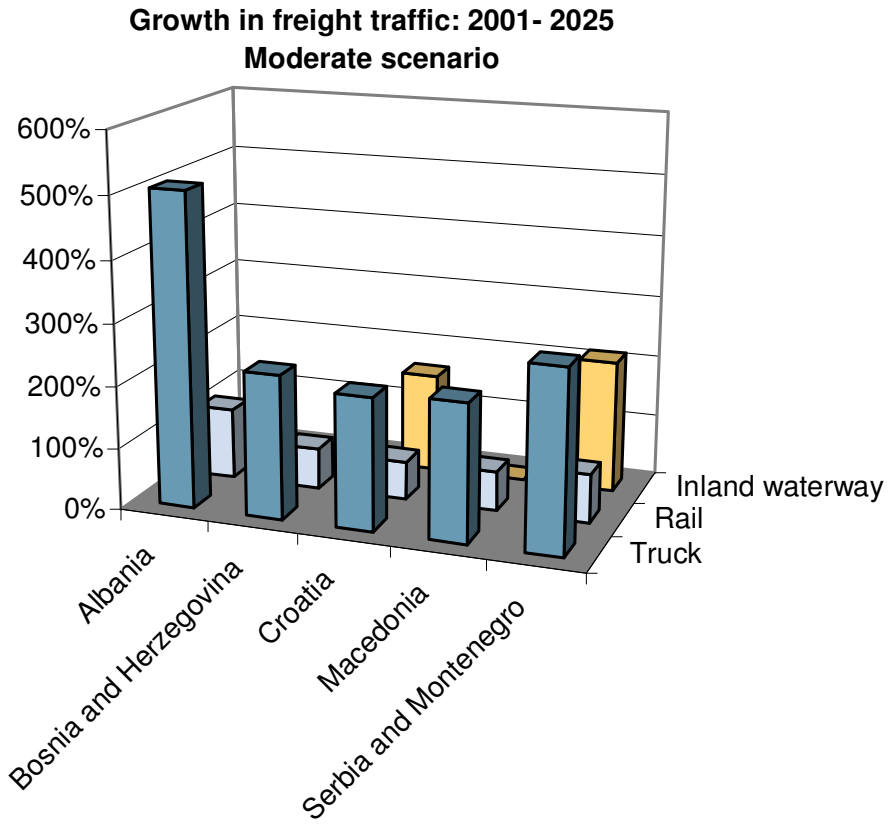
0.2 Traffic on the Core Network

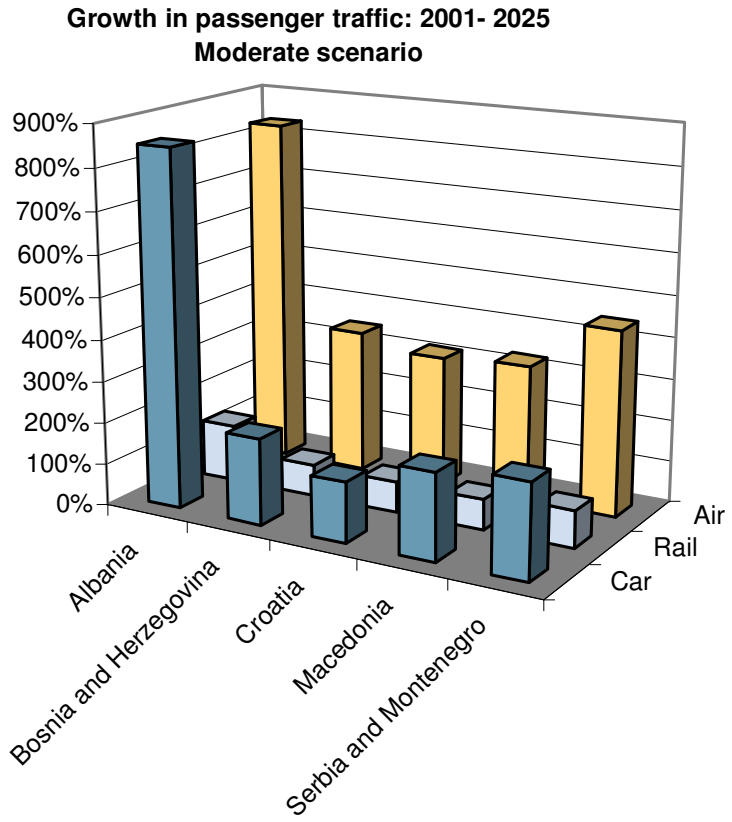
Traffic in the region dropped drastically during the 90'ies - except in Albania - but it is now slowly recovering.

In order to establish a common and consistent basis for the selection and assessment of projects, a traffic forecasting model for the Core Network was developed. Projections are made for the period 2001-2025.

In the moderate growth scenario, road traffic will increase by 200-300%, except in Albania, where the growth will be substantially higher. Rail traffic will grow at a much slower pace: 60-140%. Growth in inland waterway transport is estimated at 160-215% and air traffic at 315-830%. By the end of the period, vehicle ownership and trip rates will have reached the levels which are currently found in many West European countries.

The current traffic volumes on the roads of the Core Network is below 10,000 vehicles per day, on the majority of links, and only few links, primarily those close to the capitals, have more than 20,000 vehicles per day. The railways presently have substantially less than 1 million passengers a year, on most lines, and freight transport is concentrated in Croatia and on Corridor X. The forecasted strong increase in road transport in the coming years will significantly change the modal split for land transport and the long-term capacity requirements of the network.





Growth in passenger and freight traffic on the Core Network 2001 - 2025, moderate economic scenario.

0.3 State of the Core road and rail Network

The Core Network includes some 6,000 km of road and 4,300 km of railway line which have been assessed by REBIS.

The geometrical characteristics of the road Core Network varies substantially - from narrow 2-lane roads in many areas to 4-lane roads and motorways at main links. Generally, the roads have sufficient capacity to carry the present and estimated short- to medium-term increase in traffic, but over 70% of the roads are in need of some form of pavement renewal. In the short term, investments should, therefore, focus on this issue. The best pavement conditions are found in Croatia, whereas many roads in Albania need complete re-construction.

Also, the railway network generally has sufficient capacity in the foreseeable future. However, most lines need modernisation, and there is a severe backlog in maintenance which, in some areas, reduces the operational capacity and travel speed substantially. 85% of the network is single track, and only 10% is classified as being in good condition.

The dissolution of the Yugoslav Federation led to the creation of over 5,000 km of new border line and a shift in transport flows over previous border crossings. In spite of the general decline in traffic over the past decade, this has led to long

waiting times and unpredictable customs procedures at some stations - in particular for the transport of goods. The problems are largely related to regulatory and procedural issues, and several studies and projects address these. There are, however, still a limited number of border crossings where physical improvements are required. Infrastructure investments seem needed at 14 out of the 58 border stations on the Core Network, and further studies are required for about 11.

0.4 Long-term investment requirements of the Core road and rail Network

The present network characteristics of roads and railways have been compared to the forecasted traffic levels in 2015, and the investment required to bring the networks up to "acceptable European standard" by 2015 has been assessed.

The definition of road standards is based on the AGR agreement which i.a. sets a minimum width of 2-lane roads at 7 m. Design speeds have, in general, been set at 80 km/h (120 km/h for motorways). The analyses showed that, upon completion of ongoing or already committed projects, the majority of roads will have the sufficient capacity by 2015. 13% of the roads will need widening and over 70% will need improvement or replacement of pavements. Also, some urban by-passes will be needed. The total long-term investment requirement is estimated at EUR 4 billion.

For the railways, the standards are based on the AGC and AGCT agreements. However, the upgrading of the complete Core Network to these standards would clearly be neither feasible nor affordable within the given time frame. It has, therefore, been assumed that only Corridors X, Xb, Vb and part of Vc will be upgraded to 160 km/h and double track. For other lines, basic modernisation has been assumed, and speeds have been set at a maximum of 100-120 km/h. Even with these reduced standards, the total long-term investment requirement by 2015 will be around EUR 12 billion, which is unrealistic - given the severe financial difficulties and the relatively low market share of the railways - and not economically feasible. The challenges of the railways are further described below.

Similar calculations of investment requirements have been made for each of the countries and compared to the estimated accumulated GDP during the period. The calculations show that in Albania and Croatia required investments will be about 1% of the total GDP. In Bosnia and Herzegovina and FYRO Macedonia the corresponding figure is around 2.5% and in Serbia and Montenegro 3%. In comparison, the TINA (Transport Infrastructure Needs Assessment) defined 1.5% of total GDP as the maximum level of investment in the regional road and railway networks, and in reality, much less has been spent.

The identified needs for improvement of border crossings amount to approx. EUR 70 million. Although this amount is small compared to the required investments in road and rail infrastructure, the benefits to regional traffic of such improvements will be significant.

The long-term requirements for the sustainable maintenance of the core road and rail network are estimated at EUR 100-150 million/year.

0.5 Short-term investment plan

One of the main aims of the REBIS project is to prepare investments plans for the development of the Core Network in the short and medium term, with particular emphasis on projects which are suitable for international co-financing. This has been accomplished through a comprehensive and dialogue-based process, involving national authorities in the region as well as other stakeholders.

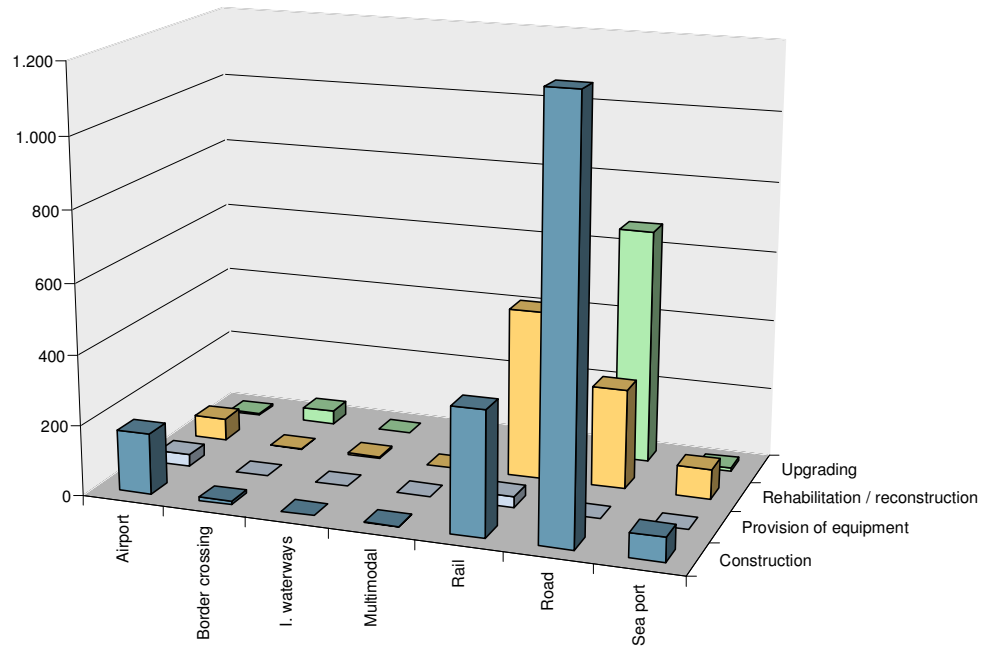
In close dialogue with the national authorities, more than 200 projects have been identified and assessed. Pre-feasibility studies have been carried out for 20 projects. The pre-feasibility studies formed an important basis for the preparation of the short-term investment plan, and the results may also be used, subsequently, by the national authorities and IFIs to decide whether and how to proceed with these projects.

The proposed short-term investment plan includes the projects on which action needs to be taken within the coming two years. The plan covers the period 2004-09. It reflects the policy recommendations presented in this report as well as the national priorities and plans of the countries. The total investment costs of the plan are at a level which seems affordable, and the plan targets at a reasonable balance between countries, modes and project types.

The plan includes a number of proposed new projects as well as ongoing and already committed projects which will be implemented during the period. The implications of the plan can be summarised as follows:

Data	Projects already committed	Ongoing projects	Identified new projects	Grand total
Investment cost (EUR million)	679	862	2,277	3,818
Percentage	18%	23%	59%	100%
Number of projects	21	33	83	137

The proposed investment during the period 2004-09 amounts to EUR 3.8 billion which represents 0.5% - 1.4% of the total GDP in the countries during the period. 60% of the investment relates to the road sector and 30% to the railway sector. The projects mostly concern upgrading, rehabilitation or reconstruction of existing infrastructure. 32% of the investment falls in Corridor X and its branches and 23% in Corridors Vb and Vc.



Investment costs by transport mode and scope for all projects (EUR million).

The investments are mostly concentrated in the first years of the period, and there is room for the identification and scheduling of additional projects for the final years of the period.

Although several important projects have been deferred to the long-term investment plan, the investment level of the plan may be difficult to realise within the stated time frames. Experience i.a. from Eastern Europe indicates that the preparation of projects and the process of securing finance requires substantial capacity and delays are likely to occur resulting in a reduced level of investment.

0.6 Transport sector management

The transport sector in the region has - to varying degrees - undergone reform in recent years, but there is still a need for substantial reform and institutional development with a view to improving efficiency in the transport sector. In the road sector, construction and maintenance are, to a large extent, being submitted in tender by the road authorities. All countries are working towards a separation of railway infrastructure from operations, and the private sector is playing an increasing role in the construction and maintenance of infrastructure. In many cases, governments are reducing their involvement in ports operations, and concessions are being introduced. Some airlines have been privatised by now.

Croatia and FYRO Macedonia have signed Stabilisation and Association Agreements with the EU, and Albania is in the process of negotiations. These agreements also include issues related to transport sector reform, and the progress on these is monitored regularly.

The course of further reforms has been set, but much preparatory work is still required. This is an area where technical assistance would facilitate and accelerate the development.

Efficient information systems are of key importance to the management of the transport sector. Such systems require up-to-date information about the features and condition of the infrastructure as well as traffic and accidents. There is a need for improvement in this area, and financial and technical assistance would be valuable. In the rail, port, airport and inland waterway sectors, the existing systems are mostly paper-based which hampers efficient utilisation of data. In three of the countries, the road inventories have not been updated recently, and there is a lack of data on the condition of pavements and structures. In all countries, the police are responsible for the collection of road accident data (except Kosovo) and there is no formal co-operation between the police and the road authorities which substantially hampers the systematic improvement of road safety.

One of the bottlenecks for improving the transport infrastructure is the lack of recent experience - in the region - on the preparation of projects for international financing and tendering. Within REBIS, training seminars have been held in the 5 capitals in order to present an overview of the project cycle and to introduce EC procurement procedures. The participants were public servants from the relevant transport authorities and companies, but also staff from the private sector. The seminars were very well received, but they also revealed a huge need for further capacity building in this area.

0.7 Road financing

There are substantial differences in the taxation levels of road users in the five countries. Particularly, the taxation on heavy vehicles in the Republika Srpska is low compared to other countries, and there may be scope for harmonisation in order not to distort competition, particularly if the level of road user charges is increased, in the future. The present levels of charges are far below the levels of the EU.

Given the severe backlog in road maintenance and reconstruction, it is important for the countries of the region to develop sustainable financing strategies within the road sector. Available information seems to indicate that present road user charges largely cover present spending on routine and periodic maintenance of the networks. There are, however, strong indications that present spending is totally insufficient to maintain an acceptable quality of the networks, in the long run. This is particularly the case in Serbia and Montenegro where present spending may only cover about 10% of the needs. Thus, there is a clear need to allocate further funds to the road sector.

One way to secure sufficient and stable financing of the road sector could be to increase road user charges and channel these to the transport sector.

Another potential - and often debated - option could be wide-scale private participation in road construction and maintenance, in the form of Build-Operate-Transfer (BOT) or similar arrangements. An analysis of the present affordability level in the countries showed, however, that the construction and operation of concession toll roads on strict commercial terms without public support will not be feasible in the short to medium term, with the exception of a few sections in Croatia. Other forms of public-private partnerships will be required, if the private sector is to be involved in the financing of road development.

0.8 Challenges in the railway sector

The dissolution of the former FR Yugoslavia has dramatically affected both the supply and the demand side of the railway sector, and - although there are substantial differences between the countries - all the railway companies are now facing severe difficulties.

Investments and maintenance have been severely neglected. This has led to deteriorated infrastructure, obsolete rolling stock and outdated signalling and telecommunication systems resulting in low speeds and poor quality of service.

On the demand side, both goods and passenger transport dropped severely. As an example, rail passenger traffic dropped by 90% in Bosnia and Herzegovina and 70% in Serbia from 1990 to 2001, and the drop in freight transport was similar. Although the decline in traffic has stopped in some of the countries and there are signs of recovery, the long-term prospects of rail transport are difficult, and traffic levels are unlikely to reach the levels of the late 80'ies. Official forecasts by some of the rail companies are clearly optimistic.

As a consequence of these developments, all railway companies are now facing severe financial difficulties. In spite of efforts to reform the companies and to downsize staff, operating costs have been recurrently increasing in recent years in all the networks, with exception of Albania, and state subsidies now make up 35-70% of the total revenues, with FYRO Macedonia as an exception. All railway companies lost money during the last three years, and some of them are virtually bankrupt - leaving little room for investment and maintenance.

In the short term, the railways need to accelerate the restructuring process and develop focussed and market-oriented business strategies. At present, only two of the railway companies of Croatia and Serbia have produced comprehensive business plans. These efforts must be combined with substantial rationalisation, cost reduction and elimination of loss-making services, and the companies need to co-operate in order to integrate networks and services and to meet market demands. Despite a severe backlog in maintenance and rehabilitation, the companies cannot afford large-scale modernisation of the infrastructure and rolling stock in the short term. They must focus on the most urgent needs.

0.9 Multi-modal transport

Multi-modal transport is little developed in the region and constitutes less than 0.5% of total goods transport. It comprises almost solely land transport of maritime containers to/from the ports.

There are several reasons for this situation: the traffic volumes on key routes are exceptionally low and long distance transport flows are unbalanced since they relate mainly to import of goods. There is no clear policy in the area, nor any fiscal or other incentives which promote multi-modal transport. The organisational framework is complex, and the roles of the parties are still unclear.

The existing terminal network links the major capitals of the region - except Tirana - and offers a potential for combined transport. Although the facilities and equipment require improvement, they do not, for the moment, constitute any major obstacle to the development of multi-modal transport. In general, the existing inter-modal terminals are largely under-utilised.

In the short term, large investments should be avoided in order to keep costs at a competitive level. Focus should be on:

- The development of coherent policies which could include liberalisation of combined transport operations, fiscal incentives in favour of combined transport, exemption from tariff regulations, provision of credits for the development of combined transport etc.

- The development of market strategies which will lead to a concentration of traffic on a reduced network. In the short and medium term, the transit market is the most promising one, given the strategic geographical position of the region.

- Clarification of the roles and functions of the participants - including the combined transport operators, the railways and the ports - and improving relations between them.

Given the small size of the countries in the region and - in particular - the limited potential for combined transport, it is important that the countries co-operate closely within these areas.

0.10 Inland waterway transport

The Danube is the main inland waterway in the region. It constitutes the Pan-European Corridor VII and connects Serbia and Croatia to Hungary, Slovakia, Austria and Germany, on the one hand, and Romania, Bulgaria and the Black Sea, on the other hand. Although traffic has fallen sharply over the past decade, the river remains an essential transport link for Europe, particularly after the construction of its link with the Rhine-Main. The main international ports are Belgrade and Novi Sad.

Navigability on the river was seriously disturbed during the War but recent initiatives are tackling these problems. The restoration of unhindered navigability is considered of prime importance. A Memorandum of Understanding on the Danube Pan-European corridor created a specific structure for promoting various initiatives to develop the Danube corridor. The river is likely to regain much of its previous importance when it has been fully restored.

The Serbian Ministry of Transport and Telecommunications and the European Agency for Reconstruction are now making preparations for a master plan study of the Danube River, a ports development plan and feasibility studies for the restoration of navigability and rehabilitation of the waterway. There is no doubt that the restoration of the river will have a positive impact at the European level.

Contrary to the Danube, the status of the Sava river is yet unresolved. Navigation on the Sava River was well developed in the former FR Yugoslavia, although at a much lower level than in the case of the Danube. Following the conflicts and the NATO bombing in 1999, transport on the Sava virtually disappeared. The four riparian states have now entered into a process of co-operation regarding the Sava River to establish its status as an international river with an international navigation regime. It is, however, uncertain how soon and to what extent demand can be restored, and what role the Sava may gain in the future transport system. A phased approach to the restoration and further development of the river is, therefore, recommended, with the restoration of navigability and basic rehabilitation as the first step.

0.11 Ports and airports

The Core ports are facing severe challenges: The market has generally dropped substantially over the last decade, and there is strong competition among the Adriatic ports. None of them have the critical mass required to achieve optimum efficiency. Most of them are undergoing a process of privatisation/commercialisation. Over time, it is likely that transport flows will concentrate on selected ports. Against this background, the ports need to focus on selected markets and to co-operate with other ports in the region. They should be careful not to over-invest. In a dialogue with the port authorities REBIS has selected a limited number of projects for short-term investment.

The airports and civil aviation sectors have been subject to a number of comprehensive studies, in particular the ATIRS study. This study made a comprehensive survey of the needs for infrastructure, and it concluded that efforts should focus on the modernisation of existing installations and that major additional passenger handling capacities at certain airports seemed premature. Within REBIS, the investment needs were reviewed - in a dialogue with national authorities - and the most urgent ones were included in the short-term investment plan.

0.12 Regional co-operation on the development and monitoring of the Core Network

The Core Network is regional in nature, and the development of the network, therefore, requires regional dialogue and co-operation. Also the establishment of efficient transport systems - particularly in the railways and combined transport sectors - require co-operation between the countries of the region.

Within REBIS, a regional dialogue was established - in the form of high-level meetings and seminars - and a framework for the continued co-operation beyond the REBIS project was prepared.

Previous experience shows that the efficient implementation of regional networks requires, in particular: 1) political commitment among the countries involved, 2) the establishment of a monitoring mechanism - in the form of a steering committee and a secretariat and 3) a shared technical back-up facility, preferably with financial support from international organisations.

For the monitoring and development of the Core Network, it is proposed to establish a joint secretariat and technical back-up facility - tentatively named SEETO - South-Eastern Europe Transport Observatory. SEETO would prepare annual and multi-annual work plans, act as an information centre for projects related to the Core Network, and operate a GIS-based database system for this network. SEETO could also disseminate information related to the Core Network, arrange seminars on best practices and make arrangements for biannual high-level regional transport conferences.

REBIS has developed a comprehensive and user-friendly database, which will be used by SEETO to monitor the development of the Core Network. Data definitions recently prepared by the European Commission for the collection of data on the TINA network have been applied. The database covers all transport modes, and data on the road and rail networks have been entered.

1 Introduction

The European Union plays a key role in repairing the damage of conflict in the Balkan region and equipping the countries of the region to promote economic development and regional integration. The development of the transport infrastructure is an important element in this context.

In 2002 the EU Commission launched the Regional Balkans Infrastructure Study, Transport - in the following referred to as REBIS. The project commenced by the end of June 2002 and was executed over a period of 13 calendar months. The study covers the five Balkan countries of Albania, Bosnia and Herzegovina, Croatia, Former Yugoslav Republic of Macedonia (FYRO Macedonia), and Serbia and Montenegro (Republic of Serbia, Kosovo, Republic of Montenegro). In the following, Kosovo - being under international administration in line with UNSCR 1244 of 10 June 1999 - will be referred to separately.

Project scope
The project focuses on assisting countries of the region to develop coherent strategies for transport infrastructure development. The objectives of the project are to:

- assess the strategic transport networks - the Core Network - of the region and suggest modifications
- establish short-term investment plans for priority projects, suitable for international financing
- establish a methodology and procedures to monitor implementation of the Core Network
- define a list of medium and long term projects, suitable for international financing
- identify suitable local counterpart institutions and provide training
- outline the organisational structure of an Agency for Transport Matters
- provide guidance for the realisation of national transport plans and for feasibility studies

In addition the project includes the examination of some specific aspects of the transport sector in the region, i.e.:

- the market and financial situation of railway companies
- the containerisation market
- review of road charges and recommendations for their harmonisation

- review and recommendations regarding information systems
- perspectives of BOT arrangements

The project comprised 10 distinct tasks, and in addition 5 special topics were studied, as shown below.

Task 1: Mobilisation and review
Task 2: Forecasting
Task 3: Network assessment
Task 4: Methods of investment planning
Task 5: Short-term investment plan
Task 6: Project monitoring
Task 7: Medium and long-term investment plan
Task 8: Terms of Reference for "SEETO" (transport observatory)
Task 9: Seminars and dissemination
Task 10: Training

Special topic 1: Road charges
Special topic 2: Analysis of railway companies
Special topic 3: Perspectives for BOT projects
Special topic 4: Containerisation study
Special topic 5: Infrastructure management systems

During the implementation of the project, some additional tasks were defined, i.a. the establishment of the long-term investment requirements to raise the standards of the core road and rail networks, a brief study of the Sava river - based on existing information, and the presentation of an overview of the reform process - based on statements by the countries.

Involvement of stakeholders
The project was managed from the home office of the consultants, in close liaison with EuropeAid who is the contracting authority for the project.

The development of regional transport strategies and the preparation for infrastructure investment clearly called for strong involvement of key stakeholders, including national authorities of the region and international institutions involved in the financing of transport projects.

In order to ensure close liaison with national authorities the REBIS consultant established permanent offices in the five capitals of the region, each of which was staffed with an international Resident Economist and with local counterparts. In all countries the consultant's team included substantial local expertise.

In order to ensure the appropriate involvement of the IFIs (International Financing Institutions) and the relevant General Directorates of the EU Commission, the project was supervised by the Infrastructure Steering Group (ISG) which is chaired by the European Commission (EuropeAid) and includes representatives from various parts of the Commission (DG TREN and DG

RELEX), of the international financial institutions which operate in the region (EIB, EBRD, World Bank and CoEdB) and of the Stability Pact.

The project organisation is illustrated below:

Figure 1.1 Project organisation.

During the course of the project two High Level meetings under the auspices of the ISG were conducted - with representatives from the countries, the EU Commission and the ISG. The first one - held in Luxemburg on 6-7 February 2003, focussed on improving transport infrastructure for closer integration of countries in South East Europe. The second one was held in London on 26-27 June 2003 and discussed i.a. the REBIS Draft Final Report and the needs for continued regional co-operation in the transport sector. In addition, a regional seminar was held in Skopje on 8 May 2003, with transport reform and institutional strengthening in the region as the main topics. These meetings and seminars substantially contributed to the involvement of stakeholders.

Content of the report

The project has been executed in a number of phases, each phase concluded by an internal project report. The present Final Report - together with its appendices - is a self-contained document which supersedes all previous reports and constitutes the full documentation of the study.

REBIS focuses on the development of regional transport infrastructure. In **Chapter 2,** a core transport network is proposed on which in particular projects with international co-financing should focus. Chapter 2 also presents long term traffic projections for the Core Network.

Chapter 3 presents the investments which are required to improve and develop the Core Network, both in the short and the long term. An overview of the total investment requirements up to year 2015 - if the Core Network is to comply with normal EU standards - is presented. Investment plans for the short- and medium term are also proposed. These plans which are one of the main outputs of the REBIS study, have been developed through a number of stages, including a comprehensive multi-criteria analysis and the preparation of approximately 20 pre-feasibility studies for selected projects.

Efficiency in the transport systems requires not only the development of transport infrastructure, but also improvements in transport sector management. In **Chapter 4,** some of these issues are analysed - in particular the establishment of efficient Management Information Systems which are a pre-condition for the efficient development and maintenance of transport infrastructure. The chapter also presents an overview of the status of transport sector reform in the region.

In order to ensure sustainability in infrastructure development, proper financing mechanisms must be established which will also ensure the sufficient maintenance of investments. **Chapter 5** describes two possible options for generation of funds for the road sector development and maintenance, i.e. road user charges and BOT.

The railways are facing severe difficulties in the entire region, and in most countries the situation is aggravating. **Chapter 6** presents the present market and financial situation of the railways and recommends the key measures to be taken. Similarly, **Chapter 7** presents the present - very limited - role of multimodal transport in the region and the difficulties facing this sector. The recommendations for the multi-modal transport are closely related to those for railway transport.

Chapter 8 presents the current status of the River Danube and also presents a brief study of the Sava River. In **Chapter 9,** a brief status and outlook for the ports and airports are presented.

Within the framework of REBIS a regional dialogue was established - in the form of high-level meetings and seminars - and a framework for the continued co-operation among the countries to monitor and develop the Core Network was proposed. This is described in **Chapter 10**.

In addition to the present English version of the report, translations of the main report will be made into the local languages of the region.

Although the REBIS project has been carried out in liaison with a wide range of stakeholders, in particular the national authorities in the region, the conclusions and recommendations in the present report are prepared by the consultants and do not necessarily coincide with the views of these stakeholders.

2 Core networks and traffic demand

REBIS focuses on the development of regional transport infrastructure in the Balkans and, in particular, on the development of infrastructure which interlinks the countries of the region, or which links the region with the rest of Europe.

As a first step a Core Network of regional importance has therefore been provisionally proposed, based on a Strategic Network previously established by the EC Commission. This network will serve as a reference and guidance for future planning and investment in the region, and in particular for the selection of transport projects for international financing.

This chapter presents the proposed Core Network and its present status. Subsequently, traffic projections for the network are described.

2.1 Previously defined regional transport networks

Much work has already been done to establish the main transport networks of the region, as described below.

2.1.1 Pan-European transport corridors

The Pan-European transport corridors have been defined at a series of Pan-European Transport Conferences, the first of which was held in Prague in 1991. These multi-modal corridors are also called the Helsinki corridors, named after the Pan-European Transport Conference held in Helsinki. The Pan-European corridors in the region form the backbone of the intra-regional network.

The Pan-European corridors for roads and railways through the region are shown in Figure 2.1. In addition, the Pan-European corridors include the river Danube (Corridor VII).

The corridors have been generally accepted in all the countries. There is general awareness of the corridors and their significance, and the corridors have been particularly guiding in relation to transport investment by the EU and the EIB.

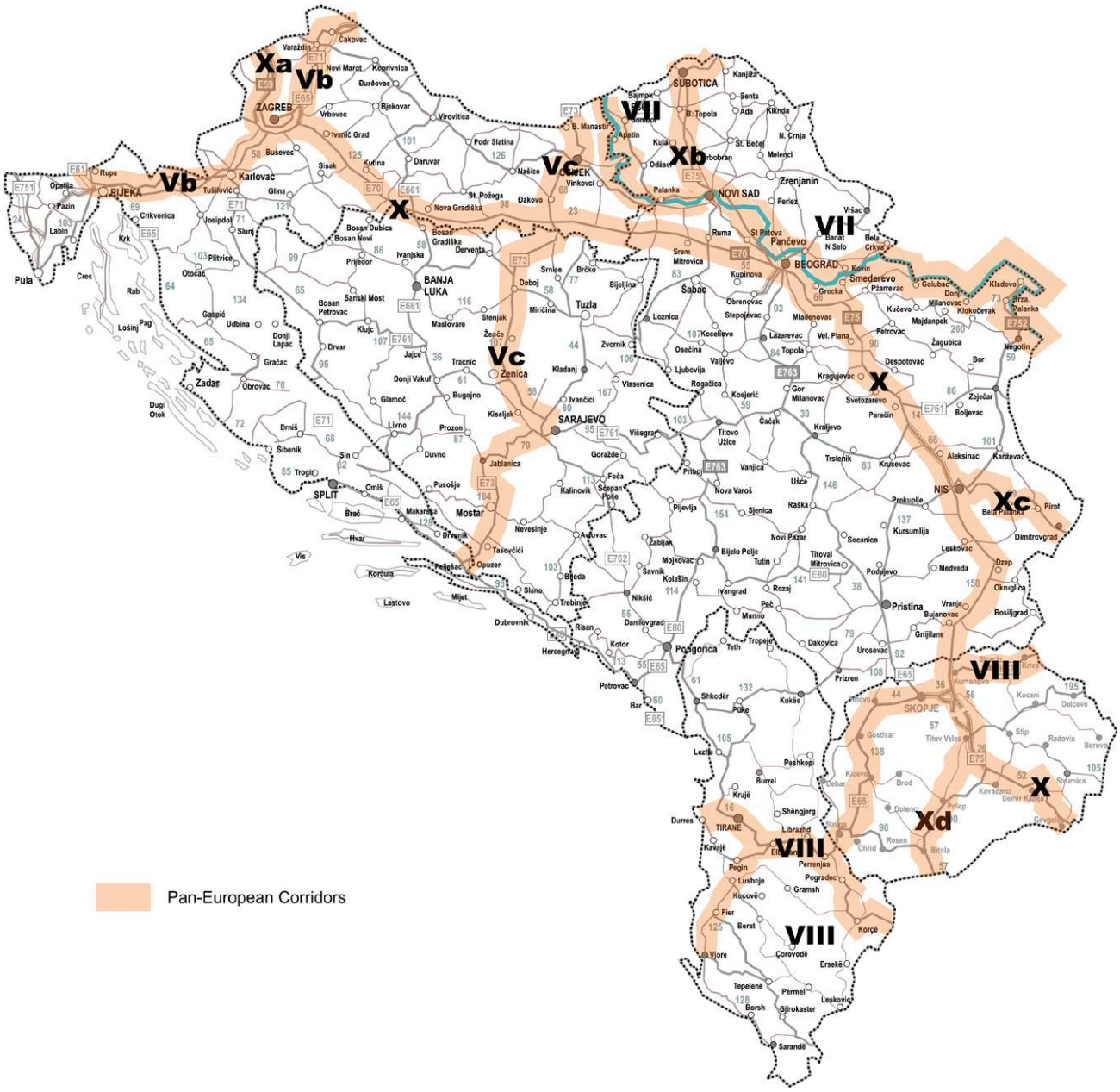


Figure 2.1 Pan-European corridors.

2.1.2 The EU strategic networks

There is, however, the need to also invest in a more fine-meshed regional network in the Balkans. Therefore, the "Transport and Energy Infrastructure in South East Europe" (European Commission, 15 October 2001) defined the strategic transport networks in the region on which investment projects for interurban transport should mainly concentrate. The networks cover the main road and rail routes, inland waterways and river ports, seaports, airports and terminals.

The strategic networks were presented at a conference in Tirana in May 2001 in which the members of the Stability Pact, the beneficiary and surrounding countries, the IFI's and other donors participated. The networks were endorsed at a conference in Bucharest in October 2001.

2.1.3 TIRS basic interregional networks

TIRS elaborated on these networks with the view to "establishing the basic inter-regional transport infrastructure networks needed in the Balkan region, in line with the TINA exercise". A number of modifications to the EU strategic networks were proposed, and some links were added which are of importance to the cross-border communication in the region.

2.2 The Core Network

Under the REBIS project, the above networks have been reviewed and discussed with the National authorities in the countries and analysed in the light of the most recent political developments in the region. Taking the EU strategic networks as a basis, a "Core Network" for the region was then proposed

This proposed Core Network includes the Pan-European corridors in the region. In addition, it interconnects the 5 capitals of the region and the cities of Banja Luka, Podgorica and Pristina. It also links these cities to the capitals of the neighbouring countries and connects to the strategic ports at the Adriatic Sea.

The proposed Core Road Network is shown in Figure 2.2. The network comprises some 6,000 km of primary road. It is slightly denser than the corresponding TINA network which was developed for countries of Central and Eastern Europe which reflects the fact that the countries of the region are smaller and thus the capitals to connect are closer to each other.

Figure 2.2 Proposed core road network.

The proposed core rail network is shown in Figure 2.3. The network is less dense than the road network which reflects the fact that the role of the railways has declined substantially over the past decades, and that it will be necessary for the railways to adopt a very focussed investment strategy in order to afford the upgrading of infrastructure to international standards, as described in Chapter 3.2 and Chapter 6.

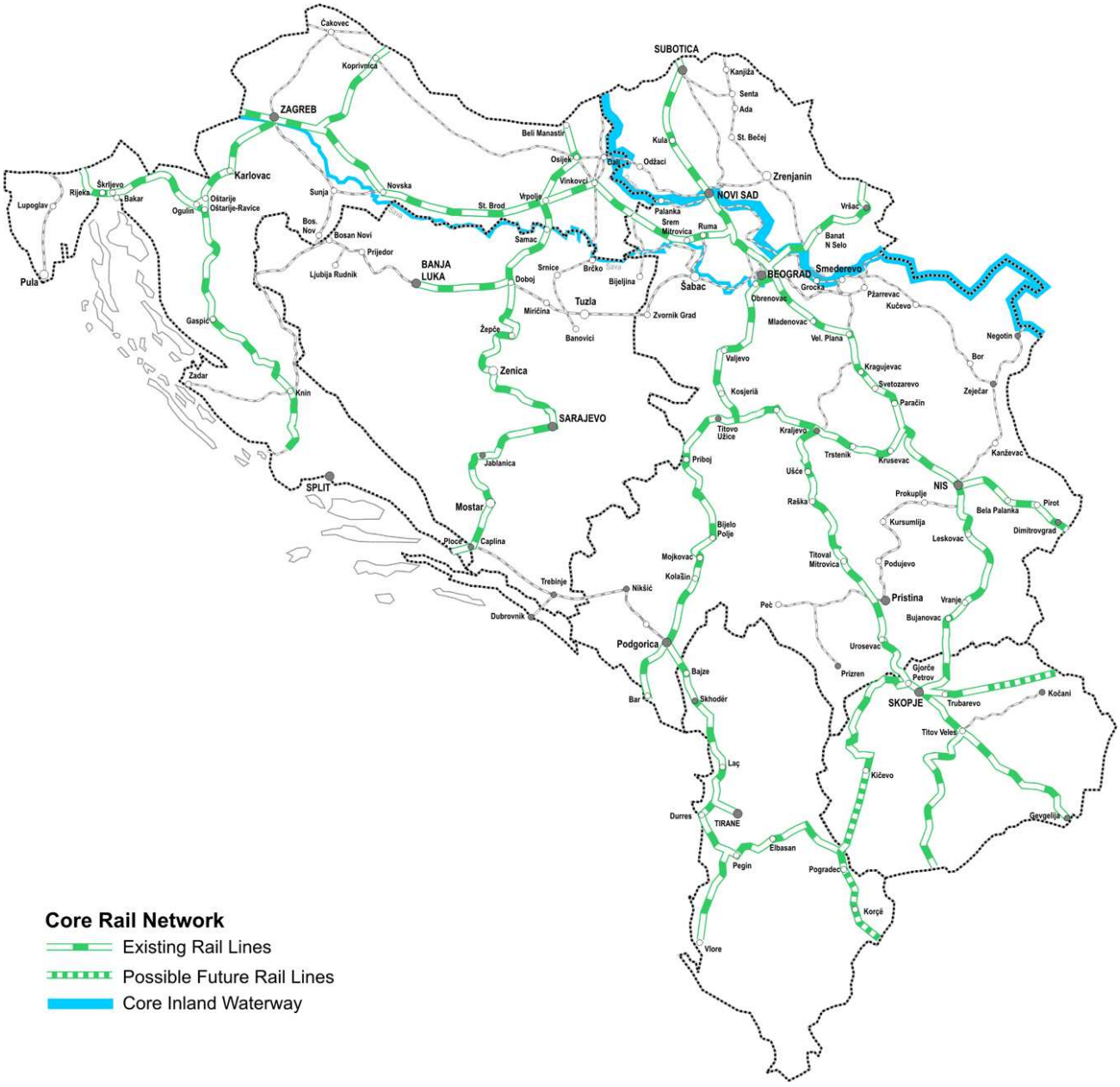


Figure 2.3 Proposed core rail network.

The Core Network also includes the River Danube - Pan-European Corridor VII. This river already plays an important interregional role, and it is expected to gain further importance in the future.

Initiatives have recently been taken to re-open the Sava river for commercial navigation. As a first stage, it is envisaged to restore the river to the navigability of before 1990. Although this initiative seems important and fully justified, it is not expected that the Sava river in the short term will gain such regional importance - from a transport point of view - that its inclusion in the Core Network is warranted. A brief analysis of the Sava River is presented in Chapter 8 and Appendix 15.

The Core Network also includes the following seaports: Durres, Rijeka, Split, Dubrovnik, Ploce, Bar and Vlore.

The airports of the EU strategic network serve the five capitals of the region and the cities of Banja Luka, Split, Dubrovnik, Nis, Pristina and Podgorica. It is realised that, in the long term, some concentration of traffic is likely to occur. At the moment, however, there is no basis for proposing further concentration.

The Core Network described above will provide efficient communication links between the capitals and other key cities of the region, and link the region to the capitals of neighbouring countries. In the subsequent phases of work, REBIS will only consider projects which relate to this Core Network.

The traffic volumes on the various links will vary considerably (see Chapter 2.6), and the development of the links should take this fully into account. For the roads, for example, some links will have to be developed into full motorway standard, whereas other links may remain two-lane highways for a longer period.

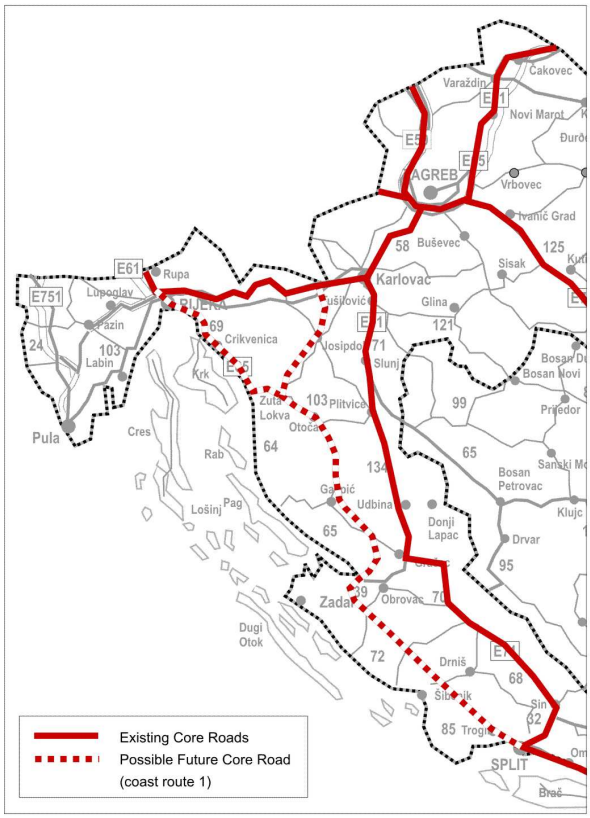


Figure 2.4 Possible future core road (route 1).

Some modifications to the network may be warranted in the future. In Croatia, for example, tendering and construction of some parts of the Bosiljevo-Split motorway and the motorway from Zuta Lokva to Rupe at the Slovenian border is in progress. Once completed, these new roads will become important intraregional links, connecting the Adriatic coast to Italy and the networks of Central Europe by a high speed connection as shown on Figure 2.4. Zadar plays an important role - second to Split - in the passenger traffic and it has some regional importance. Due to its location off the core road network it has, however, not been included in the core network. If the Bosiljevo-Split motorway is completed - as described above - this could perhaps be re-considered.

The trunk road section M5 (E761) in Serbia has been included in the Serbian rehabilitation programme and is currently financed through an EBRD loan. Once rehabilitated, this important route (>7000 vpd) will connect important industrial cities and towns of Bulgaria, Serbia, Bosnia and Herzegovina and Montenegro. It has been proposed to include this road in the Core Network

when it is completed. In Kosovo the inclusion of M9 and the cross-connection between Corridor X and Corridor VIII via Pristina have also been proposed.

2.3 Definition of routes and corridors

As described above the Core Network includes the Pan-European Corridors and some additional links of major interregional and intraregional importance.

The Pan-European Corridors have been assigned a logical and well established numbering system with the Corridors V, Vb, Vc, VII, VIII, X, Xa, Xb, Xc and Xd passing through the region.

For presentation purposes the REBIS study has assigned a numbering system to the other routes included in the core network. These routes include the following:

Table 2.1 Routes on the core road network.

Route no.	From	To	Via
1	Corridor Vb	Podgorica	Adriadic Coast
2	Corridor X	Greek Border	Sarajevo, Podgorica and Durrës
2a	*Corridor X*	*Corridor Vc*	*Banja Luka*
2b	*Corridor Vc (Sarajevo)*	*Vorë*	*Podgorica*
2c	*Fier*	*Greek Border*	*Tepelenë*
3	Corridor Vc (Sarajevo)	Route 4	
4	Romanian Border	Bar	Belgrade and Podgorica
5	Corridor X	Bulgarian Border	Zajecar
6	Skopje	Montenegrin Border	Pristina
7	Nis	Route 2	Pristina

Table 2.2 Routes on the core rail network.

Route no.	From	To	Via
1	Corridor Vb	Split	
2	Podgorica	Vorë	
4	Romanian Border	Bar	Belgrade and Podgorica
9	Corridor Vc	Banja Luka	
10	Skopje	Route 11	Pristina
11	Corridor X	Route 4	Kraljevo

The numbering of the routes and corridors of the Core Road and Rail Network is shown in Figure 2.5 and 2.6 below. This system of routes and corridors will be used for the presentation of results in the subsequent chapters of this report.

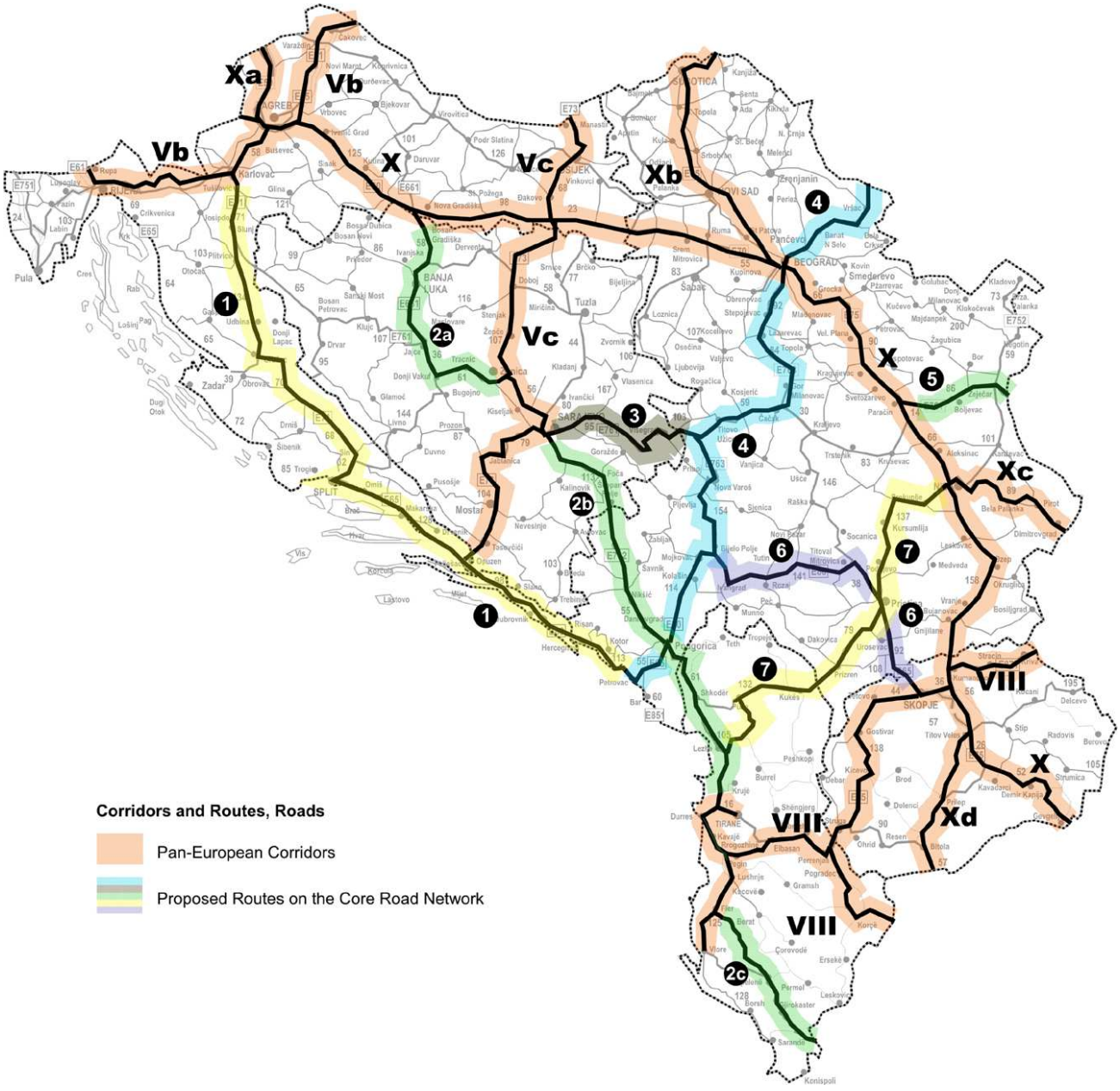


Figure 2.5 Routes and corridors, roads.

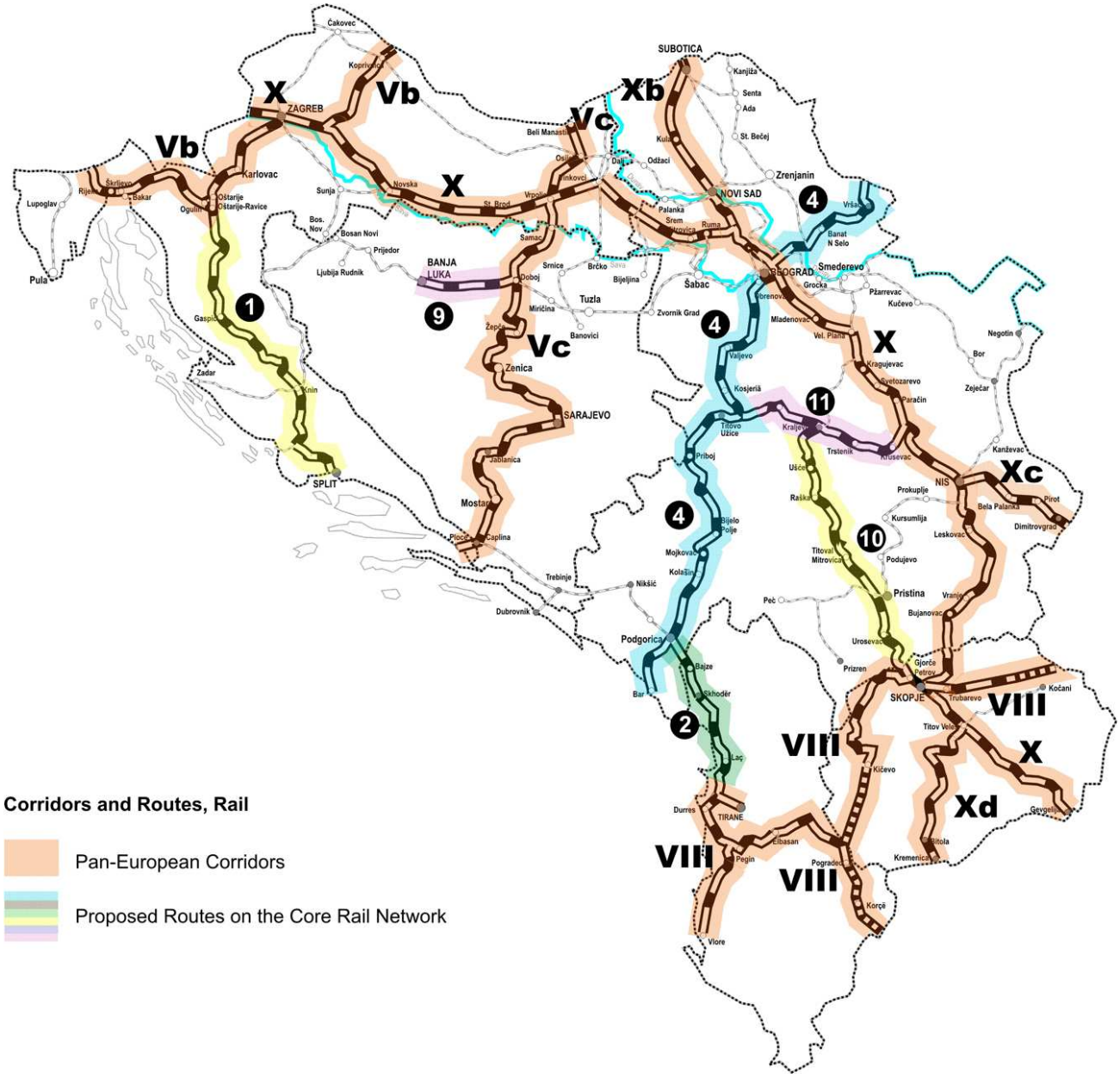


Figure 2.6 Routes and corridors, railways.

