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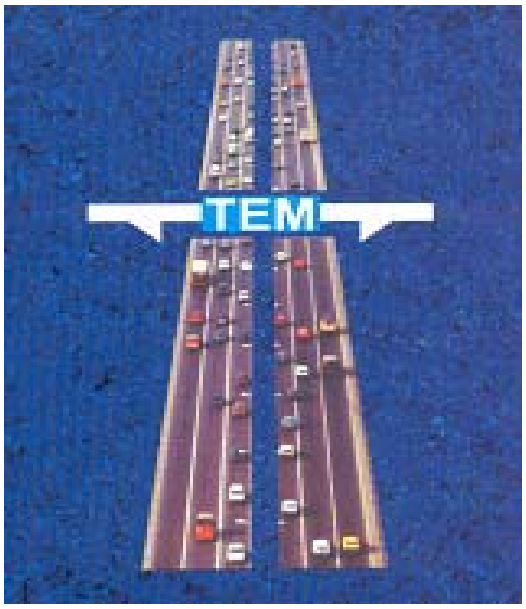
Trans-European North-South Motorway (TEM) Project



TEM Project Master Plan

Detailed Report

TEM Project Central Office
Warsaw, Poland
2005

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1.1.1. General introduction

The Trans-European North-South Motorway (TEM) Project is the oldest and one of the most developed regional infrastructure projects without precedent in the history of European transport.

The United Nations Economic Commission for Europe is its Executing Agency, responsible for technical and administrative backstopping of the Project and the co-ordination of its activities.

The Project, in which thirteen Central Eastern and Southern Eastern European countries (Austria, Bosnia-Herzegovina, Bulgaria, Croatia, the Czech Republic, Georgia, Hungary, Italy, Lithuania, Poland, Romania, Slovakia and Turkey) participate and with which three more countries – Sweden, Ukraine and Serbia and Montenegro - have the observer status, aims at the construction and management of a modern system of motorways and expressways, connecting the Baltic, Adriatic, Aegean and Black Seas. The countries' participation in the course of the development of the Project is shown in the table below:

Table 1 TEM Project participating countries per phase

TEM Project participating countries per phase							
Country	**1st Phase 9/77-12/81**	**2nd Phase 1/82-12/84**	**3rd Phase 1/85-12/86**	**4th Phase 1/87-12/91**	**5th Phase 1/92-12/96**	**6th Phase 1/97-12/00**	**7th Phase 1/01-12/04**
Austria	X	X	X	X	X	X	**X**
Bulgaria	X	X	X	X	X	X	**X**
Czech Rep.	X	X	X	X	X	X	**X**
Slovakia					X	X	**X**
Greece	X	X	X	X	-	-	-
Hungary	X	X	X	X	X	X	**X**
Italy	X	X	X	X	X	X	**X**
Poland	X	X	X	X	X	X	**X**
Romania	X	X	X	X	X	X	**X**
Turkey	X	X	X	X	X	X	**X**
Yugoslavia	X	X	X	X	-	-	-
Croatia	-	-	-	-	X	X	**X**
Lithuania	-	-	-	-	X	X	**X**
Georgia	-	-	-	-		X	**X**

Bosnia and Herzegovina	-	-	-	-	X	X	**X**
*Serbia and Montenegro	-	-	-	-	-	-	**x**
*Sweden	-	-	-	-	-	x	**x**
*Ukraine	-		-	-	-	x	**x**
TOTAL	**10**	**10**	**10**	**10**	**12**	**15**	**16**

The presentation of the countries refers to the time that respective agreements were officially signed
* Countries with observer status

To the west, its terminals will link up with the Trans-European Road Network of the European Union, while to the east and south-east it will provide direct links with the road systems of Western Asia and North Africa.

Its high-capacity, double and grade-separated carriageways, each with a minimum of two traffic lanes will ensure an adequate quality of services for modern traffic by providing for safety, speed and comfort in accordance with commonly adopted standards, thus contributing to the economic and social development of the whole European continent.

1.1.2. Organizational structure

In the whole period of twenty six years during which the TEM Project has been underway, an efficient type of co-operation and understanding has been established between the respective motorway and/or highway authorities of the participating countries, together with the Project institutional framework and organizational structure which have proved themselves practical.

Within this structure, the highest decision-making body of the TEM Project is the Steering Committee. This is composed of officially appointed members, representing the participating countries. The Steering Committee meets twice a year, determines the policy of the Project as well as the general measures to be taken concerning TEM activities, and takes decision on common action.

The main functions of the Steering Committee include:

(a) establishing any subsidiary bodies it deems necessary;

(b) issuing instructions to the Project Manager or any subsidiary bodies it might decide to establish;

(c) approving the programmes of work;

(d) adopting the reports of the Project's Groups of experts;

(e) adopting operating budgets and financial reports on their execution;

(f) examining any other matters concerning the activities of the TEM.

The Steering Committee has adopted its own rules of procedure which are used in performing its duties.

The Project has a Project Central Office (PCO) set up to co-ordinate all the activities carried out under the terms of the programme of work. It operates under the direction of the Steering Committee and under guidance from the Economic Commission for Europe. The PCO is located in Warsaw and the Polish Government covers office expenses.

The Project Central Office is headed by the Project Manager. The Project Manager's duties are many and varied, but it is worth mentioning here that he is also acting as Secretary to the Steering Committee, maintaining liaison with National Coordinators regarding all matters concerning the implementation of TEM activities, preparing the Project Manager's reports for the Steering Committee sessions and executing the Project budget in accordance with the Steering Committee decisions.

The past TEM Project Managers were made available by the Governments of Greece, Turkey, Romania, Slovakia and the Czech Republic, respectively.

The present Project Manager has been provided by the Government of Slovakia and commenced his assignment on 1 January 2002.

The TEM has a National Coordinator in each participating country appointed by the respective Government, responsible for the co-ordination of all Project activities within the country.

The funding of all Project activities in-kind as well as in cash is provided exclusively by the participating countries. In this respect, the TEM Cooperation Trust Fund was established, based on the Trust Fund Agreement signed in Geneva in December 1991. According to this Agreement, each participating country contributes US$ 7,500 annually to the Project in addition to its in-kind contribution. Under the terms of the Agreement, the UNECE is responsible for the management of the funds contributed in cash. As a result of this, the Project has a well established and permanent arrangement for the continuous administration and co-ordination of its technical, managerial and economic activities.

1.1.3. Objectives of the Project

The main objectives set for the Project are:

(a) To assist the participating countries in accelerating the construction of the TEM network through the identification of investment needs and priorities, investigation of financial resources needed for its construction and determination of appropriate payback systems for use on the TEM motorway.

(b) To assist in designing, building, maintaining, operating and administering the TEM motorway network on the territories of participating countries as part of an integrated European transport infrastructure, thus filling the gaps in the existing motorway network in the region.

(c) To pay special attention, in view of the present economic constraints, to the upgrading of existing roads and to envisage the stage construction of motorways.

(d) To promote and improve co-operation in all matters concerning road transport between TEM countries having different levels of development.

(e) To continue to disseminate the knowledge, expertise and know-how developed so far in the TEM region to other regions of the world.

These objectives could be divided in three categories e.g. general, operational and specific ones.

The general objectives of the Project are:

The facilitation of the international road traffic in Europe and among and through the countries participating in the Project.
The improvement of the efficiency of transport operations
The balance of gaps and imbalances existing in the transport infrastructure and more particularly in motorway network between Western, Eastern, Central and South–Eastern Europe
The assistance of the integration process of transport infrastructure systems of Europe, thus promoting the overall development of the region

The operational objectives of the Project are:

The assistance in accelerating of the construction of TEM network through the identification of investment needs and priorities, investigation of financial resources needed for TEM construction and the determination of appropriate and innovative pay-back systems for use at the TEM motorway
The assistance in designing, building, maintaining, operating and administrating of the TEM motorway network on the territories of participating states
The assistance in extending the TEM by including into the basic agreed network new links oriented East-West direction across the North-South axis of TEM
The assistance in consolidating the role of the TEM in the progress of transport integration in Europe
The promotion and improvement of co-operation in all matters concerning road transport

between TEM states having different levels of development
The continuation of knowledge dissemination, expertise and know-how developed so far in the TEM region to other regions of the world

The specific objectives of the Project are:

The co-ordinated actions of the participating countries for the creation of a Trans-European Motorway (TEM) network, that will form a system of high capacity roads ensuring an adequate quality of service for traffic by providing safety, speed and comfort, based on commonly accepted and adopted standards and practices recommended for use by all TEM countries. This network shall:
Link the Northern and the Southern and South –Eastern parts of Europe, from Baltic Sea to Adriatic, Aegean and Black Seas, via the participating countries
Ensure a balanced system for transportation of goods and people between countries of Eastern, Central and Western parts of Europe, in particular those situated along its North – South axis
Satisfy the transport demand of long – distance and international traffic by offering an efficient and convenient mode of transport
Constitute an important transit artery between the participating states linking them with adjacent states of Europe, North Africa and Central Asia.

1.1.4. Evolution of TEM Project

In 1972, the request for assistance concerning the preparatory studies for the design and construction of a North South Motorway (TEM) was submitted to United Nations Development Programme (UNDP) jointly by the Governments of Hungary and Poland. The question of possibility and feasibility of such a motorway had previously been raised by the Government of Poland and was considered by a number of competent European organisations, as well as among various interested countries in the region.

In 1974 and in beginning of 1975, this project was officially brought to the attention of the competent bodies of the United Nations Economic Commission for Europe (UNECE). In this period, the European office of UNDP introduced the concept of European Co-operative programme. This concept was based upon the results of the Conference on Security and Co-operation in Europe (held in Helsinki in 1975) and on the significant role conferred on UNECE to promote the development and economic and social co-operation in Europe. TEM project was considered as falling within the defined categories of UNDP inter-country projects, and the continued development of the project has taken place under the financial support principle of IPF programmes and the UNDP Regional/co-operative funds.

A mission composed of representatives of UNDP and UNECE Transport Division and of technical expert from the region, visited the countries now participating in the project in

April/May 1975. The purpose of the mission was to ascertain the interest of Governments concerned, and to which extent the development of the proposed motorway could be integrated in existing national plans.

A second mission consisting of two consultants recruited under UNDP funds took place in July, August and September 1975, in order to prepare a working paper for a meeting of representatives of Governments, scheduled for December 1975. In December 1975, the meeting of all Governments concerned was held in Geneva, which constituted itself as the Project Steering Committee, and formulated a preliminary working plan for the elaboration of the project and decided upon several operational and structural points.

A second meeting of the Steering Committee was held in Geneva, from 28 to 30 March 1977, at which a "Request in Principle" was approved containing substantive elements of the final agreement. The project started officially the 1st September 1977 and since then is extending its lifetime, with relevant decisions taken by the member countries.

Since the very beginning of the project's life, the Government of Poland offered to host the Project's Central Office (PCO) in their premises in Warsaw free of charge. The Polish Government in addition to the above offered several other facilities, free of charge (office maintenance, utilities, auxiliary personnel, car, etc.). It also offered privileges and immunities for the PCO, the Project Manager and the staff, in accordance to those of the United Nations, considering the premises of PCO as premises of the UN, and the Project Manager and staff as UN officials.

The offer was accepted by the Steering Committee and a special agreement for that was incorporated in the basic documents of the project. Since 1977 and up to now, the PCO is situated in Warsaw. Presently is hosted at the premises of a Research Institute for Roads and Bridges operating under the supervision of the Polish Ministry of Infrastructure, at Goledzinowska Str. No. 10, Warsaw 03 302.

TEM Project has been developed in two main cycles and eight phases. The first cycle from September 1977 up to December 1991, in which four project phases are incorporated, concerns the period when the Project was sponsored by UNDP. The second cycle from January 1992 up to December 2004, in which three more phases are added, is characterised as the period of Project's self sustainability and finance by the participating countries.

<u>TEM Project Cycle I</u>

(i) 1st Phase of TEM Project

On 1st September 1977, TEM Project started officially for a period of 5 years (up to December 1981). It constituted a co-operative project of the Governments of the following 10 countries, where the UNDP and UNECE were also contracting parties as Executing Agencies for the Project. The participating countries were: Austria, Bulgaria, Czechoslovakia, Greece, Hungary, Italy, Poland, Romania, Turkey and Yugoslavia.

For the elaboration of the Project, all above countries and the Executing Agencies signed the respective agreement that was referring to the objectives, structure, work plan, budget, allocation of funds, obligations and the Project's first maps.

This period from September 1977 to December 1981 constitutes the 1st Phase of the Project that generally may be described as the period of the Project's technical preparation and

structural set up. By October 1980 UNECE became the sole Executing Agency for the Project.

(ii) 2nd Phase of TEM Project

In January 1981, the Steering Committee decided to extend the life of the Project for other three years, and decided upon which main directions the project should concentrate. The Steering Committee in its 2nd annual session in Geneva from 15 to 17 July 1981 agreed in principle on the Project's new document for the 2nd Phase January 82 to December 1984 that was later finalised and signed accordingly by the same 10 countries, the UNDP and UNECE. The second phase may be generally described as the period of finalisation of Project's design standards, and technical and financial co-operation between the member countries in the technical and financial management of the project.

(iii) 3rd Phase of TEM Project

From the 1st January1985 to 31st December 1986 there is the 3rd Phase of the Project extending its life for other 2 years. In the year 1983, a comprehensive review of the Project was carried out by three independent consultants appointed by UNDP and UN/ECE. They have recommended that the Project in future should consider three priority areas: border crossing operations and port procedures, TEM operations and traffic forecasting. These three directions were accepted and incorporated in the agreement, together with the proposal of the Steering Committee, that " pending the total completion of its construction, TEM could be an operational reality using the existing sections and appropriate linking routes".

The relevant agreement signed between the same 10 countries and the UNDP and UN/ECE on 7th January 1985 followed the same inter-country Project concept of the UNDP. The 3rd phase may be generally described as the period of concentration on practical aspects of making TEM an operational reality and the preparation framework for its operational management.

(iv) 4th Phase of TEM Project

The 4th Phase of the Project from 1st January 1987 to 31st December 1991 extended its life for other 5 years. The relevant agreement was officially put in force as the previous ones by the same contracting parties. The 4th phase of the Project concentrate on the completion of the creation prior to 1992 of a harmonised and fully self-sustaining arrangement for the design, construction, operation and maintenance of the TEM network. Also was directed to respond to environmental priorities and the assistance to the member countries in developing more effective strategies for obtaining the financial resources for the construction of TEM.

<u>TEM Project cycle II</u>

(v) 5th Phase of TEM Project

The 5th Phase of the Project lasted from 1st January 1992 to 31st December 1996. Since the UNDP sponsoring of the Project arrived to its end, most of the TEM signatory countries have decided to continue it on their own financial support. Therefore, a Trust Fund Agreement was prepared and finally signed in December 1991 by Hungary, Italy, Poland, Romania and Yugoslavia with the objective to continue the co-ordinated actions of the

countries concerned on the same lines with the main objectives of the initial plan. The Trust Fund agreement was open for signatures by all TEM member countries, as well as to other countries. Within the year 1992 Bulgaria, Czech and Slovak Federal Republic and Turkey became contracting parties and signed the agreement. In 1993 Croatia followed, in 1994 Lithuania, in 1996 Georgia and Bosnia and Herzegovina. UN/ECE was agreed to be the Executing Agency of the Project.

The 5th Phase may be described as the period of self-sustaining TEM management system and as the period of the Project's adaptation in the new economic environment in Europe.

(vi) 6th Phase of TEM Project

The 6th Phase of the Project from 1st January 1997 to December 2000 was approved by the Steering Committee of the Project at its session held from 25 to 27 November 1996 in Geneva. The new Trust Fund agreement was prepared and signed and came in force by 1st January 1997. In the agreement, among other points were also described the main directions of the project for the period concerned, the action plan, budget etc. This was the final document on the basis of which the Project was operating.

The 6th Phase was characterised by the efforts of promotion and acceleration of TEM construction, enhancement of its project management system and TEM integration into the European transport systems.

(vii) 7th Phase of TEM Project

The 7th Phase of the Project covers the period from 1st January 2001 to December 2004 and has been based on the respective time extension of the Trust Fund Agreement, approved by all the member countries. This phase is characterised by the adoption and implementation of the TEM Project Short-term Strategy (Action Plan) aimed at the incorporation of the Project into the new Pan-European transport environment, reflecting inter alia the fact that five of the member countries (the Czech Republic, Hungary, Lithuania, Poland and Slovakia) joined in 2004 the European Union. For the first time in the Project's life, the TEM Master Plan covering the period until year 2020 was elaborated, too.

(viii) 8th Phase of TEM Project

The 8th Phase of the TEM Project commenced on 1 January 2005. The activities in this phase will be focused on the follow-up actions of the TEM Master Plan, on monitoring the Pan-European Transport Corridors and on the development of Euro-Asian road and motorway links.

In the course of these 28 years of Project life, several project modifications have taken place due to technical, economical, operational, social and political changes or constraints. Here follows the presentation of the most important ones:

(i) Since the initial stage of the Project, there was a firm interest of the sponsoring organisation, to see its materialisation in a near future, by incorporation of the TEM motorway plans into the national plans of the countries participating in the Project. A time horizon for TEM's possible completion was also specified.

During the course of the preparation of the agreement for the extension of TEM Project for the period 1985-1986, TEM Steering Committee proposed that pending the total completion of its construction, TEM could be an operational reality by using the existing

sections and appropriate linking routes**.** This proposal was accepted and a lot of practical steps for the implementation of TEM followed.

(ii) At the start of the Project, the main idea of TEM was based on the Corridor concept i.e. the creation of a motorway that may serve the road transport of the countries on the set directions. Progressively, the needs and transport evolution have altered the corridor concept to the motorway network. The Trust Fund agreement for the period of 1992-1996 for the first time attributed the title of network to TEM. Thereafter, the network concept is repeated in all official documents.

(iii) The geographical area targeted by the Project was also modified from its first approach. Originally, the Project had as basic orientation the North-South connection. During the course of the years, the member countries responded to the increasing demand for West-East connections that further intensified after the drastic political and social changes in the Eastern Europe by incorporating the West-East links into the Project's plans.

(iv) Looking at the plans of the 80s, it is evident that the dynamics of TEM Project towards its neighbouring regions was incorporated in the plans from the beginning. The first Trust Fund Agreement in its basic part referring to TEM mentions among other items " ….TEM constitute important transport artery between the participating countries with the adjacent states of Europe, North Africa and West Asia". Similar mention exist in the first documents of UNDP, where among the general objectives "the promotion and facilitation of commercial, tourist and other relationships with neighbouring countries in Western Asia and Africa" is mentioned. Also sea connections by RO-RO ships at the time of 80s were interesting for the Project.

(v) Another also important modification regards the financial structure of the Project. In 1992, the Project changed drastically its economic structure. From an UNDP dependent and sponsored inter-country project existing for 15 years (1977-1991), it was transformed to self-financed and self-sustainable Project funded by its members. This issue of self-sustainability of the Project attracted the attention of the Steering Committee already from mid-1980s. In the agreements of the period 1985-86 and 1987-91, the issue was incorporated in the work plans as one of the tasks. This structural modification of the Project created practical difficulties in its management that had to be adapted to the new reality. The firm interest of most of the participating countries to continue the Project and their decision to cover in full its costs changed the situation from weakness to strength.

Other modification caused partly by the financial restructuring of the Project was the non-extension of membership of some of the countries that had originally been its members. This caused the withdrawal from the Project area of important parts of the region, thus in some cases creating serious gaps in the continuity of the network. Economical or other reasons do not permit other countries to become members of the Project, too.

1.1.5. TEM Achievements and Outputs

At the time the TEM was launched, some countries had already started to design or even construct motorways along the north-south axis as parts of their national road networks, following their own transport policies and technical standards.

Such a bold undertaking was obviously no easy task, as the TEM required unique mechanisms to achieve its objectives and harmonization of respective national standards and regulations. However, the full participation and co-operation of all member countries made it possible to adopt common standards of design and construction, including respective technical specifications as well as sets of guidelines and manuals covering inter alia environmental impacts, seismic aspects, flexible and rigid pavement design, etc. The last revised version of the TEM Standards and Recommended Practice was published in February 2002. Forecasts of future traffic on each section of the TEM network were also carried out.

Each member country then took responsibility for financing, planning, design and construction on its own territory, for participating in all co-ordination activities under the aegis of the UNECE as well as for developing solutions to the various problems involved. This has required research into the latest techniques and investigations of current practices in the TEM countries themselves. The ensuing recommendations were then examined by technical experts and finally approved by the TEM Steering Committee.

Besides the co-ordination and assistance activities of the Project regarding the acceleration of the TEM construction proper, the TEM Project performed the piloting function in private sector funding of motorway and road construction and maintenance, focusing on the legal framework for building motorways with foreign credits and concession systems, evaluation of payback systems, including conditions for the application of motorway tolls, investigation and/or development of issues for assessing BOT concessionaire arrangements and technical assistance in the areas of private sector financing of motorways.

The TEMSTAT data collection and processing activity, based on the uniform reference system and operational since 1997 provides annually updated data on existing motorway and principal highway network in the member countries as well as on motorway sections under construction or in the planning stage and makes it possible to produce detailed maps of each country or of the whole TEM region, showing the present or future status of the infrastructure and traffic flows.

In the recent period, the scope of technology and know-how transfer in the framework of the TEM has also widened, going from motorway design, construction and operation to the broader field of common motorway and road issues, such as pavement and bridge management, environmental impact assessment, standardization, harmonization of signing, introduction of intelligent transport systems, etc. The forms, tools and techniques used in technology transfer within the TEM vary according to the aim and type of respective activities. They include seminars, workshops and round tables usually organized by one member country jointly with the TEM Project Central Office in accordance with the annual programme of work, often in collaboration with one or more non-TEM institutions or consultants.

The TEM Project is also encouraging and supporting bilateral and multilateral contacts and co-operation between the neighbouring countries of the region in the field of motorway and road infrastructure development, maintenance and operation in the form of so-called

TEM Permanent Tables, the first one of which, founded in 1999 is working in Trieste, Italy.

These transfer and technical assistance activities have also included valuable inputs from other OECD countries, especially from the European Union and the United States of America. Within the multitude of technology transfer programmes directed now to Central and Eastern European countries, the TEM is unique in that it deals not with the transfer from the more developed Western countries to the region only, but also with the technology transfer, co-ordination and exchange of experience and know-how between the participating countries of the region themselves. This is of extraordinary importance since the mutual contacts between some of the Central and Eastern European countries in the road and motorway field are now less frequent than in the past.

The technical potential amassed, in terms of experts trained, also constitutes a substantial resource now possessed by the TEM Project, which can be capitalized on in other regions.

One of the most important achievements of TEM Project is its significant contribution to the formation of European strategic transport infrastructure plan for the next decades.

Apart from this, the basic achievements of the TEM Project in the course of 28 years of its existence can be summarized as follows:

1. Co-ordination of actions for creation of TEM corridor, based on commonly accepted and adopted standards and practices

2. Contribution to the formation of the future Trans-European Transport Network (TEN-T) in which TEM is placed as an integral part

3. Improvement of national techniques and understanding of construction, management , operation and maintenance of motorways of the participating countries

4. Improvement of bilateral contacts, co-operation and co-ordination among TEM countries

5. Facilitation of co-operation between East-West road experts

6. Facilitation of international road traffic in Europe and among and through the countries participating in the Project
7. Improvement of efficiency of transport operations
8. Assistance towards balancing of the gaps and imbalances existing in the transport infrastructure in motorway network between Western, Eastern, Central and South – Eastern Europe

9. Assistance to the integration process of transport infrastructure systems of Europe, the formation of European strategic transport infrastructure plan and the promotion of the overall development of the member countries

These activities resulted in the principal outputs (direct products of the Project) comprised in the following list:

Assistance in accelerating construction of TEM and its extensions: Elaboration and introduction of TEM Project plans, maps and their constant extension /revision Elaboration of more than 60 studies related to motorway management, road economics, planning and design, construction and operation, among which TEMSTAT 1 & 2 . Issue of about (100) technical documents in several languages, guidelines, recommendations, methodologies, manuals and glossaries, standards harmonization continuously updated. Elaboration of TEM Brochures" TEM-INFORMATION-2000" and "TEM INFORMATION-2002"
Assistance in designing, building, maintaining, operating and administrating TEM in the member countries: Elaboration of definitions on bilateral transport agreements Collection of uniform data and processing on TEM Introduction of new ways of project financing Elaboration of common programme of upgrading non motorway links in 1992 , updated in 1998 Contribution to improvement of existing conditions Assistance towards national budget allocation for TEM sections
Assistance in consolidating the role of TEM in the progress of transport integration in Europe: Harmonization of the national standards and regulations Elaboration of comparison and interconnection with other European Networks, TINA, TEN, Pan-European Corridors Establishment of TEMSTAT 1 & 2 databases EIA process harmonization with TEM and EU countries Introduction and implementation of environmental priorities and concern in TEM Network
Promotion and improvement of co-operation in all matters concerning transport between TEM countries having different level of development: Establishment of institutional frame work for the permanent management of TEM Assistance in accelerating related national coordinated activities
Dissemination of knowledge, expertise and know-how: Organization of many conferences symposiums, work shops, round tables, ad- hoc meetings in different issues concerned in various cities inside and outside TEM member countries on an annual basis Organization of over (60) training courses and seminars in which over (600) technical persons from member countries were trained Granting of scholarships on research to students and researchers from member countries Establishment of cooperation with Western road institutions (PHARE, TINA, OECD, IRF, ECMT, HEEP, WERD, TER)

These outputs could be sorted into the following categories:

(a) Technical studies (directly co-ordinated and supervised, in whole or in part)

- Studies related to motorway management (TEM Glossary and Guidelines for TEM Data Bank), continuously updated during various periods of Project's lifetime.
- Studies related to road transport economics (Economic evaluation of highway projects, International financing of road projects, Preliminary enquiry into external financing on TEM, Principles and application of a TEM tariff system, Financial situation of TEM members, Toll level sensitivity, Toll correlation modalities, TEM financial promotion, Methodology of calculation of transport cost on TEM, Financing methodologies of the TEM)
- Technical studies for TEM planning and design (TEM Links with infrastructure of adjacent regions, Standards and recommended practice for geometric and structural design of TEM, Interrelationship between modes of inland transport, Future road transport, Trend on transport infrastructure development, International O/D traffic survey, Forecast of traffic volumes, Methodological concept for forecasting international traffic on TEM, Various studies on Pavements, Drainage, Seismic considerations, Environmental impacts, Computer aid designs, TEM bridge standards etc.
- Studies on TEM construction, motorway maintenance and repair
- Studies on TEM motorway operation

In total more then 60 important studies on TEM related matters, among which the very important TEMSTAT 1 and 2 (Data on TEM motorway and expressway network and TEM Status, regularly updated).

(b) Technical documents on standards and recommendations

Elaboration of about 100 documents in several languages, with information, guidelines, users information, recommendations, methodologies, harmonisation of standards etc.(continuously updated)

Elaboration of the TEM Brochures 2000 and 2002

(c) Technical staff training programs/ seminars

- 11 related to motorways management (Computerised road research documentation system- London - Bucharest, Management of roads - Setra France, Pavement management - Prague, Budapest, Motorway stage construction – Prague, etc.)
- 21 related to road transport economics (in Linz, Ankara, Florence, Budapest, Prague, Athens, Warsaw, etc.)
- 31 related to TEM planning, design and construction (in Athens, Thessaloniki, Prague, London, Bucharest, Sweden, Warsaw, Gdansk, Brno, Newcastle, Belgrade, Ankara, Rome, etc.)

Altogether, 63 training courses/seminars have been organised during the Project's lifetime. According to the annual reports to the Steering Committee of the Project, over (600) technical personnel from the member countries have followed the training courses, comprizing an enormous amount of know- how and expertise transfer from West to East

and among the member countries. Many scholarships on research have been granted to students and researchers of the member countries.

In addition a considerable number of symposiums, workshops , round tables, ad-hoc meetings on different issues was, held in various occasions in different cities inside and outside TEM member countries on an annual basis (5/6 per year), supporting the exchange of experience, establishment of advance knowledge in different topics, transfer of know-how, harmonisation of TEM members policy within TEM region and between EU and TEM region countries.

(d) Establishment of co-operation with European and international related organisations and institutions

The TEM Project collaborates with international organizations dealing with transport issues, especially with the respective Directorates General of the European Commission, ECMT (European Conference of Ministers of Transport), OECD Transport Division, CEI (Central European Initiative), WERD (Western European Road Directors), ERTICO (Intelligent Transport Systems – Europe), US-based HEEP (Highway Engineering Exchange Program), UN/TER (Trans-European Railway) Project Central Office in Budapest, International Road Transport Union (IRU*)*, International Road Federation (IRF) and Association of European Motorways, Bridges and Tunnels with Tolls (ASECAP).

As far as the collaboration with the European Commission is concerned, the TEM Project participated in the past actively in its Phare Multi-Country Transport Programme, assisting inter alia in the elaboration of the multimodal transport forecast for the region, in the Phare studies on Road Transport Charges and on Road Safety as well as in the Project on Road and Motorway Management in the Phare Countries. Moreover, the Co-operation Agreement was signed in 1998 between the ECE and the TINA (Transport Infrastructure Needs Assessment) Secretariat in Vienna, Austria, under the terms of which the TEM Project Central Office made available its database on roads and motorways for setting the transport infrastructure construction priorities in the region.

At present, reflecting the results of co-operation with the European Commission, the TEM Project and its bodies and the division of labour with regard to the development of Pan-European Transport Corridors and Areas between the UNECE, European Commission and the European Conference of Ministers of Transport agreed at the 1997 Third Pan-European Transport Conference in Helsinki, the direct involvement of the TEM in monitoring the technical and administrative aspects of these Corridors and Areas is envisaged on the basis of the agreement between the European Commission and the UNECE of April 2002. As from 2003, based on the request of the Polish Government and the approval of the UNECE, the TEM Project Central Office assumes the responsibility of Secretariat of Corridor VI.

The long-lasting collaboration with the ECMT and the OECD Road Transport Research Programme, in the work of the Advisory Panel for Outreach Activities (APOA) of which the TEM Project was participating, culminated in the joint organization of International Conferences on Strategic Environmental Assessment for Transport held in October 1999 in

Warsaw, Poland and on Intelligent Transport Systems in Central and Eastern European Countries held in Brno, the Czech Republic in September 2001.

In November 1993, with the United States Federal Highway Administration's and HEEP's financial and technical support, the TEM/HEEP Area V (Central Eastern Europe) was inaugurated as the first one in Europe. HEEP is a non-profit association in charge of promoting free exchange of computer programs, systems and concepts between its members in the fields of civil engineering, transportation and management with the aim of increasing the effectiveness of computer usage. The establishment of the HEEP Area V provided the TEM participating countries and their software experts with free access to the latest developments in highway electronic engineering. In the framework of the HEEP Educator and Student Participation Program, university students from the TEM/HEEP Area V are being granted each year scholarships to present reports on their research achievements in the USA and Canada.

As a result of the fruitful cooperation between the UNECE and interested international organizations and based on the draft documents elaborated under the UNECE auspices by the TEM Project Central Office, the Memoranda of Understanding were signed between the UNECE, the International Road Transport Union (IRU) and the European Association of Companies with Concessions for Motorway, Bridge and Tunnel Tolls (ASECAP) in February and March 2003, laying down the bases for closer co-operation in the framework of the TEM Project.

1.2. TEM technical characteristics, standards and operational parameters, decisions and guidelines for implementation

The Trans-European North-South Motorway (TEM) Standards and Recommended Practice serve the purpose of ensuring that the planning and design of the TEM motorway provide for the adequate traffic flow at minimum operating cost, harmonized conditions for motorway users, proper level of service, safety, speed and driver comfort over medium and long distances. They were elaborated under technical guidance provided by the countries participating in the Trans-European North-South Motorway Project (TEM) and were adopted by the Steering Committee of the Project.

They cover the following topics:
- planning
- design parameters
- traffic regulation and safety
- facilities
- environmental considerations
- bridges
- tunnels
- maintenance related to design.

Taking into account their contents and scope (13 Central and Eastern European countries), the Standards represent an international document unique of its type. Their first edition was elaborated by Italian experts and published in January 1981, being superficially updated in July 1992.

In order to revise the Standards substantially to reflect the up-to-date requirements of motorway users as well as the latest experience, research and development achievements in the fields of motorway design, construction and operation, the TEM Group of Experts on Standards was established in 1997.

In the course of the revision, inter alia the Consolidated Text of the European Agreement on Main International Traffic Arteries (AGR) as revised by Amendments 1 to 7, 1997 update of the Highway Capacity Manual (US Transportation Research Board Special Report 209) and the present state of European standardisation (CEN/TC's 226 and 227) were taken into account. In addition to these sources, the chapter on tunnels was revised basically in order to incorporate the newly required safety measures in motorway tunnels incl. the preliminary results of the work of the UNECE Ad hoc Multidisciplinary Group of Experts on Safety in Tunnels established in 1999.

Although their primary application will be to the Trans-European North-South Motorway, the Standards are at disposal to other United Nations countries which find them beneficial for the formulation or updating of their national standards. The final text of the TEM Standards and Recommended Practice is available on the UN ECE website http://unece.org/trans/welcome.html (under TEM heading).

1.3. Introduction of existing TEM network and plans

The present TEM network, consisting of motorways and some expressways of the member countries, is shown on the map attached as Annex 2.

Its status as of 1 January 2005 is presented in the following table:

Table 2 Status of TEM Network

COUNTRY	Total length	PROGRAMMED (in study, preliminary design and design phases)		UNDER CONSTRUCTION		IN OPERATION		COMPARATIVE INDICATORS		
	km	One carriageway	Both carriageways	one carriageway	both carriageways	one carriageway	both carriageways	% of total TEM length	CONSTRUCTION PROGRESS (% of length under construction)	DEGREE OF COMPLETION (% of length in operation)
Column No.	1	2	3	4	5	6	7	8	9	10
AUSTRIA	485	-	-	35	22	35	428	2.1	8.1	91.9
BOSNIA and HERZEGOVINA	331	-	319	-	-	-	12	1.4	-	3.6
BULGARIA	925	-	617	-	15	19	274	4.0	1.6	30.7

CROATIA	1465	31	508	6	161	88	742	6.3	11.2	53.7
CZECH REPUBLIC	987	-	359	26	85	-	543	4.2	9.9	55.0
GEORGIA	1053	-	1045	-	-	-	8	4.5	-	0.8
HUNGARY	1658	638	276	15	101	67	522	7.1	6.6	33.5
ITALY	1519	-	-	-	4	-	1515	6.5	0.3	99.7
LITHUANIA	731	204	12	-	-	254	466	3.1	-	81.1
POLAND	3317	312	2178	-	135	86	607	14.2	4.1	19.6
ROMANIA	3026	-	2631	-	202	-	201	13.0	6.7	6.6
SLOVAKIA	932	-	527	3	45	577	355	4.0	5.0	69.1
TURKEY	6896	-	378	-	293	3659	2566	29.6	4.2	63.7
TOTAL	**23325**	**1185**	**8850**	**85**	**1063**	**4785**	**8239**	**100.00**	**4.7**	**45.6**

The total planned length of the TEM network as of 1 January 2005 was 23325 km, out of which 10632 km were in operation and 1106 km under construction.

Taking into account the corresponding comparative indicators (last three columns of Annex 1), Turkey had the highest percentage of the TEM network length (29,6%), Croatia had the fastest construction pace (18,8% of its national TEM network under construction) and Italy had the highest degree of completion of its TEM network (99,7%). In total, 42,7% of the whole TEM network was in operation and 4,4% of its length was under construction. Pending total completion, nevertheless, TEM is already an operational reality because of the TEM Corridor, which consists of upgraded national roads linking the already constructed motorway sections.

1.4. Presentation of the TEM GIS mapping and database management system

In accordance with the main objectives of the TEM Project, two TEM databases (TEMSTAT 1 and TEMSTAT 2) have been established. TEMSTAT 1 reflects the status of existing and future TEM motorway network, while TEMSTAT 2 presents the status of the national road system, fulfilling the function of missing connections. On the basis of the decision of the Twenty-Sixth session of the Steering Committee (November, 1996, Geneva), the TEMSTAT data collection commenced in 1997. Data thus obtained are being processed and analysed by the PCO. The Twenty-Eight session of the Steering Committee (November 1997, Geneva) further decided that the TEMSTAT forms together with the reference system would be revised and updated annually and that a special co-ordination meetings of experts responsible for data supply would be convened. The reference system used for the elaboration of the Master Plan is shown in Annex 3.

In accordance with this decision, the past TEMSTAT Coordination and Training meetings were held in Istanbul, Turkey (25 – 27 March, 1998), in Prague, the Czech Republic (30 March – 1 April, 1998), in Vilnius, Lithuania (7 – 9 April, 1999), in Budapest, Hungary (17 - 19 April, 2000, 18-20 April 2001, 8 – 9 April 2002 and 19 – 21 May 2003), in Prague, the Czech Republic (18-19 March 2004 and 7-8 March 2005).

As for TEMSTAT maps, the introduction of new hardware and mounting of the ArcView software in the TEM Project Central Office in 1999 made it possible to produce these basic types of maps:

- maps showing the present status of the TEM corridor and main road network in the TEM region
- maps showing the existing (in operation) and future (under construction, in design stage, planned)
- motorway network in the chosen time horizons
- maps showing the present or forecasted traffic flows in the chosen time horizons.

These maps may cover either the whole TEM region, separate member countries or selected areas (e.g. vicinity of a big city or industrial agglomeration).

On the basis of the data transferred by the member countries, the TEM Project Central Office elaborates yearly separate network maps of all member countries mostly in the scale 1:750000 as well as the map of the whole TEM region as shown in Annex 3.

Furthermore, the TEM status tables are being produced every year, showing the total length of the TEM network in the member and associate member countries as well as respective lengths of motorways under construction and in the planning stage broken down to half-motorway and dual carriageway sections (see above).

As from 2004, the TEMSTAT data transferred electronically by the member countries and processed by the TEM Project Central Office will be interactively linked to the TEM mapping system, thus making it possible to introduce the reported annual infrastructure changes to the respective maps automatically. Upon establishment of the interactive linkage between the TEMSTAT database and ArcView mapping shapefile, the respective transfer will be materialized automatically and all the data would be visualized on the corresponding maps by maens of attribute tables when clicking on the respective road/motorway link (section). By choosing the selected parameter (e.g. traffic volume in a given year, type of road, type of bottleneck, etc.) it would be possible to create automatically a multitude of specialized maps showing for example the future status of the network, existing or forecasted traffic volumes, sections with different typed of bottlenecks, sections with exhausted capacity, etc).

1.5. TEM Project's Master Plan related decisions

The elaboration of the TEM Project Master Plan has been envisaged in the TEM Programme of Work for the years 2001-2004, constituting an integral part of the TEM Co-operation Trust Fund Agreement. In accordance with this document, the Draft Proposal for Elaboration of the TEM and TER Project Master Plans, was prepared by the UNECE Regional Adviser for Transport in September 2001.

This activity is also included in Table 1 of the Short-term Strategy for Further Integration of TEM in New European Transport Environment (TEM Project Action Plan, see below).

In line with the decision of the 35th session of the Committee (30 May – 1 June 2001, Trieste, Italy), the preparation of the TEM Master (Strategic) Plan was incorporated into the TEM Programmes of Work for the years 2002 – 2004. The Master Plan was elaborated in accordance with the Terms of Reference, prepared by the UNECE in close collaboration with the member countries and the TEM and TER Project Central Offices, the abridged version of which is attached (Annex 4).

TEM Master Plan is the key element of the Project's Short-term Strategy for Further Integration of TEM in New European Transport Environment (Action Plan), approved by the Thirty-sixth session of the TEM Steering Committee (December 2001, Geneva, Switzerland) and attached to this document as its Annex 1.

This strategy is based on the results of a respective survey and review of the TEM and TER Projects conducted during a period November 1999 to March 2001 at the initiative of the UN ECE Transport Division, in close cooperation with the TEM Project Central Office and with valuable contributions of the member countries which replied to the relevant questionnaires. The specific proposals on TEM Project Suggested Actions, contained in the seven tables attached aim at further strengthening the TEM Project efficiency in view of the current European transport developments and trends.

The tasks and tables are presented in such a way that on top there is the tasks description providing useful information such as action priority, parties involved in the execution, starting time and duration, expected results, milestones and criteria to be included. Tables are user friendly and are addressed to the decision making level, containing:

- set of actions aiming at the review of priority needs, elaboration of an updated inventory of these needs and of a realistic plan for their covering.

- tasks aiming at the integration of the TEM Project into the Pan-European transport environment and guidance as to the most important directions the TEM Project should focus on in this respect.

- cooperation of TEM with further fora and related initiatives, aiming at creation of the necessary synergy that will assist the attainment of TEM objectives and placement of TEM in the lead of transport development in the region.

- set of practical actions that will increase TEM Project visibility in the European transport reality and assist its monitoring effectiveness.

- necessary assessment and review of the results achieved and to experience from the introduction of these actions that may become the basis for further planning.

- set of tasks for further consideration and possible inclusion into TEM actions at present or later stage.

- graphic presentation of the time plan for execution of the above mentioned tasks.

It was decided that the above mentioned actions will be reflected in the TEM Programmes of Work for the years 2002 – 2005.

Annexes:

Annex 1	IMPLEMENTATION OF TEM PROJECT SHORT-TERM STRATEGY
Annex 2	TEM NETWORK
Annex 3	TEMSTAT GIS MAPS (5 maps)
Annex 4	TEM MASTER PLAN TERMS OF REFERENCE

2. TEM ENVIRONMENT IN EUROPE

2.1. Collection and review of existing relevant studies, assessments and works

2.1.1. Studies elaborated until 1999

In the course of 26 years of existence of the TEM Project, a multitude of projects and studies related to the transport infrastructure of the region were elaborated. Some of them, especially those elaborated before 1989, when most of the member countries had a planned economy system (e.g. CETIR), are obsolete and of no significance anymore. The relevant studies and their short description are listed below.
In the framework of the European Union's PHARE Multicountry Transport Programme, these studies and projects have been important and still relevant:

Updating of Transport Infrastructure Costs, elaborated in 1999 by COWICONSULT (Denmark), containing an update of cost estimates for upgrading transport infrastructure in the 10 accession countries. The detailed data served as a basis for cost estimates for infrastructure investment projects in the region and were feeded into the TINA process.