2.4 State of the Core Networks

With the view to assess the standards and conditions of the core network and to make an overall assessment of the needs for investment, an overall review of the core road and rail networks has been performed. The review basically followed the methodology used in the TINA study. A summary of the assessment is presented in this chapter but more details are provided in Appendix 1.

Data collection started with the preparation of questionnaires for geometrical information, condition information and terrain information. The questionnaires were sent to the relevant Road and Rail Authorities in the five countries.

The information received was then studied and validated by the Consultant, who also discussed the information with the authorities and inspected selected sections of the network. In some cases where reliable information was not available, the review was based on estimates and assumptions by the Consultant

2.4.1 General observations, roads

The geometrical characteristics of the core road network varies substantially - from 2-lane roads with less than 7m pavement to 4-lane roads and motorways, as shown in Figure 2.7 overleaf. Generally, the roads have sufficient capacity to carry the present traffic, although some sections in and around cities are in need for capacity improvement.

Corridor X has 4 lanes on most of its sections, except for the southern part, while the other corridors and routes have 2-lane roads. In the central part of the region bottlenecks of around 870 km of roads need widening or realignment due to insufficient pavement width. These roads have less than 7 m carriageway which is considered to be the minimum (refer Chapter 3.2.2) or the curve radii are too small.

Whereas the roads mostly have the sufficient capacity to carry present traffic volumes, the road conditions are often poor due to several years of neglected maintenance. Over 70% of the road network was found in need for some form of pavement renewal or rehabilitation. The situation may be summarised as follows ("wearing course" refers to the top layer of the pavement whereas the "overlay" is a structural layer which increases bearing capacity):

- Roads without problems 28 %
- Roads which need new wearing course 25 %
- Roads which need pavement rehabilitation 24 %
- Roads which need overlay + new wearing course 12 %
- Roads which need complete new pavement 11 %

However, there are major differences from country to country. The best pavement condition is found in Croatia, where the majority of the roads are in good condition. In Albania the roads are either newly rehabilitated or badly in need of complete reconstruction because the traditional pavement is a penetrated macadam which is not able to resist present and future axle loads.

Corridor X shows a reasonably good pavement condition, however with a need for a new wearing course and on the southern sections also combined with an overlay.

Road conditions are shown in Figure 2.8.

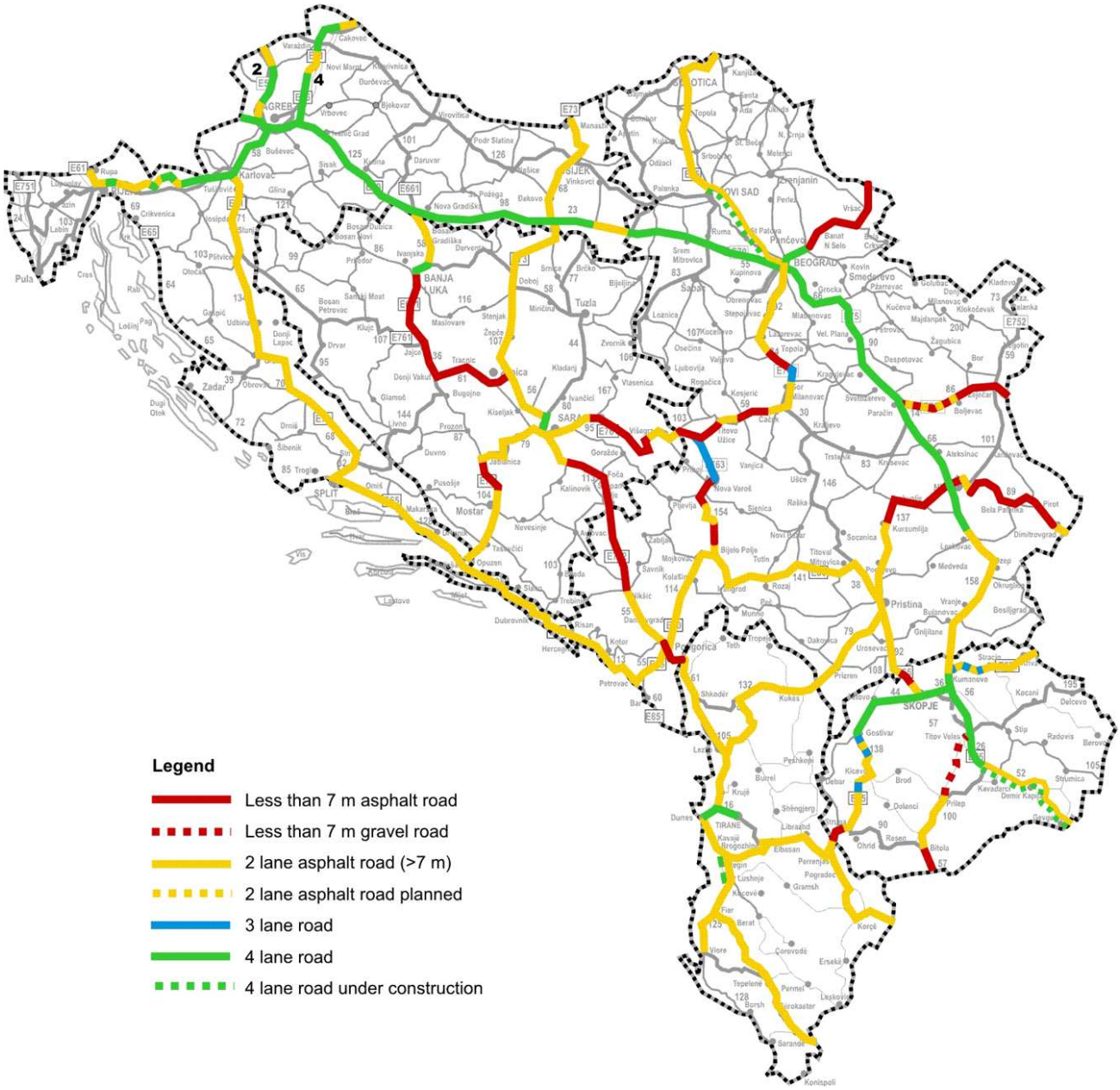


Figure 2.7 Road geometry.

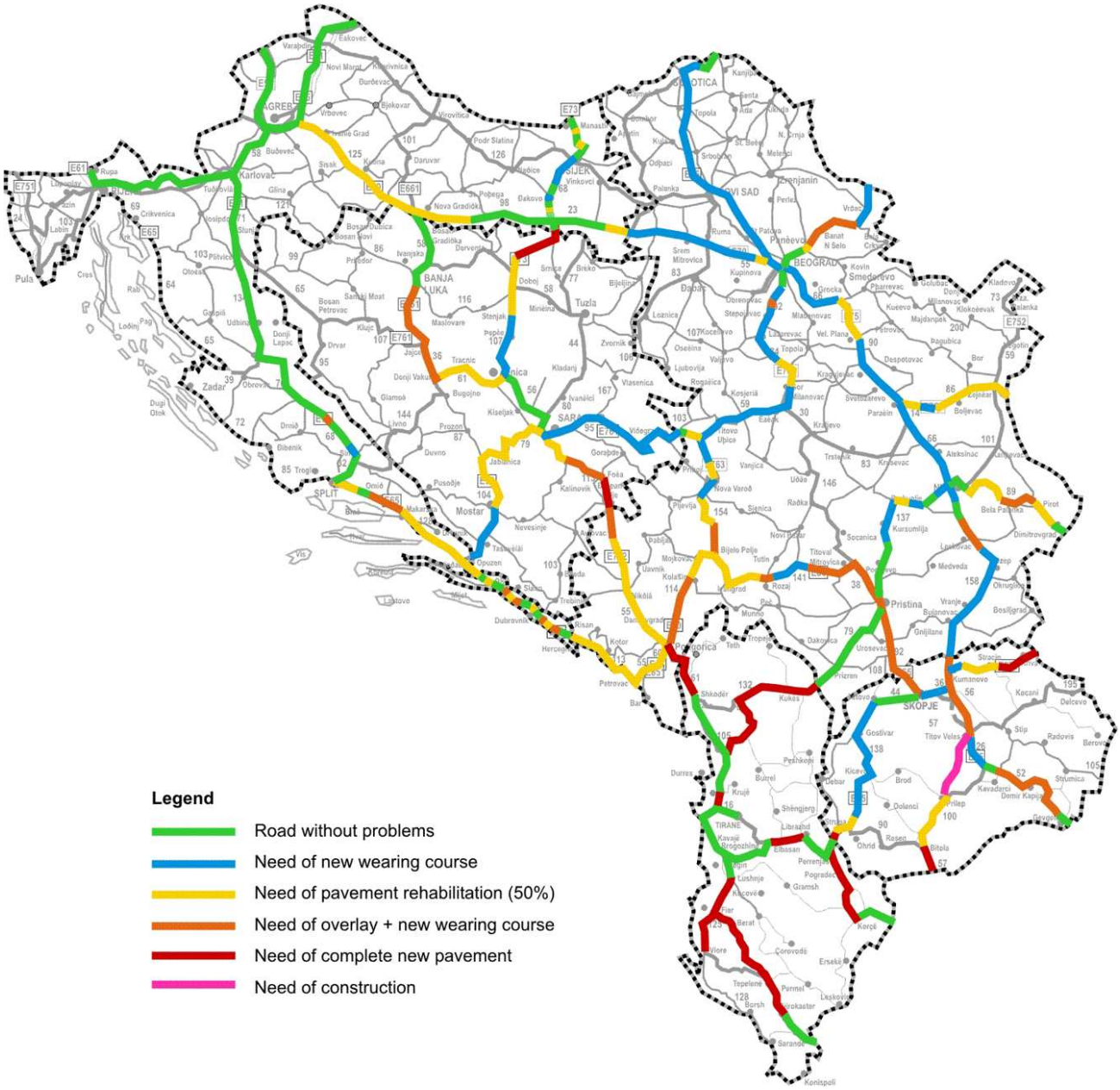


Figure 2.8 Road condition.

2.4.2 General observations, railways

Figure 2.9 shows the main technical characteristics of the core railway network.

Around half of the sections on Corridor X, together with a section on Corridor Vc (Jelina - Grapska in Bosnia and Herzegovina), have today a double track line and maximum speed 100-160 km/h.

All other existing lines are single track lines. In Table 2.3 the main characteristics of the rail network are summarised. It appears that:

- 86% of the network has only single track
- 59% of the network is electrified

Most of the railway network has ample capacity to carry the present traffic volumes. However, on a number of sections the speed is limited by the geometry of the alignment.

The main challenge - in the short term - is to restore original design speeds and technical standards of the network. Many lines are in poor condition which implies that operation speeds are below the original design speed.

Table 2.3 Overview of technical condition, railways.

Corridor/ route	Total length	Number of tracks 1	2	Electrification	Max. /min speed
	km	km	km	km	km/h
Corridor X	1,048	547	501	1,048	160/35
Corridor Xb	150	150		150	100/60
Corridor Xc	104	104		0	80/40
Corridor Vb	339	339		339	120/40
Corridor Vc	531	439	92	428	110/40
Corridor VIII	406	406		0	60/30
Route 1	322	322		0	100/35
Route 2	143	143		0	100/30
Route 4	555	555		469	100/35
Route 9	87	87		87	80/40
Route 10	442	442		0	70/35
Route 11	138	138		0	100/35
Total	4,265	3,672	593	2,521	

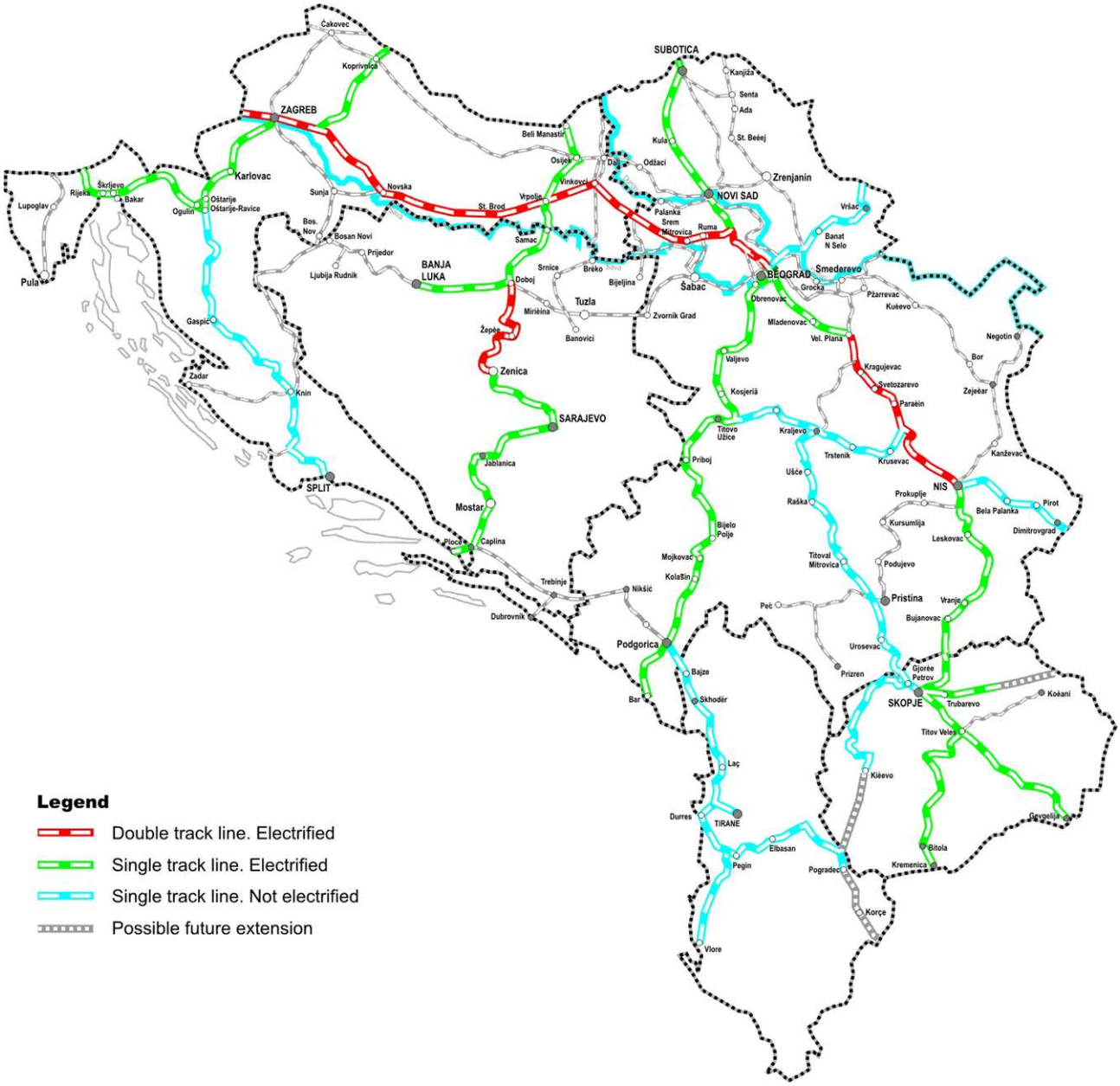


Figure 2.9 Present technical condition, railways.

2.5 Border crossings

The dissolution of the Yugoslav Federation led to the creation of over 5,000 km of new, international border lines and the shift in transport flows changed the utilisation of the already established border crossings. Goods transport, in particular, is now - at some borders - subject to long waiting times, unpredictable customs services and the necessity to make unauthorised payments[1].

[1] World Bank, Trade and Transport Facilitation in Southeast Europe Program, Progress Report 2002, November 2002.

The border crossings on the Core Network in the region are presented in Figure 2.10 for roads and Figure 2.11 for rail and briefly commented below.

The information on the border crossings are collected through reports describing the ongoing projects and questionnaires submitted to relevant authorities in each of the countries. This has been supplemented with meetings with key persons. In addition, the World Bank and CARDS projects have provided information on their ongoing and planned activities at the border crossings.

The institutional, legal and procedural aspects of border crossings are discussed in Appendix 2.

2.5.1 Present and planned initiatives

All five countries are participating in international initiatives, agreements and programmes which are related to border crossing issues. These include:

- The Balkan Stability Pact - within this framework a network of Free Trade Agreements is being established.
- The Southeast European Co-operation Initiative (SECI) - this initiative focuses i.a. on efficient transit and the combating of corruption and smuggling.
- The EU CARDS programme - this programme includes the support of trade facilitation through customs assistance programmes, the upgrading of specific border crossings, strengthening of national institutions and improvement of infrastructure.
- The World Bank Trade and Transport Facilitation in Southeast Europe Programme (TTFSE) - this programme focuses i.a. on the elimination of smuggling and corruption, improvement of integrity at border crossings, strengthening and modernisation of customs administrations and other border control agencies.

The World Banks TTFSE and the EU CARDS programmes are supporting the region with EUR 64 million during 2-4 years and EUR 117 million over 3 years respectively. In addition, also PHARE, EBRD and other investors have provided support to improvement of specific border crossings.

Table 2.4 Support to border projects under TTFSE and CARDS (EUR million)

	TTFSE				CARDS	Total
	Government	World Bank	Other	Sub-total		
Albania	2.5	5.3	2.7	10.5	20.0	30.5
Bosnia and Herzegovina	2.7	7.4	2.6	12.7	23.0	35.7
Croatia	5.3	11.8	1.6	18.7	23.0	41.7
FYRO Macedonia	2.6	7.9	1.8	12.4	20.0	32.4
Serbia and Montenegro	0.9	5.8	2.6	9.4	31.0	40.4
Total	14.1	38.3	11.3	63.7	117.0	180.7

2.5.2 Status on the corridors and in the countries

Below a brief status for the five countries is presented including existing problems not supported by investors. More detailed information on the border crossings is provided in Appendix 2.

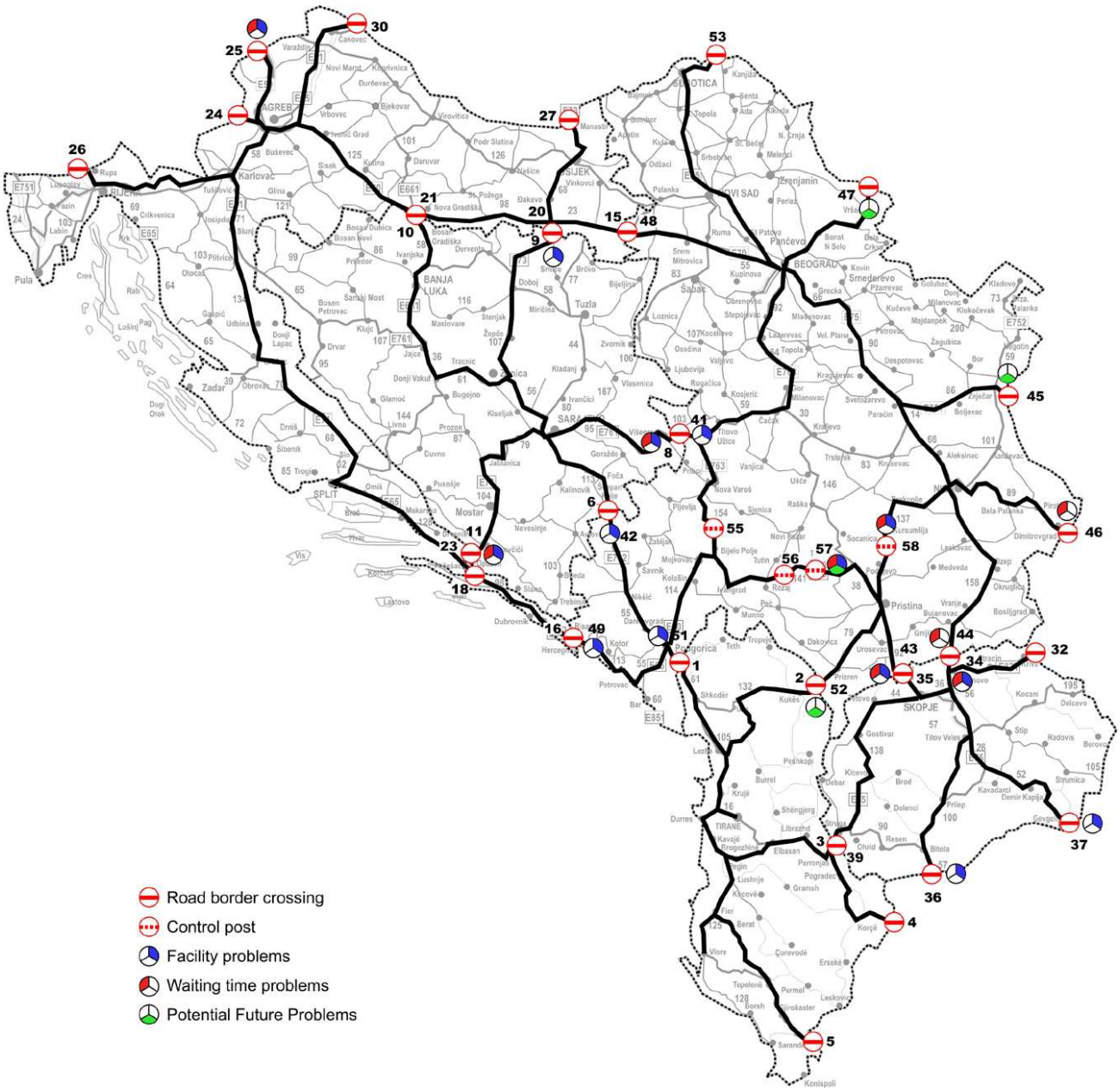


Figure 2.10 Road border crossings on Core Network and location of border crossings which are presently or potentially bottlenecks and are not already supported.

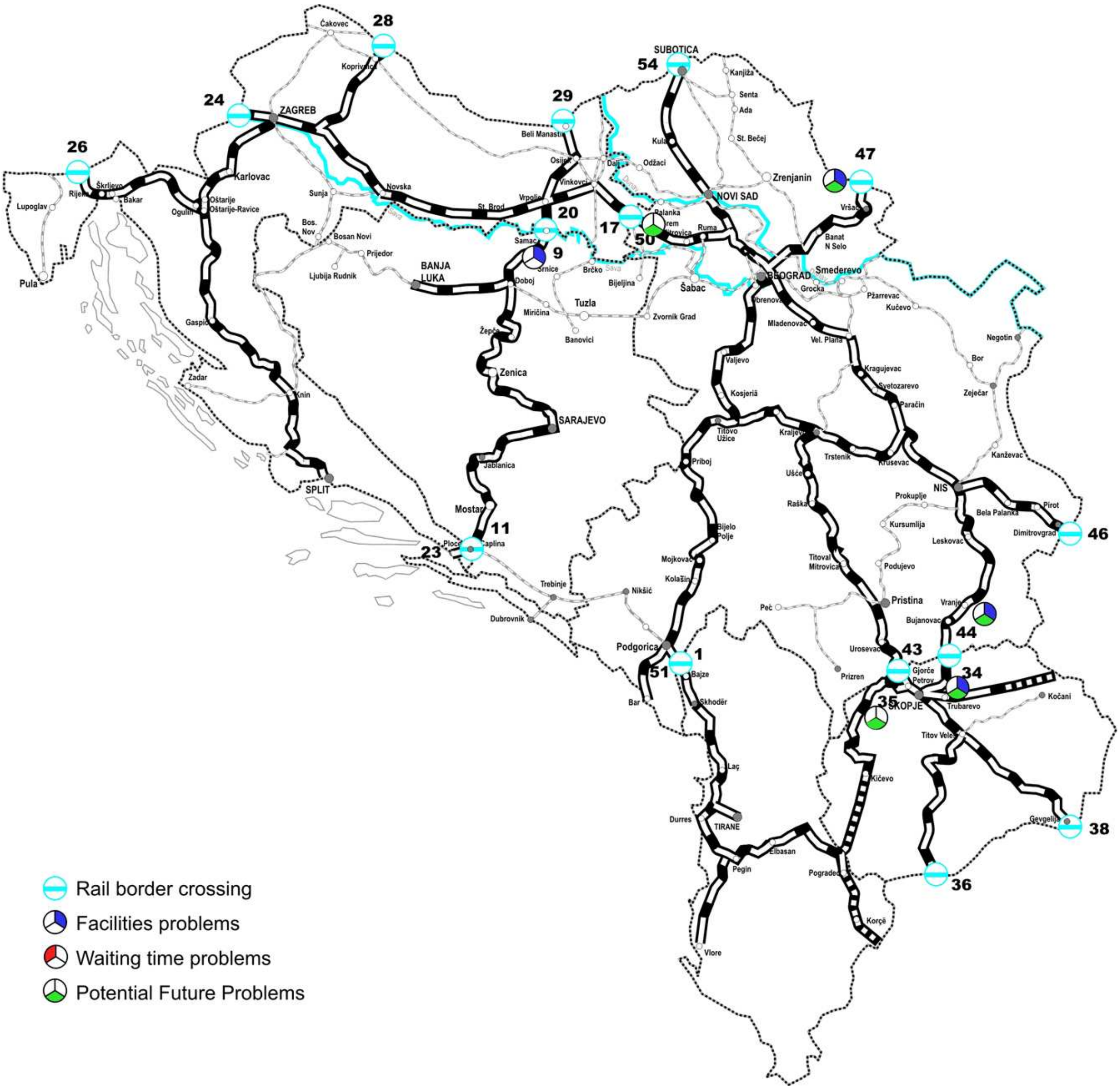


Figure 2.11 Rail border crossings on core network and location of border crossings which are presently or potentially bottlenecks and are not already supported.

Border crossings on the core network

The border crossings on the core road and rail network are shown by corridor and route in the following tables. The numbers correspond to the maps in Figure 2.10 and 2.11.

The border crossings on the core road network are listed in Table 2.5.

Table 2.5 Border crossings on the core road network.

No. and name	Between
Corridor Vb	
30 Gorican	Hungary and Croatia
26 Rupa	Slovenia and Croatia
Corridor Vc	
27 Dubosevica	Hungary and Croatia
20 Slavenski Samac and 9 Bosanski Samac	Croatia and Bosnia and Herzegovina
11 Doljani and 23 Metkovic	Bosnia and Herzegovina and Croatia
Corridor VIII	
32 Deve Bair	Bulgaria and FYRO Maceodonia
39 Kafasan and 3 Qafe Thane	FYRO Maceodonia and Albania
4 Kapështicë	Albania and Greece
Corridor X	
24 Bregana	Slovenia and Croatia
15 Bajakovo and 48 Batrovci	Croatia and Serbia and Montenegro
44 Presevo and 54 Tabanovce	Serbia and Montenegro and FYRO Maceodonia
37 Gevgelija/Bogorodica	FYRO Maceodonia and Greece
Corridor Xa	
25 Macelj	Slovenia and Croatia
Corridor Xb	
53 Horgos	Serbia and Montenegro and Hungary
Corridor Xc	
46 Gradina	Serbia and Montenegro and Bulgaria
Corridor Xd	
36 Medzitlija	FYRO Maceodonia and Greece
Route No. 1	
18 Klek	Croatia and Bosnia and Herzegovina
16 Karasovici and 49 Debeli Brijeg	Croatia and Serbia and Montenegro
Route No. 2a	
21 Stara Gradiska and 10 Gradiska	Croatia and Bosnia and Herzegovina
Route No. 2b	
6 Hum and 42 Scepan Polje	Bosnia and Herzegovina and Serbia and Montenegro
51 Bozaj and 1 Hani I Hotit	Serbia and Montenegro and Albania
Route No. 2c	
5 Kakavi	Albania and Greece
Route No. 3	
8 Vardiste and 41 Kotroman	Bosnia and Herzegovina and Serbia and Montenegro
Route No. 4	
47 Vatin	Serbia and Montenegro and Romania
55 Control post near Metanac on E763	Serbia and Montenegro
Route No. 5	
45 Vrska Cuka	Serbia and Montenegro and Bulgaria
Route No. 6	
56 Control Post between Baz and Spiljani on E80	Serbia and Montenegro
57 Control Post near on E80	Serbia and Montenegro and Kosovo
43 Djernal Jankovic and 35 Blace	Serbia and Montenegro (Kosovo) and FYRO Maceodonia
Route No. 7	
58 Control post near Meldare	Serbia and Montenegro and Kosovo
52 Vrbnica (Kosovo) and 2 Morinë	Serbia and Montenegro and Albania

The border crossings on the core rail network are listed in Table 2.6.

Table 2.6 Border crossings on the core rail network.

No. and name	Between
Corridor Vb	
28 Koprivnica	Hungary and Croatia
26 Sapjane	Slovenia and Croatia
Corridor Vc	
29 Beli Manastir	Hungary and Croatia
20 Slavenski Samac and 9 Bosanski Samac	Croatia and Bosnia and Herzegovina
11 Doljani and 23 Metkovic	Bosnia and Herzegovina and Croatia
Corridor X	
24 Bregana	Slovenia and Croatia
17 Tovarnik and 50 Sid Tovarnik	Croatia and Serbia and Montenegro
44 Presevo and 54Tabanovce	Serbia and Montenegro and FYRO Maceodonia
38 Gevgelija	FYRO Maceodonia and Greece
Corridor Xb	
54 Kelebija	Serbia and Montenegro and Hungary
	Corridor Xc
46 Gradina	Serbia and Montenegro and Bulgaria
Corridor Xd	
36 Medzitlija	FYRO Maceodonia and Greece
Route No. 2b	
51 Bozaj and 1 Hani I Hotit	Serbia and Montenegro and Albania
Route No. 4	
47 Vatin	Serbia and Montenegro and Romania
Route No. 10	
43 Djernal Jankovic and 35 Blace	Serbia and Montenegro (Kosovo) and FYRO Maceodonia

Albania

In Albania, the main issues related to border crossings are the modernisation of laws and procedures in relation to customs and excise, and the upgrading of customs' facilities. Smuggling and corruption are important issues that need also be dealt with[2].

At some border crossings there is some waiting time. This in particular applies to Qafe Thane, and for Kapështicë and Kakavi during summer periods mainly because of lack of appropriate legislation.

The most urgent improvements of the border crossings seem to have been completed or incorporated in other programmes. The PHARE programme has rehabilitated the border crossing stations at Hani i Hotit, Kavavi and Kapështicë. TTFSE includes the improvement of facilities at Qafe-Thane and Morina border crossings. Thus, there does not seem to be the need for further study of bor-

[2] World Bank, Project Appraisal Document on a proposed credit in the amount of SDR 6 million to Albania for the Trade and transport facilitation in Southeast Europe project, October 2000.

der crossing facilities, however there is still a need for improvements in procedures and legislation.

Bosnia and Herzegovina
In Bosnia and Herzegovina there are a number of unresolved border crossing issues. Facilities are, in many cases, poor, and the location of some border crossings has not yet been settled. This includes the Samac border. The CARDS programme plans to fund at least one of the stations; Doljani, Bosanski Samac/Samac, and Vardiste. The EU may also rehabilitate the border crossing at Hum. TFFSE will include funding of Orsaje, Izacic and Doljani, and the Gradiska border crossing is included as pilot project.

It appears that most of the border crossings are being considered under various programmes, however several border crossings still have poor facilities and some waiting times (Vardiste (road), Bosanski Samac/Samac (road and rail), Doljani (road)).

Croatia
In Croatia much work has already been done to improve border facilities but this is not yet complete. There is also the need to modernise laws and procedures related to customs and excise. Croatia has a total of 14 border crossings on the core network.

At some border crossings there is a substantial waiting time. This in particular applies to Maselj while Bajakovo, Karasovici, Slovonski Samac, Bregana and Rupa mainly have problems during peak periods.

In addition to the work already carried out/completed, improvements will be made under CARDS (Bajakovo, Karasovici, Metkovic, Bregana) and TTFSE (Slavonski Samac, Maselj). The government has also financed or plans to finance the improvement of several border crossings, e.g. Stara Gradiska and Dubosevica.

Macelji appears to be the main bottleneck only covered as pilot project under TTFSE. Depending on the result of the evaluation under TTFSE Maselj may be considered for improvement because of long waiting times.

FYRO Macedonia
In FYRO Macedonia there is a need to improve and adjust customs' laws and procedures and to upgrade border facilities. There is also the need to address the problems of smuggling and corruption [3].

At some border crossings there is a substantial waiting time. This in particular applies to Blace, Deve Bair and Tabanovce, especially during peak periods.

[3] World Bank, Project Appraisal Document on a proposed credit in the amount of SDR 7 million to FYRO Macedonia for the Trade and transport facilitation in Southeast Europe project, June 2000.

Improvement of facilities at Tabanovec, Deve Bair and Kafasan are included in the TTFSE programme. PHARE has rehabilitated the facilities at Medzitlija and Gevgilija/Bogorodica and the EAR is improving the facilities in Blace, e.g. the facilities for freight transport have been completed and those for passengers are being implemented.

Several border crossings seem still to have problems with waiting times, facilities and others may become bottlenecks in the future (Tabanovce (road and rail), Blace (rail), Gevgilija (road) and Medzilidja (road)).

Serbia and Montenegro
This section covers the border crossings of Serbia and Montenegro consisting of the Republic of Serbia, Kosovo and Republic of Montenegro. Serbia and Montenegro has a total of 14 border crossings and a number of control posts on the core network.

Border crossing issues in Serbia and Montenegro include inefficient procedures, overlapping responsibilities and insufficient co-ordination in terms of border management and enforcement, organisational and staffing issues and inadequate infrastructure. At certain border crossings the existing facilities will become unable to cope with increased traffic and waiting time at some of the border crossings are already considerable.

Several border crossings are included in the TTSFE programme, e.g. Presevo, Gradina, Batrovci, Debili Brihej and Horgos. EU supports Djernal Jankovic and Horgos, EAR supports Djernal Jankovic, and EIB the rail border of Gradina.

There are poor facilities and waiting times at several border crossings in Serbia and Montenegro (Kotroman (road), Djeneral Jankovic (road), Presevo (road), Gradina (road), Debeli Brijeg (road) and Bozaj (road)).

Additionally, there may be problems in the future at a number of border crossings which may require further studies (Scepan Polje (road), Vrska Cuka (road), Vatin (road and rail), Sid Tovarnik (rail), Vrbnica (road) and Presevo (rail).

Serbia and Montenegro also has internal control points between Serbia and Montenegro and between Serbia and Kosovo. At the control point between Serbia and Montenegro, the physical facilities and the procedures undertaken are limited and there are no major impacts on traffic, and they are expected to be temporary. The control points between Serbia and Kosovo, on the contrary, include strict controls and traffic is often delayed (control posts near Banje on E80 on 22-3 - presently the route is not used for political reasons) and control posts near Meldare on E80/25).

2.5.3 Border crossings problems

REBIS is mainly focused on the improvement of infrastructure. The problems at the border crossing are largely related to regulatory and procedural issues.

Much work has already been done to improve the situation - both in respect of trade facilitation and in the physical improvement of infrastructure and facilities.

There are, however, still a number of border crossings which have not adequately been addressed and where infrastructure improvements and further studies could be considered. This section together with Appendix 2 provides an overview of the finalised and ongoing work and identifies the border crossings where some infrastructure improvements remain.

The border crossings identified as present bottlenecks or border crossings which may become bottlenecks in the future are listed in Table 2.7.

Table 2.7 Border crossings on the core network which are present or potential bottlenecks and not supported by other investors. The numbers of the border crossings correspond to the location shown in Figure 2.10 and 2.11.

Location	Problems	Corridor/ route
9 Bosanski Samac/Samac -road	Temporary settlement and disagreement on location - no trucks allowed	Vc
9 Bosanski Samac/Samac - rail	Track ready but no trains yet - disagreement on location	Vc
11. Doljani - road	Often congested, so commercial traffic is diverted to other border crossing. Narrow and confined site.	Vc
34 Tabanovce - road	Waiting time at entry between 65 and 246 min over one year. Temporary facilities, but improvements to start - need financing of the gap - (also waiting time on Serbia and Montenegro side, 44 Preservo)	X
34 Tabanovce - rail	Railway station small and only for passengers. Clearance of goods in Kumanovo - (small station on Serbia and Montenegro side, 44 Preservo)	X
37 Gevgilija/Bogorodica - road	Problems with water supply systems	X
44. Presevo - road	Waiting time at entry between 130 and 180 min over one year - need financing to implement project (also waiting time on the FYRO Macedonian side, 34 Tabanovce)	X
44. Presevo - rail	Railway station small and customs clearance only for passengers. Clearance of goods in Popovci (also small station on the FYRO Macedonian side, 34 Tabanovce)	X
50. Sid Tovarnik - rail	Increasing waiting time for customs clearance of passengers and freight	X
25. Macelji - road	Waiting time at entry between 65 and 246 min over one year. Land constraints. Identified as bottleneck by Ministry of Finance	Xa
46. Gradina - road	Waiting time at entry between 15 and 80 min over one year	Xc
36 Medzilidja - road	Problems with water supply systems	Xd
49. Debeli Brijeg - road	No parking places, two traffic lanes, containers used as buildings and no computer system. Poor access roads	1
42. Scepan Polje - road	Poor facilities and poor access roads	2b
51. Bozaj - road	Customs buildings need rehabilitation, two traffic lanes and insufficient technical equipment. Poor access roads. Little traffic presently but large growth rate expected	2b
8 Vardiste - road	Existing facilities are poor and communication lacking, often flooded (also poor facilities from Serbia and Montenegro side, 41 Kotroman)	3
41. Kotroman - road	Existing facilities are very poor and communication lacking, (also poor facilities from the Bosnia and Herzegovina side, 8 Vardiste)	3
47. Vatin - road	Maybe problems to cope with future traffic	4
47. Vatin - rail	Railway station small and customs clearance only for passengers. Clearance of goods in Vrsac	4
45. Vrska Cuka - road	No truck terminal	5
43. Djeneral Jankovic - road	Some waiting time at peak hours and no facilities for passengers	6
57. Control posts near Banje on E80 (Kosovo) - road	Bottleneck because of strict control, however presently the route to Montenegro via Serbia is not used much for political reasons	6
52. Vrbnica (Kosovo) - road	Two traffic lanes but presently not much traffic	7
58 Control posts near Meldare on E80/25 (Kosovo) - road	Bottleneck because of strict control.	7
35 Blace - rail	No facilities and civilian traffic today	10

2.6 Traffic on the Core Network

2.6.1 Introduction

During the first phase of the study, a PC based forecasting model for goods and freight transport on the Core Network was developed. Using the model, forecasts were made for a 20 year period. The model was specifically developed with a view to establishing a common and consistent basis for the many pre-feasibility studies to be carried out within REBIS and to provide an overview of the expected traffic development on the Core Network.

The model takes, as a starting point, existing traffic volumes and predicts the estimated levels of traffic by 2006, 2015 and 2025. A GIS application has been developed which allows for the presentation of model results on maps for road and rail traffic. The model is documented in Appendix 3: Traffic Projections, and an overview of model and the assumptions is presented in the following.

At present the model is more flexible than the availability of data justifies. This is in order to consistently analyse and compare different scenarios in the region and to allow for improvements to the model as additional/more updated - reliable data become available.

2.6.2 Projected road and rail traffic on the network

The traffic situation has started to improve after the difficult period for the region in the late 1990s. The figures below present forecasted road and rail traffic on the core network for 2006 - assuming a moderate economic growth scenario for the region in the coming years. The forecasts do not take account of possible changes in visa regimes which could affect bilateral trade and subsequent traffic volumes between neighbouring countries in the future.

Generally, data for current traffic is more reliable for road than rail traffic, which often has to be estimated on the basis of uncertain assumptions. For some rail sections, data on current traffic is not available. Despite the uncertainties, the figures illustrate clearly the demand for the corridors and routes on the core network.

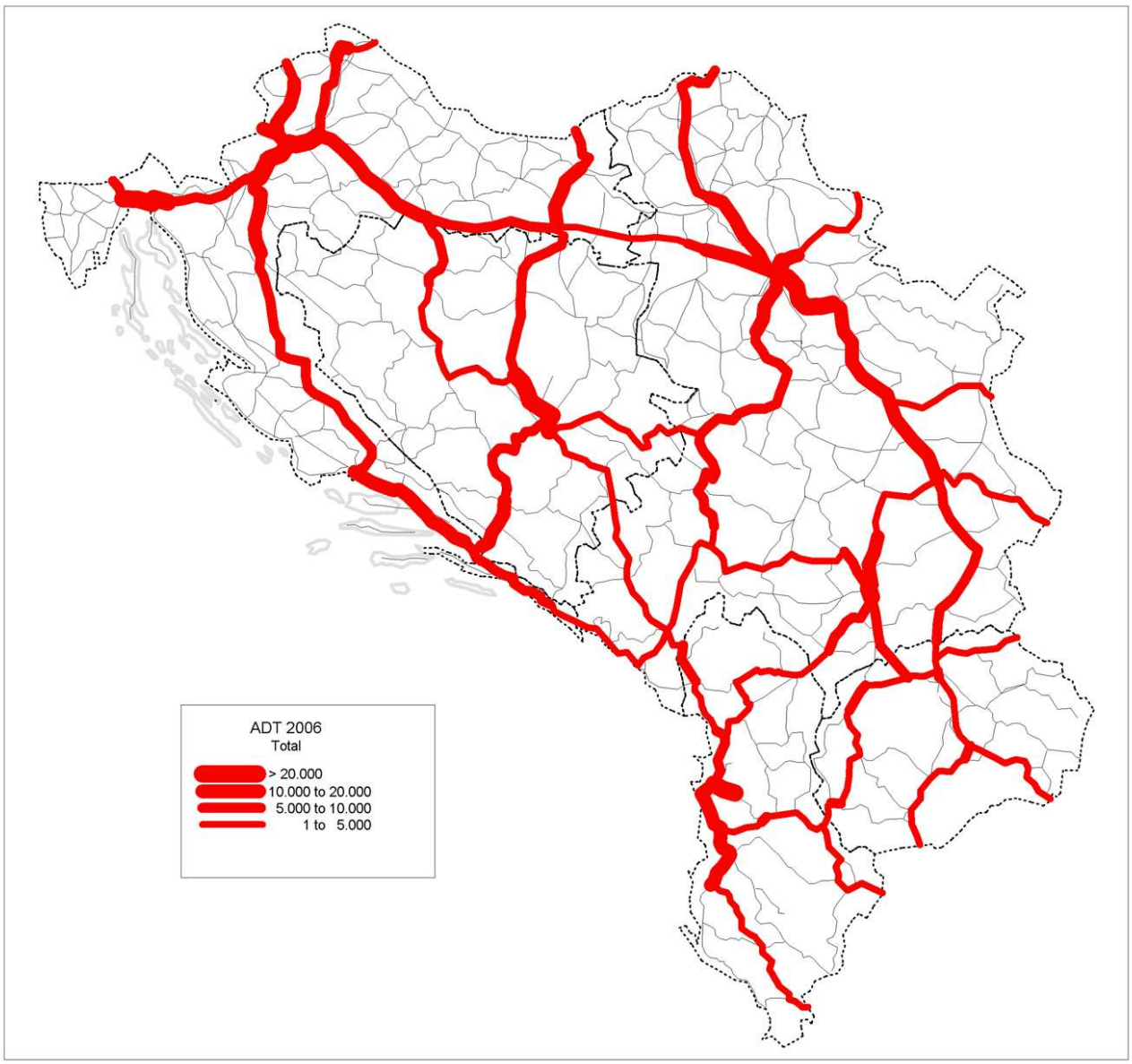


Figure 2.12 Projected road traffic 2006, moderate economic growth scenario.

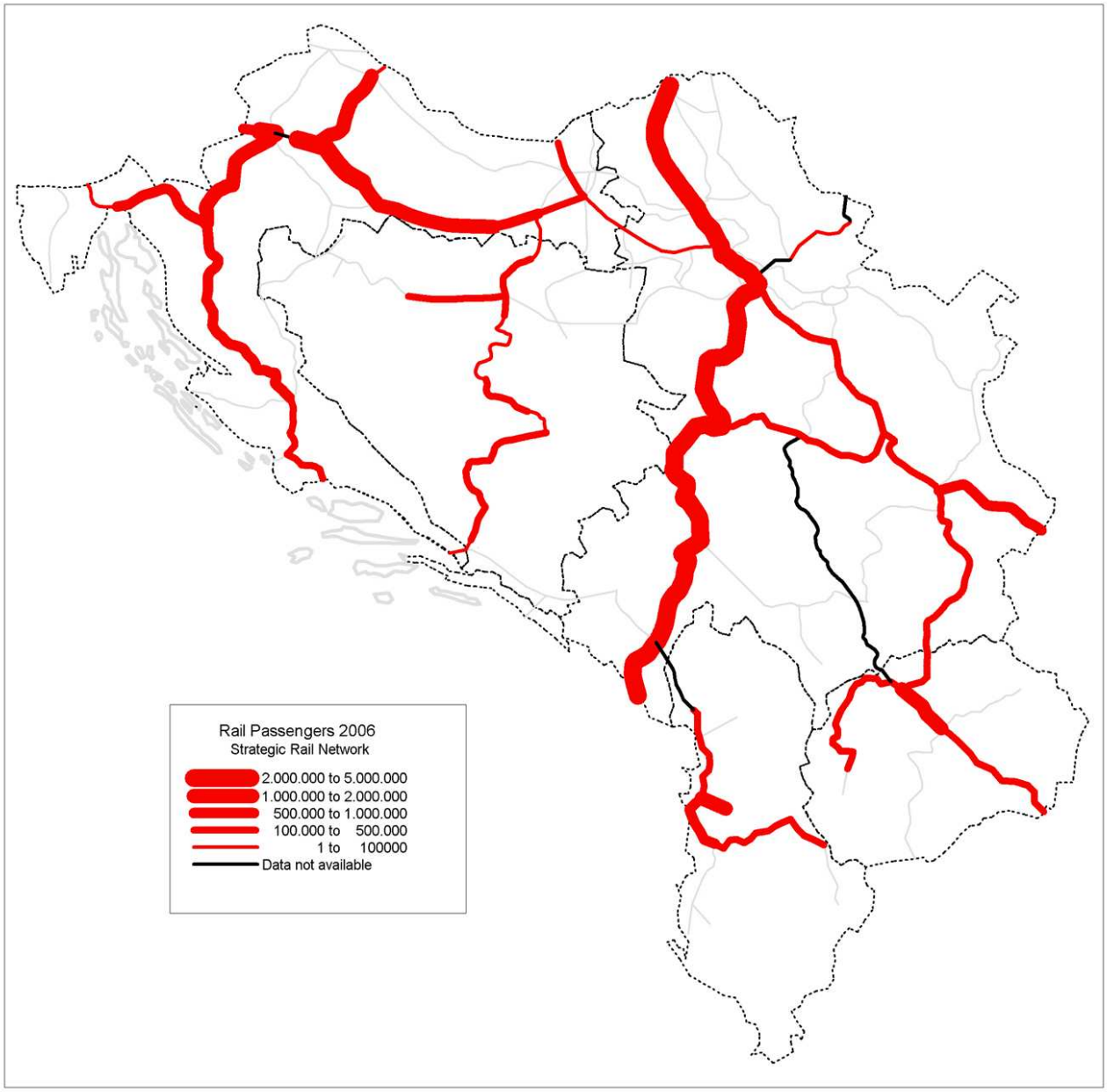


Figure 2.13 Projected rail passenger traffic 2006, moderate economic growth scenario.

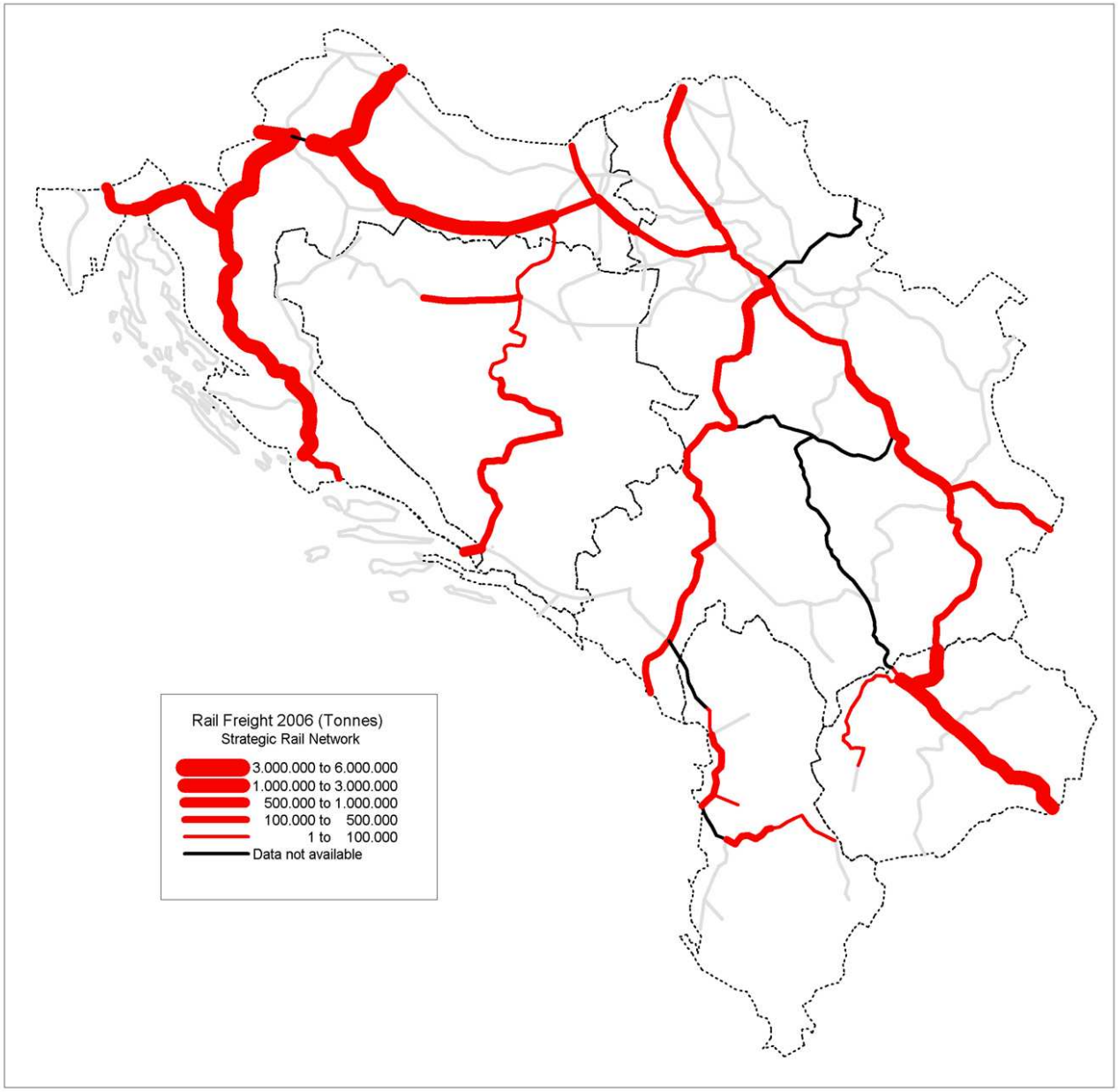


Figure 2.14 Projected rail freight traffic 2006, moderate economic growth scenario.

2.7 The forecast model

The model includes the following modes of transport:

- road traffic
- rail traffic
- air traffic
- inland waterways

For each mode of transport a forecast model is constructed. The assumed growth rates of GDP and population and the assumed elasticities jointly determine the forecasted level of traffic for each country and mode of transport.