Balkan Transport Study, elaborated in 1997 by GIBB (United Kingdom), providing a strategic plan for the development of infrastructure, examined transport bottlenecks and administrative and institutional deficiencies, and evaluated the potential benefits and costs of developing the Adriatic-Black Sea corridor. Phare countries involved: Albania, Bulgaria, FYROM, Hungary, Romania and Slovenia.

Road and Motorway Management in the Phare Countries, elaborated in 1999 by NEI (The Netherlands), containing an inventory and comparison of methods for prioritising projects and institutional requirements for road management in Phare countries with three selected EU countries.

Traffic Forecast for the Ten Pan-European Corridors of Helsinki, elaborated in 1999 by NEA (The Netherlands), formulating a consistent methodology for preparing traffic forecasts and the development of a set of traffic scenarios for all 13 Phare countries.

Transport and the Environment, elaborated in 1999 by GIBB (United Kingdom), providing a policy guidelines to integrate environmental issues into transport policy together with an Action Plan and a Strategic Planning framework with the focus on environmental legislation/enforcement, training and EIA.

Development of Branches on Corridor V, elaborated by PROGNOS AG (Germany) in 2000, identifying bottlenecks and priority projects, pre-feasibility studies and the identification of

financing sources. The study was conducted for Bosnia and Herzegovina, Hungary, Slovak Republic and Slovenia.

Road Safety Project, elaborated by FINNROAD (Finland) in 1999, transferring best practices from EU to CEECs and between CEECs, and containing recommendation for improved road safety practices.

Costs and Benefits of Enlargement for the Transport Sector, elaborated by Halcrow Fox (United Kingdom) in 1999, containing estimates of the costs and benefits of taking on the transport acquis in 10 Phare countries together with an overall comparative assessment.

Road Transport Charges, elaborated by NEI (The Netherlands) in 1999, comprising analysis and recommendations for the approximation of the system and definition of an appropriate road transport charging system for each accession country.

The PHARE assistance programme of the European Union to the Central and Eastern European Countries was followed by the ISPA (Instrument for Structural Policies for Pre-Accession, established by the European Council Regulation No. 1267/1999. ISPA provided assistance to contribute to the preparation for accession to the European Union of the following applicant countries: Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia and Slovenia (ISPA beneficiary countries).

The community assistance under ISPA included projects, stages of projects which are technically and financially independent, groups of projects or project schemes in the field of environment or transport as well as feasibility and technical studies needed for carrying out a project.

Eligible projects for transport component were transport infrastructure projects which promoted sustainable mobility, and in particular projects of common interest and those enabling beneficiary countries to comply with objectives of the Accession Partnerships, including interconnection and interoperability of national networks as well as with the Trans-European networks together with access to such networks.

Taking into consideration that 8 out of the total 10 ISPA beneficiary countries are members of the TEM Project, this financial instrument was very important for TEM participating countries.

In the third Pan-European Transport Conference held in Helsinki in 1997, the importance and use of the links between Europe and Asia were considered to have a further grow. This showed the necessity of the ongoing extension of AGR, AGC, AGTC and AGN networks to the Trans – Caucasian and Central Asian members of the UNECE.

United Nations ESCAP has studied road corridors linking Europe with Central Asia, concerning the overland trade between Europe and all Asian countries. The precise routing for these corridors has been established, and existing road networks allow a variety of different routes.

These routes maps were presented in the Planco/High-Point Rendel study of February 1998 for EC/DG VII, for Transport Routes between Europe and Asia.

2.1.2. Recent studies

Special studies, mostly by the European Commission, have been devoted to the transport system in Balkans, which are also of great interest for TEM Project. These are the TIRS (Transport Infrastructure Regional Study) dealt with under the Task 2.5. and the REBIS (Regional Balkans Infrastructure Study) which fulfilled the function of TINA in Balkan countries and covered also TEM member countries Bosnia and Herzegovina and Croatia, completed in June 2003.

The purposes of the study inter alia were:

- to assess the strategy transport network of the region in the light of updated economic developments and traffic forecasts and suggest some modifications if required;
- to create a proper investment plan for the short-term priority projects, suitable for international financing, which have been identified in the TIRS study;
- to establish a methodology and proper procedures and to monitor the implementation of the transport projects on the strategic network;
- to define a list of medium and long term projects, needed to improve the transport networks and suitable for international financing;
- to identify suitable local counterpart institutions in each of the recipient countries and to strengthen them through training;
- to provide guidance for the realisation of national transport plans and for feasibility studies for the specific projects selected in the subsequent investment programme.

Finally, the recent relevant transport studies, regarding inter alia the road and transport infrastructure in the region and especially the European Union accession countries, should be mentioned.

The first of them was the PLANTIS Study, which should formulate the investment requirements of the Union's Trans-European network including its extension to the Central and Eastern Europe, which, nevertheless, produced not fully satisfactory results for accession countries due to lack of timely data and their insufficient reliability.

The very important document represents the Report of the European Commission's High-Level Group on the Trans-European Transport Network of June 2003.

The High-Level Group was mandated by the Vice-President of the Commission in charge of Transport and Energy to identify the priority projects of the Trans-European transport network up to 2020 on the basis of proposals from the Member States and the acceding countries. This exercise was part of a broader review of the Community guidelines for the development of the Trans-European transport network. The Group, which was chaired by Mr. Karel Van Miert, consisted of one representative from each Member State, one observer from each acceding country and an observer from the European Investment Bank.

One of the major tasks of the Group was to select a restricted number of priority projects on the transport network of the expanded Union. Such projects were essential to complete the

internal market on the scale of the European continent and to reinforce economic and social cohesion. The Group also studied the obstacles of a financial, legal and administrative nature to the implementation of these priority projects.

In accordance with the Group's mandate, the list of priority projects included only the most important infrastructure for international traffic, bearing in mind the general objectives of the cohesion of the continent of Europe, modal balance, interoperability and reduction of bottlenecks. In addition, an assessment was made as to how well each project fits the objectives of European transport policy, the added value for the Community and the sustainable nature of its funding up to 2020. The Group established its own methodology to assess and identify, amongst the candidate projects proposed by the present and future Member States the new priority projects to be carried out until 2020.

The Group also identified several „horizontal" or crosscutting priorities aimed at a better management of the European transport system, the effectiveness of which will be closely connected to the introduction of accompanying regulatory measures. The integration of traffic management systems on the basis of common techniques and standards for an optimised use of the existing networks will require incentive aid. A group of measures to manage more efficiently the allocation of capacities, particularly for freight transport, appears moreover unavoidable, with regard in particular to requirements imposed by the sustainable development of transport. In this context, the Group recommended particularly keenly the gradual introduction, with the support of all market operators, of a European rail network dedicated to freight transport.

The Group's mandate was to identify priority projects for the internal market. The Group did, however, identify a number of connections with third countries, which were of interest for the development of the European Union's external trade and in order to improve the transit conditions of some new Member States. Consequently, the Group recommended that they be developed, particularly with the help of structural financial instruments – in the case of sections within Union territory – or in the framework of transit or association agreements between the Community and the third countries concerned (such agreements could even include a financial component), in the case of sections outside the Union.

The priority projects selected by the Group represent funding estimated at euro 235 billion between now and 2020. What is more, these new priority projects represent only a part of the investment needed for the Trans-European network of the expanded Union. The Group stressed that the total cost of the network, including priority projects and other projects, was estimated at more than euro 600 billion, exclusive of maintenance costs.

The Group also considered that it was necessary for coordination – not just financial, but also operational coordination – between the States concerned by projects on a single axis to be strengthened and institutionalised. To that end, a coordination team under the auspices of the Community, headed by a personality recognised and accepted by all the States concerned, should be set up to spur on the achievement of projects on the major axes and to canvass private and institutional investors.

The priority projects selected by the Group are those, which contribute most to promoting transnational traffic on the major Trans-European axes. This selection procedure has made it possible to highlight a certain number of major Trans-European axes. The identification of European axes characterised by major flows unavoidable for geographical or economic reasons facilitates the ordering of priorities and the establishment of consistency between the national plans. Consequently, the Group asked for this initial identification to be completed in the context of the revision of the guidelines by more detailed analyses of traffic flows in a Union of 27 countries.

The definition of a core network comprising these axes will constitute an indispensable working tool for further revisions of the list of priority projects. Recourse to a group of high-level experts appointed by the transport ministers has, moreover, permitted the identification of broad guidelines for the Trans-European network and the incentives needed for its development. Given the strong territorial dimension and financial implications of the network, the work of a group of this kind constitutes and important prerequisite of any substantial revision of the Community guidelines.

Finally, two undergoing relevant studies should be mentioned, namely the study „Towards a European Main Road Network" combining the TERN/TINA and E-Road networks on the basis of the functional requirements of the TEN-T Guidelines, under elaboration by the IVV-Aachen and SPP Consult (Germany). The aim of the study is to develop a methodological approach for the uniform (all over Europe) identification of those parts of the study road network, which fulfil the functional requirements of the TEN-T-Guidelines and to show to which extent these parts either belong to TERN/TINA or to the E-road network or to both networks.

On this basis a proposal for defining two hierarchical levels of one future Trans-European Road Network is being developed. The validity of the approach will be proven by a case study showing whether and how the links of the two aforementioned road networks fulfil the functional TEN-T requirements.

The TEN-STAC study aimed at establishment of scenarios, traffic forecasts and analysis of corridors on the Trans-European network was elaborated by the NEA Transport Research and Training BV in collaboration with these partners: COWI, IWW, NESTEAR, PWC, TINA, IVT, HERRY and MK metric in 2004.

A principal objective of the study was to test different alternatives of development and realisation of TEN-T policies for the Community. This challenge required the specification of scenarios, three of which have been chosen in agreement with the Commission for the horizon year 2020. It was proposed that all scenarios incorporate the same socio-economic assumptions and basic policy actions to ensure the realisation of White Paper in terms of liberalisation and harmonisation for 2020.

The accompanying measures to be applied on TEN corridors will address measures as: interoperability, management of slots, dedicated freight network, which is in fact priority freight network and intermodal policy. All accompanied measures will be adapted to corridor specificity and will address also the problems identified on each corridor.

The focus will be concentrated on accompanying measures dedicated to the selected infrastructure projects in order to support the operational, institutional and organisational frameworks addressing the intermodal transport. These measures will maximise the effect of the realisation of the specific infrastructure projects.

2.2 Pan-European Transport Corridors (PETCs) and the TEM Project

2.2.1 Second Pan-European Transport Conference 1994

The second Pan-European Transport Conference held in Crete in 1994 endorsed the Progress Report Toward Indicated Guidelines for further Development of Pan-European Transport Infrastructure. This report was based on the Declaration adopted by the first Pan-European Transport Conference in Prague in 1991, which was jointly submitted by the European Commission, the Secretariats of the European Conference of Ministers of Transport and the United Nations Economic Commission for Europe.

In this report, nine multimodal Pan-European transport links were identified as being of European interest and were considered to be a basis for future work on transport infrastructure development in Central and Eastern Europe. These Pan-European transport links are now commonly called the Corridors.

The progress report towards indicative guidelines for further development of Pan-European transport infrastructure also introduced a three-layer concept for transport infrastructure development at a Pan-European level:

- *The first layer* set long term perspectives for infrastructure development at Pan-European level. These are reflected in the international instruments (AGR, AGC, AGTC) developed under the auspices of UNECE.
- *The second layer* introduced a set of medium term objectives in various parts of Europe running up to 2010. For the European Union, these objectives provided the guidelines for the development of Trans-European Transport Networks (TENs), which were adopted in July 1996. For Central and Eastern European Countries road and rail infrastructure, they predominately follow the TEM and TER networks developed under the auspices of the UNECE.
- *The third layer* introduced the short-term priority actions implementing the second layer.

The nine Crete Corridors constituted a set of eight road and rail links (which totalled 18000 km for both modes) and the river Danube (other inland waterways, airports and ports were not included in the Corridor concept). It was accepted from the outset that the main focus for action would be to increase the capacity of existing infrastructure in order to meet the expected traffic volumes and travel speeds (particularly on the railway network).

Work on the Crete Corridors has advanced well until 3rd Pan-European Conference and many positive developments have been realised since Crete Conference. Memoranda of

Understanding for the development of the nine Crete Corridors have been signed and Steering Committees and Working Groups have been established.

2.2.2 Third Pan-European Transport Conference 1997

The third Pan-European Transport Conference held in Helsinki in June 1997, following a detailed analysis by the parties concerned, confirmed by competent bodies of the UNECE (Steering Committees of TEM and TER Projects) and endorsed by the ECMT at its Ministerial Conference in Berlin in April 1997, came to the conclusion that the nine Pan-European transport corridors in CEE and the guidelines adopted for the development of Trans-European Transport Network continued to constitute a valid basis for coherent infrastructure development at Pan-European level.

No changes or adjustments to the set of nine corridors appeared to be necessary in the near future, apart from the cases addressed in the following paragraphs, which dealt with further destinations, and a small number of missing links between the nine corridors.

In the light of the consideration of the peace process in the successor states of the former Yugoslavia, it seemed appropriate to propose the establishment of a new corridor (Corridor X) which broadly follows the traditional transport route to South Eastern Europe which was widely used before the outbreak of hostilities. The effective development of this corridor would however require the co-operation of all the countries concerned. The Corridor X, together with the other proposals adopted by the Conference participants is presented in the annexed map of the " Pan-European Transport Corridors and Areas". (Annex 5).

Other extensions and additions were concluded by the Conference, which were the following:

Corridor V:

- Extension beyond Moscow towards Volga region (Nizhny Novgorod) connecting to Trans-Siberian route.
- Addition of new branch from Adriatic coast (port Ploce) via Sarajevo and Osijek to Budapest.

Corridor VI:

- Additional branch, leading to Corridor IV and connecting Katowice via Ostrava-Breclav as a rail route, and via Ostrava-Brno as a road route.

Other developments of links were also suggested:

- (Baltic Sea-Gdansk and Black Sea-Odessa, Constanta) through Warsaw and Kowel and rail link between Baltic Sea and the Northern Adriatic.

It also became apparent that, in certain areas, particularly those surrounding or linked to sea basins, the corridor concept, based on the development of links between major activity centres, did not adequately address transport infrastructure needs. A more comprehensive

approach, reflecting the complex structure of transport requirements in these areas, most of which are strongly influenced by the sea, therefore needed to be adopted. The countries concerned endorsed this complementary concept of Pan-European Transport Areas. The proposed areas were:

- The Barents Euro - Arctic Area
- The Black Sea Basin Area
- The Mediterranean Basin Area, and
- The Adriatic/ Ionian Seas Area.

It was intended that, in each of these areas, the countries concerned and appropriate regional co-operation organisations, where existed, should work on a infrastructure development plan for each area, and for its links with the Pan-European Corridors and the Union's Trans-European Networks as well as, where appropriate, eastwards to Central Asia. This work should include study of possibilities for complementing the Pan European Transport Corridors to ensure their greatest possible integration with Areas in question.

2.2.3 Overview and Present State of the Corridors

Annex 6 summarizes the basic data regarding the individual Corridors and Annex 7 shows the share of TEM countries in each of them.

The construction costs for the corridors were estimated by the countries themselves and are presented in the table below. The investments for the TINA countries (see Chapter 2.3. below) were presented in the final report "TINA – A Common Transport Infrastructure Needs Assessment" of October 1999. The figures for investments on corridors outside TINA countries were included where available. However, a detailed analysis of the investment measures in the non-TINA countries should be based on defined assumptions and criteria as laid down in the guidelines for the Trans-European Transport Network.

The presented costs for the construction of the corridors gave a rough estimation, because not all necessary measures were included.

Based on projects already underway or ready for implementation, and possible investments identified by the proposing countries, cost estimates led to a total investment volume of 72 860 M€ for the Corridors until the year 2015. Of this amount, 32 580 M€ was assigned for rail mode and 39 625 M€ for road mode.

Table 3 Lengths and costs of the Corridors

	Length in km	Cost in M€
Corridor I: Total		3 835
Rail	1 710	2 278
Road	1 630	1 557
Corridor II: Total		8 404
Rail	2 310	3 635
Road	2 200	4 768
Corridor III: Total		5 575
Rail	1 650	1 860
Road	1 700	3 715
Corridor VI: Total		16 814
Rail	4 440	8 583
Road	3 740	8 231
Corridor V: Total		13 378
Rail	3 270	5 671
Road	2 850	7 707
Corridor VI: Total		12 471
Rail	1 800	5 719
Road	1 880	6 752
Corridor VII: Total	2 415	657
Corridor VIII: Total		2 547
Rail	1 270	1 127
Road	960	1 420
Corridor IX: Total		7 344
Rail	6 500	2 606
Road	5 820	4 738
Corridor X: Total		1 837
Rail	2 360	1 100
Road	2 150	737
Rail: Total	25 310	32 579
Road: Total	22 930	39 625
Total	48 340	72 861

Regarding the coordination and monitoring of development of the Corridors, each of them has its Steering Committee and a secretariat in some of the EU member and accession countries and special Corridors and Areas Coordination Group is headed by the European Commission, in which also the UNECE takes active part.

The UNECE submitted to the EC the proposal for the establishment of a harmonized system of corridors data that was requested during the 4th meeting of the Corridors Coordination Group and underlined its readiness to offer its contribution towards the introduction and implementation of such a system in close cooperation with the countries concerned.

Within this initiative and based on the request of the Government of Poland endorsed by the TEM Steering Committee and the UNECE, the TEM Project Central Office has been chosen to undertake the function of Secretariat of Corridor VI, which is chaired by Poland.

2.3. Transport Infrastructure Needs Assessment (TINA) and the TEM Project

2.3.1. The establishment of TINA process

In July 1996, the European Parliament and Council adopted a decision on Guidelines for the development of the Trans-European Transport Network. In the Agenda 2000, the Commission identified the importance of transport for the Union's Pre-Accession Strategy. It therefore proposed that substantial funds be allocated for the transport infrastructure investments in the candidate countries in Central Europe.

In April 1997, the EC proposed a structure for transport networks serving the entire continent to the third Pan-European Conference, in which the Trans-European Transport Network of the European Union and its extension to the future new Members in Central Europe plays a prominent role. This structure was eventually included into the declaration of Helsinki Conference.

The first structural dialogue between the Transport Council of the EU and the Transport Ministers of the associated countries in September 1995 recommended undertaking a Transport Infrastructure Needs Assessment (TINA) for the candidate countries for accession. On the basis of this recommendation, the Commission launched the TINA process, with view to defining the future Trans-European Transport Infrastructure Network in the enlarged European Union, using the criteria of the Decision 1692/96/EC.

To advance and monitor the TINA process, the Commission established in 1996 a Group of Senior Officials (the TINA Senior Officials Group) with representation from all Member States and from the 11 candidate countries (Bulgaria, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, Slovenia and Cyprus).

At operational level, the TINA Group worked in three geographically oriented subgroups: the Baltic Sea, the Central European and the Southern Central European Area. Germany, Austria and Greece chaired these three subgroups.

The TINA Secretariat, which has been set up as a technical support unit in Vienna, supported the TINA process; this was a project partially financed under the PHARE Multi-Country Transport Programme mentioned above.

The financial assistance for the project from PHARE funding, was euro 1,491,394. This cost represented fees and expenses for the cost of the persons involved in the project, which was a part of the total cost only. The City of Vienna hosted the offices of TINA Secretariat, and covered a substantial part of the project's total cost.

The TINA process has been designed to support the planning and development of a multi-modal transport network within the candidate countries for accession.

2.3.2. TINA results and recommendations

The starting point for the TINA work was the backbone network based upon the Pan-European Transport Corridors confirmed with some adjustments at the third Pan-European Transport Conference in Helsinki.

For this backbone network, construction costs were estimated on a common basis using existing information and inputs from TINA countries. These investments costs estimates were available per mode and per country. The costs were also broken down for each section of the network.

The results of the estimated transport infrastructure needs for the 11 accession countries amounting to euro 91,596 billion were presented in the final report of TINA in October 1999. Main map of the TINA road network is attached to this report as its Annex 8.

TINA report contained an interesting paragraph with recommendations for follow up actions, the most important of which should focus on monitoring the implementation of the network and, during the accession process, adapting it to developments in transport and economic conditions.

A concise investment strategy would need to be implemented over the next 15 to 20 years. This will require a smooth transition from pre-accession support under ISPA to the support schemes available for Member States, with careful co-ordination between the different financial institutions. In this respect, TINA could be a useful forum for the development of transport network strategies jointly between countries concerned, funding and lending institutions, and the Commission**.** In addition, investment schemes would be dependent on specific project proposals being made, which have to meet a number of economic, financial and institutional criteria. The establishment and development of common methodologies and organisational approaches would permit the identification and continuous development of project pipelines. The TINA process should support this co-ordination.

The TINA process in future would need to be co-ordinated with that going on inside the Union on the Trans European Transport Network. This will require the use of similar, if not identical, methodologies and common reporting framework, particularly as regards the establishment and maintenance of a database using GIS techniques. Following core actions were recommended to be primary undertaken by the Commission, EIB, and other IFIs:

- Establish priorities amongst possible investment measures using the criterion of sustainable mobility and an investment project pipeline for external financing.
- Promotion of institution building, and organisational and regulatory measures favouring the competitiveness of rail.
- Promotion of PPP schemes for TENs projects in the future enlarged Union.
- Promotion of Intelligent Transport Services for the benefit of the TINA network.

Further technical assistance would be required to monitor progress, and develop common methodologies for project analysis and priority setting, etc. Functions for which the European Commission will need to draw extensively on this technical support are:

(i) Development and adaptation of assessment methods for the future Trans-European transport network, including strategic environmental assessment, for its components, and for possible investment measures and projects.

(ii) Monitoring of the development of the future Trans-European Transport Network in the acceding countries and its usage, with the publication of regular information on progress.

(iii) Maintenance of Geographical Information System (GIS) in the field of monitoring as part of the overall GIS implemented.

An examination of the scope of technical assistance for applicant countries in developing PPP would be necessary. This would require very specific expertise, and should cover the possibility of setting up an interlocutor between the Public and Private Sector, enjoying the confidence of both sides.

The experience gained in TINA could furthermore constitute a useful basis for the discussions on planning of transport infrastructure development in the context of Stability Pact for South - Eastern Europe and co-ordination of the integrated development of infrastructure in Central Europe.

It was recommended that TINA continue its work in order to facilitate the integration of transport infrastructure the candidate countries into the EU.

2.3.3. TEM participation in the TINA process

The European Commission DG VII and the UN ECE took the joint decision to involve TEM and TER Projects in the TINA activity. On the basis of this decision, the Cooperation Agreement between the TINA Secretariat in Vienna and the UNECE Trans-European North-South Motorway Project was signed on 5 June 1998, in which both parties agreed to co-operate in carrying out the assessment of the motorway and road infrastructure needs in the countries acceding to the European Union. The motorway and road links situated on the Pan-

European Transport Corridors in other Central and Eastern European TEM countries were also assessed. The TEM Project Central Office took the obligation to supply the TINA secretariat the data on motorways and major road infrastructure and traffic flows of its member countries participating in the TINA process, as specified in Annex 2 of the above Cooperation Agreement.

Apart from this co-operation, the results of the TINA process significantly influenced also the further development of the TEM network. In accordance with the decision of the Thirty-First session (22-24 June 1999, Geneva, Switzerland) of the TEM Steering Committee, the TEM PCO prepared the document comparing the TEM and TINA networks country-by-country accompanied by maps and submitted it to the Thirty-Second session of the Committee, held on 1-3 December 1999 in Trieste, Italy, for examination.

In this document, all the differences between the TEM and TINA network were listed. This analysis showed that the TEM and TINA networks were almost identical in Hungary, Romania and Slovakia. In Bulgaria, the Czech Republic, Lithuania and Poland there existed substantial differences (TINA network having been generally more dense than the TEM one), partly due to the fact that in these countries the TINA network comprized more non-motorway links.

The document suggested, therefore, that through some modification of the TEM network the better compatibility of both systems could be attained. The proposed modifications included:

- Deletion of the TEM links not having the motorway character and having no reflection in the TINA network,

- Addition of new TEM links of motorway and expressway character of high importance for international road traffic, being at the same time parts of the TINA network.

In order to achieve the desirable homogeneity of the TEM system, it was also suggested to add to the TEM network the remaining existing and/or future motorway links so that the TEM system could represent all the future motorway networks in the region.

Upon the examination of the above document, the Thirty-Second session of the Steering Committee also approved the following principles to govern the future modifications of the TEM network.

a) The TEM network in the non-EU member countries should include all existing and future motorways and exceptionally also some expressways (e.g. border links), thus ensuring continuity and interoperability, offering the same driving conditions and level of service;

b) In TINA countries, maximum compatibility with the TINA network should be attained on condition that the above principles are fully respected.

2.4. Trans-European Network (TEN-T) and the TEM Project

2.4.1. The establishment of the TEN-T

A fully integrated transport network is a prerequisite for a real freedom of movement of goods and people and for bringing together the peripheral, island or isolated areas with the central regions. A modern, interconnected and interoperable network allows, through a better use of transport, to enhance the competitiveness of the European economy as a whole. Without implementing the necessary infrastructure and an appropriate regulatory framework for an efficient network management, the concepts of the internal market and the territorial cohesion of the European Union will remain unfinished.

The decision to develop an integrated transport network in the European Union was taken in July 1996. This can probably be regarded as the single most reaching decision since 1992, when transport policy became an integral part of the affairs of the European Union.

Even since the original Rome Treaty in 1957, transport has been acknowledged as important, since movement of people and goods is essential for economic development, which is one of the cornerstones of the treaty. The European Economic Community (EEC) as the present Union was called at that time formally attached interest to transport only to ensure fair competition e.g. conditions for road haulage to be harmonized in Europe.

In 1985, the European Commission presented a White Paper on implementation of the Single Market to be completed by 1993. The idea behind the Single Market was for the European Union to ensure free movement of people, goods and services. The White Paper highlighted a common transport policy as one of the most important instruments to fulfil the potential of the Single Market i.a by developing an efficient, sustainable and integrated transport network. Such a network development was also seen as an instrument to promote long term competitiveness, growth and job creation.

With the historical Maastricht Treaty of 1992, the European Union became a reality including transport among its many affairs. The inclusion in the Treaty of Maastricht as a title for a policy on the Transport-European network gave the European Community competencies and the instruments for their development. In accordance with Article 154 of the Treaty establishing the European Community, the community contributes to the establishment and development of Trans-European networks in the sectors of transport, telecommunications and energy infrastructures with a view to contributing to the establishment of the internal market and to economic and social cohesion. To do this, it must firstly develop the interconnection and the interoperability of national networks.

Under these conditions, the Trans-European transport network will support the development of the economy of the European Union. People, goods and services should be able to circulate throughout the market in an effective way and at the least cost. However, in the last decades, the transport infrastructure of the member states was still excessively oriented inwards, with

the national capitals representing the nerve centres towards which the major transport routes converged.

Establishing such a network would have become an instrument of economic integration, facilitating communication, reducing distances and making contacts easier between the peripheral and the central regions. As it is of crucial importance for the orderly functioning of the single market, the Trans-European network also takes on a fundamental role in developing economic and social cohesion.

It soon proved necessary to promote the establishment of the Trans-European transport network, as its implementation suffered from slow economic growth, which reduced the availability of funds. The Commission's 1993 White Paper on growth, competitiveness and employment consequently evoked the idea of drawing up a list of projects of community interest together with a number of measures aiming at mobilising public and private actors.

Within this framework, the role of the Union was to eliminate the financial and administrative obstacles in the development of these major and costly priority projects, among which many cross-border projects, by encouraging private investors to play a larger part in their financing. This approach included the development of an action plan for each project in a form which intended to give the political impetus necessary for speeding up its implementation and financing.

At its meetings in Corfu in June 1994 and in Essen in December of the same year, the European Council endorsed a list of 14 priority transport projects, listed in the table below. It also invited the member states concerned to take all the measures necessary to advance these projects by in particular speeding up the administrative, regulatory and legislative procedures.

Table 4 Priority transport projects

PROJECT	**LENGTH (Km)**	**Cost MECU**	**FINANCING**
1.High Speed train (HST) /Combined transport North-South	958	115102	Partly secured, some difficulties remain
2.Paris-Brussels-Koln-Frankfurt-Amsterdam-London	1176	17232	Some delays , now all sections on track
3. High Speed Train South	1601	14072	Partly secured, some difficulties remain
4.HST eastern France-south-western Germany TGV	551	4777	Largely secured
5.Betuwa Line	160	4 094	Possibility for PPP being explored
6.HST/Combined Transport - Lyon -Turin- Trieste	734	18260	Partly secured, some difficulties remain
7.Greek Motorways	1580	9242	Tree PPP schemes on PATHE, support from WRDF & Cohesion Fund
8.Multimodal link Portugal-		6212	Support from ERDF & Cohesion

Spain-Europe			Fund expected, some difficulties remain
9.Conventional rail link	502	357	No difficulties
10.Malpensa Airport		1047	Financing in place
11.Oresund Fixed road / rail Link	52.5	4158	Financing in place
12.Nordic Triangle Multimodal corridor	1800	10070	Partly secured, some difficulties remain
13.Ireland-UK-Benelux road link	1530	3629	Uncertainties remain
14. West cost Main Line	850	3000	Financing secured PPP, between private infrastructure and services companies, with public subsidy

Subsequently, on 23 July 1996, the European Parliament and the Council adopted Decision No. 1692/96/EC on Community guidelines for the development of the Trans-European transport network, that included a much larger list of projects of common interest.

This decision set 2010 as its target date for completing the network. The guidelines were intended to encourage the Member States, and if necessary the Community, according to its budgetary resources, to carry out projects of common interest aimed at ensuring the consistency, interconnection and interoperability of the Trans-European transport network as well as access to this network.

The guidelines put in a single reference framework the plans and criteria for each mode of transport, which has made it possible to identify projects of common interest likely to be eligible for the TENs budget or under financial structural instruments. Furthermore, the Decision incorporated within its Annex III the priority projects adopted by the Essen European Council.

2.4.2 TEN-T objectives

The aims of the Trans-European Transport Network are:

- To support the Single Market and
- To promote social and economic cohesion.

TEN-T comprise transport infrastructure, traffic management systems and navigation systems. The transport infrastructure comprises road, rail, and inland waterway network plus airports, seaports, and inland waterway ports.

The traffic management systems and the navigation systems include the necessary technical installations, information systems and telecommunication systems to ensure harmonious operation of the networks and efficient traffic management.

The further objectives of this transport network are to:

- Ensure best possible safety conditions and environmental considerations
- Offer high quality infrastructure on acceptable economic terms
- Allow optimal use of existing capacities
- Encourage intermodality (to ensure best use of the entire system)
- Be, insofar as possible, economically viable
- Facilitate access to all regions of the Union
- Connect to networks of EFTA, CEEC and the Mediterranean countries
- Promote projects of common interest (remove bottlenecks between member states and connect peripheral regions with the central region of the Union).

2.4.3 TEN-T financing

Basically, member states are to develop and finance their own parts of TEN-T. Some financial support from the Union is, however, possible once a link is accepted as part of TEN-T. (This has had the effect that some road links have been put on the map that should probably not have been included).

There ways of financial support are available:

- The TEN-T budget of the Community
- The Regional Fund incl. a special Cohesion Fund for the less developed countries
- The European Investment Bank (loans)
- The European Investment Fund (guarantees).

The annual TEN-T budget has been about 0,4 billion euro of which 75% was used for the 14 priority projects, The Regional and Cohesion Funds allocated about 3 billion euro to TEN-T annually, while the European Investment Bank granted loans of app. 6 billion euro a year to TEN-T. These amounts of money have supplied investments of member states. It may be interesting to note that the total predicted investments needed to upgrade/extend TEN-T in the period from 1995 to 2010 amounted to about 400 billion euro.

2.4.4. Trans-European Road Network (TERN)

TERN comprises motorways and high quality roads which play an important role in long distance traffic, bypass main urban centres, provide interconnection with other modes, and link peripheral regions to central regions of the Union. While the primary road network in the old EU comprises some 280 000 km of motorways and main inter-urban roads, the TERN includes some 57 000 km, but is planned to increase to app. 74 500 km by the year 2010. Roughly, two thirds of TERN today are motorways and remaining are so called high quality roads. In spite of its limited size compared to the entire primary network, TERN carries more than a third of all road traffic.

Traffic continues its growth trend. The last decade has seen an average annual growth of 3.2% in passanger transport and 2.8% in goods transport. All indications seem to estimate a doubling of traffic (veh. x km) between 1995 and 2010, a formidable challenge when taking into account the wish to reduce traffic accidents and environmental impacts.

Investments in TERN (i.e. major upgrading e.g. from 4 to 6 lanes, from ordinary 2-lane road to 4 lane motorway or construction of entirely new links of TERN) represent about 38% of investments in all modes of infrastructure of TEN.

2.4.5 Extension of TERN to the new member states and the role of the TEM Project

A reformulation of the current Trans-European transport network guidelines was especially necessary because of the largest expansion of the European Union. Ten countries joined the European Union in May 2004: Cyprus, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia and Slovenia. Romania and Bulgaria should join in 2007. This situation emphasises the need for upgraded or new infrastructure on the corridors serving these countries in order to connect them effectively to the Trans-European network of the 15 current member states. There is also a need to improve the connections between these countries themselves. A new infrastructure network must therefore be developed East-West, and also North-South.

Adequate transport infrastructure is one of the conditions for the economic development of the acceding countries and their integration into an internal market on a continental scale, as well as for strengthening the accessibility of the peripheral regions towards the central regions. Borders will not be truly opened and people and goods will not be able to circulate freely and efficiently if the roads, railways, airports and ports of these countries are not modernised.

The accession negotiations revealed important needs regarding transport in the acceding countries. Approximately 20 000 km of roads and 30 000 km of railways, as well as ports and airports, will have to be built or modernised to achieve the criteria and the objectives of the Decision on the Trans-European network guidelines applicable in the old member states. The investments to be made in those countries can be estimated at about €100 billion, which is huge figure compared with their GDP.

As described above, the Pan-European Conferences of the Ministers of Transports in Crete in 1994 and in Helsinki in 1997 made it possible to identify a series of Pan-European Transport Corridors crossing the Central and Eastern European countries and connecting them with the network of the European Union. These Corridors, whose purpose is to take up the major part of international traffic, made it possible to coordinate the interventions of the various authorities, including those of the Union that already actively supported the Central and Eastern European countries through the PHARE and ISPA programmes.

Raising the economies of the acceding countries to the level of the 15 old member states will still, however, require considerable investment efforts. Moreover, economic growth will itself generate unprecedented growth in the transport needs in these countries, and consequently for

infrastructure as well. Since the cycle of development of an efficient transport network is relatively long, it is understood that large-scale facilities must be planned and launched now in order to develop the future Trans-European transport network of the extended Union. Furthermore, it is necessary to make up for investments that were not made for several decades because of the past separation of Europe.

The effects of enlargement on the Trans-Europeans transport network are nor limited to those part of it located in the future member states. The integration of markets will be accelerated by enlargement and this will also probably lead to the generation of new traffic flows on the network of the current member states. Some of the existing peripheral member states will benefit from new intra-EU connections with central areas, for instance through the Baltic states or Eastern Balkans. It is difficult to estimate the magnitude of this phenomenon, which will depend on new territorial dynamics and the international division of labour.

In all these developments and activities and especially with regard to the extension of the Trans-European Road Network to the new and accession countries, the TEM, backstopped by the UNECE, may play the important role. The existing TEM network may represent the core of the extended TERN, since it represents the most important and highest category (motorway) backbone of the transport infrastructure of the region. The sophisticated TEMSTAT database and mapping system, based on the uniform international reference system, may fundamentally contribute to the administration, management and monitoring of the extended TERN in the TEM member countries. Furthermore, the well established and functioning Project structure, its contacts with the Road Administrations/Directorates of the member countries as well as its detailed knowledge of national road systems and respective local conditions may be utilized with advantage in the process of integration of main road network of the TEM member countries to the Trans-European Road Network of the extended Union.

2.5 TIRS and CARDS

2.5.1. The CARDS countries

A special attention is paid to the 5 Balkan countries – Albania, Bosnia and Herzegovina, Croatia, Serbia and Montenegro and former Yugoslav Republic of Macedonia, two of which are the member countries of TEM, too.

Transport infrastructure in these countries is generally below European standards and has been severely affected by direct war damage, which destroyed or rendered unusable important components of the infrastructure in the Serbia and Montenegro and in Bosnia and Herzegovina, including roads, railway lines and airports. The destruction of bridges across the Danube and Sava rivers is still severely impeding road and rail traffic flows and inland navigation in addition to the indirect damage from the conflicts as well as negligence and under-investment, which led to severely curtailing periodic and current maintenance and renewal activities.

Road endowment in the region is significant, although not reaching the typical levels of the European Union. In all five countries, road networks are relatively extensive, albeit density and quality are quite different. Primary and secondary roads amount to some 57000 km. There are 1008 km of motorways concentrated in Croatia, Serbia and Montenegro and the former Yugoslav Republic of Macedonia.

The state of the network is very uneven, although in general it shows a serious lack of periodic and current maintenance. The maintenance problem is becoming particularly acute in certain cases. Furthermore, many roads do not comply with the requirements of European trucks, which are allowed to have axle loads up to 11.5 tons, which needs special attention.

2.5.2. The CARDS Programme and TIRS study

In the region, the European Union is playing a central role in repairing the damage of conflict, and equipping the countries of the region to promote economic development and regional integration. The EU policy – known as the Stabilisation and Association Process (SAP) – is designed to help each of the countries of the region to implement fundamental economic and political reform. The Balkan region is part of Europe, and the future of the region is intimately linked to that of the rest of the continent.

The SAP draws on experience in the candidate countries, and offers each of the Balkan countries a demanding contractual relations with the EU in which the Union undertakes to assist them in implementing reforms in exchange for a proven commitment on the part of each country to carry out such reforms. The objective is to give the countries of this region a credible prospect of membership in the European Union. The SAP is a long-term policy modelled on the EU previous experience of reform in Central and Eastern Europe.

The SAP sets the standards for implementing reform. The faster reforms are carried out, the faster the progress of integration with the EU. This is formalised through the Stabilisation and Association Agreements (SAA), which individual countries negotiated with EU. These agreements are legally binding contractual agreements and impose obligations and confer rights on the countries concerned. They embody the core principles that underlie membership of the EU itself and provide benchmarks by which to measure progress.

The countries of the region are expected to establish a network of relations among themselves reflecting the bilateral relationship with the EU. In particular, they are expected to create a network of bilateral free trade agreements removing barriers to intra-regional trade, thus reintegrating the Western Balkans into the infrastructure European networks for transport, energy, border management and environment. How each country performs in implementing this part of the SAA agenda will influence the EU's assessment of the country's ability to take on the demands of full integration into the EU.

The preparation, negotiation and implementation of Stabilisation and Association Agreements are backed by very substantial assistance from the EU budget – some €4.65 billion for the five years to 2006.

The European Commission launched for these countries a special Regional Programme called CARDS, in the framework of which the Transport Infrastructure Regional Study (TIRS) was elaborated, completed in February 2002 and aimed at establishment of list of priority projects for transport infrastructure in the region.

In the course of the first phase of the TIRS study using the "bottom-up" approach and financed by France, selection of short-term priority projects and medium-term investment proposals was carried out, while the second phase, using the "top-down" approach, to be financed by the EU will concentrate at the definition of a longer term (2015) transport infrastructure plan.

2.6. Overview of the TEM Project role and perspectives in the Pan-European context

2.6.1. The TEM Project involvement in European international cooperation

Apart from the TEM involvement in the monitoring and development of Pan-European Transport Corridors, described in Chapter 2.2. and in the extension of the Trans-European Road Network of European Union to its new member states (Chapter 2.4.5.), the TEM international cooperation with other European institutions and bodies involved in the transport field is expected to continue and intensify.

The cooperation with the major international organisations of this type and its outputs are described in Chapter 1.1.5 of this document. Furthermore, the TEM Project is collaborating or plans to extend its activities also to the regional initiatives and fora, active especially in South-Eastern Europe and listed below.

Southeast European Co-operative Initiative (SECI)

SECI is a regional initiative of States of Southern Europe, aiming to encourage the co-operation among the countries of the region and facilitate the access of Southeast Europe to European integration. Members of SECI are Albania, Bosnia and Herzegovina, Bulgaria, Croatia, FYROM, Greece, Hungary, Moldavia, Romania, Turkey and Slovenia.

SECI is a forum in which representatives of the participating states meet to discuss common regional economic and environmental problems calling for concerted action and take into account region-wide plans for dealing with these problems. Meetings of representatives are followed by the convening of ad hoc working groups of technical experts, who are responsible for the development of concrete proposals.

SECI co-operates closely with the United Nations Economic Commission for Europe (UNECE), as well as with the Organisation for Security and Co-operation in Europe (OSCE). The UNECE provides technical assistance to SECI and the needed expertise to the project groups. It brings together experts from the member countries and experts from international financial institutions under the auspices of the co-ordination.

The SECI offices are hosted by the OSCE in Vienna since May 1997. The OSCE provided vital technical support to the SECI secretariat in the form of providing office space and office technical equipment. Important co-operation is also established with European Commission, supporting states (US, Austria, Italy, and Switzerland) and international financial institutions. The Russian Federation is invited to attend SECI Committee meetings and has also observed the work of some project group meetings.

TRACECA

The TRACECA Programme was launched at a conference in Brussels in May 1993, which brought together Trade and Transport Ministers from the original eight TRACECA countries (five Central Asian republics and three Caucasian republics), where it was agreed to implement a programme of European Union funded technical assistance to develop a transport corridor on a West-East axis from Europe across the Black Sea through the Caucasus and the Caspian Sea to Central Asia.

The TRACECA programme has resulted in closer co-operation and dialogue among government authorities, which has led to agreements to keep transit fees at competitive levels, and efforts to simplify border-crossing formalities. The technical assistance provided through TRACECA has helped to attract large investments from the IFIs that include the European Bank for Reconstruction and Development, which have made a number of commitments for capital projects on ports, railways and roads along the TRACECA route totalling over USD 250 million, the World Bank which have made commitments for new capital projects on roads in Armenia and Georgia totalling over USD 40 million, and the Asian Development Bank, which have committed substantial funds to road and railway improvements. The EU is supporting the programme with other TACIS projects to further enhance regional co-operation and economic sustainability in the region.

The concept of TRACECA as a multimodal transport route was further developed and all ongoing projects were fully evaluated. The participating states agreed that Ukraine, Moldova and Mongolia would become full beneficiaries of the TRACECA programme. They also reiterated the necessity of linking TRACECA route to the Crete Corridors that link the Black Sea region with the TENs.

Also, the project is a concrete implementation of bilateral agreements between Georgia and Azerbaijan and between Georgia and Armenia, in the broader context of the Multilateral Agreement on International Transport between the TRACECA countries, and it will thus foster regional co-operation.

Black Sea Economic Co-operation (BSEC)

Upon invitation of the Turkish Government, the Heads of State or Government of eleven countries in the region: Albania, Armenia, Azerbaijan, Bulgaria, Georgia, Greece, Moldavia, Romania, Russia, Turkey and Ukraine convened a summit in Istanbul. This was culminated by a Summit Declaration signed on 25 June 1992 heralding the establishment of the Black Sea Economic Co-operation (BSEC).

BSEC is created in conformity with the objectives of the United Nations Charter and inspired by and based on the principles of the Helsinki Final Act, the Paris Charter for a New Europe and other universally recognized principles of international law. The Summit Declaration and the Bosphorus Statement of the same date are introducing a new relationship to the region to transform the Black Sea into an area of peace, stability and prosperity.

The mechanism to attain these goals will be through multilateral and bilateral economic co-operation. The co-operation priority sectors are being selected to increase yields in order to help accelerate the momentum of development and transition into market economies. The participating States committed themselves to improve the business environment and stimulate collective and individual activities of enterprises. Similarly, they engaged themselves to fostering intra-regional trade, promoting flow of foreign direct investments and exchange in science and technology which are strong stimuli for progress. The Permanent International Secretariat of the BSEC, which was established in Istanbul in March 1994, marked the end of the initial stage of the BSEC progress.

BSEC operates as an intergovernmental, interparliamentary, interbusiness, financial and academic platform. The highest organ endowed with decision-making authority of the BSEC is the Council of the Ministers of Foreign Affairs. It meets on a regular bi-annual basis. The Council meetings take place in the member states on the principle of rotation. The Minister who hosts the Council meeting assumes the chairmanship until the following meeting.

Central European Initiative (CEI)

The Central European Initiative seeks to promote regional peace and stability, as they are both essential ingredients of political and economic renewal. CEI countries have successfully mixed political and economic co-operation in a creative and productive blend. Fora for debate about many aspects of the region's future are now running in parallel with pragmatic actions on the economic front.

The CEI provides these regular fora, involving officials at the highest level and political leaders:

- Heads of Government Meeting (annual)
- Ministers of Foreign Affairs (annual)
- Meetings of National Co-ordinators (regular)
- Special meetings of sectoral Ministers.

The CEI Presidency co-ordinates CEI activities and committees and rotates among the member countries at the beginning of the calendar year. The member state, which chairs the CEI organises the meetings of Heads of Government, Ministers of Foreign Affairs and Committee of National Co-ordinators.

The CEI has established a series of creative and productive relationships with other international and regional bodies, seeking always to complement and not duplicate existing activities. The CEI maintains permanent structures as auxiliary bodies of the grouping in London and Trieste. The Secretariat for CEI Projects at the EBRD (CEI- EBRD Secretariat) is based in London at the offices of the EBRD. The Secretariat advises the CEI committees on investment projects, develops methodology and technical co-operation, supports the CEI strategies for economic sectors and infrastructure, and is responsible on a day-to-day basis to the EBRD First Vice President.

The CEI Executive Secretariat (CEI-ES) in Trieste, Italy, provides training, information, documentation, project administration, liaison between CEI fora and manages "institutional projects", including training programmes. The Secretariat is supported by the Italian central and regional governments.

MEDA – Euro Mediterranean Transport Forum

The Euro-Mediterranean partnership, concluded at the November 1995 Barcelona Conference, identifies three priority areas of actions between the Community and the Mediterranean countries, including the development of economic and financial cooperation and the promotion of social, cultural and human exchanges. It aims, in particular, at the creation of an economic free trade zone between the European Union and its Mediterranean partners by 2010.

In accordance with the work programme annexed to the Barcelona Declaration, the objective of the Forum is to develop cooperation in the transport sector by the adoption of a multimodal air-sea transport system in the Mediterranean region, through improvement and modernisation of ports and airports, the suppression of unjustified restrictions, the simplification of procedures, the strengthening of maritime and air safety, the harmonisation of the environmental rules at a high level, including more effective control of pollution due to maritime transport, adoption of harmonised systems of management of the traffic, as well as

development of East-West land connections on the Southern and Eastern banks of the Mediterranean and the connection of the Mediterranean networks of transport to the Trans-European networks in order to ensure their interoperability.

The Forum covers the geographical area of the European Union and of the twelve Mediterranean partners: Algeria, Cyprus, Egypt, Israel, Jordan, Lebanon, Malta, Morocco, the Palestinian Authority, Syria, Tunisia and Turkey. It will ensure the consistency of actions in this region with those undertaken in adjacent geographical areas of the Mediterranean and the Black Sea. Its work will integrate, as needed, the results of work in the framework of the Mediterranean Pan-European Transport Area set up following the Pan-European Transport Conference in Helsinki, as well as that in the context of the Trans-European Transport Networks and the TINA initiative for acceding Central and Eastern European countries. The aim should be to avoid wasteful duplication of work, which might reduce the overall effectiveness of the transport action plan. The Forum may, if necessary, utilise two substructures, one for the Western Mediterranean and the other for the Eastern Mediterranean, ensuring at the level of the forum itself, consistency between the work of these two sub-structures, and working to eliminate possible differences in the progress of work in these two areas.

According to the Barcelona Conference and in line with the recommendations of the European Commission, the Forum will focus on aspects relating to transport networks in the operational sense (infrastructures, including telematics, superstructures and their use) for all transport modes.

The permanent members of the Forum are the European Union, represented by the Presidency of the Council (as a permanent member), the European Commission and the twelve Mediterranean partners.

The Forum will also permit the participation, as observers, of International Financial Institutions (primarily the EIB and the World Bank), interested international organisations (in particular the ECMT and the UNECE), as well as representatives of the two other Pan-European Transport Areas concerned, in the Adriatic-Ionian Seas and the Black Sea. The Forum will ensure that, when required, representatives are invited from other institutions/organisations, which can contribute usefully to its work. These may include representatives of administrative structures or regional cooperation initiatives or of the private sector, either when their contribution to the financing of projects is considered essential, or when they can help in defining the constraints on measures to be proposed by the Forum. The Forum will not have its own budget. It will depend on existing Community financial instruments, with each participant (permanent member or observer) being responsible for demonstrating their interest and their involvement as a complement to these instruments.

Apart from the co-operation with the above mentioned international organizations, institutions, initiatives and fora, the TEM Project is extremely interested in involvement in the development of Freight Villages as well as in the Framework of Research and Development (RTD&D) Priorities of European Union.

The increased need for modal integration, interoperability and complementarity generated new conditions in the process of transport, distribution and management of goods. Transport evolutions and needs brought the necessity for the development of new infrastructure facilities capable to respond the current needs. These are the Freight Villages, where the users and transport operators develop new ways and methods of management of goods (logistics) and where they could exploit and evaluate the use of the different means of transportation that are now functioning supplementarily in the transport chain.

A Freight Village is a well designated territory inside of which all activities related to transport are developed along with the handling and distribution of goods, for the national and international transports by the different users that are established in the Freight Village and which is administered by one and only organisation. The users of the Freight Village could be the proprietors or those that have hired the facilities and services that are developed inside the Freight Village.

Freight Villages serve the concentration of cargo carried by different means and kinds of transport or needed to be transhipped from a short distance transport to a long distance transport by the same means of transportation, or by any other. They assist the optimal use of different transport modes by concentrating them in the same area and giving the freedom of the best choice according to the real market and transport conditions, including the change of vehicles for long distances to smaller ones suitable for short distances. This is increasing the efficiency of transport operations and decreasing the costs.

EU Framework RTD & D activities are aiming to help the preparation of policy making, industrial and related service sectors and generate a strategic vision of research in all sectors throughout Europe.

The structure of the programme comprises three elements:

- A set of key actions oriented to solve clearly identified socio-economic problems by developing critical technologies and clustering research and demonstration projects of strategic common challenges in innovative products, processes and organisation, sustainable mobility and intermodality, land transport and marine technologies and new perspectives in aeronautics.

- RTD on generic technologies helping to develop the scientific and technological base in following critical areas: materials and their production and transformation, measurement and testing.

- Support for more efficient utilisation of research infrastructures to provide an attractive environment in the fields covered by this programme.

In general, the key challenge is how to reconcile the increased demand for transport on the one hand and the need to reduce its impact on the physical, social and human environment on the other hand, and how to reduce the transport intensity of economic growth. This key action offers the opportunity to involve all stakeholders in facing this challenge and enhancing innovation in the providing new concepts and policies. The key action bases itself on an integrated systems approach to transport. As the road, rail, water and air transport modes are at different stages of their development, their optimisation from modal perspective will continue to be necessary. However, a major focus will be to enhance the integration between different modes of transport in respect to infrastructure, operations, services, procedures and regulations. i.e. to enhance intermodality in order to enable a better use of existing capacities.

The main priorities of the programme are concentrated in the following objectives:

- to promote a long–term balance between the growing demand for mobility on the one hand and the necessity to respect environmental, safety, social and economic constrains on the other. Some parameters to guide the key action's activities should be to enable the transport sector to contribute to the environmental quality standards for air quality and noise in a cost-effective way, as well as to increase the use of public transport.
- to improve the overall cost-effectiveness and functions of transport operations and infrastructure with particular attention paid to how to best integrate the respective strengths of all modes of transport in order to provide door-to-door services for both passengers and freight. The aim is also to support Union's policy in the field of transport charging across Europe and integrate information technologies and second generation satellite navigation and positioning systems in the transport sector.

- to ensure a high level of safety and user-friendliness at an affordable cost for the individual user as well as for society. Parameters to be taken into account include the development and promotion of the use of new technological and behaviour-oriented tools to reduce the number, severity and impact of accidents, both in terms of safety and pollution prevention. The parameters should also significantly reduce the total number of fatal and other severe accidents, in particular in truck and coach traffic and to improve travellers' perception of security and to reduce loss or damage of goods.

2.7 Trucks and Coaches Impacts on TEM Traffic

2.7.1. Introduction

Any driver (of coach or truck) using TEM is likely to be on a long journey away from his base for long periods, crossing several different countries. Consequently, he must be prepared to carry with him different documents, which are related to the vehicle (e.g. insurance, road permits) and for the goods. It is noted that the passengers of coaches carry their own documents. Moreover, he must obey the specific rules and legislation relevant to driving contact, vehicle specifications and transport of goods and people for trucks and coaches respectively.

This report aims at introducing simple criteria of how documents, initiatives and legislation relevant to truck and coaches, will affect the traffic in TEM network

The report is divided in two parts. The first part deals with documentation related to truck and coaches in use along the TEM and its various terminals and the points of joining, and to short comments for documentations that have an effect on TEM traffic. The second part deals with EU initiatives and legislation concerning truck and coaches and the third with the effect of the above on the traffic movement.

2.7.2. Documentation

This part is heavily based on work done for UNECE, with assistance from a number of sources.

2.7.4.1 Border Crossing Procedures

- Customs Transit of Goods

  (a) Within TEM

Vehicles carrying goods in transit and using TEM must use some form of transit procedure. Customs transit systems are described next.

- National transit procedures: A separate transit procedure is applied in every transit country.
- TIR: The Customs Convention on the International Transport of Goods under Cover of TIR Carnets (TIR Convention), of 14 November 1975 is the most universal Customs system in operation. The Convention is managed by the UN. The international guarantee system backing the TIR system and the printing and issuing of TIR Carnets is managed by the IRU. All TEM countries are Contracting Parties to the TIR Convention.
- Community and Common Transit systems: The European Union and associated counties Systems

- - -

Every effort must be made to ensure that all TEM countries adopt the TIR Convention.

Effort should be made to implement and correctly apply f the TIR Convention by Contracting Parties.

Recognition and mutual acceptance of TIR procedures is essential for the proper functioning of the system.

At present, the Community and Common Transit systems do not extended to all TEM countries.

- *Outside TEM but affecting traffic flows at each end of TEM*

- Arab Manifest: or else "The Convention Organizing the Transit Transportation Between the Arab League Countries"

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The Arab Manifest does not include any guarantee provisions and can therefore cause long delays.

(ii) Commercial Documentation

(a) The CMR Consignment Note: this is applied to the carriage of goods for hire or reward.

(b) The Multimodal Convention and Document

i CMEA Convention on the Carriage of Goods: this is a local Convention similar in content to CMR

(d) □ulet Manifest

(e) Invoices: commercial invoices are carried by all goods vehicle operators. The driver may have several copies for use on the journey and presentation at the Customs Office of destination

(f) Passenger and their Luggage: the CVR Convention was intended to introduce uniform rules on "The Contract for the International Carriage of Passengers and Luggage by Road"

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It is important for TEM project that all governments adopt CMR Convention.

The Multimodal Convention and Document needs further investigation regarding the effect on TEM.

A possible conflict between the CMEA Convention (if it is still in force) and the CMR might exist.

It is advisable for vehicles entering Iraq to be in position of the Iraq manifest in order to avoid big delays.

To investigate if some CMEA countries have an agreement between them for a standard contract for carriage of passengers and this would probably conflict with the CVR

(iii) Controls on Goods

(a) ATP Convention: for perishable foodstuffs

(b) ADR Convention: for dangerous goods

i Livestock Health and Phytosanitary Certificates: There is no standardized control for categories of goods requiring these certificates, so each country sets its own rules

(d) Harmonization Convention: The International Convention on the Harmonization of Frontier Controls of Goods, 1982 prescribes harmonized border crossing procedures for cross border goods transport. The Convention is managed by the UN.

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TEM countries must agree with the ATP.

An in-depth study needs to be undertaken to ensure that the requirements of ADR, wherever practicable, are compatible with the International Maritime Dangerous Goods Code (IMDG), which is applicable on ships, including Ro/Ro ferries. This is critical if intermodal transport has to be promoted

The volume of traffic needing Livestock Health and Phytosanitary Certificates may be relatively small but the impact of delay on one vehicle can have repercussions along the line to other vehicles.

The provisions of the Harmonization Convention should be implemented and applied by all TEM Countries. It is, in particular, recommendable in establishing national control procedures and in bilateral relations between neighbouring TEM countries. All TEM countries with the exception of Turkey are Contracting Parties to the Harmonization Convention

(iv) □ulet□ Customs Documents and procedures

The following documents are not generally essential to the transit operations

(a) Temporary importation procedures: Exists for both goods (ATA Convention) and vehicles (Carnet de Passage system).
(b) Origin documents: are required to prove the place of manufacturer of the goods

i Import licenses: mainly for control of foreign exchange

(d) Local import procedures: to ensure that the goods are included in trade statistics and that Custom duties and taxes are paid on import

(e) Local export procedure: to control the exported goods

(f) Passenger's luggage: normally not a serious problem but Custom authorities retain the right to search luggage

The ATA system is a Convention of the Customs Co-operation Council, valid for some of the TEM countries providing for the temporary importation of goods by using the ATA Carnet. The issuing and guarantee of the ATA Carnet is managed by the ICC.

The Customs Convention on the Temporary Importation of Private Road Vehicles, 1954 and Customs Convention on the Temporary Importation of Commercial Road Vehicles, 1956 are temporary importation Conventions applicable to vehicles by use of the so-called "Carnet de Passage" (CPD). The UN manages the Conventions. Most TEM countries are Contracting Parties to the temporary vehicle importation Conventions. The issuing and guarantee of the CPD is managed by AIT/FIA.

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All the above need to be noted. It may be worth considering whether there could be a standardized import and export procedure from a Customs point of view.

2.7.2.2 The Driver/ Passenger

(i) Passports/ Visas

Generally both the driver and passengers must carry a passport for all TEM countries. Specifically for the EU countries, national identity cards are also acceptable. No passport control is done in SHENGEN countries, although random checks are performed.

Visas are required for a limited number of countries. The rules for obtaining visas are left to individual governments or are on a bilateral basis.

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In general advice must be to get a visa before leaving home but TEM governments should consider whether some flexibility could be introduced into the system to allow transit permits at border crossings.

- Health Certificates

Generally health certificate is not required in TEM countries but drivers entering from the Middle East and North Africa will have to be in possession of one. Without them passports and visas are often invalid.

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Since most of TEM countries recognize each other's health schemes it is possible, in case of driver's illness, to make reciprocal use of medical facilities.

- Compulsory Exchange

Between the EU countries there is no need, since the introduction of € (but even before that). Where necessary, the compulsory exchange problem is very small but it can be frustrating, since it can be considered as a hidden tax.

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It can cause delay at borders.

There needs to be study for:

- Banking facilities □u borders
- □ulet□f inland
- Special credit card available for drivers

- Driving Licences

Driving licences do not tend to cause problems. Most TEM countries appear to accept each other's national driving licences. Most drivers of trucks and coaches carry international licences for those countries, which require them. There are seldom checks at the borders for them.

- Drivers' Hours of Work and Records

From the limited accident statistics available, it seems that most TEM countries would not be in the top ten safest countries of Europe. The causes of road accidents are many, but long hours of driving can be a serious cause. There is no doubt that some control is essential and most countries do have domestic rules. There are though and three □ulet□f International □ulet:

(a) EEC Rules: applied within EEC countries

(b) AETR Rules: The European Agreement concerning the work of Crews of Vehicles Engaged in International Road Transport (AETR) is the most widely accepted Convention.

(c) ILO Convention number 153: The "Hours of Work and Rest Periods (Road Transport Convention, 1979 (No. 153)".

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The AETR is the best possibility for consistent rule for drivers' hours within TEM. It is unnecessary to carry out full check at borders with this Convention, since the tachograph is recording the driving hours. All TEM countries must agree with AETR for the above reason. The EU is proposing the electronic tachograph and the satellite monitoring with the GALLILEO.

- The Vehicle

(i) Permits (Goods Vehicles/trucks)

(a) Bilateral permits

(b) Permit exemptions

(c) Multilateral permits—ECMT permits

(d) Traffic regulations

(e) Road Rail services

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A standardisation of the above would be desirable, since most of them are different from country to country.

(ii) Permits (Coaches)

(a) Occasional or "Closed Door" □harg

(b) Shuttle services

(c) Regular services

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It is advisable that those countries requiring Permit de Passage consider eliminating this demand.

(iii) Fiscal □harge

Many countries collect large sums of money at their borders daily, not only for road charges but also for taxes on fuel. Whatever the amount there is no standard system for collection, therefore the volume of paperwork is considerable.

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Regarding the road charges, there are many conflicting views on financing the infrastructure, which is generally the argument used for this type of charging. From the point of view of keeping road traffic moving and avoiding border delays, a satisfactory solution to the problem may be a system of grants (shadow tolls). In the short term this is unlikely to occur and therefore other solutions need to be looked for.

Plus, since road charges are likely to have a EU application, there is the difficulty for the driver of carrying large amounts of money. Hence, it would be useful if governments along TEM, which have road charges, permit payment in advance at Embassies in the haulier's own country and simply issue a receipt at the borders. However, this will not exist in EU, when the collection via satellite/GALLILEO is introduced.

Regarding fuel taxes, some countries require that fuel be supplied against coupons, which have to be purchased at certain offices. This can cause delay. Efforts should be made towards allowing that normal tanks of diesel fuel cross international boundaries without restrictions. Also, the currency exchange problem must be tackled. Payment by credit cards should be promoted and/or gas station cards to be introduced (the example of SHELL is a good one in Europe).

An electronic fee (charge) collection systems were introduced in Austria and in Germany.

(iv) Insurance

The International Motor Insurance card (Green Card), which was established as a result of ECE resolutions, is accepted in all TEM countries. A second system known as the blue card operates in some TEM countries. Outside TEM the Middle East States have the Orange Card.

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It is advisable that TEM countries consider whether there can be a mutual recognition of each other's insurance system and agreement to give reciprocal cover in order that Green Card checks can be abolished. This requires that the levels of insurance are the same in all countries.

(v) Vehicle Registration Certificates

Domestic registration numbers are accepted by most TEM countries.

(vi) Weights and Dimensions

This area of transport operation is one of the most difficult and its solution is unlikely in the short term because of the different procedures from country to country.

(vii) Abnormal Loads

Loads that are overlength, overwidth or overweight have always presented serious problems to transport operators. At present governments rules for abnormal loads are complex even on a domestic basis.

2.7.3. EU Initiatives and Legislation Concerning Trucks and Coaches

For the purpose of this report the following EU Initiatives and legislation, relevant to trucks and coaches, were reviewed.

2.7.3.4 EU Initiatives concerning trucks and coaches

(i) Carriage of Goods

- Towards a safer and more competitive high-quality road transport system
- Carriage between Member States
- Community safeguard mechanism
- Inland cabotage: non-resident carriers in the national market
- Charges for the carriage of goods by road
- Restrictions (periods of time, sections of road network) on the movement of heavy goods vehicles

(ii) Carriage of Passengers

- International carriage by coach and bus
- Non-resident carriers in the national market: conditions of admission

(iii) Carriage of Goods and Passengers

- Admission to the occupation of road transport operator and mutual recognition of diplomas

- Organization or working time in respect of road transport activities
- Driver attestation

(iv) Road Safety

- Transport of dangerous goods by road
- Checks on the transport of dangerous goods by road
- Safety adviser for the transport of dangerous goods
- Community database on road traffic accidents
- Action programme on road safety (1)
- Driving licences
- Maximum authorized level of alcohol in the blood for motor-vehicle drivers
- Road vehicles: maximum weights and dimensions
- Roadworthiness tests for motor vehicles and their trailers
- Roadworthiness testing of heavy goods vehicles
- Transportable pressure equipment

(v) Technical Harmonization of Motor Vehicles

Analytical explanation for each one of the above can be found in the following link: http://www.europa.eu.int/scadplus/leg/en/s13001.htm

2.7.3.2 EU Legislation relevant to truck and coaches

2.□.□.□ Market Access (Freight)

Council Regulation (EEC) No 881/92 on access to the market in the carriage of goods by road within the Community to or from the territory of a Member State or passing across the territory of one or more Member States.

Council Regulation (EEC) No 3118/93 laying down the conditions under which non-resident carriers may operate national road haulage services within a Member State: cabotage.

Council Regulation (EC) No 3315/94 amending Regulation (EEC) No 3118/93 laying down the conditions under which non-resident carriers may operate national road haulage services within a Member State.

Commission Regulation (EC) No 792/94 laying down detailed rules for the application of Council Regulation (EEC) No 3118/93 to road haulage operators on own account.

Council Regulation (EEC) No 3916/90 on measures to be taken in the event of a crisis in the market in the carriage of goods by road.

Council Regulation (EEC) No 4058/89 on the fixing of rates for the carriage of goods by road between Member States.

Council Directive 84/647/EEC on the use of vehicles hired without drivers for the carriage of goods by road, as amended by Directive 90/398/EEC.

Council Regulation (EEC) No 4060/89 on the elimination of controls performed at the frontiers of Member States in the field of road and inland waterway transport.

Council Regulation (EEC) No 3912/92 on controls carried out within the Community in the field of road and inland waterway transport in respect of means of transport registered or put into circulation in a third country.

2.□.□.□ Market access (Passengers)

Council Regulation (EEC) No 684/92 on common rules for the international carriage of passengers by coach and bus, amended by Council Regulation (EC) No 11/98.

Council Regulation (EEC) No 56/83 concerning the implementation of the Agreement on the international carriage of passengers by road by means of occasional coach and bus services (ASOR) – INTERBUS Agreement on the international occasional carriage of passengers by coach and bus.

Council Regulation (EEC) No 12/98 laying down the conditions under which non-resident carriers may operate national road passenger transport services within a Member State.

Commission Regulation (EC) No 2121/98 laying down detailed rules for the application of Council Regulations (EEC) No 684/92 and (EC) No 12/98 as regards documents for the carriage of passengers by coach and bus.

(iii) Fiscal harmonization

Directive 1999/62/EC of the European Parliament and of the Council on the charging of heavy goods vehicles for use of certain infrastructure.

Council Regulation (EEC) No 1108/70 introducing an accounting system for expenditure on infrastructure in respect of transport by rail, road and inland waterway.

(iv) Social legislation

Council Regulation (EEC) No 3820/85 on the harmonization of certain social legislation relating to road transport.

Commission Decision 93/172 EEC: drawing up the standard reporting form provided for in Article 6 of Council Directive 88/599/EEC concerning road transport.

Council Directive 88/599/EEC on standard checking procedures for the implementation of Regulation (EEC) No 3820/85 (see above) and Regulation (EEC) No 3821/85 on recording equipment in road transport.

Council Regulation (EC) No 2135/98 amending Regulation (EEC) No 3821/85 on recording equipment in road transport and Directive 88/599/EEC concerning the application of Regulations (EEC) No 3820/85 and (EEC) No 3821/85.

Directive 2002/15/EC of the European Parliament and of the Council of 11 March 2002 on the organization of the working time of persons performing mobile road transport activities.

Council Directive 96/26/EC on admission to the occupation of road transport operator, amended by Directive 98/76/EC.

Council Directive 76/914/EEC on the minimum level of driver training for some road transport drivers.

(v) Technology, safety and environment

Council Directive 96/53/EC laying down for certain road vehicles circulating within the Community the maximum authorized dimensions in national and international traffic and the maximum authorized weights in international traffic, amended by Directive 2002/7/EC of the European Parliament and of the Council.

Council Regulation (EC) No 2411/98 of 3 November 1998 on the recognition in intra-Community traffic of the distinguishing sign of the Member State in which motor vehicles and their trailers are registered.

Council Directive 92/6/EEC on the installation and use of speed limitation devices for certain categories of motor vehicles in the Community.

Council Directive 89/459/EEC on the approximation of laws of the Member States relating to the tread depth of tyres of certain categories of motor vehicles and their trailers.

Council Directive 91/671/EEC on the approximation of the laws of the Member States relating to compulsory use of safety belts in vehicles of less than 3,5 tones amended by Directive 2003/20/EC of the European Parliament and of the Council.

93/704/EC: Council Decision on the creation of a Community database on road accidents.

Council Directive 91/439/EEC on driving licences.

Council Regulation (EEC) No 3821/85 on recording equipment in road transport, amended by Council Regulation (EEC) No 2135/98.

Council Directive 96/96/EC on the approximation of the laws of the Member States relating to roadworthiness tests for motor vehicles and their trailers.

Parliament and Council Directive No 2000/30/EC of 6 June 2000 on the technical roadside inspection of the roadworthiness of commercial vehicles circulating in the Community.

Commission Regulation (EC) No 3298/94, as amended by Commission Regulation (EC) No 1524/96, laying down detailed measures concerning the system of Rights of Transit (Ecopoints) for heavy goods vehicles transiting through Austria, established by Article 11 of Protocol No 9 of the Act of Accession of Norway, Finland and Sweden.

Council Directive 1999/37/EC on the registration documents for vehicles.

(vi) Transport of dangerous goods

Council Directive 94/55/EC on the approximation of the laws of the Member States with regard to the transport of dangerous goods by road; amended by Commission Directive 96/86/EC, Commission Directive 1999/47/EC, Directive 2000/61/EC of the European Parliament and of the Council, Commission Directive 2001/7/EC and Commission Directive 2003/28/EC (see Commission Decision 2002/886/EC regarding implementation).

Council Directive 95/50/EC on uniform procedures for checks on the transport of dangerous goods by road; amended by Directive 2001/26/EC of the European Parliament and of the Council.

Council Directive 96/49/EC on the approximation of the laws of the Member States with regard to the transport of dangerous goods by rail; amended by Commission Directive 96/87/EC, Commission Directive 1999/48/EC, Directive 2000/62/EC of the European Parliament and of the Council, Commission Directive 2001/6/EC and Commission Directive 2003/29/EC (see Commission Decision 2002/885/EC regarding implementation).

Council Directive 96/35/EEC on the appointment and vocational qualification of safety advisers for the transport of dangerous goods by road, rail and inland waterway and Directive 2000/18/EC of the European Parliament and of the Council on minimum examination requirements for safety advisers for the transport of dangerous goods by road, rail or inland waterways.

Council Directive 1999/36/EC on transportable pressure equipment, amended by Commission Directive 2001/2/EC and Commission Directive 2002/50/EC (see Commission Decision 2001/107/EC regarding implementation).

2.7.3.4 IRU sponsored related studies and documentation

IRU has initiated and sponsored several studies related to truck and coaches. In addition, it issues regular news bulletins and documents that are quite useful. Some of these are:

- IRU Manifesto: Europe Needs Road Transport, 1999, IRU
- Second Report on Road Transport Best Industry Practices, 2003 and 2004 IRU

- Buses and coaches: Driving Public Transport and tourism (brochure), 2000, IRU
- Comparative analysis of energy consumption and CO_2 emissions of road transport and combined transport Road/rail, 2002, IRU and BGL
- Guide to sustainable development, 2000, IRU
- Documents to be on board a tractor vehicle, 2001, IRU/ECMT
- The importance of road transport for the competitiveness of European business, 2001, KPMG/IRU
- Moving people, driving the economy (brochure), 2001,IRU
- Study on East-West Road Transport Productivity, IRU
- Economic Cost of Barriers to Road Transport, 1998, IRU
- Study on East-West Road Freight Transport, IRU
- Co-operation Opportunities in East/West Road Freight Transport, IRU
- Competition in West-East Road Transport Market – providing opportunities for all, 2001, IRU
- Own account transport of goods by road in the European union, 1999, IRU
- Payment guarantees for road carriers, 2004, IRU
- Truck parking areas in Europe, 2003, IRU in cooperation with ECMT
- Fair and efficient pricing, 1999, IRU
- ROAD TRANSPORT AND EU ENLARGEMENT. Main Problem Areas in the Pre-Accession Period and Progress Made. PROGRESS REPORT N°3, 2002 IRU
- Industry as a partner for sustainable development: Road Transport, 2002, IRU
- Road Transport Regulating and Enforcement Bodies, 2003, ECMT and IRU
- Guide for government officials and carriers on the use of the ECMT multilateral quota, 2001, ECMT and IRU, 2nd Edition
- Translex – 3rd Edition, IRU Handbook on the Harmonization of European Road Transport Legislation and Practice, 2001
- 1st Euro-Asian Road Transport Conference. "Opportunities for and barriers to international road goods transport between Asia and Europe", Irkutsk (RF), 13-14 September 200
- 6th IRU East-West Road Transport Conference. "Leading the way towards integrating transport markets", Prague, 31 May – 1 June 2001
- 28th IRU World Congress Bucharest, 2002, "Emerging Markets – Challenges and Opportunities: IRU Congress Highlights"
- IRU- Waiting time at borders (Interactive website)

The contents of the key studies/documents are presented in the following:

(1) IRU Manifesto: Europe Needs Road Transport

The IRU manifesto evidences the road transport sector's major role in building Europe and highlights those fields where public-private partnerships should be developed to improve its effectiveness for the benefit of a larger, more prosperous and socially fairer Europe. The document comprises seven fact sheets, presenting the themes, which correspond to the various

fields of road transport represented by the IRU: professional passenger and goods transport, and own-account transport.

(2) Second Report on Road Transport Best Industry Practices

The *IRU Report on Best Industry Practices* is a follow-up to the *IRU Guide to Sustainable Development*. Using a bottom-up rather than a top down approach, it presents examples of best practice in sustainable development from the road transport industry. The objective of this report is to demonstrate progress in the implementation of sustainable practices at transport operator level and to confirm that best practices are profitable (sustainability = profitability). The report should not only encourage all road transport operators to imitate best industry practices (learning from the best), but also provide public recognition of the transport sector's considerable achievements in the field of sustainable development.

(3) Buses and coaches: Driving Public Transport and tourism

It is brochure that presents how public buses improve the lifestyle and contribute to the tourist development of regions.

(4) Comparative analysis of energy consumption and CO2 emissions of road transport and combined transport Road/rail

The research consisted of a comparison between primary energy consumption and CO2 emissions of pure road transport on the one hand and combined road/rail transport on the other The objective of the study was to compare key environmental impacts of transporting, over a given European route, one load unit by road only and the same load unit by combined transport road/rail. In contrast to previous studies, energy consumption and CO2 emissions were taken into account for both the initial and final legs carried out by road and for handling operations. Typical load factors were also taken into consideration. Road haulage in 40-tonne lorries was compared with various combined road/rail transport techniques: container, swap body, semi-trailer and rolling highway – the latter being where the tractor, semi-trailer and driver are transported together by train.

(5) Guide to sustainable development

The guide aims at promoting best practices and implementing at transport operator level policies that favour sustainable development. Hence, it is a practical uport for implementation.

(6) Documents to be on board a tractor vehicle

This publication provides the details of national and international documents for tractor vehicles for goods traffic by road.

(7) Moving people, driving the economy (brochure)

This 4-page brochure presents facts and figures of 2001, highlighting the impact of the coach on the economy.

(8) Economic Cost of Barriers to Road Transport

On behalf of the IRU, the Hague Consulting Group undertook an investigation of the economic impacts of avoidable obstructions to the free movement of road freight and coach operations: so-called 'barriers' to transport. Assessments of the costs of these barriers or 'invisibles' have been calculated and are compared with the total cost of road transport to the national economy.

(9) Competition in West-East Road Transport Market – providing opportunities for all

In the international freight and passenger road transport market, strong competition exists between western and eastern European transport operators. As a result of the opening of markets, operators have gained better access to transport markets traditionally closed to foreign nationals. The consequence is that market shares of the various national operators have shifted in favour of the most competitive. The competitive position is determined by a number of factors, including the cost factor, productivity, and the scope of the market in which they offer their services. The objectives of this pilot study are to produce a comprehensive background document comprising a compilation of available sources of information and to analyse cost structures, profitability, and productivity in east-west road transport. The study highlights the different issues that operators from both western and Eastern Europe will need to address to be able to compete effectively throughout the expanded single market that will result from EU enlargement.

(10) Own account transport of goods by road in the European union

This report establishes what the role of own account transport is at present, and examines the changes since 1985. It also deals with problems experienced by own account operators in using their fleets as efficiently as possible, i.e. in lowering both costs and environmental impact. A comparison of different national legal systems leads to recommendations to the European institutions and to the Member States.

(11) Payment guarantees for road carriers

This study reviews the possibilities for international or domestic road hauliers to recover transport and related costs in 10 European countries (Austria, Belgium, the Czech Republic, Denmark, France, Germany, the Netherlands, Spain, Sweden and the United Kingdom). The study explains the rights of road carriers (right of retention, lien) and the procedures to be applied in order to assert these rights in each of the countries surveyed.

(12) The importance of road transport for the competitiveness of European business

This study has focused on the transport and logistics part of today's supply chain management. It determines how the calculation of transport and logistics costs has changed over the last decades as a consequence of improved supply chain management and the increasing significance of supply chain management. It assesses to what extent this has led to a shift in the relative significance of transport and logistics costs compared to production/manufacturing. It evaluates whether and how transport and logistics costs can be reduced in Europe. It determines what the consequences of in-action could be for European business. It assesses how this would influence the competitiveness of European business.

(13) Truck parking areas in Europe

It presents all the relevant signs and words in four languages as well as a list of 2240 parking areas in 39 countries in Europe with all relevant information.

(14) Road Transport and EU Enlargement . Main Problem Areas in the Pre-Accession Period and Progress Made (Progress Report N°3)

This publication presents an IRU analysis of the current situation with regard to the progress made by the candidate countries in taking over and implementing the EU road transport-related acquis. It includes a general introductory section followed by a country-by-country report. Main problems areas are identified, and possible short and medium term solutions suggested.

(15) Industry as a partner for sustainable development: Road Transport

This report is part of a series facilitated by the United Nations Environment Programme (UNEP) as a contribution to the World Summit on Sustainable Development. It outlines the IRU's comprehensive strategy to implement sustainable development, underlining the achievements of the road transport sector since the Rio de Janeiro Earth Summit in 1992 as well as future challenges and targets.

(16) Guide for government officials and carriers on the use of the ECMT multilateral quota

This publication, aimed at carriers holding ECMT licences and officials involved in managing the quota, briefly describes the main characteristics of licenses and the conditions and scope for their use

(17) Translex – 3rd Edition, IRU Handbook on the Harmonization of European Road Transport Legislation and Practice

This document is the third edition, revised and extended, of the International Road Transport Union's "CEEC Manual". It groups together the key road transport legislation and regulations from the United Nations Economic Commission for Europe (UN/ECE) and the European

Conference of Ministers of Transport (ECMT), as well as the entire road transport-related acquis of the EU.

2.7.3.4 EU and International Studies and Works on Trucks and Coaches

Furthermore a list of specific studies in the EU (and worldwide), regarding trucks and coaches, which were reviewed (either in executive summary or in a full study form) is presented below.

- 2003 OREGON HIGHWAY COST ALLOCATION STUDY, Prepared for Oregon Department of Administrative Services
- Regular Interurban Coach Services in Europe, 2001, European Conference of Ministers of Transport
- Road Freight Transport for Own Account in Europe, 1999, European Conference of Ministers of Transport

2.7.4. Trucks and Coaches Initiatives and Legislation Effects on TEM

From the short comments (*in italics*) made for each document type -described in Part 1 of this report- as well from the general review done on documents, legislation and initiatives (of UNECE, the EU and TEM countries etc.) traffic on TEM can be seriously affected in terms of delays at borders, security or safety, either negatively or positively. So summarising in bullet points:

Problems can be created due to:

- TEM countries not in agreement with Conventions or rules
- Different documents and procedures at borders.
- Different weight and dimension permits
- Borders operation/working hours
- Drivers working hours
- Ports, at the end of TEM network, operating hours
- Different billing procedures
- Different toll system
- Different in-vehicle technologies for electronic tolls

Problems can be eliminated by:

- TEM countries agreement with Conventions and rules
- Standardisation of documents and procedures at borders.
- Standardisation of permits and even elimination of some
- Standardisation of working hours/ tachographs in all vehicles
- Standardisation of billing procedures
- Standardisation of toll system
- Standardisation of in-vehicle technologies for electronic tolls

Annexes:

Annex 5	MAP OF THE PAN-EUROPEAN TRANSPORT CORRIDORS AND AREAS
Annex 6	BASIC DATA ON INDIVIDUAL CORRIDORS
Annex 7	SHARE OF TEM COUNTRIES IN EACH CORRIDOR
Annex 8	MAP OF THE TINA ROAD NETWORK

3. SOCIO-ECONOMIC FRAMEWORK OF THE COUNTRIES IN TEM AND TER REGION

3.1 Economic and Social characteristics of the countries in the TEM and TER Region

The study area encompasses 21 countries, Austria, Bosnia & Herzegovina, Bulgaria, Croatia, Czech Republic, Georgia, Hungary, Italy, Lithuania, Poland, Romania, Slovakia, Turkey, Belarus, F.Y.R.O.M, Greece, Republic of Moldova, Russian Federation, Serbia & Montenegro, Slovenia, Ukraine.

The work is based on existing studies and data available concerned the economic and social characteristics of each country, but also motorway and railway information. It appeared necessary to have a reliable overview of this data before preparing any assessment of the present and future demand, and before presenting realistic GDP estimates up to 2020 based on alternatives scenarios of growth. In the table below, are presented some significant indicators for each country, for the year 2003:

Table 5 Population, GDP, Exports-Imports (in 2003)

	Population (in million)	***GDP (in billion $)***	***Exports (Index: 2000=100)***	***Imports (Index: 2000=100)***
Austria	8,2	209,5	109,3	105,7
Greece	10,7	136,5	85,3	81,5
Italy	58,0	1214,0	91,9	96,0
Bulgaria	7,5	16,0	89,2	104,6
Czech Rep.	10,2	72,3	95,2	93,7
Hungary	10,0	69,1	87,4	87,0
Lithuania	3,6	14,2	103,4	98,9
Poland	38,0	198,1	105,1	96,9
Romania	22,3	47,1	116,1	116,1
Slovakia	5,4	24,4	104,7	101,7
Slovenia	1,9	22,7	95,2	91,7
Turkey	68,1	192,3	118,7	90,8
Belarus	9,9	15,1	100,8	98,8
Bosnia & Herzegovina	4,0	5,9	97,3	93,0
Croatia	4,5	23,1	100,3	105,5
Georgia	5,1	3,5	131,3	101,1
Fed. Rep. of Yugoslavia	10,6	16,3	63,9	101,2
F.Y.R.O.M	2,0	4,0	87,3	83,7

Russia Federation	143,4	362,5	108,5	106,3
Ukraine	48,3	43,6	89,4	95,4
Rep. Of Moldova	4,2	1,7	120,1	101,4

The situation obviously differs according to each country, because of their respective potentials and historical development time period they entered into the process of transition as well as the political developments.

Despite the unfavourable external conditions, most economies in the region managed to preserve some of their dynamism in 2003, but there was a general moderation of the pace of growth. The aggregate real GDP of all economies in transition is estimated to have increased by some 3% in 2002, which was a notable deceleration from the 5% average rate of growth in 2001. The adverse impact of the global slowdown has been strongest on Central Europe, where GDP grew by just 2%, making it the slowest growing sub-region among the economies in transition. Real GDP in South-Eastern Europe increased by 4% year-on-year, a rate which is just slightly lower than that recorded in 2001.

All the necessary economic, social and transport parameters that play a role while designing a network are identified and presented in Annexes 9-12.

Next, is presented an overview of the demographic and economic situation of each of the 21 countries in the region, as well as transport characteristics and data for each country.

3.1.1 Social, economic and transport characteristics of each country

(1) Austria

Social parameters

Austria is located in Central Europe, north of Italy and Slovenia. The total area that surrounds Austria is 83,858 sq km, land is 82,738 square kilometers and the remaining is water 1,120 sq km.
The population that was estimated on 2003 was 8,2 million inhabitants.
In 2002, the long-term unemployment rate (12 months and more) as a percentage of the total active population was 0,9%.

Economic parameters

Austria with its well-developed market economy and high standard of living is closely tied to other EU economies, especially Germany's. Membership in the EU has drawn an influx of foreign investors attracted by Austria's access to the single European market. Through privatization efforts, the 1996-98 budget consolidation programs, and austerity measures, Austria has brought its total public sector deficit down to 2.1% of GDP in 1999 and public debt - at 63.1% of GDP in 1998 - more or less in line with the 60% of GDP required by the

EMU's Maastricht criteria. Cuts mainly have affected the civil service and Austria's generous social benefit system, the two major causes of the government's deficit.
The GDP, for 1999, was estimated at $210.045 billion USD, for 2002 reached at $204.066 billion. The GDP, for 2003, was estimated at 209.5 billion $.