For road and rail transport, separate sub-models are developed for passenger transport and for freight transport. It is expected that passenger and freight transport will grow at different rates when GDP increases.

Substitution between the various modes of transport and network effects are not explicitly treated in the model. However, as a result of the assumed elasticities for the different types of transport, the market share for these will change when GDP increases.

Specific seaport forecasts have not been prepared as a part of the model. This issue is further dealt with in Chapter 9.1.1.

2.7.1 Input to the model

For each country, the following data form inputs to the model:

- current level and expected growth of GDP (input for road, rail, waterway and air model)
- current level and expected growth of population (input for road, rail and air model)
- current level of car ownership (input for road model)
- current traffic levels on the network (input for road, rail, waterway and air model).

The following additional data may be included in the model, if available:

- index of fixed vehicle costs
- index of variable vehicle costs
  - affected by taxation
  - affected by time savings and improved infrastructure

Table 2.8 shows the expected growth in GDP and population for each country for three different scenarios.

Table 2.8 Assumptions about annual GDP and population growth used in the forecast model.

Scenario	Country	GDP% 2001-2005	GDP% 2006-2025	Population% 2001-2005	Population% 2006-2025
High		8.00	7.50	1.0%	0.8%
Moderate	***Albania***	6.50	6.50	1.0%	0.8%
Low		5.00	5.50	1.0%	0.8%
High		5.50	5.75	0.6%	0.5%
Moderate	***Bosnia and Herzegovina***	4.40	4.25	0.6%	0.5%
Low		3.50	2.75	0.6%	0.5%
High		5.00	4.50	1.2%	0.5%
Moderate	**Croatia**	4.40	4.00	1.2%	0.5%
Low		4.00	3.50	1.2%	0.5%
High		5.00	6.00	0.5%	0.5%
Moderate	***FYRO Macedonia***	3.70	4.25	0.5%	0.5%
Low		3.00	2.50	0.5%	0.5%
High		6.00	7.00	0.5%	0.5%
Moderate	***Serbia and Montenegro***	4.30	5.00	0.5%	0.5%
Low		3.50	3.00	0.5%	0.5%

Source: Ten Pan-European Transport corridors of Helsinki prepared under the Phare program, World Bank and consultants estimates.

As there are measurement problems in relation to GDP in the countries, the assumed growth rates should be broadly interpreted as the growth rates of fundamental economic activities in the various countries. This is what determines the growth rate in traffic, regardless of whether it is registered in the National Accounts or not.

2.7.2 Model assumptions and elasticities

The models are based on a number of assumptions, some of which can be modified whilst others are fixed.

Assumptions that can be modified within the model:

- All assumed elasticities can be changed.
- The effect of saturation on car ownership can be changed.
- The real price of both fixed and variable costs related to car ownership and use can be changed.

Basic assumptions that cannot be modified:

- Any relation between traffic inside the network and traffic outside the network is disregarded.
- The complex relationship between the fixed cost of owning a car and the variable costs of using it are assumed to be independent. This means that

car ownership is only affected by the fixed cost component and kilometres per car are only affected by the variable cost component.

These simplifications in the model would only have marginal effects on the model results.

2.8 Description of the models and results

Based on the forecast model, traffic growth rates for each type/mode of transport and for each country are estimated as presented in Table 2.9. In Appendix 3 the model is presented in further detail and the traffic forecasts can be seen for each section of the network.

Traffic forecasts are made for a 25 year period and show the following trends over the next 25 years:

- Road traffic will increase 2 to 3 times more than rail traffic for both passenger and freight transport.
- Inland waterway transport (freight) may not increase as much as road transport but probably more than rail transport.
- Air transport (passengers) will increase faster than any other mode in the period.

Furthermore, for all modes, traffic is expected to increase most in Albania and least in Croatia.

The modal split between road and rail traffic will, in all countries, change so that road traffic will increase its market share. A calculation with simplified assumptions but based on available data for three of the countries indicates that for passenger traffic, the market share for road traffic will increase from 87%-92% to 92%-94% over the next 25 years. For freight the increase of road traffic will be from 79%-95% to 88%-98%.

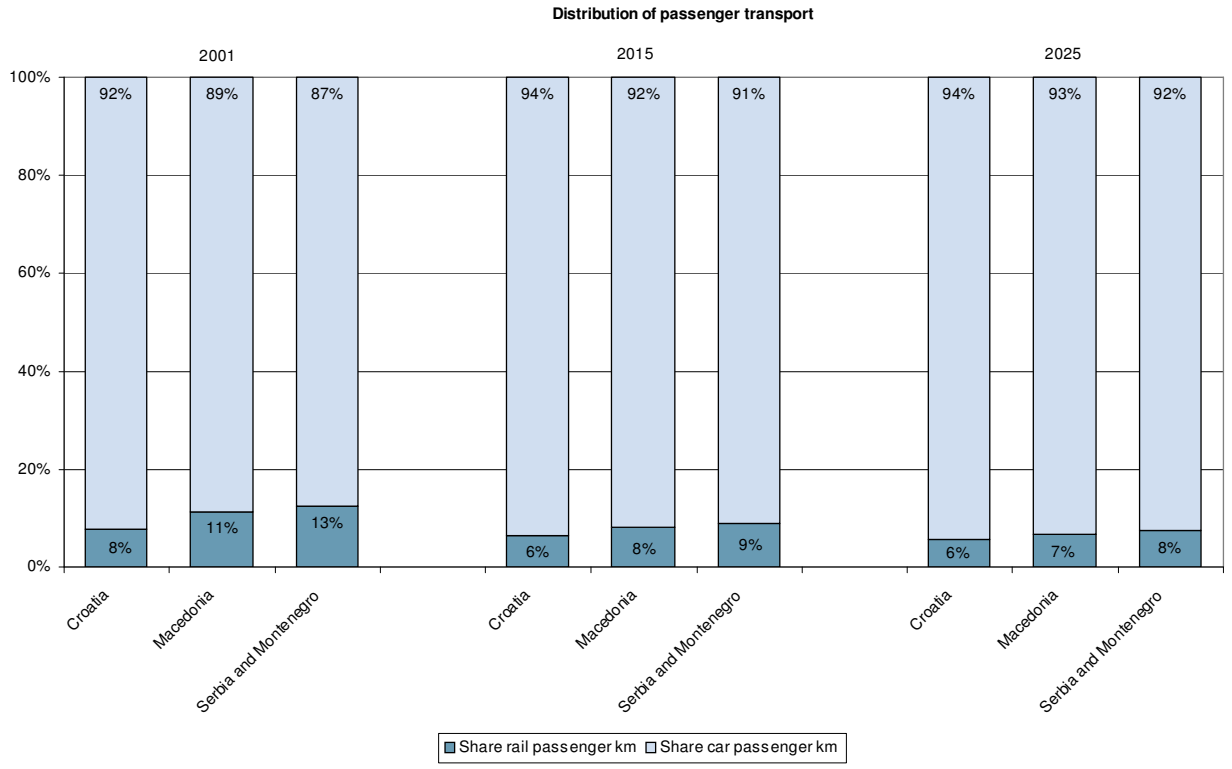


Figure 2.15 Distribution of passenger transport between road and rail transport, 2001, 2015 and 2025.

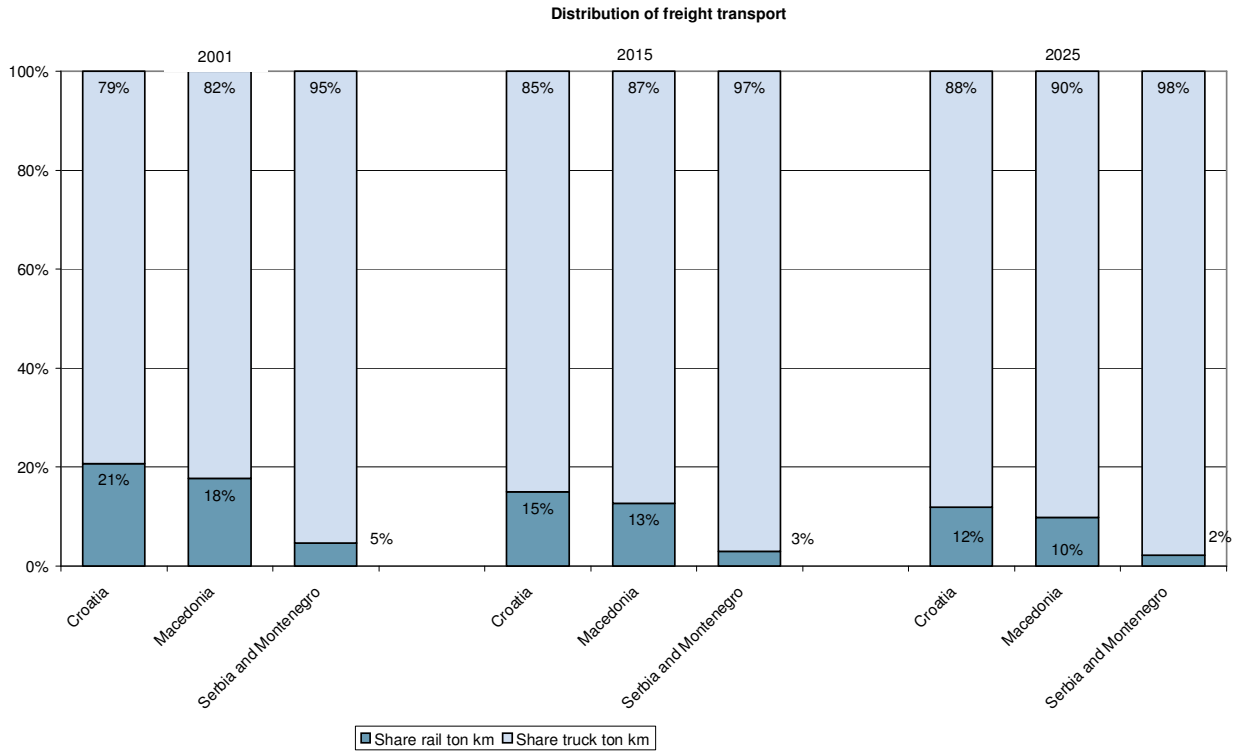


Figure 2.16 Development in market shares between road and rail transport, 2001,2015 and 2025.

2.8.1 Road traffic

For passenger cars, the relationship between income (GDP) and total car kilometres is complex. The relation between growth of GDP and growth of car ownership in the five participating countries is based on experiences from other countries. The relation between GDP and car ownership is not linear in the long run. Therefore saturation effects can be included in the forecast model and different elasticises can be applied below and above specified levels of car ownership in the country.

The traffic level for trucks and busses is determined by the growth rate of GDP. As it has not been possible to obtain separate data for national and international traffic, a common elasticity of 1.2 has been applied to the total traffic level in the respective countries.

Table 2.9 Growth rates for road traffic (ADT) in the moderate scenario.

	2001-2006	2001-2015	2001-2025
Albania - Passenger cars	63%	299%	850%
Albania - Trucks and busses	46%	186%	507%
Bosnia and Herzegovina - Passenger cars	30%	108%	206%
Bosnia and Herzegovina - Trucks and busses	29%	102%	232%
Croatia - Passenger cars	25%	72%	144%
Croatia - Trucks and busses	29%	96%	214%
FYRO Macedonia - Passenger cars	25%	99%	207%
FYRO Macedonia - Trucks and busses	25%	96%	222%
Serbia and Montenegro - Passenger cars	30%	110%	226%
Serbia and Montenegro - Trucks and busses	30%	119%	292%

2.8.2 Rail transport

Passenger rail transport is determined by GDP per capita and per population while freight transport is determined by total GDP.

The forecast for rail traffic presented in Table 2.10 should be interpreted with some caution. Because the composition of freight transport by rail is more concentrated than freight by road, the growth rates will depend on factors specific to each country and in certain cases few companies account for most of the rail freight transport on certain sections of the network. When applying the model e.g. for the pre-feasibility analysis of a proposed rail project, an adjustment to the actual type of traffic on that particular section has been considered.

Table 2.10 Growth rates for rail traffic in the moderate scenario.

	2001-2006	2001-2015	2001-2025
Albania - Tonnes of freight	17%	56%	115%
Albania - Passengers	20%	65%	136%
Bosnia and Herzegovina - Tonnes of freight	11%	35%	66%
Bosnia and Herzegovina - Passengers	13%	39%	76%
Croatia - Tonnes of freight	11%	33%	62%
Croatia - Passengers	14%	39%	74%
FYRO Macedonia - Tonnes of freight	10%	33%	64%
FYRO Macedonia - Passengers	11%	37%	73%
Serbia and Montenegro - Tonnes of freight	12%	39%	78%
Serbia and Montenegro - Passengers	13%	44%	89%

The growth rates presented in Table 2.10 are based on elasticities of 0.5 of the GDP for both freight and passenger transport. This implies that the market share of rail traffic decreases as incomes increase, which reflects the pattern observed in other countries during transition.

2.8.3 Inland waterways

The current level of freight on the Danube is considerably lower than the levels 10 years ago. In the overall forecast of freight transport on inland waterways, it is assumed that growth rates will follow that of the total GDP (the elasticity is 1).

Table 2.11 Growth rates of freight on inland waterways in the moderate scenario.

	2001-2006	2001-2015	2001-2025
Bosnia and Herzegovina - Tonnes of freight	24%	80%	173%
Croatia - Tonnes of freight	24%	76%	160%
Serbia and Montenegro - Tonnes of freight	24%	93%	214%

2.8.4 Air traffic

The air passenger network comprises domestic routes and international routes within the region. It is not possible to assign traffic data to this network as, for many airports, only the number of departures and arrivals are available and not the destination or origin.

The forecast of total passengers by air traffic is determined by GDP per capita and population.

Table 2.12 Growth rates for air traffic in the moderate scenario.

	2001-2006	2001-2015	2001-2025
Albania - Passengers	59%	268%	833%
Bosnia and Herzegovina - Passengers	37%	140%	344%
Croatia - Passengers	37%	131%	314%
FYRO Macedonia - Passengers	32%	130%	327%
Serbia and Montenegro - Passengers	38%	165%	445%

3 Investment requirements on the Core Network

3.1 Introduction

One of the main aims of the REBIS project is to prepare investment plans for the development of the core network in the short and the medium term, with particular emphasis on projects that are suitable for international co-financing.

The preparation of investment plans has been undertaken through a comprehensive and dialogue-based process, starting at the very beginning of the project. It has involved a wide range of stakeholders, in particular, the national authorities in the region who have contributed with project proposals, substantial information and analytical work and have taken part in the discussions of priorities. Also the Client and the Infrastructure Steering Group have been involved in key decisions.

As in the TINA process, emphasis has been placed on roads and railways, but projects have also been proposed and considered within the sectors of airports, inland waterways and seaports.

Figure 3.1 illustrates this process, which has involved the following stages:

- **Assessment of long-term investment requirements**. The current state of the core road and railway network was reviewed, based on existing information, interviews with national authorities and field investigations/inventories. The present network characteristics were then compared to the forecast traffic in year 2015, and, in line with the TINA methodology, the investments required to bring the network up to "European standard" by year 2015 were assessed.

- **Project identification**. Specific potential projects on the networks were then identified, based on existing plans and studies, observations in the field, and the above assessment of the long term investment requirements. The identification of projects took place in close dialogue with the national authorities.

- **Project screening**. For the purpose of screening the many road and railway projects and preparing a preliminary ranking of them, a dedicated

multi-criteria screening tool was developed. In close co-operation with national authorities a comprehensive assessment was undertaken of each road and railway project. The assessment included a total of 15 criteria, and for each criterion a score was given. The screening tool assigned weights to these scores and arrived at a total score for each project under study. Projects for which the screening tool did not apply were assessed on an individual basis. Substantial detail is provided in appendice 5.

- **Selection of projects for pre-feasibility study**. Among the projects scoring high in the screening process, some 20 projects were selected for pre-feasibility analysis. Projects for which recent and adequate feasibility studies are already available, or which can be assessed without further study were not selected for pre-feasibility analysis under REBIS. The selection of projects for pre-feasibility studies was approved by the EC Commission and the ISG.

- **Pre-feasibility studies**. Pre-feasibility studies, including cost-benefit analyses, were then carried out for the selected projects. In order to ensure consistency between projects and countries, a standard methodology was applied, and a common basis for the projection of traffic was used. The detailed inputs and analyses were established in close co-operation with national authorities.

- **Preparation of short-term investment plan**. Based on the long-term investment requirements and the detailed assessment of projects a short-term investment plan was prepared. The plan comprises 137 projects on the core network, which seem feasible in the short term, and, which are suitable for international co-financing.

- **Preparation of medium/long term investment plan**. The list of identified projects include several projects, which will be relevant in the medium- or long term, but which do not seem feasible or affordable in the short term. Such projects were included in the medium/long term investment plan.

This chapter gives an overall presentation of the tasks performed and the main findings and recommendations. Substantial detail is provided in the Appendices.

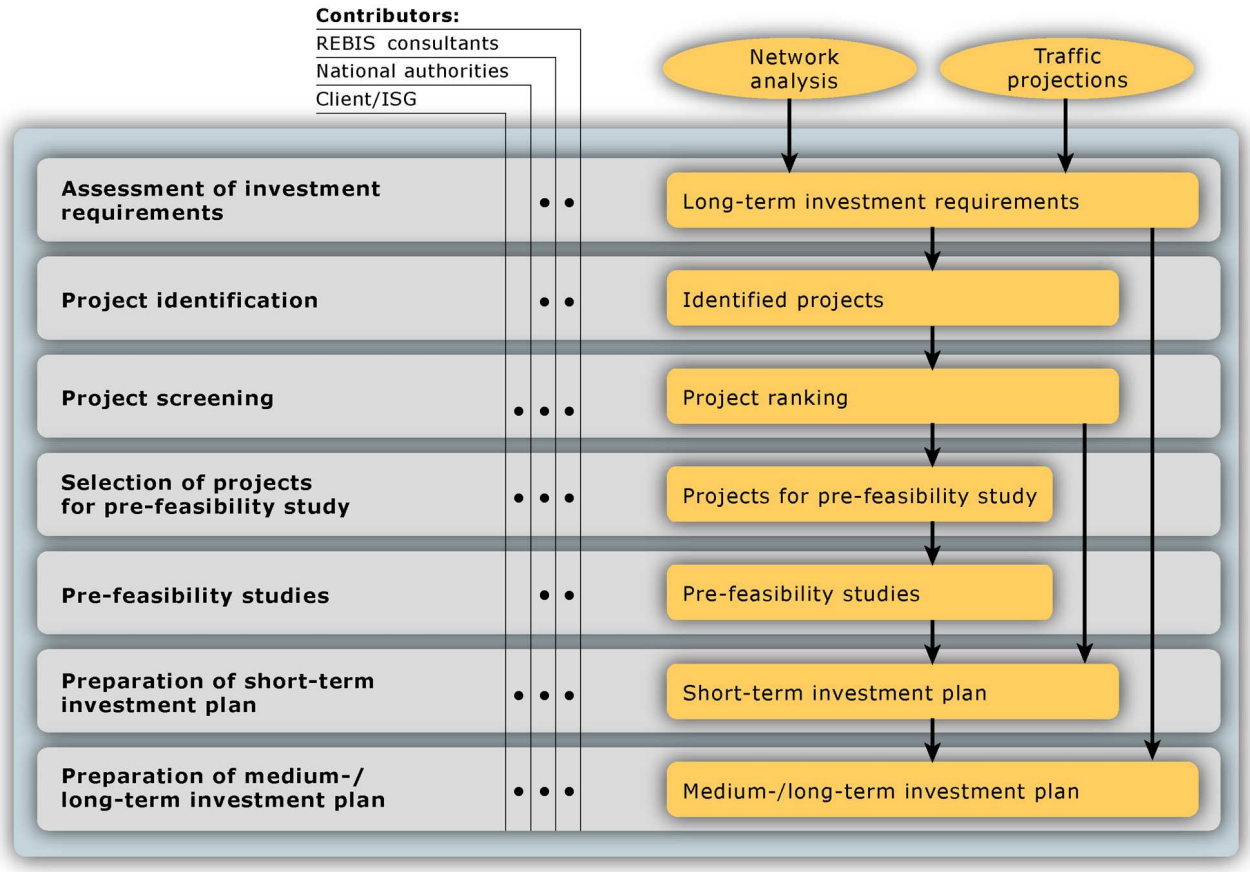


Figure 3.1 The planning process.

3.2 Long-term investment requirements on the Core Network

3.2.1 Introduction

As described in Chapter 2.4 the present standard and condition of the road and rail network has been assessed. The present situation has been compared to an "acceptable European standard" and the costs needed to upgrade the network to such standard have been assessed. The objective of this assessment has been to establish an overview of the investments needed to eliminate the bottlenecks in the road and railway sector during the coming 12 years.

However, it has to be underlined that this assessment does not automatically mean that all projects identified are feasible or "bankable". Especially in the railway sector it is not likely that all projects will prove to be feasible when feasibility studies have been carried out.

3.2.2 Standards

The future standards for roads have been based on the European Agreement on Main International Traffic Arteries (AGR). The design speed is, in general set at 80 km/h for all express and ordinary roads and 120 km/h for motorways. The

design speed has been reduced in exceptional cases of limited lengths and in difficult topographic and other conditions. Application of the AGR-standard also means that the minimum width of a 2-lane road is 7 m of asphalt carriageway preferably with paved shoulders. Roads of less than 7m width have thus been assumed widened and provided with hard shoulders.

For railways the "European Agreement on Main International Railway Lines" (AGC), and "European Agreement on Important International Combined Transport Lines and Related Installations" (AGTC) have been used as a basis. However, these agreements are rather ambitious, and it will be neither feasible nor affordable to upgrade the entire core network to these standards. In the present analyses only Corridor X has been assumed to be upgraded to 160 km/h and to double track. For other lines modernisation has been assumed (electrification, signalling and telecommunication), but speeds have been set at 100 to 120 km/h.

3.2.3 Determination of unit costs

Unit costs for the typical road and railway improvements have been collected from the road and railway authorities. Unit costs were specified for the main components of work. However, not all authorities have been able to provide the required recent prices from international tendering and, in some cases, unit costs from other sources have, therefore, been used. In general, the unit costs of the TINA study (updated to present price level) have been used as a reference along with recent tender results for roads from Croatia and unit costs for railways from Serbia. Although some differences exist between the countries today it is expected that these will be reduced during the coming years when they approach the EU level.

The price level is 2003, and more details regarding the applied unit costs are found in Appendix 4.

3.2.4 Investment costs on each corridor/route

Based on the above the long-term investment requirements for the core road and rail networks have been calculated. Table 3.1 shows the results by corridor/route.

Table 3.1 Long-term investments on the Core Network.

Corridor/route	Road investment cost, EUR million	Rail investment cost, EUR million	Total investment, EUR million
Corridor V b	421	1,099	1,520
Corridor V c	461	1,593	2,054
Corridor VIII	409	1,167	1,576
Corridor X	689	2,731	3,420
Corridor X a	27		27
Corridor X b	132	369	501
Corridor X c	75	173	248
Corridor X d	75	304	379
Route No. 1	672	671	1,343
Route No. 2	463	244	707
Route No. 3	150		150
Route No.4	256	2,157	2,413
Route No.5	20		20
Route No. 6	144		144
Route No. 7	231		231
Route No. 9		213	213
Route No. 10		1,343	1,343
Route No. 11		288	288
Total	**4,225**	**12,352**	**16,577**

It is apparent that most of the identified investment requirements are found within the railway sector, which account for over EUR 12 billion. Most of these investments concern the general modernisation of old lines. It should be noted, however, that traffic on many of the lines may be insufficient to economically justify the high construction costs.

In Figure 3.2 and 3.3 the location of the modernisation projects is shown.

3.2.5 Maintenance costs

In addition to the above investment costs, substantial funds must be made available to the maintenance of the core road and railway network in order to keep its standard at acceptable levels. The long-term requirements for such maintenance can be estimated at EUR 10-15.000 per kilometre of road as well as railway. This estimate is based on the pre-feasibility studies carried out within REBIS, as well as experience from other regions. Also the report "Road User Charges in Bosnia Herzegovina (NEI Transport, May 2000) confirms this level".

This leads to a total requirement of EUR 100-150 million per year for the sustainable maintenance of the core road and rail networks, whereof about 60% will be in the road sector.

3.2.6 Cost per country compared to Gross Domestic Product (GDP)

The GDP for the different Balkan countries in 2001 has been collected as described in Chapter 2.7. Based upon these figures and estimates for the increase during the coming 12 years the following GDP has been calculated and the investment costs have been compared to the GDP:

Table 3.2 Comparison of GDP and investments.

	Sum of GDP from 2003 to 2015 (both incl.) in EUR million	Road investment, EUR million	Rail investment, EUR million	Total, EUR million	Total investment in percent of GDP
Albania	102,410	607	821	1,428	1.4
Bosnia and Herzegovina	99,420	889	1,584	2,473	2.5
Croatia	407,491	1,084	2,549	3,633	0.9
FYRO Macedonia	69,880	341	1,233	1,878	2.7
Serbia and Montenegro	233,322	1,304	5,861	7,165	3.1

In the TINA study a limit of 1.5% of the GDP was used as a guideline for the maximum investment in transport infrastructure (roads, railways, ports and airports). Assuming the same guideline in the REBIS countries the investment level in Bosnia and Herzegovina, FYRO Macedonia and Serbia and Montenegro is slightly higher. However, compared to the TINA network the Core Network is more dense due to the fact that the countries are smaller, and a higher level of investment may, therefore, be acceptable. In Serbia and Montenegro it may be difficult to ensure financing for all identified investments.

3.2.7 Investments in road network

Traffic in 2015

The results from the Traffic Forecast Model (the Moderate Scenario) have been used to determine the traffic volumes (ADT) in 2015. A comparison of the traffic forecast for year 2015 and the present capacity has been used to determine the need for capacity improvements, e.g. to upgrade from 2 lanes to 4 lanes.

Determination of investment needs

The investment projects have been identified either as projects which have been planned, designed or tendered already or projects needed in future to ensure that:

- the width of the highways as a minimum fulfil the AGR-standard

- the capacity of the roads is sufficient by 2015
- the pavement will be able to handle the expected traffic without unreasonably high vehicle operating costs

The projects have, generally, been suggested by the road authorities and validated by the consultant. Not all suggestions have been accepted, e.g. some new motorways or four lane roads proposed by road authorities have not been included because the expected traffic in 2015 is not considered sufficient to make the investment feasible. In addition other improvements have been suggested to eliminate bottlenecks, e.g. additional bypasses around major cities.

However, it must be underlined that only feasibility studies can later determine the exact feasibility of the individual projects.

Typical upgrading projects on the core network
The typical upgrading project until 2015 will include the rehabilitation of the pavement, bridges and tunnels, widening of the pavement to 7 m and some realignments.

Widening of narrow roads. An important issue is widening of roads and increasing curve radii. About 870 km or 13% of the roads need to be upgraded as they are too narrow. They have to be at least 7 m wide in order to fulfil the minimum AGR standard.

Pavement condition. Another main issue is the upgrading of the existing pavement condition on some of the roads. The pavement condition survey indicated that 72% of the network needed investments ranging from a new wearing course to a complete new pavement.

By-passes. Transit traffic is hindered near some of the big cities due to heavy internal traffic. For that reason some by-passes (around Belgrade, Tirana, Pristina, Podgorica, Mostar and Skopje) have been included.

Capacity. The majority of the roads have sufficient capacity to cover the projected traffic in 2015. Most of the roads which need upgrading due to capacity constraints up to 2015 are already under construction.

The locations of the road investments are shown in Figure 3.2. Details regarding the road investment costs in each corridor and in each country can be found in Appendix 4.

Figure 3.2 Location of road investments.

3.2.8 Investments in railways

Basis for the investment needs

The AGC and AGTC Agreements are rather ambitious. The requirements to infrastructure parameters in the agreements, which are considered in this study are:

- there are no minimum requirements for the number of tracks to be provided on existing lines. However, it is noted that it will normally only be possible to provide high capacity and precise timing of operation on lines with at least two tracks

- the nominal minimum speed in the AGC agreement is 160 km/h for passenger trains on existing lines
- the minimum platform length at principal stations is 400 m.
- the AGC aims at eliminating the existing level crossings

The traffic data shows that there is no immediate need to increase the capacity of the railway lines. However, it is expected that the traffic will increase with the growth of the economy.

European traffic has been considered to have great importance, and it has been proposed to modernise Corridor X and Xb together with Corridor Vb to AGC standard (double track line and maximum speed 160 km/h).

Today, the line section Jelina - Grapska in Bosnia and Herzegovina is a double track line. It is proposed to modernise the line to AGC standard.

All other existing lines are single track lines. Some are electrified and some are not. It is proposed to modernise the lines with electrification, modern signalling and telecommunication systems, and maximum speed 100 or 120 km/h.

New single track line sections are proposed to be modern lines with speed 120 km/h and electrified.

Proposed modernisation
Overleaf the situation after the proposed modernisation of the railway network is shown. In general, the modernisation comprises upgrading of the existing lines in order to improve the travelling speed, but the overwhelming bulk of the lines will still have only a single track after modernisation.

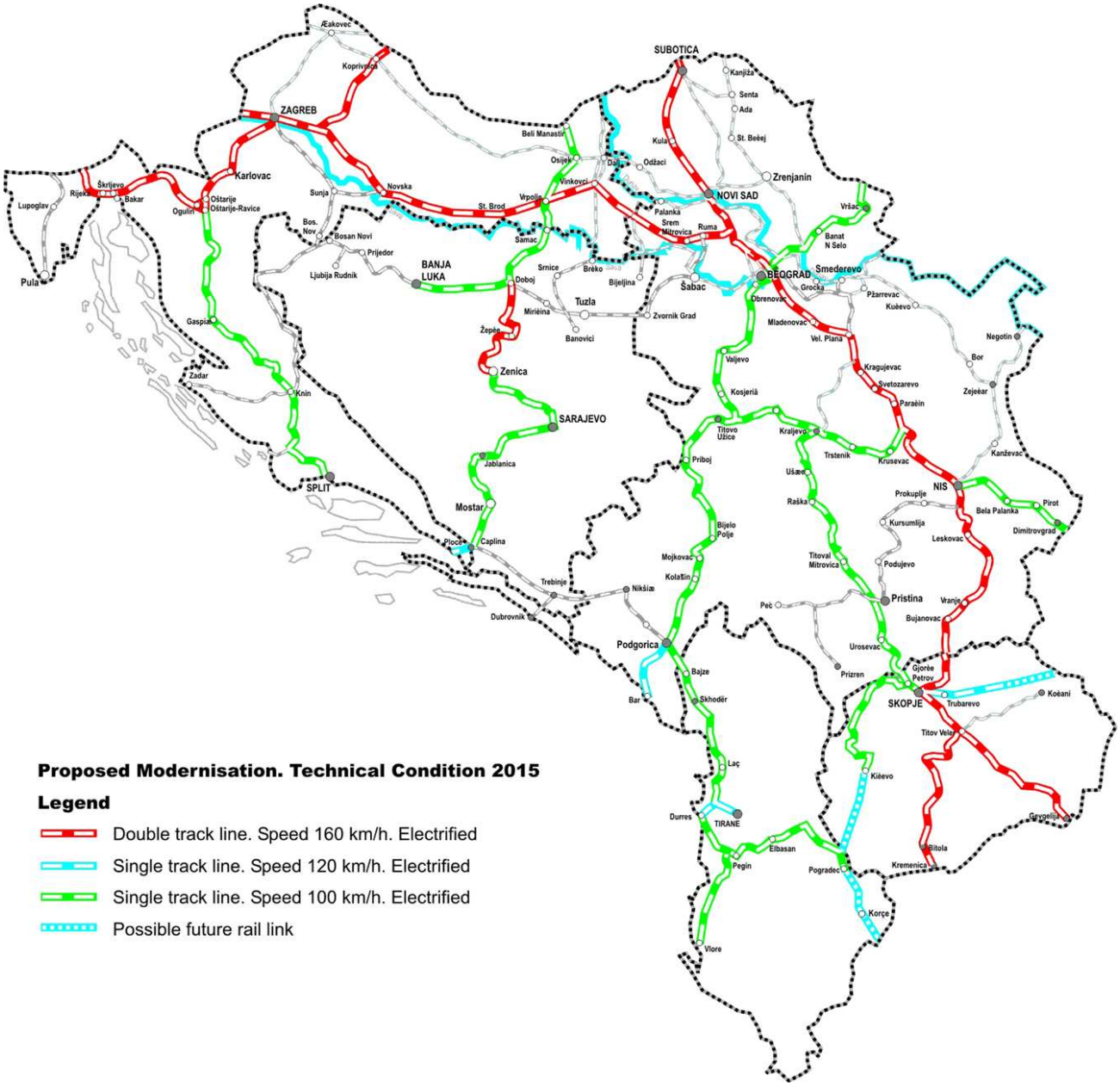


Figure 3.3 Proposed rail modernisation.

Details regarding the costs for the modernisation of the railways in each corridor and each country can be found in Appendix 4.

3.2.9 Border crossing projects and studies on the REBIS network

The need for investments in border crossings has been assessed in a separate task as described in section 2.5 and is described in more detail in Appendix 2. The information on the border crossings has been collected through reports describing the ongoing projects and questionnaires submitted to relevant authorities in each of the countries. In some of the countries, this has been supplemented with meetings with key persons. The World Bank and CARDs projects

have provided information on their ongoing and planned activities at the border crossings.

Even though a great number of border crossings have been improved, there are still a number of border crossings, which have not been addressed adequately, and for which some kind of study or project could be considered. This section together with Appendix 2 identifies the border crossings where some infrastructure improvements remain. The improvement of infrastructure is in focus in REBIS, but it is important also to consider the improvement of e.g. regulative and procedural issues as they are often the main problems.

The 14 border crossing on the REBIS network identified for infrastructure improvements and the further 11 for studies are presented in Figure 3.4 for roads and Figure 3.5 for railways and they are briefly summarised in Tabel 3.3.

The total cost of improving the 14 border crossings is estimated to be approx. EUR 50 million. Assuming that approx. 6 of the investigated border crossings are assessed to be feasible, an additional EUR 20 million approximately to the EUR 50 million will be required. The improvement of these border crossings may reduce waiting time and working conditions of the border staff.

No specific border crossing projects are identified in Albania as they are, generally, already covered under other programs.

In Bosnia and Herzegovina three road border crossings and one rail border crossing could potentially be improved.

One particular border crossing seems to be the main bottleneck in Croatia and may be considered for improvement depending on the result of the evaluation following the pilot project under TTFSE. The rest of the border crossings are covered under other programs.

In FYRO Macedonia one border crossing seems warranted for improvements and additional minor improvements may be considered at two other border crossings. Two border crossings may be considered for detailed study.

There is a potential for projects at 6 road border crossings in Serbia and Montenegro, and for studies on 4 road border crossings. Additionally, 3 rail border crossings could be considered for detailed studies.

A study is also needed to assess the future requirements of the control points between Serbia and Kosovo.

Table 3.3 Potential border crossing projects and studies on the Core Network.

Location	Projects/actions needed	Corridor
9 Bosanski Samac/Samac -road	Infrastructure improvement	Vc
9 Bosanski Samac/Samac - rail	Infrastructure improvement	Vc
11. Doljani - road	Infrastructure improvement	Vc
34 Tabanovce - road	Infrastructure improvement - financing of the gap - (also project on Serbia and Montenegro side, 44 Preservo)	X
34 Tabanovce - rail	Study of railway border crossing to identify whether investments necessary for future traffic - (study also needed on Serbia and Montenegro side, 44 Preservo)	X
37 Gevgilija - roadrail	Minor improvement - financing of water supply systems	X
44. Presevo - road	Infrastructure improvement - provide financial resources to implement project (also project on the FYRO Macedonian side, 34 Tabanovce)	X
44. Presevo - rail	Study to assess whether any investment is necessary for future traffic (also study needed on the FYRO Macedonian side, 34 Tabanovce)	X
50. Sid Tovarnik - rail	Pre-feasibility of joint railway operation	X
25. Macelji - road	Infrastructure improvement (depending on the result of TTFSE evaluation)	Xa
46. Gradina/Bogorodica - road	Infrastructure improvement to increase capacity of border crossing to reduce waiting time	Xc
36 Medzilidja - road	Minor improvement - financing of water supply systems	Xd
49. Debeli Brijeg - road	Infrastructure improvement - construction of parking places, traffic lanes and improved technical equipment (risk of overlap)	1
42. Scepan Polje - road	Pre-feasibility to upgrade access roads	2b
51. Bozaj - road	Infrastructure improvement - construction of customs buildings, parking places, traffic lanes and improved technical equipment (risk of overlap)	2b
8 Vardiste - road	Infrastructure improvement (also relevant from Serbia and Montenegro side, 41 Kotroman)	3
41. Kotroman - road	Infrastructure improvement (project also relevant from Bosnia and Herzegovina side, 8 Vardiste)	3
47. Vatin - road	Study to assess current and future needs	4
47. Vatin - rail	Study to assess current and future needs	4
45. Vrska Cuka - road	Study to assess whether any investment is necessary for future traffic	5
43. Djeneral Jankovic - road	Infrastructure improvement - passenger terminal similar to the one planned on the FYRO Macedonian side needed	6
57. Control posts near Banje on E80 (Kosovo) - road	Pre-feasibility study to identify current and future needs, however the route is not presently used for political reasons	6
52. Vrbnica (Kosovo) - road	Study needed to assess future needs	7
58 Control posts near Meldare on E80/25 (Kosovo) - road	Pre-feasibility study to identify current and future needs.	7
35 Blace - rail	Brief pre-feasibility study of railway border crossing to identify if any investments is necessary for future traffic (no facilities and traffic today)	10

The road border crossings 8 Vardiste/41 Kotroman on road route no. 3 between Serbia and Montenegro and Bosnia and Herzegovina, and 34 Tabanovce/44 Preservo on corridor X between Serbia and Montenegro and FYRO Macedonia need improvements from both sides. The same is the case for the rail border crossing 34 Tabanovce/44 Preservo. The remaining border crossings need improvements at one side or has borders with countries outside the REBIS area e.g. to Romania or Bulgaria.

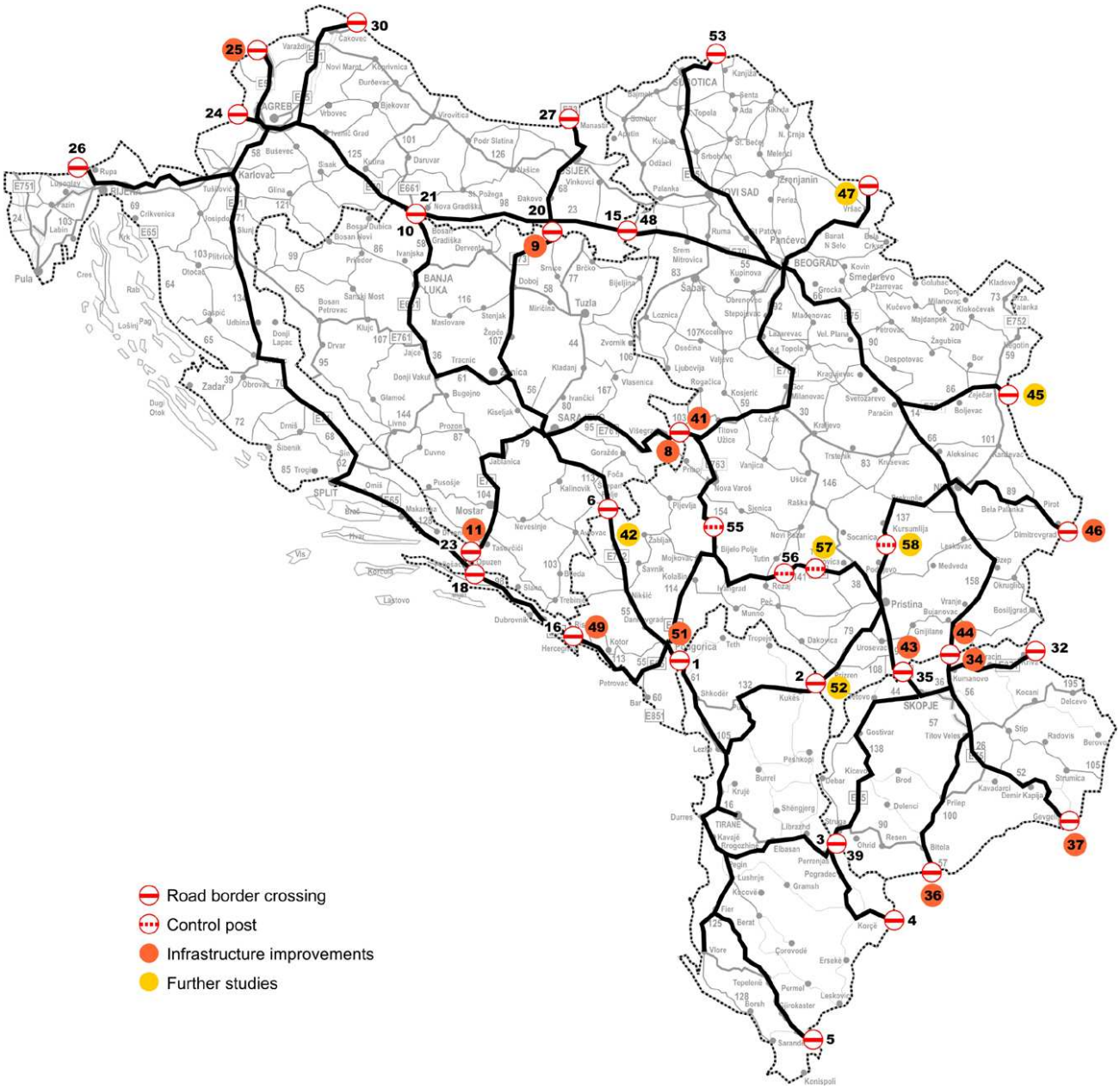


Figure 3.4 Potential road border crossing projects.

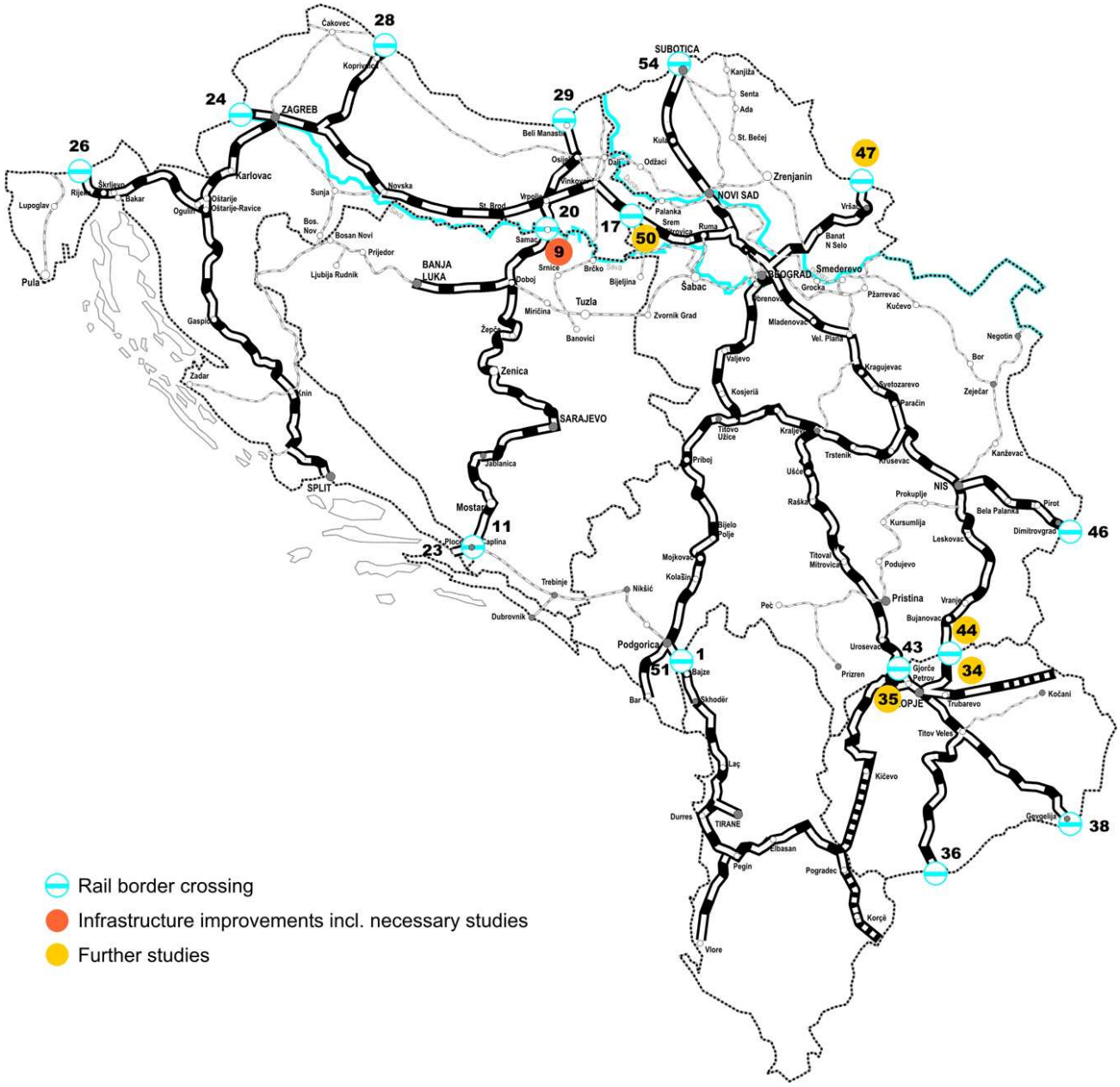


Figure 3.5 Potential rail border crossing projects.

3.3 Short-term investment plan

The short-term investment plan includes projects on the core network which seem feasible and affordable in the short term, and which seem suitable for international co-financing.

The short term investment plan, therefore, includes projects for which action is required within the first 1-2 years. Some of these projects are already in progress and may be implemented within a relatively short time horizon. Other projects have to go through the whole process of project preparation before im-

plementation can start. The completion of such projects may, therefore, in some cases only be completed within a 5-7 year time horizon.

The short-term investment plan was prepared through a number of steps as described below.

3.3.1 Project identification

During the study over 200 transport projects were identified and reviewed. Several sources were used for this purpose:

- The **network analysis** provided an overview of the total investment requirements for road and railways up to year 2015. This analysis gave a good understanding of the existing and potential bottlenecks in the networks as well as inadequate geometry, standards and technical conditions of infrastructure.

- Several projects have already been identified in **previous studies**. In particular, the TIRS study identified a great number of projects within all modes of transport. These projects were reviewed and updated as relevant.

- The **national authorities** in all countries have put forward plans and projects which they consider important. Projects, which were not already committed to or under implementation, were reviewed by the REBIS team.

- Finally, our **national project teams** identified a number of projects based on their review of infrastructure and systems.

After a preliminary review of all identified project, the most promising projects were retained for further analysis.

3.3.2 Project screening

The screening process performs an initial evaluation of the projects, enabling the selection of a limited number of projects within the 6 transport modes for a more detailed appraisal. The methodology used for the screening is based on a multi-criteria analysis, where a number of predefined, aggregated criteria are assessed for each project. The projects are ranked by using the scores and weights of the aggregated criteria.

Screening methodology
The methodology used for the screening can briefly be described by the following two phases:

Phase 1: Collection of project data in the region
Phase 2: Screening of project data

The screening of projects in phases 1 and 2 encompasses five criteria related to the project, plus one criterion related to the potential speed of implementation of the project:

I: Economic appraisal (cost-benefit assessments including safety impacts)
II: Financing viability (sustainability and additively of donor funds)
III: Environmental effects
IV: Functionality and coherency of the network (including strategic issues e.g. connecting border regions)
V: Readiness of the authority
VI: Speed of implementation

To put greater perspective into the assessment of certain criteria these have been split into a number of sub-criteria. These sub-criteria are defined in the screening tool.

An in-depth description of the criteria and the methodology used for the screening can be found in Appendix 5: Methods for Project Screening and Pre-feasibility Analyses.

In Phase 1 each project identified is assessed according to the number of predefined criteria and sub-criteria in a qualitative, as well as in a quantitative way based on available project documentation about the projects, and knowledge at local authority level. This information is entered in a so-called project fiche for each project.

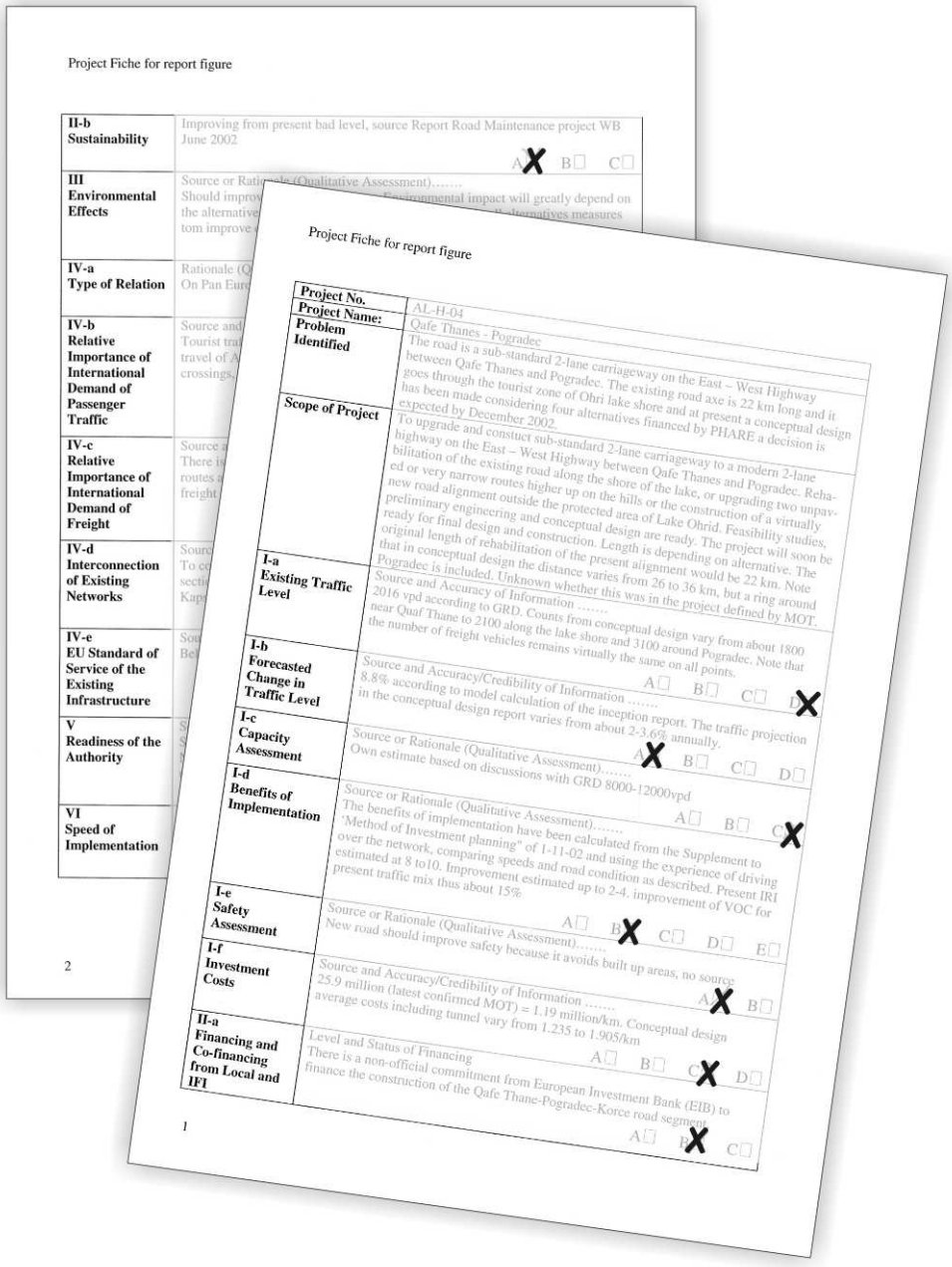


Figure 3.6 Example of project fiche.

In Phase 2, the collected project data is screened through a multi-criteria analysis based on the quantitative assessments of the criteria and sub-criteria.

Phase 2 of the screening process comprises the following steps:

1 Evaluation of the quantitative assessments performed for each project in phase 1. This includes quality assurance of the assessments with focus on e.g. bias between different countries.

2 Assessment of weights for the different criteria and sub-criteria to enable an aggregate evaluation of each project based on the project's total score.

3 Ranking of the identified projects based on the total scores. The ranking is performed in two dimensions: one dimension for the total score of the projects and another for the project's implementation time.

4 Sensitivity analysis of the weights is performed to analyse how sensitive the ranking is to changes in the weights.

In Phase 2 a numeric value is assigned to each criteria and sub-criteria within each project, based on pre-defined scores. To enable an aggregate evaluation of a project, the numeric values are weighted together and the project's total score is calculated. The weighting is based on the following two types of weights:

1 A *criteria weight* used to weight the five main criteria: I Economic appraisal, II Financing viability, III Environmental effects, IV Functionality and coherency of the network, V Readiness of the authority. The criteria weights sum to 1.

2 A *sub-criteria weight* used to weight the sub-criteria within each criterion. The sub-criteria weights within each criteria sum to 1.

The criteria weights used to rank the projects are illustrated in Table 3.4 below.

Table 3.4 Weights of criteria.

		Criteria-weight
Criterion I:	Economic appraisal	0.50
Criterion II:	Financial viability	0.20
Criterion III:	Environmental effects	0.05
Criterion IV:	Functionality and coherency of the network	0.15
Criterion V:	Readiness of the Authority	0.10

The weight of each criterion is based on an assessment of its importance in relation to the objectives of REBIS, where focus is placed on short-term investment plans for priority projects suited for international financing. Other subjects in focus are the financial situation and the readiness of the authorities to implement the project.

The Economic Appraisal (Criterion I) has been assessed to account for 50% of the total score. The other weights are assessed according to the perceived focus of the REBIS study including e.g. the political importance of international transport corridors.

In the analysis, the projects have been ranked according to their total score. However, to illustrate the relative importance of the economic related criteria, a sub-ranking has been performed for A) Criteria I, III and IV, and B) Criteria II and V.

Within each mode category the projects are ranked in two dimensions:

Dimension 1: Ranking of projects based on the total scores comprising Criteria I, II, III, IV, and V.

To illustrate the relative importance of the economically related criteria a sub-ranking is performed for Criteria I, III and IV which is referred to as the Economic Appraisal score

Dimension 2: Ranking of the projects based on the speed of implementation corresponding to the score of Criterion VI.

The differentiations between these two dimensions enable special focus to be placed on the short-term implementation of projects. The main ranking of projects is based on dimension 1 and the final selection of projects for pre-feasibility analyses has not eliminated projects with a low dimension 2 ranking in advance.

As the weighting criteria applied may influence the ranking of the projects, sensitivity analyses are performed to analyse the influence of changes in weighting with regard to investment costs, the environment, traffic safety and financing.

The objective of the screening is to assess the long list of projects across countries and transport modes. To ensure consistency within the different modes, the ranking is performed for each mode separately.

Screening results
The screening tool is best suited for the evaluation of a great number of comparable projects. However, the screening process has disclosed that only the highway and railway projects are sufficiently numerous and standardised to allow for a meaningful quantitative screening. The screening of projects within other modes is performed on a more qualitative basis. Most of these projects belong to one of the following groups:

- regional projects requiring a network approach (river and canal systems)
- projects related to the superstructure of the basic infrastructure and suited for commercial financing based on user payments (terminals and handling equipment in ports and airports)
- projects related to repairing/cleaning up the damage as a result of the war in the late nineties (e.g. river beds)

The screening comprises projects from the five countries. All of these projects are on the core network and comprise projects within 6 different mode categories.

101 road and rail projects have been screened using the quantitative screening tool, whereas qualitative assessments have been performed for the other projects.

Table 3.5 Number of road and rail projects on the core network comprised by the quantitative screening.

	Albania	Bosnia and Herzegovina	Croatia	Serbia and Montenegro	FYRO Macedonia	Total
Highway	9	12	7	19	11	58
Railway	1	7	13	14	8	43

The output of the screening is a ranking of the projects within the countries and the different mode categories. Most of the projects are either road projects or railway projects. The output from the screening tool is illustrated below - based on Dimension 1 screening. The project profile reflects the combination of the level of total score (1-3) with the speed of implementation (A-C). The detailed results of the screening process are shown in Appendix 6: Project screening/ project details.

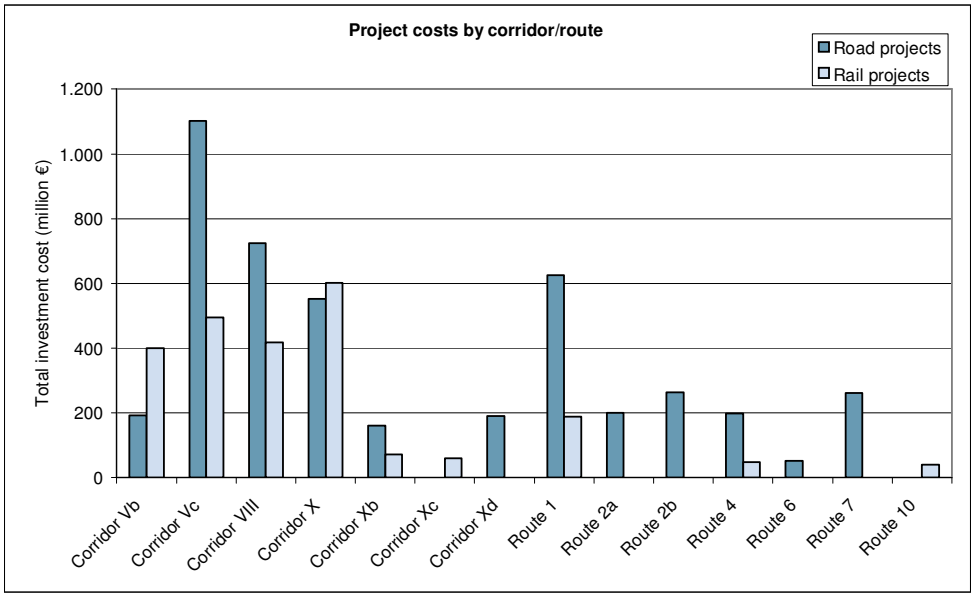


Figure 3.7 Costs of screened projects by corridor/route.

Project number	Project title	Total ranking Ranke	Score	Economic ranking Rank	Score	Project profile	Route
Yu-Ko-H-05	West ring, Prishtina	1	92,2	1	67,2	1B	Route 6
Yu-Ko-H-04	Prishtina-Prizren-Vrbnica	2	91,0	2	66,0	1B	Route 7
Bo-H-04	Reconstruction of Doboj - Šešlije	3	87,7	4	57,7		
Yu-H-28N	Čačak by-pass, phase I	4	82,1				
Yu-H-13	Completion of Belgrade by-pass						
YU-H-16	Tunnel Sozina; Stage II, acces road (6+2 km)						
Yu-Ko-H-02	Prishtina-Mitrovica						
Yu-H-11	Completion of Motorway						
Bo-H-01							

Figure 3.8 Example of output from screening model

Most of the highest ranked road projects concern the improvement, widening and reconstruction of existing sections on the core network and the finalisation of planned motorway sections. Only few projects concern new roads.

The projects in Croatia connect Zagreb with the Sea and with Serbia. The projects in Bosnia and Herzegovina are concentrated in the Northern part of the country connecting Banja Luka with other major towns in Bosnia and Herzegovina and with Croatia. The projects in FYRO Macedonia focus on improving sections on Corridor X and VIII. Finally, the projects in Serbia and Montenegro focus on improving sections on Corridor X through Belgrade and on the connection between Podgorica and the Sea.

Most of the highest ranked railway projects are either general overhaul projects, including some reconstruction, or general modernisation of signalling, telecommunication and electric traction systems due to a large maintenance backlog. Other projects concern the re-establishing of rail bridges (in Belgrade and Novi Sad).

Most of these railway projects are located in Serbia and Montenegro on Corridor X and in Croatia on Corridor V. In Serbia and Montenegro many projects are located in the northern half of Corridor X, passing Belgrade. The projects in FYRO Macedonia are also located on Corridor X.

3.3.3 Pre-feasibility studies

This subsection presents the criteria used in the process to select projects for pre-feasibility analysis, defines the scope of the analyses and gives a short summary of conclusions and recommendations for each project analysis.

The criteria for selecting the projects for analyses were:

- The project score - in the screening process - above 70% of the maximum score possible (about half of all screened projects did)
- up-to-date pre-feasibility analyses or feasibility analyses for the project were not available
- an analysis of the project was required to decide if the project was eligible for further detailed analysis or implementation even without further analysis, and
- the project had not been approved for implementation, and financing was not secured

In other words the REBIS project could - by conducting the analyses - contribute to a speedy implementation of "good" projects and complement other ongoing activities in the region.

The analyses have been made by REBIS consultants in the countries to ensure maximum utilisation of existing information and a close dialogue with national authorities about project specifications and project aims. The analyses have been performed and presented within a standardised framework to ensure consistency of results across countries.

The general principles of the methodology are described in Appendix 5: Methods for Project Screening and Pre-feasibility Analyses. However, to ensure the highest possible level of standardisation some additional specific guidelines for project analyses have been prepared. The specific guidelines and the full pre-feasibility studies are presented in Appendix 7: Pre-feasibility Studies.

The aim of the pre-feasibility analyses has been to conduct a - preliminary - economic cost benefit analysis comparing the defined project with a realistic project reference focussing on changes:

- in investment costs, operation and maintenance costs of the infrastructure
- in travel time for persons
- in operating costs of rolling stock and equipment
- in traffic safety

In addition, project information on financial issues, major environmental impacts and potential institutional barriers for project implementation have been considered qualitatively.

The pre-feasibility analyses follow the general principles for economic cost-benefit analysis - including those used in the TINA process. In general, the same approach and assumptions are used in all countries, but data inputs are adopted to the local conditions, if specific up-to-date local data are available.

The major differences between the conducted pre-feasibility analyses - carried out over a short period of time with limited use of resources - and normal full comprehensive feasibility analyses are that:

- the traffic analyses are not based on major surveys and comprehensive network modelling or specific modal choice modelling
- estimates of infrastructure costs are in many cases not based on up-to-date specific design studies and are, therefore, more uncertain
- that traffic safety benefits are more uncertain due to lack of specific historical accident data
- external costs related to environmental impacts are not included directly in the analysis

The results of the pre-feasibility analyses can be used by the national authorities and IFIs to decide whether a more comprehensive and detailed analysis is required before a decision about the project can be made. The project results are also used by the REBIS consultants in the process of preparing the recommendations for the short term investment plan.

A short summary of the results and recommendations for the analysed projects is presented in the following. For each project the real internal rate of return p.a. (IRR) and the estimated investment cost (exclusive VAT and taxes, land costs and design and supervision) are shown in 2003 prices.

The location of projects is shown in Figure 3.9 and 3.10.

AL-H-06: Rehabilitation Road Link Hani Hotit - Shkoder (EUR 29 million)

Location: Route 7 on the Core Network

Recommendations and conclusions:
The project concerns the improvement of the link of the Core Network between Albania and Montenegro and the reduction of the costs for regional and local traffic. Two alternatives have been analysed, with and without bypasses of main urbanised areas. For both alternatives, the economic cost-benefit analysis indicates that the projects are feasible. The IRR for the solution with bypasses is 13.4% (Alternative I), while it is 17.8% for the alternative without bypasses (Alternative II).

It is recommended:

- to undertake the necessary environmental assessment
- to start engineering design for the project
- to update the pre-feasibility study to a full feasibility study once the final cost estimates from the engineering design are ready and the environmental assessment has been carried out.

Bo-H-03: Reconstruction of the road link Šešlije – Šamac (EUR 18 million)

Location: Corridor Vc on the Core Network

Recommendations and conclusions:
The economic pre-feasibility analysis indicates that the rehabilitation of the road from its southern end at Šešlije up to the northern end at Šamac at the border crossing with Croatia is economically feasible. The project IRR in the base case scenario is very high, 49%, and is robust even under pessimistic assumptions regarding traffic growth and investment costs.

It can be recommended to consider immediate implementation of the project without a detailed feasibility study.

Bo-H-10: Reconstruction of road link South Zenica – Visoko (EUR 156 million)

Location: Corridor Vc on the Core Network

Recommendations and conclusions:
The economic calculations show an economic IRR of 15.2%. This indicates that the project is feasible, primarily because the project covers the second step of the construction of the motorway. The previously made investments, included in the construction of the first phase, are not included in the above investment cost and are expected to reduce the costs of this project considerably.

It should be noted that there is considerable uncertainty related to the traffic data. The figures used are from the REBIS model concerning the traffic between Sarajevo and Zenica. Other sources provide figures that are different and significantly lower, which would have a marked effect on the IRR of the project.

The project should be further developed as the pre-feasibility study indicates a strong economic performance. The following steps are recommended:

- to develop a full-scale feasibility study including EIA, traffic counts and OD surveys

- to develop - as part of or parallel to the feasibility study - a conceptual design for better estimation of costs and environmental issues, and for better understanding of the technical requirements in the difficult terrain

Bo-R-02: Reconstruction of the rail line Konjic to Mostar (EUR 26 million)

Location: Corridor Vc on the Core Network

Recommendations and conclusions:
The pre-feasibility analysis of the rehabilitation of the 62 kilometres long single-track line section between Konjic and Mostar shows that the project may not be economically feasible in the short term.

The railway project is a continuation of the ongoing rehabilitation of the railway line between Sarajevo and Konjic, which is carried out under an EBRD/EIB loan to be completed by 2004.

The economic analysis shows an IRR of around 1% in the base case. Taking into account the uncertainties related to the demand assessment, an updated economic feasibility analysis could be launched at a later stage. This should be based on a more detailed assessment of the market development to/from the port of Ploce and take into account impacts on road traffic, if rail traffic were to stop completely on the line.

Cr-H-02abc: Upgrade from semi-motorway to full motorway on three sections from Kikovica-Kupjak (Section a: EUR 141 million, section b+c: EUR 155 million)

Location: Corridor Vb on the Core Network

Recommendations and conclusions:
The main effect of the three sub-projects is increased capacity of the southern end of the ARZ motorway. However, due to initial low levels of traffic and high capital costs, benefits are forecast to be relatively small compared to the cost of the individual projects. NPV and IRR are clearly negative, so that the cost-benefit results are unable to justify any upgrade to full motorway profile for the moment.

From a financial viewpoint, any upgrade not yet initiated should be deferred until there is significantly more traffic and the motoring public becomes more willing to pay the higher tolls that would be required by the proposed projects.

Cr-R-02b: Modification of electrical traction system Moravice-Rijeka-Sapjane sections (EUR 56 million)

Location: Corridor Vb on the Core Network

Recommendations and conclusions:
The pre-feasibility study has analysed the proposed upgrading of the remaining part of the Croatian railway network that operates on 3kV to 25kV traction. The main effects of the proposed project are the avoided investment and operating costs associated with keeping the existing system. The economic analysis shows attractive returns. For the central case, IRR is nearly 34%.

It can be recommended to consider immediate implementation of the project without a detailed feasibility study, provided that the investigated reference alternative is still considered the most realistic one, which means that other alternatives such as diesel locomotive options are considered unrealistic. In addition, further financial assessments of freight revenues are recommended.

Cr-R-06an: Remote control traffic system Savski Marof - Zagreb - Tovarnik (EUR 23 million)

Location: Corridor X on the Core Network

Recommendations and conclusions:
The project analysed includes the installation of a remote control system for train traffic regulation. The main quantifiable benefit from the project is expected to be a reduction in manpower at many of the stations on the Corridor X railway line.

The cost-benefit results indicate that the project is likely to be economically feasible. For the central case, the economic IRR is about 16%. The project

could turn out to be a politically sensitive project, involving a significant number of redundancies, if the benefits from the project are to be realised.

It is recommended to carry out a feasibility study, and it may be sensible to include a similar project (CR-R-02c) on railway Corridor Vb and the section Zagreb-Sisak-Novska (which can be considered as part of Corridor X) as integrated components of the study.

Ma-H-11: Upgrading of Gradsko-Prilep (EUR 13 million)

Location: Corridor Xd on the Core Network

Recommendations and conclusions:
The proposed project is economically feasible with an IRR in real terms of more than 21% - if a new competing road connection is not constructed.

However, the road is most likely a temporary alternative to the direct route from Veles to Prilep, for which the Government is actively seeking financing and, which has a higher priority than the rehabilitation of the project road (and an even higher IRR according to another study).

It is suggested to carry out a feasibility study building on the present pre-feasibility study and a pre-feasibility study carried out on the alternative new route Veles-Prilep. The study should also include environmental impact assessments of the two possible projects. Based on such a feasibility study, a decision should be taken on how to develop this part of the Core Network and where to focus the investment. As, at least, one of the projects will most likely be recommended for implementation, planning should proceed immediately.

Ma-H-18: New motorway Kumanovo - Tabanovce (EUR 6 million)

Location: Corridor X on the Core Network

Recommendations and conclusions:
Due to the low traffic, the economic performance of the project is relatively weak with an IRR of 7 %.

Furthermore, there is a need to better analyse the environmental aspects and to assess mitigation costs associated with e.g. noise barriers more precisely.

The project may soon become the only short stretch for a relatively long part of Corridor X, which is not motorway standard, and, thus, it can be considered to upgrade the road in the medium term to complete the network. Furthermore, the project can be re-considered at short notice as the design exists in case traffic develops faster than expected.

Ma-R-10n: Up-grading of the railway line Skopje - Tabanovce (EUR 16 million)

Location: Corridor X on the Core Network

Recommendations and conclusions:
The project concerns the modernization of the railway line between Skopje and Tabanovce at the border with Serbia Montenegro over a total distance of 48,8 km.

The economic analysis of the upgrade shows a low IRR at around 4%. Traffic levels are insufficient to make the investment economically attractive, even assuming that significant traffic may be attracted to the railway as service is improved. It is recommended to conduct a feasibility study at a later stage to assess, in more detail, the potential of increasing future traffic as well as the alternative and less costly investment solutions that could sufficiently improve the quality of the services to attract more international traffic.

Yu-H-11: Construction of a second carriageway on the E-75 Highway between Novi Sad and the Hungarian border (Horgoš) (EUR 92 million)

Location: Corridor Xb on the Core Network

Recommendations and conclusions:
The economic pre-feasibility analysis indicates that the upgrading of the existing road to a full motorway between Novi Sad and Feketić (70 km) may be feasible in the short term, as the IRR is around 10%. A feasibility study to confirm the conclusion and to determine the optimal phasing of the construction works is recommended. The section between Feketić and Horgoš is, with an IRR of 6%, less likely to be feasible in the short term and may be considered in a longer term perspective for the development of Corridor Xb.

Yu-H-19: Podgorica Eastern Bypass (EUR 15 million)

Location: Route 4 on the Core Network

Recommendations and conclusions:
The project involves the construction of a bypass road including a 330 m bridge across a river east of the existing road, which is presently used for both local and transit traffic. The bypass is aligned along an existing road which is, thus, made part of the bypass.

The pre-feasibility analysis shows an internal rate of return of above 20%. The estimates on speed/traffic relations are rather elaborate, hence the time saving calculations are thorough. However, the results contain some degree of inaccuracy/uncertainty due to the rough traffic model used.

A more detailed feasibility is recommended as a next step. It is proposed to look at the entire traffic of Podgorica and possibly establish a traffic model for major roads into and through Podgorica. The bypass project may also include a

review of traffic regulation (signals etc.) through the city centre with the aim of increasing capacity.

Yu-R-01ab: Rehabilitation of Belgrade – Stara Pazova – Sid – Tovarnik (EUR 71 million)

Location: Corridor X on the Core Network

Recommendations and conclusions:
The rehabilitation of the railway section from Stara Pazova to Sid on the line Belgrade - Tovarnik (at the border to Croatia) will establish a fully functional rail line between Belgrade and Croatia, which meets Trans European Railways requirements.

However, the current traffic level is not sufficient to justify the high investment cost. The economic cost-benefit analysis shows a relatively poor result with an IRR reaching –0.7% for the main scenario. This does not take account of possible changes in visa regimes.

If effects of mode shift from road to rail and induced traffic were to lead to a 100% growth in traffic under a high traffic growth scenario, IRR would reach 6.8%.

The rehabilitation of the railway section from Stara Pazova to Sid on the line Belgrade - Tovarnik (at the border to Croatia) is urgent from an operational point of view, but from an economic perspective, the justification needs to be strengthened by further detailed studies.

It is recommended to launch a feasibility study, which should also look at more cost-effective options such as restoration of the railway section to original design speed.

Yu-R-02: Modernisation of the railway section from Ralja to Kovacevac (EUR 14 million)

Location: Corridor X on the Core Network

Recommendations and conclusions:
The rehabilitation of the railway section from Valja to Kovacevec on the line Belgrade – Nis – Presevo – Tabanovce will contribute to the establishment of a fully functional rail line from Belgrade in Serbia and Montenegro to Bulgaria and FYRO Macedonia.

The economic cost-benefit analyses show good results with an IRR of 13% for the main scenario without including the external effect of mode shift from road to rail and possible induced traffic.

It is recommended to proceed with a full feasibility study and an EIA.

Yu-R-07: Repair of Danube and Sava Bridges at Belgrade (EUR 12 million)

Location: Corridor X on the Core Network

Recommendations and conclusions:
The project includes the repair of the destroyed Ostruznica Bridge on Sava River and the strengthening of the old Pancevo Bridge on Danube River in order to re-establish a fully functional corridor X rail line for freight transit traffic bypassing Belgrade centre and to ensure a fully functional rail line for rail passenger traffic (both commuter and long distance).

The economic cost-benefit analyses show the following results:

- for the Ostruznica bridge, the analysis results in an IRR of 27% for the main scenario
- for the Pancevo bridge, the result is an IRR reaching 13% for the main scenario

It can be recommended to consider immediate implementation of the two bridge projects without a detailed feasibility study due to their acceptable economic feasibility and strategic importance.

Yu-R-08: Reconstruction of the Zezlj Bridge at Novi Sad (EUR 30 million)

Location: Corridor Xb on the Core Network

Recommendations and conclusions:
This reconstructed bridge will have two road lanes for road traffic and three railway tracks for rail traffic. The reconstruction of the Zezlj bridge at Novi Sad will establish a fully functional rail line by removing the present rail bottleneck in the form of a temporary bridge on the corridor X while, at the same time, facilitating river transport on the Danube, which is presently hampered by the temporary bridge.

The economic cost-benefit analysis shows an IRR of 6.9% for the main scenario. It can be recommended to consider immediate implementation of the bridge project without a detailed feasibility study.

Yu-Ko-H-04: Improvement/up-grading of M25 Pristina-Prizren-Vrbnica (EUR 19 million)

Location: Route 7 on the Core Network

Recommendations and conclusions:
The project concerns the upgrading of the road between the Albanian border and Lipljan, where the road M25 South merges with the road M2 South about 7.5 km of Pristina, covering a total distance of 77.5 km. The project considers various up-grading possibilities including:

- improvement of the existing road
- construction of a new four-lane motorway
- construction of by-passes around the three major cities, which the road crosses or, alternatively, rehabilitation of city streets

The pre-feasibility analysis shows that the rehabilitation and up-grading of the road from Lipljan to the Albanian border, including the construction of about 10 km of climbing lanes, has an IRR of more than 20% and, thus, is economically justified. The analysis also shows that the construction of a new motorway from Lipljan to the border is not likely to be justified.

It can be recommended to consider immediate implementation of the project without a detailed feasibility study.

Yu-Ko-H-05: Western road by-pass of Pristina on the Core Network (EUR 31 million)

Location: Route 6 and 7

Recommendations and conclusions:
The key routes linking the North with the South of Kosovo (M2 and M25) and linking the East with the West (M9) go to the center of Pristina. As a result the through traffic must merge with the local traffic to cross Pristina, creating heavy traffic jam in the city center.

The pre-feasibility study analyses a number of different investment options in the form of improvement or upgrading of roads. The economic analyses show that several of the proposed investments result in IRRs of more than 20%

It is recommended to carry out a full feasibility study comprising all major options considered in the pre-feasibility analysis including an EIA.

Al-P-Durres: Master plan for the development of the Port of Durres (n.a.)

Location: Corridor VIII on the Core Network

Recommendations and conclusions:
The purpose of the study is to review, update and complete the current Land Use Plan of the Port of Durres from 2000 taking into account all the studies carried out since 1989, and embodying the new policy for the development of the Port as laid down in the proposed Port Law, recently, submitted to Parliament.

It can be recommended to consider immediate implementation of the master plan study.

YU-H-35N: Bypass Bijelo Polje (EUR 15.1 million)

Location: Route 4 on the Core Network

Recommendations and conclusions:
The project concerns the construction of the by-pass to avoid transit traffic through the centre of Bjelo Polje and to improve the condition at Bjelo Polje. In addition, the improvement of the existing road alignment and the rehabilitation of the most deteriorated sections are also included.

The pre-feasibility analyses show an IRR of less than 5% and it is therefore recommended that a full feasibility study may be made at a later stage.

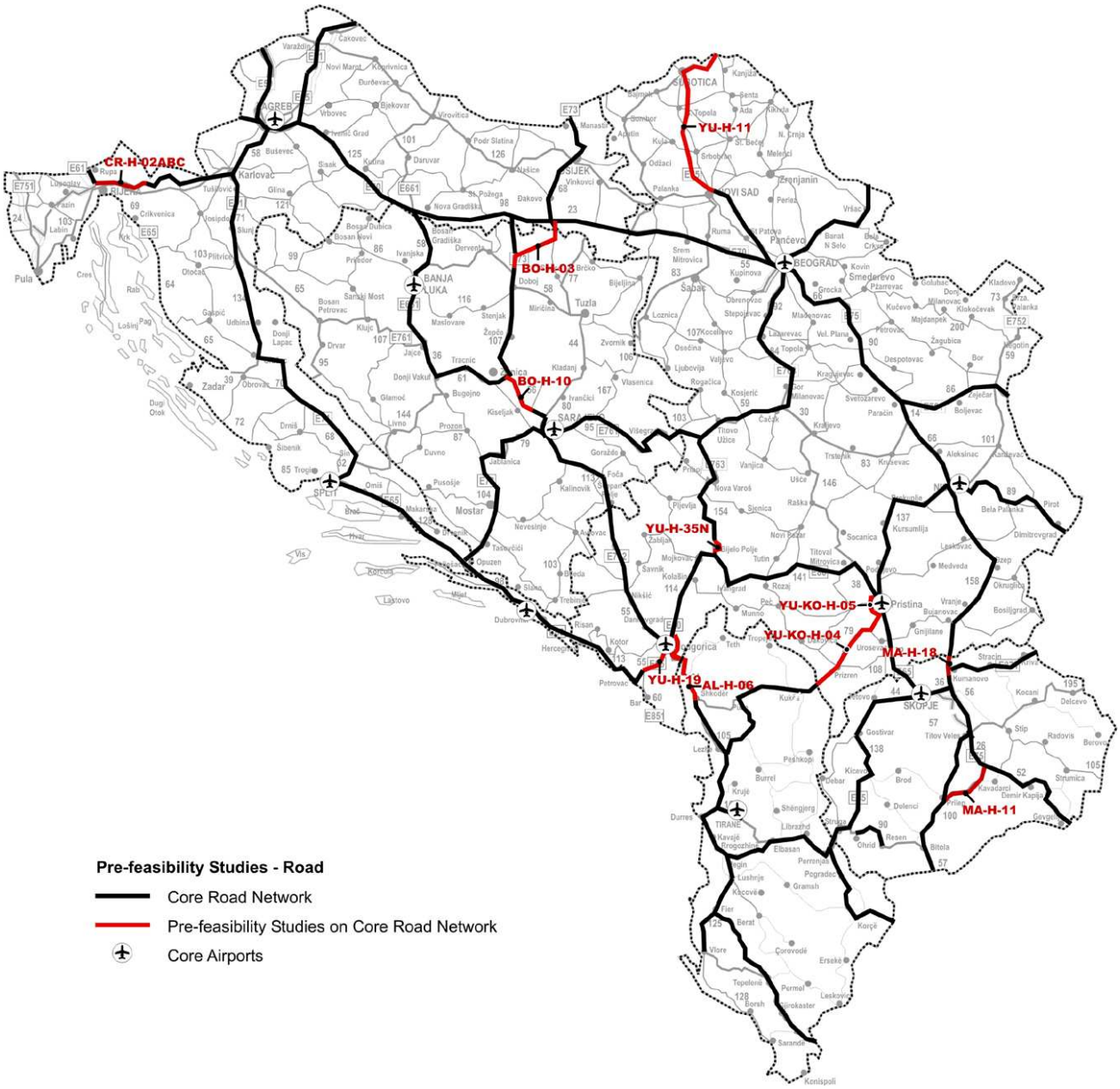


Figure 3.9 Location of pre-feasibility studies - road.

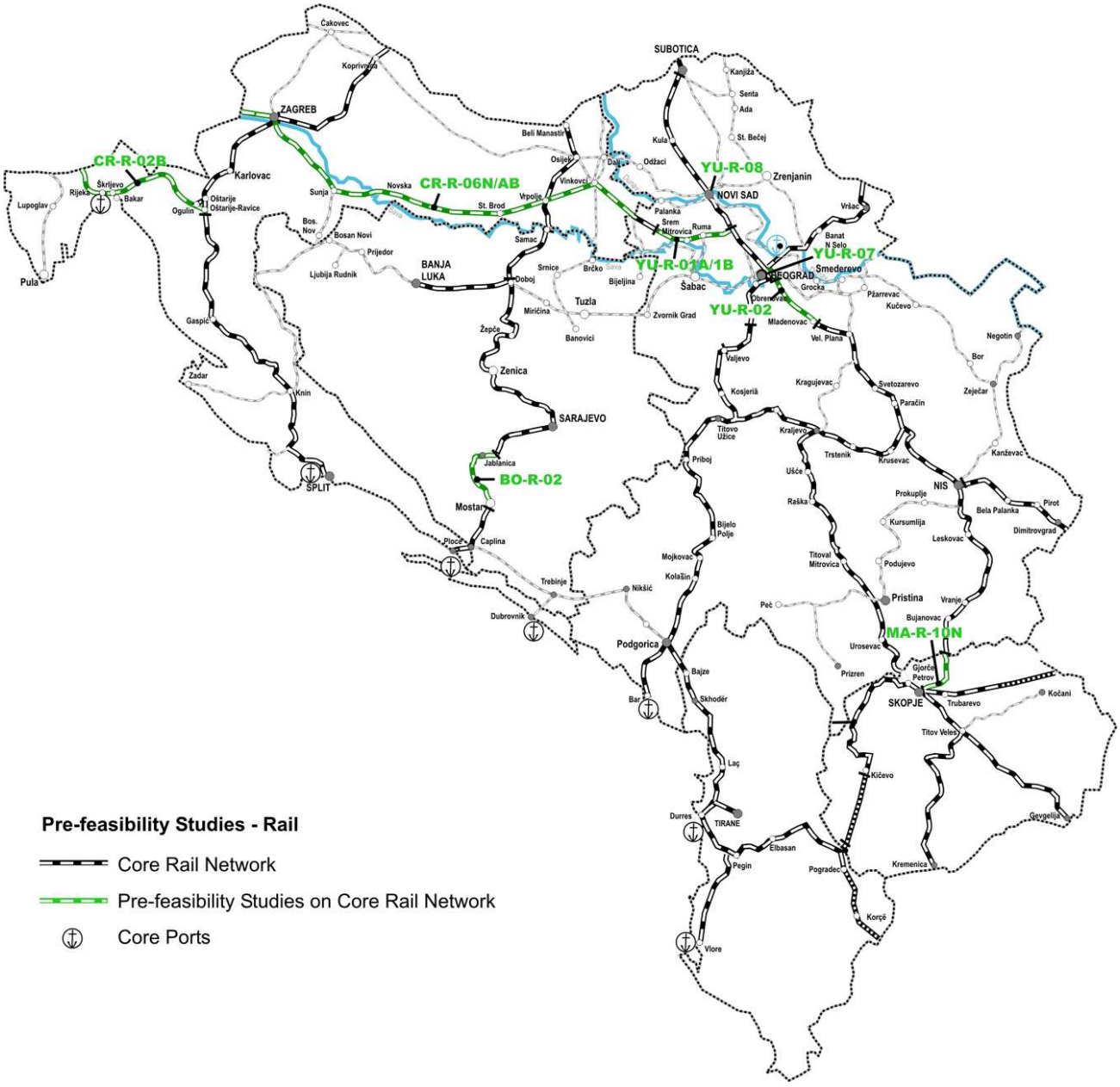


Figure 3.10 Location of pre-feasibility studies - rail.

3.3.4 Short-term investment plan

A short-term investment plan for the Core Network has been established and is presented in Table 3.6. The plan has been prepared in the light of the long-term investment requirements and priorities and the detailed assessment of projects as described above.

The current status of projects included in the short-term investment plan varies considerably. Some projects have only been broadly identified, and recommended for feasibility studies and preliminary and final design studies, before

tendering and construction can start. This may take several years. Other projects have already been appraised and studied in detail and the physical implementation can start almost immediately. The plan includes all infrastructure projects on the Core Network for which action is recommended within the first 1-2 years (to the end of 2004).

This includes projects for which studies, design or implementation should start during this period, although the timing of the physical investment will vary considerably and might, in principle, extend over the rest of the decade.

Taking this into account, the duration of the plan is 2004-2009.

The total number of projects identified by far exceeds what can realistically be implemented within the plan period. Projects for which specific actions are not recommended within the next 1-2 years may be postponed for investment programming in a later stage as described in 3.3.6.

In order to arrive at a balanced plan, a number of issues had to be considered:

First of all, the general policy recommendations presented elsewhere in the present report have been used as a basis. The focus has been on:

- maintaining present transport infrastructure rather than constructing new links and increasing capacity
- the concentration of investments on the most important interregional and intraregional connections, and
- striking a reasonable balance between transport modes

The national priorities - as expressed by the national authorities - have been considered in order to secure that the plan coincides with or supports national transport planning.

Total investments, as well as the distribution between countries and transport modes, have also been reviewed, as investments have been compared to the population and estimated total GDP during the period.

Finally, all projects selected are expected to have a sound economic performance. For some of them, pre-feasibility analyses establishing sound economic performance have been carried out while, for others, this is still needed.

Substantial investment costs are, currently, being spent on the development of the Core Network, and further improvements have already been committed. The short-term investment plan clearly takes account of these ongoing and committed investments. The plan then proposed a number of additional projects - in the following referred to as "new projects" - to be initialised within the first two years.

The investment costs presented in the plan are made in EUR at price level 2003, and they are net of taxes and land acquisition. Costs for design and supervision are not included.

The projects included in the plan are presented in Figure 3.11 and 3.12. Some important implications of the proposed short-term investment plan are presented below.

Figure 3.11 Location of ongoing, committed and new road and airport projects.

Figure 3.12 Location of ongoing, committed and new railway and ports projects.

Table 3.6 List of projects in short term investment plan.

Project N°	Project Name	Corridor/ routes	Status	*2004*	*2005*	*2006*	*2007*	*2008*	*2009*	Total (€ mill)
Al-A-01	Tirana Airport New Terminal		Committed		16,0	16,0	8,0			40,0
Al-A-02	Tirana Airport ATS improvements		Ongoing	13,0	14,0					27,0
Al-H-01	Upgrading of Durres-Pepla road	VIII	New	1,0	4,0					5,0
Al-H-02	Construction of Rrogozhine Bypass	VIII	New	1,0	2,0					3,0
Al-H-04	Upgrading Qafe Thanes - Pogradec road	VIII	New		23,0	23,0				46,0
Al-H-05	Upgrading Pogradec - Korca road	VIII	New		15,0	15,0				30,0
Al-H-06	Upgrading Hani Hotit - Shkoder road	2b	New	3,0	13,0	13,0				29,0
Al-H-07	Upgrading Milot - Shkoder road	2b	Ongoing	7,5	7,5					15,0
Al-H-08	Upgrading Lushnje - Fier road	VIII	Committed	11,5	12,0					23,5
Al-H-09	Upgrading Fier - Vlore road	VIII	Committed	4,0	8,0	8,0				20,0
Al-H-10	Upgrading Fier - Tepelene road (excluding bypasses)	2c	New		10,0	20,0	23,0			53,0
Al-H-11	Upgrading Tepelene - Gjirokastre road	2c	Committed	7,5	10,0	3,0				20,5
Al-H-12	Upgrading Milot - Morine road	7	New			50,0	50,0	50,0	50,0	200,0
Al-H-14	Construction road link to Tirana Airport	VIII	Committed	1,2	2,5	1,3				5,0
Al-H-15	Upgrading Vore Fushe - Kruja Spur road	2b	Committed	10,0						10,0
Al-H-23	Upgrading Elbasan - Libradz road	VIII	Ongoing	11,5	8,5					20,0
Al-P-01	Upgrade Port of Durres		Ongoing	2,0	2,0					4,0
Al-P-03N	Dredging Port of Durres		Committed	4,0						4,0
Bo-A-01	Reconstruction and modernisation of Sarajevo International Airport		Ongoing	4,0						4,0
Bo-BCH-02	Upgrade border crossing at Vardiste	3	New		2,0	1,5				3,5
Bo-BCH-03	Upgrade border crossing at Samac	Vc	New		2,0	2,0				4,0
Bo-BCH-04	Construction of border crossing at Doljani	Vc	New			2,5	2,0			4,5
Bo-H-01	Construction of a new motorway Banja Luka - Gradiška	2a	Ongoing	4,0	11,0	30,0	30,0	30,0	20,0	125,0
Bo-H-03	Reconstruction of Šešlije - Šamac road	Vc	New	2,0	7,0	6,0	3,1			18,1
Bo-H-04	Reconstruction of Šešlije - Doboj road	Vc	Ongoing	1,0						1,0
Bo-H-09	Upgrading Tarčin - Konjic road	Vc	New		5,5	9,0	6,0			20,5
Bo-H-10	Construction of a motorway on Zenica - Visoko	Vc	New		10,5	45,0	45,0	45,0	10,0	155,5
Bo-H-11	Mostar By-pass	Vc	New		9,0	20,0	20,0	22,0		71,0
Bo-H-20N	Strategy for Environment Protection on Corridor Vc	Vc	Ongoing	2,7	2,8	2,8	1,5			9,8
Bo-R-05	Signalling on rail Corridor Vc and line parallel to Corridor X	Vc	Ongoing	9,0	5,0	25,0	25,0	25,0	25,0	114,0
Cr-A-01	Zagreb Air Traffic Control		Ongoing	15,0	16,0					31,0
Cr-A-03	Split Airport: New Aircraft Platform i.e. apron		New		5,0					5,0
Cr-BCH-01	Upgrading of Macelj border crossing	Xa	New		2,0	1,5				3,5
Cr-H-02a	Construction of Section 6,7,8 of Zagreb-Rijeka Motorway	Vb	Ongoing	141,0						141,0
Cr-H-03	Completion of Zagreb - Macelj Motorway i.e. missing section between Krapina & Macelj	Xa	Committed							N.A.
Cr-H-07	Completion of Corridor X motorway (Lipovac & Zupanja)	X	New			19,2	19,2	19,2	19,2	76,9
Cr-H-07a	Rehabilitation Zagreb-Slavonski Brod-Lipovac Motorway	X	Committed	55,0	2,0					57,0
Cr-P-01	Rijeka Port: rehabilitation and environmental improvement		Committed	23,0	23,0	22,5				68,5
Cr-P-01b	Port of Rijeka: construction of final phase of container terminal - Brajdica		New			3,5	3,5			7,0
Cr-P-02	Ploce Container Terminal		New				8,0	9,0		17,0
Cr-P-05a	Port of Dubrovnik: construction of international passenger terminal		New	3,5	4,0	4,0	4,0	2,5		18,0
Cr-P-05b	Port of Dubrovnik: Construction of passenger Terminal - Domestic transport		New			2,0	2,0	2,0		6,0
Cr-P-05c	Port of Dubrovnik: Development of the operative coast - Kantafig		New		2,5	2,5	2,5	2,5	2,0	12,0
Cr-P-05d	Port of Dubrovnik: Expansion of the operative coast - Gruž		New	6,0	6,0	5,0				17,0
Cr-R-01	Reconstruction of Railway section of Corridor Vc	Vc	Ongoing	30,7	30,7					61,4
Cr-R-01a	Electrification on north section (Beli Manastir - Vr. Polje)	Vc	New					10,3	10,3	20,6
Cr-R-02	Track overhaul of railway section of Corridor Vb	Vb	Ongoing	5,3	15,1	7,7				28,1
Cr-R-02a	Construction of 2nd rail track on 36 km Dugo Selo - Krizevci section	Vb	New	7,1	20,0	20,0	9,1			56,1
Cr-R-02b	Modification of the electrical traction system on rail line Moravice-Rijeka-Sapjane (Skriljevo-Bakar)	Vb	New	14,0	19,4	11,4	11,4			56,2
Cr-R-02c	Remote control system on rail lineBotovo-Zagreb-Rijeka (329 km) section	Vb	New	0,9	1,1	1,1				3,2
Cr-R-02e	Reconstruction of Zagreb Main Railway Station	X	New		9,3	9,3	22,7	13,3		54,7
Cr-R-03c	Ostarije-Knin-Split: Track reconstruction on Kosovo (Knin)-Split section	1	Ongoing	29,9						29,9
Cr-R-03d	Reconstruction of stations on rail line Ostarije - Knin - Split	1	New	3,3	2,7					6,0
Cr-R-05aN	Construction of 2nd rail track on 53 km Zagreb-Karlovac section	Vb	New		8,0	22,7	24,0			54,7
Cr-R-05bN	Rail track overhaul Ostarije-Ogulin (6,2 km), Skrad-Drivenik (32,2 km) & Skriljevo-Rijeka (11,4 km) sections. Total 54,8 km of single track line.	Vb	New	9,0	18,9					27,9
Cr-R-05c	Construction of 2nd track on section Zagreb-V.Gorica	Vb	New		8,0	12,0				20,0
Cr-R-06aN	Remote rail control traffic system Savski Marof-Zagreb-Tovarnik (319 km)	X	New	7,8	7,8	7,8				23,4
Cr-R-06bN	Rail track overhaul Savski Marof-Zagreb & Ivankovo-Tovarnik sections, total 92.8 km.	X	New	24,3		22,8				47,1
Cr-R-09	Project of optical telecommunication rail network (whole HZ network)		New	22,7	8,0					30,7
Cr-R-10	Ro - La Terminal Spacva (road/rail)	X	New	1,0						1,0
Ma-A-01	Up-grading of Skopje airport		New	0,5	10,0	10,0				20,5
Ma-BCH-01	Upgrading of border crossing at Tabanovce	X	New	0,7	0,7					1,4
Ma-BCH-02	Improvement of border crossing at Medzilidja	Xd	New	0,3						0,3
Ma-BCH-17	Modernisation of Blace border crossing passenger	6	Committed	0,6	0,4					1,0
Ma-BCH-18	Improvement of border crossing at Gevgilja	X	New	0,5						0,5
Ma-H-01	Up-grading of Skopje-Blace road	6	New	10,0	14,0					24,0

Project N°	Project Name	Corridor/ routes	Status	2004	2005	2006	2007	2008	2009	Total (€ mill)
Ma-H-05-B/1	Up-grading of Smokvica-Gevgelija road	X	Committed	6,0	4,0					10,0
Ma-H-05-B/2	Up-grading of Demir Kapija-Smokvica (ph1) road	X	New	0,5	20,0	30,0	7,5			58,0
Ma-H-06	Construction Veles - Prilep	Xd	New			21,0	60,0	35,0		116,0
Ma-H-07	Up-grading of Stracin-Kriva Palanka road	VIII	New	0,2	0,5	10,0	15,0	5,0		30,7
Ma-H-10	Rehabilitation Kumanovo-Veles road	X	New	5,0	13,0	2,0				20,0
Ma-H-18	Kumanovo-Tabanovce (corridor X) road	X	New	0,5	3,0	2,2				5,7
Ma-H-24-N	Up-grading of Nigotino-Demir Kapija (II) road	X	Ongoing	6,0						6,0
Ma-H-24-N	Up-grading of Nigotino-Demir Kapija (III) road	X	Committed	10,0	6,0					16,0
Ma-H-25-N	Skopje by-pass phase I	VIII	Ongoing	12,0	15,0	15,0	8,0			50,0
Ma-H-25-N	Skopje by-pass phase II	VIII	Committed			25,0	25,0	20,0		70,0
Ma-R-01	Construction Kumanonvo - Debil Bair	VIII	Ongoing	5,0	5,0	5,0	5,0	5,0		25,0
Ma-R-02	Upgrading Veles - Kreminica (ph1)	Xd	New		3,8	2,0				5,8
Ma-R-09N	Rehabilitation rail line Tabanovce-Gevgelija	X	New	10,0	5,0					15,0
Ma-R-13N	Up-grading rail signaling and telecommunications along corridor X	X	New	0,3	3,5	2,0				5,8
Yu-A-01	Functional improvements of Terminal building and landside at Belgrade airport		Ongoing	27,0						27,0
Yu-A-04	Ramp handling and Safety Equipment Modernization at Belgrade airport		Ongoing	2,7						2,7
Yu-A-04N	Functional improvements of airside at Belgrade airport		Ongoing	7,2						7,2
Yu-A-06N	Cargo hub development in Belgrade airport		New			16,0	16,0	16,0		48,0
Yu-A-07	Extension of facilities at Podgorica airport		Committed	20,0	20,0					40,0
Yu-A-08N	Extension facilities of the airport of Nis		Ongoing	1,2						1,2
Yu-BCH-1N	Upgrading of border crossing at Kotroman	3	New		2,0					2,0
Yu-BCH-2N	Upgrading of border crossing at Presevo	X	New	3,5	3,5					7,0
Yu-BCH-3N	Upgrading of border crossing at Gradina	Xc	New		1,0	5,0	4,0			10,0
Yu-BCH-4N	Upgrading of border crossing at Debeli Brijeg	1	New			2,0	2,0			4,0
Yu-BCH-5N	Upgrading of border crossing at Bozaj	2b	New			2,0	2,0			4,0
Yu-H-05	Rehabilitation of Bujanovac - Presevo road	X	Ongoing	14,3						14,3
Yu-H-06/1	Rehabilitation on Leskovac-Bujanovac	X	Ongoing	5,8						5,8
Yu-H-07	Rehabilitation of Liberty bridge in Novi Sad	Xb	Ongoing	20,0						20,0
Yu-H-09	Rehabilitation of Belgrade-Nis road	X	Ongoing	27,9						27,9
Yu-H-10	Improvement Rzav Nova Varos road	4	Committed	9,9						9,9
Yu-H-11	Completion of Motorway Novi Sad -Horgos	Xb	New	50,0	42,0					92,0
Yu-H-11a	Completion of motorway Belgrade - Novi Sad	Xb	Ongoing	20,0						20,0
Yu-H-12	Upgrading Nis - Pirot - Gradina road	Xc	Ongoing	5,0						5,0
Yu-H-13	Completion of Belgrade by pass	X	Committed		57,5	57,5	57,5			172,5
Yu-H-14	Rehabilitation of Pancevo - Romanian border road	4	Ongoing	3,8						3,8
Yu-H-15	Removal of bottlenecks on roads in Ovcar Banja	4	Committed		3,0	3,0				6,0
Yu-H-16	Sozina Tunnel, access roads	4	New	10,0	4,5					14,5
Yu-H-19	Eastern mini bypass of Podgorica	4	New	3,0	7,0	5,0				15,0
Yu-H-20	Rehabilitation of road Podgorica- Bjelo Polje	4	New	16,0	20,0	20,0				56,0
YU-H-20	Rehabilitation of road Podgorica Bjelo Polje	4	Ongoing	10,0						10,0
Yu-H-27N	Rehabilitation of Cacak-Pozega road	4	Committed		7,0	7,0				14,0
Yu-H-28N	Cacak bypass, Phase 1	4	Committed		8,0	8,0	9,0			25,0
Yu-H-30N	Bypass Niksic	2b	New				5,5	5,5		11,0
Yu-H-37N	Rehabilitation of Petrovac Budva road	1	New	10,0						10,0
Yu-Ko-A-01	Rehabilitation of Pristina Airport		New	10,0	5,7					15,7
Yu-Ko-A-02	Up-grading air traffic control at Pristina airport		New	3,0	2,6					5,6
Yu-Ko-BCH-01	Construction of Border crossing Merdare	7	New		1,0	0,5				1,5
Yu-Ko-BCH-02	Construction of passenger terminal at Djernal Jankovic border crossing	6	New		1,0					1,0
Yu-Ko-BCH-04	Construction of Border crossing Vrbnica/Vrmica	7	New		1,0	0,5				1,5
Yu-Ko-H-01-b	Repaving of of road M2 Kacanik- Blace (Macedonian border)	6	Ongoing	1,3						1,3
Yu-Ko-H-01-c	Repairing of 9 bridges on road M2	6	Ongoing	2,5	2,5					5,0
Yu-Ko-H-01-Nd	Repairing remaining 8 of bridges on road M2	6	New		5,0	5,0				10,0
Yu-Ko-H-02	Upgrading Pristina-Mitrovica road	6	New		2,0	2,0				4,0
Yu-Ko-H-04	Upgrading Pristina-Prizren-Vrbnica road	7	New			1,5	4,0	8,0	5,0	18,5
Yu-Ko-H-05	West ring Pristina	6	New			5,0	15,0	11,0		31,0
Yu-Ko-R-01	Rehabilitation of North South rail line	10	New	9,5						9,5
Yu-P-02N	Ro Ro Berths on passenger terminal (Port of Bar)		New	3,8						3,8
YU-P-03N	Volujic quay (Port of Bar)		New		4,3					4,3
Yu-R-01a/01b	Priority rehabilitation works Belgrade-S.Pazova Tovarnik rail line	X	New		23,7	23,7	23,6			71,0
Yu-R-02/2	Priority rehabilitation on Belgrade - Nis - Presevo rail line	X	New	10,0	4,0					14,0
Yu-R-02N	Widening of rail tunnels Ripanj and Ralja	X	New		8,0					8,0
Yu-R-03/1	Priority rehabilitation works on S.Pazova Kelebia-section Petrovaradin Cortanovci rail line	Xb	Ongoing	11,2						11,2
Yu-R-03/2	Priority rehabilitation of Stara Pazova - Kelebia rail line	Xb	New	21,0	21,0					42,0
Yu-R-04/1	Priority rehabilitation on Nis - Pirot - Dimitrovgrad	Xc	Committed	10,0	20,0	30,0				60,0
Yu-R-05	Upgrading of Valjevo - Pozega rail line	4	New		13,5	13,5				27,0
Yu-R-06/1	Rehabilitation of Vrbnica - Podgorica - Bar rail line	4	Ongoing	5,0	2,0					7,0
Yu-R-06/2	Rehabilitation of Vrbnica - Podgorica - Bar	4	New	15,0	10,0					25,0
YU-R-07	Repair of Danube and Ostruznica rail bridges at Belgrade	X	New	6,0	5,9					11,9
YU-R-08	Reconstruction of Zezelj rail bridge at Novi Sad	Xb	New	15,0	15,0					30,0
Yu-R-09	Completion of Belgrade railway junction	X	New			34,0	33,0	33,0	33,0	133,0
Yu-R-11	Electrification of rail lines	4	New	10,0	10,0	5,0				25,0
Yu-W-01	Clearance of the Danube waterway	VII	Committed		2,0	3,7				5,7

The short term investment plan - as presented above - is not definite. As pointed out during the High Level Meeting in London in June 2003, the plan is an initial step of a longer, dynamic process. New projects may be included if the required information or documentation becomes available. The updating of the plan could be done within the framework of SEETO (see Chapter 10).