Transportation

The rail sector in Austria has been identified as a priority market for UK Trade & Investment. Austria has a wide variety of transportation services, reflecting the diversity of its terrain and its central location in Europe. Austria is an important segment of the European railroad network, and the country's importance in east-west travel is likely to increase with the opening of Eastern Europe.
Austria has 6,123km of railways nationwide (standard gauge 5,639km, narrow gauge 484 km.), of which 3,523 km are electrified, and 200,000 km of road network, all paved.
Total Traffic in Austria is estimated to increase by some 4% per annum for the foreseeable future. Today, two-thirds of all traffic is road traffic, but the figure is forecast to increase to as much as 75% by 2015.
The Austrian Overall Transport Concept (GVK-Φ) was published in 1991. It sets out the basic features of a transport policy, based on protecting the environment, life and health, and at the same time recognizing the importance of an efficient transport system as an economic sector and creator of jobs. It aims to create an infrastructure, which meets every transport requirement and makes it possible to switch traffic to environmentally friendly forms of transport, whilst every effort is to be made to avoid unnecessary traffic.

(2) Belarus

Social parameters

Belarus is situated in the centre of Europe at the crossing of roads going from east to west and from north to south. The country is bounded by Latvia, Lithuania, Poland, Russia and Ukraine. The actual area of Belarus is 207,600 square kilometers.
The population of Belarus is 9.9 million (2003), the density being 50 people per sq. km. The average annual population growth is 0.5%, which is considered quite normal for a European country. The urban population accounts for 68% and the rural for 32%.

Economic parameters

The average of GDP growth rate, in 2003, was estimated at 6,00%, although the Gross Domestic Product was estimated at $15.1 billion.
Belarus stands fairly well if compared to other CIS countries. It is the biggest producer of potash fertilizers, fodder harvesters and industrial sewing machines. It ranks second in the manufacture of trucks, motorcycles, tractors, chemical fibers and yarn, commercial wood. It is the CIS third largest producer of metal-cutting machines, electric motors, tyres, timber, paper, cardboard, window glass, refrigerators and freezers, TV and radio sets, bicycles and textiles.

In fact it is industry that plays a major part in its economy, accounting for about 60% of the country's gross national product. Around 1400 factories, power stations, quarries and petroleum wells are in operation to attain the magnitude.
As part of the former Soviet Union, Belarus had a relatively well-developed industrial base, it retained this industrial base following the break up of the U.S.S.R. The country also has a broad agricultural base and a high education level. Among the former republics of the Soviet Union, it had one of the highest standards of living. But Belarusians now face the difficult challenge of moving from a state-run economy with high priority on military production and heavy industry to a civilian, free-market system.
Close relations with Russia, possibly leading to reunion, colour the pattern of economic developments. For the time being, Belarus remains self-isolated from the West and its open-market economies.

Transportation

The transportation complex of the Republic of Belarus is of crucial importance in supporting normal conditions for its diversified economy and social policy of the Government. Belarus has a well-developed transportation infrastructure, including railways and motorways, internal water waterways, oil and gas pipelines. The major trunks connecting the CIS member-countries with the European countries traverse its territory.
Being situated in the Central Europe, the Republic is a transit connecting link between East and West. Railway and motor transport account for the major portion of cargo and passenger traffic. Belarus has become a full member of the 'North-South' international transport corridor agreement.
With the addition of Belarus, the 'North-South' transportation corridor connects a transportation network from the Indian Ocean, to Iran and further on through Astrakhan following through Russia in the direction of Moscow and St. Petersburg. On the territory of Belarus, the primary direction of the international transportation corridor 'North-South' runs from the Belarussian border with Lithuania through Minsk and Orsha on to the Belarussian border with Russia over to Moscow, and the border with Poland to Minsk and Orsha on to the border with Russia and over to Moscow.
Two of nine international transport corridors which were identified as crucial at the Second Pan-European Transportation Conference at Crete traverse its territory: No.2 Berlin-Warsaw-Minsk-Moscow and No. 9 Helsinki-St.Petersburg-Pskov-Vitebsk-Gomel and further Ukraine- Moldova- Bulgaria with a branch Kiev-Minsk-Vilnius-Klaipeda.
Belarus has a well-developed transport system: 30% of all freight and 10% of passengers are carried by train. The total railroad length is 5,523 km. The total length of motor roads is 98,200 km.

(3) Bosnia and Herzegovina

Social parameters

Bosnia and Herzegovina, country of Southeastern Europe, is bounded in the north and west by Croatia and in the east and south by Serbia and Montenegro. Its area is 51,129 square kilometer. The main cities are Sarajevo, which is the capital, Zenica, Banja Luka, Tuzla, Mostar and Prijedor.
At the year 2003, the total population was estimated at 4.0 million inhabitants. About 40% of the total population was considered as urban. Nearly 60% of population still live in rural areas. The population growth rate, estimated in 2003, is 0.48%.

Economic parameters

Bosnia and Herzegovina's economy remains largely based on agriculture, with tobacco and fruit as the major products. Much of the industry is located in regions occupied by Serbs, and it was estimated that 80 per cent of the industrial plants were destroyed. Agriculture has always characterized the Bosnian way of life and has played an important role in the country economy as it employed during the war 20% of labor on full time, and at least the same percentage on half time.
In terms of industry, the highest increase of production was recorded in the area of energy products supply, when compared to the average production recorded in 1999. In the Republic of Srpska, the industrial production in 2000 increased by 5.6% compared to the average in 1999.
The country’s gross national product (GNP) per capita reached $1,900 in 2002, and GDP is $5.9 billion, in 2003.

Transportation

Bosnia and Herzegovina is one of the poorest countries in the region. As road transport accounts for over 95 percent of all goods and passenger movements, efficient and low cost road transport is essential to facilitating local, regional and even international commerce. In an ethnically divided country like Bosnia and Herzegovina, road development is also an important integration factor.
The road network of Bosnia and Herzegovina consists of approximately 22,600 km, with 3,788 km of main roads (of which about 96 percent is paved), 4,842 km of regional roads and 14,000 km of local roads. Of these, 2,024 km of main and 2,724 km of regional roads are in the Federation of Bosnia and Herzegovina, and 1,764 km of main and 2,384 km of regional roads are in Republika Srpska. Despite the emergency program, a significant part of the main road network is still in poor condition.
The BiH railway network, with a total of 1,021 km, is connected with the port Ploce and the river ports Samac and Brcko. Main corridors Corridor 5c and Parallel 10 provide transport linkages to Mediterranean Europe, South East Europe, Croatia, and Yugoslav economies. Before the war, the railway driven transport system was functioning well. However, after the war, it deteriorated considerably.

(4) Bulgaria

Social parameters

The Republic of Bulgaria, situated in the Balkan Peninsula, is bounded in the north by Romania, in the east by the Black Sea, in the south by Turkey and Greece, and in the west by Yugoslavia and FYROM. The area of Bulgaria is 110,910 square kilometers.
The last official estimate (2003) of the population of Bulgaria is 7,5 million. Population density is about 80 people per square kilometer.
In 2002, the long-term unemployment rate (12 months and more) as a percentage of the total active population was 11.9%.

Economic parameters

In 2003, GDP was $16.0 billion and GDP per capita touched $6500.
Sofia is an important part of the country's economy. With its modest size of less that one percent in territory, Sofia produces close to 30 percent of goods, services and tax revenues. After the 1997 crisis, Sofia growth rates exceeded the national average. About half of all foreign direct investments to Bulgaria go to Sofia.
Today, 52 percent of the labor force is employed in the private sector, which resulted from a rapid growth of SMEs. This strong development contributed to keeping unemployment levels down to about a third of the national unemployment rate (5.2 percent). In promoting Sofia's future economy, the City authorities will seek to sustain and improve Sofia competitiveness, encourage future SME growth, support a conductive business and investment climate, and better manage the environment.

Transportation

Bulgaria has an extensive transport infrastructure but in generally poor condition. Road and rail transport are the two most important modes of transport. In the freight area, road transport, which has a share of about 55% of the combined road plus rail market, largely complements rail transport, focusing on shorter distance, higher value, and more time sensitive shipments. In the passenger area, on the contrary, road transport competes aggressively with rail transport and has gained a share of about 70% of the intercity transport market. The total length of the Bulgarian road network is 37,286 km. About 90% of the roads have an asphalt pavement.
Bulgaria is also crossed by five Pan European Corridors, corridors IV, VII, VIII, IX and X.

(5) Croatia

Social parameters

The country has an area of about 56,542 square kilometers.
The main cities are Zagreb, the capital and primary industrial centre, Split and Rijeka, two important seaports, and Osijek, an industrial centre.
The total population of Croatia according to the 1991 census was 4,784,265, it was estimated in 2003 at 4,5 million. Half the population lives in urban areas.

Economic parameters

Before the outbreak of war in mid-1991, close to two-thirds of the country's land was cultivated (sugar beet, wheat, and maize). Abundant mineral resources supported a productive mining industry. Other industries included oil refineries, iron and steelworks, shipyards, and plants producing chemicals, foodstuffs, machinery, cement and concrete, metal products, and textiles.
The GDP per capita, PPP method, for 1999, was estimated at 5,287 USD, for 2002 reached at $9,800.
The economic growth has started to recover in 2000, with an increase of 3.6%, whereas it was negative in 1999. The GDP, estimated in 2003, was $23.1 billion. The industrial production has risen by only 1.7% between 1999 and 2000. This positive trend has been observed at the end of the year, which leads to expectations of a better situation in 2001. The Chemical industry goes through the best growth (+10%), whereas the maritime industry contracts and loses 9 points.
Since late 1999, growth and production are recovering, though quite weakly. Important sectors for economy, such as the maritime industry, food industry and textiles are more active than the previous years. Besides, tourism is now in very good shape.
Agriculture is diversified in the plains in north and central part of the country (wheat, maize, sugar beet, hop and cow stock breading).

Transportation

Croatia has achieved a great deal in the transport sector in the short time since the independence, repairing most war damage, writing laws which are generally suitable for the transport sector of a sovereign state, and privatizing some transport enterprises.
The Croatian road network comprises 6930 km of state road, 10510 km of county roads and 10197 km of local roads, for a grand total of 28,123 km.
Part of this network is 593 km of high standard roads encompassing 417 km of motorways, 72 km of first stage motorways and 104 km of highways. The railway network catches 2,296 km.
The study network consists of three main routes corresponding to the Pan European corridors Vb, X and Vc and several other routes providing linkages between the Pan European corridors as well as servicing the Adriatic Coast which has huge development potential in tourism activities.

(6) Czech Republic

Social parameters

Czech Republic, in central Europe, is bounded in the south and east by Germany. Other border countries are Austria, Slovakia and Poland. Its area is about 78,866 square kilometers and covers 1 percent of the area of Europe. Its capital is Praha.
The total population of Czech Republic according to the 2003 census was 10,2 million inhabitants. In 2002, the long-term unemployment rate (12 months and more) as a percentage of the total active population was 3,7%.
The country is divided into 13 regions and 1 capital city, Praha.

Economic parameters

Growth in 2000-02 was led by exports to the EU, especially Germany, and foreign investment, while domestic demand is reviving. Uncomfortably high fiscal and current account deficits could be future problems. Unemployment is gradually declining as job creation continues in the rebounding economy. Inflation is moderate.
Moves to complete banking, telecommunications, and energy privatisation encourage additional foreign investment, while intensified restructuring among large enterprises and banks and improvements in the financial sector should strengthen output growth.
The average year-on-year inflation rate for 2003 compared to 2002 was only 0.1% (the inflation slowed down 1.7 percentage points on 2002). Inflation rate calculated comparing the CPI in December 2003 and December 2002 reached 1.0%, which is 0.4 percentage points up on the inflation rate calculated comparing the CPI in December 2002 and December 2001. The month-on-month inflation amounted to 0.2% in December 2003.
The GDP per capita for 2002 was estimated at $15,300, and the GDP was $72.3 billion, in 2003.

Transportation

The Czech Republic (CR) has made good progress in privatizing some transport operations, and now needs to concentrate on commercializing activities, identifying, which activities, will remain in the public sector, and completing remaining privatization. CR published its transport policy in 1998, which commendably drew together different political views and sought to retain a significant role for the State *Transport Policy of the Czech Republic*.
However, CR has joined the European Union (EU) where transport is overwhelmingly market oriented. This has put pressure on transport organizations, particularly Czech Railways (CD), to compete successfully or become increasingly marginalized. In addition, the public cost of supporting transport activities, more than two percent of GDP in the case of the railways, is becoming increasingly unaffordable.
The Czech road network comprises 55,408 km of total road and rail network covers 9,462 km of surface.

(7) Former Yugoslav Republic of Macedonia (F.Y.R.O.M)

Social parameters

The FYROM, located in the south-central part of the Balkan Peninsula is bounded in the north by Serbia and Montenegro, in the east by Bulgaria, in the south by Greece and in the west by Albania. Its area is 25,333 square kilometers. The major cities are, the capital of the country Skopje, Bitola, Prilep, Kumanovo, Tetovo and Veles.
According to the 1994 census final results, the population on 20 June 1994 was 1,945,932. An estimated 60% of the population lived in urban areas. In 2003, the total population estimate was 2.0 million inhabitants.

Economic parameters

The national currency of FYROM is the denar (MKD) of 100 deni. The average exchange rate for the year 2000 was 65,19 MKD for one USD. The Gross Domestic Product, PPP method, in 1999, was estimated at USD 1,039 per capita. In 2003, the GDP was estimated at $4.0 billion.
Following a long recession in the first half of the 1990s, real economic growth turned positive in 1996 and accelerated to 2.9 percent in 1998, the highest growth achieved since independence.
Following 2 years of rapid growth, domestic demand was sluggish in 1999, the investment environment deteriorated with the onset of the Kosovo crisis in the first half of 1999.
On the supply side, growth during 1996-98 was spurred by a strong pickup in industry and a gradual recovery in transport and communication.
The main generators of the registered growth of GDP in 1999 were transport and telecommunications2 (13.7%) and construction (12.2%), resulting from the intensified activities related to the road infrastructure in the country, catering and tourism (9.2%), as a result of the increased presence of non-residents in the country, and trade (6.7%). Hence, the unfavourable developments in industry and mining were not only fully compensated with the increase in tertiary activities, but also there was an increase in value added activities.

Transportation

Although FYROM has a common border with Greece, the volume of trade with the European Union is low in comparison with exchanges between the EU and other former-Yugoslavian countries or Eastern and Central European countries.
The main issues in the transport sector of FYR Macedonia are associated either with the changing geographical patterns of trade and transport flows, or with the process of economic transition itself.
The road network totals 8,684 km (5,540 km paved) of roads of which some 4,900 km, or about 60%, have been modernized and about 3,300 still have earth surfacing. Roads are classified as Arterial, Regional and Local. Of the total network, 915 km are Arterial, 2,611 km are Regional and 4,690 km are Local. In addition to the national classification, about 520

km of the arterial roads are part of the European road network ('E" Roads). The arterial network serves seven major corridors in the country. The historically most important corridor is served by the 174 km arterial road No. 1, a section of the Trans-European E-75 highway, which runs roughly north south across the country from the border with the Federal Republic of Yugoslavia (Serbia/Montenegro) to the border with Greece. The next most important arterial road serving international and national traffic is the East-West corridor. The 302 km road runs from the Bulgarian border at Deve Bair through Skopje, Gostivar and Ohrid to the Albanian border and connects Skopje with Sofia, capital of Bulgaria, and Tirana, capital of Albania as well as linking the former Yugoslav Republic of Macedonia with ports on the Black Sea. The third most important corridor is also in the east-west direction and is served by a 330 km arterial road which runs from the Bulgarian border near Delcevo through Veles, Bitola and Ohrid to the Albanian and Greek borders.
The Macedonian Railways (MR) network consists of 699 km of open line that includes 226 km of direct station track. The entire network is single track and 233 km are electrified.

(8) Georgia

Social parameters

Georgia is located in South-western Asia, bordering the Black Sea, between Turkey and Russia.
The total area that surrounds Georgia is 69,700 square kilometers. The capital of the country is Tbilisi.
Georgia controls much of the Caucasus Mountains and the routes through them.
The population of the country is 5.1 million inhabitants (2003 est.).

Economic parameters

Georgia's main economic activities include the cultivation of agricultural products such as citrus fruits, tea, hazelnuts, and grapes; mining of manganese and copper; and output of a small industrial sector producing alcoholic and non-alcoholic beverages, metals, machinery, and chemicals. The country imports the bulk of its energy needs, including natural gas and oil products. Its only sizable internal energy resource is hydropower.
Georgia has been growing at an average rate of 6% per annum since 1994. Because of the dramatic downturn of economic activity especially during 1990-1994, the real GDP per capita is $588, which is roughly one third of the level in 1989. Living standards have not risen despite growth in GDP because growth has been concentrated in a narrow set of sectors, and there have been no effective mechanisms to redistribute its benefits. 51.8% of the population fall below the national poverty line. The most promising opportunities for developing Georgia's economy continue to be in natural resources and agribusiness.
The country's role as an important oil and gas transit centre is rapidly increasing, while several foreign companies are already successfully exploiting Georgia's own oil and gas reserves. Potential exists for the development of Georgia's tourist industry. Georgia's geographical position makes it an important transport link between the Black and Caspian Seas and between Russia and Turkey.
The GDP, for 2003, was estimated at $3,5 billion.

Transportation

Georgia's roads consist of international motorways (1,474 kilometers), state highways (3,326 kilometers), and local roads (15,429 kilometers). The poor condition of roads in Georgia, caused by a lack of financing, represents a large barrier to investment and growth. According to Georgian MOTC, 80% of road maintenance and 100% of road construction are privatized. The funds available to the Georgian State Department for Roads (SDRG) for road maintenance are connected to a Road Fund. The funds available for SDRG have steadily declined each year since 1999. This development is not in line with the IDA credit terms for road projects, especially since overall Government revenues have been increasing. Apart from problems with loan arrangements, the result is that Georgia is not able to provide even a minimum amount of maintenance of the road network.
Georgia's fully electrified railway network covers 1,612 kilometres of track. The main route runs across the country, starting from Baku in Azerbaijan, via Tbilisi to Samtredia and then on to Batumi and Poti ports, as well as into Russia via Sukhumi. Today Georgian Railways is completely independent and has agreements with the railways of Azerbaijan and Armenia for transit and exchange of traffic. About 80% of the network is in mountainous terrain with grades reaching 4.9%, 247 km have curves with radii of less than 300 m. The main lines are all electrified with 50 cycles AC at 25 KV.

(9) Greece

Social parameters

The country consists of a large mainland, the Peloponnesus Peninsula, connected to the mainland by the Isthmus of Corinth, and more than 1,400 islands, including Crete, Rhodes, Corfu, and the Dodecanese and Cycladic groups. Greece has more than 14,880 kilometers (9,300 mi.) of coastline and a land boundary of 1,160 kilometers (726 mi). The total area of the country is about 131,940 square kilometers.
About 80% of Greece is mountainous or hilly. Much of the country is dry and rocky, only 28% of the land is arable.
Greece is located at the junction of three continents: Europe, Asia, and Africa. Greece's foreign policy, despite its joining NATO in 1952 and its accession to the European Community in 1981, has remained focused on the Balkans and the eastern Mediterranean region.
The largest and most important city is Athens, the capital, with a population of about 748,110. Piraeus, seaport of Athens, is the largest port of Greece (second largest in the Mediterranean Sea after Marseilles in France). Thessaloniki, is a seaport and an important textile centre. Patra, located on the northwestern part of Peloponnisos. Other sizable cities are Heraclion, Crete and Larisa.
The population of Greece at the 2003 census was 10,7 million.
In 2002, the long-term unemployment rate (12 months and more) as a percentage of the total active population was 5,1%.

Economic parameters

Greece remains a net importer of industrial and capital goods, foodstuffs, and petroleum. Leading exports are manufactured goods, food and beverages, petroleum products, cement, chemicals, and pharmaceuticals.
Services, including tourism, make up the largest and fastest-growing sector of the Greek economy, accounting for about 62,7% of GDP in 1998. Over the last decade, real GDP growth has averaged 1,6% a year, compared with the European Union average of 2,2%. Inflation continues to be well above the EU average, and the national debt has reached 140% of GDP, the highest in the EU. In 2003, GDP was estimated at $ 136.5 billion.
Tourism is a major source of foreign exchange earnings. Although it is one of the country's most important industries, it has been slow to expand and suffers from poor infrastructure. With more than 10 million tourists visiting Greece in 1996, the tourist industry faced declining revenues, partly due to the strong drachma. Revenue from tourism exceeded $5.2 billion in 1998, having increased somewhat as Greek tourism benefited from problems in neighboring countries and an economic recovery in the European Union.

Transportation

The road network of Greece is estimated to represent some 117,000 km of total main, regional and local roads. The rail network is estimated to represent 2,571 km of the surface.
At Svilengrad in Bulgaria, the branch of Corridor IX bends southwards to the near border crossing at Ormenio in Greece, where it joins Egnatia Odos and runs down towards the port of Alexandroupoli.
In Ardanio, 35 km east of Aleksandroupoli, Egnatia Odos is split and an eastern branch crosses the Greek/Turkish border at Kipi/Ipsala. Via Egnatia runs along D 110 to Silivri (175 km), where it joins Corridor IV.
In Haskovo in Bulgaria, where Cortidor IV and IX southern section split, Corridor IX southern section is split as well. One road section of Corridor IX goes southwards via Kardzali and Podkova to the Bulgarian/Greek border in Makaza. From the border, the alignment passes via Nimfea to Komotini on the Egnatia Odos, which links Makedonia with Thrace, the port of Aleksandroupoli. The other road section is Corridor IV, which passes Svilengrad to Turkey.
Svilengrad is a railway junction in southern Bulgaria close to two borders, where the common alignment of Corridor IV and Corridor IX south, splits to respectively. Turkey (border crossing Svilengrad/Kapikule) and Greece (border crossing Svilengrad/Ormenio). From Ormenio, the railway runs southwards along the border river to Turkey, Evros/Meric. At Prangio, the railway has a border crossing to Turkey, where it joins Corridor IV at Pehlivankoy (30 km), and is linked with Istanbul.

(10) Hungary

Social parameters

The country has an area of about 93,030 square kilometers and covers 1 percent of the area of Europe.
Hungary occupies the low-lying areas of the Carpathian basin. Two-thirds of the territory consist of below 200 meters.
The main cities are Budapest, the capital and primary industrial centre, Baranya, Heves, Zala, Somogy, Bikis etc.
The total population of Hungary according to the 2003 census was 10,0 million inhabitants.
In 2002, the long-term unemployment rate (12 months and more) as a percentage of the total active population was 2,4%.

Economic parameters

The Hungarian economy was primarily oriented toward agriculture and small-scale manufacturing.
Hungary has made the transition from a centrally planned to a market economy, with a per capita income one-half that of the Big Four European nations. Hungary continues to demonstrate strong economic growth especially after its accession to the European Union in May 2004.
By the end of 1997, Hungary had shifted much of its trade to the West. Trade with EU countries and the OECD now comprises over 70% and 80% of the total, respectively. Germany is Hungary's single most important trading partner. The U.S. has become Hungary's sixth-largest export market, while Hungary is ranked as the 72d largest export market for the U.S. Bilateral trade between the two countries increased 46% in 1997 to more than $1 billion. The U.S. has extended to Hungary most-favored-nation status, the Generalized System of Preferences, Overseas Private Investment Corporation insurance, and access to the Export/Import Bank.
The private sector accounts for over 80% of GDP. Foreign ownership of and investment in Hungarian firms are widespread, with cumulative foreign direct investment totaling more than $23 billion since 1989. Inflation has declined substantially, from 14% in 1998 to 4.7% in 2003, unemployment has persisted around the 6% level.
Germany is by far Hungary's largest economic partner. Short-term issues include the reduction of the public sector deficit to 3% in 2004 and avoiding unjustified increases in wages.
The GDP for 2003 was estimated at $69.1 billion, and the GDP growth touched, in 2003, the 3,70%.

Transportation

The new transport strategy which was in harmony with the efforts made in respect of Hungary's accession to the European Union and the EU's transport policy issued in 2001, for the period up to 2010, had a decisive impact on the national expressway and ordinary road

network development activity of the government. The aim of the strategy is to establish a balance between the economic and social demands and the transport development, maintenance and operating activities, which take into consideration the division of available sources as well.
In Hungary, 188,203 km of road was kept on record at the turn of the millenary. Of this amount 137,000 km were the length of public roads – within this, 30,000 km of state-owned national road network, 107,000 km were local roads owned by the local governments – and 53,000 km were the length of privately owned roads. Solid pavement was on 99 per cent of the national roads, on 60 per cent of the local roads situated in inhabited inner areas, on 5 per cent of local roads situated in the outskirts, and on 50 per cent of all public roads
The rail network covers about 7,875 km. Hungary and Austria jointly manage a cross-border, standard-gauge railway connecting Gyor, Sopron, and Ebenfurt (Gysev railroad) with a route length of 101 km in Hungary and 65 km in Austria; 156 km of this line is electrified (2002).

(11) Italy

Social parameters

The total land area of Italy is about 301,230 square kilometers.
Rome is Italy's capital and largest city. Other major cities include Milan, Naples, Turin, Genoa, Bologna, Florence, Venice, Messina, Verona, and Padua.
The total population of Italy at the 2003 census was 58.0 million. In 2002, the long-term unemployment rate (12 months and more) as a percentage of the total active population was 5,3%.

Economic parameters

The Italian economy has changed dramatically since the end of World War II. From an agriculturally based economy, it has developed into an industrial state ranked as the world's fifth-largest industrial economy. Italy belongs to the Group of Eight (G-8) industrialized nations, it is a member of the European Union and the OECD.
Italy has few natural resources. With much of the land unsuited for farming, it is a net food importer. There are no substantial deposits of iron, coal, or oil. Proven natural gas reserves, mainly in the Po Valley and offshore Adriatic, have grown in recent years and constitute the country's most important mineral resource. Most raw materials needed for manufacturing and more than 80% of the country's energy sources are imported. Italy's economic strength is in the processing and the manufacturing of goods, primarily in small and medium-sized family-owned firms. Its major industries are precision machinery, motor vehicles, chemicals, pharmaceuticals, electric goods, and fashion and clothing.
Italy is in the midst of a slow economic recovery and is gradually catching up to its west European neighbors. Italy's economy accelerated from anemic 0,7% growth in 1996 to 1,4% in 1999 and continued to rise to about 2,9% in 2000, which is closer to the EU projected growth rate of 3,1%. Domestic demand and exports were the dominant factors in GDP growth, but it nevertheless remains one of the lowest among industrialized countries.
With respect to inflation, Italy is now firmly within norms specified for Economic and Monetary Union (EMU), a major achievement for this historically inflation-prone country.

Consumer inflation fell from 3.9% in 1996 to 1.7% in 1999 but did rise again to 2.5% in 2000. The 1992 agreement on wage adjustments, which has helped keep wage pressures on inflation low, remains in effect.
Since 1992, economic policy in Italy has focused primarily on reducing government budget deficits and reining in the national debt. Successive Italian governments have adopted annual austerity budgets with cutbacks in spending, as well as new revenue raising measures. Italy has enjoyed a primary budget surplus, net of interest payments, for the last 7 years.
The deficit in public administration declined to 0,60% of GDP in 2003, down from 7% in 1995. The GDP, in 2003, was estimated at $1214.0 billion.
Italy's agriculture is typical of the division between the agricultures of the northern and southern countries of the European Union. The northern part of Italy produces primarily grains, sugarbeets, soybeans, meat, and dairy products, while the south specializes in producing fruits, vegetables, olive oil, wine, and durum wheat.

Transportation

The Italian road network covers approximately 45,000 kilometers, about 21,000 of which are part of the ANAS network stretching from mountain passes to urban, port and airport systems and inter-modal centres and motorways. The remaining kilometers are managed by local authorities and motorway agencies. There are 6,500 kilometers of motorway, 5,500 of which are subject to toll charges, 3,300 kilometers are granted to the Motorway Association and associated companies, and over 1,200 are managed by Anas. The network managed by the Motorway group is the largest in the country and is used annually by more than 760 million vehicles. Some 80% of the traffic consists of cars and 20% of commercial vehicles.
Italy's railway lines cover a total of 16,200 km, two-thirds of which are electrified, with 6,300 km of double track. Approximately 9,200 trains carry 1.3 million travellers daily but on Friday, the busiest day, the number of trains exceeds 10,000. As many as 472 million passengers and 88 million tons of goods are transported annually between roughly 2,700 stations across the country in 10,000 carriages hauled by 4,500 locomotives.
Railway transport in Italy is managed, for the most part, by the State Railways Company (Ferrovie dello Stato or FS), a holding company that carries out the strategic aims of the group and which is composed of 36 units, amongst which is Trenitalia which runs the passenger and goods transport unit, while Italian Railway Network (RTI) manages the infrastructure and is responsible for the equipment and the safety of the trains in circulation.

(12) Lithuania

Social parameters

Lithuania is part of the economic region, known as the Baltic Republics, extending along the Eastern coast of the Baltic Sea. Its area is 65.200 sq. km. Lithuania borders are on Latvia in the north (610 km of the border line), on Byelorussia in the east and south (720 km), and Poland (110 km) and the Kaliningrad region of the Russian Federation (303 km) in the southwest. The total length of the mainland borders is 1747 km, with the sea coastline extending for another 99 km. From east to west the country stretches 373 km, and the

distance from the southern end of the country to the northern one is 276 km. The capital of the country is Vilnius.
Located in the centre of Europe, Lithuania is situated at one of the largest crossroads of the continent. It is divided by a straight line connecting Paris and Berlin with Moscow via Vilnius, whereas another straight line, connecting Helsinki with Athens, also crosses the centre of Lithuania.
The population of the country is 3,6 million inhabitants (2003 est.). In 2002, the long-term unemployment rate (12 months and more) as a percentage of the total active population was 7,0%.

Economic parameters

The Statistics Department of Republic of Lithuania reports a 6.7% growth in GNP, O.3% rise in CPI and a 2.8 % drop in PPI, for year 2002. This makes Lithuania as one of the fasted growing economies in Central and Eastern Europe. The European Bank for Reconstruction and Development that the countries of that region averaged only 2.5% growth. The Statistics Department further reports that during the first quarter of 2003 Lithuania's economy grew at a rate that was 9.4% higher than over the same period in 2002, with highest growth experienced in energy (27%), construction (18.3%) and manufacturing (16.3%).
Unemployment remains high, still 10.7% in 2003, but is improving. Growing domestic consumption and increased investment have furthered recovery. Trade has been increasingly oriented toward the West. Lithuania has gained membership in the World Trade Organization. Privatization of the large, state-owned utilities, particularly in the energy sector, is nearing completion. Overall, more than 80% of enterprises have been privatized. Foreign government and business support have helped in the transition from the old command economy to a market economy.
The GDP, for 2003, was estimated at $14.2 billion.

Transportation

All major Lithuanian cities are interconnected by 1997 km long network of railroad lines. Express passenger service is available along the major line interconnecting the cities of Vilnius, Kaunas, Siauliai and Klaipeda.
Lithuanian rail lines are an integral part of the major Central and Eastern European international rail system. In 1997 total 30,500,000 tons of goods were carried by Lithuanian rails. The same year the railroads carried 11,000,000 passengers of which almost 2 mil were international travellers. In 2002 railway network covers 1,998 km.
Over 63 thousand km, road system interconnects the country's cities, towns, and villages. Only 7 thousand km. of local roads, serving the smallest communities and settlements, are still without hard paved surface. Unlike some of the street in a number of cities and towns, all state roads appear to be maintained and are in excellent condition. 300 km long four lanes divided limited access expressway links the capital city of Vilnius with the port city of Klaipeda. At Kaunas, the second largest city in Lithuania, it connects with the “Via Baltica” the major North-South international thoroughfare from Tallinn in Estonia to Warsaw, Poland. The road network covers 75,243 km.

(13) Moldova

Social parameters

Situated between the Danube, Prut and Nistru rivers, the Republic of Moldova occupies a territory of 33,843 square kilometers. It borders Romania in the West and Ukraine in the East and South.
The major cities of Moldova include the capital city, Chisinau, with 735,000 people, Tiraspol, Balti and Bender.
The Republic of Moldova is one of the most densely populated European countries. Its population grew from 3,000,000 in 1961 to nearly 4,300,000 in 1995. In 2003, the population was estimated at 4,2 million inhabitants. Population density increased, respectively, from 88 to 129 persons per square kilometre.

Economic parameters

The economy of Moldova depends heavily on agriculture, featuring fruits, vegetables, wine and tobacco. Industry accounts for only 20% of Moldova's labor force, while agriculture's share is more than one-third.
Moldova must import all of its supplies of oil, coal, and natural gas, largely from Russia. As part of an ambitious reform effort, Moldova introduced a stable convertible currency, freed all prices, stopped issuing preferential credits to state enterprises, backed steady land privatization, removed export controls, and freed interest rates. Yet these efforts could not offset the impact of political and economic difficulties, both internal and regional.
In 1998, the economic troubles of Russia, by far Moldova's leading trade partner, were a major cause of the 8.6% drop in gross domestic product, the value of the currency in relation to the dollar fell by half. In 1999, GDP fell again, by 4.4%, the fifth drop in the past six years, exports were down, and energy supplies continued erratic.
The economy returned to positive growth, of 2,1% in 2000, 6,1% in 2001, 7,2% in 2002, and 5,3% in 2003. In 2003, the Gross Domestic Product was $1.7 billion.
The government has liberalized most prices and has phased out subsidies on most basic consumer goods. A program begun in March 1993 has privatized 80% of all housing units and nearly 2,000 small, medium, and large enterprises. Other successes include the privatization of nearly all Moldova's agricultural land from state to private ownership, as a result of an American assistance program, "Pamint" ("land"), completed in 2000.
Inflation was brought down from over 105% in 1994 to 12% in 1997. Though inflation spiked again after Russia's 1998 currency devaluation, Moldova has made great strides in bringing it under control.

Transportation

Moldova is a "gateway" between the former Soviet Union countries and the West. Its transport and even telecommunication sectors can be considered as a "Hub" for the region.

The Pan European Corridor IX (Moscow-Kiev-Bucharest) crosses Moldova from East to West, traversing the capital city Chisinau. Moldova is a net importer of transport services. Moldova is well developed transport sector (albeit with institutional and physical deterioration problems) consists of 12,657 km of roads (excluding municipal, agricultural and forestry roads), 1,300 km of railroad (about 100 km electrified), and four airports, one of which is up to international standards.
Moldova's extensive transport infrastructure is seriously deteriorated. Road and rail transport are the two most important modes of transport. In the freight area, the modal split over the last six years has largely remained of about 72% and 28% for road and rail, respectively. Both road and rail freight traffic decreased as a result of the economic decline in Moldova during the last decade. Passenger traffic shows a similar decline, thought less acute, with road transport playing a leading role (80%), and constantly increasing to the detriment of railway transportation.

(14) Poland

Social parameters

The country has an area of about 312,685 square kilometers.
The capital, Warsaw, is situated in the center of the country. Poland` s surface area of 120,727 sq. miles ranks eighth in Europe. The country lies almost entirely on the North European Plain and is a land of gentle relief, rarely rising above 350 feet except along the southern border with the Sudety and Carpathian mountain ranges. Rysy is the highest mountain peak, 8200 feet above sea level.
The total population of Poland according to the 2003 census was 38,000,000 inhabitants.

Economic parameters

Poland today stands out as one of the most successful and open transition economies. The privatization of small and medium state-owned companies and a liberal law on establishing new firms marked the rapid development of a private sector now responsible for 70% of economic activity. In contrast to the vibrant expansion of private non-farm activity, the large agriculture component remains handicapped by structural problems, surplus labor, inefficient small farms, and lack of investment.
Warsaw continues to hold the budget deficit to around 2% of gross domestic product. Structural reforms advanced in pensions, health care, and public administration in 1999, but resulted in larger than anticipated fiscal pressures. Further progress on public finance depends mainly on privatization of Poland's remaining state sector.
The Polish economy grew rapidly in the mid-1990s, but growth has slowed considerably in recent years. The gross domestic product (GDP) grew 4.0% in 2000, but was expected to increase only by about 1.0% in both 2001 and 2002. Slowing growth has boosted unemployment, which stood at 17.4% at the end of 2001. Tight monetary policy and slow growth have helped temper inflation, which was down to 5.5% in 2001. Likewise, Poland's

current account deficit, which grew rapidly in the late 1990s, fell to 4.0% of GDP in 2001. In 2003, the GDP was estimated at $198.1 billion.
Agriculture employs 28,4% of the work force but contributes only 3,4% to the gross domestic product (GDP), reflecting relatively low productivity. Unlike the industrial sector, Poland's agricultural sector remained largely in private hands during the decades of communist rule.

Transportation

Major investments in transport infrastructure, including motorways, are clearly required as Poland's economy continues its rapid growth after its accession to the EU. However, the cost of the planned motorway program will be very high: nearly $1 billion per year (0.7% of GDP) sustained over some 15 years. Considering the competing demands on the State budget for financing many other investments in social and physical infrastructure, Ministry of Infrastructure is revisiting the timing and phasing of the motorway program and looking at other alternatives which could still meet Poland's transport needs in the coming years, but at lower cost.
The total length of the Polish road network is 364,656 km, although the rail network covers 23,420 km.

(15) Romania

Social parameters

The total area of Romania is about 237,500 square kilometers. Forests cover approximately 28 per cent of the total land area.
Bucharest is the capital with a population of 2,400,000 (2000), and it is also the prime industrial and commercial centre of the country.
Romania has a population of 22,3 million (2003 estimate). Population density is about 94 people per square kilometer. The population is about 55 per cent urban.
In 2002, the long-term unemployment rate (12 months and more) as a percentage of the total active population was 3,8%.

Economic parameters

The Gross Domestic Product, in 2003, was estimated at $47.1 billion.
For the third year in a row, the growth has been negative in 1999. The decrease of the GDP has reached 20% in a 3-year period. The industrial production has decreased by 8.4%, to be compared to an 18% drop in 1998. Theses figures do not take into account the informal economy, considered by experts as close to 50% of the declared economy. However, the growth of GDP in 2002 was estimated at 4,9%.
In 1999, agriculture has strongly decreased compared with 1990, both in vegetal and animal activities. By the end of 1999, it represented 14.6% of GDP (13.9% in 1997). Agricultural trade balance also deteriorated, mainly because of a rise in meat imports.

The main Romanian partner, both for imports and for exports (34% of total food exports and 32% of food imports) is the European Union. Exports mainly concern Italy (32% of exports towards EU), Germany (23%), Greece (13%). The main providers are Germany (21%), Austria (12%), France (11%), the Netherlands (11%) and Greece (11%).
Romanian industry in general, and agriculture and consumables industry in particular have deeply suffered from the economic and financial transitions, which have lasted for 10 years. The privatization of several State industries has somehow boosted the economy.

Transportation

Romania is a major crossroad for international economic exchange in Europe. The road network of Romania has a length of 198,603 km, including city streets, 0,15% motorways, 18,70% national roads and 81,16% country and communal roads. The rail network covers 11,385 km of the Romanian surface.
In terms of road surface types, 19 521 km are paved (24.84%), 19 431 km have a light asphalt pavement (24.72%), 27 029 km are gravel (34.38%) and 12 620 km are earth roads (16.06%).
The national roads correspond to the major road network and carries 70% of the total road traffic.
Romania is crossed by three Pan European Corridors, Corridors IV IX and VII (Danube river):
Corridor IV runs West-East from Nedlac at the Hungarian-Romanian border to Constanta on the Black Sea for one branch and North West-South East, from Timisoara to Vidin where it will cross the Danube River on a new bridge whose construction is to be financed mainly by the EIB.
Corridor IX runs North-South from the Moldavian-Romanian border to Giurgiu where it will cross the Danube River on the existing bridge between Giurgiu and Ruse in Bulgaria.
Besides the rehabilitation of the National Roads network, Romania has focus its major investments on the road sections of the Pan European corridors IV and IX within Romania and more particularly on roads along corridor IV.

(16) Russian Federation

Social parameters

Russia is occupies the vast area between Europe and the North Pacific Ocean. It has an area 17,075,200 square kilometres and a population of almost 143.4 million people (2003). All in all, 73 per cent of Russian citizens live in urban areas.
The capital of the Russian Federation is Moscow. With its 10 million population it is the largest city in the country, its principal economic and political centre.

Economic parameters

The macroeconomic situation in August 2002 was characterized by slow growth in consumer prices, continuing economic growth, a new rise in household real money income and the

expansion of fixed capital investment. The situation in the financial markets remained relatively stable.
In September, consumer prices rose 0,4% month on month and in the first three quarters this year inflation slowed to 10,3% from 13,9% in the same period last year.
Industrial output expanded 3.8% in January-August year on year. Monthly dynamics of industrial output, excluding seasonal and calendar factors, show that industrial output growth has slowed down since May (100,6% in August against 100,9% in May).
With real GDP of $362.5 billion, 2003 was on the whole a positive year for the Russian economy. This growth was triggered primarily by increased domestic demand and increasing oil prices in the 2nd half of the year.
With a foreign trade surplus of USD 46.6 billion, a budget surplus of 1.4% of GDP, an 8.8% rise in disposable real income and a fall in unemployment from 9.0% in 2001 to 7.1% at the end of 2002, remarkable benchmarks were attained despite the difficult global economic climate. The rate of inflation fell from 18.6% in 2001 to 15.1% in 2002. This contrasted with a massive fall in gross capital investment to 2.6%, following growth of 8.7% in 2001.
Inflation was brought down from over 105% in 1994 to 12% in 1997. Though inflation spiked again after Russia's 1998 currency devaluation, Moldova has made great strides in bringing it under control.