A few projects were omitted from the short-term investment plan because the information provided to the Consultant was insufficient or communicated only after the preparation of the plan. This concerns particularly the following projects:

- The construction of a 12 km road section, including a bridge over the river Tara (400 m length), between Brod na Drini and Scepan Polje (border between Bosnia and Herzegovina and Montenegro). The project is a missing link on the Route 2b, but the required information is not yet available.

- The construction of a new motorway between Leskovac- Bujanovac on the Corridor X (projectYU-H-06/2). So far, the rehabilitation of the most deteriorated sections of the road Leskovac- Bujanovac has been carried out (ongoing project Yu-H-05). The proposed construction of a first stage (semi-motorway) has not been included as no feasibility study has been prepared and traffic seems insufficient to justify an investment of about EUR 270 million. A suggestion has been made by the Serbian Ministry of Transport to carry out a feasibility study within the TPPF. The project is supported by Government of Greece within the so-called Hellenic Plan.

- During the High Level Meeting in June 2003 the Montenegrin authorities have proposed that the construction of a by-Pass in Rozaje (Road route 6) is included in the short term investment plan. However, the available information is insufficient at the moment.

- The Pristina East Ring has not been included in the investment plan (contrary to the west ring) in accordance with the main conclusions of the prefeasibility study carried out within REBIS. However, the authorities have asked for the project to be reconsidered. New traffic counts and traffic modelling need to be carried out in order to substantiate this request.

3.3.5 Implications of the short-term investment plan

Total investment costs

The plan comprises a total of 137 projects. Their status has been classified as:

- ongoing - i.e. implementation has already commenced
- committed - i.e. it has already been decided to implement the project and financing is already secured
- new - i.e. no final decision on the project has yet been made, and the project has been subject to assessment by REBIS

The total investment costs, broken down on project status; i.e. "Committed projects", "On-going projects" and "New projects" as well as the percentage distribution between the project status and the number of projects are shown in Table 3.7 below. The total investment cost in the Balkan region is EUR 3,818 million for the three types of investments.

Table 3.7 Total investment costs broken down by project status (EUR million).

Data	Committed projects	Ongoing projects	New projects	Grand Total
Investment cost	679	862	2,277	3,818
Percentage distribution of investment costs	18%	23%	59%	100%
Number of projects	21	33	83	137

There are 83 "New projects" and they comprise 59% of the total short-term investment costs amounting to EUR 2,277 million. There are 21 "Committed projects" and 33 "Ongoing projects", which comprise respectively 18% and 23% of the total short-term investment costs.

Timing of investment costs over the implementation period
The investment costs broken down by project status with the annual investment costs phased over the implementation period are presented in Figure 3.13.

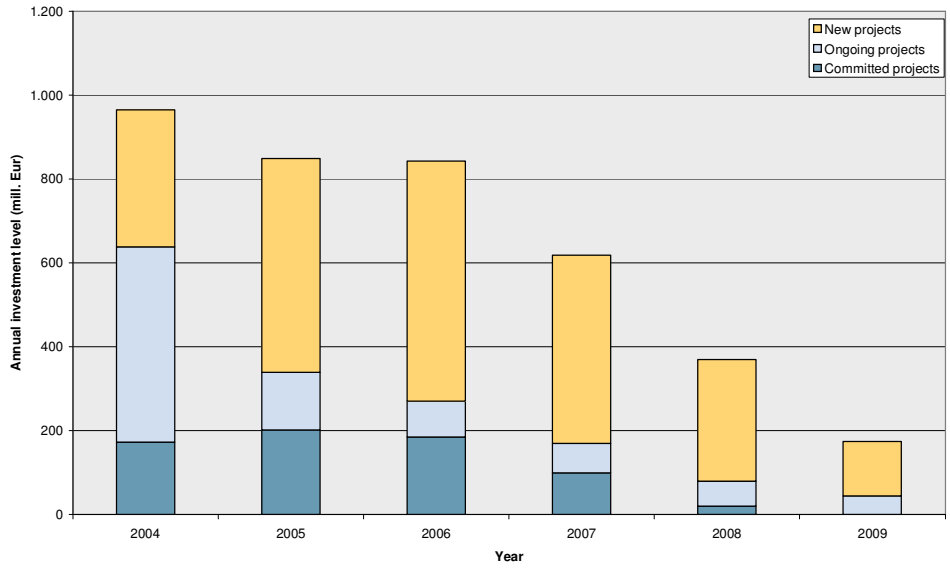


Figure 3.13. Investment costs broken down by project status phased over the implementation period (EUR million).

It appears that the investments for "Ongoing projects" reach a maximum in year 2004 with investments amounting to EUR 465 million and that they are, subsequently, reduced significantly in the following years. On the contrary, the annual investment costs for "Committed projects" will stay relatively high until year 2006. Looking at the "New projects", the annual investment costs will increase until year 2006, but will stay relatively high during the entire implementation period, though it drops at the end of the implementation period.

As the investment level decreases during the period, there will be a potential for adding some more investment projects to the plan over time in the process as described in Chapter 3.3.6.

Distribution of investment costs by corridors and routes
The distribution of investment costs by Corridors and Routes, broken down by project status, is shown in Table 3.8. It appears from the table that the investments in Corridor X (22.6%), Corridor Vc (12.6%) and Corridor Vb (10.1%) require almost half of the total investment costs of the plan.

The "Ongoing projects" have primarily addressed the investment needs in Corridor Vc (EUR 186 million) and Corridor Vb (EUR 169 million) and Road route 2a (EUR 125 million) as well as the needs of Core Airports (EUR 100 million). These Corridors Vc and Vb and the Road route 2a are not addressed by the presently "Committed projects".

For the "Committed projects" the investments are allocated primarily to Corridor X (EUR 256 million) followed by Corridor VIII (EUR 119 million) and Corridor Xc (EUR 60 million). Approximately, 12% of the total "Committed projects" are for Core Airports (EUR 80 million) and Core Seaports (EUR 73 million), respectively.

The "New projects" are primarily focussed on Corridor X (EUR 554 million), followed by Corridor Vc (EUR 294 million), Corridor Vb (EUR 218 million), Road route 7 (EUR 222 million) Corridor VIII (EUR 115 million), Corridor Xd (EUR 122 million) and Corridor Xb (EUR 164 million).

Table 3.8 Distribution of Investment Costs by Corridors and Routes broken down by project status (EUR million).

N° of Corridor and routes:	Committed projects	Ongoing projects	New projects	Grand Total	Percen-tage
Corridor Vb	0	169	218	387	10,1%
Corridor Vc	0	186	294	480	12,6%
Corridor VII	6	0	0	6	0,1%
Corridor VIII	119	95	115	328	8,6%
Corridor X	256	54	554	864	22,6%
Corridor Xa	0	0	4	4	0,1%
Corridor Xb	0	51	164	215	5,6%
Corridor Xc	60	5	10	75	2,0%
Corridor Xd	0	0	122	122	3,2%
Road route 1	0	0	14	14	0,4%
Road route 2a	0	125	0	125	3,3%
Road route 2b	10	15	44	69	1,8%
Road route 2c	21	0	53	74	1,9%
Road route 3	0	0	6	6	0,1%
Road route 4	55	14	86	154	4,0%
Road route 6	1	6	70	77	2,0%
Road route 7	0	0	222	222	5,8%
Rail route 1	0	30	6	36	0,9%
Rail route 10	0	0	10	10	0,2%
Rail route 4	0	7	77	84	2,2%
Core airports	80	100	95	275	7,2%
Core seaports	73	4	85	162	4,2%
Others	0	0	31	31	0,8%
Grand Total	679	862	2.277	3.818	100%

Note: "others" is provision of telecommunication equipment to the whole rail network in Croatia.

Investment costs by transport mode and project status

The distribution of investment costs by transport mode broken down by project status is shown in Table 3.9. It appears that road and rail projects are absorbing the major part (88%) of the funds for "Ongoing projects" while the Airports receive 11.6% of the funds allocated to "Ongoing projects".

For the "Committed projects" the majority (close to 68%) of the projects are within the road sector. This also applies to the "New projects" where the road projects absorb 54% of the financial resources followed closely by the rail projects accounting for 36%.

The "New projects" also address the investment needs for airports (EUR 95 million), seaports (EUR 85 million) and border crossing projects (EUR 49 million).

Table 3.9 Distribution of transport mode investment costs broken down by project status (EUR million).

Transport Mode/Project status	Committed projects	Ongoing projects	New projects	Grand Total
Road	459	481	1,224	2,165
Rail	60	277	823	1,160
Airport	80	100	95	275
Sea port	73	4	85	162
I. waterways	6	0	0	6
Multimodal	0	0	1	1
Border crossing	1	0	49	50
Grand Total	679	862	2,277	3,818

Investment costs by transport mode and project scope

Figure 3.14 illustrates the investment costs distributed by transport mode and broken down by project scope (i.e. on construction, provision of equipment, rehabilitation/reconstruction or upgrading) for all projects in the plan.

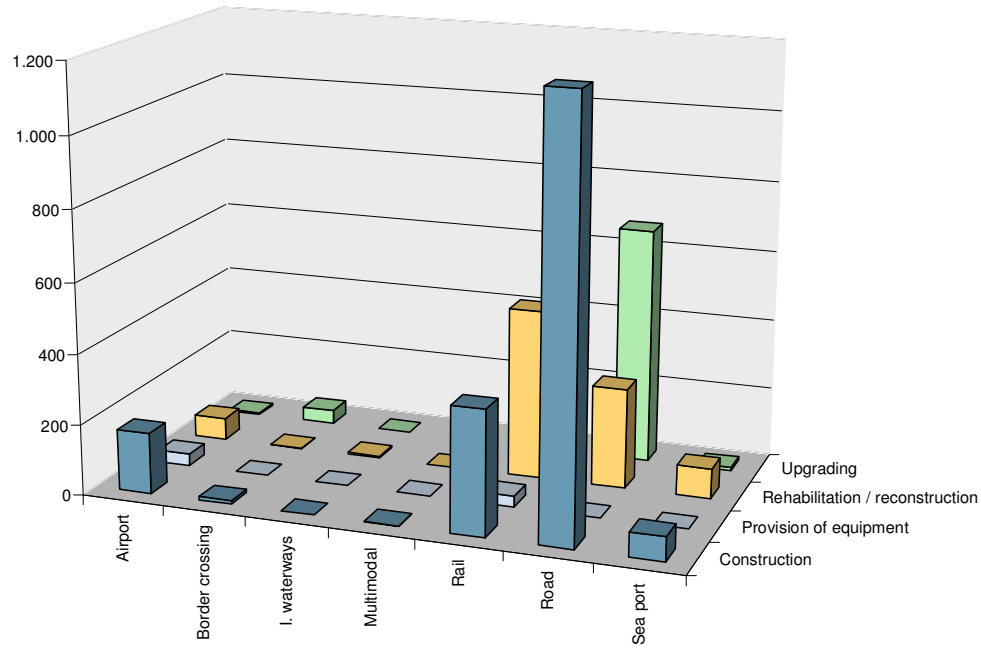


Figure 3.14 Investment costs by transport mode and scope for all projects (EUR million).

It appears from the Figure that the major part (57%) of the projects in the short-term investment plan are road projects, of which construction works on roads account for 56% (or EUR 1,209 million) followed by upgrading the roads, which constitutes 31% or (EUR 671 million). The second most important transport mode is the railway transport, which takes on 30% of the resources required in the plan. The rail projects are primarily for rehabilitation/recon-

struction works (EUR 481 million), for construction works (EUR 352 million) and for upgrading (EUR 296 million).

Table 3.10 below shows the investment costs distributed by transport mode and broken down by project scope (i.e. on construction, provision of equipment, rehabilitation/reconstruction or upgrading) for the "New projects" included in the plan. Figure 3.15 illustrates the distribution of investment cost by transport mode and by project scope.

Table 3.10 Investment costs by transport mode and scope for all "New projects" (EUR million).

Sector	Construc-tion	Provision of equipment	Rehabilitation/ reconstruction	Upgrading	Grand Total
Road	601	0	114	509	1,224
Rail	327	31	356	110	823
Airport	79	0	16	0	95
Sea port	68	0	17	0	85
Multimodal	1	0	0	0	1
Border crossing	9	0	1	39	49
Grand Total	1,084	31	504	658	2,277

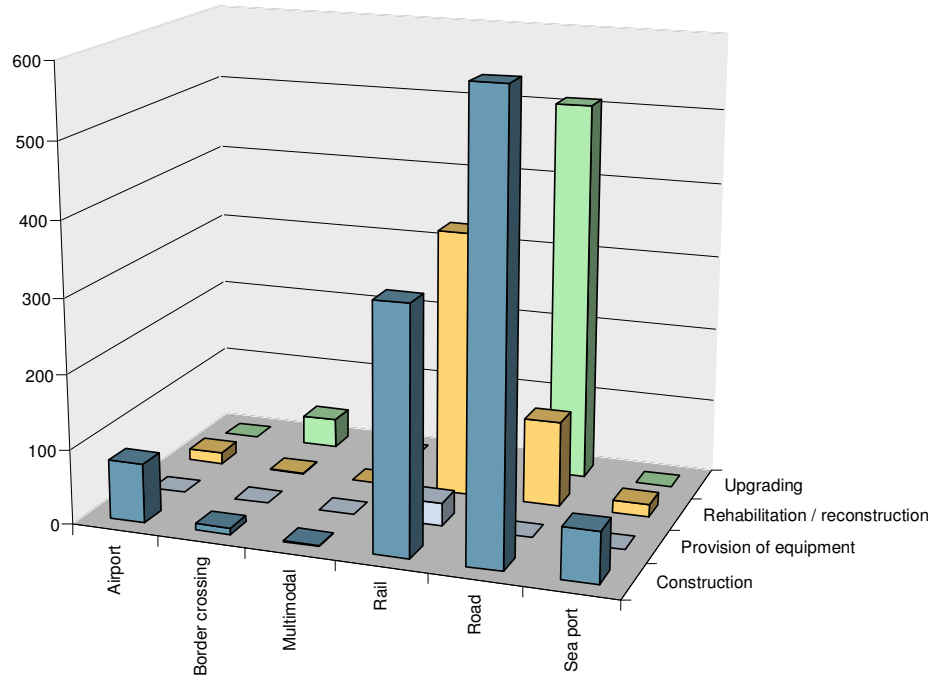


Figure 3.15 Investment costs by transport mode and scope for all "New projects" (EUR million).

Table 3.10 reveals that the most of the "New project" investments (54%) are for road projects, of which 49% (or EUR 601 million) is dedicated for construction

works, followed by upgrading the roads, which constitutes (42% or EUR 509 million). The second most important transport mode is railway transport, which takes on 36% of the resources required in the plan. The railway projects are for both construction works and rehabilitation/reconstruction works accounting for approximately 40-43% of the total investment needs within the railway sector or EUR 327-356 million.

Phased investment costs by transport mode
Table 3.11 shows the investment costs phased over the implementation period for each transport mode.

Table 3.11 Phased investment costs by transport mode (EUR million).

Implementation year	Road	Rail	Airport	Sea port	I. waterways	Multi-modal	Border crossing	Grand Total
2004	524	292	104	39	0	1	6	964
2005	392	304	89	46	2	0	15	848
2006	485	255	42	40	4	0	18	843
2007	409	154	24	20	0	0	12	619
2008	251	87	16	16	0	0	0	369
2009	104	68	0	2	0	0	0	175
Grand Total	2,165	1,160	275	162	6	1	50	3,818

The table shows that the investment costs in the coming three implementation years are high with a declining trend, while the annual investments are modest from year 2007.

Phased investment costs by transport mode
Figure 3.16 and 3.17 below show the annual investment costs phased over the implementation period and broken down by project status, for road and rail projects respectively.

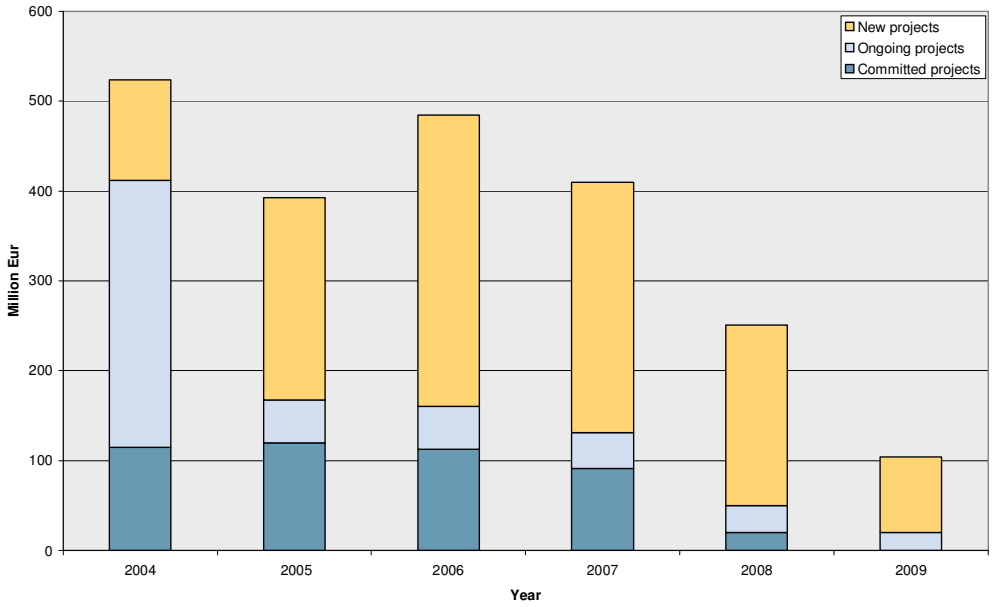


Figure 3.16 Roads - phased investment costs broken down by project status (EUR million).

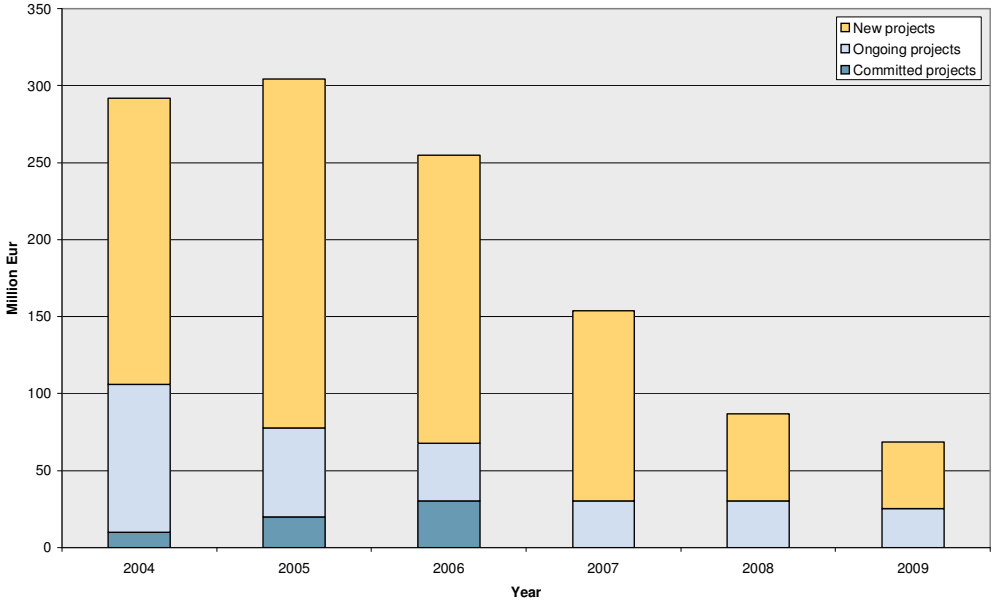


Figure 3.17 Rail -phased investment costs broken down by project status (EUR million).

Distribution of investment costs by country versus status, transport mode and corridor/route

In Table 3.12 the distribution of the investment costs by country broken down by project status is shown.

Table 3.12 Distribution of investment costs by country broken down by project status (EUR million).

Country	Committed projects	Ongoing projects	New projects	Grand Total
Albania	123	66	366	555
Bosnia and Herzegovina	0	254	277	531
Croatia	126	291	564	981
Kosovo	0	6	98	105
FYRO Macedonia	97	81	304	482
Serbia and Montenegro	333	163	669	1.165
Grand Total	679	862	2.277	3.818

Table 3.13 summarises the distribution of investment costs by country and transport mode.

Table 3.13 Distribution of investment costs by country and transport mode (EUR million).

Country	Road	Rail	Airport	Sea port	I. waterways	Multimodal	Border crossing	Grand Total
Albania	480	0	67	8	0	0	0	555
Bosnia and Herzegovina	401	114	4	0	0	0	12	531
Croatia	275	520	36	146	0	1	4	981
Kosovo	70	10	21	0	0	0	4	105
FYRO Macedonia	406	52	21	0	0	0	3	482
Serbia and Montenegro	533	465	126	8	6	0	27	1.165
Grand Total	2,165	1,160	275	162	6	1	50	3,818

Country affordability considerations

The total investment costs within each of the Balkan countries included in the above table have been compared to the national affordability to pay for these investments. The TINA process estimated that from a macroeconomic view 1.5%-2% of the GDP could be used on transport infrastructure investments on core networks.

GDP estimates have been obtained for each Balkan country. The figures have been converted to 2003 GDP figures and projections for the GDP in the period 2004-2009 have been established (also used in the traffic scenarios). These projections are summarised in a total GDP for each country for the period 2004-2009. The figures are then compared to the estimated investment costs in order to illustrate the proportion of the investment costs in transport infrastructure relative to the GDP.

Table 3.14 Investment costs and GDP.

	Estimated GDP	Total GDP	Assumed real growth in period	Estimated investment costs	Investment/ GDP
Year	2003	2004-2009	2004-2009	2004-2009	2004-2009
Unit	EUR billion	EUR billion (2003 prices)	Real growth (%)	EUR million (2003 - prices)	% of GDP
Albania	5.5	40.9	45%	555	1.4%
Bosnia and Herzegovina	6.1	49.2	28%	531	1.1%
Croatia	25.3	206.4	27%	981	0.5%
Kosovo*	1.7	14.7	33%	105	0.7%
FYRO Macedonia	3.8	39.3	26%	482	1.2%
Serbia & Montenegro	12.3	108.1	32%	1,165	1.1%

Source: The GDP figures are estimated based on the World Bank's GDP figures for 2001 and projected based on real growth rates between 3.7% and 6.5% per year. The figure for Kosovo is estimated by IMF who assess the GDP to be DEM 3 billion corresponding to around EUR 1.5 billion in year 2000.

From the table it can be seen that all the countries are below the 1.5 - 2% level established by TINA as the investments compared to the GDP vary in the range from 0.5% to 1.4% for the period 2004-2009 as a whole. This indicates that the investment plans are within the affordable range even though the actual timing of the investments might imply higher proportions of investments to be undertaken in specific years. The experience gained from the investments undertaken in the TINA projects was, that during the period 1996-2001 investment projects on core networks were implemented corresponding to only 0.26% of GDP, although much higher investment levels were considered affordable.

Furthermore, it is noted that the countries' investments in transport infrastructure should also address other issues than those of regional importance, e.g. the increased traffic problems in the cities.

3.3.6 Long-term investment requirements

Investment planning is an ongoing, rolling process, where new projects are continuously identified and assessed as need arises, and where final selection is based on strategic priorities, economic feasibility studies and availability of financial means.

The short-term investment plan includes only those projects, for which concrete action - project preparation or implementation as relevant - is recommended in the immediate future, i.e. before the end of 2004. This means that, already after two years, further projects need to be identified and included in the planning process. The application of screening techniques and pre-feasibility studies - as presented in the present report - may be useful in this task, as a basis for selection of projects for detailed project preparation.

During the REBIS project a large number of possible projects were identified and assessed. For economic, financial and strategic reasons many promising projects were excluded from the short-term investment plan. These projects are listed in Appendix 6 and should be considered in the coming investment planning. They include approx. 40 projects and represent a total investment of approx. EUR 2.5 billion, of which the majority are road projects. This reflects the fact that the detailed selection of railway projects in the medium term will depend on the preparation of comprehensive business plans for the rail companies.

The planning process would allow the implementation of some of these projects to begin already within the planning horizon of 2009. The planning should consider both national and regional interests, and should be monitored by and coordinated through the SEETO (see Chapter 10).

The short-term investment plan includes a total investment in road infrastructure of EUR 2.2 billion. This should be compared to the total long-term investment requirement of EUR 4 billion up to 2015, as presented in Chapter 3 and shown in Figure 3.2. Up to year 2010, it is expected that this will almost entirely involve the improvement/reconstruction of pavements and the upgrading of roads to acceptable standards. Only after 2010, it is expected that major investments in increased road capacity will be warranted.

For the railway sector the short-term investment plan includes a total investment of EUR 1.2 billion, as compared to the long-term investments required to bring the main rail lines up to "European" standards, which is estimated at 12 billion. The identified long-term investment requirements are shown in Figure 3.3. In the first few years the railways should focus on developing and focusing their business, rather than on large-scale upgrading of infrastructure to AGC/AGCT standards, which is clearly not economically feasible in the coming years. Many of the projects planned by the railways address the poor conditions of the lines, which is a result of several years of lack of maintenance and investment, and aim at bringing the infrastructure up to the standard for which they were originally designed. This may be a viable approach in many cases. In the assessment of such projects it should, however, be considered to modernise tracks to higher standard, in line with the proposed modernisations described in Chapter 3, with the view to avoiding re-investing in the same infrastructure in the medium term. Modernisation of signalling and telecommunication may be postponed to a later stage.

The long-term investment requirements for airports are difficult to foresee. The airports of the region will compete to attract carriers. It is also expected that major airports, in the future, will have to operate on commercial terms, which means that the users will have to pay fully for the facilities. This will, in turn, reduce the need for subsidies, and financial support will focus on the development of Public-Private-Partnership (PPP).

The situation of the ports is similar. Ports are facing growing competition, and they have to operate, increasingly, on commercial basis, without public funding and support from IFI's.

Major investments are likely to be needed on the Danube and its ports in the short term. The type and level of investment required will be identified by the upcoming studies financed by the European Agency for Reconstruction (see Chapter 8).

4 Transport sector management

The development of modern economies and societies is dependent on the overall quality of the transport system and therefore the development of the transport sector. An efficient development of the transport sectors, in the Rebis countries, requires the simultaneous development of infrastructure, institutional framework and management tools and capabilities.

The transport sector has - in varying degrees - undergone reform within the Rebis countries over recent years, but there is still a need for substantial reform and institutional development with a view to improving efficiency in the transport sector. Several projects address this issue.

The REBIS project includes a number of specific, and targeted, institutional and management components, but it does not aim to advise on reforms or institutional development in the transport sector in general. The following specific activities were carried out within the project:

- An overall status of the reform process has been made - based on statements by the national authorities.

- When identifying and preparing physical projects, the REBIS consultant took note of any obvious institutional constraints which may hamper the implementation of projects or their subsequent operation and maintenance.

- Efficient and adequate information systems are vital to management of the transport sector. Within the project, a special study of the current management information systems in the region was undertaken and improvements were proposed.

- The implementation of projects under international financing requires special skills and competences within the various stages of the project cycle. Such skills and competences are still scarce in the region. The REBIS consultants carried out a targeted training exercise on these topics, aimed at government institutions, the construction industry and the consultancy sector.

This chapter presents the results of these specific activities.

4.1 Status of the reform process

In Western Europe, the transport sector has undergone substantial reform over the past decades, and the process accelerated in the 1990'ies. Especially the EU has been the driving force in this process, which can be said to comprise 3 levels of policy action:

- ensuring equal access to common markets including liberalisation of transport sectors.
- harmonisation of competition in the form of adaptation of common standards in some areas, e.g. minimum level of fuel taxes and acceptance of common technical standards for vehicles.
- introduction of common requirements to improve efficiency in the transport sector e.g. outsourcing of public transport services

This means that the national transport authorities, to a large degree, have focussed on adapting and implementing the EU policies and directives at national level. The role of sectoral ministries (e.g. the Ministry of Transport) has increasingly been confined to the development of transport policy and regulation frameworks within the sector.

Some of the general trends are concretely:

- operations have been separated from infrastructure, i.a. in the railway and port sectors
- operators - within all modes of transport - have increasingly been granted access to the market - on an equal basis
- the operating agencies (road administrations, national railways etc.) have gained increased autonomy.
- more ports and airports have been privatised, or the private sector has gained increased access to these sectors
- construction and maintenance, and, in many cases, operation, has increasingly been outsourced and subject to open tender procedures
- peripheral services have, to a large extent, been hived off

These reforms have been implemented with the view to increasing efficiency in the sector.

In the Balkan region, the transport sector is also undergoing change, and many of the above trends have been subject to discussion in the region. In most cases, the general course of reforms has been set, but much preparatory work is still required. This is an area where technical assistance is needed.

In order to gain a broad impression of the sectoral reforms which have already been accomplished, as well as planned future reforms, the delegations at the high-level meeting in Luxemburg in February 2003 (see Chapter 10.1) were requested to report on the status of the reform process. Subsequently, a standard questionnaire was prepared and the delegations were requested to provide the information on a standardised basis.

The questionnaire covered all modes of transport and addressed key aspects, such as:

- the role of the central ministries versus the road and rail authorities, ports, airports etc.
- the autonomy granted to operating agencies, i.a. in respect of ownership of facilities, and decisions on investments and tariff setting
- the separation of infrastructure and operations
- divestiture or privatisation of peripheral services
- the involvement of the private sector - i.a. in the construction and maintenance of infrastructure and in transport operations - and the privatisation of transport facilities such as ports and airports
- financing mechanisms, subsidies and tariff setting
- access to the market for private operators

The questionnaires - as completed by the national authorities - are presented in Appendix 8. A brief summary, based on these questionnaires, is given below.

4.1.1 Roads and road transport

For roads and road transport the picture is more diversified than for railways. Generally, the overall ownership and responsibility lies with the state and management is mostly the responsibility of road directorates. In Croatia concessionaires have been set up for construction and operation of new highways.

A road fund (fuel levy, registration fee, import taxes) for maintenance has been established in FYRO Macedonia. In Croatia a fuel levy is a funding source for state roads and the motorway concession. Albania and Bosnia and Herzegovina are considering setting up road funds.

Road construction, rehabilitation and maintenance are, to a large degree, being tendered out.

4.1.2 Railways

Historically, both in western and eastern Europe, the railways have, to a large degree, been owned, managed, developed and controlled by the state. This is also the general picture in the Rebis countries. In all the countries, the state is responsible for the railways through their transport ministries. Some of the countries have set up directorates that are responsible for the networks' management.

Inspired by reforms in Western Europe, and through preparation of the stabilisation and association agreements, the countries are all working towards a separation of the infrastructure and the transport services. The states generally remain owners of the infrastructure, while the operation of passenger and goods transport is being prepared for privatisation.

In Montenegro, the train operation is owned at a ratio of 61% by the state and 39% by private companies/investors. Albanian Railways (HSH) and Croatian Railways (HZ) are both operated as limited companies, but are still state owned. In Bosnia and Herzegovina, train/railway operations are in a transition phase between state and private ownership.

In most cases the state controls or supervises tariffs. The competition with other transport modes plays an important role when deciding tariff levels.

With regard to maintenance and rehabilitation of the rail infrastructure, there is a trend towards tendering out works, although there is still a lot of work being carried out with in-house staff and resources. Financing is mainly derived from the state budget supported by donors. In Bosnia and Herzegovina maintenance is carried out in-house.

State subsidies for passenger transport still play an important role in financing the railway services (see also Chapter 6).

4.1.3 Civil aviation

The airports are generally state owned and state run - in some cases small airports are owned and managed by local authorities. Public and private enterprises are responsible for the management of the airports.

Airport administration, airline management and Air Traffic Control (ATC) are, in most cases, undergoing structural changes towards separation from the state. Airport infrastructure is mostly state owned and run by a civil aviation organisation. Airlines are, in many cases, private or apply mixed state/private ownership. The ATC function is, in some cases, tendered out to private companies; however the related equipment and ATC infrastructure remain state property in most cases.

The general trend for airlines is to be privately run. The airline markets are managed differently. In most countries the market is open to new operators.

Construction and maintenance works in the airports are mostly tendered out to contractors.

Croatia, Albania and FYRO Macedonia are Eurocontrol members. Serbia and Montenegro has initiated procedure for membership. Bosnia and Herzegovina is member of ECAC.

Bosnia and Herzegovina and Serbia and Montenegro have made bilateral and multilateral agreements to regulate air traffic. For the other countries, information was not provided.

There is generally no subsidy for air transport, but only government and donor supported investments in new equipment and airport and ATC rehabilitation works.

4.1.4 Ports

The status of the ports in the region varies considerably.

In Albania, the port of Durres has been transformed into a state owned limited liability company. A new law under preparation will allow the government to privatise, through concessions, the port's operations as well as the port's facilities.. The Albanian merchant fleet is fully privatised.

In Croatia, a Port Authority provides concessions for port services for periods up to 12 years. Ports are state owned.

In Montenegro the Port of Bar is owned at a ratio of 54% by the state and 46 % by private funding. The port is managed and run by a port authority.

In Bosnia and Herzegovina there are two major river ports in Brčko and Šamac. Brčko is owned by the local authorities and is run as a Public Enterprise. The port in Šamac is a share holding company with 65% state ownership; the remainder being private investment funds and small stock holders.

The river ports in Serbia and Montenegro are private entities with limited regulation by MOTT.

4.1.5 Inland waterways

In Croatia there are plans to establish a new agency for inland waterways. In Serbia, MOTT is responsible for safety on inland waterways, and a state owned company PLOWPUT is responsible for maintenance. The maintenance is subsidised by the state.

4.1.6 UNECE transport agreements and conventions

The countries are parties of the UNECE international inland transport legal instruments which are important for international transport. These legal instru-

ments, which include a total of 55 international agreements and conventions, have been established under the umbrella of the UNECE Transport Committee, which has been a framework for intergovernmental co-operation and concerted action in order to facilitate international transport. Further information is found at the homepage: www.unece.org/trans/Welcome.html.

4.2 Status of the stabilisation and association process (transport sector)

4.2.1 General

The stabilisation and association process is a long-term commitment to the region, both in terms of political effort and financial and human resources. Through the Stabilisation and Association process, the region's agreement to a clear set of objectives and conditions has been gained in return for the EU's offer of a prospect of accession on the basis of the Treaty on European Union (TEU) and the 1993 Copenhagen criteria.

As an important means of implementing the process, Stabilisation and Association Agreements (SAA) are made with the individual countries.

The Stabilisation and Association Agreements represent both the cornerstone of the Stabilisation and Association process and a key step to its completion. The conclusion of Stabilisation and Association Agreements represents the signatories' commitment to complete, over a transition period, a formal association with the EU. Such an association has a high political value. It is based on the gradual implementation of a free trade area and reforms designed to achieve the adoption of EU standards with the aim of moving closer to the EU.

Within the transport sector, the SAA's are focusing on:

- liberalisation of road transit traffic and unrestricted road transit traffic
- harmonisation of transport legislation with that of the Community
- unrestricted access to the maritime transport market and traffic on a commercial basis
- adapt air and inland transport legislation to that of the Community
- restructuring and modernisation of transport and related infrastructure
- improve movement of passengers and goods access to the transport market, by the removing of administrative, technical and other barriers
- achieve operating standards comparable to those in the Community
- develop a transport system compatible and aligned with the Community system

- improve the protection of environment in transport, reduction of harmful effects and pollution

Cooperation (within the transport sector) shall include the following priority areas:

- the development of road, rail, airport and port infrastructure and other major routes of common interest and Trans-European and Pan-European links
- the management of railways and airports, including appropriate cooperation between the relevant national authorities
- road transport, including taxation and social and environmental aspects
- combined rail and road transport
- harmonisation of international transport statistics
- modernisation of technical transport equipment
- promotion of joint technological and research programmes
- adoption of coordinated transport policies that are compatible with those applied in the Community

Croatia and FYRO Macedonia have signed an SAA with EU. The agreements are available on the EU-SEE web-site. In the following sections a summary of SAP issues related to transport, as reported in the SAP reports 2003, is provided.

4.2.2 Albania

Albania started SAA negotiations January 2003.

The following issues have been raised in the 2003 SAP report:

It is recommended that Albania develop a comprehensive national transport plan, strengthen border management and re-ensure proper management/functioning of the Albanian customs administration.

4.2.3 Bosnia and Herzegovina

The following issues have been raised in the 2003 SAP report:

Bosnia and Herzegovina has not yet started the SAA process.

Attention is turning towards establishing the regulatory framework needed for a competitive transport market. In August 2002, the Civil Aviation Law was amended, facilitating more efficient management within the Bosnia and Herze-

govina Dept. of Civil Aviation. Bosnia and Herzegovina joined the Civil Aviation Conference. The civil aviation administration remains fragmented and this needs to be addressed in 2003.

4.2.4 Croatia

Croatia has signed an SAA in October 2001 and is making much progress.

None of the SAP priority areas needing attention in the next 12 months are particularly related to transport.

4.2.5 FYRO Macedonia

In FYRO Macedonia, the SAA was signed in April 2001. The following issues have been raised in the 2003 SAP report:

There is limited but encouraging progress in the improvement of transport connections with neighbouring countries. The countries whose territories are crossed by Corridor VIII signed a memorandum of Understanding in September 2002 which should speed up the implementation of several infrastructure projects foreseen for this important South-East European artery.

It is recommended that FYRO Macedonia promotes development of small and medium sized enterprises, establishing a favourable environment for the growth of the private sector, entrepreneurship and the integration of the informal sector.

4.2.6 Serbia and Montenegro

No SAA has been made so far. The following issues have been raised in the 2003 SAP report:

The previous recommendations on the need to rapidly put transport policy and co-ordination in place, at state-level, have not yet been implemented. Liberalisation of road transit traffic, guaranteeing non-discriminatory treatment for EC operators, is only at the draft stage. The new company "Serbian Rail", is not yet operational. Restructuring of this enterprise, with a distinction between asset-holders and operators, is a key factor to sectoral reform. There is complete liberalisation of maritime navigation, with equal treatment of foreign and national operators.

Priority areas needing attention (in the next 12 months) in relation to transport include:

- transport policy and co-ordination should be put into place on state level
- further improvement of transport infrastructure and accompanying measures to improve safety

- improve transit through the state and reduce congestion

4.3 Management information systems

Poor maintenance planning - e.g. due to a lack of information on the infrastructure system - often leads to inefficient use of the limited funds for infrastructure maintenance. In most of the REBIS countries it would thus be an economic advantage to introduce or improve management information systems for the infrastructure (roads and structures, rail and structures, ports, airports, inland waterways). This could include hardware and software, as well as technical assistance, in order to get the systems operating with data.

Management of infrastructure is based on the idea that the infrastructure is considered an asset which needs to be maintained and improved to ensure the maximum life service, as well as securing good performance and value for money, of the infrastructure[4].

In order to ensure efficient maintenance of infrastructure, through a properly managed series of works and activities, it is necessary to have up-to-date information about the features and condition of the infrastructure as well as on traffic and accidents. Additionally, when resources are scarce for maintenance of the infrastructure it is important to have the necessary data in order to properly prioritise the maintenance work according to identified needs.

The management of infrastructure is thus based on information that needs to be continuously updated. Therefore, a survey of the management information systems in the region has been carried out and with a view to obtaining an overview of the information systems for traffic and infrastructure data in the REBIS countries. The overview provides information on organisations having and collecting data, the level of updating of the data, and areas covered by the systems, e.g. data on traffic, structures, road, rail, port, airport and inland waterways conditions, etc. Detailed information for each country is presented in Appendix 9.

Information on Management Information Systems for infrastructure is collected centrally at the Ministry of Transport e.g. in institutions such as a Directorate for Roads, Railway Directorate and Government Agencies for Inland waterways and decentralised at ports and airports.

Generally there are for most infrastructure types a need to improve the existing management information systems, i.e. to update data and in most cases to computerise the information in a coordinated manner. The rail, port, airport and inland waterway sectors have generally updated data on condition, traffic, and, in most cases, also an updated inventory, but mostly on paper. For the road infrastructure inventories have not been updated in 3 countries and condition data is not updated in 2 countries. Most of the countries need to extend their traffic

[4] Based on TRL and DFID, Guidelines for the design of operation of road managements systems, Overseas Road Note 15, 1998.

data collection to all roads and to update the information on the condition of structures.

With regard to management of the regional core network, the countries will generally not be able to supply necessary data or updates as envisaged for the foreseen South Eastern Europe Transport Observatory (SEETO). This underpins the need for technical assistance, as discussed in Chapter 10.2.

4.3.1 Road management information systems

Croatia and Kosovo is well in the process of developing a central management information system for roads, and not much assistance seems to be needed.

In most of the other REBIS countries, data exists but is generally in separate systems, and some data is paper-based. In many of the countries only some data is updated.

Most of the other countries need improvements to their information system as summarised in Table 4.1. All the countries apart from Croatia and Kosovo need to extend their traffic counting system to cover the entire main road network. This would i.e. require additional traffic counters. Updated condition data of the structures are generally needed as well as functioning bridge management systems. The inventory data needs to be updated in FYRO Macedonia, and in Albania and Bosnia and Herzegovina the condition data and inventory needs to be updated.

Generally the paper-based data should be updated and computerised before one unified system is developed. The next phase could be to support all the countries except Croatia to unify the separate databases and provide a management information system as an umbrella for all data.

All the countries have similar road safety procedures where the police collect the road accident data and there is - apart from Kosovo - no formal cooperation between the police and the road authorities. Data is not systematically used by the road authorities to identify black spots.

Support for cooperation between the police and road authorities to improve road safety could be relevant in all countries. The aim of such a project should be to enable the Road Authorities to systematically reduce road accidents. First of all, a common reference (location) system should be developed and used by both authorities and a formal procedure to transfer data from the police to the road authorities should be established. The police mainly write reports so as to decide who the guilty party is in accidents. It may be relevant to add features to the police reports which enable further information on location of accident, cause of accident, involved parties, severity of accident etc. in order to allow analysis of accidents.

Table 4.1 Summary of need for road management information systems.

	Update inventory data	Update condition data	Update traffic data	Update accident data	Update structure data
Albania	Full update of inventory of the remaining approx 70% of the network and computerise the remaining 96% of the network still missing.	Need to update condition data which are from 1996 and to computerise the data.	Need to ensure that the remaining 60% of the road network comes under regular traffic counts.	Need for proper data collection by police including location and transfer of information to the road authorities	Need for full update of structure inventory on the remaining approx 70% of the network and computerise the remaining 96% of the network still missing and need for a bridge condition system.
Bosnia and Herzegovina	Update data from 1991 and make it computerised.	Need to update condition data which are paper-based and from 1991 and to computerise the data.	Need to ensure that the entire road network comes under regular traffic counts.	Need for proper data collection by police including location and transfer of information to the road authorities	Update condition data which are paper-based and from 1999 and to computerise the data.
Croatia	-	-	-	Need for proper data collection by police including location and transfer of information to the road authorities	-
FYRO Macedonia	Update inventory and to make it computerised.	-	Need to ensure that there are sufficient numbers of counters to include regional roads in the national counting system.	Need for proper data collection by police including location and transfer of information to the road authorities	Have developed own system but data are 3 years old, thus assistance is needed to update and computerise all the data.
Serbia and Montenegro					
Serbia	-	-	Need to ensure that there are sufficient numbers of counters to include regional roads in the national counting system.	Need for proper data collection by police including location and transfer of information to the road authorities	Have new Bridge Management System but data are 10 years old data, thus assistance could be required to update the data to the new system.

	Update inventory data	Update condition data	Update traffic data	Update accident data	Update structure data
Montenegro	-	-	Need to ensure that there are sufficient numbers of counters - presently there are only10 counters.	Need for proper data collection by police including location and transfer of information to the road authorities	The inventory and condition data are generally from 1990, but inventory is part of the COWI/BCEOM study[5], thus a study may be relevant to update condition data of the structures.
Kosovo	-	-	May need some computerisation	May need some computerisation	May need some computerisation

Status of road management information systems in the countries

For each country, the status of the data collection and storage, and management information systems are presented in Appendix 9 and summarised in Table 4.2.

[5] BCEOM - COWI, Preparation of Feasibility Study for the Ministry of Maritime Affairs and Transport Montenegro (FRY).

Table 4.2 Summary of status of road management information systems.

	Inventory	Condition	Traffic	Accidents	Unit costs	Structures	Computerisation
Albania	Reference system from 2000. Inventory of approx 30% carried out in paper form.	Not updated since 1996.	40% of road network under regular traffic counts.	Police collect accident data, but no formal cooperation between police and road administration.	No formal unit costs, but some are calculated for planning and budgeting.	No structure system, but included in inventory for Road Data Bank.	New road data bank not fully implemented - 4% of inventory in computer. Plan later to include condition etc. Traffic data in separate computer system.
Bosnia and Herzegovina	Reference system exists from former FR Yugoslavia. Inventory is paper-based from 1991.	Condition data last updated in 1991 on paper.	Traffic data last updated in 1991 on paper.	Accident data is at the police in 10 cantons of Federation of Bosnia and Herzegovina.	Some unit costs are calculated for planning	Visual inspection of bridges from 1999 in paper form.	Generally information is paper-based.
Croatia	Reference system updated in 2003. Inventory data updated in 2003 in rolling updating.	Condition data updated in 2003 in rolling updating.	Traffic data is covered by traffic data in almost entire country (updated).	Police collect accident data, but no formal cooperation between police and road administration.	Pricelist for costs is updated regularly for annual planning.	Structures are part of the information system established, and is updated on inventory and condition.	They are fully computerised with new equipment and network which functions well and is being continuously developed.
FYRO Macedonia	Reference system is based on former Yugoslavian system, and is from 1995 and not updated. Road inventory exists mainly in paper and is not updated.	They have condition data from 2001 in PMS system.	Main network covered but too few counters to include regional roads. Have traffic database.	Police collect accident data, but no formal cooperation between police and road administration.	Prepare a pricelist for costs used in PMS and for annual planning.	Inventory on bridge exist as mixed paper-based and computerised. Have developed software for bridge, but data are 3 years old.	Have a PMS system and traffic database but not a real inventory database. There are plans to digitalise and update the whole network with GIS but stopped due to lack of financing.

	Inventory	Condition	Traffic	Accidents	Unit costs	Structures	Computerisation
Serbia and Montenegro							
Serbia	Referenced according to system from former FR Yugoslavia. Road inventory is fairly updated based on video recording - last round finalised in 2002.	Road condition is fairly updated based on video recording - last round finalised in 2002.	Main network covered but less on regional roads. Have computerised traffic database.	Police collect accident data, but no formal cooperation between police and road administration.	Pricelist for costs are updated regularly for annual planning. Also have some VOC cost for HDM4 model.	Bridge inventory exist but is 10 years old. New bridge management system but has mainly transferred old data.	Different and separate databases for road, traffic and bridge. No immediate plan to introduce an umbrella to coordinate all databases.
Montenegro	Referenced according to system from former FR Yugoslavia. Have paper-based inventory from 1990.	Road condition assessed as part of COWI/-BCEOM study from 2002.	Traffic data was last updated in 2002. Traffic data is computerised.	Police collect accident data, but no formal cooperation between police and road administration.	Prepare a pricelist for costs.	Structure inventory and condition data exists but last updated in 1990. Inventory part of COWI/-BCEOM study from 2002.	Traffic data computerised and maybe road data as part of COWI/BCEOM study from 2002.
Kosovo[6]	Reference and inventory updated. Inventory is continuously updated.	Condition data is continuously updated.	Traffic data is continuously updated for motorised traffic, but the counting programme is only partially done due to lack of equipment.	Traffic police has since 2001 collected accident data and forwarded these to the Ministry of Transport.	Unit costs are continuously updated.	Structure inventory and condition data generally exists and are updated continuously. No BMS system.	Most data are computerised and they have a PMS. The computer system may require upgrading and connections to the regions. Accident and traffic data may not be fully computerised.

[6] Under international administration in line with UNSCR 1244 of 10 June 1999.

4.3.2 Rail management information systems

In principle, Bosnia and Herzegovina, Croatia, FYRO Macedonia and Serbia and Montenegro follow the same principles for data collection and are thus, more or less, collecting the same information. Albania seems to be following similar principles. Generally updated inventories and updated data exist on, condition, traffic and structures on the entire rail network. The information is mainly paper-based though some data are also computerised.

Bosnia and Herzegovina is in the process of tendering for the development of a management information system, including for computers. The financing has been secured through donations from Canada.

For the other REBIS countries it could be relevant to finance software and hardware to computerise their information on the rail network systematically and to provide technical assistance. This would help obtain an overview of maintenance needs and corresponding financing needs which would be helpful in all countries.

Status of Rail Management Information Systems in the countries
In Appendix 9 the status of the data collection and storage, and management information systems are presented for each country and summarised in Table 4.3.

Table 4.3 Summary of status of rail management information systems.

	Inventory	Condition	Traffic	Unit costs	Structures	Computerisation
Albania	Collects inventory data annually for annual report.	Collects condition data annually for annual report.	Collect information on passengers and freight.	Unit costs for infrastructure calculated annually.	Condition of bridges now annually for annual report.	All data in separate files and generally paper-based.
Bosnia and Herzegovina	Inventory data exist in both companies from 2002.	Condition data exist in both companies from 2002.	Traffic data exist in both companies from 2002.	Unit cost data exist for planning and investment.	Traffic data exist in both companies from 2002.	Presently system is not fully computerised, but funding is ensured for new information system.
Croatia	Inventory data are collected according to common regulation.	Condition data are collected according to common regulation.	Traffic data are collected according to common regulation.	Unit cost data exist for planning and investment.	Structure data are collected according to common regulation.	No unique database and information is mainly on paper.
FYRO Macedonia	Inventory data are collected according to common regulation.	Condition data are collected according to common regulation.	Traffic data are collected.	Unit cost for planning and investment.	Structure data are collected according to common regulation.	No unique database and information is mainly on paper.

	Inventory	Condition	Traffic	Unit costs	Structures	Computerisation
Serbia and Montenegro						
Serbia	Inventory data are collected according to common regulation.	Condition data are collected according to common regulation.	Traffic data are collected.	Each sector has specific unit cost.	Structure data are collected according to common regulation.	No unique database and information is mainly on paper.
Montenegro	Inventory data are collected according to common regulation.	Condition data are collected according to common regulation.	Traffic data are collected.	Unit costs for planning purposes.	Structure data are collected according to common regulation.	No unique database and information is mainly on paper.
Kosovo	Inventory last updated in 2002 and is updated regularly.	Condition data is updated continuously.	Traffic data are collected and updated.	Unit cost data exist	-	No specific program to register inventory and condition data. Collected on paper and later on computer in excel and word. Traffic data are only collected in paper.

4.3.3 Port management information systems

The Port of Bar has an almost complete port management information system and is planning to extend it with GIS soon. The system is updated but a need for more equipment has been identified by the port authorities in order to properly run the system.

In the other ports of the REBIS countries, traffic data are often computerised or a mixture of computerised and paper-based records while condition and inventory data generally are paper-based.

For the remaining REBIS countries (apart from Montenegro) it could be relevant to finance software and hardware to computerise their information on the port systematically and to provide technical assistance. This would help obtain an overview of maintenance needs and corresponding financing needs which would be helpful in all countries.

In the Port of Durres, a specific (German) system has been identified as the desired system and negotiations on financing etc is ongoing. In Port of Belgrade it is considered relatively easy to implement a new system and the existing data and system could be used as the backbone for the new system. However, the management needs to make a decision whether to go ahead, thus the Port of Belgrade would like to begin with a project to identify needs.

Status of port management information systems in the countries
In Appendix 9, the status of the data collection and storage, and management information systems are presented for each country and summarised in Table 4.4.

Table 4.4 Summary of status of port management information systems.