Transportation

Due to Russia's favorable geographic position, the volume of international motorway links grew 12-15 % during recent years and the number of transportation means crossing our border into the EU countries increased by 10-15%. There have also been changes in the structure of traffic flow with an increase in heavy trucks and trailers.
The number of road sections with frequent traffic jams entering large congested cities has increased. A large number of road sections that run through developed areas over considerable lengths, do not have the required lane or shoulder width, as well as no dividing lines or flyovers at railway crossings with high traffic.
Within the next few years, the upswing in Russia's economy will stimulate the growth of automobile transportation and increase the load on network roads, especially on those providing international and interregional links. Therefore the Russian Federation's national program for improvement and development of motorway networks will construct a modern road system that meets western standards. The total roadway length is about 87,157 km.
Russia's railway system makes up the bulk of the world's largest and most intensively operated railway system. The former All-Union or Soviet Railways (SZD) was operated as an integrated system across eleven time zones over 148,000route kilometers with 62,000 locomotives, 1.5 million freight wagons, and 56,000 passenger coaches. SZD carried half of all the world's railway freight traffic and about one-fourth of all the world's passenger traffic. It had the highest traffic density of any railway in the world. Traffic density per route kilometer was 51 million gross tons in 1990.Daily train density averaged 40 trains for freight trains and 20 for passenger trains. The heaviest sections carried over 250 million gross tons annually and 300 trains daily.

(17) Serbia and Montenegro

Social parameters

The new country will have dual capitals - Belgrade, the capital of Serbia, will serve as the primary capital while Podgorica, the capital of Montenegro will administer that republic.
The total land area is 102,350 square kilometers (Serbia: 88,412 sq km, Montenegro: 13,938 sq km). Serbia and Montenegro have a diverse landscape. Serbia, which lies to the north, accounts for 86 per cent of the land area of the country. In the southeast ancient mountains and hills rise up from the plains, while a 199 km coastline on the Adriatic Sea forms the southwest boundary, where the republic of Montenegro is located.
The population of Serbia and Montenegro at the 2003 census was 10,6 million. Half of the population of the federation live in urban areas. About 94 per cent of the population live in the republic of Serbia. The country has a density of 102 people per square kilometer. Its largest cities include Belgrade, the capital, with a population (2000) of 1,168,000, Novi Sad (180,000), Niš (176,000), Kragujevac (146,000), Podgorica (118,000), Priština (118,000) and Subotica (108,000).

Economic parameters

The swift collapse of the Yugoslav federation in 1991 has been followed by highly destructive warfare, the destabilization of republic boundaries, and the break-up of important interrepublic trade flows. Output in Serbia and Montenegro dropped by half in 1992-93. Like the other former Yugoslav republics, it had depended on its sister republics for large amounts of energy and manufactures.

The break-up of many of the trade links, the sharp drop in output as industrial plants lost suppliers and markets, and the destruction of physical assets in the fighting all have contributed to the economic difficulties of the republics. Hyperinflation ended with the establishment of a new currency unit in June 1993, prices were relatively stable from 1995 through 1997, but inflationary pressures resurged in 1998.
Reliable statistics continue to be hard to come by, and the GDP estimate is extremely rough (The GDP was estimated in 2003, at $16.3 billion). In 2000, GDP represented only 40% of 1990 GDP, and 50% of 1996 GDP. The informal economy remains the safety net, which has prevented the country from collapsing so far. Industrial reform was hardly a priority for a country so close to collapse and with FRY industry badly damaged by the war years. In the 1980s the old Yugoslavia had set up a series of joint ventures with foreign companies and firms usually had Western equipment.

Transportation

The road network of the whole Federation is estimated to represent some 16,200 km of main and regional roads, and about 24,300 km of local roads. The rail network is estimated to represent 4,059 km of the surface.

The study network is organized around the backbone of Pan-European Transport Corridor X, which connects Salzburg and Thessaloniki through Ljubljana, Zagreb, Beograd, Nis and Skopje. The highway is a dual carriageway motorway from the Croatian border, up to Leskovac, South of Nis. This motorway has been constructed at the end of the sixties, financed by a World Bank loan. South of Leskovac, the road becomes a so-called "Yugoslav expressway ", typical road infrastructure in the region before 1965, i.e. a single carriageway of two lanes with large shoulders, with limited access and separate level crossings. The last section before the Macedonian border, Bujanovac-Presevo, is a mere two-lane highway in very poor condition and requiring immediate rehabilitation.
Two branches stem from this main route in Serbia and Montenegro:
1. branch B, from the Hungarian border to Beograd, through Subotica and Novi Sad.
2. branch C, from Nis to Gradina on the Bulgarian border, through Pirot, with an old two lane
highway in poor condition.
Other highway links in the study network are:
• the road from Pancevo to Moravita , towards Timisoara in Romania and Corridor IV,
• the road from Paracin to Zajecar and V.Cuka, towards the crossing of the Danube at Vidin and further Craiova and Bucharest,
• the North-South liaison between Novi Sad and Tuzla in B&H, one of the most heavily trafficked highway in FRY, with more than 8,000 vehicles a day,
• the transversal liason from Paracin to Uzice, towards Sarajevo,
• the North-South liaisons from Belgrade to Podgorica and Bar and from Belgrade to Pristina and further to Deneral Jankovic towards Skopje,
• the transversal liaison from Sarajevo to Shkoder, through Niksic and Podgorica in Montenegro,
• the transversal liaison from Nis to Bijelo Polje through Pristina in Kosovo,
• the continuation of the route along the Adriatic sea, from Dubrovnik to Bar, via Herceg Novi and Kotor in Montenegro,
• the liaison from Pristina to Albania through Prizren and Vrbnica.

(18) Slovakia

Social parameters

The capital, Bratislava, is the political, economic and cultural centre of the country. Slovakia's total area is 49,035 sq km. The country's maximum length from east to west is about 416 km. and its maximum width from north to south is about 208 km.
The last official estimate (2003) of the population of Slovakia was 5,4 million.
In 2002, the long-term unemployment rate (12 months and more) as a percentage of the total active population was 12,1%.

Economic parameters

Slovakia continues the difficult transition from a centrally planned economy to a modern market economy. The economic slowdown in 1999 stemmed from large budget and current

account deficits, fast-growing external debt, and persistent corruption. Even though GDP growth reached only 2.2% in 2000, the year was marked by positive developments such as foreign direct investment of $1.5 billion, strong export performance, restructuring and privatization in the banking sector, entry into the OECD, and initial efforts to stem corruption.
Economic stabilization measures successfully halved current account deficits that had reached almost 10 percent of GDP by 1998, while lowering the fiscal deficit and building up foreign reserves (1999-00). The Slovak Republic has recovered from a 1999 slowdown and has managed to restore healthy growth levels. Privatization of large public enterprises reached the telecom, gas, transportation, and power sectors, which combined with green-field investment, reached record high FDI inflows for the region. Financial markets and the international community responded favorably. Spreads on sovereign bonds fell by more than 50 percent and the country regained its investment grading in late 2001. The Slovak Republic joined the OECD in 2000; the economic transformation over the last four years has positioned the country well for the European Union accession.
In 2003, GDP was $24.4 billion.

Transportation

The total length of road network is 42,717 km. About 90% of the roads have an asphalt pavement.
Strategic objectives of the transport policy for Slovakia follow below:
Road network:
• Create a separate Motorway Agency (eventually to be privatized) to finance, build and operate the own-revenue generating road network.
• Reformulate the financing of the development and maintenance of Class I, II and III and local roads, with focus on bridges.
• Reallocate responsibility for Class II and Class III roads to new regional governments and restructure the SRA to administer Class I roads and provide technical services to regional road agencies.

Rail network:
• Improve the financial health of the railways
• Dispose of all non-railway and non-essential railway activities and concession specific multi-modal services
• Prepare proposal to create freight, long-distance passenger and regional passenger subsidiaries
• New regional governments to be responsible for financing PSO for regional passenger services

(19) Slovenia

Social parameters

The country covers an area of 20,273 square kilometres.
Slovenia is the third most forested country in Europe, right after Finland and Sweden, as forests cover half the territory, as much as 10,124 square kilometres and it has 46.6 km of seacoast - an inch per inhabitant.
The republic of Slovenia has a population of 1,9 million (2003 est.) and its capital city is Ljubljana.
In 2002, the long-term unemployment rate (12 months and more) as a percentage of the total active population was 3,3%.

Economic parameters

Slovenia is among the most successful of the countries in transition from socialism to a market economy. It boasts a stable growth in GDP and ranks among the countries with the lowest degree of risk.
Slovenia, with its historical ties to Western Europe, enjoys a GDP per capita substantially higher than that of the other transitioning economies of Central Europe. Despite the economic slowdown in Europe in 2001-2003, Slovenia maintained 3,1% growth. The GDP, for 1998, was estimated at $19.585 billion USD, for 2002 reached at $21.960 billion USD. The GDP, in 2003, was estimated at $22.7 billion.
Structural reforms to improve the business environment allow for greater foreign participation in Slovenia's economy and help to lower unemployment. Further measures to curb inflation are also needed.

Transportation

Representing the fastest link between the North Adriatic, and Central and Eastern Europe in addition to being part of the Transport European Network (TEN) since it links Barcelona with Kiev, corridor no. V is given more attention at the moment. As part of this corridor, Slovenia would like to see transport run smoothly as soon as possible on what has been labelled the Slovene transport backbone, namely a diagonal transport route running from Pince near Lendava on the Slovene-Hungarian border, to the Port of Koper, in the southwestern corner of Slovenia.
The Slovene transport axis was given international approval when what is termed European transport corridors were defined, namely corridor no. V Venice - Trieste/Koper - Ljubljana - Budapest - Kiev, which was declared a priority at the Pan-European Transport Conference in Crete in 1994, and corridor no. X Salzburg - Ljubljana - Zagreb - Belgrade - Thessalonike, which was approved at the Pan-European Conference in Helsinki in 1997.
Known as the fifth and the tenth transport corridors, the railway and road transport routes are two out of ten pan-European transport corridors going across Slovene territory which further highlight the role of the country in its integration into the transport networks.

A further 554 kilometers of motorways, highways and roads leading to the motorway network in the directions from east to west (corridor no. V) and north to south (corridor no. X) are to be built under the national programme by the end of 2004. Two thirds or slightly more than 400 kilometers of these roads will overlap with pan-European transport corridor no. V.
There is a total length of 6,253 km of public roads in Slovenia. They are classified according to their importance and their connecting function into: Motorways, Expressways, Main Roads - Category I, Main Roads - Category II, Regional Roads - Category I, Regional Roads - Category II and Regional Roads - Category III.
Also as part of pan-European transport corridor no. V, Slovenia is speedily renovating its railway infrastructure in addition to building a 25-kilometre direct railway line with neighbouring Hungary.

(20) Turkey

Social parameters

Turkey is roughly rectangular in shape and is 1,660 kilometres wide.
The actual area of Turkey inclusive of its lakes is 814,578 square kilometres, of which 790,200 are in Asia and 24,378 are located in Europe.
Turkey has a population of 68,1 million (2003 estimate) and is generally divided into seven regions: the Black Sea region, the Marmara region, the Aegean, the Mediterranean, Central Anatolia, the East and Southeast Anatolia regions. In 2002, the long-term unemployment rate (12 months and more) as a percentage of the total active population was 3,2%.

Economic parameters

Turkey's dynamic economy is a complex mix of modern industry and commerce along with a traditional agriculture sector that in 2001 still accounted for 40% of employment. It has a strong and rapidly growing private sector, yet the state still plays a major role in basic industry, banking, transport, and communication. The most important industry - and largest exporter - is textiles and clothing, which is almost entirely in private hands.
The average growth rate of 5,4 % for the last 5 years, in 2002 it was estimated at 7,8% (the Gross Domestic Product was estimated at $192.3 million), which is well above many OECD countries, implies a dynamic and growing economy.
Turkey has a number of bilateral investment and tax treaties, including with the United States that guarantee free repatriation of capital in convertible currencies and eliminate double taxation. Nonetheless, foreign direct investment has totalled only $15.7 billion as of November 2002, a modest sum reflecting investor concerns about political and macroeconomic uncertainty, burdensome regulation, and a large state role in the economy.
The Turkish privatization board is in the process of privatizing a series of state-owned companies, including the state alcohol and Tobacco Company and the oil refining parastatal. In 2004, the Privatization Board is scheduled to privatize the telephone company and some of the state-owned banks.

Meanwhile, the public sector fiscal deficit has regularly exceeded 10% of GDP - due in large part to the huge burden of interest payments, which account for more than 50% of central government spending. Inflation, in recent years in the high double-digit range, fell to 26% in 2003.

Transportation

Turkey's geopolitical position as a link between the East and the West makes the transport sector crucial for the economic development of the region. The severe fiscal instability and the recent external developments with regard to EU accession and the growing role of Turkey in trade between Central Asia and the South Caucasus make the focus on transport even more important.
Transport demand in Turkey has grown significantly over the past five decades. Overall, demand has grown at an annual rate of nearly 8% since 1950. Demand for road transport has grown at an annual rate of about 7.6% while rail transport demand has grown at about 2%, demand for water transport by 5% and air at over 16% per year. As in most developing countries, road transport is becoming a much more significant factor for both freight and passenger transport.
Transport in Turkey has grown beyond the railway. Rail market shares have declined. It is not likely that much new traffic can be attracted to the railway without significant investment in new and very expensive railway infrastructure, or major changes in railway service. The total rail network is about 8,607 km (2002).
Road transport represented about 37% and rail 55% of the total transport market in 1950. By 2000, road transport represented 93% of the total market, rail about 4%, water about 2% and air 1% of the total intercity transport market in Turkey. While the current rail transport task is not insignificant, it is certainly much less important to the economy of Turkey than in the past. Although TCDD's rail traffic market shares have declined significantly, overall railway traffic has grown somewhat. Total TCDD railway traffic units have grown at about a 2% annual rate. Freight services have grown at an annual rate of about 2,3%. Suburban services have lost traffic at about 3% per year, while intercity passenger traffic has increased by about 1% per year.

(21) Ukraine

Social parameters

The total area of Ukraine is about 603,700 square kilometers. Its border countries are Russia, Romania, Hungary, Slovakia, Poland and Belarus.
It has developed a varied industry, concentrated mostly in and around big cities, such as Kiev, which is the capital of the country. Its population is 48,3 million, estimated in 2003.

Economic parameters

After Russia, the Ukrainian republic was far and away the most important economic component of the former Soviet Union, producing about four times the output of the next-ranking republic. Its fertile black soil generated more than one-fourth of Soviet agricultural output, and its farms provided substantial quantities of meat, milk, grain, and vegetables to other republics.
Ukraine depends on imports of energy, especially natural gas, to meet some 85% of its annual energy requirements. Shortly after independence in December 1991, the Ukrainian Government liberalized most prices and erected a legal framework for privatisation, but widespread resistance to reform within the government and the legislature soon stalled reform efforts and led to some backtracking. Output by 1999 had fallen to less than 40% of the 1991 level. Loose monetary policies pushed inflation to hyperinflationary levels in late 1993.
GDP in 2000 showed strong export-based growth of 6% - the first growth since independence - and industrial production grew 12.9%. The economy continued to expand in 2002 as real GDP rose 9% and industrial output grew by over 14%. GDP of $43.6 billion in 2003 was more moderate, in part a reflection of faltering growth in the developed world. In general, growth has been under girded by strong domestic demand, low inflation, and solid consumer and investor confidence.

Transportation

Ukraine has a relatively well-developed system of major roads and the number of foreign nationals deciding to travel by car is on the increase. However, Ukrainian roads are not as well marked as in Western Europe and road signs might be difficult to read as most of them are in Cyrillic. The total motorway length is 169,491 km.
Ukraine generally has a good railway system. The fastest trains between Lviv and Kyiv run at night and the journey lasts about 8 hours. The country has a wider gauge compared to the rest of Europe and the total rail road length is about 22,473 km.
Russia and Ukraine are going to build a railway tunnel under the Kerch strait, linking the Black and Azov seas. Its annual throughput capacity will be 15 million passengers and 150 million tonnes of cargo. The 15 kilometer-long tunnel will connect two sea ports on the Russia and Ukrainian shores of the strait.

3.1.2 Summary and Conclusions

Particularly for *Task 2 - Alternatives scenarios of growth of WP 3*, the socio-economic data have a very important role. The most important social and economic characteristics of each country in TEM and TER Region were presented above, and more analytically can be found in the Appendix.

The data sets on socio-economic variables are enriched by some information concerning area, population, population growth, GDP growth and some characteristics of motorway and

railway network in each country. So, based on the main information of this report, the external consultant will evaluate the present situation and produce projections of population, economy and trades of the countries in TEM/TER Region.

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3.2 Alternative Scenarios of Growth

It appeared necessary to have a reliable overview of the economy of the region before preparing any future transport demand for the project needs. Thus, in this report the external factors and the data availability for the present situation (the base year) is presented. Based on the available data, projections of population, economy and trade in TEM and TER region are made for the year 2020. This was done using a combination of official forecasts, international studies forecasts as well as trend line extrapolation. It is well documented that traffic growth is proportional to GDP growth (for freight traffic, most of the time, is almost identical).

Needless to say that there is a risk involved in the elaboration of growth scenarios, and this has to do with the data availability, their quality and degree of detail. Hence, this is the reason why the alternative scenarios will be mainly on a qualitative macro-scale.

As a starting point, the main socio-economic characteristics identified in Task 3.1 of WP3 were used. In addition, useful studies for the scenarios development were STAC-TEN of the EU, SCENARIOS, CODE-TEN, TINA, TIRS and REBIS (for Balkans), CARDS, World Bank studies and UNECE studies.

In this report it is also investigated how truck and coach/buses traffic will grow.

3.2.1 Introduction

For many years the main emphasis in transport forecasting and modeling has been to enrich their behavioral content and improve data-collection methods as means to enhance their accuracy, predictability and reduce application costs. A parallel line of research has sought to improve transport modeling by emphasizing the use of readily available data and the communication of simpler model features and results. This stream of research has had an important impact in practice as it offers not only reduced costs in forecasting but also simplified data collection and processing requirements (Ortuzar and Willumsen, 2001). Consultants and local authority modelers are often asked to elaborate transport related issues in short time spans, so the development of better and sounder simplified methods to achieve this is sought. The idea of not using any formal model –due to the above mentioned limitations- means that empirical heuristic approaches will be applied. They are formed and refined through observations, analogies, discussions, experimentations and mistakes/ corrections.

Scenario techniques, following forecasting/ modeling techniques have also developed rapidly in recent years, because of the increasing difficulty in making appropriate forecasts, during a period when there is a very strong need to enlighten long-term decision-making.

A simple definition of a scenario would be as a description of the transport situation at a given date, usually at a long term horizon: it is an "image" of the transport situation, which may be the most "probable" state, or the most "desirable" or even a situation, which should be avoided because of the contradictions or conflicts it might imply. In order to be consistent and useful for decision-making such a description must include the external environment, which has a direct influence on transport.

This present work was defined as a top-down approach starting from the socio-economic external environment. But it also benefits from results of other projects in order to clarify the traffic forecasts assumptions, which are taken into account in policy decisions.

This document consists of two basic parts.

In the **first part**, the different social, economic and foreign trade elements are considered and proposals for socio-economic external scenarios that could influence a specific country's development are outlined.

The relevant and consistent factors needed for the scenarios development are demography, GDP and its components and foreign trade development. The economic environment has an impact on transport, and may be very important as regards transport policy decisions.

The objective of the **second part** is to analyse the *interrelation between transport and its socio-economic environment* and to complete the picture of the scenarios with the description of the state of the transport situation. In this part, the relation between the socio-economic environment and the transport system is analysed, based on different policy options.

3.2.2 Basic Assumptions for the Socio-economic Scenarios

The future development of the world economy is of direct importance for the traffic forecasting on the TEM and TER system. At present, however, this development can only be predicted with a high degree of uncertainty. Therefore it would be advisable to work with different scenarios for the future economic development, but in order to facilitate the use of the traffic forecasts later on, only two scenarios of growth have been established (a moderate and an optimistic).

Due to the many countries members of the TEM and TER system, the scenarios should be global, though with major emphasis on the TEM and TER countries. Also the scenario assumptions should be as realistic as possible.

For the scenarios, 2000 was chosen as the base year and data from years 1995-2000, 2001, 2002 and 2004 were employed to establish the trends to be used in forecasting. Trend forecasting of population, economy and trade started from this base line and has been prepared on a group-country[1] level (and then for each group on a country level) for 2020.

[1] There are three country groups, namely: EU member countries before 01/05/2004, EU member countries after 01/05/2004 and acceding countries, and Non-EU, non-acceding countries.

The time horizon of most of the published studies normally extends to 2005 sometimes to 2010, with the exception of TINA where it is until 2015, but there are hardly any projections or trends up to 2020, except for population. Where projections were available they were used for the trend forecasting.

A forecast can be generated by observing a change through time in the character of something and projecting or extrapolating that change into the future. In making such a forecast, the focus is on the long-term trend, so short-term fluctuations are disregarded. Trend analysis requires the forecaster to have an understanding of the factors which contributed to change in the past, and to possess confidence in the notion that these factors will continue to influence developments in a similar fashion in the future (Schwarz, Svedin, Wittrock, 1982).

One commonly employed approach to trend analysis in forecasting involves the use of growth curves (Cornish, 1977). Growth curves are loosely based upon the notion that the growth of a socioeconomic indicator can be charted in the same way organic growth can be charted. For example, the growth in height (and weight) of an individual can be charted, and will commonly display a pattern, which indicates a leveling off around early adulthood. It is believed that the growth pattern of a socio-economic indicator (e.g. increasing share of employment in the tertiary sector according to the sector hypothesis; Hoover, 1948) can also be plotted and charted in a similar fashion.

The level of detail and spatial disaggregation required for the external factors depends on the type of model being used. In general terms an aggregate transport demand model makes fewer requirements than a disaggregated one. Projections on a regional level always have to be embedded in national forecasts to prevent mistakes, which occur due to isolated thinking at a regional level. The preparation of regional projections therefore must consider development tendencies in other regions, which are part of the whole study area.

The apparently simplest option in dealing with external factors is to use official forecasts. Of course, these forecasts are seldom at a sufficient level of spatial disaggregation to be directly usable in a detailed model. However, they do reduce the amount of work needed to generate the required values for the external factors at regional level. To some extent the problem with using official forecasts is that they sometimes reflect the expected effect of economic and regional policies whose success may actually depend on other uncontrollable factors like international trade and co-operation.

Based on literature research and analysis of long-term projections, estimations are provided for average annual growth rates up to 2020 (concerning population, GDP and productivity). The sources for these trend forecasts were many; all of them can be found in the report of Task 1 of WP3 and more specifically in its Appendices, and a summary in the Annexes of this report.

3.2.3 Proposals for Socio-economic Scenarios Development

It has been mentioned that only two alternative scenarios of growth will be developed. This is due to the fact that many uncertainties exist concerning the socio-economic environment of transport for the next 20 or 30 years. When studying the enlargement of Europe these uncertainties increase because of the political decision to be taken concerning accession of new members to the EU, and the new situation created by transition, which has never been experienced before. This environment does have an impact on transport, which may be very important as regards transport policy decision.

However the purpose of TEM and TER Master Plan is not to concentrate on the possible evolution of this socio-economic environment but to develop an evaluation methodology for TEM and TER network development.

Therefore it is proposed to frame this socio-economic environment using a few credible assumptions, which should be sufficient for this methodological exercise, keeping in mind that the purpose is not primarily to build scenarios for assessment of a policy or a project but to introduce the scenario approach as a necessary element of an evaluation methodology on a macro scale.

Concerning EU member countries before 01/05/2004 it could be possible to take only one "trend" scenario, which will be a moderate one. Nonetheless, an optimistic scenario for the EU member countries before 01/05/2004 is also provided. This latter scenario is not expected to be significantly different from the moderate one, for this group of countries.

Concerning the EU member countries after 01/05/2004 and the acceding and the non-acceding countries it appears better to initially consider some contrasting hypotheses, which will be characterized by a significant difference in GDP growth (high and low), and two options for the transition period, in order to form the "borders" of scenario development area.

Following this analysis, two axes of the scenario development have been defined (Figure 1), and the two possible combinations have been created. The red-shadowed area represents our moderate (medium) scenario, while the blue shadowed area the optimistic (high) scenario.

Blue represents the lower limit of the combination of "High Growth – Quick Transition", green represents the exact opposite, the upper limit of "Low Growth – Slow Transition" and purple and light blue represent the two other combinations, "High Growth – Slow Transition" and "Low Growth – Quick Transition", respectively. Red stands for the "Medium Growth – Medium Transition".

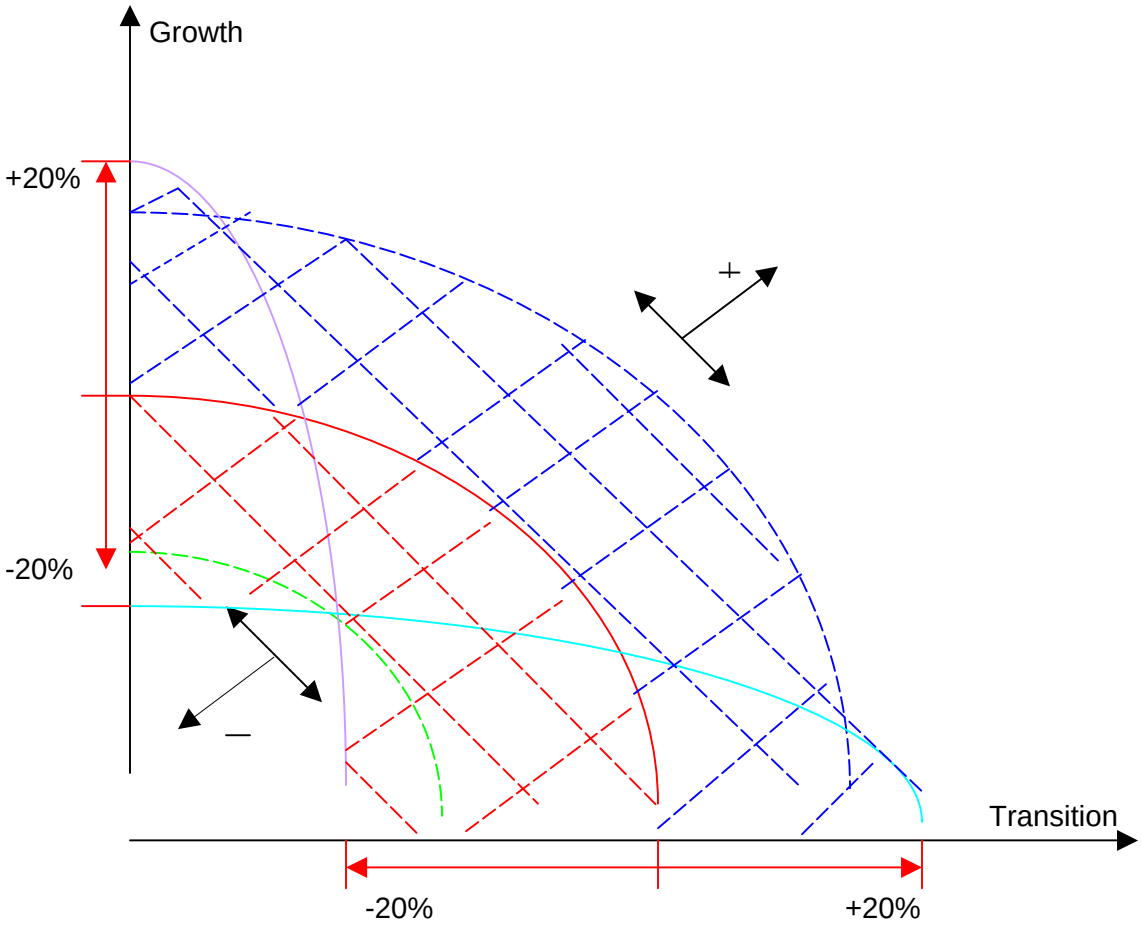

Fig. 1 Scenario Development

3.2.4 Alternative Scenarios of Socio-economic Growth

In the following an analysis is presented separately for the EU member countries before 01/05/2004 (Group 1), the EU member countries after 01/05/2004 and the acceding countries (Group 2) and finally for the non-EU, non-acceding countries (Group 3). The situation obviously differs according to each country, because of their respective potentials and historical development, time period they entered into the process of transition as well as the political developments.

Table 6 TEM and TER Countries

EU member countries before 01/05/2004	**EU member countries after 01/05/2004 and acceding countries**	**Non-EU non-acceding countries**
Country Group 1	***Country Group 2***	***Country Group 3***
Austria, Greece, Italy	Bulgaria, Czech Rep., Hungary, Lithuania, Poland, Romania, Slovakia, Slovenia, Turkey	Belarus, Bosnia & Herzegovina, Croatia, Georgia, Serbia and Montenegro, F.Y.R.O.M, Russia Federation, Ukraine, Rep. Of Moldova

3.2.4.1 Demography

Demography/population is supposed to be one of the most predictable factors in scenario definition. According to UN data, the trend of falling birth rates is set to continue into the first quarter of the next century. In this context, migration (positive, negative) will be a key determinant of the level of demographic/ population growth in each country.

Today, demography is very much influenced by external migration: the contribution of migration to demographic growth in countries of Group 1 is close to 75%, which means an average growth of 0,3 % per year in a context of a low demographic growth rate in Europe, which is below 0,5 % per year. Regarding countries of Group 2, for some years, since 1993, there has been a demographic decrease.

The demographic evolutions between countries and within countries show indeed high contrasts inside Group 1 countries and among the rest. Fertility rates estimate per regions twenty years ago, which are supposed to reflect now the importance of young generations confirm these contrasts.

Therefore there is a high potential of migration between Eastern and Western countries as well as between Central and Eastern countries when looking at the high fertility rate of the Eastern regions, which are often the poorest ones. This means also that migration rates will also be very much influenced by the type of integration scenario considered and is probably a strong argument to develop more cohesion in the development in order to limit this kind of population movement.

(1) EU Member Countries before 01/05/2004 - Group 1

As already mentioned, migration is currently responsible for almost 75% of demographic growth in Europe, with the largest impact in large urban areas.

Trend analyses performed from World Bank, IWW and similar projects showed that the demographic factors are not at all similar throughout Europe; the structure per age varies

greatly from one country to another, but also from one region to another within the same country.

The table below is produced specifically for the TEM and TER Master Plan, based on a number of population projections (TINA, SCENARIOS and STAC-TEN) and using a system dynamics approach, gives population projections for 2020, with base year 2000. As can be seen, there are differences in the projected populations in each country.

Table 7 Population projections for Group 1 countries

Country	***Population in 2000***	***Population in 2020***		***Average Annual Change 2000-2020***	
		Moderate Scenario	***Optimistic Scenario***	***Moderate Scenario***	***Optimistic Scenario***
Austria	8.100.000	8.707.551	8.829.061	0,38%	0,45%
Greece	10.600.000	11.047.999	11.137.598	0,21%	0,25%
Italy	57.800.000	59.135.324	59.402.389	0,12%	0,14%

(2) EU Member Countries after 01/05/2004 and Acceding Countries - Group 2

Like the Group 1 countries, diverging trends in population growth figures can also be found in this group. For example, most countries population is predicted to decline over the 20-year period, with Slovenia presenting the highest decrease of –0,96% to –0,77% per year, whilst in Lithuania the population is expected to increase about 0,95% to 1,14% per year.

Table 8 Population projections for Group 2 Countries

Country	**Population in 2000**	**Population in 2020**		**Average Annual Change 2000-2020**	
		Moderate Scenario	**Optimistic Scenario**	**Moderate Scenario**	**Optimistic Scenario**
Bulgaria	8.200.000	6.700.000	7.000.000	-0,91%	-0,73%
Czech Rep.	10.300.000	9.967.818	10.034.254	-0,16%	-0,13%
Hungary	10.000.000	10.308.389	10.370.067	0,15%	0,19%
Lithuania	3.500.000	4.166.467	4.299.760	0,95%	1,14%
Poland	38.600.000	34.804.473	35.563.579	-0,49%	-0,39%
Romania	22.400.000	21.559.917	21.727.934	-0,19%	-0,15%
Slovakia	5.400.000	5.603.458	5.644.150	0,19%	0,23%
Slovenia	2.000.000	1.614.897	1.691.918	-0,96%	-0,77%
Turkey	67.500.000	71.843.233	72.711.880	0,32%	0,39%

The table above is produced specifically for the TEM and TER Master Plan, based on a number of population projections (TINA, SCENARIOS, STAC-TEN and CODE-TEN) and using a system dynamics approach, gives population projections for 2020, with base year 2000.

(3) Non-EU, Non-acceding Countries - Group 3

For the countries of Group 3, projection figures can be found in Table 4, next. Table 4 is produced specifically for the TEM and TER Master Plan, based on a number of population projections (TIRS and World Bank database of indicators) and using a system dynamics approach, gives population projections for 2020, with base year 2000.

Table 9 Population projections for Group 3 Countries

Country	***Population in 2000***	***Population in 2020***		***Average Annual Change 2000-2020***	
		Moderate Scenario	***Optimistic Scenario***	***Moderate Scenario***	***Optimistic Scenario***
1.1.1 Belarus	10.005.000	9.267.619	9.415.095	-0,37%	-0,29%
Bosnia & Herzegovina	3.923.400	4.422.035	4.521.762	0,64%	0,76%
Croatia	4.491.000	4.314.733	4.349.986	-0,20%	-0,16%
Georgia	5.262.000	4.694.541	4.808.033	-0,54%	-0,43%
Serbia and Montenegro	10.601.060	10.815.108	10.857.917	0,10%	0,12%
F.Y.R.O.M	2.008.000	2.174.893	2.208.272	0,42%	0,50%
Russia Federation	145.555.008	132.981.276	135.496.023	-0,43%	-0,35%
Ukraine	49.501.000	42.189.642	43.651.914	-0,74%	-0,59%
Rep. Of Moldova	4.278.000	4.055.812	4.100.250	-0,26%	-0,21%

The trend forecasting, for the TEM and TER Master Plan, of Demographic characteristics is presented in Annex 10 – PART II.

In PART I of Annex 10 a selection of population projections of TINA, SCENARIOS and STAC-TEN, CODE-TEN, TIRS and World Bank that served as inputs for TEM and TER Master Plan population projections, is presented.

3.2.4.2 Economic Prospects

In general, the basic economic indicator is considered to be the GDP (real GDP or annual growth). The projected GDP for 2020 should be handled carefully. The forecast of the economic development of the three country groups is based on the endogenous growth theory. This theory links the long-term economic growth mainly with such factors as the human capital development, economic and political stability, economic freedom and the good legal framework for the economic activity, the private entrepreneurship and the growth-supporting policies of the State. The theory predicts the process of the conditional real convergence.

For the countries of Group 1, forecasts do exist for the year 2020. For the rest, extrapolations to the future years (up to 2020) are made under the assumption that growth rates in the countries of Group 2 and 3, will gradually converge with average growth rates in countries of

Group 1. However, it is assumed that they are always larger than the growth rates of the latter mentioned. The former assumptions are analyzed more in the following paragraphs.

Analytically the GDP trend forecasting for the TEM and TER Master Plan, is presented in Annex 11 – PART II.

In PART I of Annex11 a selection of GDP projections of TINA, SCENARIOS, STAC-TEN and World Bank database that served as inputs for TEM and TER Master Plan GDP projections, is presented.

(1) EU Member Countries before 01/05/2004 - Group 1

It is possible to define trend hypotheses of GDP for these countries. In countries of Group 1, the existence of series and a relatively stable economic context over the past period allows such trends to be determined. For these 3 countries, concrete data exist up to 2002, from World Bank.

Trend forecasting projections, performed in this project, up to 2015 were compared with TINA forecast model. Finally, projections for the period 2015 – 2020 were checked against SCENARIOS and STAC-TEN results. In general countries of Group 1 will keep a level of between 2 and 3% of growth rates, until 2020.

Table 10 GDP projections for the Group 1 countries

Country	***GDP in 2000 (billion $)***	***GDP in 2020 (billion $)***		***Average per annum percentage change of GDP for the period 2000-2020***	
		Moderate Scenario	***Optimistic Scenario***	***Moderate Scenario***	***Optimistic Scenario***
Austria	190,74	327,9	359,8	2,67%	3,20%
Greece	112,05	217,2	239,1	2,77%	3,32%
Italy	1074,76	1850,3	2019,7	2,51%	3,01%

(2) EU Member Countries after 01/05/2004 and Acceding Countries - Group 2

Because of the transition process it seems difficult to establish the same scheme of approach between Group 1 and Group 2 countries. The recent situation of the latter mentioned with decreasing production and transport at the beginning of the nineties followed by a recent increase makes it difficult to define a clear trend.

There are now large uncertainties about their rate of growth for future years and a “trend” scenario does not really mean much: transition is a new situation, never experienced before. Furthermore consistent statistical data are not easy to obtain. For the past few years, the general economic evolution shows a confirmed recovery of growth in all of the countries in Central and Eastern Europe, including the Baltic States. This recovery had long been uncertain and it is now achieved in different ways depending on the country. Therefore, the economic situation of Group 2 countries may develop in various directions.

In order to cover a majority of possible cases, two main hypotheses will be studied: a moderate and an optimistic growth of GDP. According to TINA, a reasonable range for annual GDP growth can be taken between 2,5% and 7%.

Therefore, the moderate scenario, of TEM and TER Master Plan, assumes that average growth rates in Group 2 countries will reach levels up to 4 - 5% and maintain this level until 5 years after accession and will then slowly converge with Group 1 levels, keeping a level of between 3 and 4% growth rates.

The optimistic scenario, of TEM and TER Master Plan, assumes that average growth rates in Group 2 countries will reach levels up to 6 - 7% and maintain this level until 5 years after accession and will then slowly converge with Group 1 levels, keeping a level of between 3 and 4% growth rates.

Both scenarios are based on the assumption that on one hand the accession process will follow the optimistic plan of the European Commission and on the other hand, that the countries themselves will have a strict policy of structural reforming and direct foreign investments are increasing.

For this group of countries, concrete data existed until 2002, from the World Bank. Trend forecasting projections up to 2015 were compared with TINA forecast model. Finally, projections for the period 2015 – 2020 were compared with SCENARIOS and STAC-TEN results.

Table 11 GDP projections for Group 2 countries

Country	***GDP in 2000 (billion $)***	***GDP in 2020 (billion $)***		***Average per annum percentage change of GDP for the period 2000-2020***	
		Moderate Scenario	***Optimistic Scenario***	***Moderate Scenario***	***Optimistic Scenario***
Bulgaria	12,60	26,36	27,21	3,00%	3,18%
Czech Rep.	51,43	140,82	191,13	4,00%	5,78%
Hungary	46,68	158,46	213,73	5,00%	6,76%
Lithuania	11,17	22,29	24,49	2,70%	3,24%
Poland	164,13	438,80	517,08	4,79%	5,75%
Romania	37,05	77,88	86,47	3,00%	3,60%
Slovakia	19,67	40,32	44,76	3,00%	3,60%
Slovenia	18,96	40,79	41,51	3,50%	4,20%
Turkey	199,26	418,38	491,43	4,68%	5,62%

(3) Non-EU, Non-acceding Countries - Group 3

A moderate scenario to be used for countries of Group 3 assumes that average growth rates will reach levels up to 2 -3% until 2020. An optimistic scenario assumes that average growth rates will reach levels up to 4 -5% until 2020. It can be argued that such scenarios are unrealistic for this group of countries, or that the differences between these countries will be much more significant than between the countries of Groups 1 and 2.

In any case, it is not unrealistic to assume that the existence of cohesion policies, which will help Group 2 countries, can also contribute for the countries in a stage of pre-accession to catch up and integrate more rapidly, therefore speed up their development. It seems logical that countries of Group 3 could benefit from European integration facilitating the opening of markets in all of Europe, the free traffic of freight and travelers and the suppression of all border effects. Another positive effect could come from the desire of world companies to return to Europe where risks seem more controlled after the "Asian Crisis". In that way we will observe an inflow of FDI (Foreign Direct Investments) towards the region of the countries of Group 3 as well.

In CODE-TEN project it was possible to follow and plot the pace of reform for some of these countries (CIS and Baltic countries). The indexes obtained were compatible with the growth rates forecasted for countries of Group 2. This means that there would be a fairly good correlation between implementation of reforms and economic development between the two country-groups.

In any case, it is also useful to keep in mind that the present estimation of the level of GDP in countries of Group 3 remains difficult and the "unofficial" economy represents a relatively more important role than the other country-groups. Corresponding activities are either not taken into account, or are poorly assessed. GDP figures for the countries emerging from war have thus to be considered with some care, even more so if we keep in mind the fluctuations of the local currencies' exchange rates.

For these countries, data existed until 2002, from the World Bank. The projections up to year 2015 –for some of the countries- were compared with TIRS project results.

Table 12 GDP projections for Group 3 countries

Country	***GDP in 2000 (billion $)***	***GDP in 2020 (billion $)***		***Average per annum percentage change of GDP for the period 2000-2020***	
		Moderate Scenario	***Optimistic Scenario***	***Moderate Scenario***	***Optimistic Scenario***
Belarus	12,73	36,24	44,44	5,30%	6,50%
Bosnia & Herzegovina	4,55	12,37	17,69	4,50%	6,60%
Croatia	18,43	37,53	52,17	2,90%	4,80%
Georgia	3,04	4,77	9,53	1,90%	5,90%

Serbia and Montenegro	8,60	31,77	47,90	4,00%	6,40%
F.Y.R.O.M	3,58	8,37	11,19	4,50%	6,20%
Russia Federation	259,71	778,57	1634,58	4,60%	9,00%
Ukraine	31,26	99,82	140,19	5,00%	7,00%
Rep. Of Moldova	1,29	2,72	3,91	2,90%	5,00%

3.2.4.3 Foreign Trade

In order to have a connection between economic growth and traffic growth for goods, details are needed concerning the trend of the national foreign trade.

Foreign trade is an important socio-economic variable for transport. International traffic flows are growing at a much faster rate than national traffic, in parallel with international trade, which is rising more quickly than national trade. On trunk networks international traffic is taking a growing share, which may often reach between one third and one half of the total traffic of many links within the next 20 years. The evolution of traffic in the hinterland of the large ports provides just one example of this phenomenon.

For international trade and the relative evolution of intra-European and extra-European relations, several analyses have been made (OECD 2020 for example), which are compatible with the GDP growth.

Analytically the foreign trade forecasts for the TEM and TER Master Plan, are presented in Annex 12 – PART II.

In PART I of Annex 12 a selection of foreign trade data from World Bank that served as inputs for TEM and TER Master Plan GDP projections, is presented.

(1) EU Member Countries before 01/05/2004 – Group 1

The general trend in the countries of Group 1 is well known but can be clarified: a falling share of primary goods and bulk products, a decreasing share of intermediate goods, but on the contrary a rapidly increasing share of the high value goods. In this latter case the average value of one tone transported increases and the volume (measured in cubic meters) becomes a more relevant unit of transport than the tonnage. In parallel, we observe a decrease in the shipment size and the development of associated logistic services.

Trend forecasting was made, on observed trade trends between 1998 and 2003 (Database of World Bank).

Growth hypotheses of the import and export growth have been chosen for these countries, which are compatible with GDP growth with the underlying assumption that EU trade growth will increase at a similar rate as world trade.

Table 13 Exports of Goods and Services (index: 2000=100) projections for Group 1 countries

Country	***Exports in 2000***	***Exports in 2020***	
		Moderate Scenario	***Optimistic Scenario***
Austria	100	200,95	203,0
Greece	100	117,15	118,3
Italy	100	111,35	112,5

Table 14 Imports of Goods and Services (index: 2000=100) projections for Group 1 countries

Country	***Imports in 2000***	***Imports in 2020***	
		Moderate Scenario	***Optimistic Scenario***
Austria	100	179,25	181,04
Greece	100	156,10	157,66
Italy	100	163,10	164,73

(2) EU Member Countries after 01/05/2004 and the Acceding Countries - Group 2

The economies of the countries of Group 2 are already very open economies although their GDP per capita is fairly low, showing again another characteristic of the transition situation. The same order of magnitude can be taken for the increase of the imports and exports than for countries of Group 1. However more detailed geographic analysis will be necessary to investigate the potential growth of trade between neighboring countries in the Baltic areas, the Central Europe area (Visegrad countries), the Black sea area and the Balkans.

Table 15 Exports of Goods and Services (index: 2000=100) projections for Group 2 countries

Country	***Exports in 2000***	***Exports in 2020***	
		Moderate Scenario	***Optimistic Scenario***
Bulgaria	100	164,35	166,0
Czech Rep.	100	154,40	155,9
Hungary	100	114,70	115,8
Lithuania	100	180,75	182,6
Poland	100	110,8	111,8
Romania	100	221,47	223,7
Slovakia	100	214,35	216,5
Slovenia	100	111,20	112,3
Turkey	100	210,70	212,8

Table 16 Imports of Goods and Services (index: 2000=100) projections for Group 2 countries

Country	***Imports in 2000***	***Imports in 2020***	
		Moderate Scenario	***Optimistic Scenario***
Bulgaria	100	237,70	240,08
Czech Rep.	100	162,60	164,23
Hungary	100	120,15	121,35
Lithuania	100	112,60	113,73
Poland	100	110,40	111,40
Romania	100	272,70	275,43
Slovakia	100	171,85	173,57
Slovenia	100	125,60	126,86
Turkey	100	137,50	138,88

(3) Non-EU, Non-acceding Countries - Group 3

The general trend in countries of Group 3 will follow the trend of Group 2, based on the same hypothesis as in the GDP growth. It can be argued that such scenarios are unrealistic for these countries, or that the differences between these countries will be much more significant than between the countries of Group 2.

Table 17 Exports of Goods and Services (index: 2000=100) projections for the Group 3 countries

Country	***Exports in 2000***	***Exports in 2020***	
		Moderate Scenario	***Optimistic Scenario***
Belarus	100	188,70	190,6
Bosnia & Herzegovina	100	175,58	177,3
Croatia	100	180,05	181,9
Georgia	100	243,71	246,1
Serbia and Montenegro	100	110,20	111,2
F.Y.R.O.M	100	110,90	111,9
Russia Federation	100	155,95	157,5
Ukraine	100	179,73	181,5
Rep. Of Moldova	100	173,65	175,4

Table 18 Imports of Goods and Services (index: 2000=100) projections for Group 3 countries

Country	*Imports in 2000*	*Imports in 2020*	
		Moderate Scenario	*Optimistic Scenario*
Belarus	100	178,15	179,93
Bosnia & Herzegovina	100	128,05	129,33
Croatia	100	157,30	158,87
Georgia	100	128,95	130,24
Serbia and Montenegro	100	294,90	297,85
F.Y.R.O.M	100	109,95	111,05
Russia Federation	100	167,95	169,63
Ukraine	100	186,70	188,57
Rep. Of Moldova	100	148,15	149,63

3.2.5 Transport Demand

The objective of the previous section was to forecast long-term demographic and economic trends of all country groups. These forecasts will be used in this section as determinants in their passenger and freight transport demand.

Consequently, the primary objective of this section is to perform transport demand forecasting that will include such parameters as: population, GDP or any other relevant economic data, such as foreign trade, from the base year 2000 to the forecast year 2020.

A secondary objective of this section is to analyse the current trends in transport industry in order to identify existing interrelations between transport demand and its determinants, which will be used in the forecasting, and thus complete the picture of the alternative scenarios of growth.

Such analysis requires a transport system framework adapted to the context of TEM and TER Master Plan. It has been already said that such a framework does not necessarily require the definition of mathematical models linking socio-economic variables (inputs) and traffic levels (outputs), assigned on a network. But this does not mean that the models are not useful, in particular for the estimation of traffic growth. However we must be aware of their limits due to an over simplified description of reality, and sometimes a distortion of some mechanisms which could not be reflected with mathematical formulation, or because of the lack of reliable data to calibrate the parameters.

By doing this it is clear that the scenario definition can better take into consideration the current interrelation between economic and social parameters as well as the different transport policy scenarios concerning future network development.

Section 3.2.5.1 will identify current transport trends in relation to the socio-economic environment, based on data of the previous decade, and will provide the trendlines for the trend forecasting.

In Section 3.2.5.2 the development of a transport policy framework will take place, which will be based on the different possible spatial/ national transport policy scenarios.

Section 3.2.5.3 will address how the different policy scenarios can affect the forecasted transport growth rates, in order to finally propose Transport Demand Scenarios.

Finally, in Section 3.2.5.4 the basic drivers of transport demand will be finalized and used and a trend forecasting of transport growth will be attempted for each country group (and for each country in the group if possible). For the trend forecasting performed in section 3.2.5.4, the analysis of section 3.2.4 will be used as basic input (population and GDP as the independent variables) as well as the results of section 3.2.5.1 (the trendlines connecting the dependent variables of traffic growth with the independent variables of population and GDP growth).

It has to be noted here that for some countries, official forecasts do exist, and the apparently simplest option when dealing with forecasting of planning variables, such as transport growth, is to use official forecasts. Of course, official forecasts are seldom at a sufficient level of disaggregation to be directly usable in a modeling exercise; however, they do reduce the amount of work needed. To some extend the problem with using official forecasts is that they sometimes reflect the expected effect of economic and regional policies whose success may actually depend on other uncontrollable factors like international trade and cooperation. Therefore, in Section 3.2.5.4, even if official forecasts of transport growth do exist, for some countries, they will be treated with reticence and as a reference/ comparison point.

3.2.5.1 Current Transport Trends

(1) EU Member Countries before 01/05/2004 - Group 1

Based on official EC analysis on the trends identified in the previous decade, the following brief remarks can be made for Group 1 countries.

From policy side the EC has set itself the following objectives to achieve sustainable transport:

- Reduce the link between economic growth and passenger transport demand (‘decoupling’);
- Shift transport use from road to rail, water and public passenger transport (SDS);
- Bring back the shares of alternative modes (rail, water and public passenger transport) to their 1998 levels by 2010 and thus make for a shift of balance from 2010 onwards (White Paper).

Passenger transport (in terms of passenger-kilometers) grew at the same pace as GDP between 1991 and 1999 and has therefore not yet moved towards the objective of decoupling economic development and passenger transport demand. The share of the more environment friendly modes (bus/coach, rail and tram/metro) declined slightly. Certain countries are showing some progress in shifting transport flows away from cars and domestic aviation (*See Figure 2*). Passenger transport continues be dominated by cars, with 81 % of total passenger-kilometers in Group 1 (*See Figure 3*).

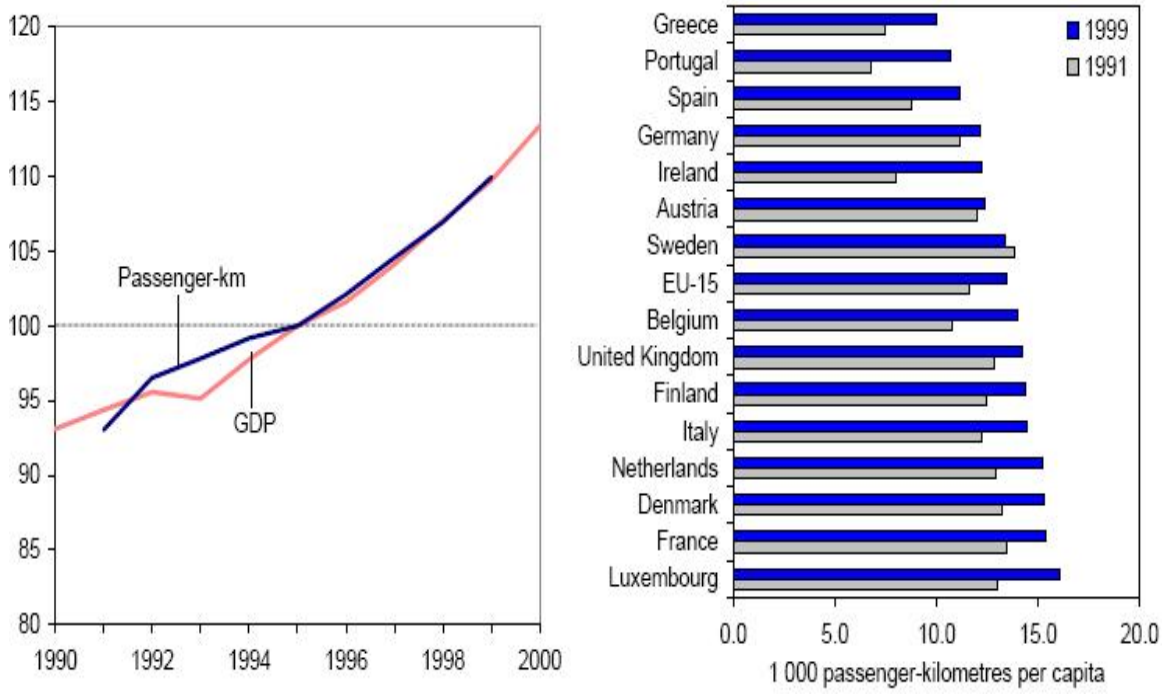

Fig. 2 Passenger transport demand and GDP (EU-15)

Source: Eurostat, 2002
Note: Passenger transport (passenger-kilometers) includes car, bus/coach, rail, tram/metro and domestic, intra- and extra-European aviation. GDP based on US dollars in constant 1995 prices.

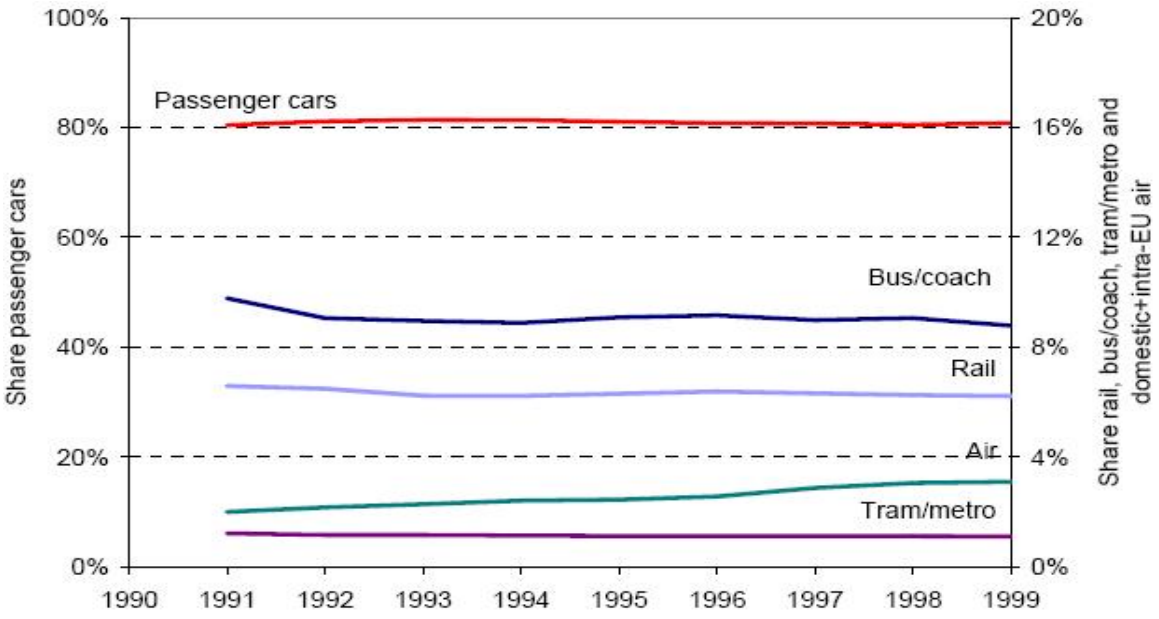

Fig. 3 Modal shares of passenger transport demand (EU-15) — including domestic and intra-EU aviation

Source: Eurostat, 2002
Note: Shares based on passenger-kilometres. Air includes domestic and intra-European only, since no mode shift on a European level is reasonably possible on extra-European flights.

Freight transport demand (in terms of tonne-kilometres) grew faster than GDP, thereby moving away from the objective of reducing the link between economic growth and freight transport demand. There is no sign as yet of a shift of freight from road to rail: rail's share dropped from 10.4 % in 1991 to 8 % in 1999. Road haulage remains the main freight transport mode, with a share of respectively 43 of the tonne-kilometres (*See Figures 4 and 5).*

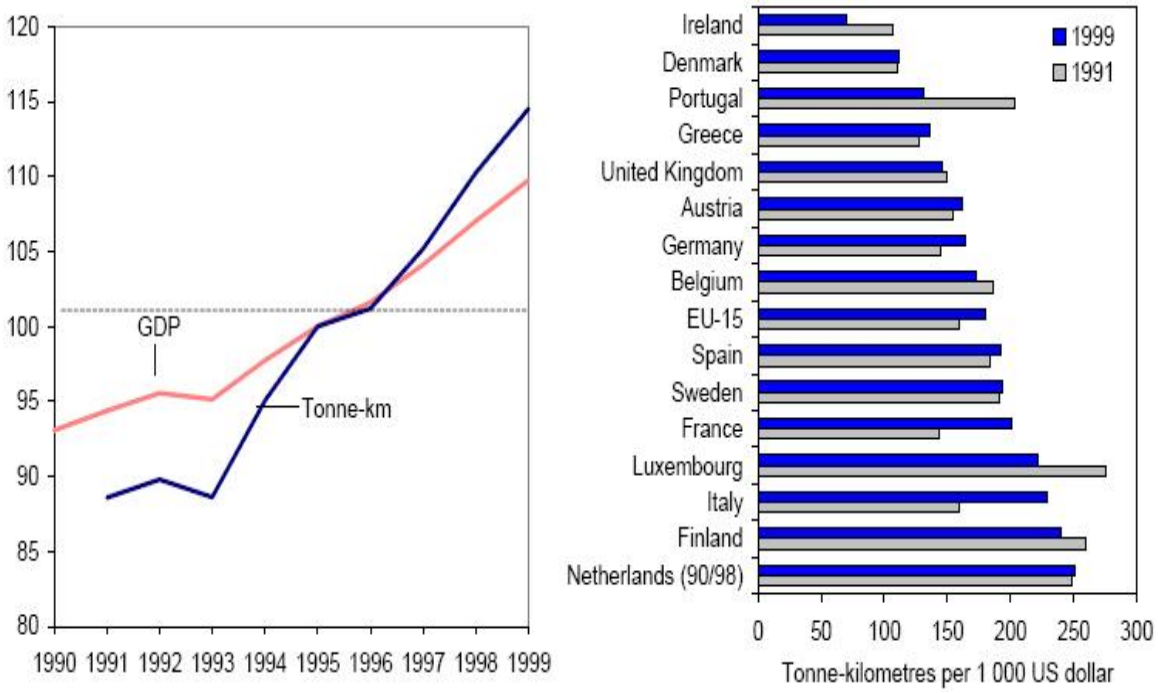

Fig. 4 Freight transport demand and GDP (EU-15) and (b) freight transport per unit of GDP by country

Source: Eurostat, 2002.
Note: Total EU freight transport (tonne-kilometres) includes road, rail, inland waterways, short sea shipping and oil pipelines. Freight transport per unit of GDP and by country excludes short sea shipping.

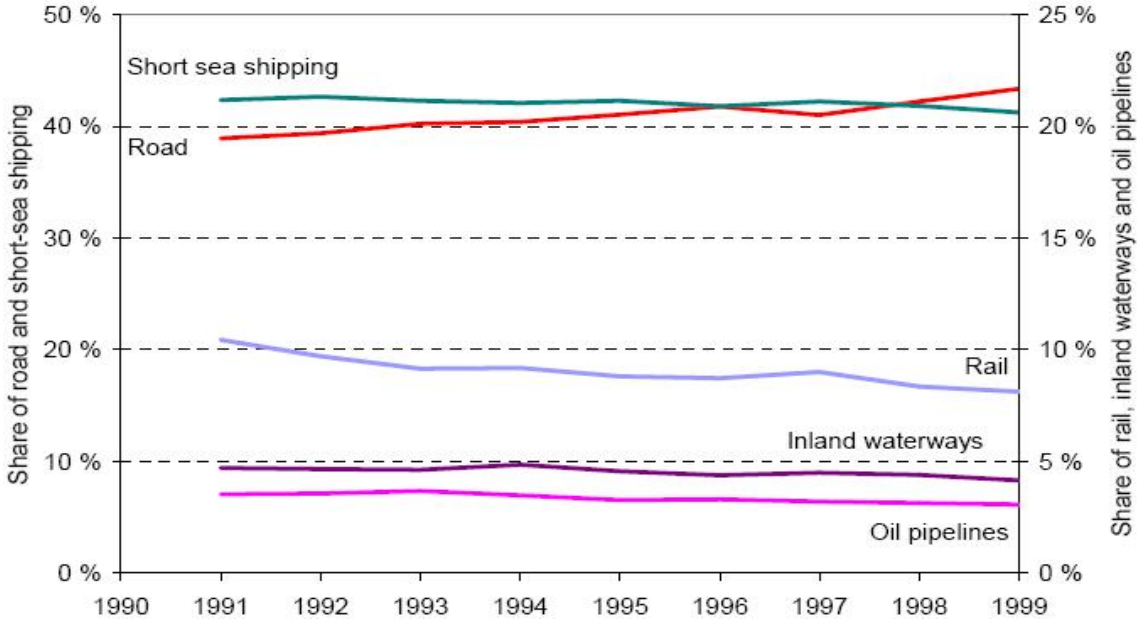

Fig. 5 Modal shares in freight transport demand (EU-15)

Source: Eurostat, 2002
Note: Shares based on tonne-kilometres.
We conclude, that from the demand side the traffic can be estimated. The best way of doing that is by using trend analysis. Trend analysis is used to identify trends in data and to analyze problems of prediction. By using this kind of analysis, it is possible to also produce the trendline of the data as well as extend that trendline beyond the actual data to predict future values.

Trend analysis on the data of Figure 2 produces a linear trendline:

Total Passenger Traffic Growth ≅ GDP Growth (5.1)

So, based on the previous presented past observations, pass-kms growth can be linked directly with GDP growth, per annum. The population variable is not included in equation 3.2.5.1 because population growth in countries of Group 1, is minimal.

As for ton-kms growth in relation to GDP growth, trend analysis on data of Figure 3a produces the following trend line:

Total Freight Traffic Growth ≅ (1,625) * (GDP Growth) (5.2)

So, based on the previous presented past observations, tone-kms growth can be linked with GDP growth with a percentage difference in respect to the GDP growth of around 62,5% more, per annum.

It has to be noted here, that a linear trendline is the best-fit trendline when the data show increases or decreases at a steady rate, like in Figures 2 and 4.

From the supply side, the impacts of the variables are much more difficult to measure though. Especially for goods transport, it is difficult to isolate the effects of performance of industries in the general development of trade from the effects of improvement in transport quality of services. Furthermore, regarding the improvement of transport quality of services: the limited data available on investment in transport infrastructure in countries of Group 1, show that between 1990 and 1995 these investments were dominated by road (62 % in 1995) and rail (20 % in 1995). Decisions on transport infrastructure are still made mainly as a response to problems of traffic bottlenecks. This reactive approach favours extension of the road infrastructure. Since, such effects are difficult to be measured on a macro-scale, it is assumed that they are included in the GDP growth, and transport investments will follow the pace of development.

(2) EU Member Countries after 01/05/2004 and Acceding Countries - Group 2

Based on EC analysis on trends of the past decade, the following remarks can be made for this group of countries:

In order to diminish the environmental consequences of transport, the following policy objectives have been defined for the European New and Candidate Member States:

- Decouple transport significantly from growth in gross domestic product in order to reduce congestion and other negative side effects of transport;
- Bring about a shift in transport use from road to rail, water and public passenger transport so that the share of road transport in 2010 is no greater than in 1998 (the most recent year for which data are available).
- The primary objective in the context of enlargement is, however, to improve current infrastructure, in particular in the regions bordering the EU and to reform the railways to benefit from the extensive and dense rail network available in the new EU member countries and the ACs (European Commission, 2001a and b).

Statistics on car passenger transport volume are lacking, but trends in public transport demand, car ownership levels and transport energy consumption indicate that passenger transport demand (in terms of passenger-kilometres) increased in these countries between 1990 and 1999. Public transport has fallen, both as a share of total transport and in absolute terms. As a result, the modal split has generally shifted towards car transport (*See Figure 6*).

Rail and bus/coach transport, which historically dominated the transport system, have lost a great deal of their shares during the first years of transition. The share of rail and bus/coach transport is still higher in most of these countries than in the countries of Group 1, but this difference is becoming smaller (*See Figure 7*).

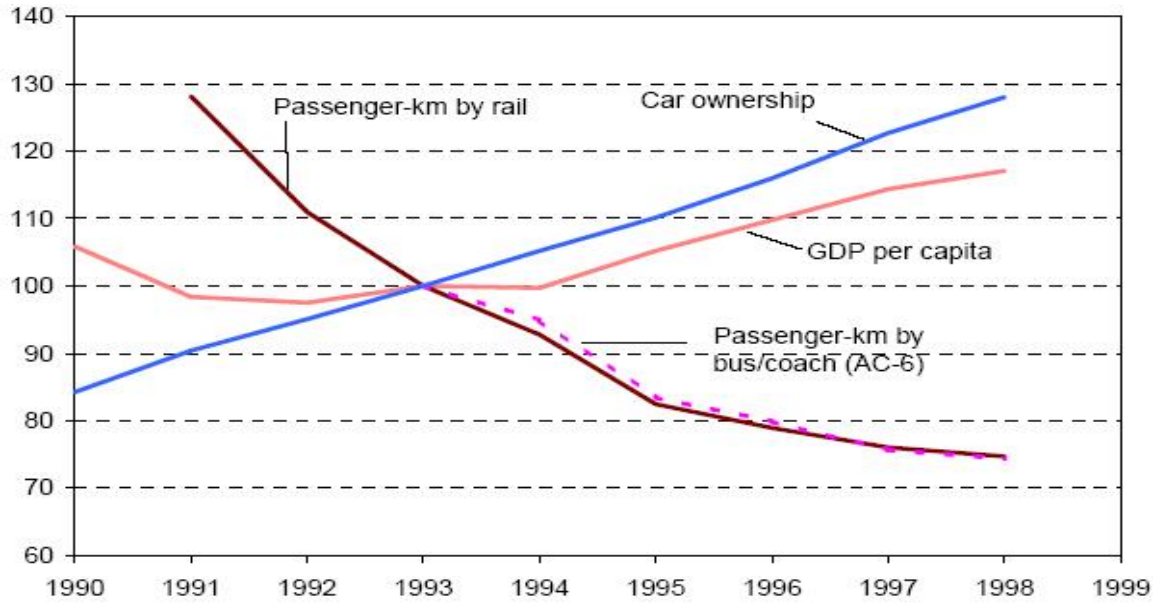

Fig. 6 Evolution of passenger-kilometres by rail and bus/coach, GDP per capita and car ownership

Source: UNECE, 2001.

Note: Passenger-kilometres by bus/coach are based on data from the Czech Republic, Latvia, Lithuania, Poland, Slovakia and Slovenia and are only available from 1993 onwards. Car ownership in cars per inhabitant; GDP per capita in constant 1995 US dollars. Air transport in all countries -except Cyprus, Malta

and Turkey- increased by 17 % between 1993 and 1998 according to Eurostat/ECMT/Energy and Transport DG data (included in European Commission, 2001c).

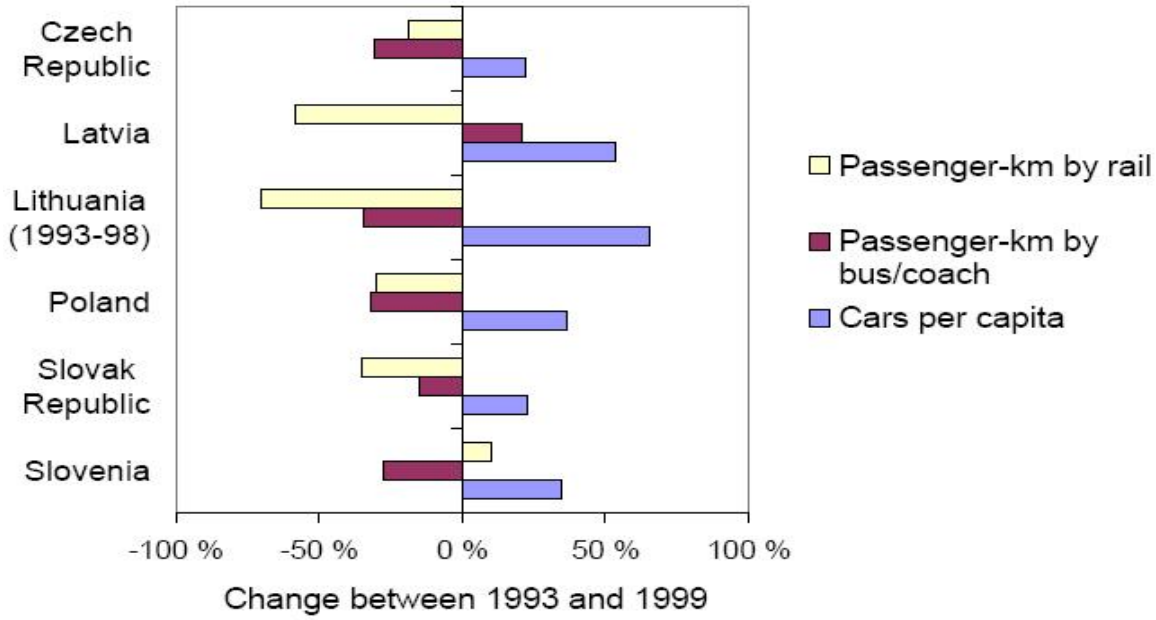

Fig. 7 Change in passenger-kilometres by bus and rail and car ownership between 1993 and 1999 in selected countries

Source: UNECE, 2001.
Note: Bus/coach in Lithuania is based on 1993–98.

Overall freight transport demand (in terms of tonne-kilometres) increased slightly in these countries, following economic development. Freight intensity dropped markedly, but this was mostly due to the collapse of rail. Rail transport dominated freight transport at the beginning of the 1990s (with an average share of around 57 % in most of these countries in 1993), but lost this position to road by the end of the 1990s (*See Figure 8*).

Freight transport intensity, the amount of tonne-kilometres carried per unit of GDP, dropped significantly in most of these countries (except for the Baltic States) in the beginning of the 1990s, mostly due to the collapse of rail. The continuation of the decline in the second half of the 1990s can be contributed to structural changes in the economy, away from transport-intensive industry (*See Figure 9*).

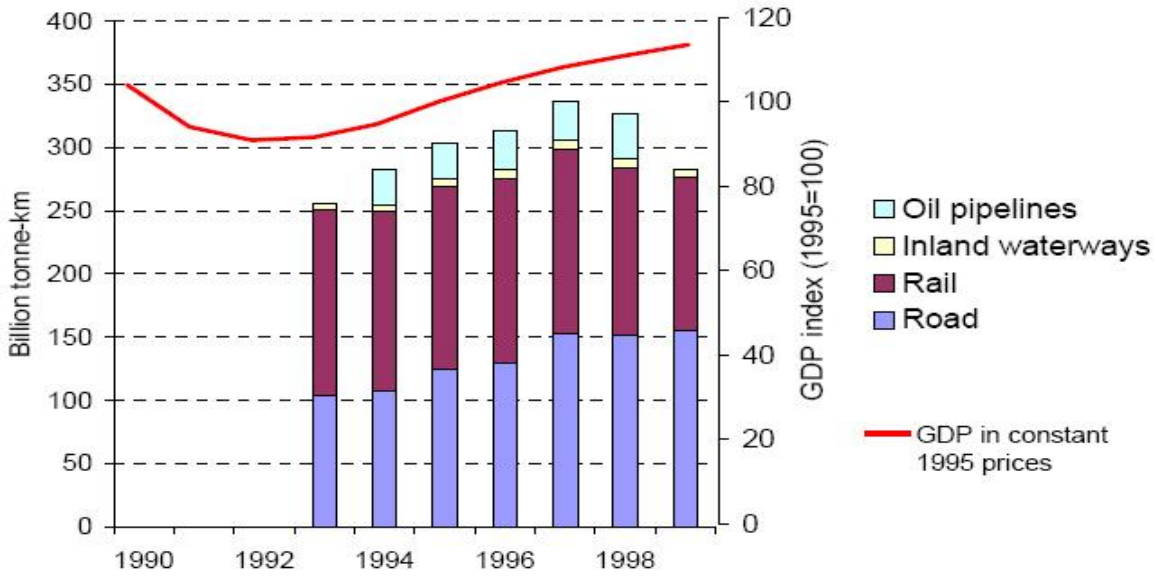

Fig. 8 Freight transport demand by mode in selected countries

Sources: UNECE, 2001; Eurostat, 2002 (GDP).
Note: Selected countries are Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland and Romania, representing around 60 % of total freight transport in 1997 (excluding Cyprus and Malta). Freight transport demand by oil pipelines in 1993 and 1999 is not available.

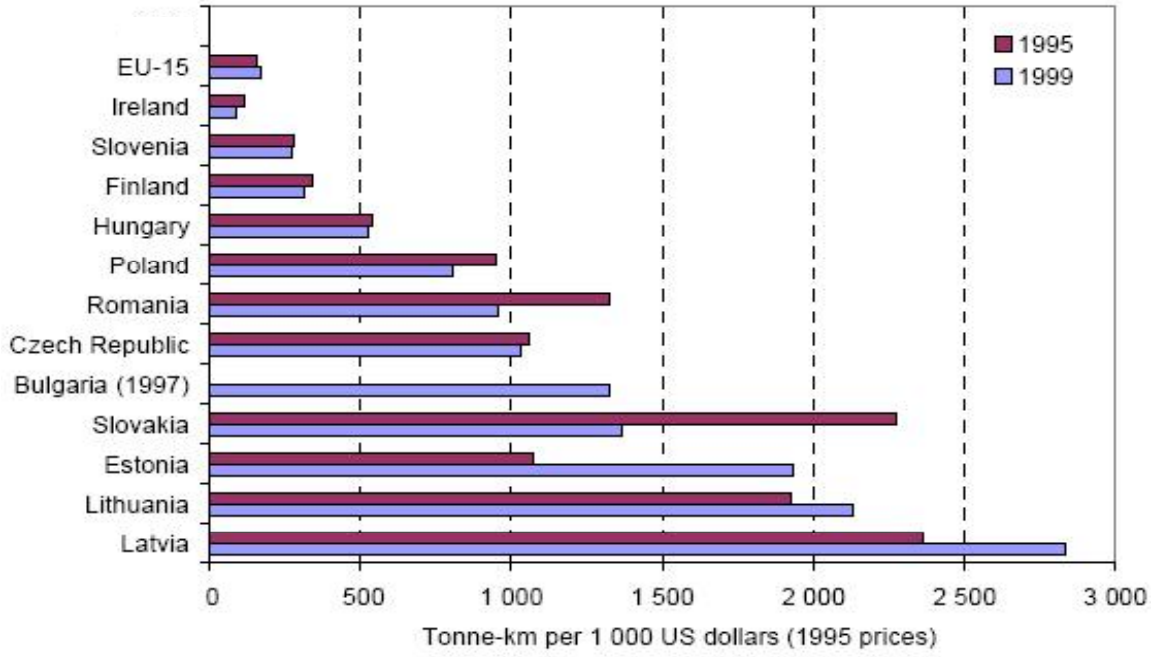

Fig. 9 Freight transport intensity in selected countries in 1995 and 1999

Sources: UNECE, 2001; Eurostat, 2002.
Note: Selected countries don't include Bulgaria, Cyprus, Malta and Turkey. Modes included are road, rail and inland waterways. GDP in constant 1995 prices.

Therefore, from the demand side the answers regarding transport trends are much more open in the case of these countries where structural changes are fast, or where the past experience of a market economy does not exist. The best way of identifying data trends is by using trend analysis. One major point to note is that a clear segmentation of the market must be made, since trends are quite different from one segment to another. The market segmentation in this case, is among the three modes of land transportation illustrated in Figure 4a, car, rail and bus/coaches.

Trend analysis on the data of Figure 6, produced a linear trendline for car ownership:

Car Ownership Growth ≅ (1,55) * (GDP Growth) (5.3)

So, based on the previous presented past observations, car ownership growth can be linked with GDP per capita growth with a percentage difference in respect to the GDP per capita growth of around 55% more, per annum.

Of course car ownership growth is not exactly car pass-kms growth but an assumption used in this phase of this study, is that both indicators grow at the same pace. Based on UNECE's analyses (*UNECE Transport Division presentation, 2004*) the total increase in passenger transport by road reflects surge in personal mobility, urban sprawl, new shopping habits and leisure travel. Based on these and on the fact that the public road modes (bus/ coaches) pass-kms are decreasing (*see Figure 6*), then the only reason for the increase of the total passenger traffic by road, is the increase of car pass-kms. Therefore, a rather reasonable hypothesis drawn in this section is that car ownership can be directly linked with car traffic growth.

Consequently, passenger traffic growth by car can be linked with GDP growth, with formula (5.4) below.

Passenger Traffic by Car ≅ (1,55) * (GDP per Capita Growth) =>

$$\Rightarrow \textbf{Passenger Traffic by Car} \cong (1{,}55) * \left(\frac{\textbf{GDP}}{\textbf{Population}}\right)\textbf{Growth} \qquad (5.4)$$

Trend analysis on the data of Figure 6, produced the following linear trendlines for passenger traffic by rail and bus/ coaches –following the same logic as above for passenger cars-:

$$\textbf{Passenger Traffic by Rail} \cong (-1{,}71) * \left(\frac{\textbf{GDP}}{\textbf{Population}}\right)\textbf{Growth} \qquad (5.5)$$

$$\textbf{Passenger Traffic by Bus/ Coaches} \cong (-1{,}68) * \left(\frac{\textbf{GDP}}{\textbf{Population}}\right)\textbf{Growth} \qquad (5.6)$$

Regarding freight traffic, trend analysis on the data of Figure 8, produced a linear trendline again, for road and rail:

Freight Traffic Growth by Road ≅ (GDP Growth) (5.7)
Freight Traffic Growth by Rail ≅ (0,95) * (GDP Growth) (5.8)

So, based on the previous presented past observations, tone-kms growth by road can be linked directly with GDP growth and by rail almost directly with GDP growth, per annum.

From the supply side, the impacts of the variables are again difficult to measure for the same reason as before. As it concerns the improvement of transport quality of services in these countries: the limited data on investments show that the greatest part of investments in new infrastructure was allocated to roads, reflecting the very limited starting position of road infrastructure quantity and quality in these countries. The second largest share is taken by rail, in order to upgrade the infrastructure to higher standards. Considering expenditures devoted to infrastructure maintenance, the largest share is used for railways.

(3) Non-EU, Non-acceding Countries - Group 3

Traffic trends of the last decade can be observed for some of the countries in Group 3. In the website of UNECE organization links to the statistical departments of these countries exist (*http://www.unece.org/stats/links.htm*). Some of these countries departments (specifically: Belarus, Bosnia and Herzegovina, Croatia, Georgia and Russian Federation) have publicly available statistical data regarding traffic production – both for passengers and freight traffic – for the last years (usually for 3 or 4-years periods in the time period of 1995-2003), expressed in pass-km and ton-km.

For the rest countries last decade's traffic data do not exist in convenient format (format of units and for more than one years). Project TIRS and REBIS have data only for the year 2001 for the countries Serbia & Montenegro and F.Y.R.O.M., in form of ADT for road passenger and passengers for rail, and in tones for freight traffic. The ECMT for Ukraine gives annual changes of pass–kms (for all modes) for the period 1988-1999 and as for the Republic of Moldova, no efficient data existed in any studies, apart from an estimation of per annum trips for the year 1999 in TIRS.

All the above-mentioned data are summarized in Tables 19 and 20, as collected from the above-mentioned sources.

Table 19 Group3 countries passenger traffic for road and rail

Passenger Traffic (million Passenger-kms)		***1996***	***1997***	***1998***	***1999***	***2000***	***2001***	***2002***	***2003***
Belarus	Road	10.340	11.448	13.085	14.231	14.212	14.533	14.070	-
	Rail	11.657	12.909	13.268	16.874	17.722	15.264	14.349	-
Bosnia & Herzegovina	Road	-	-	-	-	-	92,815	86,429	84,769
	Rail	-	-	-	-	-	4	4	4
Croatia	Road	-	-	-	-	3.331	3.478	3.570	-
	Rail	-	-	-	-	1.252	1.241	1.195	-
Georgia	All	-	-	5.500	5.700	6.000	6.100	6.500	-
Serbia & Montenegro	Road	-	-	-	-	-	-	-	-
	Rail	-	-	-	-	-	-	-	-
F.Y.R.O.M	Road	-	-	-	-	-	-	-	-
	Rail	-	-	-	-	-	-	-	-
Russia Federation	Road	-	-	-	-	164.600	154.500	-	-
	Rail	-	-	-	-	167.100	157.900	-	-
Ukraine	Road	-	-	-	-	-	-	-	-
	Rail	-	-	-	-	-	-	-	-
Rep. Of Moldova	Road	-	-	-	-	-	-	-	-
	Rail	-	-	-	-	-	-	-	-

Table 20 Group 3 countries freight traffic for road and rail

Freight Traffic (million tone-kms)		*1996*	*1997*	*1998*	*1999*	*2000*	*2001*	*2002*	*2003*
Belarus	Road	8.658	9.065	9.686	9.232	9.745	10.241	11.090	-
	Rail	26.018	30.636	30.370	30.529	31.425	29.727	34.169	-
Bosnia & Herzegovina	Road	-	-	-	-	-	22,405	25,471	26,644
	Rail	-	-	-	-	-	13	24	23
Croatia	Road	-	-	-	-	-	6.783	7.413	-
	Rail	-	-	-	-	1.788	2.074	2.206	-
Georgia	All	-	-	10.400	9.000	5.000	5.200	5.700	-
Serbia & Montenegro	Road	-	-	-	-	-	-	-	-
	Rail	-	-	-	-	-	-	-	-
F.Y.R.O.M	Road	-	-	-	-	-	-	-	-
	Rail	-	-	-	-	-	-	-	-
Russia Federation	Road	-	-	-	-	23.000	22.000	-	-
	Rail	-	-	-	-	1.373.000	1.434.000	-	-
Ukraine	Road	-	-	-	-	-	-	-	-
	Rail	-	-	-	-	-	-	-	-
Rep. Of Moldova	Road	-	-	-	-	-	-	-	-
	Rail	-	-	-	-	-	-	-	-

Regarding transport trends for this group of countries, due to the above-mentioned data limitations it is rather difficult to be identified.

But projects TIRS and REBIS, in their process of traffic forecasting have identified some trends for selected countries. More specifically for Bosnia-Herzegovina, Croatia, Serbia & Montenegro and F.Y.R.O.M., projects TIRS and REBIS produced (among other countries) traffic projections up to 2015, based on data and trends of 2000, for both passenger and freight traffic.

Project TIRS resulted that local traffic will grow per annum about **(1,25) x (GDP growth)** -for the period 2000-2015-, with three possible GDP per annum growths of 2%, 3,5% and 5%, and that overall traffic (including international) will be **(Traffic multiplicator) x (GDP growth)**, with the traffic multiplication factor, depending on the scenario variation, and taking values from 1.68 in the low scenario to 2.60 in the high scenario, and 2.10 in the medium scenario, again for the period 2000-2015.

Project REBIS moderate scenario produced growth in passenger traffic and freight traffic for the period 2001-2025 as it presented in Figures 10 and 11.

For the rest countries: Belarus, Georgia, Russian Federation, Ukraine and Republic of Moldova, we will have to base forecasting on the same hypotheses adopted in projects that already produced forecasts for Group 3 countries.