	Inventory	Condition	Traffic	Unit costs	Computerisation
Albania	Inventory data updated annually and some parts are computerised.	Condition data updated mainly on paper.	Traffic data collected continuously mostly on paper and some in computer.	Unit costs assessed case by case.	Presently mixed computer and paper-based. Plans to purchase German Port Management Information System.
Croatia	Inventory data updated continuously and mostly paper-based.	Condition data updated continuously and mostly paper-based.	Traffic data collected continuously on paper and some in computer.	Some unit costs exist.	Presently no management information system. Started to use GIS and plans to extend its use.
Serbia and Montenegro					
Serbia	Inventory exists from 2000 from privatisation.	Condition inspected monthly.	Traffic data collected monthly.	Some unit costs exist.	Presently no management information system, but are well working with computers and network. Data are presently collected and could be used as backbone for new system.
Montenegro	Inventory data covers entire port and is computerised.	Condition data covers entire port and is computerised.	Traffic data covers collected continuously and is computerised.	Unit costs exist and are computerised.	Have an information system which they plan to extend with GIS soon.

4.3.4 Airport management information systems

There is generally no airport management information system in any of the airports in the REBIS countries. Visual inspection of runways and other infrastructure is mainly carried out by airport staff, and more complicated assessment, such as bearing capacity etc., is, or will be, done by e.g. the road directorates. The collected data are generally kept in a mix of a paper-based and computer-based system. However, traffic data is generally computerised. Navigation and lighting systems are generally handled separately.

There are plans for new systems in Croatia, Serbia and FYRO Macedonia while there are no specific plans in Bosnia and Herzegovina and in Albania. In Montenegro, the aviation authority is a completely new organisation and at the time of the survey they did not any overview of existing data or on how to handle data in the future.

For all the REBIS countries it could be relevant to finance software and hardware to computerise their information on the airport systematically and to provide technical assistance. In some of the countries, e.g. in Albania, updating of

inventory data are necessary and assistance may be required to get the paper-based data computerised in FYRO Macedonia, Serbia and Montenegro, and Kosovo. This would help to get an overview of maintenance needs and corresponding financing needs which would be relevant in all countries. The assistance needed for Montenegro is uncertain and depends on the information they receive from the former owners of the airports.

Status of airport management information systems in the countries

In Appendix 9, the status of the data collection and storage, and management information systems are presented for each country and summarised in Table 4.5.

Table 4.5 Summary of status of airport management information systems.

	Inventory	Condition	Traffic	Unit costs	Computerisation
Albania	Inventory of entire airport exist from 2000 as part of Airport Master Plan.	Condition data exist and is updated daily and most are paper-based. Navigation and lighting are continuously checked.	Traffic data continuously updated and computerised.	Unit costs exists but was calculated last time 2-3 years ago.	No airport management information system and data are mixed computerised and paper-based in separate systems.
Bosnia and Herzegovina	Inventory data exist and is updated continuously and most are computerised.	Condition data exist and is updated daily and most are computerised. Navigation and lighting are continuously checked.	Traffic data continuously updated and computerised.	Unit costs used for planning and budgeting according to work needed.	No airport management information system but most data is computerised in separate systems.
Croatia	Inventory data exist and is updated continuously and most are computerised.	Condition data exist and is updated daily and most are computerised.	Traffic data continuously updated and computerised.	Unit costs used for planning and budgeting according to work needed.	No airport management information system but most data is computerised in separate systems.
FYRO Macedonia	Inventory data are collected continuously, and is mixed paper and computer based.	Condition data are collected continuously, and is mixed paper and computer based. Navigation and lighting are continuously checked.	Traffic data continuously updated and computerised.	Unit costs used for planning and budgeting according to work needed.	No airport management information system and data are mixed computerised and paper-based in separate systems.
Serbia and Montenegro					
Serbia	Inventory data exists in paper and in computer.	Condition data exist in paper form and inspections are registered daily and major surveys annually. Navigation system has log file for condition.	Traffic data continuously updated and computerised.	No defined unit costs. Calculate costs according to work needed.	No airport management information system and data are mixed computerised and paper-based in separate systems. Started to implement integrated airport operational database.
Montenegro	New organisation started on day of meeting - thus no overview of data and computerisation.	New organisation started on day of meeting - thus no overview of data and computerisation.	New organisation started thus no overview of data and computerisation. Data exist in former Federal Bureau of Statistics	New organisation started on day of meeting - thus no overview of data and computerisation.	New organisation started on day of meeting - thus no overview of data and computerisation.
Kosovo	Updated inventory of entire airport exist on paper as part of Airport Master Plan.	Condition data exist and is updated daily and is paper based.	Traffic data continuously updated and computerised.	No unit costs.	No airport management information system and data are mixed computerised and paper-based in separate systems.

4.3.5 Inland waterway management information systems

Both Croatia and Serbia have computerised their data on inland waterways to some extent. Croatia has specific plans to extend their present system to a management information system by 2004, and in Serbia there are ideas to extend the system but not yet any specific plans.

For Serbia it could be relevant to finance software and hardware to computerise more of the information on the inland waterways systematically, and e.g. assist to update the inventory and traffic data and, together with condition data and unit costs, to develop a management information system. This would help obtain an overview of maintenance needs and corresponding financing needs.

Status of inland waterway management information systems in the countries

In Appendix 9, the status of the data collection and storage, and management information systems are presented for each country and summarised in Table 4.6.

Table 4.6 Summary on inland waterway management information systems.

	Inventory	Condition	Traffic	Unit costs	Computerisation
Croatia	Inventory data exists and are updated.	Condition data exists and are continuously updated.	Traffic data are up-to-date and computerised.	Unit cost data exist for annual planning	Mix of computer and paper-based.
Serbia and Montenegro					
Serbia	Inventory kept in books and 10 years old.	Condition data is generally collected regularly and information such as the cross-sections is computerised.	No traffic data are collected but are received from the ports through statistical bureau.	Assessment of costs not part of system but based on actual needs.	Mix of computer and paper-based.

4.4 Capacity building

Although the transport sector, in all five countries, has undergone substantial reform in recent years, there is still a need for institutional development and capacity building, both in the public and private sectors. Several projects are addressing this issue.

4.4.1 Issues for Core Network development

The REBIS project was undertaken in close liaison with national authorities, which has given the project team an understanding of the capacities of the institutions involved. Although the study does not address the institutional aspects

of the transport sector in general, we have noted the following, relevant for the development of the Core Network:

- Support by PMU's and PIU's. Although some of the countries have several years of experience in implementation of projects under international financing, the implementation of the proposed packages of projects within a relatively short time frame will clearly require the support from Project management Units or Project Implementation Units, and in some cases the support by international experts. Experience from Central and Eastern Europe shows that such assistance will be required for quite a long time.

- Support in economic analysis and planning. The Ministries of Transport and the responsible transport authorities generally lack the capacity to perform economic assessment of projects and to prepare investment planning. There is the need to build capacity in this area, and - in the short term - to provide technical assistance.

- Road Maintenance Systems. REBIS included a survey of Management Information Systems, as described above. This survey revealed a lack of capacity in the field of road maintenance planning. Generally, insufficient data is collected regarding present conditions of pavements and structures, and there is insufficient analytical capacity to optimise the use of resources in this field.

- The project cycle. One of the bottlenecks for improving the transport infrastructure is the lack of experience in preparation of projects for international financing and tendering. Taking into consideration that the Balkan countries in the coming years will receive substantial amounts from EC via the Cards programme there is also a great need for capacity building related to EC procurement procedures. As part of the REBIS study, five seminars have been held in order to present an overview of the project cycle and to introduce EC procurement procedures. The aim of the seminars was to present the topics to the participants so that they, at a later stage, will be able to go into more detail in one or more of the items. This component is further described below.

4.4.2 The training component

To alleviate a small part of the training needs, two-days training seminars were arranged in Zagreb, Belgrade, Tirana, Sarajevo and Skopje during May and June 2003. The programme for the seminar included the following main modules:

- Introduction
- Project cycle
- Feasibility study
- EC and IFI procurement rules
- Procurement of services
- Procurement of works
- Tender evaluations

The first day gave a general, common introduction to the Project Cycle, and on the second day it was possible to follow either Economic and Financial Analyses or Implementation of Works Contracts. In order to illustrate the theoretical part in practice, a number of workshops were included where the participants were given the possibility to work in smaller groups. A detailed programme is shown in Appendix 10.

The seminars were held in English but the slides used were handed out in a double language version so that the English version was shown side by side with a translation to the local language. The lecturers were a transport economist and a civil engineer.

The typical number of participants was between 20 and 25 and they represented public servants from ministries, railway, road, port or airport administrations and municipalities as well as private design companies. In Belgrade, six participants from Montenegro attended the seminar and in Skopje representatives from Kosovo participated.

The seminars were held in hotels with facilities for such seminars and with the possibility of splitting the presentation into two streams on day two.

A questionnaire was filled in by the participants in order to check the quality of the presentations, the material handed out and its relevance for the participants. On the whole the seminars received very positive response and although it was only possible to give the participants an overview of the items, the typical reaction was that the seminars were successful. A summary is presented in Appendix 10.

However, there is no doubt that there is a huge need for additional seminars covering the project cycle items and it is proposed that more seminars be arranged, targeting the individual items in more details, e.g. by using two or three days seminars covering feasibility studies or EC procurement rules. This will enable the training to be more tailor-made to the needs of the participants and also to go into greater detail within each item.

5 Financing of roads

5.1 Introduction

The financing of roads takes many different forms in the European countries. In Northern Europe, the UK and Scandinavia roads have traditionally been financed almost entirely from public budgets, which again have been generated partly from taxation of road users in the form of registration fees, petrol taxes etc. In Southeastern Europe motorway systems have, to a large extent, been developed over the last decades based on direct user charges, such as road tolls.

The tendency now seems to be that, in most European countries, direct user charges will play a more important role in road financing due to tight public budgets combined with an increased demand for road capacity.

For the REBIS countries it is important to develop sustainable financing strategies within the road sector for both investments and operating and maintenance costs. Further, financing strategies should be developed as an integrated part of the overall transport policy, which also considers modal policies, environmental concerns and trends in the general EU transport policy.

At present, the financing of road developments in the REBIS countries generally comes from the following sources:

- general public budgets : e.g. from indirect user charges within the road sector (i.e. registration fees, annual ownership fees), or from general taxation
- earmarked public funds for road development (i.e. fuel taxes dedicated to road funds)
- direct user payments (road tolls)
- IFIs and EU in the form of loans and/or grants
- private operators of infrastructure (e.g. in the form of BOT arrangements)

The pace of the development and the implementation of financing strategies will naturally depend on the political will to prioritise the road sector, the economic growth and the willingness of road users to pay for improved services.

In this chapter the existing level and structure of road user charges in the various countries is reviewed and the level of road user charges is compared to road user costs. Furthermore, the status of and experience with BOT projects in the countries is summarised and the perspectives and recommendations for BOT arrangements in the coming years are presented.

The analyses identify two major issues, which apply to all REBIS countries. Firstly, there is a need to increase road expenditures in order to ensure an acceptable quality of the existing network in the long run; one option is to increase road user charges. Secondly, the construction and operation of concession toll roads on strict commercial terms without any public support is not feasible in the short to medium term. Other forms of public-private partnerships will be required, if the private sector is to be involved in financing the road development.

The detailed analyses of road user charges are documented in Appendix 11: Road User Charges and in Appendix 12: BOT.

5.2 Road user charges

5.2.1 Introduction

During the first phase of the study, the present types and levels of road user charges (RUC) in the five countries have been analysed and compared with a view to assessing any needs for harmonisation. In some cases, the information collected also allowed analysis of the contribution from road user charges to the financing of the cost of roads. Where possible, such analyses have been included in the study.

Only the taxes and fees exceeding the regular level of taxes have been considered as specific road user charges. In all five countries, the excise taxes on petroleum products and the yearly registration fees constitute the core of the road user charges. As a result, the study focused on these. In addition, some countries collect road tolls, and Albania has established an axle tax. Revenues from other taxes such as tax on foreign vehicles, environmental taxes, vehicle inspection fees etc. are, generally, of less importance.

5.2.2 Levels of taxes and fees

Petroleum taxes

The excise taxes on petroleum products can be summarised as follows:

Table 5.1 Petroleum taxes in 2002.

EUR/litre						
	Albania	Bosnia and Herzegovina		Croatia	FYRO Macedonia	Serbia and Montenegro
		Federation of Bosnia and Herzegovina	Republika Srpska			
Petrol	0.11	0.20	0.15	0.16	0.17	0.19
Diesel	0.09	0.125	0.095	0.16	0.12	0.135

Source: National Authorities

For comparison - the current minimum fuel taxes in the EU (Directive 92/12/EEC) are EUR 0.287/litre for un-leaded petrol and EUR 0.245/litre for diesel. Rates in application are higher, the weighted average rate being EUR 0.581 for petrol (Eurosuper) and EUR 0.411 for diesel.

In all countries of the area, the excise taxes on petroleum products are collected directly by the governments and are included as revenues in the budget. In Albania, the excise taxes on petroleum products are collected directly by the state and, apparently, not systematically reallocated to the road administration. In Croatia, a fixed share is automatically allocated to the Croatian Motorway and the National Road Administration. In FYRO Macedonia, the share of the petroleum taxes allocated to the Fund for National and Regional Roads (FNRR) is reviewed each year depending on government priorities.

In Bosnia and Herzegovina, the taxes vary between the Federation of Bosnia and Herzegovina and the Republika Srpska. In the Republika Srpska, half of the proceeds of these taxes are automatically allocated to the road network. The Federation of Bosnia and Herzegovina also charges road fees, which are automatically allocated to the road administration.

Registration fees

The yearly registration fees vary according to the type, the size, the power and/or the capacity of the vehicle in question. Albania also charges an axle load fee.

The table below presents examples of charges (EUR per year) for different categories of vehicles:

Table 5.2 Examples of charges (2002).

	Albania	Croatia	Bosnia and Herzegovina[7]		FYRO Macedonia	Serbia and Montenegro*)
			Federation of Bosnia and Herzegovina	Republika Srpska		
Cars	18	16-110	12 to 125	72 to 160	17 to 93	2 to 54
Bus (40/seats)	44 + 285	600	420	240	140	33
10-tonne truck	45 + 395	265	175	260	280	57
20-tonne payload truck	60 + 835	530	415	520	740	75
20-tonne payload trailer	75 + 835	345	490	465	400	80 to 208

Source: National Authorities.
*) Different charges apply for the two republics.

For comparison - in the EU the annual ownership fee for a medium sized (petrol) car varies between approximately EUR 60 - 500; the fee being lowest in Portugal and highest in the Netherlands.

Albania has the highest taxation level for trucks and trailers. The tax structure for these vehicles does not seem to be related to the actual road costs generated by the road users since it favours trucks with fewer axles, which are often more damaging to the pavement.

As it appears, the taxation level for buses and trucks in Serbia and Montenegro is very low compared to that of the other countries.

In all countries, registration fees are collected directly by the road administration at national or regional levels.

In Serbia and Montenegro, 44% of the registration fees collected is transferred to the budgets of the local road authorities and 56% to the Road Directorate.

Road tolls
In Croatia, FYRO Macedonia and Serbia and Montenegro, road tolls are charged on Corridor X, in particular, but also on other corridors.

In Croatia, road tolls are charged on 7 sections, whereof 2 are operated on a BOT basis. The charges vary between EUR 0.03 and 0.05 per km.

In FYRO Macedonia, two sections (Corridors X and VIII) are toll roads, and charges amount to EUR 0.02-0.03 per km.

[7] "Road User Charges in Bosnia Herzegovina", NEI 2000

In Serbia and Montenegro, road tolls are applied on Corridors X and Xb. The charges for domestic vehicles are low - typically EUR 0.004 to 0.01 per km (year 2002)whereas charges for foreign vehicles are substantially higher. The toll levied on the motorway network in Serbia and Montenegro is, presently, the main source of financing of the maintenance and development of the road system.

In the EU the level of road tolls is typically 2-3 times the levels presently applied in Croatia and FYRO Macedonia.

Other taxes and fees
Various other taxes and fees are paid by the road users such as vehicle inspection fees, environmental taxes etc. These taxes are usually collected directly by the road administration, but the revenue is quite low. The most important revenues originate from the taxes paid by foreign vehicles.

Average taxes per year
Based on a number of fundamental assumptions as to the average number of km run and average fuel consumption, the average yearly tax levels (excluding road tolls) have been estimated as follows:

Table 5.3 Average tax per year in EUR in 2002.

	Albania	Croatia	Bosnia and Herzegovina[8]		FYRO Macedonia	Serbia and Montenegro
			Federation of Bosnia and Herzegovina	Republika Srpska		
Car (1300/1500 cc)	120	210	305	235	205	200
Bus	1,155	1,800	2,310	1,690	1,075	1,045
10-tonne trucks	1,520	2,185	1,250	1,030	1,765	1,677
20-tonne payload truck	2,350	3,090	2,230	2,230	2,600	2,295

Source: National Authorities.

The table shows considerable differences among the countries. There is, however, less difference in the case of heavy trucks (20 tonnes and above), which are probably used most frequently for international traffic.

5.2.3 Road user charges versus road costs

Available information for Albania, FYRO Macedonia, Bosnia and Herzegovina and Serbia and Montenegro shows that, to a great extent, the road user charges cover the present cost of routine and periodic maintenance of the networks. However, available information for the Republika Srpska indicates that the road user charges are not sufficient to cover the present periodic and routine maintenance costs.

[8] "Road User Charges in Bosnia Herzegovina", NEI 2000

The countries' present level of expenditure for routine maintenance, resurfacing and overlay is, however, unlikely to be sufficient to maintain an acceptable quality of the networks in the long run. Although such analysis is not part of the TOR of the present study, available information indicates that the funds spent on the road networks for periodic and routine maintenance average EUR 2,500 per km in Albania and approx. EUR 3,500 per km in FYRO Macedonia. According to the experience of consultants on previous projects in the region, appropriate routine and recurrent maintenance would call for about twice these amounts. In the analysis of the road user charges in Bosnia and Herzegovina, the consultant (NEI) estimated that, on a road averaging 1,500 ADT, a reasonable level of expenditure for routine maintenance, resurfacing and overlay would be around EUR 6,250 per km.

The situation is particularly critical in Serbia and Montenegro where the budget allocated to routine and periodic maintenance (EUR 13.4 million in 2001) only covers about 10% of the needs.

5.2.4 Allocation of funds

None of the countries have independent, fully autonomous road funds where all revenues from the road users are automatically deposited and which have authority to decide on the road programme on a yearly basis. Considering the considerable volume of the revenues represented by the excise taxes on petroleum products and the fact that these taxes are not paid directly to the road funds, it is clear that the road administrations are still dependant on the decisions of their governments when it comes to the volume and priority of the road programmes.

5.2.5 Recommendations

There are substantial differences in the taxation levels in the five countries. Particularly, the taxation on heavy vehicles in the Republika Srpska is low compared to the other countries, and there may be scope for harmonisation in order not to distort competition, especially if the level of road user charges is increased.

The analyses indicate that there is a severe need to ensure that long-term funding requirements for the roads sector are met. Considering the importance of a satisfactory road network to ensure economic growth, the countries should make sure that good and efficient road maintenance policies and strategies are adhered to and implemented, and that sufficient budgets are made available for, at least, routine and periodic maintenance of the networks. The funding mechanisms and the channelling of the funds to the road authorities should be efficient and sustainable; one option is to establish autonomous road funds managed by independent boards.

5.3 Perspectives for BOT road projects

5.3.1 Introduction

Past experience, in both Eastern and Western Europe, has clearly demonstrated that the introduction of toll roads, based on a Build Operate Transfer (BOT) principle, is very complicated, for both private investors and public authorities, and that BOT projects need careful appraisal and preparation before they are implemented.

5.3.2 Status and experiences in REBIS countries

Some toll roads presently exist in the REBIS countries. There are 2 toll roads in FYRO Macedonia and 4 in Serbia and Montenegro, but none are operated on a BOT basis.

In Croatia, there are 7 toll roads, of which 2 are BOT operated. There are no toll roads in Albania and Bosnia and Herzegovina.

The (pricing) level for car tolls is highest in Croatia (ranging from EUR 0.03 to 0.05 per km) and lowest in Serbia and Montenegro (ranging from EUR 0.004 to 0.01 per km for domestic cars in year 2002) with the exception of tolls for foreign vehicles which, in Serbia and Montenegro, are approximately 5 times the toll levied on domestic vehicles. In the medium term perspective, and with international financing, it must be considered unrealistic to maintain a nationality dependent toll system. This should be taken into consideration when formulating future financing strategies for road development, including BOT projects.

5.3.3 Aims of tolling and BOT

Governments are tempted to finance road investments from funds obtained from outside sources and not from state budgets due to the severe restrictions on public finances.

When considering BOT projects, it is strongly recommended that such projects be assessed in a broader national (or regional) transport infrastructure financing context. This includes issues such as:

- should taxes and tolls influence transport behaviour and support specific transport policy aims or should they be considered purely as a means of financing?
- what should the role of the private sector be with respect to road development (finance, construction, operation)?
- should new infrastructure projects be fully or partly financed by the users?
- what should the role of different user financing sources be (e.g. vehicle taxes, fuel taxes, road user charges)?

- what portion of the costs should road tolls cover (investments, operation and maintenance)?

Experience in Europe suggests that the financing costs on BOT projects are usually considerably higher than on projects where the state, or a state owned company is the borrower. However, this may not necessarily apply in countries with a relatively weak economy such as the REBIS countries. On the other hand BOT projects may lead to better cost control in both the construction and operational phases.

Tolling of roads naturally decrease the diversion of traffic from non-toll roads, thereby, reducing the general economic benefit to society, as the existing network is then used in a less than optimal way from an economic point of view. This loss in economic efficiency should be assessed and compared to the gains society may obtain through financing from non-state budget sources.

5.3.4 Affordability to pay on BOT roads - an example

The assessment of affordability can be based on a comparison of the tolls required to finance a road and the general willingness to pay for shorter travel time and better quality roads in the REBIS countries.

A simplified toll road financial model has been developed to assess the affordability in the REBIS countries. For the purpose of the analysis, a number of realistic financial and cost parameter assumptions have been made, including a required rate of return on equity (ROE) of 22% to the BOT investor.

In October 2002, the proposed car toll (120 kuna or EUR 16) for Zagreb to Split (once the Split motorway is completed) received much opposition, even though on a per kilometre basis (EUR 0.04) it is comparable to the rate currently charged. In Hungary, affordability and the users' willingness to pay were greatly over-estimated in the analyses, which formed the basis for the decision to commence the BOT projects. This shows that there are clearly limits as to what toll levels are acceptable.

The average "willingness to pay" for time saved in the other REBIS countries would be much lower, as the value of time (work and leisure), in these countries, is likely to be lower than that in Croatia.

The general conclusion from the model is that a concession toll road operated on a strictly commercial (i.e. BOT) basis, without any support from the government in Albania, Bosnia and Herzegovina, Serbia and Montenegro and FYRO Macedonia is not realistic in the short to medium term as the present general income level for car owners is too low. The implicit tolls, which have been arrived at through the model, particularly for cars and the domestic market, are too high when compared to affordability, i.e. the user's actual ability to pay. Even for Croatia, significant road development, based on BOT without subsidies, would be difficult in the short and medium term. In the REBIS coun-

tries a BOT toll road project would, thus, need a financial inducement to make it financially attractive to the BOT sponsor.

5.3.5 The Governments' role and BOT implementation

Experience suggests that many emerging countries tend to rush into a BOT project without thorough preliminary investigations. Consequently, the government (or more precisely, its implementation agency) finds itself at a disadvantage, especially at the negotiation stage. The results could be costly. For example, the contract made with the private sector might be less favourable to the government than it ought to be. Sound preparation on the government's part, on the other hand, could lead to lower transaction costs for the project sponsor and the government itself.

Guidelines on BOT implementation will be developed for the government, focussing on the relationship between the government and the BOT sponsor. The main issues are discussed in the following pages, and a more detailed guide can be found in Appendix 12 on perspectives for BOT projects.

The guidelines discuss the following topics:

- BOT approval and appraisal process. The need for sound preparation can not be emphasized enough. For the government, this applies at project level as well as at the strategic level. A BOT toll road project should only be implemented, if the economic situation justifies it. A transparent and independent cost-benefit analysis not only helps the government to form a viewpoint/decision on the social desirability of a BOT toll road project in relation to other transport projects, it also enables the government to assess the nature and level of financial support that it might be prepared to offer to the concessionaire on a particular project that it deems socially desirable.

- BOT procurement. There should be transparency throughout the whole procedure for 3 important reasons. The first is to avoid accusations from the public of a government selling out to foreign investors. Secondly, there have been instances where donor institutions have refused to fund potential BOT projects on the grounds that the concession has been awarded in an ‘irregular’ manner. Thirdly and lastly, transparency would demonstrate to the private companies that their bids would be assessed in a fair manner.

- Risk allocation. Emerging "best practices" indicate that risk allocation should adhere to two basic principles. Firstly, risk should be allocated to the party best able to manage it. Secondly, it should be allocated to the party or parties best able to bear it.

- Deal structuring. Government financial support is very likely a negotiation issue, and this is not necessarily limited to a minimum revenue or traffic guarantee, but could include other incentives, as well. However, if any financial incentive is granted to the prospective concessionaire, it should be

cost estimated and assessed. On the other hand, profit sharing can also be negotiated.

- Regulatory framework. On most BOT toll roads, the regulatory authority is also usually the implementing agency. This is due to the nature of the concession contract, which is designed to cover all specifications regarding construction and operations, as well as other matters.

- Legal framework. The government should establish the legal framework necessary for BOT implementation. Is a general law on concessions preferable, as it would cover other forms of private sector participation? Would a BOT law suffice? If so, should the BOT law apply specifically to the road sector?

- Project financing. Project financing is the sole responsibility of the BOT sponsor. However, there are certain actions which, when taken by the government, would make it easier to raise funds e.g. permission to obtain financing on the domestic capital markets. Others could include allowing the BOT company to issue corporate bonds, and shares at reduced rates enabling venture capitalists to earn higher rates of return proportionately to the risks involved.

5.3.6 General issues for assessing BOT applicability

Besides affordability and fulfilling the government role, as described in the two previous sections, a number of general issues influence the applicability of BOT financing for roads, such as:

- Stable government and good governance. All REBIS countries are progressing within these fields, however the democracies are very new and it will take time to build investor confidence. Lehman Brothers and Eurasia Group, recently, rated Hungary and Poland, both EU Accession countries, as two of the world's most politically and financially stable emerging economies (The Economist, November 9, 2002).

- A history of honouring payment commitments. From an investment point of view, the countries - as they are new - do not have a history of honouring payments. The FR Yugoslavia had a history of not honouring payments on international loans, however, agreements have been reached with all major funding organisations.

- Absence of political violence targeting foreign-owned investments. This is not a problem in the REBIS countries.

- A freely convertible currency and reasonable macro-economic policy. The countries are progressing with regards to these matters; however, the economies in the region are still relatively weak.

- Rule of law prevails and there is a high degree of transparency. As the EBRD states in the 25/11-02 Presentation of transition, there are definite signs that these countries are progressing within these areas. However, the perception of the international business community, as represented by Transparency International, is that corruption is widespread and that transparency with regard to awarding public contracts is still well below the normal standards of the countries of the European Union.

- A clearly defined regulatory framework. So far, only Croatia has experience with establishing a regulatory framework for BOT toll roads.

These general issues clearly indicate that there are still many problems - besides the willingness to pay by users - which need to be solved before BOT projects can be successfully implemented in the road sector in the REBIS countries, with Croatia as an exception. Furthermore, experience from other CEE countries, i.e. Hungary and Poland, in which attempts to introduce BOT roads have not been very successful, should be taken into account before BOT roads are introduced in the REBIS countries.

6 Challenges in the railway sector

6.1 Introduction

The railway sector has previously played an important role in the countries, but freight and passenger railway transport have been significantly affected by the dissolution of FR Yugoslavia, the regional conflict, reduced activities within the mining and heavy industry sector - all leading to a general decrease in railway activities in the region.

This chapter analyses the present market for railway services and performs an evaluation of the present financial situation of the railway companies. The physical condition of the railway network has been assessed separately and is described in Chapter 2.4.

The present financial situation of the railway companies and the traffic volume (freight and passengers) have been assessed based on official available data and statistics collected from the railway companies and, in some cases, from the ministries of transport through visits, interviews and data collection. Prior to the visits an extensive questionnaire translated into each of the languages has been sent to the railway administrations.

The impression of the services of the railway sector has been assessed through interviews with the railway freight clients in each country. The interviews have been based on questionnaires distributed prior to the interviews.

The chapter is divided into the following three sections: the present market situation, the financial situation of the railways and conclusions.

The first section begins with a brief presentation of the current passenger and freight supply system followed by a description of the demand for passenger and freight transport following the same structure; past traffic trends, current traffic flows and recent trends, traffic distribution by market segment and traffic perspectives for the railway transport.

The second section, describing the financial situation, is structured around the following three subsections; general overview of the financial situation, revenues and expenses, and balance sheet and investment loans.

The last section presents the main findings and conclusions for the improvement of the situation.

6.2 The present market situation

The dissolution of FR Yugoslavia and the regional conflict, which burst out in the 90's, has dramatically affected both the supply and demand aspects of the railway transport sector.

6.2.1 General overview of the supply system

The railway network in the region consists of some 9,296 km of lines, of which only 612 km have double track and 3,160 km (34%) are electrified.

In general, the network density is very similar to that of West European standards, but there are significant differences between the respective countries. The density is very low for Albania, Bosnia and Herzegovina and FYRO Macedonia, whereas it is high in Serbia (3,811 km) and in Croatia (2,775 km).

The are several operating companies. The dissolution of FR Yugoslavia has brought about the creation of separated railway companies. In Serbia and Montenegro and Bosnia and Herzegovina, two companies have been established. This puts more pressure on the operation of the railways as it makes it more difficult to establish a well working railway system at the national level. In the absence of large volumes on the small scale (local), it is important to allow the organisation of unified and well coordinated railway services at the national level. If the various existing domestic companies merge into one national company, efficient operating strategies on long distance market segments (where railways have a competitive advantage compared to its main competitor - road transport) can be more easily implemented.

Reforms according to the EU Directive 2001/12/CE on the separation of infrastructure and operations have been only partially implemented (Croatia and FYRO Macedonia), so much work is still to be done in order to ensure the establishment of an efficient institutional framework.

The railway network follows the same pattern. Railway links in the region do not form a well integrated network, on the contrary, the railway system is, to a large extent, a patchwork of networks, characterised by missing links such as, for instance, the link between Albania and FYRO Macedonia.

Investments in maintenance of the networks have been heavily neglected resulting in a deteriorating infrastructure, obsolete rolling stock and lack of renewal of signalling and telecommunication systems.

The fleet of wagons is oversized and only part of it is in operation (25% in Serbia and Montenegro). Rolling stock availability ratios are about 65% for traction units and 60-65% for wagons. As a result, the average commercial speed is very low (only 25 km/h in Albania).

The overall staff in the regional railways adds up to 67,300 employees. As a result of staff downsizing during recent years, the proportion of employees per track-kilometre is now 7.4, which is below the average of the entire European networks (8.7) and close to that of France (6.0) and Germany (5.5). However, the proportion of employees per unit of activity (tons – kilometres) is still much higher compared to Western Europe.

The following diagramme compares the different railways with respect to the length of the network.

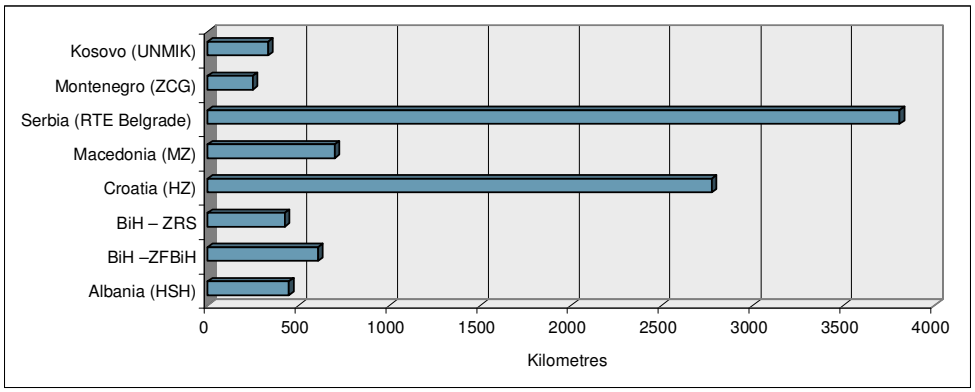


Figure 6.1 Railways' network length in 2002.

The diagramme shows that most of the existing network is concentrated in Serbia and Croatia.

6.2.2 Market demand for freight transport by rail

Past traffic trends
The combined effect of different factors characterising the ongoing restructuring process of the countries' economies has had a strong impact on the demand for railway transport. Among these factors the ones mentioned below are considered to be most important:

- the decline in the economic production itself, particularly, within the heavy industry and mining sectors, where railway transport used to have a strong foothold

- the reorientation of the economy to be more service orientated and the change in the demand for transport towards high value goods, requiring a faster and more flexible transport is changing the modal split to the detriment of railway transport

- the reduction of trade between the countries in the region resulting in a decrease in the demand for railway transport at regional scale

During the period 1985 – 1995, the railways lost more than 50% of its traffic while road transport developed slowly but steadily reinforcing its predominant role in the general transport system. Whereas the railways carried 78% of the freight traffic in 1970 and the road 15%, the proportions were 51% and 38% in 1995.

From 1990 to 2001, railway traffic has continued its decline; it dropped more than 95% in Albania and Bosnia and Herzegovina. While in 1990 the railway freight transport in Bosnia and Herzegovina accounted for 34.2% of the total freight transport, it only accounted for 3.7% in 2000. In Montenegro and Serbia traffic volumes have also decreased dramatically by 86% and 70%, respectively. In 1994 the railway traffic volume in FYRO Macedonia was only 1.5 million tons, which is only 23% of the total traffic registered in 1990 (6,5 million tons). In Albania, the railway hauls only 1% of the tonnages as 98% of the freight traffic is operated by road

Recent trends and current traffic flows
In the last two years, the decline seems to have stopped or, at least, diminished in most of the countries. However, present traffic volumes are still much lower than those registered in the past.

During the period 2001 - 2002, the traffic growth, in tons, was as follows:

- Kosovo: +90% (low volume: 180,000 tons in 2001);
- Croatia: +17%
- Serbia: +3.7% (in net tonnes-kilometres)
- Albania: -26.7% (in net tonnes-kilometres)
- FYRO Macedonia: -12.5%
- Montenegro: +31.4% (in tons)

The traffic figures by Railway Company are as follows.

Table 6.1 Railways' traffic by country for the year 2001.

	Tonne -km (Million)	Tonnes (Million)	Average distance (km)
Albania (HSH)	19	0.26	73
Bosnia and Herzegovina –ZFBiH	162.9	3.4	48
Bosnia and Herzegovina – ZRS	118	0.9	131
Croatia (HZ)	2,249	11.96	203
FYRO Macedonia (MZ)	461.5	2.8	165
Serbia (RTE Belgrade)	1,990	8.72	228
Montenegro (ZCG)	61.5	0.9	68
Kosovo (UNMIK)	13.1	0.18	73
Total	5,075	29.12	174

As shown in the above table, traffic volumes in tonnes-kilometres are mainly due to Croatia (44.3%) and Serbia (39.2%). The traffic registered in the other countries is much lower - the contribution of FYRO Macedonia, Bosnia and Herzegovina and Montenegro is 9.1%, 5.5% and 1.2%, respectively. The volumes recorded in Albania and Kosovo are almost insignificant.

The table also shows the average short transport distances involved in railway transport, confirming the short distance orientation of the railways. The average rail transport distance for all the countries is 174 km which is about 65% of the average distance observed in western European countries (267 km).

Traffic distribution by market segment
An analysis of the traffic figures according to the market segment (national or international) shows that, in the absence of significant traffic volumes on the domestic market, the international transport represents the larger share. For instance, in a small country such as FYRO Macedonia, almost all of the railway traffic (97.6%) is international. In the two bigger countries, Croatia and Serbia and Montenegro, the share of the international market segment is 73% and 45%, respectively.

As for the main commodities hauled, the railways in the region have a strong foothold with respect to the transport of low value bulk products (coal, oil, chemicals, wood, stone), which are the main products exported, chiefly to Western and Northern Europe. The percentages and figures shown below show how dependent the regional railways are on these products:

- clinker, coal, fuel, chrome in Albania (75% of total tonnes)
- metal and wood products, coal, iron in Bosnia and Herzegovina
- metal and wood products, oil, fertilizers in Croatia (45% of ntkm)
- oil and oil products, coal and coke, fertilizers in Kosovo
- metal products, oil, coal, ores in FYRO Macedonia
- coal and metal products, construction materials, ores, fuel in Serbia (65% of total tonnes)
- bauxite, steel scraps, oil, soda, coal in Montenegro (73% of ntkm)

The predominant railway transport technique is transport by full train loads, carrying about 600 tons net. More than 90% of the traffic registered in Croatia and Serbia, both countries representing 83.5% of the total traffic of the region, is shipped by full train loads. For Montenegro, the figure is 70%.

As described in Chapter 7 most of the Balkan countries do not apply other techniques such as combined transport. Container traffic is exceptionally low and insufficiently organised. Container traffic activities on trunk routes do not allow the establishment of railway routes of sufficient frequency and regularity. On the other hand, the demand for container transport is mainly related to import of goods, leading to a very unbalanced transport flow, which poses the problem of transport of empty containers.

The tariff applied to the services (based on distance and tonnage) must have the specific state's prior approval. This reflects the lack of autonomy in most of the

region's railways, which may affect the railways' ability to prepare appropriate marketing strategies and may also decrease their competitiveness and financial situation.

Freight traffic perspectives

It is a difficult task to predict the future position of the railways in the transport market as there are several unknown factors which are dependent on the uncertain global context.

However, it is clear that, to a great extent, the future of the railways depends on the economic revival of the heavy industries, where the regional railways have traditionally had a strong foothold. The demand for transport of bulk goods also depends on the restructuring of the mining and industrial sector, in which the activities have been strongly reduced during the last decade. All in all, the transport market requirements for such products (bulk cargo, fuel, semi processed and industrial products) are likely to remain stable over the next years as the region is still in a transition process

On the other hand, as the importance of the service sector is increasing, representing already more than half of the GDP in some of the countries, it is likely that the relative role of the railways in the transport market will never regain its former status. On the contrary, experience in other Central and Eastern European countries as well as in the member states of the EU shows that the role of the road transport will increase.

In spite of this rather unfavourable context for railway transport, traffic forecasts have been prepared by the railways in the Region. They seem quite optimistic and some comments are required:

- the railway freight traffic in Montenegro is expected to increase by +190% from 2001 and 2005 and by +500% in 2010 (in tonnes – kilometres). These prospects are based on the development of the production of aluminium and bauxite

- in Kosovo, the freight traffic is expected to grow +150% in tonnes-kilometres during the period 2001 - 2005)

- in Bosnia and Herzegovina, the freight traffic is expected to grow by +57% between 2001 and 2005 (in tkm)

- in Serbia, a 42% growth (2001-2006, in tonnes) is foreseen partly due to the development of the traffic through the port of Bar and to the increase in the international traffic

- in FYRO Macedonia, a +24% increase (2001-2004) is expected

- in Croatia, railway traffic it is expected to rise +11% in 2004 (in tkm) and +30% in 2007 as a result of the growth of transit traffic and the increase in the transport of hazardous material and containers

6.2.3 The market demand for passenger transport by railway

Past traffic trends

As for the freight market, the railway passenger traffic has been declining rapidly during the last decade. It plummeted 90% from 1990 to 2001 in Bosnia and Herzegovina (million passenger), 69% in Serbia and Montenegro and 62% in FYRO Macedonia.

The decline reflects different factors:

- the general increase in income in the population, which has led to an increase in the use and ownership of private cars
- the increasing competition from bus transport on short distances and from air transport on long distances
- the predominant demand for relatively short distance transport in most of the countries, which enhances the competition from the increasing use of passenger cars
- the improvement of the road network, including the construction of new motorways (especially in Croatia)
- the deterioration of the rail services, the low passenger transport speed (40 km/h in Albania and 60 km/h in Montenegro), little comfort (due to the bad condition of the track and the coaches) combined with relatively high tariffs

Therefore, the railways only play an insignificant role in the passenger market segment as it accounts for only 1% of the market in Albania; 5% in Serbia Montenegro and 0.6% in Bosnia and Herzegovina

Current traffic flows and recent trends

Recent trends show that the railway passenger traffic has stopped its decline in some countries whereas it continues to drop in others:

- it has started to increase in Albania (+48% from 1997 to 2001 in number of passengers), Croatia (+6%, 2001/2000), Bosnia and Herzegovina and Kosovo (+70% in pkm, 2001/2000)
- In FYRO Macedonia it dropped (-30%, 2001/2000 in number of passengers), in Serbia (-8%) and in Montenegro (-6% in pkm from 1997 to 2001)

For the year 2001, all the regional railways companies transported a total of 59 million passengers, representing some 3 billion passenger-kilometres

The distribution by country (railway company) is summarised in the following table.

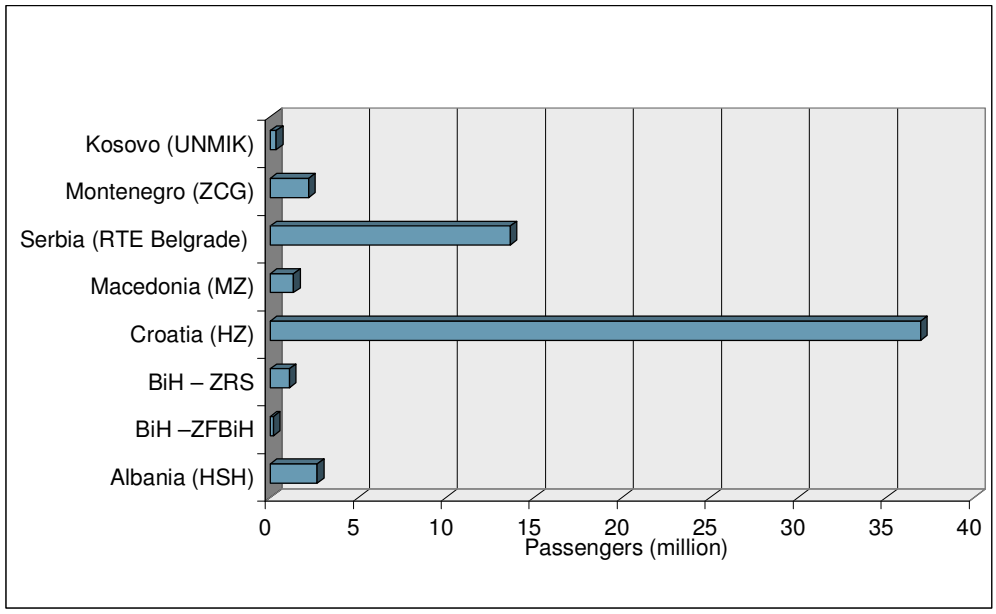


Figure 6.2 Railways' passenger traffic for the year 2001.

As shown in the diagram the passenger traffic volumes are mainly due to Croatia (63.2%) and Serbia (23.3%), and, to a much lesser extent, to Albania (4.6%) and Montenegro (3.8%). The traffic registered in the other countries is very low.

Traffic distribution by market segment
Almost all of the traffic is registered in the domestic market: 94% in Croatia and 99% in FYRO Macedonia.

The passenger transport is concentrated on a few main sections (3 to 6 according to the countries) linking the main cities of each country.

As earlier mentioned, the competition from passenger cars and buses is increasing for short distance transport, challenging further the already weak position of the railways in this market segment.

In the long distance market segment, air transport, although not yet a real threat, is becoming increasingly competitive compared to the railway services. Air transport is already competitive to railway transport on some specific sections- in Croatia, for instance, air transport concentrates on the route between Zagreb and Split/Zadar offering better travel time and tariff.

In most of the countries, railway passenger tariffs are regulated (must be submitted to prior government approval) except in Montenegro. In many cases, the tariffs applied for railway services are not sufficient to cover the costs- this may have a negative impact in their competitiveness. This particularly applies to many of the secondary lines, where railways have to follow special provisions related to Public Service Obligations activities according to which they are not allowed to abandon some of the most unprofitable services and make use of these resources to develop the more profitable parts of the network.

Perspectives for passengers traffic
As for the freight market, it is not easy to predict the future position of the railways within the passenger transport market.

However, the different factors causing the decrease in railway traffic in the long run will continue to affect the railways' passenger traffic, even if there have been signs of a modest recovery in some countries during the last two years (Albania, Croatia and Kosovo).

As for the freight traffic, very optimistic traffic forecasts have been prepared by the railways in the Region, which require some comments. In all the REBIS countries, the passenger traffic is expected to grow in the medium term. The expected increase should reach 22% in FYRO Macedonia and 13% in Montenegro from 2001 to 2005 (number of passengers). In Croatia and Serbia, traffic forecasts are also optimistic (respectively +11% in 2004 and + 10% in 2006 in passenger-kilometres). The increase is foreseen as a result of an increase in the domestic traffic in Serbia (+23% until 2006), Croatia (+17% until 2007) and Montenegro.

6.3 The financial situation of the railways

6.3.1 General view of the financial situation

All railways in the Balkan countries have experienced a sharp fall in both passenger and freight transport activities over the last decade, which has resulted in a drop in revenues.

On the other hand, despite some reforms including downsizing of the staff in some of the countries, the operating costs have been recurrently increasing in recent years in all the networks, with the exception of Albania.

This context has left the railways of the Balkan countries with huge and increasing deficits, little money for investments and maintenance, and staff expenses remain at a high level. All the railways have lost money during the last 3 years, some of them are virtually bankrupt as losses exceed the total revenue (including state subsidies).

Even in recent years, between 2000 and 2001 when it appeared that the decrease in traffic stopped or at least diminished, in most of the countries, the losses continued to increase.

6.3.2 Revenues, expenses and balance (revenue/expenses)

Revenues
The revenues come from three different sources: direct revenue or income from operating activities, state subsidies and other revenues.

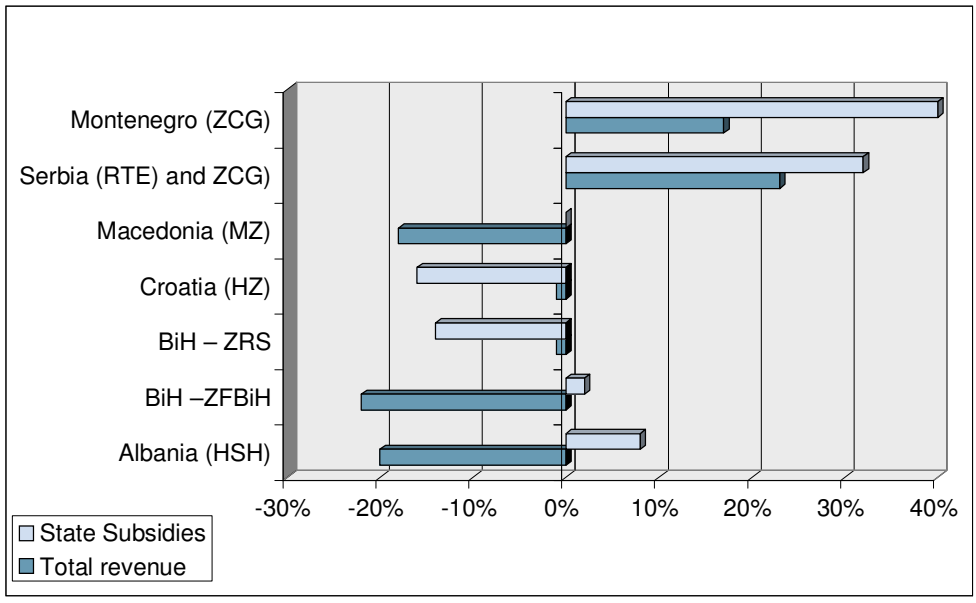
Direct revenues from the operation of both passenger and freight services, which are (or should be) the core activities of the railways, are in the order of

40% (around 33% in Albania and Serbia, 38% in Croatia and 46% in Montenegro). In all cases the state budget provides a higher contribution.

State subsidies represent 35% to 70% of all of the railways' revenues, according to the country under consideration, except in FYRO Macedonia.

The latest figures available for the years 2000 and 2001 show that, in spite of the modest growth registered in the traffic activities, and the increasing state subsidies, the total revenue has decreased in all the countries. The following diagram illustrates this situation.

It should be noted that, on the small networks, the information available with respect to total revenue includes "Other revenues" which sometimes account for up to 20% of the total revenue (21% in Albania, 9% in Bosnia and Herzegovina; 12% in FYRO Macedonia).



Note: Same figures for Kosovo were not available (only the operating revenue).

Figure 6.3 Changes in total railways' revenue and state subsidies (2001 / 2002).

The diagram shows that the total revenues have increased only in Serbia (+23%) and Montenegro (+17%), where the state subsidies have increased at a much higher speed than the revenues.

In Croatia, the total revenue also dropped (1%), but state subsidies decreased at a higher pace (18%).

The revenue of the Albanian Railways plummeted (20%) while the increase in State subsidies remained modest and the passenger/freight revenue grew +3%.

In fact, railways are highly dependent on state budget means. In most countries the state subvention to the railway increases year after year, thus making railway transport a growing financial burden on the public budget.

The following diagram illustrates the strong dependence on state budget means in the different countries.

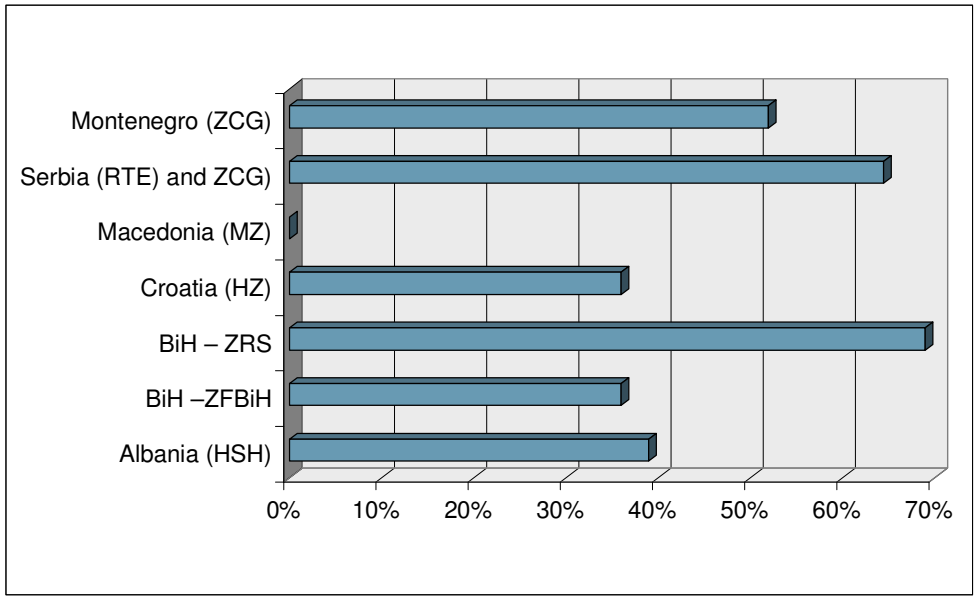


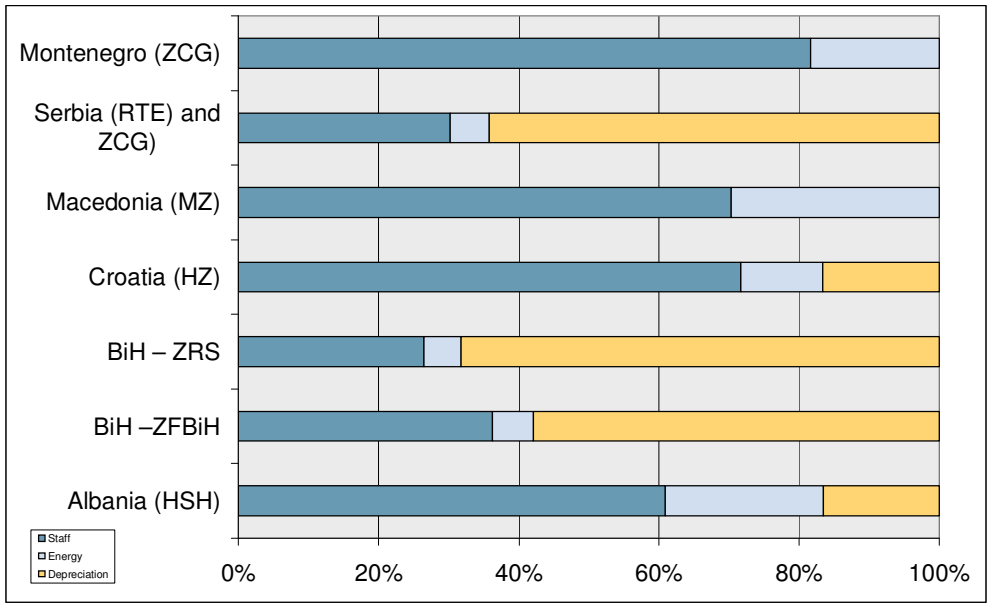
Figure 6.4 Contribution of the State to the total revenue in % in 2001.

The operating revenue is mainly due to freight transport activities. The available information is scarce and does not allow to clearly determine each subsector's share of the total operating revenue. In Serbia, the freight transport represents 70% of the total revenue, in FYRO Macedonia the figure is 93%.

With the exception of Croatia, no information is available concerning the distribution of the operating revenue (freight and passenger operation) and concerning the infrastructure. In Croatia the operating revenue accounts for 60% of total revenue (state subsidies contribute to cover 80% of the infrastructure revenue).

The expenses

The expenses of the railways cover staff salaries and social charges, energy, depreciation and other charges (materials, services, etc). The three first items by far represent the largest share of the total expenses. The following diagram shows the weight of each of these main items in the total expenses for the different countries.



Note: Depreciation cost in FYRO Macedonia and Montenegro are excluded (not available).

Figure 6.5 Weight of different items in the total expenses in 2001.

As shown in the diagram, the staff costs represent the largest share of the total expenses and vary from one country to another from 22% in Serbia to 43% in Croatia. These expenses tend to increase (except in Croatia), though not as fast as total expenses. This is partly a result of efforts made by the companies to downsize their work force (for example, staff was cut about 7% in Serbia from 2000 to 2002).

Energy costs account for 4% up to 13% of the total expenses of the railway companies considered. These expenses also tend to increase but less than the total expenses.

Depreciation varies from 10% in Albania and Croatia to 45% in Serbia. These expenses tend to drop slightly in recent years. This may be due to the expenses in connection with the renewal of the rolling stock and equipment.

Balance (revenue/expenses)
As a consequence of the current situation, the balance between revenues and expenses is largely negative.

All of the railways are loss making, financially troubled organisations and, in some countries, even almost bankrupt.

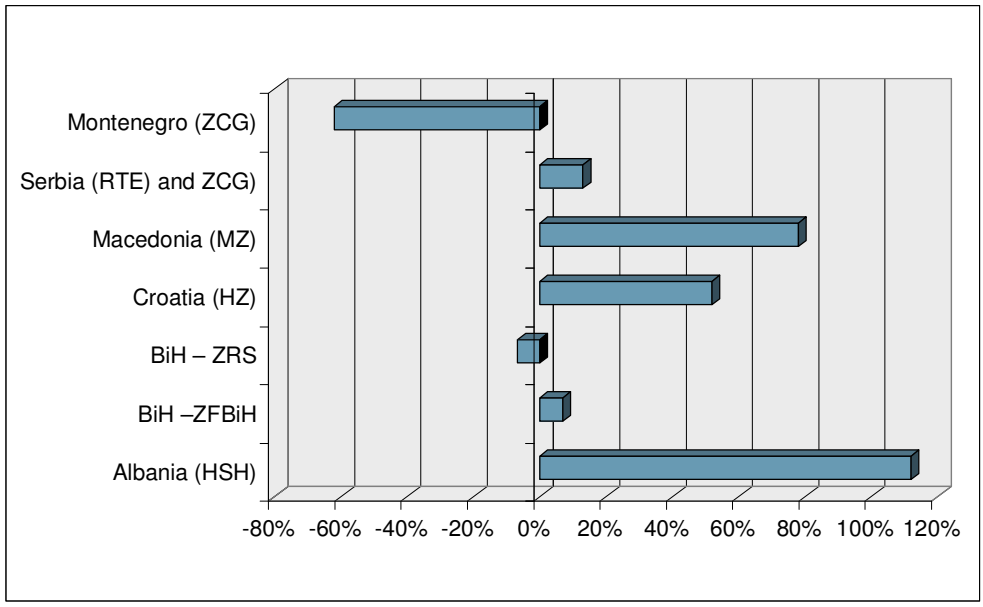


Figure 6.6 Losses for 2000 - 2001, as percentage of the total revenue.

The situation in Serbia and, specially, Montenegro does not seem as dramatic, but it has to be taken into account that the changes in the period 2000 – 2001 in state subsidies have increased the revenue of these railways more than it has been the case in the other countries.

6.3.3 Balance sheet, investment and loans

The information obtained from the railways about assets and liabilities is scarce, not very detailed and not shown in a uniform presentation. It is expected that the current assets will decrease steadily by 54% in the Croatian Railways over the period 2000-2006. During the same period the current liabilities have dropped 50%, thus the current ratio is maintained around 1.

The long term indebtedness is expected to rise 360% from 2000 and 2006 whereas the total equity increases only 21.5% over the same period making the debt/capital and reserves ratio (debt as % of total capitalisation) increase from 34% to 120%.

In the Serbian Railways the current assets are expected to drop 14% from 2001 to 2006 while current liabilities rise 90%.

The current indebtedness of the Albanian railways amounted to EUR 14.5 million in 2002 (with a EUR 3.2 million investment for the Shkoder-Ballsh railway line). In Croatia the railway investments grew 13.5% between 1999 and 2001 (of which 60% was dedicated to transport activities, mainly rolling stock). The total investment is expected to grow 4.5 times between 2002 and 2006 and the infrastructure share is expected to be 65%. The cash flow will cover only 9% of the total amount and the Croatian Railways seek new loans to cover 65% of new investments.

In Kosovo, the UNMIK Railways intends to invest a total of EUR 41.5 million from 2003 to 2005, of which 80% is dedicated to infrastructure (mainly track rehabilitation).

In 2001, the Serbian Railways' loans amounted to EUR 77 million (Dinars 4,696 million), mainly from the World Bank, the European Investment Bank, Eurofima and foreign railways. The Railways expect to invest EUR 1,258 million from 2002 to 2006, of which almost 80% is for infrastructure. If only priority investments are considered, the total amount is expected to be about EUR 1,000 million in 2006, for which only 12% is currently covered by loans.

6.4 Conclusions and recommendations

Freight transport by railway has been strongly affected by the decline of the production within the traditional sectors such as heavy industries and mining where the railways usually had good foothold. The economic revival of these industries is essential for the future of the railways. Although there are signs of recovery, the demand for bulk transport is, however, likely to remain stable or grow moderately.

On the other hand, the reorientation of the economy to become increasingly service-orientated and the shift in the transport pattern towards high value goods, require a faster and more flexible transport. The share of transport by rail depends on the ability of the railways companies to adapt to this situation.

In any case, the relative role of the railways within the freight transport market will never regain it past status. The experience in other Central and Eastern European countries and in EU member states shows that the role of the road transport will increase considerably at the expense of railway transport, unless immediate efficient measures are taken to counterbalance this general trend.

As for the passenger sector, which has also been characterised by a rapid decline during the last decade despite signs of a modest recovery, the decline is likely to continue in the long run. For short distances, where railways used to have a good foothold the competition from passenger cars and buses is likely to sharpen. For long distance transport, air transport will probably increase. In such a context, the future of the railways depends on its ability to improve its marketing strategies and the quality of its services in terms of comfort, travel time and tariffs.

Theses trends, for both freight and passenger transport, have had and continue to have a strong impact on the financial situation of the railways. All the railways are losing significant amounts of money, including in recent periods, and some of them are virtually bankrupt as the losses exceed the total revenue (including state subsidies).

To reverse this trend, significant efforts are urgently required within several areas such as:

- acceleration of the restructuring process
- strengthening the institutional building
- developing modern practices and marketing strategies
- modernising the rolling stock and the infrastructure.

Acceleration of the restructuring process
The elimination of the monopoly of the railway companies by separating infrastructure from operations and the general separation between operation and commercial activities (which is not yet the case in Montenegro, for instance) should be achieved rapidly. The capability of the railways to restructure into profit oriented companies, including sales promotion and cooperation with other transport mode companies is of vital importance. This requires the reduction in certain assets and staff resources, investment in new technology and changes in the work methods to improve the operational productivity. The existing assets need to be brought in line with the expected transport volumes and some of the assets should be replaced with new technologies that produce greater payload and require fewer maintenance and labour inputs.

To ease the transition, the railways must establish a program (some railways already have) which covers the following aspects: early employee retirement programmes, training programmes, redundancy payments for employees giving up employment rights etc.

The reform process must be sustained by planning programmes. Some of the railway companies have already set up 5-year business plans whereas other seem to be in total lack of any prospective view of their near future. The business plan sets the targets of the railway management so as to increase efficiency, reduce costs, strengthen operation, financial control and performance, put a stop to cross subsidizing between freight and passenger activities, improve communications and computer technology, rationalise assets, etc.

The clear separation between the management of infrastructure and operation, at least in the accounts, must be introduced soon (this has already been done some of the railways). Then a mechanism for control and charging the use of railway infrastructure must be developed to comply progressively with the rules already in force in West European networks.

Strengthening the institutional building
It is highly recommended to strengthen the institutional framework in the countries where various state owned companies co-exist as this seems to hamper the optimal operation of the railway companies at state level.

On the other hand, it is important to clarify the responsibilities of the State and of the railways companies as far as Public Service Obligations is concerned, especially with regard to the secondary lines where railway passenger transport is often maintained with low rates making the service highly unprofitable.

The relationship between the government and the railways must be formalised in documents determining the obligations of each of the parties (railway law, contract plan or performance agreement). These documents should address the issues of contracting for loss-making services required by the authorities (Public Service Obligations – PSO, for suburban transport and light density lines services, for example), for property ownership (infrastructure), etc. The government must also clarify the regulations imposed on the railways concerning price control over tariffs – which is still the case in most of the railways. The government should not hamper the railways' commercial policy, which is required in open market economies.

Developing modern practices and marketing strategies
The definition and implementation of efficient business plans (as it has been done in Croatia and Serbia) will pave the way for a better management of the networks and the provision of more attractive services.

It is essential to develop the marketing capability if the railways are to participate actively in the evolving open market economy. Passenger and freight marketing and sales departments operated as independent business units must be established. This is not the case in all the railways, at present.

It will be necessary to increase the tariffs, curtail the services and ensure subsidies for the non-profitable activities required by the authorities in order to close the gap between passenger revenues and costs. Most of the improvement will come from increase in revenues (increase in tariffs and subsidies) or reduction of the service level. The passenger business must be managed so as to eliminate cross subsidies, to cut services with a low patronage, to develop transparent accounting practices and to meet the market demand in terms of comfort, flexibility and reliability.

The freight activity must also be balanced through a combination of reduction in services, freight tariff increase, efficiency improvement and cost reduction. Much emphasis must be placed on the elimination of loss-making services and cost reductions as government subsidies are not a sustainable solution and tariff increases, naturally, are limited by the market conditions.

The most important freight customers of the railways are the metallurgical enterprises shipping coal, coke, ore and steel products. It is questionable whether considerable volumes of these products will continue to be hauled in the long term. The price component (including transport) of the cargo is faced with increasing competition from the same commodities from other parts of the world. As the Balkan's economy becomes more commercial, the volume of consumer and finished goods is likely to increase.

Thus, the railways must adapt to new markets. One way of doing this is to enhance the cooperation with the international forwarders operating on the international markets and who are able to concentrate cargo and ship it overseas in large quantities. Rail freight services must also be improved, notably through the operation of a wider range of services. In connection with the freight survey, many railways' clients insisted on the need for additional services, such as

better scheduling of the transport, help with filling in freight documents and calculating tariffs, etc. These new services, which are not all costly to set up, will contribute to meeting the changing demands of the market place.

Modernisation of the rolling stock and the infrastructure
The modernisation of the rolling stock on the busiest railway lines is vital to maintain the competitively towards road transport. The development of Pan-European corridors and the railways' ability to develop international traffic on these rehabilitated corridors, where shipment distances are long, are crucial.

Furthermore, track rehabilitation on main railway corridors, electrification and construction of new lines should be given immediate consideration on the long distance sections such as Zagreb-Split.

7 Multi-modal transport

Multi-modal transport is hardly developed in the Balkan region. Traffic flows are limited, and, generally, the present facilities and equipment are not fully used.

Within the scope of REBIS the current market for multi-modal transport solutions has been studied, and the future prospects for such solutions assessed. During a mission to the region by a containerisation expert interviews have been held with representatives from the relevant participants, both at policy level (Ministries of Transport) and at operational level (railways, combined transport operators, shipping companies, forwarders etc.).

The study analysed the different aspects of the system and the recent development. It particularly covered the following aspects:

- organizational context, including the existing co-operation between several of the actors associated with/involved in the various segments of the chain
- infrastructure and technology (rail, road, inland waterways, maritime), loading units (container, swap bodies and trailers) and handling facilities
- traffic flow and services; maritime transport of containers (intercontinental) and its terrestrial prolongation and intermodal transport (intra-continental)

A complete version of the container study is attached in Appendix 14.

This chapter describes the main problems encountered within the sector and the perspectives and possible supporting measures by distinguishing the nature of the recommended actions (technical, operational or institutional), which could improve the sector.

7.1 Analysis of the current situation

7.1.1 General environment of the combined transport sector

The economic framework in the Balkan countries is characterised by a series of factors, which can be seen, in the short term, as an obstacle to the development of efficient combined transport systems:

- As a result of the dissolution of the Yugoslav Federation, the present transport flows on key routes in most of the Balkan countries are exceptionally low and insufficiently organised. Therefore, the logic of combined transport cannot be applied easily - the present low concentration of traffic on trunk routes does not allow for the establishment of frequent regular through trains

- In most of the Balkan countries, the transport demand over long distances (international trade) is mainly related to the import of goods, leading to an unbalanced transport flow, which poses the problem of returning empty containers.

7.1.2 Institutional and regulatory framework

General overview

The institutional structures at the "policy level" and the organisational framework prevailing at the "operational level" are insufficiently developed to allow the implementation of best practices in the combined transport sector:

- At the "policy level" no clear government policy appears to have been defined for the development of combined transport in the Balkan countries. Within the Ministry of Transports and Communication, the implementation of unimodal infrastructure programmes (road, rail, ports, and aviation) is still the main focus area.

- At the "operational level", the organisational framework is complex, characterised by unclear relationships and poor definition of the role of each partner involved in combined transport (CT operators, railways, ports and freight forwarders).

At the "policy level", the definition and adoption of a national programme for a combined transport system, within the states, is a short term task. This includes determining rules and legal issues to establish guidelines to the participants within the transport sector, to provide financial support for the improvement or development of the infrastructure for combined transport and determine main/basic operating principles for the further development of the sector.

An investigation of the existing regulations and policies governing the combined transport sector shows that the provisions to support combined transport, as defined by EU directives and resolutions, ECMT (European Conference of Ministers of Transport) are not well defined or applied and the results are disappointing, especially those related to the following points:

- access to the market: promotion for the liberalization of combined transport operations from all quota systems and systems of authorisation

- fiscal incentives in favour of combined transport such as measures to ensure that the purchase or leasing of special vehicles, handling equipment, swap bodies and containers (including their purchase or leasing from domestic manufacturers), as well as road tax applicable to road vehicles involved in combined transport are reduced or reimbursed

- Exemption from compulsory tariff regulations for initial or final road haulage stages which should form part of the combined transport operations

At the "operational level", the role and function of the various actors involved in combined transport (CT operators, railways, ports and freight forwarders) is still unclear. For instance, present operators are only active on the intercontinental traffic market (maritime containers to/from ports). In spite of larger freight volumes exchanged with continental neighbours, the intra – continental flows involving combined transport are practically equal to zero (swap – bodies, semi-trailers, etc).

Apart from the organisational problems within the different railways due to the dispersion and number of companies operating within the same country, the understanding of their role in the promotion of combined transport is ambiguous; the railways regard container traffic as suitable only for specific types of freight. There is no clear distinction in railway operation procedures for wagon freight traffic and container traffic.

7.2 Organisational framework in the different countries

Croatia is the only country in the region where a first decisive step towards the creation of a combined transport industry has been made. The general organisation appears to be similar to that of Western Europe. In Croatia there is one container company, AGIT, and an independent combined transport operator, Crokombi. The container company is a subsidiary of the railway company and, has been established by the Croatian authorities to develop the combined transport activities in the country. Crokombi was established in 1998 as a national combined transport operator (member of IURR).

However, in practice, the role and function of these companies is still unclear and results are disappointing. For instance, the traffic registered by Crokombi, after five years of operation, is still close to zero. Instead of trying to develop its market in the field of intra-continental traffic over long distances, as IURR companies usually do, the company strategy focuses on the traction of containers to/from Koper, in competition with road carriers and even with AGIT. On the other hand, the company has not developed any particular facility, purchased swap bodies or built up a network to operate at the "other end".

The performance of the container company AGIT is also poor and the strategy rather unclear; no connection with the Intercontainer hub in Sopron has been developed or even contemplated.

In **Serbia and Montenegro** an excessively complex organisational framework prevents the only container company (ZIT), which is a subsidiary of the RTE Belgrade, direct access to the intra-continental international market of land container transport.

ZIT is established under the Serbian Railways, which is then responsible to the FR Yugoslavian Railways so that the container company cannot organise any international container trains on their own. The company has to go through the FR Yugoslavian Railways Committee, which acts as the main interlocutor of the international networks. This is a problem as this committee is not an operator and, thus, cannot organise any container transport (they are only in charge of the organisation of trains in transit through Serbia). As a result, no operator is empowered to sell rail traction, provide container wagons, containers as well as handling services for potential customers.

The situation in **Bosnia and Herzegovina**, where the network is operated by three different railway companies, is worse than in Serbia as the country has no domestic container companies or combined transport operators.

In **Albania**, with the exception of the private company operating in Durres, there is very little involvement by the authorities or the railways in favour of combined transport.

In **FYRO Macedonia**, combined transport is evolving towards a better organisation with the involvement of ICF, which operates a weekly direct container train between Skopje and the ICF hub in Sopron.

7.2.1 Infrastructure and technologies

Combined transport networks

The Pan-European transport corridors crossing the Balkans (IV, V, VII, VIII, and X) offer a potential for the organization of a combined transport sector, though some major improvements are needed, especially regarding the railway and road links on the east-west corridor 8 and Corridor X.

In the present context (low volumes, unbalanced character of traffic flows, weak organization), the improvement of the transport infrastructure in order to facilitate the development of the container traffic is considered to be a medium term task. All the existing inter-modal terminals are largely under-utilised. All efforts in favour of this technique, in the short term, should be focused on the organisational, regulatory and institutional framework.

7.3 Combined transport terminals layout and equipment

Apart from Tirana, the existing terminal network links the major capitals of the region and offers a potential for the organization of a combined transport sector in the Balkan region, though some improvements are needed, especially in FYRO Macedonia.

In **Albania**, the only terminal for containers is in located the Port of Durres. The Albanian Railways does not handle containers and are in no position to do so as the railways do not operate a container terminal. The existing facility in Durres has been created behind quay 6. The terminal is operated by a container operator, Pelican, which is established under the port authority. Containers are handled with the ships' own gear or with a 40 tons gantry crane. For the removal of containers to a smaller stacking area, behind the berth, the terminal has two mobile cranes. The present area for container handling and storage is about 32,500 square meters. Current traffic is 1,024 TEU / year.

A project for the future expansion to include Quay 7 and to increase storage capacity (by increasing the paved area) is foreseen. The future capacity is estimated at 60,000 TEU per year.

Croatia has a well developed container terminal network, including five major facilities in Zagreb Vrapce, Osijek, Split and Rijeka Bradjica.

The Container terminal in " Zagreb Vrapce " has a relatively modern design including its own information system. It is the property of the railways and the main inland terminal of Croatia. The terminal has good road and rail connections and it is equipped with a gantry crane with a transhipment capacity of 120 UTI/day, lifting capabilities of up to 40 tons and the ability to handle 40' containers. It is also equipped with three tracks (1,712 m), and has a storage area of 25,000 m^2. However, current traffic is low and even declining : 4,475 TEU / year in 2001 (7,612 TEU in 1997).

The small container terminal in Osijek, is also the property of the railways, -it is located at the railway station Osijek. It has a transhipment capacity of 10 UTI/day with handling capabilities for 40' containers. The terminal has one track length of 200 m and a storage area of 2,400 m^2. The traffic volume is particularly low and has remained unchanged since 1996: about 60 TEU/year.

The container terminal of the port of Split is connected to city and state coastal roads and has a transhipment capacity of 35 UTI/day with handling capabilities for 40' container. The terminal has one track length of 80 m and a storage area of 1,600 m^2. Traffic activities in 2002 only amounted to15 TEU (456 TEU in 1997).

The container terminal Rijeka Brajdica (Port of Rijeka) is connected to the railway station Rijeka Brajdica and Rijeka junction by a special track line. The terminal has a transhipment capacity of 240 UTI/day and a crane with a lifting capacity up to 40 tons. The terminal is the property of the Port Rijeka. The op-

eration of the terminal is carried out jointly by AGIT, a subsidiary container company of the Croatian Railways and the port and is situated close to the Port Rijeka. The traffic activities have increased modestly: 15,239 TEU in 2002 (12,580 TEU in 1997).

In **Bosnia and Herzegovina** there are four container terminals: Sarajevo, Mostar, Tuzla and Ploce. None of these are modern terminals, but, for the time being, they are able to meet the demand - although some improvements are needed, especially in Sarajevo's terminal, which concentrates 50% of the total traffic (4,776 TEU in the 2002). The access road to the terminal is in a poor condition. The crane has a lifting capacity of up to 40 tons. Three forklifts with a capacity of up to 12 tons are used to handle empty containers.

FYRO Macedonia has one container terminal at Tovarna close to Skopje near the railway station. The terminal is poorly equipped; one gantry crane with limited transhipment capacity and a small storage area limited to 600 TEU. Traffic activities are low: 1,500 TEU/year from / to Thessaloniki in 2002. A weekly container train is also organised from/to Sopron.

Serbia and Montenegro have three main container terminals: Port of Bar, the Port of Belgrade and the ZIT inland terminal of Belgrade.

The Port of Bar is the major maritime facility within the territory of Serbia and Montenegro. It extends over an area of 200 ha with good road and rail connections and excellent expansion potential (600 ha). The port facilities include a container cargo depot, 120,000 m² of warehouses and a Ro-Ro terminal. While most of the handling equipment is relatively old (20 years and more), it has been sufficiently maintained to offer a robust handling performance with few equipment breakdowns. While the port offers good (service) performance to its users, its weak interior connections affect its overall competitiveness. In particular, Montenegro has problems regarding gauge equipment and does not allow handling of high cubes (special maritime container higher than a standard 404 container). Traffic activity was only 5,000 TEU in 2002 and is declining (10,000 TEU in 2000).

The Port of Belgrade also has a container terminal. The transport infrastructure of the terminal facilitates reloading of containers from vessels, railway wagons on three tracks, and road vehicles in two traffic lanes. The port has good railway connections, but its location, in the central area of Belgrade, makes the connection to and organisation of road transport difficult. The connection with corridor X will require large investments (a Belgrade eastern by-pass). It has a large container storage area and copes with a terminal capacity of 10,000 TEU per year (used at 10% at present).

The inland terminal of Belgrade, operated by the company ZIT (established by the RTE Belgrade) is provided with good roads and rail connections; 8,000 m^2 of covered storage warehouses (including customs warehouses) and a 20,000 m^2 open storage area. The terminal is equipped with a gantry crane with a lifting capacity able to handle 20' and 40' containers. The company owns 300 con-

tainers and 18 semi-trailers. The terminal registered a traffic volume of 10,000 TEU last year

Fleet and rolling stock dedicated to combined transport traffic
As a rule, the Balkans' intermodal operators are poorly equipped with regard to intermodal railway wagons. The existing container wagon fleet is mainly adapted to the transport of ISO containers. There is lack of road equipment, which can be handled by a TEU carrier (containers, swap bodies) for RoLa and RoRo techniques.

7.4 Traffic flows and services

7.4.1 General

In general, the flow of unitised traffic (container and swap bodies) accounts for less than 0.5 % of the total traffic, which is exceptionally low compared to the about 4% in Western European countries.

Most of the traffic registered concerns land transport of maritime containers from/to overseas (intercontinental traffic) organized from/to many different ports, which means short distances and dispersed volumes, - conditions, which are all in favour of transport by road.

Meanwhile, the intra-continental traffic (involving semi trailers and/or swap bodies in intermodal transport chains) is close to zero as Balkan carriers do not own or use this technique. The segment remains unexplored in spite of its potential: the volume of continental trade is much higher than overseas trade, it involves longer distances and, it has become easier to operate as an important hub[9] has been created in the area allowing faster connections with the international continental networks. The newly created Intercontainer "South-East European hub" in Sopron, near the border between Austria and Hungary has been connected to the "X.net" hub located in Herne since October 2002. In Sopron, the intermodal transport units are being transferred to 5 "block trains" connecting Western Europe to the Balkan region by a two-way rail.

However, the conditions for organising block trains are not met as the volumes of traffic are exceptionally low, traffic is largely unbalanced and distances are shorter than required, especially in the market segment of maritime containers transport from/to ports.

The domestic market, with the exception of containerised overseas traffic from ports, does not appear to be relevant for the cost-efficient combined transport. On the other hand, the transit market represents a promising market, given the strategic geographical position of the countries, especially Serbia and Montenegro as well as FYRO Macedonia and Albania.

[9] Central point for the collection, sorting, transshipment and distribution of goods for a particular area. This concept comes from a term used in air transport for passengers as well as for freight. It describes the collection and distribution through a single point.

Current traffic flows by country

In **Albania**, the traffic figures for 2002 provided by the single main operator based in the Port, Pelikan Ltd, show that the existing traffic comprises only few containers passing through the port. The Albanian Railways is not involved in specific container traffic.

Table 7.1 LO-LO Traffic in the Port of Durres (TEU in 2002).

Traffic	TEU
Imports	742
Exports	282
Total	1,024

The land transport of these maritime containers from/to the port is made by road. Besides, the same operator registered limited Ro-Ro traffic as follows:

Table 7.2 RO-RO Traffic in the Port of Durres (TEU in 2002).

Traffic of the Port of Durres	TEU
Imports	369
Exports	450
Total	819

In **Croatia**, the hinterland transport of maritime containers (intercontinental cargo) is practically the only form of combined transport registered in Croatia. The continental flows of unitised traffic (O - D in Europe, without need for transhipment) are close to zero.

Most of the transport of maritime containers is carried out between the terminal of Rijeka Bradjica (the container terminal of the Port) and the inland terminal of Zagreb. With more than 80%, road transport accounts for the largest share. The railway's share (20%) is organised by AGIT , which operates the Zagreb terminal - the only significant inland terminal in the country in terms of traffic: 4,475 TEU in 2002 (70% is from/to Rijeka and the rest, approx. 1,300 TEU is from/to Koper). This traffic is highly unbalanced as imports represent 80% of the total traffic registered.

The table below summarises the container transport activity in the different terminals in 2001.

Table 7.3 Container traffic in Croatia, by terminal (in TEU for the year 2002).

Terminal	TEU
Port of Rijeka	15,239
Zagreb Terminal Vrapce (1)	4,475
Osijek	59
Port of Split	15
Total	19,788

Despite the creation of a specific container company, no attempts to explore the continental market by organising direct block trains to Sopron have been made. AGIT concentrates on the rail traction of maritime containers from/to the port of Rijeka for a limited number of customers and does not offer any container rental service or organization of initial haul operations, etc.

The company Crokombi has not established or operates any specific facility. With this strategy, the company has only little chance to emerge as a serious operator able to develop combined transport in the near future.

In **Bosnia and Herzegovina**, the traffic of unitised cargo consists of the hinterland transport of maritime containers (intercontinental cargo), mainly between the Port of Rijeka and Sarajevo and, to a lesser extent, from Koper and from northern European ports (Hamburg and Rotterdam).

The container traffic registered in the four domestic container terminals (Sarajevo, Mostar, Tuzla and Ploce) amounted to about 4,776 TEU in 2002. With more than 50% of the traffic, Sarajevo is the main container terminal. About 80% of the traffic is from/to Rijeka and Koper (via Zagreb), but the traffic is largely unbalanced as imports represent 80% of the total traffic.

Although low, the container activity registered in **FYRO Macedonia,** in the container terminal of Skopje at Tovarna, is, contrary to other Balkan countries, not only due to overseas cargo, but also to the continental flows from/to western Europe, and, to a lesser extent, to the transit cargo from Greece to Kosovo.

The inland transport of maritime containers between Thessaloniki and Skopje, of about 1,500 containers in 2002 is mainly made by road. Due to the insufficient volume, the daily direct container train Thessaloniki-Skopje was abandoned two years ago as the volumes of freight were insufficient to allow commercially attractive operations on this route.

As for the continental market, a block-train, *"EFCE – Europe –FYROM Container-Express"*, operates once a week in both directions between Sopron and Skopje. The organisation of the block train has been made possible as a result of the FYRO Macedonian exports, which have allowed the necessary balance in the flow. The containerised export traffic from FYRO Macedonia is essen-

tially composed of chrome (going to Germany) and wine. Volumes are sufficient for ICF to organise this weekly block train.

In spite of difficulties to meet the minimum requirement of combined transport operations, the Macedonian Railways is planning to purchase two mobile cranes to facilitate container operations at the Bitola and Prilep railway stations (along corridor Xd) and at the stations of Gevgilija and Gradsko (along corridor X).

The transit traffic of maritime containers from Greece to Kosovo (for the KFOR, the military troops) is being organised by road by a Greek company.

In **Serbia and Montenegro**, the hinterland transport of maritime containers (intercontinental cargo) is the main form of combined transport registered in Serbia. The continental market of unitised traffic is very small and includes only a few containers carried through the Danube from / to the port of Belgrade. The institutional barriers already mentioned[10] are one the reasons for this situation (besides, there is a transit flow of 331 container trains/year registered on the Serbian section of the Corridor X).

On the continental market, the institutional barriers mentioned earlier need to be overcome in order to allow the main traffic of maritime containers which is from/to the Mediterranean ports (Thessaloniki, Koper and Rijeka and Bar) and, to a lesser extent, from/to the northern European ports of Hamburg and Rotterdam.

The container traffic of the Port of Bar reached 5,000 TEU in 2002. Considering that Bar is the only seaport of Serbia and Montenegro, the volume is very low, and continues to decline (10,000 TEU in 2000). At present, attempts to organise combined transport from the port of Bar have failed. A block train was organised last year, but the initiative was abandoned immediately, apparently due to the high tariffs charged by the Montegrin Railways which makes railway transport uncompetitive compared to road transport on this particular route.

Efforts aiming at making Bar a regional hub should be abandoned considering the weak domestic market and the fact that poor hinterland connections place Bar in an unfavourable position when compared to its competitors, the ports of Koper and Thessaloniki.

From/to Koper, three block trains were organised by AdriaCombi last year. The service has since been abandoned, not due to the lack of competition in terms of tariffs (from/to Koper by road is EUR 1,200/TEU while the customer pays 1,100 by rail), or delays but due to the shipper preference for "door-to-door" service offered by road transport whereas transport by rail involves customs clearance operations at the rail terminal customs warehouses.

[10] The container company, ZIT, is not currently able to establish business relationship with intercontainer so as to initiate a business process consisting on canalising and shipping, by one unique frequent block train, the available traffic to western Europe, via Sopron

Most of the container traffic registered from/to these main ports consists of import (up to 85%) ,which is transported by road to the main destination, Belgrade, where the two other significant terminals are located. The traffic in the inland terminal of ZIT in Belgrade was about 10,000 TEU last year whereas the port of Belgrade registered a traffic of only 1,000 TEU.

A more detailed summary of the traffic registered in the main terminal (ZIT) is shown in the following table.

Table 7.4 Container traffic registered by ZIT in the inland terminal in Belgrade (in TEU for the year 2001).

Ports	TEU
Koper	4,005
Rijeka	1,300
Bar	1,800
Thessalonikia	1,800
Northern European ports	1,000
Total	9,905

The traffic is largely unbalanced as import represents 85% of the total traffic registered. Most of these volumes are due to imports from China (70% of total).

The facilities of the port of Belgrade are used to serve, not only river traffic, but also maritime containers from Bar. The number of units loaded and unloaded is very small and represented some 1,000 TEU in 2002.

The transit traffic through Serbia of about 331 trains is being organised by the Serbian Railways.

In Montenegro, only little of the container traffic between Bar and Podgorica is organised by road. The Montenegrin Railway has no transhipment or storage facilities for container transport.

7.4.2 Summary of container traffic by terminal

The following map shows the location of the main container terminals and summarises their respective traffic levels.

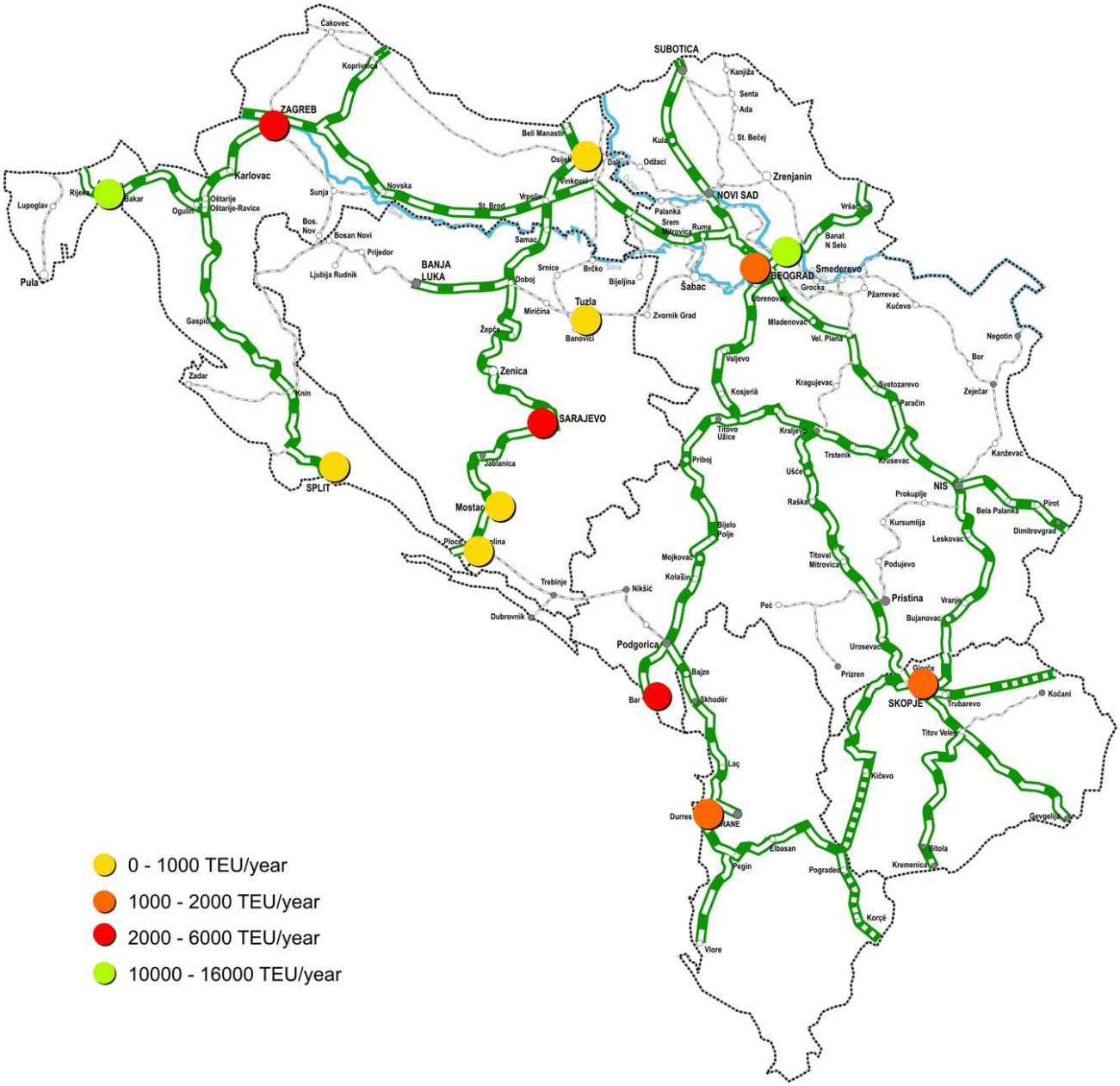


Figure 7.1 Main terminal and traffic level (TEU/year).

7.5 Recommendations for improvements

The study of the current situation showed that the problems of developing combined transport in the Balkan countries is rooted in the deficiencies in the supply system (existing infrastructure and technical means) but, first and foremost, in the poor understanding and knowledge of the potential market for combined transport; the poor ability of suppliers to organise and the lack of appropriate marketing strategies directed at each of the different product/market combinations.

Although the existing inter-modal facilities and equipment require improvement, they do not, for the moment, constitute an obstacle to the development of long distance traffic through the region. Therefore, if investments are required

to upgrade the handling equipment, large investments for the creation of new infrastructures must be avoided as they are not urgently required and may only push up the cost per TEU handled.

On the contrary it seems essential, in the short term, to strengthen the knowledge of the market and the creation of a new, adequate and a more efficient regulatory, organisational and institutional framework. Therefore, the strategic recommendations proposed place greater emphasis on the understanding of the potential market, the definition of a corresponding transport policy and the improvement of the organisational framework. In the short term perspective, less emphasis should be put on infrastructure and technological matters.

The objectives of the following four proposals are to engage a process of creating the initial conditions for an efficient development of the combined transport in the Balkans. These proposals comprise: a market and capacity study, an organisational study, a policy study and a long term investment study.

In general, it should be emphasized that, if the recommended measures are to be of maximum value, it would be a good idea to implement them on a regional rather than national level.

7.5.1 A market and capacity study

From interviews conducted with the different operators and suppliers, it appears that the redundancy in the container services on the intercontinental market segment reflects a lack of marketing strategies directed at each of the different product/market combinations.

None of the current participants in the combined transport sector seems to have a clearly defined marketing strategy so as to increase sales. None of the suppliers have performed an evaluation of the potential traffic on a selected axis, in particular on intra-continental O-D relations, which are the most promising segment for commercially attractive CT operations. When questioned about this, the operators emphasise the deficiencies of the technological system, but say little about their own lack of marketing strategies.

As a first priority measure, it is recommended to undertake a market study to appraise the real potential of combined transport in the export/import of main products (volumes and commodities) and identify strategies to be followed for each product/market combination - this might contribute to strengthen the transfer of freight currently forwarded by road to the combined transport sector.

In addition, the objective of the market study is to provide a clearer understanding of the current problems and specify the precise needs in terms of operating techniques and possible investments in new terminal infrastructure (a business plan should be prepared in more detail).

The market study should cover the following activities:

- evaluate the existing traffic (all modes) on selected relevant itineraries, including, as a priority, the continental market
- evaluate the existing "real" opportunities for combined transport, taking account of the potential of each sub-market (maritime; continental and transit) for relevant import/export commodities (auto supplies, chemical in bags, etc.) and for pertinent distant origin/destinations.
- define a relevant market product (based on the results of pertinent statistical studies and interview with selected firms and organisations)
- assess the resources to be implemented (technical and organisational)
- monitor the start up of the operational plan

The assessment should integrate the need to operate a reduced number of terminals in order to allow a concentration of the available traffic on a few key corridors and routes chosen for their reliability and high degree of management attention and support. Concentrating the traffic on a reduced number of terminals will allow for an increased number of departures.

The advantage of such a strategy should be reflected in the price of traction and services (collect and delivery, main transport, handling, storage, etc.), but also in the lead-time (the global "door-to-door" time of the journey), reliability and associated controls.

The analysis should then enable a definition of the number, the size and location of terminals to be included in the network of terminals for selected for improvements.

This improvement process does not only include the implementation of the required investments in terminal up-grading but should also include training programmes as well as the re-evaluation of the commercial relationship between the parties, a redesign of the product and the control procedures at the operational level.

7.5.2 Organisational study

The organisational study involves three related issues; clarification of the role and function of the participants; improvement of the relationship between the partners and strengthening of the co-operation with international operators.

Clarification of the role and function of the different actors
From the organisational point of view, the current situation is characterised by a certain confusion and misunderstanding of the role and function of the different actors which results in a negative background for the development of combined

transport systems. This is a main obstacle for the implementation of the required investment on a profitable basis.

A clarification of the role and position of the different actors and the preparation of co-operation agreements will allow reversing the negative trend within the combined transport business. Through a genuine process of co-ordination, the redundancy of the services offered and conflicting relationship between actors could be overcome. Positive relationships will favour the creation of conditions, which will gain customers' confidence. This firstly calls for a clarification of "who is doing what" (operators, railways, ports; customers, equipment makers and dealers and the relevant authorities) and understanding of inherent conflicts of interest therein.

The following guidelines have been prepared with the aim of guiding the improvement process.

The role of combined transport operators
The role of both, container companies and railroad operators should be redefined according to the following:

- The Croatian initiative to create a national coordinator for combined transport should be followed in all the other countries of the Balkans in order to explore and develop the most promising market of intra continental combined transport. However, as other UIRR members CroKombi, the "co-ordination" role must be concentrated on transport concepts able to attract road carriers. Companies such as Crokombi should concentrate on the main "profitable axis" on the continental market and deal as a priority with road carriers which should use their own swap bodies; semi-trailers, and should become the "distributors" of the combined transport product.

- On the other hand, companies such as AGIT and ZIT, railways' subsidiaries, should clarify their market positioning. They have to choose between being a combined transport operator or a forwarding agent in order to gain confidence from suppliers: shipping companies and forwarding agents, especially those dealing with large industrial firms, which are the « natural » client of such railways affiliated firms. Then, they should develop an efficient marketing strategy based on the global transport concept: « door-to-door » container transport operations. If the continental market becomes a significant activity, the container market should be given priority.

The role of the railways
If the role of the operators is to provide the railway companies with organised and concentrated transport volumes (to increase the utilisation of rail transport capacities) the role of the railway companies is to guarantee fast, punctual, reliable and competitive transport . The Railways should take the risk of becoming simple rail traction providers.

They should concentrate on the design of renewed operating techniques to match the operators' requirements (propose to their client a schedule plan and tariff level which is, at least, as cheap, fast and as reliable as the road transport).

The adaptation to a free-market economic system will decrease the market for full load trains while the demand for more frequent and smaller consignments by container will increase. Considering the present low traffic flow, there is a need for negotiating with all the existing operators in the sector and agree on the conditions under which the concentration of flows should be organised as well as on schedules and discounts to be provided in return.

The role of the ports
The Balkans' maritime port network should concentrate on the accessibility to only a few Adriatic ports, with the aim of supporting short sea shipping, which requires the convergence of substantial traffic volumes. These ports should be adequately linked to the land transport network and equipped for combined transport. It should be considered to give priority to the river ports of Belgrade and Novi Sad on the Danube. The use of the river Sava between Zagreb and the Danube, as well as the construction of the Sava-Danube canal, needs to be studied further.

Improving relations between the different actors and cooperation with international combined transport networks
The coordination between the various participants from the different transport modes involves not only a clarification of their role but also an assessment of their relationships and inherent conflicts of interest along the transport chain.

This can, to some extent, be achieved through increasing the objectivity in the relationship, which is done by:

- defining the delivery processes and procedures
- defining the inputs and outputs for each phase in the process, including: information, documentation
- defining the roles, and skills required for each player in the process individually and collectively, so that each player knows what is expected of him and of the others, and possesses the skills and authority perform this task

In this sense, it is recommended, within the framework of the national railways, to create, a structure in charge of the development or improvement of the intermodal terminals' operation and facilities in order to implement a coherent investment policy at regional level and at European level as well.

7.5.3 Policy study

A precondition of the preparation of proposals for the development of combined transport is the definition of the actual priority of combined transport within the general transport policy as combined transport is only one alternative out of many.

The starting point could be to recognize that compared with unimodal transport, multi-modal transport appears much more complicated (as it requires co-ordinating the various modes involved). Nevertheless, the potential difficulties of co-ordination are compensated by its advantages:

- direct economic advantages; the intermediate transport segment (rail, inland waterway, short sea shipping) may be cheap compared with road transport, particularly, if it consists of mass transport such as block trains, large container barges, etc.

- indirect economic advantages; these advantages are not taken into account in the transport prices (externals) but include less detrimental effect to the environment, safety, less traffic congestion, improved land development, etc.

A first step in the process could be to ensure the transposition, in the Balkan countries, of the transport provisions contemplated in the European directives and ECMT resolutions, relating to the use of the infrastructure and the principles of priority to grant to the combined transport, in particular, those related to:

- promotion of the liberalisation of combined transport operations from all quota systems and systems of authorisation

- fiscal incentives in favour of combined transport

- exemption from compulsory tariff regulations for initial or final road haulage legs forming part of combined transport operations and financial support (granted under the form of guarantee of credits for the CT development to purchase railway wagons for CT, upgrading of existing terminals)

As the state role is more complex than that of a simple distributor of government aid, efforts should be made at the political level by the Ministry of Transport, Post and Telecommunication. A Combined Transport Division should be created by the Balkan states to deal with the following issues: determination of rules and legal issues to guide transport sector participants, determination of the main operating principles of combined transport development within the transport system of the state.

7.5.4 Long - term investment study

When a sufficient knowledge of the potential market has been acquired and clear relationships between the different actors have been established, it is recommended to carry out specific studies, at a later stage, to identify the most urgent infrastructure investments and their respective size, related, in particular, to the adequacy of the a selected terminal network necessary to encourage the growth of the share of combined traffic within the transport sector.

The study should be based on the following principles:

- The network should be based on a selected, reduced number of terminals around which there will be a concentration of freight, connections with the existing network within the region and with the Pan-European transport corridors; TEN-T and TINA networks and interconnections between all capitals in the region as well as connection to the capitals of the neighbouring countries.

- The number, size and location of the terminal network must correspond to the expected traffic in the next decade. It is essential that, before any decision on project selection and financing is made, a specific market study for traffic forecasts is carried out (first proposal). All these aspects, which have been more or less ignored in the recent studies made available to the Consultant, make it difficult; within the present study, to hypothesize on the dimension of any commercially attractive combined transport system.

- Investment in «key» terminals (equipment and layout improvement). Priority is given to the use of the existing infrastructure through repairs and rehabilitation. Upgrading of the infrastructure or new infrastructure components should be kept at a minimum.

The network should concentrate on the accessibility to only a few Adriatic ports, which requires the convergence of substantial traffic flows. Selected ports should be adequately linked to the land transport network and equipped for combined transport.

8 Inland waterways transport

The inland waterways regional transport system involves rivers and inland ports in Serbia and Montenegro, in Croatia and in Bosnia and Herzegovina.

The Core Network of the region includes one inland waterway, the Danube.

Other main waterways in Serbia and Montenegro are one interstate navigable route (the river Tisa) and river Sava. Sava still has an unresolved status (interstate or international river).

The Croatian waterways network comprises the river Sava (to Sisak) and the river Drava (to Osijek). The clarification of the status of the Sava and the future construction of Danube – Sava Canal is being considered by the Croatian authorities.

The Bosnia and Herzegovina network includes an important section of the Sava.

The Sava is, thus, the second most important inland waterway seen from a regional perspective.

The region's inland navigation system is dominated by the Danube, which constitutes the Pan-European Corridor VII and is also part of the Core Network.

In order to obtain a comprehensive description of the waterways transport in Serbia and Montenegro including the Danube and to attract projects to be financed by international institutions, a Master Plan and various feasibility studies will be elaborated by the Ministry of Transport and Telecommunications (MTT) and the European Agency for Reconstruction (EAR) for a total budget of around EUR 2.1 million. Consequently, is has been found of limited value within the current REBIS study to emphasize the Serbian waterways network, in general, and more specifically the Danube.

As an international agreement on the management and development of the Sava river basin has been made, it was, however, decided by the Steering Group of the REBIS study to undertake a brief study of the Sava, based on available information. As a result, a special study included in Appendix 15 was undertaken to assess the state of the river, including historic traffic data and the scope and costs of proposed improvements.

This chapter documents the current situation of the inland waterways with emphasis on the Sava river, and provides an initial indication on its future potential and ongoing activities and projects.

The chapter provides an overview of the inland waterways system: profile of the river and main ports as well as past and present traffic figures. The overview also includes a description of the legal and institutional situation regarding the Sava before the future transport prospects on this river are addressed.

Then transport-related projects regarding the restoration and development of the Sava are introduced, and finally some preliminary conclusions are drawn regarding issues that should be addressed in the future Sava process.

Data and information have been collected through interviews with local authorities, universities and other involved parties. Valuable documentation has been provided by the parties involved in the Sava Basin Initiative.

An overview of Danube and Sava is presented in the following map.

Figure 8.1 Core Inland Waterway Network and River Sava.

8.1 Overview of the Danube waterways system

The Danube is linking Serbia and Montenegro in the direction northwest-east and north-south with the neighbouring Danube region countries (Hungary, Croatia, Rumania, Bulgaria) as well as the countries of Central and Western Europe (Slovakia, Austria, Germany). From Belgrade down to the Black Sea the Danube is a Class VII river canalized from Belgrade to Turnu-Severin. Class VII rivers admit nine barge-pushed convoys with a maximum of 27,000 tons; this is the stretch of river from Bulgaria to the Black Sea. Upstream of Belgrade, the Danube is a Class VIc free flow river between Belgrade and Bu-

dapest. The VIc class admits six barge-pushed convoys with a maximum of 18,000 tons.

However, the navigability of the Danube has been seriously disturbed since the NATO bombing. Recent initiatives are tackling the river navigability problems. In this way, an agreement to revitalise the Danube, funded by the European Commission (85%), has been reached in February, 2002. The Memorandum of Understanding on the Danube Pan-European corridor created a specific structure for promoting various initiatives to develop the Danube corridor. The most important projects were to clear the sector of Novi Sad where three bridges were destroyed by NATO bombing in 1999. However, there are still some damaged areas in the Serbia and Montenegro sectors of the Danube where navigation is not safe.

The blockage of navigation at Novi Sad has already been remedied, although destroyed parts of three bridges are still lying in the river bed. As a result of common actions of the EU and the Danubian countries, it is now possible for cargo ships to pass through this section. A temporary fairway exists, but ships have to adjust to the time table of opening the pontoon bridge. In 2001 the pontoon bridge was opened 30 times and a total of 3 705 ships used this possibility to pass.

Undoubtedly the restoration of the Serbian and Montenegrin sections of the Danube will have a positive impact on a very large scale, as the river is an essential transport link between Central and Western Europe (Slovakia, Austria, Germany), Eastern European countries (Hungary, Croatia, Rumania, Bulgaria) as well as the Ukraine and Moldavia.

The main international ports on the Danube are: Apatin, Novi Sad, Pancevo, Smederevo, Prahovo and Belgrade, of which Belgrade and Novi Sad are the primary ones. In addition, also Kovin and Sombor are national ports.

As a consequence of decreasing industrial production and economic difficulties, destructions due to the bombing on key infrastructures, and the lack of maintenance of both port and river fleets, traffic on the inland waterways has decreased drastically during the last two decades: 25.2 million tons passed in 1980; 19.5 million tons in 1990 and only 12.6 million tons in 1998.

In the port of Belgrade alone, traffic dropped from 5.2 million tons in 1970 to less than 1 million in 1998. In the same year, transit traffic on the Danube barely reached 5.6 million tons. Passenger traffic no longer exists.

The restoration of the damaged sections of the Danube should gradually allow to serve the increasing trade between Western and South-eastern Europe, which in turn will generate significant flows of traffic.