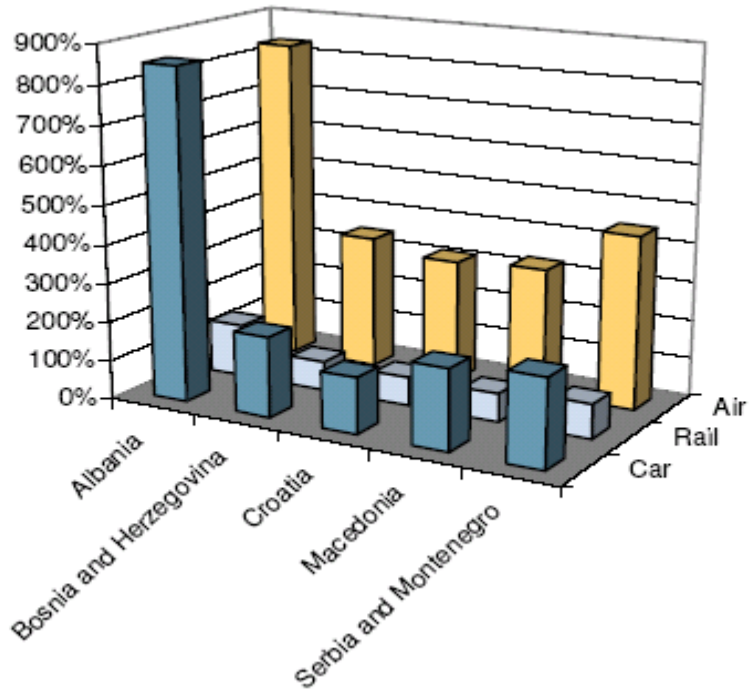

Figure 10 Growth in passenger traffic: 2001- 2025, Moderate scenario
Source: REBIS, 2003

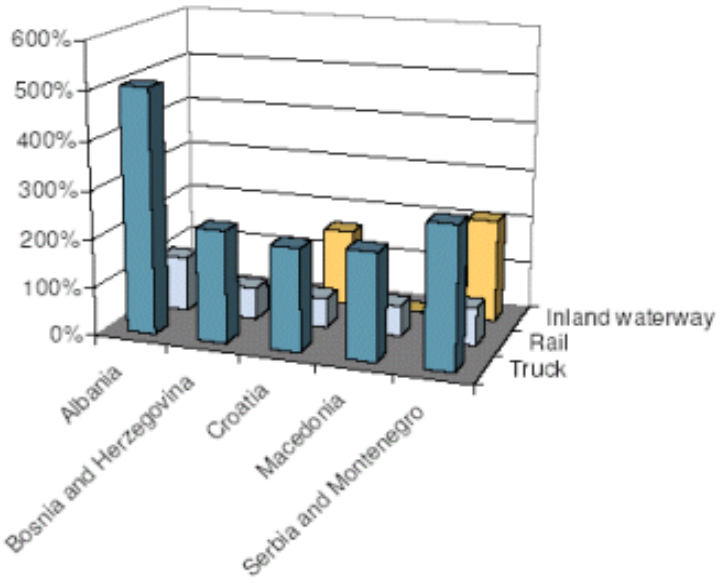

Fig. 11 Growth in freight traffic: 2001- 2025, Moderate scenario

Source: REBIS, 2003

Summarizing, we conclude that it will not be possible to compare traffic forecast methodologies for Group 1, Group 2 and Group 3 of countries. However it is worth noting that an effort will be made to remain consistent with the socio-economic environment scenario: the concept of one moderate and one optimistic transport demand scenario helps to achieve this purpose.

3.2.5.2 Transport Policy Framework

Section 5.2 highlights the main policy concerns for four transport policy scenarios and also discusses the development of the Common Transport Policy, in order to identify a number of key policy objectives that could possibly affect future transport demand (passenger and freight).

(1) Transport Policy Scenarios

Market scenario

This scenario is characterized by an emphasis on liberalization and deregulation and on increasing cross-border or international traffic. It also places an emphasis on infrastructure development. As the free market principles are favoured, road pricing for external costs and restricting road traffic are given a lower emphasis. This scenario assumes that the market will decide the kind of projects to be funded, whereby road takes priority.

The perquisite for such a scenario would be that reforms are promptly implemented: liberalization and market competition but also structural changes in production and adaptation of the institutional framework (legal, financial, administrative framework).

This is an idealistic situation, which is not impossible to reach when we refer to the history of integration in European Union. Difficulties of integration have been overcome more easily than what has been feared initially.

Macrobiotic scenario

This scenario lays emphasis on the management of supply and demand hence on regulation or management rather than deregulation, which is in fact what distinguishes this scenario from the previous one. Other goals are the promotion of intermodal and interoperability and the structural goals of increasing accessibility and promoting regional development. Infrastructure development is still considered a means to achieve these goals. Rail projects or a network approach are more likely to be prioritized under this scenario.

Practical scenario

This scenario shares a number of features with the market scenario with a greater emphasis on deregulation. It however does not place such a strong emphasis on infrastructure development and considers this also as being guided by the market. Instead it is in favour of measures promoting interoperability.

Repressive scenario

In this scenario emphasis is placed on decoupling with the specific objective of promoting environmental sustainability, hence the strategic importance assigned to the application of environmental regulation and the restriction of local traffic. Overcoming structural deficiencies, hence promoting regional development, is still thought of as important, however not at the expense of environmental damage, hence also the absence of increasing accessibility as a significant goal.

3.2.5.3 Transport Demand Scenario

The moderate transport demand scenario, consists of the following elements:
- Moderate economic growth
- Existing infrastructure
- No harmonization effects on mode choice in passenger or freight transport (Existing modal split per spatial level/group-countries level)

The optimistic transport demand consists of:
- High economic growth
- Existing towards Moderate infrastructure development

– No harmonization effects on mode choice in passenger or freight transport (Existing modal split per spatial level/group-countries level)

Differentiations in these forecasts are expected in case of a different transport policy scenario, like the four presented in previous section. For a better understanding, Figure 12 summarizes the possible differentiations in the two transport demand scenarios.

Demand / Infrastructure	*Regulation*	*Deregulation*
Strong Development	*Macrobiotic Scenario (MC)*	*Market Scenario (M)*
Moderate Development	*Repressive Scenario (R)*	*Practical Scenario (P)*

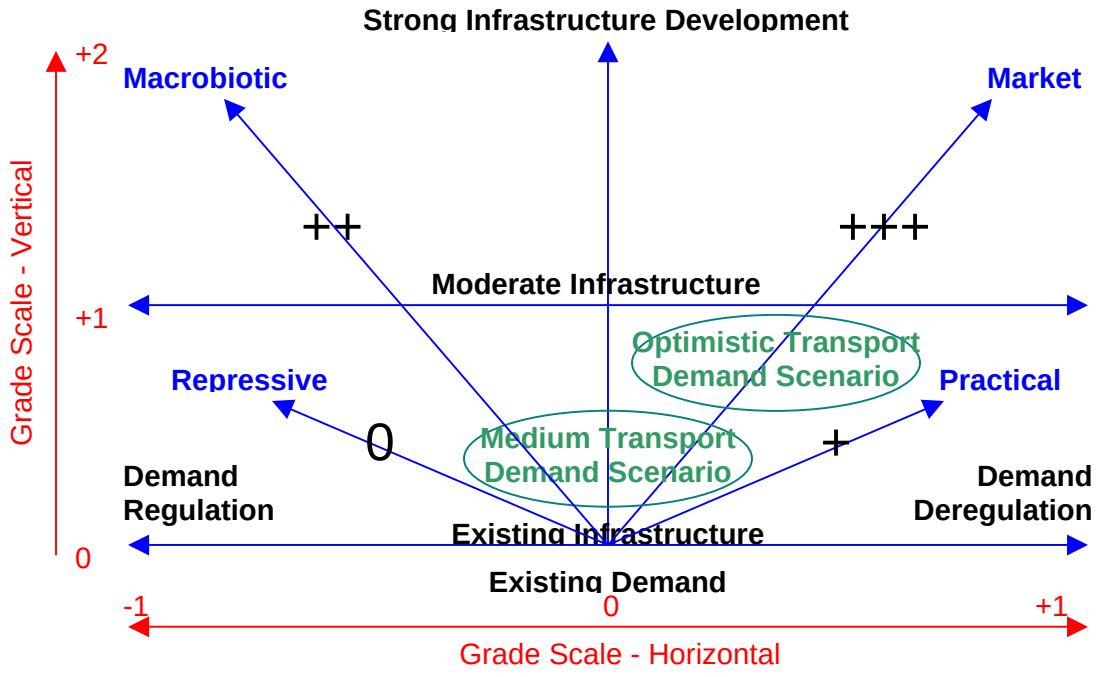

Fig. 12 Transport Demand Scenarios Differentiations according to Different Transport Policy Scenarios

* It has to be noted that the final "grade" of each scenario results by adding vertical and horizontal grades.

(a) Hence: the demand in the Moderate Transport Demand Scenario is expected to:
- Be the same with the Repressive Transport Policy Scenario,
- Have a normal increase with the Practical Transport Policy Scenario
- Have a high increase with the Macrobiotic Transport Policy Scenario
- Have a very high increase with the Market Transport Policy Scenario

(b) Hence: the demand in the Optimistic Transport Demand Scenario is expected to:
- Have a normal decrease with the Repressive Transport Policy Scenario,
- Be the same with the Practical Transport Policy Scenario
- Have a normal increase with the Macrobiotic Transport Policy Scenario
- Have a high increase with the Market Transport Policy Scenario

3.2.5.4 Projection of Transport Demand

From data collected and presented, the drivers of transport demand have been identified and trendlines correlating transport demand and its drivers have been presented. Thus, a generic trend forecasting of transport demand will be attempted for each country group (and for each country in the groups if it is possible), for the period 2000-2020. Trend forecasting will be performed separately for passenger and freight transport.

It has to be noted here that official EC forecasts exist for countries of Group 1 until 2010. Forecasts of projects/ studies, similar to TEM and TER Master Plan, exist for Group 2 countries up to 2015, and for some countries of Group 3 until 2025. Therefore for the common year period of 2000-2010 (or 2015 for some) the existing forecasts will be used, since the underlying hypotheses of the existing forecasts have been adopted in this study.

(1) EU Member Countries before 01/05/2004 - Group 1

Trend analysis on GDP and traffic data produced linear trendlines (Equations 5.1 and 5.2), correlating GDP growth with traffic growth.

We already have GDP projections for Group 1 countries (*Table 5*). So based on GDP projections and the relevant equations, as well as observed transport trends of the previous decade (1990-2000) and EC official projections up to 2010, a number of traffic projections were made to the horizon year 2020 for Group 1 countries, using as base year 2000, for two reference scenarios, a “moderate-trend” scenario and an “optimistic-trend” scenario, both characterized by liberalization measures.

Passenger Transport (Road –cars, buses, coaches- and Rail)

The total number of passenger-km performed in Group 1 (excluding walking and cycling) has increased from 3.500 billion in 1980 to more than 5.400 billion in 1998, a 55 % increase or an average of 2.8 % per year. GDP grew by 2.2 % per year in the same period. Obviously there is a link between economic growth and passenger transport demand. Some slight decoupling is expected by 2010 for passenger transport (European

Commission, 2000a and b), since the Commission is focusing the revised Common Transport Policy more on freight.

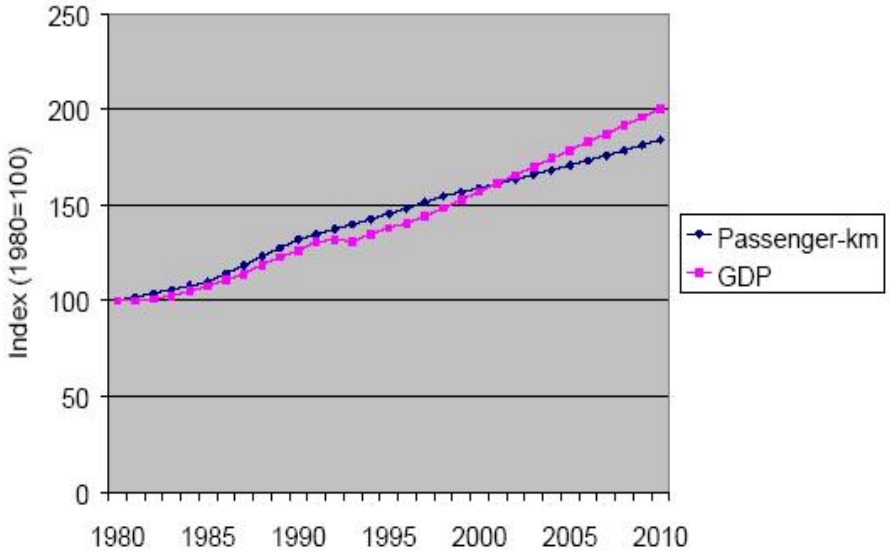

Figure 13 Passenger-kms and GDP (EU-15), 1980 to 2010

Source: Eurostat, 2001; EEA, 2000; projections: European Commission 1999

There are several factors underlying the continuing growth of total passenger-km.

- The main factor is probably growing incomes: passenger transport demand is highly sensitive to changes in average income per head. Per capita expenditure for transport has increased in most countries in line with disposable income, resulting in a rise in personal mobility.

- Another underlying factor is growing car ownership, which is strongly correlated with GDP growth.

Regarding passenger-kms per mode:

- Road is by far the fastest growing mode followed by aviation. Road transport has been growing by an average of 2.5 % per year. The growth in road transport is expected to continue, albeit at a slower pace due to the gradual saturation of infrastructure and consequently the relative reduction in average speed of cars compared with other modes (especially rail). However, road is still the most-used mode. Rail has lowest growth rates of 0.8 % per year.

– Increases in road transport are mainly a result of growing passenger-km by car. This growth is highly correlated with the level of car ownership, which in turn is correlated with GDP growth. Countries with relatively low car ownership levels in 1980 (i.e. Greece) show the highest increases in car ownership up to 1998, corresponding with the highest increases in passenger-km traveled. The number of passenger-km traveled by rail in Group 1 increased by 14 % between 1980 and 1998, an average of 0.8 % per year.

– The share of passenger-km traveled by cars and motorcycles increased from 71 % in 1980 to a maximum in the beginning of the 90s (75 %), but seems to have declined since, to 74 % in 1998, mainly because of the declining share of passenger-km by motorcycle.

– The share of passenger transport by bus or coach has decreased by 3 % between 1980 and 1998.

– The share of rail has declined by 2 % from 1980 to 6 % in 1998.

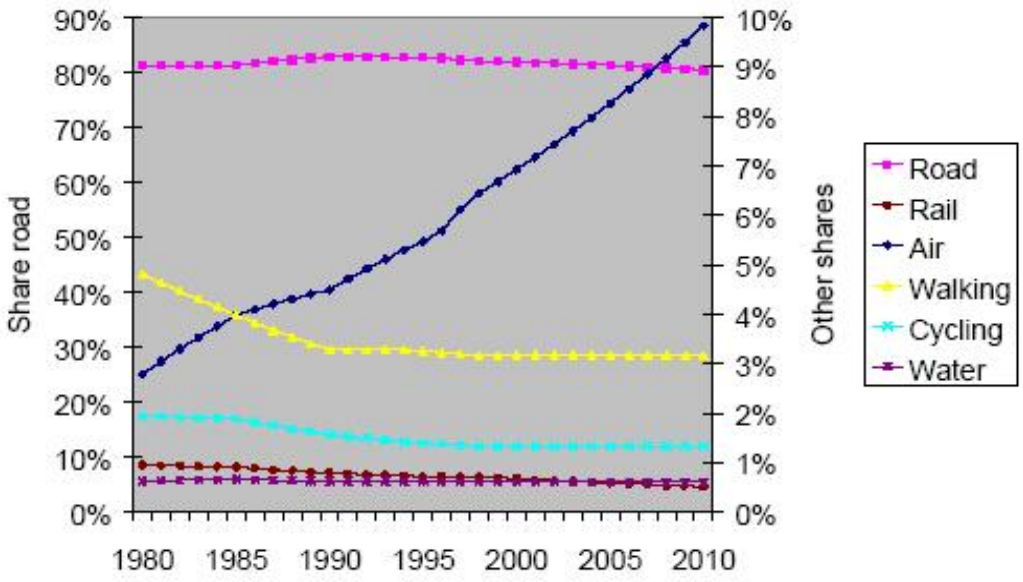

Figure 14 Modal shares of passenger transport demand (EU-15), 1980 to 2010

Source: Eurostat, 2001; EEA, 2000; projections: European Commission, 2000
It should be noted that:

- As a general rule, the elasticity of traffic growth to GDP is below unity both for passengers and for freight, which would indicate that growth in traffic, despite being significant in volume terms over such a long period, will remain modest.

- With regard to passenger traffic, growth rates would seem to be fairly flat and the traffic largely consists in short-distance movements; long-distance rail traffic is highly sensitive to assumptions regarding the entry into service of a high-speed train network although it should be borne in mind that the construction of a trans-European network and the substantial investment this would require poses a number of problems.

- In a reference scenario ("liberal" trend), the market share of road increases substantially; even on the assumption that rail prices remain unchanged, rail loses a significant amount of market share and even the introduction of better targeted and more sophisticated rail operating modes (full trains, faster shuttles) is not sufficient to offset productivity gains in the road sector.

- As a general rule the results are more sensitive to assumptions relating to market operating conditions and price trends than to those relating to infrastructure development; in developing a network, it is essential to adjust operating modes in certain areas.

Table 21 Group 1 Countries - Passenger Demand Forecasts (Road –car and bus/coaches- and Rail) Moderate Scenario

Years	Road*		Rail*	Percentages		Annual Road Growth		Annual Rail Growth
	Car	Coach		Road	Rail	Car	Bus	
2000	3.831	382	382	92%	8%	-	-	-
2001	3.873	382	387	92%	8%	1,10%	0,03%	1,09%
2002	3.917	383	391	92%	8%	1,12%	0,03%	1,12%
2003	3.961	383	395	92%	8%	1,14%	0,04%	1,15%
2004	4.007	383	400	92%	8%	1,15%	0,04%	1,18%
2005	4.054	383	405	92%	8%	1,17%	0,05%	1,21%
2006	4.102	383	410	92%	8%	1,19%	0,06%	1,24%
2007	4.151	384	415	92%	8%	1,21%	0,06%	1,28%
2008	4.202	384	421	92%	8%	1,23%	0,07%	1,31%
2009	4.254	384	426	92%	8%	1,25%	0,08%	1,35%
2010	4.308	384	432	92%	8%	1,27%	0,08%	1,40%
2011	4.364	385	439	92%	8%	1,29%	0,09%	1,44%
2012	4.421	385	445	92%	8%	1,31%	0,10%	1,49%
2013	4.480	386	452	91%	9%	1,33%	0,11%	1,55%
2014	4.540	386	459	91%	9%	1,35%	0,11%	1,61%
2015	4.603	386	467	91%	9%	1,38%	0,12%	1,67%
2016	4.667	387	475	91%	9%	1,40%	0,13%	1,74%
2017	4.734	387	484	91%	9%	1,43%	0,13%	1,82%
2018	4.803	388	493	91%	9%	1,45%	0,14%	1,91%
2019	4.874	389	503	91%	9%	1,48%	0,15%	2,01%
2020	4.947	389	514	91%	9%	1,51%	0,16%	2,12%

Source: Data up to 2010, based on growth and modal split data and projections of European Commission (2000), as shown in Figures 13 and 14

* *Billion Passenger-kms*

** *Percentages are per total of road and rail (other modes not included)*

Table 22 Group 1 Countries - Passenger Demand Forecasts (Road –car and bus/coaches- and Rail) Optimistic Scenario

Years	Road*		Rail*	Percentages		Annual Road Growth		Annual Rail Growth
	Car	Coach		Road	Rail	Car	Bus	
2000	3.831	382	382	92%	8%	-	-	-
2001	3.882	382	387	92%	8%	1,32%	0,03%	1,31%
2002	3.934	383	393	92%	8%	1,34%	0,04%	1,34%
2003	3.987	383	398	92%	8%	1,36%	0,05%	1,38%
2004	4.043	383	404	92%	8%	1,38%	0,05%	1,41%
2005	4.099	383	410	92%	8%	1,40%	0,06%	1,45%
2006	4.158	383	416	92%	8%	1,43%	0,07%	1,49%
2007	4.218	384	422	92%	8%	1,45%	0,08%	1,53%
2008	4.280	384	429	92%	8%	1,47%	0,09%	1,58%
2009	4.344	384	436	92%	8%	1,49%	0,09%	1,63%
2010	4.410	385	443	92%	8%	1,52%	0,10%	1,68%
2011	4.478	385	451	92%	8%	1,54%	0,11%	1,73%
2012	4.548	386	459	91%	9%	1,57%	0,12%	1,79%
2013	4.621	386	467	91%	9%	1,60%	0,13%	1,86%
2014	4.696	387	476	91%	9%	1,62%	0,13%	1,93%
2015	4.774	387	486	91%	9%	1,65%	0,14%	2,01%
2016	4.854	388	496	91%	9%	1,68%	0,15%	2,09%
2017	4.937	388	507	91%	9%	1,71%	0,16%	2,19%
2018	5.023	389	518	91%	9%	1,74%	0,17%	2,29%
2019	5.112	390	531	91%	9%	1,78%	0,18%	2,41%
2020	5.205	391	544	91%	9%	1,81%	0,19%	2,55%

** Billion Passenger-kms*

*** Percentages are per total of road and rail (other modes not included)*

Freight Transport (Road –trucks-, Rail)

Freight transport (in tonne-km) in Group 1 increased by 55 % between 1980 and 1998, an average of 2.5 % per year. Over the same period, GDP grew by an average of 2.3 % per year. Freight transport fell between 1991 and 1993, reflecting the economic climate. Since 1996, freight transport has grown even more rapidly (*see Figure 15*). According to some projections, there will be no significant decoupling of GDP growth and freight transport demand by 2010.

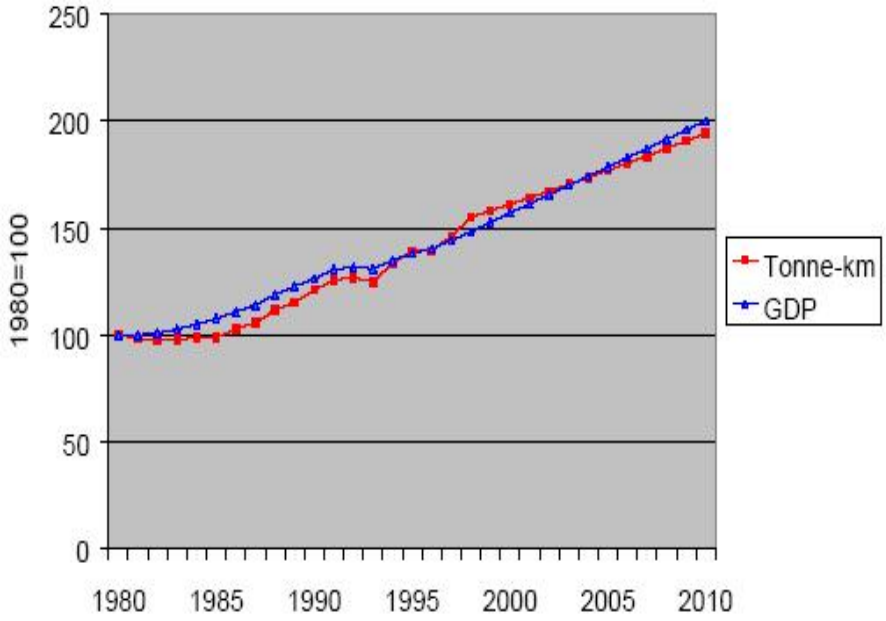

Fig. 15 Tonne-km and GDP in the EU, 1980 to 2010

Source: Eurostat, 2001; projections: European Commission, 1999; European Commission, 2000

On the basis of the data available for eight Member States[2], the average annual growth rate between 1982 and 1998 of tones carried was 1.7 %. The average annual growth rate of tone-km in the same period was 2.9 %. It is difficult to assess whether this is because the average distance over which the goods were transported grew more rapidly than the weight of goods carried, because the goods transported became lighter, or because the load factors became lower (so that more 'just-in-time' trips were needed to transport a given weight of goods over the same distance).

On the road, the average number of kilometers over which a tonne of goods is transported is 110 km (a distance for which rail and inland waterways are less efficient, as transport kilometers by road to and from the points of loading and unloading may be a high proportion of the total distance covered. For short sea shipping, which has become quite successful in some part of the EU, the average transport distance of a tonne of goods is 1430 km (European Commission, 2000).

Freight transport demand is closely linked to changes in the volume and structure of economic activity. The main underlying factors stimulating the growth in distances (vehicle-km) over which goods are transported are:

[2] Belgium, Denmark, Greece, Spain, France, the Netherlands, Portugal and the United Kingdom

- Globalization of the economy and liberalization of the internal market have increased the distances between material extraction, the manufacture (and recycling) of goods and the final consumer.

- Complex trading networks have evolved, primarily to exploit differentials in labor cost. Especially within the EU, constraints on cross-border movements have been removed and related 'barrier costs' are reduced (TNO, 1999);

- Specialization of production processes and preferences of customers cause additional, and longer freight movements.

- Load factors are still low, with empty runs accounting for between 25 and 40 % of total vehicle-km. This is unlikely to improve, since transport is relatively cheap compared to the costs of labour and the products transported. Companies prefer inefficient transport to inefficient time management, resulting in an increasing number and decreasing size of shipments (TNO, 1999).

Regarding modal shares, in general it has been observed that the share of road freight transport has grown mainly at the expense of rail freight transport.

- Road transport is still by far the fastest growing mode for freight transport, with an average of 3.9 % per year between 1980 and 1998. However, short sea shipping is becoming more important in absolute terms and is close to becoming the most important mode for freight transport (road freight transport 43 %, short sea shipping 42 % in 1998).

- Freight transport by rail fell by 16 % between 1980 and 1998.

The modal shares are not expected to change dramatically up to 2010. However, additional legislation and measures at the EU level could change the shares significantly, by creating a better climate for the more environmentally friendly transportation modes. Additionally, proper infrastructure pricing and internalization of external costs can alter the modal split for freight transport significantly, since commercial enterprises, in particular, will always search for the least expensive mode. In the long run, increasing congestion on roads is expected to shift road transport to short sea shipping. Railways and inland waterways should also benefit from road congestion, but to a lesser extent due to their limited accessibility. A prerequisite for the shift from road to sea is that transporters are aware of the possibilities of short sea shipping.

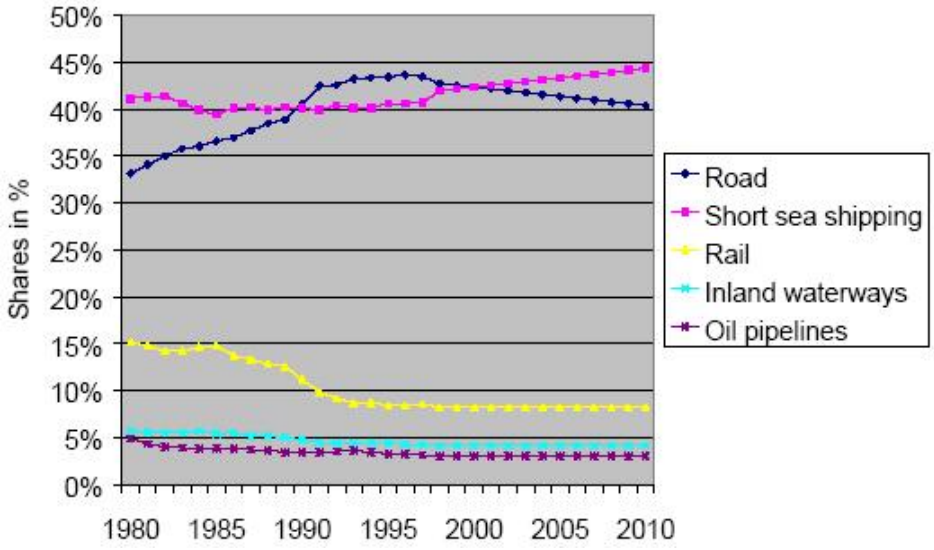

Fig. 16 Modal shares in freight transport in the EU, 1980 to 2010

Source: Eurostat, 2001; projections: European Commission, 2000a

It should be noted that:

- As a general rule, the elasticity of traffic growth to GDP is below unity both for passengers and for freight, which would indicate that growth in traffic, despite being significant in volume terms over such a long period, will remain modest.

- With regard to freight transport, growth in international traffic is higher than growth in national traffic and growth in tonne-kilometres is higher than growth in tonnages, reflecting an increase in the distances traveled; there is an increase in all types of traffic relating to international trade, but a decline in certain types of bulk transport at the national level.

Table 23 Group 1 Countries - Freight Demand (Road and Rail) Moderate Forecasts

Years	Road*	Rail*	Percentages**		Annual Growth	
			Road	Rail	Road Growth	Rail Growth
2000	1.299	253	84%	16%	-	-
2001	1.333	260	84%	16%	2,67%	2,86%
2002	1.369	268	84%	16%	2,67%	2,87%
2003	1.405	276	84%	16%	2,68%	2,88%
2004	1.443	284	84%	16%	2,69%	2,89%
2005	1.482	292	84%	16%	2,70%	2,90%
2006	1.522	300	84%	16%	2,70%	2,91%
2007	1.563	309	83%	17%	2,71%	2,92%
2008	1.606	318	83%	17%	2,72%	2,93%
2009	1.650	327	83%	17%	2,73%	2,94%
2010	1.695	337	83%	17%	2,73%	2,95%
2011	1.741	347	83%	17%	2,74%	2,96%

2012	1.789	357	83%	17%	2,75%	2,97%
2013	1.838	368	83%	17%	2,76%	2,98%
2014	1.889	379	83%	17%	2,77%	2,99%
2015	1.942	390	83%	17%	2,77%	3,00%
2016	1.996	402	83%	17%	2,78%	3,01%
2017	2.052	414	83%	17%	2,79%	3,03%
2018	2.109	427	83%	17%	2,80%	3,04%
2019	2.168	440	83%	17%	2,81%	3,05%
2020	2.229	453	83%	17%	2,82%	3,06%

Source: Data up to 2010, based on growth and modal split data and projections of European Commission (2000), as shown in Figures 15 and 16

** Billion tone-kms*
*** Percentages are per total of road and rail (other modes not included)*

Source: Data up to 2010, based on projections of European Commission, 2000

Table 24 Group 1 Countries - Freight Demand Forecasts (Road and Rail) Optimistic Scenario

Years	Road*	Rail*	Percentages**		Annual Growth	
			Road	Rail	Road Growth	Rail Growth
2000	1.299	253	84%	16%	-	-
2001	1.340	262	84%	16%	3,20%	3,43%
2002	1.383	271	84%	16%	3,21%	3,45%
2003	1.428	280	84%	16%	3,22%	3,46%
2004	1.474	290	84%	16%	3,23%	3,47%
2005	1.521	300	84%	16%	3,23%	3,48%
2006	1.571	310	83%	17%	3,24%	3,49%
2007	1.622	321	83%	17%	3,25%	3,50%
2008	1.675	333	83%	17%	3,26%	3,52%
2009	1.729	344	83%	17%	3,27%	3,53%
2010	1.786	357	83%	17%	3,28%	3,54%
2011	1.845	369	83%	17%	3,29%	3,55%
2012	1.906	382	83%	17%	3,30%	3,57%
2013	1.969	396	83%	17%	3,31%	3,58%
2014	2.034	410	83%	17%	3,32%	3,59%
2015	2.102	425	83%	17%	3,33%	3,60%
2016	2.172	441	83%	17%	3,34%	3,62%
2017	2.245	457	83%	17%	3,35%	3,63%
2018	2.320	473	83%	17%	3,36%	3,64%
2019	2.399	490	83%	17%	3,37%	3,66%
2020	2.480	508	83%	17%	3,38%	3,67%

** Billion tone-kms*
*** Percentages are per total of road and rail (other modes not included)*

(2) EU Member Countries after 01/05/2004 and Acceding Countries - Group 2

Trend analysis on GDP and traffic data performed in section 3.2.5.1.(2) produced linear trendlines (Equations 5.3 to 5.8), correlating GDP growth with traffic growth.

We already have GDP projections for countries of Group 1, presented in section 3.2.4.2 (*Table 10*). So based on GDP projections and the relevant equations, as well as observed transport trends of the previous decade (1990-2000) analyzed by EC, a number of traffic projections were made to the horizon year 2020 for Group 2 countries, using as base year 2000, for two reference scenarios, a "moderate-trend" scenario and an "optimistic-trend" scenario, both characterized by liberalization measures.

Passenger Transport (Road –cars, buses, coaches- and Rail)

There are important data gaps[3] on passenger transport by car that hamper a complete assessment of passenger transport demand. However, based on the observations of Section 5.1.2 –summarized also below-, it can be stated that total passenger transport demand increased between 1990 and 1999 in Group 2 countries, though the magnitude of the increase is unknown. Available statistics do, however, suggest that the increase mainly took place in countries geographically close to the EU.

- Car ownership levels increased by more than 50 % between 1990 and 1998 in these countries. The correlation between car ownership and car passenger transport demand is significant: statistics on passenger-kilometers by private cars in the Czech Republic show a 27 % increase between 1993 and 1999, while in the same period car ownership increased by 21 %. Hungarian data show a 2 % increase in passenger-kilometers by car between 1996 and 1999 and an equal increase in car ownership levels.
- Road and rail energy consumption (including both passenger and freight transport) increased by 28 % between 1993 and 1998 in 5 countries (Czech Republic, Latvia, Lithuania, Poland and Slovenia) while, in the same period, road and rail freight transport demand only increased by 16 % (in the same 5 countries). It can therefore be assumed that the additional increase in energy consumption can be attributed to increasing passenger transport demand. Poland and Latvia are exceptional, since the increase in road and rail freight transport demand outstripped the increase in road and rail energy consumption in both countries, suggesting decreasing passenger transport demand by car. In Poland, however, private car transport demand is estimated to have increased from 59 to 215 billion passenger-km (264 %) between 1990 and 1998 (ECMT, 2000). This figure is probably overestimated when compared with growth in road energy consumption (44 %) and growth in car ownership levels (67 % in the same period). The Polish and Latvian exemptions are therefore assumed to be caused by errors in statistics.

[3] For this exact reason, reference to countries members of the EU since 01/05/2004 but not members of TEM and TER project was considered useful in order to decide on transport trends of this group of countries and attempt producing forecasts up to 2020.

Due to limitations in data availability, only some country-specific details concerning passenger transport trends can be provided.

– Countries bordering the EU, which are also the richer countries in Group 2, show increased passenger transport demand –not necessary high increase, but at least an increase. In the Czech Republic, passenger transport demand increased by 10 % between 1993 and 1999. In Hungary, passenger transport demand increased by 1 % between 1996 and 1999. ECMT statistics show that Polish passenger transport demand increased by 76 % between 1990 and 1998. Although no transport demand statistics are available for Slovakia and Slovenia, the increase in transport energy consumption suggest increasing passenger transport volumes as well.
– The Baltic and southeastern States are amongst the group of poorer countries. In these countries, transport energy consumption decreased, indicating decreasing passenger transport demand (freight transport demand decreased in Estonia, grew in Latvia and remained stable in Lithuania between 1994 and 1999).

The negative trend in public transport in Group 2 countries can be explained by the higher competitiveness from private cars, which are also seen as a symbol of the higher standard of living experienced in the EU. Additionally, decreasing accessibility, a consequence of both urban sprawl and degrading public transportation systems (European Commission, 1999), can also be mentioned as an explaining factor behind decreasing passenger transport demand for rail and buses

- Rail lost 43 % of its passenger-kilometers between 1991 and 1998, though the rate of decline is slowing down. In Hungary, Poland and Slovenia, passenger-kilometers by rail have been increasing slightly since 1995.
- The Baltic States show the highest decrease in passenger transport by rail (around 80% between 1990 and 1998. Bus/coach transport also decreased in these countries. This decline in public transport demand corresponds to the high increases in car ownership (and in consumption of petrol and diesel: 42 % in the same period). The Baltic States are among the most advanced States as concerns railway reform in these countries, but this has not yet resulted in trend reversal.
- Available statistics show that passenger-kilometers by buses decreased in all countries. Based on six countries, the Czech Republic, Latvia, Lithuania, Poland, Slovakia and Slovenia, they decreased by 26 % between 1993 and 1998.

It should be noted that:

- Even when GDP growth rates are high, traffic elasticities remain modest, at below unity, and thus mitigate the idea that transport amplifies changes in rates of activity; it should be recalled that these countries still have economies that are strongly geared towards bulk traffic, which is growing at a slower rate if not declining and which certainly does not favor rail; in addition, the rationalizing of product distribution is likely to result in lower traffic levels for the same level of economic activity.
- Car ownership rates in these countries are rising but are already high with regard to GDP levels and the level of private car usage is sensitive to assumptions regarding fuel prices.

Table 25 Group 2 Countries - Passenger Demand Forecasts (Road and Rail) in a Moderate Scenario*

Years	Percentages**		Annual Road Growth		Annual Rail Growth
	Road	Rail	Car	Bus	
2000	87%	13%	-	-	-
2001	87%	13%	1,73%	-0,03%	0,62%
2002	87%	13%	1,75%	-0,01%	0,63%
2003	87%	13%	1,78%	0,00%	0,65%
2004	87%	13%	1,81%	0,01%	0,67%
2005	87%	13%	1,84%	0,03%	0,68%
2006	87%	13%	1,87%	0,03%	0,70%
2007	87%	13%	1,91%	0,05%	0,72%
2008	87%	13%	1,94%	0,06%	0,74%
2009	87%	13%	1,98%	0,07%	0,76%
2010	88%	12%	2,02%	0,09%	0,77%
2011	88%	12%	2,06%	0,10%	0,79%
2012	88%	12%	2,11%	0,12%	0,81%
2013	88%	12%	2,15%	0,13%	0,84%
2014	88%	12%	2,21%	0,14%	0,85%
2015	88%	12%	2,26%	0,15%	0,87%
2016	88%	12%	2,32%	0,17%	0,89%
2017	88%	12%	2,38%	0,18%	0,92%
2018	88%	12%	2,44%	0,20%	0,94%
2019	88%	12%	2,51%	0,21%	0,96%
2020	89%	11%	2,58%	0,23%	0,98%

Source: TREMOVE Model served as the basic source since it has provided very analytical forecasts for some of these countries. The "average" passenger traffic growth of some selected countries, presented in TREMOVE, was used for TEM and TER forecasting.

** Projections based on a "moderate" socio-economic/GDP scenario*
*** Modal Shares per total of road and rail (no other modes included)*

Table 26 Group 2 Countries - Passenger Demand Forecasts (Road and Rail) Optimistic Scenario*

Years	Percentages**		Annual Road Growth		Annual Rail Growth
	Road	Rail	Car	Bus	
2000	87%	13%	-	-	-
2001	87%	13%	2,07%	-0,01%	0,75%
2002	87%	13%	2,11%	0,00%	0,76%
2003	87%	13%	2,14%	0,01%	0,79%
2004	87%	13%	2,17%	0,02%	0,81%
2005	87%	13%	2,21%	0,04%	0,82%
2006	87%	13%	2,25%	0,05%	0,84%
2007	87%	13%	2,29%	0,06%	0,86%
2008	87%	13%	2,33%	0,07%	0,89%
2009	88%	12%	2,38%	0,09%	0,91%
2010	88%	12%	2,42%	0,11%	0,93%
2011	88%	12%	2,48%	0,12%	0,95%
2012	88%	12%	2,53%	0,14%	0,97%
2013	88%	12%	2,59%	0,15%	1,00%
2014	88%	12%	2,65%	0,17%	1,02%
2015	88%	12%	2,71%	0,18%	1,05%
2016	88%	12%	2,78%	0,21%	1,07%
2017	89%	11%	2,85%	0,22%	1,10%
2018	89%	11%	2,93%	0,24%	1,13%
2019	89%	11%	3,01%	0,25%	1,15%
2020	89%	11%	3,10%	0,28%	1,18%

** Projections based on an "optimistic" socio-economic/GDP scenario*
*** Modal Shares per total of road and rail (no other modes included)*

Freight Transport (Road –trucks- and Rail)

Following the economic downturn after the fall of the Iron Curtain in 1989, a general trend can be observed of declining freight transport demand in the early 1990s, up to 1992/93 (based on data from Estonia, Poland and Romania). After 1992/93, freight transport demand, closely following economic recovery, increased rapidly. In the seven new EU member states plus one accession country for which longer time series are available (Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania and Slovenia, representing more than 60 % of total transport in 1997), freight transport demand by road, rail and inland waterways increased by 11 % between 1994 and 1999. Turkish freight transport demand, accounting for 30 % of all tonne-kilometres performed in 1997 in these countries, increased by 51 % over the same period. Since not all freight modes are covered by statistics, no general observations can be made regarding the link between GDP and freight transport demand.

An important factor behind increasing transport demand is the opening-up of the borders between Group 1 and Group 2. It has to a great extent shifted transport flows from and to

the former Soviet Union towards the EU. Between 1988 and 1995 a marked increase in trade flows was observed, which have resulted in increasing freight transport demand.
The upward trend in freight transport due to Group 1 with Group 2 trade will continue as GDP keeps growing. Fortunately, it is also likely that freight transport intensity will decrease generally, reflecting the changes in production structure and the efficiency improvements, which are expected to be brought about by the transition to a market economy. In other words: the growth in freight transport — measured in tonne-kilometres — will probably be (substantially) lower than the increase in GDP (IVM, 1998).

There are significant differences in modal split between intra- Group 1, intra- Group 2 and Group 1– Group 2 freight transport. In Group 2, rail transport was the dominant mode in 1995, while, for intra- Group 1 and Group 1– Group 2 trade, road was the dominant mode.

The expectation for 2010 is that the modal split for Group 1–Group 2 trade will be similar to that of intra- Group 1 trade in 1995, mainly due to the following reasons (IVM, 1998).

a. The shift in composition of output away from lower-value bulk commodities towards higher valued products and the location of new production facilities that takes account of transport costs will lead to a fall in the transport intensity of output.
b. With the shift towards higher-value products, road will become more competitive for freight transport in terms of cost and service compared with rail.
c. The road haulage sector will be operating in the private sector and will tend to be more responsive to customer demands.

The European Union is by far the most important trading partner of these countries. Between 1993 and 1999, the total value of trade increased almost threefold to EUR 210 billion. At 13.7 % of total trade, these countries as a group are the EU's second trade partners, after the USA (European Commission, 2000).

Road freight transport increased in most countries over the last decade, most profound in countries close to the EU, but the variations between countries are large.

- The Czech Republic, Hungary and Poland, neighbouring the EU, all show increases in road freight transport. On the contrary, in Slovakia, road freight transport demand continuously decreased.
- Slovenian road transport decreased by almost 30 % between 1990 and 1999, which is probably due to the unstable political situation in its neighbouring countries.
- In the Baltic States, road transport decreased during 1991–93, following their independence from and collapse of the former Soviet Union. Between 1993 and 1999, road transport recovered in all three States, most profoundly in Estonia (+ 276 %) and Latvia (+ 232 %).
- Even though no data are available for Bulgaria, decreasing energy consumption by road suggests that road freight transport decreased. In Romania, it more than halved.
- Turkish road freight transport (representing 44 % of total road transport in 1997 in the countries of Group 2) has increased continuously and more than doubled between 1990 and 1998, after some small decline in 1992/93.

There is a notable difference in trend in tonne-kilometres and in tonnes transported by road in these countries: while the number of tonne-kilometres increased, the amount of tonnes transported decreased. Increasing distances over which tonnes are transported, decreasing weights of loads carried (by shift in type of goods transported) and decreasing loading factors can all explain this development. In 1997, crude and manufactured minerals and building materials were the most important category of goods forwarded: 49 % in total tonnes and 27 % in total tonne-kilometres. In the European countries, this category of goods accounted for 47 % in total tonnes and 21 % in total tonne-kilometres.