As mentioned, various initiatives are taken to assess the current situation and propose strategies, programmes and projects for reconstructing and developing the Danube. The first objective is to prepare a Master Plan for Inland Water-

ways. The second objective is to prepare a Feasibility Study involving three projects:

- quickly restoring unhindered navigation
- rehabilitating the Serbian waterways network taking into consideration the Master Plan recommendations, and
- preparing a Port Development Plan

As restoring unhindered navigation on the Danube network is considered to be extremely urgent, a full set of tender documents for cleaning works will also be prepared for this aspect of the Feasibility Study.

8.2 Present situation for Sava River

Navigability
Navigation on the river Sava, and its tributaries, was well developed in 1990. The commercial waterway had a length of 586 kilometers and reached from Belgrade to Sisak (Croatia) around 50 km from Zagreb. The links between the ports on the Sava, by rail and road, facilitated low-cost transportation of goods between the Sava basin and a range of locations.

From the mouth of the Sava at Danube up to Brcko at 225 km, navigability was Class IV, whereas from Brcko to Sisak it was Class III. Class III implies that the river was navigable for ships with a tonnage of up to 1,000 tons, while the figure for Class IV is 1,500 tons with a draught of 2.5 meters.

Historically, there has been very limited possibility of navigating from Sisak to Zagreb, and there are no plans to restore or upgrade this section.

The navigability of the Sava has a seasonal aspect as well. At Brcko, for example, the river was considered navigable for around 275 days per year, the main problem being low water levels during July-August. Navigability higher up on the river was below 200 days/year. During foggy weather, limits were introduced on navigation speed.

The present navigability of the Sava is also limited by heavy sedimentation at particular places together with non-maintenance of the river bed (considerable amount of dredging would be required to restore the river depth); but also by riverbank constructions, whose maintenance have been neglected or are destroyed. Besides, inadequate or obsolete marking signals and navigational safety do not facilitate the navigation on this river.

As a consequence, the navigability of the river has been virtually non-existing apart from a few local stretches.

However, a number of rehabilitation activities have already taken place in Croatia, Bosnia and Herzegovina and in Serbia and Montenegro. In Croatia, the authorities are planning to restore the stretch Sisak-Slavonski Brod and have set aside EUR 2 million for dredging of the river bed for each of the years 2002

and 2003. Croatia has also carried out bathymetric surveys and reconstructed signs on part of the river. Bosnia and Herzegovina has invested EUR 600,000 in the demining of riverbanks and has commissioned bathymetric surveys and planning of riverbed cleansing. Finally, Serbia and Montenegro have spent around EUR 1 million on cleaning of unexploded ordinance from the riverbed.

Main ports of Sava

In Serbia and Montenegro, Sava is serviced by ports at Belgrade, Sremska Mitrovica and Sabac. The two other ports than Belgrade are considered minor ports with limited strategic importance compared to ports on the Danube. This is reflected by the fact that for neither of the ports have projects been proposed as priority investments of the Interim Action Plan of the Sava Basin Initiative.

The main ports in Bosnia and Herzegovina are Brcko, Samac (not in operation) and Brod.

Of the three main ports in Bosnia and Herzegovina, the one in Brcko at 225 km was the largest in terms of cargo turnover. Pre-war capacity was around 750,000 tons per year. A marked decrease in turnover took place during the late 80's, and by 1990, traffic had decreased to 77,000 tons of cargo. The port had direct connections to the rail and road networks. While there was significant capacity, operational efficiency was relatively low. With funding from the Italian government, repair work has been carried out recently on the two cranes, and the port is now operational. Further reconstruction of the port would require initiatives in terms of dredging, quay reconstruction, and repair of warehouses. A feasibility study of port restoration has been carried out.

The second port in Bosnia and Herzegovina, Samac (at 304 km) is not in operation. Rehabilitation needed to put the port back into operation would include dredging of port access, quay reconstruction, repair of warehouses, repair of cranes and restoration of road and rail infrastructure. The port was originally designed for 1 million tons per year with plans to expand to 3 and 5 million tons in subsequent phases and adding a customs-free zone. Pre-war capacity at the port was 3-400,000 tons of goods. The port was connected to road and railway systems. It is usable approx. 220 days per year.

The port in Bosanski Brod is a dedicated port for liquid cargo connected to the refinery in Brod.

On the Croatian side, the port at Slavonski Brod is second in Croatia to Sisak**,** Croatia's biggest river port and centre of river shipping industry.

Traffic figures: past and current developments

Brcko, Samac and Brod were the key Sava ports in the region up to 1990. Brod was the most important facility in terms of volume, handling around 50%. The cargo volume in 1990 totalled 5.2 million tons with the following distribution: Brod (2.8); Sisak (0.8); Zupanja (0.6); Samac (0.5) and Brcko (0.5). Following the conflicts in the early 90's and the NATO bombing in 1999, transport on the Sava virtually disappeared. Most of the transport has been transferred to road.

Even against a background of very restricted navigability and slow economic recovery, there are, however, recent signs of transport resuming under the entire responsibility of the navigation companies. Most of the resumed transport is local such as transport of oil and coal between Raca and Sisak, but also transport over larger distances is taking place. Only small, local ships are being utilized for this kind of transportation, which takes place at the risk of the operators and potentially at a risk for the environment. Generally, the fleet is old and has deteriorated due to idleness and age.

According to the Croatian Ministry of Maritime Connections (MPPV), an annual amount of 250,000 tons (mainly oil) is being shipped from Brod to Sisak.

Legal and institutional situation
In 1990, the river Sava was used as a domestic network. Now, the Sava covers four countries, Serbia and Montenegro, Bosnia and Herzegovina, Croatia and Slovenia. This entails a range of institutional and management challenges for the countries involved, which have to be dealt with as part of post-conflict regional cooperation efforts.

With the support of the Stability Pact for South-Eastern Europe, the four riparian states have entered into a process of cooperation for the sustainable management of the water resources of the basin. Negotiations began with the signing of a Letter of Intent by the parties, on 29 November, 2001 in Sarajevo. In the Letter of Intent, the parties decided to cooperate regarding:

- establishing the status of the Sava as an international river and putting in place an international navigation regime on the Sava and its main tributaries, the Una and the Drina

- promoting sustainable management of the Sava Basin waters and related resources

- fostering integrated economic development while preserving the environment and the well being of the population

- creating the proper institutional framework to fulfil these objectives; cooperation developed toward the formulation of the "Framework Agreement on the Sava River Basin", which has been signed by the four countries and is pending ratification

A key feature of the agreement is the establishment of the International Sava River Basin Commission, which will be responsible for the implementation of the Agreement. Two annex protocols are related to transport, one on regulation of the navigation regime and a second one addressing the prevention of water pollution caused by navigation.

According to the Agreement the Sava Basin Commission has the following functions:

- to support the provision of safe navigation

- to decide on the financing of the construction of navigable waterways and their maintenance
- to make decisions on its own work, budget and procedures
- to make recommendations on all other issues regarding the realisation of the agreement

A key element of the Sava Initiative is the development of an Action Plan that provides a framework for identifying, prioritising, scheduling and managing activities and projects for executing the Framework Agreement.

In early 2002, the Sava countries established a Rehabilitation and Development (RD) Working Group to assume the task of designing an interim Action Plan, comprising a number of high priority projects. The first task of the group has been to define objectives and actions in the area of rehabilitation and development of navigation, to be followed up by design of priority programmes.

The process of institutionalising the cooperation around the Framework Agreement currently centres around four issues:

- ratification (The Framework Agreement will enter into force 30 days after the date of deposit of the fourth instrument of ratification by the parties)
- appointment of representatives of the Sava Commission (two representatives will be appointed by each party)
- selection of the Sava Commission Seat (the Selection of the Seat of the Commission has been deferred and is still under negotiation by the parties)
- Interim Sava Secretariat (an Interim Secretariat is serving the Sava Initiative with support from international donors)

Whereas the ratification process is ongoing, issues regarding the seat and funding of the Sava Commission appear to be a matter of some difference of opinion among the parties. Of more fundamental importance in the longer term might be the fact that Serbia and Montenegro appears to puts less emphasis on the Sava's role for transportation purposes than Bosnia and Herzegovina and Croatia, while the environmental and water management issues have a higher priority from the perspective of Serbia and Montenegro.

The prospect of committing to major investments in establishing and maintaining navigability with limited national benefits to Serbia and Montenegro may be cause of some reservations. The Danube is more important from a Serbian and Montenegrin transport perspective, while it is recognized that the Danube development may provide spin-offs to the Sava.

The desirability of setting up a new institutional structure that will have to deal with issues that are overlapping with the work of the Danube Commission has also been raised. Once operational, the Sava Commission is expected to take on

a role similar to that of the Danube Commission in terms of harmonizing laws, implementing EU directives (most importantly the EC Water Framework Directive), and coordinating major development projects.

A separate ongoing Sava-related initiative is the Working Group on the Sava River Basin Management Plan that has been established by the International Commission for the Protection of the Danube River (ICPDR) within the framework of a UNDP/GEF project.

It should be noted that from the perspective of Bosnia and Herzegovina, the Sava Commission and its secretariat is seen as a facilitator that will not just promote international cooperation, but will also be a vehicle for the complex coordination between the three main institutional parties involved from the side of Bosnia and Herzegovina, i.e. the federal level, the District of Brcko, and Republica Srpska.

The ratification of the Framework Agreement will establish the Sava as an international waterway with the resulting obligations that this entails. At the same time, the signing by the parties of the "European Agreement on Main Inland Waterways of International Importance (AGN)" may be regarded as a commitment by the parties.

Not only the technical state and the transport potential of the river ports are important to the future infrastructure development along the Sava, but also the organizational and institutional issues. The process of moving toward increased market orientation and commercialisation is taking place in the countries in question, but at different speeds. Separation of the functions of port management/planning/supervision (to reside with the port authority) and commercial operations are on the agenda in all countries, but also progressing at different speeds.

Presently, Croatia has advanced the most along the path toward privatisation and concessioning of port activities. This is reflected most strongly in the case of Slavonski Brod, where a multi-modal transport project is under development in cooperation with the private sector.

8.3 Outlook and prospects for Sava

On the Sava, the still unclear status of the river and the absence of large traffic volumes to justify the significant investment required by the construction of the future canal to integrate the Sava system into the Danube make the future uncertain.

On the other hand, the future development of transport on the Sava and the need for port investment will depend on the economic and industrial development of the region. Future volumes of commercial traffic will be determined by industrial and commercial demand including types of industries and location of industrial centres.

So far, a comprehensive regional assessment of the transport potential on the Sava, (task beyond the scope of REBIS study) providing the basis for the preparation of individual port projects has not been carried out. Consequently, the information is not presently available that would provide the basis for an integrated planning and prioritisation of investments in the Sava transport infrastructure.

This fact is also reflected in the output of the design of the Interim Action Plan. When it comes to investments beyond the basic restoration of navigability, the investment proposals put forward regarding the port facilities are projects that have mainly been designed and developed at the national level rather than as the result of a regional planning process.

The volume of national and international cargo can be expected to grow with the economic development and once navigation on the Sava is fully restored. At the same time, considerable uncertainty remains regarding the future production and trade patterns with the European Union and Central and Eastern Europe (CEE). Historic traffic statistics available from former FR Yugoslavia can not be extrapolated to forecast future traffic.

It appears to be a reasonable assumption that the volume of bulk and liquid cargo (such as minerals, building materials, and petroleum products) will increase, although the data available does not provide a clear indication of the likely level. Transport projections for the Sava should take into account the fact that there is modal competition, as the river runs parallel to Corridor X, for which both road and rail projects have been defined.

Experience from other CEE countries does not suggest that any dramatic increase in the modal share of river transport is likely. The share of ton-kilometers of rivers has been between 2 and 3% since the 70's, with a slight increase in share during the late 90's. However, this has taken place against a backdrop of substantial decline in absolute freight traffic volume. The modal shares in CEE countries correspond to that of West European countries with a modest level of waterway infrastructure development. On the other hand, the modal share for countries with a well-developed infrastructure could be over 20%. In the REBIS project, the growth rate of inland waterway traffic is roughly assumed to follow the GDP, which is higher than rail and less than the projected growth in road traffic.

8.4 Recommendations for Sava development

There is considerable regional and national commitment to the Sava process, and in this process, Sava's potential as a transport corridor is high on the agenda. Transport on the Sava is playing a prominent role both in the Sava Basin Initiative and in the transport planning at the national level in the countries concerned.

Four main issues can be identified that will be essential in order to make the ambitious visions for Sava's role in the regional transport system come true:

1 The status of the Sava as an international waterway must be clearly established, as it is likely to happen through the ratification of the Framework Agreement.

2 The Sava Commission and other regional processes and institutions must become operational vehicles for regional cooperation, analysis, planning, and project development. The parties interviewed for this study have expressed a common need for regional transport and economic analyses that can provide the necessary basis for the development and financing of future projects. In particular, there is insufficient knowledge about the potential for linkages with rail/road transport modes and opportunities for combined transport solutions. Both national and local governments, port authorities and potential private sector investors would benefit from additional knowledge, and it can be expected that the Sava Commission will address these issues.

3 Financial resources for upgrading of the Sava and its ports and transport facilities will be scarce, which means on the one hand that public funding will have to be prioritised and allocated based on accepted economic rationales, while at the same time public-private partnerships will be required to reach the desired level of investment. Legal and institutional issues will have to be resolved with regard to port management, restructuring and privatisation. International Technical Assistance may be able to provide support for this process.

4 Finally, economic and industrial development patterns in the region must provide the underlying demand for transportation services that match the special characteristics of river transport.

In the light of the findings of the present study and the uncertainties associated with the four issues mentioned above, a phased approach to the restoration and further development of the Sava as an international waterway is recommended.

During the first phase, navigability would be restored and basic rehabilitation carried out to make selected ports operational. Initiatives to restore navigation and do basic rehabilitation of ports are already underway in all of the countries.

In a second phase, more comprehensive development plans and investments may take place, depending on the development in the above parameters with due consideration of the overall scheme of transport in the region, including linkages with Trans-European Corridors. This could also include upgrading of navigability to Class IV over the entire length. It is recommended to investigate the possibilities for private sector involvement, particularly in port superstructure development, before major investments are undertaken.

9 Ports and airports

This chapter provides a brief overview of the current situation in the seaports and the airports on the Core Network.

The chapter is divided into two sections dealing with the seaports Core Network and the airports Core Network, respectively.

The chapter is based on data collected by the team of resident economists during interviews with relevant counterparts during the project-screening period.

An overview of the investments suggested in the short-term investments plan for ports and airports are provided in Chapter 3 of the present report.

9.1 Seaports Core Network

9.1.1 Introduction

The Balkan countries have outlets to the Adriatic Sea. The ports are, generally, important for oil and other bulk commodities, while container traffic is gradually being developed, especially in Rijeka.

Outside the region, the port of Koper in Slovenia and Thessaloniki in Greece are important ports for traffic to/from Bosnia and Herzegovina, Serbia and Montenegro as well as FYRO Macedonia.

With the exception of the ports along the Mediterranean sea, Northern and Western European ports still have a strong foothold within the market of overseas traffic related to South European countries in general (specially container traffic) via ports such as Rotterdam, Antwerp and Hamburg. Nevertheless, a system of "Hub-ports"[11] or transhipment ports recently developed in Malta (Marsaxlokk), in Italy (Gioia Tauro) and in Spain (Algeciras) is strengthening the position of the Mediterranean ports.

[11] In these ports, the transhipment constitutes practically the only activity, contrary to the "market ports" which are basically turned towards their hinterland (Rotterdam, Hamburg, etc).

In the region, many of the ports are still trying to service many market segments in terms of types of cargo and are still having a limited geographical hinterland due to national considerations as described below. There is not yet a strong specialisation between the ports. It can be expected that as the traffic starts flowing more freely in the region across the borders, and as competition intensifies even more between the ports, port specialisation will occur.

Thus, while there is a relation between developments in maritime transport and local, regional and international economic development and trade, such a relation will be difficult to apply for on each cargo type in each port. However, maritime transport, in general, can be expected to grow with a growth rate between rail and road, i.e. between 40% and 100% to year 2015. Such a pattern between the modes has, in general, been observed in Europe during the last 20 years. However, it must be noted that because total present traffic is limited, specific discrete events can change the actual growth rate a lot in the medium to long-term, e.g. if one of the ports is chosen as location for a major new oil-refinery.

Another important demand prospect is that short-sea shipping on many occasions has proved a viable alternative to land-based transport and in particular to road transport. This applies, in particular, for services where short-sea shipping can provide a short-cut compared to land-based transport leading to shorter transport distances and often also shorter transport time. Examples of this are found many places, and candidates in the region for such services could - as examples - be routes between Italy and the region and between Spain and the region. Such routes would not be a result of a general increase in traffic but be the result of a specific targeted effort to take over market shares from road traffic. Such "motorways of the sea" are being promoted by e.g. the EU Commission and some major short-sea shipping operators, and in the region there may be scope for such concepts.

The Core Network consists of the following ports:

- Rijeka
- Split
- Dubrovnik
- Ploce
- Bar
- Durres
- Vlore

Zadar plays an important role - second to Split - in the Croatian passenger traffic and also has some regional importance.

9.1.2 Port status

The port of Rijeka

Most of Croatia's export and import is made via the Rijeka Port. The port is also a significant transit port for countries such as Hungary, Slovakia, the Czech Republic, Austria, Slovenia and Bosnia and Herzegovina.

The traffic flows strongly decreased between 1991 and 1996 as the port lost 50% of its traffic. Since then, the situation has stabilised around 3 millions tons of general and bulk cargo (3.1 million in 2001) and 5.3 million tons of crude oil.

The port's total capacity is evaluated to 33 million tons/year of which 24 million tons concern oil and petroleum products, and 9 million tons traffic of general and bulk cargo.

The passenger traffic of the Rijeka port serves mainly traffic along the coastal passenger ships lines, which connects Rijeka with Zadar, Split and Dubrovnik during the whole year and with Greece during the summer.

The port of Rijeka's main facilities are a general cargo terminal, for containers, a Ro - Ro terminal as well as specialised terminals for cereals, soya bean, phosphates, fruits, frozen meat and fish, timber, livestock, heavy lifts and dangerous cargoes.

The Port of Rijeka, the largest port of the region, is in direct competition with Koper (Slovenia) and Trieste (Italy). These three ports share the same profile-same favourable location, universal ports with specialized terminals. To avoid an exhausting competitive struggle between them, the ports are taking initiatives with the aim to gradually transform the present three North-Adriatic neighbour-ports into a single integrated port system, in which each individual infrastructure would have its own recognized specialisation. The improvement of Rijeka's poor hinterland connections is a prerequisite to maintain its future position within such a system.

Port of Split

In the beginning of the 1990s the Port of Split was the 3rd port by size in Croatia - for the last 30 years it has had an annual traffic of 1.5-2.0 million tons. The yearly traffic was about 850,000 tons in 1988. Since then, the port activity has been strongly declining serving only 75,000 tons in 2002.

With the re-opening of the Lika railway (which is the only connection to the interior parts of the country), there is now prospects of revitalising the port of Split. The expected modernization of the Lika railway (which will shorten the travel from Split to Zagreb from 10 to 5 hours), and the future opening of the UNA railway are expected to help the recovery of the port activity. Also the opening of the duty free zone in the port of Split is expected to attract foreign partners. The Free zone started operating in January 2001.

The port of Dubrovnik
The port has an important passenger/tourist traffic activity, which has increased, from 187 passenger/cruise vessels in 2000 to 337 passenger/cruise vessels in 2002.

The port's freight traffic is limited.

In the study "Port of Dubrovnik - Passenger Port Development", four different projects have been identified. The main component is the construction of a passenger terminal aiming at separating domestic traffic from international traffic and speed up traffic throughput.

The port of Ploce
The port of Ploce is located on Corridor Vc serving the south of Croatia and Bosnia and Herzegovina.

The port traffic is mainly composed of general cargo. The port's activity has been slightly declining since1997 when it reached 403 cargo vessels. In 2002, the traffic was 359 cargo vessels.

The future development depends on the future configuration of the regional port system, which still appears to be uncertain. The projected construction of a new container terminal with one berth, deep channel access, ro-ro ramp, storage and cargo-handling areas could also be of interest in connection with the port traffic development.

Port of Bar
The port of Bar is the only sea port on the Core Network within the territory of Serbia and Montenegro. Of the total port activities, 95% is turned to Serbia and Montenegro.

Today, the capacity of the Port of Bar is five million tons per year of all types of cargo; general, liquid and bulk.

Traffic fell to 1.3 million tons in 2000 compared to 2.7 million tons in 1989. The annual volumes in 2001 are 1.4 million tons (28% as compared with its capacity). Container traffic activity was 5,000 TEU in 2002 (10,000 TEU in 2000).

The Port facilities include terminals for general cargo, oil products, liquid cargo, containers, Ro-Ro, timber and passengers.

While the port offers good (service) performance to its users, its weak interior connections by rail and roads affect its overall competitiveness.

The main breakwater of the port, partially destroyed in a storm in 1998, has recently been reconstructed. The European Investment Bank has secured EUR 6 million for the execution of urgent works.

The Port is commercially managed. The whole territory of the Port of Bar is also being converted into a duty free zone.

These efforts aim at making Bar a regional hub. However, the weak domestic market and the poor hinterland connections place Bar in an unfavourable position as compared to its direct competitors the ports of Thessaloniki and, to a lesser extent, Koper and Rijeka particularly for lo-lo traffic.

Port of Durres
Durres is Albania's main seaport and the second largest industrial centre. The port is the gateway on the Adriatic for Pan-European Corridor VIII.

In the seven-year period, 1993 through 1999, the port cargo throughput increased from 759,000 tons to over 1.2 million tons. The port was then said to be near the limits of its capacity (TIRS study). However, since 1999, traffic has been continuously growing and reached 1.77 million tons in 2002.

The a high proportion of the freight traffic registered in 2002 related to imports (94%) of which cement, fuel oil and chemical products represented more than 50% of the total imported volumes. General cargo representing near 40% of the total is also important.

The container traffic is almost insignificant: 1,024 TEU in 2002. Traffic in the ferry terminal is approximately equal to 20,000 truck and trailers.

Most of the relevant facilities, as well as road and rail connections have been subject to upgrading and rehabilitation.

The regional road connections to the hinterland, under rehabilitation or construction, involve the Pan-European Corridor VIII linking with FYRO Macedonia and Greece; a new planned direct road connection to Kosovo, and other core regional roads such as the North South corridor linking to Montenegro and Greece. On the contrary, there has been little development of the regional rail connections except for the reconstruction of the damaged railway link to Montenegro. The severe reduction in the exploitation of minerals and heavy industries has greatly reduced the importance of rail traffic for the Port of Durres.

The port facilities themselves have been the subject of a Port Development Master Plan Study, financed under the World Bank. The EIB loan, which is closely linked and complementary to the on-going World Bank financing of the port, concerns basic port infrastructure and equipment serving multiple uses and improving efficiency as well as safety of cargo handling in the port. In Appendix 7, Terms of Reference are suggested for up-dating this master plan.

Port of Vlora
The Port of Vlora has been included recently as a core port of the Pan-European corridor VIII.

At present, this port handles some general cargo imports of foodstuffs and building materials and fuel for the local market that has been slightly reduced in

2002. The main function is regular ferry traffic which is now limited to the connection to Brindisi in Italy.

As the port is in bad condition, with substandard facilities and problems of access, in particular during the winter, an investment plan for its upgrading has been prepared in the framework of the Port Master Plan. The plan has been partially implemented; the first phase has been started. However, investments have been suspended due to the cancellation of a contract and the international financing scheme has been scrapped, though the Ministry of Transport and Telecommunications (MTT) has maintained the programming of the planned works.

9.1.3 General conclusions

The seaports, in general, constitute an important part of the infrastructure on the Core Network. Freight traffic volumes have declined compared to 1990, and there are only limited capacity problems.

The transformation of the regional political and economic context, the inadequacy of transport infrastructure, port facilities and infrastructure to the new market environment have seriously affected the activity of the main regional ports.

Due to the current situation the ports in the Adriatic, which is characterised by an extremely competitive environment, the ports of the region have little choice; greater efforts should be made to strengthen its individual positions and, when relevant, it should also be considered to establish a regional agreement on joint promotion, co-ordinated development of infrastructures and port facilities and port specialisation for specific cargo.

The development of an efficient port system calls for a network concentrated on only a few ports, with the aim of facilitating the convergence of substantial traffic flows that, in turn, will reduce unit cost and help increase the frequency of services. Following such a concentration/focus for each port, the development of high-frequency ro-ro services could be attractive between the region and Italy - similar to the services operated between for instance Denmark and England on the North Sea and between Finland and Sweden in the Baltic Sea. The rationale for such services, relying on semi-trailers and containers, is the much shorter travel distances by ro-ro ship than by road between - for example - central Italy and Serbia and Montenegro.

9.2 Airports

The airports and civil aviation sector has been the subject of a significant number of comprehensive studies. The most important study is the Air Traffic Infrastructure Regional Study (ATIRS), launched as part of the Regional Funding Conference for South-Eastern Europe held in March 2000 and carried out in the spring of 2001 by Nordic Aviation Resources AS under the auspices of the EIB. The study results cover physical and institutional aspects, and include indications on priority investments.

The key results were presented at the European Investment Bank and, subsequently, at a Workshop on ATM Cooperation in South-Eastern Europe held in Sofia in March 2001 under the auspices of the Air Traffic Services Authority of Bulgaria.

One of the areas singled out for further study within ATIRS was air traffic infrastructure, which presented considerable needs for making up lost ground. A considerable scope for investments in air traffic infrastructure in the region was identified, including their differentiation according to the degree of urgency. The study recommended that efforts should be focused on the modernization of existing installations or maximising their potential. The construction of sizeable additional passenger handling capacities at certain airports seemed premature. In certain cases, where new investments can be justified, the critical bottlenecks are in the institutional area, where reforms need to be undertaken.

This report also deals with the strategic level, and measures recommended for early implementation in the various Country Reports (quick-start projects) are to be implemented in the Short-term. The reader is referred to that report for specific details.

The objective of the REBIS study as for the airport sector has been to review and update, to the extent possible, the status of the infrastructure projects under consideration for further investment. The result from this work, based on interviews with relevant national aviation authorities, is presented in the short-term investment plan.

The Core Network of airports comprises airports in the capitals and, furthermore, the airports in Banja Luka, Split, Dubrovnik, Nis, Pristina and Podgorica.

10 Regional co-operation on the development and monitoring of the Core Network

Since the Core Network is regional in nature, the development of it requires regional dialogue and co-operation. Also the establishment of efficient transport systems - particularly in the railways and the combined transport sectors - requires co-operation between the countries of the region, since none of the countries have the sufficient size or market potential required for such efficient systems.

Within the framework of REBIS a regional dialogue was established - in the form of high-level meetings and seminars - and initiatives have been taken to continue the dialogue and co-operation beyond the duration of the REBIS project.

This chapter describes in 10.1 the dialogue that took place within the framework of REBIS in the form of high-level meetings. In Chapter 10.2, a framework is proposed for continued co-operation in the form of joint Core Network management involving all countries of the region. In addition, Chapter 10.3 presents a database to be used for the joint monitoring of the Core Network.

Further detail on the High Level Meetings are presented in Appendix 20.

10.1 High-level meetings

Within the framework of the REBIS project two high-level meetings were conducted. The meetings were organised by the Infrastructure Steering Group (ISG) Secretariat with the assistance of the REBIS consultants.

The first high-level meeting took place in Luxemburg on 6-7 February 2003. From the region the participants were high-level representatives from the Ministries of Transport and the Ministries of Economy/Finance, or similar. The members of the ISG were also represented, as well as representatives of the REBIS consultants, the Greek EU presidency and the European Conference of Ministers of Transport.

The agenda of the meeting included the following subjects:

- the transport strategic perspectives of the enlarged European Union and of the countries in the region
- the role of the Infrastructure Steering Group (ISG)
- the REBIS project
- project financing
- border crossing issues
- the status of the reform process and institutional strengthening
- mechanisms for building political endorsement
- a follow-up work programme
- the importance of regional co-operation

The meeting demonstrated the importance of planning transport systems from a regional and multi-modal perspective and on the basis of a commonly agreed Core Network. Criteria for the selection of priority projects on the Core Network were discussed, and a preliminary list of regional projects for priority consideration was presented.

The status of the reform process in each of the countries was presented, and the importance of institutional reform was highlighted. Also the importance of maintenance management for ensuring sustainability of transport investments was underscored.

The EC Integrated Border Management programme (IBM) and the World Bank programme on Trade and Transport Facilitation in Southeast Europe (TTFSE) were discussed and there was a broad agreement to identify possible remaining gaps affecting border crossing on the Core Network.

The second high-level meeting was held in London on 26-27 June 2003. During this meeting the regional dialogue was continued, and a possible framework for future co-operation was further elaborated. Participants were high-level representatives from the Ministries of Transport and the Ministries of Economy/Finance of the region, as well as representatives of the members of the ISG, the Greek EU presidency, the Italian EU presidency, the European Conference of Ministers of Transport and the REBIS consultants. During the meeting the Draft Final Report of the REBIS project was presented and discussed with particular emphasis on the finalisation of the Core Network. Also the future regional co-operation on the development of the Core Network was a key issue for the meeting.

Between the two high-level meetings, a regional seminar was held in Skopje on 8 May 2003. High-level representatives of the countries participated, together with representatives from the EU Commission, the ISG Secretariat and the REBIS consultants. The main subjects of the seminar were transport reform and institutional strengthening.

The seminar concluded i.a. that:

- although the REBIS study will be finalised and its key conclusions discussed at the high-level meeting in London, future high-level meetings should continue to be organised by the ISG at regular intervals

- an effort should be made to prepare and sign a Memorandum of Understanding confirming the countries' commitment to implement an agreed transport Core Network before the end of 2003

- concrete proposals for the establishment of a regional steering committee and a permanent secretariat should be prepared and submitted for the high-level meeting on June 2003

Details of the three meetings are presented in Appendix 20.

10.2 Transport observatory - SEETO

This section gives a practical proposal on how to achieve/support continued regional co-operation and joint development and monitoring of the Core Network. The proposed mechanisms have been used earlier for similar issues in countries in Central and Eastern Europe. However, the proposal for continued joint co-operation presented here has been adapted to meet the needs of the region and to take in to account experience from Central and Eastern Europe and elsewhere.

10.2.1 Core Network implementation and monitoring

Experience shows that progress in implementing a regional Core Network implies three essential requirements:

- a firm and clear political commitment by the parties to subsume their individual interests in agreed regional goals typically expressed through a Memorandum of Understanding and through making available resources for joint monitoring of the development of the Core Network

- a **monitoring mechanism**, however light, in the form of a Steering Committee supported by a Secretariat to provide capacity for discussing and evaluating progress and for agreeing priorities and resolving problems on a multilateral basis

- shared **technical back-up** to ensure that key data can be collected, analysed, used and presented in a regional context

Experience also shows that if regional co-operation is to prosper, the involved countries are much assisted and the process accelerated when a leading international organisation is devoting; i) funds for technical back-up, and also; ii) expert/policy resources in support of the process. In general, on a world-wide basis, organisations such as the EU Commission and IFIs, eg EBRD, EIB, the World Bank and ADB, are often dedicating funds and expert/policy resources in support of regional co-operation processes with clear positive catalytic results.

For several important issues, such as designing investments within an appropriate regional framework - through prioritisation of major regional transport

links, ensuring compatibility of regulation and facilitating border crossing - a regional approach to Core Network management instead of several national ones is expected to bring about substantial benefits.

REBIS is investigating the currently operating infrastructure management systems in the region as documented in the present report. In general, there are large differences between the countries and between the modes, and data are not collected nor compiled in a way suitable for monitoring regional development of the Core Network. This underpins the fact that some form of technical back-up is needed to ensure that key data are compiled in a form suitable for regional network monitoring and analysed and used, if monitoring and implementation of the Core Network are to be achieved.

One important instrument amongst others to ensure such a secretarial and technical back-up function is a joint office shared between the countries. The office is tentatively named SEETO - South Eastern Europe Transport Observatory.

An overview of the three levels of Core Network management is provided in the figure below.

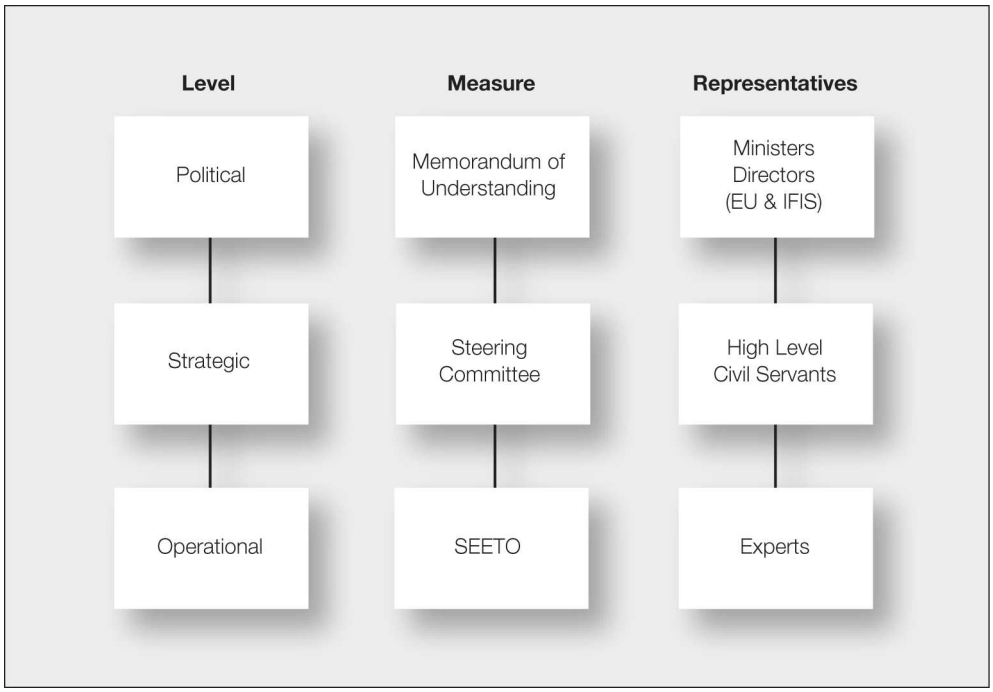


Figure 10.1 Overview of levels of Core Network management and monitoring.

10.2.2 SEETO objectives

In order to fulfil its role as the practical secretariat for the regional co-operation and Core Network management, SEETO should target the following specific objectives:

- preparation of annual and multi-annual work plans

- being a recognised information centre for projects related to the Core Network
- running and maintaining a GIS-based system with information and data on the Core Network

10.2.3 SEETO tasks

In order to meet its specific objectives, SEETO is proposed to have the following main tasks:

- Task 1 - Assist the Steering Committee by preparing and updating annual and multi-annual work plans for the development of Core Network projects and priority areas.
- Task 2 - Maintaining a Core Network database with information on the network and its bottlenecks. The database - suggested to be implemented in GIS - will also contain information on traffic flows on the Core Network. Reference is also made to Chapter 10.3.
- Task 3 - Compiling and disseminating information on projects on the Core Network, policy development and network status.
- Task 4 - Improving planning practices. Arranging best practice regional transport seminars for participants from the region.
- Task 5 - Make the practical arrangements for 6-monthly high-level regional transport conferences (from 2005 and onwards).

10.3 Database for the monitoring of the Core Network

10.3.1 General framework

An important task of the South Europe Transport Observatory (SEETO) is to monitor traffic and physical conditions of the Core Network, and to oversee how projects are planned and implemented. This task requires the regular reporting of data from relevant transport authorities in the region, and an appropriate tool to process and store data and to produce the required reports.

For this purpose REBIS has developed a comprehensive and user-friendly database.

The EC Commission has recently prepared detailed data definitions for the collection of such data on the TINA network, and subsequently UN-ECE has agreed to use the same definitions in their work. The REBIS project has therefore taken these data definitions as a basis, in order to harmonise data collection and presentation in a larger region.

The database is developed in Microsoft Access. In the first version it is developed as a single user database, to be located at the SEETO premises. The database will contain basic data on the current status as well as planned and ongoing projects on the Core Network. For each project the database provides information on the type of project, the state of the network after completion of the project, and the project financing.

This chapter briefly presents an overall description of the database and the required procedures for collection and processing of data. Further details are presented in Appendix 17.

National authorities will send data to SEETO on a regular basis. The operator of SEETO will enter the data into the database and extract regular standard reports as well as special reports on request. In the longer term it is envisaged to establish a user interface via the internet, enabling the national authorities to enter data directly into the database and to draw standard reports. The database is also prepared for GIS application, which may be added at a later stage.

10.3.2 Organisation

In this first version, the database has been developed as a single user database, located at the SEETO.

The SEETO is the responsible authority for the database and also serves as the operator entering new data and creating reports.

The other partners are all the relevant authorities and institutions in the five countries as well as in EU. These include road authorities, rail authorities, ministries of transport etc. The other partners can specify a request for data and then obtain reports from the SEETO.

10.3.3 System architecture

The database has been developed as a Microsoft Access desktop application. The database thus resides in a single file. The user interface consists of Access forms generated in Visual Basic for Applications. Application logic is likewise generated in Visual Basic for Applications. Data is stored in a Relational Database based on the Microsoft Jet database engine. Business Rules are implemented in the Application Logic and Database layers.

When the user accesses the user interface, the technical flow is as follows: the VBA forms receive input from the user. This input is handled by the Application Logic and appropriate queries to the database are executed. The database returns record sets that are handled by the Application Logic and passed on to the User Interface. Data is presented in forms or as a report. Certain reports will be transferable to Microsoft Excel.

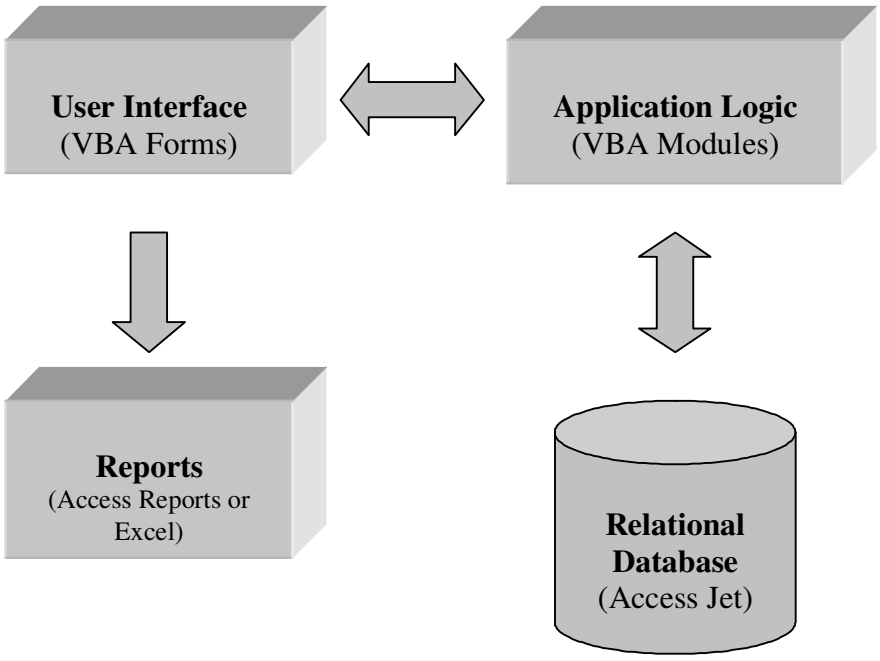


Figure 10.2 Database structure.

10.3.4 Contents of the database

A full documentation of the database is provided in Appendix 17. This chapter gives a brief introduction of the database and its contents.

The database is organised with separate tables for the different modes:

- roads
- railways
- inland waterways
- inland ports
- airports
- seaport

The road network and the inland waterways consist of a number of *links*. A link is defined as a section, within which the conditions are fairly unchanged, for example a section between two major cities.

Railways also consist of links, but for this mode there are also *nodes*. A node is a terminal, where loading and unloading of goods and passengers is possible. Thus, for railways, the nodes are stations and freight terminals.

Airports, inland ports and seaports consist only of nodes.

The database contains one record for each link or node. Although there are some obvious differences between the modes, it has been emphasized to establish similar table structures. Thus, each mode is described in a set of tables, organised as follows:

- **Section A:** Identification of link or node (country, route no, name of section, etc).
- **Section B:** Current data of link or node (length or size, type, capacity, amounts of traffic, physical condition, traffic forecasts, etc).
- **Section C:** Description of planned or ongoing project on the link or node (upgrading or new construction, type of measure, etc).
- **Section D:** Data on the link or node *after* implementation of the project (basically the same data as in section B, but concerning the conditions after the upgrading or new construction).
- **Section E:** Implementation report of the project (current project status, starting date and estimated completion date).
- **Section F:** Project financing (total costs in EUR, specification of amounts from various sources).

As indicated above, only sections A and B concern the current link or node, whereas sections C, D, E and F concern a planned or ongoing project on the section. Therefore, sections C-F will be blank for many links and nodes, if there are no projects related to them. Sections A and B, on the other hand, will contain data for all sections and nodes.

For a more specific description of the database contents, please refer to Appendix 17.

10.3.5 Use of the database

The SEETO is the operator of the database with the full responsibility for updating and maintaining the database and for providing reports to interested partners.

The initial screen of the database is shown below:

Figure 10.3 Initial screen of database.

There are two basic functions: Input of new data and creation of reports. These functions are described briefly in the following. For a more thorough description, however, please refer to Appendix 17.

10.3.6 Input of data

It is possible to enter data manually into the database, but the most feasible way is to read data from an Excel spreadsheet into the database.

The operator of the database is the only one who has access to entering data, and a manual input of data will only be relevant in exceptional cases.

Input of data from an Excel spreadsheet is the most appropriate way of entering data. Data are put into a pre-defined spreadsheet, containing the same variables as the database in an organised set-up. Then the data are read into the database through a function in the database.

The operator of the database will initiate an annual update by sending questionnaires to the relevant partners in the five countries. The questionnaires are sent both in a paper version and an electronic version to be filled in by the partners and returned to the operator before a fixed date. Then the operator will validate the data and enter them into the database.

10.3.7 Output of data

The database provides a series of standard reports showing the state of the existing networks, the projects and the financing.

The screen for report data is shown below. Here the user needs to specify which mode is to be examined. Reports can be created for one mode only. If the user wants data on two or more modes, he will have to create the reports one by one.

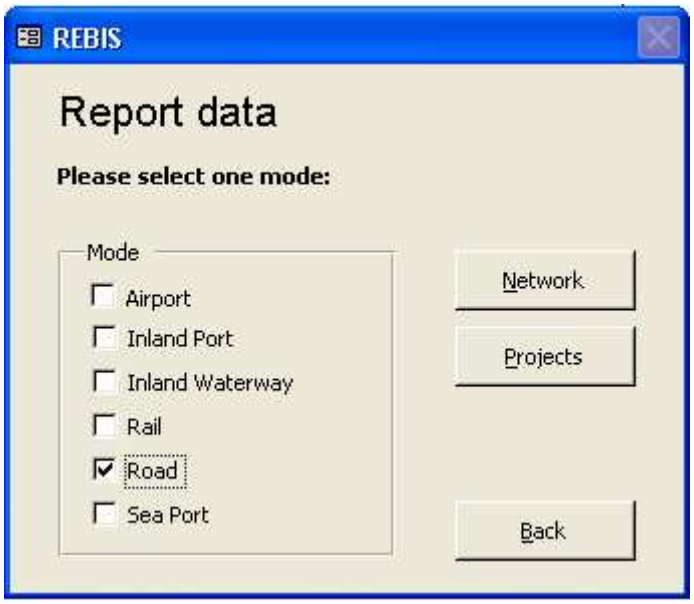


Figure 10.4 Report data, selection of mode.

After selecting the mode, the user needs to specify some key issues on the reports:

- **corridor/route no:** here the user can specify one or more (or all) corridors or routes to be investigated
- **country:** here the user can choose any combination of countries to investigate
- **links/nodes:** here the user can specify which links or nodes to include - all links or nodes, those with upgrading planned or those with plans of new construction
- **project stage:** finally the user can specify the relevant project stage. There are four pre-defined stages: planning phase, design phase, construction phase or completion phase

It is possible to choose any combination of the key issues. For example, one can look at road projects in Croatia and Albania, which involve the construction of new links and which are in the design or construction phase.

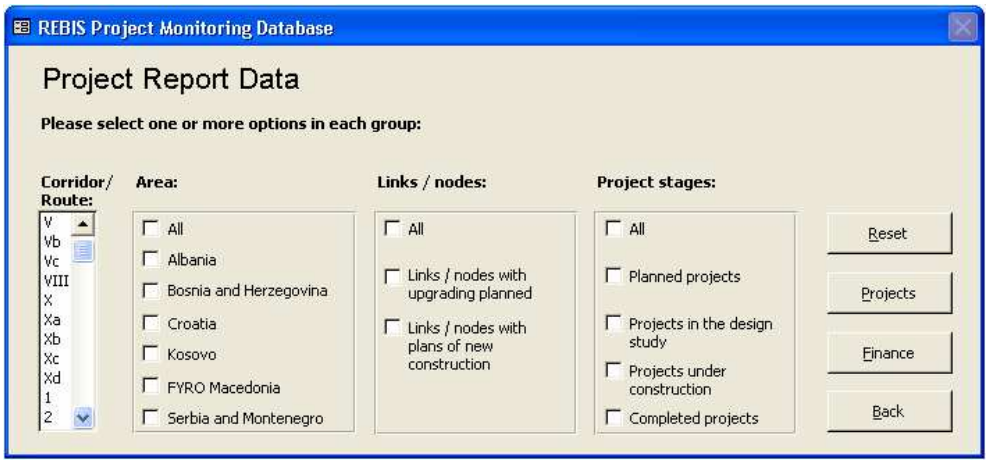
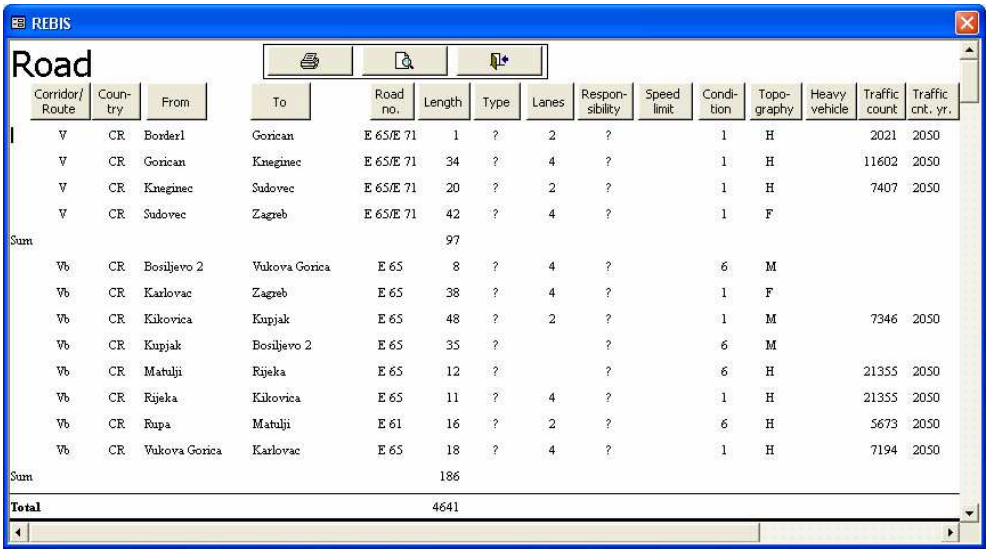


Figure 10.5 Report data, selection of area, type and stage of project.

Once the choices have been made, the user can click on "Projects" or "Finance" which will result in a report in screen format that is shown below.



Corridor/ Route	Country	From	To	Road no.	Length	Type	Lanes	Responsibility	Speed limit	Condition	Topography	Heavy vehicle	Traffic count	Traffic cnt. yr.
V	CR	Border1	Gorican	E 65/E 71	1	?	2	?		1	H		2021	2050
V	CR	Gorican	Kneginec	E 65/E 71	34	?	4	?		1	H		11602	2050
V	CR	Kneginec	Sudovec	E 65/E 71	20	?	2	?		1	H		7407	2050
V	CR	Sudovec	Zagreb	E 65/E 71	42	?	4	?		1	F			
Sum					97									
Vb	CR	Bosiljevo 2	Vukova Gorica	E 65	8	?	4	?		6	M			
Vb	CR	Karlovac	Zagreb	E 65	38	?	4	?		1	F			
Vb	CR	Kikovica	Kupjak	E 65	48	?	2	?		1	M		7346	2050
Vb	CR	Kupjak	Bosiljevo 2	E 65	35	?		?		6	M			
Vb	CR	Matulji	Rijeka	E 65	12	?		?		6	H		21355	2050
Vb	CR	Rijeka	Kikovica	E 65	11	?	4	?		1	H		21355	2050
Vb	CR	Rupa	Matulji	E 61	16	?	2	?		6	H		5673	2050
Vb	CR	Vukova Gorica	Karlovac	E 65	18	?	4	?		1	H		7194	2050
Sum					186									
Total					4641									

Figure 10.6 Project report as it appears on the screen.

By using the buttons on the top of the page the user can sort data according to any criteria he wants. Once data are sorted in the preferred way, the report can be printed in the proper format, which is shown below.

Road

Route	Country	From	To	Road no.	Length	Type	Lanes	Responsibility	Speed limit	Condition	Topography	Heavy vehicles	Traffic count	Traffic cnt. yr.	Traffic forecast	Forecast year	Forecast source	Project
V	CR.	Bosiljevo 2	Gorican	E 65/E 71	1	?	2	?		1	H		2021	2030	3254	2030	Unknown	No
V	CR.	Gorican	Krapinac	E 65/E 71	34	?	4	?		1	H		11402	2030	18290	2030	Unknown	No
V	CR.	Krapinac	Sulovec	E 65/E 71	20	?	2	?		1	H		7407	2030	11759	2030	Unknown	No
V	CR.	Sulovec	Zagreb	E 65/E 71	42	?	4	?		1	F							No
Sum					97													
Vb	CR.	Bosiljevo 2	Vrbovec Gorica	E 65	8	?	4	?		6	M							No
Vb	CR.	Karlovac	Zagreb	E 65	38	?	4	?		1	F							No
Vb	CR.	Kikovica	Krapjak	E 65	48	?	2	?		1	M		7346	2030	11387	2030	Unknown	No
Vb	CR.	Krapjak	Bosiljevo 2	E 65	35	?		?		6	M							No
Vb	CR.	Matulji	Rijaka	E 65	12	?		?		6	H		21355	2030	33801	2030	Unknown	No
Vb	CR.	Rijaka	Kikovica	E 65	11	?	4	?		1	H		21355	2030	33801	2030	Unknown	No
Vb	CR.	Rupa	Matulji	E 61	14	?	2	?		6	H		5473	2030	8948	2030	Unknown	No
Vb	CR.	Vrbovec Gorica	Karlovac	E 65	18	?	4	?		1	H		7194	2030	11346	2030	Unknown	No
Sum					184													
Vc	BA.	Bos. Samac (border)	Podnovlje	E 73	44	?	2	?		5	F		4084	2030	11339	2030	Unknown	No
Vc	BA.	Buna	Jasenica	E 73	23	?	2	?		2	M							No
Vc	BA.	Doboj	Maglaj	E 73	28	?	2	?		3	M							No
Vc	BA.	Jablanica	Zuljiwa (Mostar)	E 73	37	?	1	?		3	M							No
Vc	BA.	Konjic	Jablanica	E 73	25	?	2	?		3	M							No
Vc	BA.	Maglaj	Zenica	E 73	72	?	2	?		2	M							No

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Figure 10.7 Printed project report.

This report can be printed on paper to be used for further reporting on the projects.

The SEETO can create reports on request by any relevant authority, such as ministries or transport authorities, or for example donors like the EU and the World Bank.

In the long term perspective, an internet site will be created, from which any user can extract reports from the database. It will be possible for the authorities to enter new data via the internet site. Finally, there will be a GIS application facilitating graphic presentations of the transport network, for example a map of the network with planned projects in one colour, projects under construction in another colour, etc.