Rail transport decreased continuously in Group 2 countries between 1990 and 1999. Recovery of rail freight transport can be observed since 1994 in the Baltic States (probably benefiting from their excellent geographical positions as transit countries) and Hungary and Slovenia (due partly to improved political circumstances in the north-western Balkans).

The decline in volume of rail freight transport during the first years of transition was mainly caused by the negative trend in container transport. The containers were used extensively for movements to and from the former Soviet Union, which broke down completely. Reasons for a continuing decline in rail transport volumes, even after the collapse of the Soviet Union, are:

- An increase in rail transport prices (ECMT, 2000);
- Liberalization and deregulation in road transport, which is close to completion; in the case of railways, this process is much slower; road transport is therefore more efficient than rail transport (ECMT, 2001a and b);
- Capacity expansion of most infrastructure is directed to roads

Regarding freight transport intensity a decline was observed in almost all these countries, following structural changes in the economy. Between 1995 and 1999, it decreased by 14 % in AC-9. Estonia (+ 79 %), Latvia (+ 20 %) and Lithuania (+ 11 %) are notable exceptions from this general decrease of freight intensity. For comparison, EU freight intensity (road, rail and inland waterways) increased by 7 % in the same period (Eurostat). However, freight intensities in the accession countries are in general still much higher than the EU average. This high freight intensity can be regarded as an inheritance of the old Soviet-type systems with their emphasis on heavy industry, their focus on output figures rather than profitability, and their lack of material efficiency (IVM, 1998). High freight transport intensities, in particular in the Baltic States, can also be related to a high share of transit freight transported through these countries. The Czech Republic, Poland and Slovakia have high freight intensities, which is to a large extent due to the relatively high shares of industry in total production. On the other hand, Slovenia, Hungary and Romania are among the group of countries with high shares of industry in total production, while these countries show the lowest freight transport intensities.

Finally, regarding modal shares, road transport gained almost the entire loss split from inland waterways and rail and has become the most important mode in freight transport. The road sector has been undergoing radical transformation with privatization. The

liberalization of the road transport sector radically influenced the modal split (OECD, 2001). The preference for road can be explained by current logistical trends that favor road freight transport, which better meets the requirements of accessibility, flexibility and reliability compared with other competing transport modes. Additionally, road transport has already been liberalized to a great extent, while rail transport is still a State monopoly in various countries.

The modal split in tonnes transported changes significantly in favour of road, compared with the modal split in tonne-kilometres. The modal share of rail (in tonnes) is less than its share in tonne-kilometres. This can either be explained by heavier loads being carried by road than by rail (corresponding with the 49 % share in total tonnes forwarded of crude and manufactured minerals and building materials) or by loads being carried over larger distances by rail than by road. The share of tonnes carried by maritime transport is significant in the Baltic States, Slovenia, Bulgaria, Romania and Poland. Since most maritime freight is carried over relatively long distances (when compared with road), it can be expected that the share of tonne-kilometres by maritime transport, for which no statistics are available, is significant in these countries.

A challenge for Group 2 countries is embarking immediately on a strategy for sustainable transport, including maintenance of the modal split at its current level, rather than expanding road transport. The lost market shares of rail transport might be hard to win back in the future. It is expected that the split in these countries in 2010 will be similar to the split in the EU in 1995 (IVM, 1998). This means that the more environment friendly modes of transport, in particular rail transport, will lose even more of their shares.

It should be noted that:

- Even when GDP growth rates are high, traffic elasticities remain modest, at below unity, and thus mitigate the idea that transport amplifies changes in rates of activity; it should be recalled that these countries still have economies that are strongly geared towards bulk traffic, which is growing at a slower rate if not declining and which certainly does not favor rail; in addition, the rationalizing of product distribution is likely to result in lower traffic levels for the same level of economic activity.
- Foreign trade flows from the countries of Group 2 are growing strongly but have already been reoriented towards the European Union and there is no way of telling whether trade will resume at the regional level.

Table 27 Group 2 Countries - Freight Demand Forecasts (Road and Rail) Moderate Scenario*

Years	Percentages**		Annual Road Growth	Annual Rail Growth
	Road	Rail		
2000	54%	46%	-	-
2001	54%	46%	2,19%	2,27%
2002	54%	46%	2,21%	2,28%
2003	54%	46%	2,22%	2,28%
2004	55%	45%	2,24%	2,28%
2005	60%	40%	2,25%	2,28%
2006	61%	39%	2,27%	2,28%
2007	61%	39%	2,28%	2,28%
2008	63%	37%	2,29%	2,28%
2009	65%	35%	2,31%	2,28%
2010	68%	32%	2,32%	2,28%
2011	71%	29%	2,33%	2,28%
2012	73%	27%	2,35%	2,28%
2013	75%	25%	2,36%	2,28%
2014	75%	25%	2,37%	2,28%
2015	77%	23%	2,38%	2,28%
2016	80%	20%	2,40%	2,28%
2017	81%	19%	2,41%	2,29%
2018	81%	19%	2,42%	2,29%
2019	82%	18%	2,43%	2,28%
2020	83%	17%	2,44%	2,29%

Source: TREMOVE Model served as the basic source since it has provided very analytical forecasts for some of these countries. The "average" freight traffic growth of some selected countries, presented in TREMOVE, was used for TEM and TER forecasting.

** Projections based on a "moderate" socio-economic/GDP scenario*
*** Modal Shares per total of road and rail (no other modes included)*

Table 28 Group 2 Countries - Freight Demand Forecasts (Road and Rail) Optimistic Scenario*

Years	Percentages**		Annual Road Growth	Annual Rail Growth
	Road	Rail		
2000	58%	42%	-	-
2001	58%	42%	2,49%	2,57%
2002	58%	42%	2,50%	2,58%
2003	58%	42%	2,52%	2,58%
2004	58%	42%	2,53%	2,58%
2005	60%	40%	2,55%	2,58%
2006	61%	39%	2,57%	2,58%
2007	61%	39%	2,58%	2,58%
2008	63%	37%	2,60%	2,58%
2009	65%	35%	2,62%	2,59%
2010	68%	32%	2,63%	2,58%
2011	71%	29%	2,64%	2,58%
2012	73%	27%	2,66%	2,59%
2013	75%	25%	2,67%	2,59%
2014	75%	25%	2,69%	2,59%
2015	77%	23%	2,70%	2,59%
2016	80%	20%	2,71%	2,59%
2017	81%	19%	2,73%	2,59%
2018	81%	19%	2,74%	2,59%
2019	82%	18%	2,76%	2,59%
2020	83%	17%	2,77%	2,59%

** Projections based on an "optimistic" socio-economic/GDP scenario*
*** Modal Shares per total of road and rail (no other modes included)*

The only problem for forecasting separately between passenger and freight traffic, is that only three countries, namely Czech, Hungary and Poland have analytical data to support separate forecasting. In addition for these same countries future traffic was already forecasted from TREMOVE model.

For the rest countries of this group, separate projections of passenger and transport demand was impossible, but trend forecasting of total traffic (passenger and freight) growth, was relatively easier, since TINA had already produced projections up to 2015 (separately for road and rail) for most countries in this group, which were used in order to continue the projections for the horizon of 2020.

Table 29 Accumulated Road Traffic Growth in Group 2 Countries (Moderate scenario)

Countries	**1995-2005**	**2005-2015**	***2000-2020****
Bulgaria	47,00%	38,00%	*37,31%*
Czech Rep.	21,00%	18,00%	*15,58%*
Hungary	38,00%	20,00%	*23,91%*
Lithuania	53,00%	38,00%	*40,21%*
Poland	59,00%	38,00%	*43,10%*
Romania	117,00%	83,00%	*107,94%*
Slovakia	129,00%	47,00%	*85,85%*
Slovenia	27,00%	17,00%	*18,11%*
Turkey	-	-	-

Source: Based on TINA projections
* Used TINA forecasts until 2015, and then with 2000 as base year trend forecasting was performed for 2020, based on a moderate socio-economic scenario.

Table 30 Accumulated Road Traffic Growth in Group 2 Countries (Optimistic scenario)

Countries	**1995-2005**	**2005-2015**	***2000-2020****
Bulgaria	47,00%	38,00%	*44,77%*
Czech Rep.	21,00%	18,00%	*18,70%*
Hungary	38,00%	20,00%	*28,69%*
Lithuania	53,00%	38,00%	*48,25%*
Poland	59,00%	38,00%	*51,72%*
Romania	117,00%	83,00%	*129,53%*
Slovakia	129,00%	47,00%	*103,02%*
Slovenia	27,00%	17,00%	*21,73%*
Turkey	-	-	-

Source: Based on TINA projections
* Used TINA forecasts until 2015, and then with 2000 as base year trend forecasting was performed for 2020, based on an optimistic socio-economic scenario.

(3) Non-EU, Non-acceding Countries - Group 3

For this group of countries, limited data and only for some countries, existed to support forecasting. Therefore on the basis of available data for Bosnia & Herzegovina, Croatia, Serbia & Montenegro and F.Y.R.O.M[4], as well as REBIS Project projections, and two reference scenarios, a number of traffic projections were made to the horizon year 2020.

Table 31 Accumulated Road Traffic Growth in Group 3 Countries (Moderate Scenario, Base Year: 2000)

Road Traffic (in % of growth)		**2001-2006**	**2001-2015**	**2001-2020**	***2000-2020****
Belarus**	Passenger	-	-	-	-
	Freight	-	-	-	-
Bosnia & Herzegovina	Passenger	30%	108%	206%	*159%*
	Freight	29%	102%	232%	*172%*
Croatia	Passenger	25%	72%	114%	*93%*
	Freight	29%	96%	214%	*159%*
Georgia**	Passenger	-	-	-	-
	Freight	-	-	-	-
Serbia & Montenegro	Passenger	30%	110%	226%	*171%*
	Freight	30%	119%	292%	*213%*
F.Y.R.O.M	Passenger	25%	99%	207%	*156%*
	Freight	25%	96%	222%	*164%*
Russia Federation*	Passenger	-	-	-	-
	Freight	-	-	-	-
Ukraine*	Passenger	-	-	-	-
	Freight	-	-	-	-
Rep. Of Moldova*	Passenger	-	-	-	-
	Freight	-	-	-	-

Source: Based on REBIS

* Using REBIS projections until 2025, and then with 2000 as base year, trend forecasting was performed for 2020, based on a moderate socio-economic scenario.

** Due to limited data no specific projections were made, but a general hypothesis says that these countries will probably follow the rest Group 3 countries or we can use the formula of TIRS (1,25)*(GDP Growth) as GDP is forecasted in Section 3.2.4.2.

[4] For the rest countries: Belarus, Georgia, Russian Federation, Ukraine and Republic of Moldova, we will have to base forecasting on the same hypotheses adopted in projects that already produced forecasts for the rest non-EU, non-acceding countries.

Table 32 Accumulated Road Traffic Growth in Group 3 Countries (Optimistic Scenario, Base Year: 2000)

Road Traffic (in % of growth)		2001-2006	2001-2015	2001-2020	*2000-2020**
Belarus	Passenger	-	-	-	-
	Freight	-	-	-	-
Bosnia & Herzegovina	Passenger	30%	108%	206%	*190,80%*
	Freight	29%	102%	232%	*206,40%*
Croatia	Passenger	25%	72%	114%	*111,60%*
	Freight	29%	96%	214%	*190,80%*
Georgia	Passenger	-	-	-	-
	Freight	-	-	-	-
Serbia & Montenegro	Passenger	30%	110%	226%	*205,20%*
	Freight	30%	119%	292%	*255,60%*
F.Y.R.O.M	Passenger	25%	99%	207%	*187,20%*
	Freight	25%	96%	222%	*196,80%*
Russia Federation	Passenger	-	-	-	-
	Freight	-	-	-	-
Ukraine	Passenger	-	-	-	-
	Freight	-	-	-	-
Rep. Of Moldova	Passenger	-	-	-	-
	Freight	-	-	-	-

Source: Based on REBIS

* Using REBIS projections until 2025, and then with 2000 as base year, trend forecasting was performed for 2020, based on an optimistic socio-economic scenario.

** Due to limited data no specific projections were made, but a general hypothesis says that these countries will probably follow the rest Group 3 countries or we can use the formula of TIRS (1,25)*(GDP Growth) as GDP is forecasted in Section 3.2.4.2.

3.2.6 Truck and Coaches Specificities

Analytical data on trucks and coaches traffic are available for countries in Groups 1 and 2. For Group 3 countries no analytical data for trucks and coaches exist, but a general hypothesis says that these countries will probably follow Group 3 countries "behavioural" changes in traffic growth.

Next, we will summarize the characteristics of truck and coaches past, existing and future demand, as already presented in previous sections, and draw some conclusions regarding these two modes of transport.

3.2.6.1 Coaches

(1) Past, Present and Future Trends

In Group 1, the last 20 years, the share of the more environment friendly modes (bus/coach, rail and tram/metro) declined slightly. More specifically, the share of passenger transport by bus or coach has decreased by 3 % between 1980 and 1998. This share is expected to slightly increase the period 2000 – 2020. More specifically a

moderate forecast on coaches' traffic predicts an average annual increase of 0,1% (starting with 0,03% in the year 2000 and reaching a 0,16% increase in 2020). The optimistic scenario does not change the scene dramatically for coach traffic (*See Tables 21 and 22*).

In Group 2, rail and bus/coach transport, which historically dominated the transport system, have lost a great deal of their shares during the first years of transition. The share of rail and bus/coach transport is still higher in these countries than in Group 1 countries, but this difference is becoming smaller (*See Tables 25 and 26*). Furthermore, as we observe in Tables 25 and 26, traffic of coaches was decreasing until the year of 2003, and we can expect minor increases the next 16 years (up to 2020). More specifically, a moderate forecast on coaches' traffic predicts an average annual increase of 0,1% (starting with -0,03% in the year 2000 and reaching a 0,23% increase in 2020). The optimistic scenario does not change the scene dramatically for coach traffic (*See Tables 25 and 26*).

For Group 3 countries specific data for coach traffic do not exist, but we can assume that a present decline in public transport demand can be expected (present as now and the next couple of years) corresponding to the high increases in car ownership in these countries. Then, probably a similar course with that of Group 2 countries can be expected.

Summarizing:

Passenger traffic is expected to grow but bus/coach modal share and traffic volumes are not expected to change dramatically up to 2020, for none of the above country-groups, neither in moderate nor in the optimistic trend scenario.

Regarding the present decrease in public transport volumes, this is due to the high increase in car ownership and usage as well as in the development of air transport industry in all countries.

Regarding the minor increases expected in the future, these would probably be a result of the EC policy objectives that have been defined for countries of Group 1 and 2[5], in order to diminish the environmental consequences of transport and bring about a shift in transport use from road to rail, water and public passenger transport.

(2) Concluding Remarks on Bus/ Coaches Future in TEM Network

For Group 1, growth in road passenger transport by coach has been lower than overall growth in personal mobility for many years, mainly as a result of the growth in the share of travel by private car. It appears unlikely that this trend can be reversed in the short term, despite efforts by national governments, local authorities and others. This is largely because of the ineffectiveness of many of the traditional measures adopted in bringing

[5] These policy objectives can also affect the countries of Group 3.

about the changes in attitude and lifestyle required. The liberalization of the market, the increased competition within the same mode of transport, mergers and acquisitions, governmental cost-increasing measures, increased bureaucratic market entry and the discrepancies in the regulations regarding fuel taxes and VAT returns, constitute additional burdens to this field of activity.

For Group 2, membership of the Union will exert an influence on the demand for international passenger transport, in both western and eastern directions. On the one hand, the anticipated economic growth after accession and the gradual improvement in living standards in Group 2 may lead to lowered demand, due to competition from air transport and perhaps railways. On the other hand, though, the potential opening of the western European labour market will cause an intensified movement of persons employed in western Europe (at first, mainly in low-paid jobs), who will generate new demand for inexpensive coach transport.

Accession to the Union will entail significant simplification in organising the international lines. Instead of obtaining licences from the destination and transit countries it will be sufficient to have an authorisation (licence) from the domestic decision making body.

It can be assumed, though, on the other hand, that admission to the European Union will not drastically influence the demand for long-distance domestic bus connections. The slow decline in this demand will presumably persist, in relation to the growing numbers of cars and this latter stands also for Group 3. At the same time, even the appearance of a greater number of western European transport agents on the market, offering high-quality service, will not cause a perceptible increase in the competitiveness of long-distance bus transport.

A positive boost to coach services could be deregulation. Although deregulation is well underway in the transport sector, regular coach services are still largely regulated. On the whole, it is true that the coach service industry does not have a great deal of economic freedom. Perceived as competing with rail transport, still largely protected by governments, interurban coach services are regarded as a threat to the latter.

3.2.6.2 Trucks

(1) Past, Present and Future Trends

In Group 1, there is no sign as yet of a shift of freight from road to rail: rail's share dropped from 10.4 % in 1991 to 8 % in 1999. Road haulage and short sea shipping remain the main freight transport modes, with a share of respectively 43 % and 42 % of the tonne-kilometres.

This share of road freight traffic (mainly trucks and some LDV) is expected to increase the period 2000 – 2020. More specifically a moderate forecast on trucks traffic predicts an average annual increase of 2,7% (starting with 2,67% in the year 2000 and reaching a

2,82% increase in 2020). The optimistic scenario gives an average annual increase of 3,29% (starting with 3,2% in the year 2000 and reaching a 3,38% increase in 2020) (*See Tables 23 and 24*).

In Group 2, freight intensity dropped markedly, but this was mostly due to the collapse of rail. Rail transport dominated freight transport at the beginning of the 1990s (with an average share of around 57 % in 1993), but lost this position to road by the end of the 1990s.
For this group of countries, the share of road freight traffic (mainly trucks and some LDV) is expected to increase the period 2000 – 2020. More specifically a moderate forecast on trucks traffic predicts an average annual increase of 2,32% (starting with 2,19% in the year 2000 and reaching a 2,44% increase in 2020). The optimistic scenario gives an average annual increase of 2,63% (starting with 2,49% in the year 2000 and reaching a 2,77% increase in 2020) (*See Tables 27 and 28*).

For Group 3, current or future modal shares are not analytically available but the underlying trend shows a more rapid growth in road than in rail freight transport.

Freight traffic is expected to grow and trucks "share" in absolute numbers-not as modal share- is expected to grow up to 2020, for all the above country groups, both in moderate and in the optimistic trend scenario.

(3) Concluding Remarks on Trucks Future in TEM Network

Opening up of the borders between Group 2 and Group 1 has to a great extent shifted transport flows from and to the former Soviet Union towards the EU. Between 1988 and 1995 a marked increase in trade flows was observed, which have resulted in increasing freight transport demand.

The upward trend in freight transport due to trade between Group 2 with Group 1 will continue as GDP keeps growing. Fortunately, it is also likely that freight transport intensity will decrease generally, reflecting the changes in production structure and the efficiency improvements, which are expected to be brought about by the transition to a market economy. In other words: the growth in freight transport — measured in tonne-kilometres — will probably be lower than the increase in GDP (IVM, 1998).

There are significant differences in modal split between intra- Group 1, intra- Group 2 and Group 1– Group 2 freight transport. In Group 2, rail transport was the dominant mode in 1995, while, for intra- Group 1 and Group 1– Group 2 trade, road was the dominant mode.

The expectation for 2020 is that the modal split for Group 1– Group 2 trade will be similar to that of intra - EU-15 trade in 1995, mainly due to the following reasons (IVM, 1998).

- The shift in composition of output away from lower-value bulk commodities towards higher valued products and the location of new production facilities that takes account of transport costs will lead to a fall in the transport intensity of output.

- With the shift towards higher-value products, road will become more competitive for freight transport in terms of cost and service compared with rail.
- The road haulage sector will be operating in the private sector and will tend to be more responsive to customer demands.

In the EU member states (of Group 1 and Group 2), it is expected that government policies will aim at a shift from road freight to rail and water transport. This should reduce pollution, accidents and congestion in urban areas. Such policies will try to reverse the current trend towards an increasing market share for road freight transport.

However, it will be difficult to reverse this trend. Several economic analyses showed that the performance – or price-quality ratio - of each transport mode determines its competitive position. Costs, speed and reliability are the most important factors. So, the question is whether rail freight and inland waterways can improve their performance strongly, to catch up with the quality road freight can offer. During the last decades the opposite has happened. Road transport has improved its price-quality ratio (or generalized costs) substantially by technical and logistical innovations. In the same period rail freight and inland waterways did not improve their performance so much and they managed to follow the price cut of road freight by concentrating on long distance and large volume hauls, thus losing market share.

3.2.7. Conclusions

The focus of this report was to provide reference scenarios to frame the general evolution of transport demand and supply. It has been already said that such a framework does not necessarily require the definition of mathematical models linking socio-economic variables (inputs) and traffic levels (outputs), assigned on a network. But this does not mean that the models are not useful, in particular for the estimation of traffic growth. However we must be aware of their limits due to an over simplified description of reality, and sometimes a distortion of some mechanisms which could not be reflected with mathematical formulation, or because of the lack of reliable data to calibrate the parameters.

The relevance of the evaluation process, as a concentration and decision process is the main objective. Therefore the transport system framework proposed, with different contexts transport policy contexts, seems to us more appropriate for transport scenarios than any model framework.

The moderate and optimistic scenarios for socio-economic and transport demand described in this report highlight the most important medium and long-term trends, given the past and present development of key variables.

Results are given for the external environment for a 2020 horizon, it is expected that GDP in Group 1, Group 2 and Group 3 will continue to increase steadily, but that the population will decline slightly from around 2015. However, such general trends must be

taken with caution, since there will be significant differences between regions, in relation to their potential development factors and the external economic environment.

Considering transport demand, the main trends were highlighted for freight and passenger transport. For passengers these include the increased dependency on the car against other modes like bus/ coach and rail. For freight transport, the main trends show dominance of road transport.

The forecasted economic growth and traffic growth will serve as inputs for the evaluation methodology in WP4 of TEM and TER Master Plan.

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- WORLDBANK ON-LINE DATABASE: http://devdata.worldbank.org/data-query/
- UNECE: http://www.unece.org/stats/links.htm

⇒ ***Documents Used for the Data Collection and Forecasting***

- TINA Final report
- SCENARIOS Final report
- STAC-TEN Final report
- REBIS Final report
- TIRS Final report
- CODE-TEN Deliverables 4 & 8

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Annexes:

Annex 9	SOCIO-ECONOMIC FRAMEWORK OF THE COUNTRIES IN TEM AND TER REGION
Annex 10	DEMOGRAPHY
Annex 11	ECONOMY
Annex 12	FOREIGN TRADE
Annex 13	TRAFFIC FORECASTS FOR INDIVIDUAL COUNTRIES (available to the participating countries only)

4. PROJECT METHODOLOGY FOR TEM MASTER PLAN

4.1. Objective

The ultimate goal of the methodology was to identify project's prioritization/ categorization, in order to support the elaboration of a medium and long-term investment strategy in the region concerned and encourage the realization of projects that have good chances of implementation and fall within the TEM Master Plan objectives.

This methodology concerned at the first step the definition of an initial two-dimensional network and subsequently it covered among other things data collection, description of existing "national networks" and their problems, forecasting and assessment, and finally the needed project identification. The methodology can be divided in four phases:

PHASE A – Identification

↓

PHASE B – Forecasting

↓

PHASE C – Evaluation

↓

PHASE D – Prioritisation

Identification -according to generic criteria- of the projects that worth further analysis and evaluation; *forecasting* the future conditions of the identified network; *evaluation* of the selected projects, with respect to specific evaluation criteria; *prioritisation* of the projects -based on the evaluation results- in order to classify them into four priority levels.

4.2. PHASE A - Project Identification

This phase was designed in three screening levels, the first dealing with the projects' "**relevance**", the second with their "**readiness**" and the third with their "**viability**". All three levels are simple and easy to apply in this first stage of the project, in order to choose from the National Plans, the projects *(local, national and international)* that worth for further evaluation.
Thorough evaluation was performed in order to mainly identify investment priorities and later establish a timetable for their realisation and assess cost and financing arrangements within the time horizon of 2020.

Thorough evaluation was applied **only** for the projects passing all the screening levels. The ones with insufficient information for the identification phase or the ones that did not pass all the screening levels were automatically classified in the last priority category, which lists all projects to be implemented at a later stage.

1st Level : Relevance of Project

- The project is consistent with UNECE AGR, TEM technical standards and recommendations, respectively.
- The project advances one or more goals of the TEM TER Master Plan
- The project is on a main trans-European axis pertinent to the internal market of the enlarged Europe, the Pan-European corridors, TINA, REBIS, TEN-T etc.
- The project is contributing to the connection of TEM and TER networks to other regions (e.g. the 4 Euro-Asian corridors identified Euro-Asian Conference on Transport, St. Petersburg, 2000)
- The project is capable of reducing bottlenecks and eliminating missing links[6]
- The project is consistent with the objectives of country's National Plans, or neighborhood countries plans, or other sub-area plans, or the visions of country leadership.

Note: At this screening level a project is considered passed, if meets minimum two, or more of the above-mentioned criteria

2nd Level: Readiness

- The project has been defined and development responsibility has been established and acknowledged (*e.g. in terms of a) existing budget for the project in country's public investment budget, b) project's assignment to a specific agency, which will be responsible for its planning and/or execution, c) existence of studies*).
- Additional considerations could be:
  Whether a management plan exists that can lead to a successful implementation of the project (*in other words, the responsible agency has approved the time plan for the project implementation*)

3rd Level: Viability

- For the purpose of TEM Master Plan projects with a minimum budget amounting to 10 million per project were considered.
- The existence of evidence, out of the project's feasibility study, showing potential economic viability (e.g. acceptable IRR and other measures for socioeconomic benefits), and firm commitments from the concerned countries to carry out the required impact assessments with a view to completing the project within an agreed timeframe (*This criterion assumes that a feasibility study is already implemented and accepted*).

[6] An initial suggestion is that bottlenecks be defined as places where a typical inter-urban journey is lengthened by at least 10% beyond what it would other wise be and where this delay occurs at least one hour per working day, or 250 hours per year. The capacity of a road or a railway line can be regarded as a bottleneck criterion. An initial suggestion is that a missing link be defined as a piece of infrastructure which, if it were built, would allow a typical inter-urban journey is shortened by at least 10% beyond what it would otherwise be.

- Whether there are no major environmental constraints (major according to international treaties for protected areas) that would prevent the start of implementation
- Whether the expected/ forecasted demand associated with the project, can justify the need for the project.

According to the above identification criteria, countries identified all the projects worth for further evaluation and complete TEMPLATE 1. For each project in TEMPLATE 1, the respective TEMPLATE 2A and 2C were completed as well.

Table 33 (TEMPLATE 1) Identified Projects

Project ID*	Road and related infrastructure	Project Name	Project cost (€ MIO)	Overall Budget (€ MIO)
	Sections	*e.g. Rehabilitation of: Ankara by-pass*	*Please indicate the currency*	*per year of the years covered by the national plans*

Note: Each country is expected to fill a template

** Finalized by the Consultants upon collection of country replies*

Table 34 (TEMPLATE 2A) Road and related infrastructure Project Fiche

Project Name:	
Nature of Project:	☐ New ☐ Rehabilitation ☐ Upgrade ☐ Other
Location:	*(Geographical Description including main cities, ports, etc and preferably a map)*
Status of Project:	☐ Identification ☐ Planning ☐ Study ☐ Design ☐ Tendering ☐ Under Construction
Project Objectives: *	
Project Description: *Describe the new project, as it differs from the existing situation (Technical Characteristics of existing situation will be provided in section V of the template, and the new project characteristics in section VI of the template)*	
*Current average annual daily traffic (AADT)***	
a) All vehicles	
b) International traffic	
b1) trucks b2) buses / coaches b3) private vehicles	
c) Domestic traffic	
c1) trucks c2) buses / coaches c3) private vehicles	
a) All vehicles	
b) International traffic	
b1) trucks b2) buses / coaches b3) private vehicles	
c) Domestic traffic	
c1) trucks c2) buses / coaches c3) private vehicles	
III. Travel costs for private vehicles/for passenger in a bus per km for the section considered (existing, and if project is implemented)* **	
IV. Travel time for passengers and for freight for the section considered (existing, and if project is implemented)* **	
V. Technical Design characteristics of the existing situation	
a) Part of an international agreement (as AGR) b) Type of road (highway, controlled access motorway, open access motorway, etc;) c) No of lanes d) Length (in km) e) Type of special structures (length of	

tunnels, length of bridges, etc) f) Existence of tolls / toll fare	
VI. Technical Design characteristics of the project	
a) Part of an international agreement (as AGR) b) Type of road (highway, controlled access motorway, open access motorway, etc;) c) No of lanes g) Length (in km) h) Type of special structures (length of tunnels, length of bridges, etc) i) Existence of tolls / toll fare	
a) Type of special infrastructure b) Location of special infrastructure c) Area (km2) for special infrastructure	

Estimated Investment Cost (€ or $, 2003 prices):	
IRR	*From the feasibility study or expected one*
Expected benefits:	
Existing Reports:	
Implementation Programme (years):	**Preparation: …… Expropriation: …… Construction: ….** **Total: ……**
Implementation Authority:	
Funding Sources: (Total number per source or in % of total budget per source)****	National funds:…… Bank loan:…….. Grants (e.g. from EU, USA, Japan etc.):…….. Private sector:…….

Note: Data characterized with

***** *are optional*

*** if not existent in official statistics, an estimate is sufficient. If no estimation, then relevant studies will be used as sources (i.e. TINA, TIRS etc.)*

**** estimation only*

***** if not available leave it blank*

4.3. PHASE B - Forecasting

It was necessary to the consultants to have a reliable overview of current transport demand as well as transport characteristics of the TEM and TER region before preparing any future transport demand scenarios for the projects. Plus, any official forecasts or official estimations could serve in verifying and finalize the consultants' forecasts.

Alternative demand scenarios were produced, using a combination of official forecasts, international studies forecasts as well as trend extrapolation. The forecasting was performed in a qualitative macro-scale based on the expected economic development of the countries concerned as well as other characteristics.

4.4. PHASE C - Evaluation

The still very preliminary level of definition of most projects, the lack of precise information on the present situation, the imperfect knowledge of transport demand perspectives, the large array in types of projects as well as the specific objectives of TEM, mitigate in favor of utilizing a Multi-Criteria Analysis, instead of any other method, to compare and evaluate the identified projects.

Such a method allowed available information to be taken into account on projects, even at their very preliminary level of definition, as well as background data. At the same time some specific elements of particular interest for the decision-makers were introduced.

1. Selection of criteria

The criteria to be evaluated were defined according to three basic concerns:
- the socio-economic return on investment,
- the functionality and the coherency of the network,
- the strategic/ political concerns of the network.

Under these three fundamental orientations of the evaluation process, the following criteria were introduced, which were aimed at covering all of the objectives and specifics relating to the TEM and TER exercise.

CLUSTER A - Socio-economic return on investment (C_A):
- Degree of urgency (C_{A1}),
- Cost effectiveness (C_{A2}),
- Relative investment cost (C_{A3}),
- Level of transport demand (C_{A4}),
- Financing feasibility (C_{A5}).

CLUSTER B - Functionality and coherency of the network (C_B):
- Relative importance of international demand of traffic/ passengers (C_{B1}),
- Relative importance of international demand of traffic/ goods (C_{B2}),
- Alleviation of bottlenecks (C_{B3}),
- Interconnection of existing networks (international level) (C_{B4}),
- Interoperability of networks (C_{B5}).

CLUSTER C - Strategic/ Political concerns regarding the network (C_C):
- Border effects (C_{C1}),
- Political commitment (C_{C2}),
- Regional and international cooperation (C_{C3}),

- Historical/ heritage issues (C_{C4}),
- Economic impact (C_{C5}).

For each of the above-mentioned fifteen criteria, the actual substance is as follows:

Degree of urgency is aimed at indicating whether a project has to be implemented as soon as possible or whether its implementation may be postponed somewhat. Typically, the most urgent projects are those, which will lead to the highest economic losses if implementation is postponed. This is the case when the optimal date for implementation has already passed, or when non-implementation may result in serious disturbance to trade or economic activity.

Cost effectiveness is aimed at giving an indication of the likely level of Internal Rate of Return (IRR) for the project. It is determined basically according to the type of investment, the importance of the demand and the relative magnitude of the advantages expected from the implementation of the project. When an IRR has already been estimated and is known, its value is directly taken into account, provided the assumptions made on costs and demand appear realistic. In most cases, the IRR has been estimated from the experience of the Consultant.

Relative investment costs is aimed at indicating the project's relative importance in relation to the country's GDP. This is simply an indication and it provides a relative comparison of projects in a country. Relative investment cost quantification will be done separately for each country.

Level of transport demand is aimed at giving an indication of the relative level of traffic using the infrastructure. It is determined according to ranges of existing traffic, with adjustment when such existing traffic is evidently biased by temporary circumstances (interruption of traffic, institutional constraint, etc.).

Financing feasibility is aimed at giving an indication to potential financing institutions of (i) the capability of the project to generate the necessary additional resources for its own operations (including maintenance) and to facilitate the reimbursement of loans, and (ii) the reliability of the cost estimate and of the definition of the project, to limit the risks of either unexpected increases in investment costs or an overestimation of potential revenues.

Relative importance of international demand of traffic (one criterion for passengers and one for goods) indicates the amount of international transport in the total transport demand associated with the project.

Alleviation of bottlenecks is aimed at showing the contribution of the link or the itinerary associated to the elimination of existing or expected bottlenecks.

Interconnection of existing networks is aimed at indicating the extent to which the project is improving communications between one regional/national and international networks with another one (elimination of bottlenecks and missing links), thus facilitating the development of trade between two regions/countries.

Interoperability of networks is aimed at indicating the extent to which the project is improving or eliminating interoperability issues between networks, especially in the case of technical interoperability in railway networks.

Border effects is aimed at indicating the extend to which the project is affecting the existing border conditions.

Political commitment, indicating degree of assurance from each country authorities for the project elaboration.

Regional and international cooperation is aimed at indicating the level of regional and international cooperation of the relevant agencies and authorities for the project implementation

Historical/ heritage issues, concern the possible effects of the project on the historical and/ or physical heritage of the countries involved.

Economic impact, is aimed to indicate the extend to which the project affects the country's GDP.

2. Quantification of criteria

Criteria were quantified for each of the projects under consideration either by direct classification according to measurable characteristics, or by "quality attributes", assessed by expert judgment. Such subjective measurement was unavoidable in a multi-criteria analysis, whenever available information was not precise or reliable enough.

A. Measurement of criteria

An indicative measurement for the above criteria -based on TIRS similar work as well as on Consultants experience-follows.

CLUSTER A - Socio-economic return on investment (C_A)

1. Degree of urgency **(C_{A1})**
   A: Immediate requirement (in the next 2 years-until 2005) or projects under construction, B: Very urgent (between 2005 and 2010), C: Urgent (between 2010 and 2015), D: May be postponed for some years (between 2015 and 2020), E: To be reconsidered later (after 2020)

2. Cost effectiveness **(C_{A2})**
   A: Excellent (IRR more than 15%), B: Very good (13-15%), C: Good (10-13%), D: Acceptable (4,5-10%), E: Low (less than 4,5%)

3. Relative investment costs (costs/GDP) **(C_{A3})**
   (Please see provided figure to be completed for each country to covert the physical values to a common artificial scale).

- Rehabilitation/upgrading of highways: A: less than (min cost of this project type/GDP*)%; …(intermediate values to be calculated assuming linearity)…* E: more than (max cost of this project type/GDP)%
- New two-lane highway or single carriageway: A: less than (min cost of this project type/GDP)%; *…(intermediate values to be calculated assuming linearity)…* E: more than (max cost of this project type/GDP)%
- Complete four-lane motorway: A: less than (min cost of this project type/GDP)%; *…(intermediate values to be calculated assuming linearity)…* E: more than (max cost of this project type/GDP)%

Since, relative investment cost is related o national GDP, variable GDP of different countries could influence the evaluation of the projects, especially with a cross-border project. A simple way to overcome this problem was to perform quantification on a project-country basis.

4. Level of transport demand **(C_{A4})**
   - Highways: A: present traffic more than 14000 vpd; B: present traffic from 10000 to 14000 vpd; C: from 6000 to 10000 vpd; D: from 3000 to 6000 vpd; E: less than 3000vpd
   - Border crossings: A: present traffic more than 3500 vpd; B: present traffic from 2500 to 3500 vpd; C: from 1500 to 2500; D: from 800 to 1500; E: less than 800 vpd

5. Financing feasibility (it is a global criterion: based on studies and other relevant information) **(C_{A5})**
   A: Excellent, B: Very Good, C: Good, D: Medium, E: Low

CLUSTER B - Functionality and coherency of the network (C_B):

6. Relative importance of international demand of traffic (passengers) **(C_{B1})**
   A: more than 30 % of total traffic; B: from 25 to 30 % of total traffic; C: from 15 to 25 % of total traffic; D: from 7 to 15 % of total traffic; E: less than 7 % of total traffic

7. Relative importance of international demand of traffic (goods) **(C_{B2})**
   A: more than 30 % of total traffic; B: from 25 to 30 % of total traffic; C: from 15 to 25 % of total traffic; D: from 7 to 15 % of total traffic; E: less than 7 % of total traffic

8. Alleviation of bottlenecks **(C_{B3})**
   A: Satisfactory, B: Adequate, C: Medium, D: Inadequate, E: Unsatisfactory

9. Interconnection of existing networks **(C_{B4})**
   A: Missing Link[7], B: Natural Barrier, C: Improve the connection, D: No influence, E: Averse effects on rest of network

[7] As missing link, a part of the network destroyed by natural disaster (or war) can be included

10. Technical interoperability of network **(C_{B5})**
A: No interoperability problems, B: Minimal interoperability problems, C: Tolerable
Interoperability problems, D: Serious interoperability problems, E: Unsolvable interoperability problems

CLUSTER C - Strategic/ Political concerns regarding the network (C_C)

11. Border effects **(C_{C1})**
A: No border problems, B: Minimal border problems, C: Tolerable border problems, D: Serious border problems, E: Unsolvable border problems

12. Political commitment **(C_{C2})**
A: Strong, B: High, C: Medium, D: Adequate, E: Low

13. Regional and international cooperation **(C_{C3})**
A: Satisfactory, B: Adequate, C: Medium, D: Inadequate, E: Unsatisfactory

14. Historical/ heritage/ environmental issues **(C_{C4})**
A: No effects, B: Minimal effects, C: Tolerable/ Reversible effects, D: Serious effects, E: Irreversible effects

15. Economic impact **(C_{C5})**
A: Strong impact, B: High impact, C: Medium impact, D: Low impact, E: No impact

B. Derivation of criteria

The criteria scores for each project, according to the above quantification, will be derived following the next steps:

→ **Step 1**:
Based on the completed TEMPLATES 1 and 2A, 2C received from the countries, the Consultants proposed the default set of criterion scores to be used for the evaluation of the projects (*See TEMPLATE 3*).

For projects that no data or insufficient data are provided, the scores were produced using the Delphi method. The Delphi team was constituted from:

- The external consultants
- The UNECE representative
- The PCOs

→ **Step 2:**

The template for criterions scores is TEMPLATE 3.

According to the quantification of criteria – as described above – the A value is 5 (the highest) in terms of score. Respectively for value E, is 1 (the lowest).

Therefore:
$C_{Ji} \in [1,5]$
where:
J = A, B or C and
i = 1,….,5

3. Weighting/ Hierarchy of Criteria

Having the criteria scores, the evaluation of projects was complete. But in order to proceed with the prioritization of projects criteria weights were defined.

The template for criterions weights is TEMPLATE 4.

The sum of criteria weights should be 1.

Therefore:
$W_{Ji} \in [0,1]$ and
$\sum_{J=A}^{C} \sum_{i=1}^{5} W_{Ji} = 1$
where:
J = A, B or C and
i = 1,….,5

It has to be noted here, that the good communication between the externals and the country experts was necessary in order to quantify as good as possible all the criteria.

Table 35 (TEMPLATE 3) Project Criteria Scores (*each country complete the relevant column, if so wishes*)

Criteria	Default Set of Scores by consultants*	Scores per Country - involved in the project **																			
		AT	BG	B-H	BL	CZ	CR	FYROM	GE	GR	HU	IT	LT	MD	PL	RO	RU	SK	SL	S-M	TU	UKR
C_A																						
C_{A1}																						
C_{A2}																						
C_{A3}																						
C_{A4}																						
C_{A5}																						
C_B																						
C_{B1}																						
C_{B2}																						
C_{B3}																						
C_{B4}																						
C_{B5}																						
C_C																						
C_{C1}																						
C_{C2}																						
C_{C3}																						
C_{C4}																						
C_{C5}																						

* Or provided by the Delphi team when necessary.

** In case country experts disagree with proposed scores, they may fill up the respective column of their country with their proposed scores, providing an adequate justification of the wanted change.

Table 36 (TEMPLATE 4) Project Criteria Weights (*each country complete the relevant column, if so wishes*)

Weights	Default Set of Weight by consultants*	Weights per Country - involved in the project **																			
		AT	BG	B-H	BL	CZ	CR	FYROM	GE	GR	HU	IT	LT	MD	PL	RO	RU	SK	SL	S-M	TU	UKR
W_A																						
W_{A1}	12%																					
W_{A2}	4%																					
W_{A3}	8%																					
W_{A4}	12%																					
W_{A5}	4%																					
W_B																						
W_{B1}	10%																					
W_{B2}	10%																					
W_{B3}	13%																					
W_{B4}	10%																					
W_{B5}	8%																					
W_W																						
W_{W1}	4%																					
W_{W2}	1%																					
W_{W3}	3%																					
W_{W4}	1%																					
W_{W5}	2%																					
SUM	***100%***																					

* **Provided by the Delphi team**

** In case country experts disagree with proposed weights. They may fill up the respective column of their country with their proposed weights providing an adequate justification of the wanted change.

4.5. PHASE D - Prioritization

1. Projects total score

To derive the project's **total score in each country** the following relationship was used:

$$T.S._{Project/Country} = \sum_{J=A}^{C}\sum_{i=1}^{5} C_{Ji} * W_{Ji}$$

where:

$C_{Ji} \in [1,5]$
$W_{Ji} \in [0,1]$
J = A, B or C and
i = 1,….,5

Therefore:
$TS_{Project/Country} \in [1,5]$ or else the Total Score – for all dimensions together - of each project **in each country** will be the weighted sum of the criteria scores and takes values between 1 (the lowest) and 5 (the highest).

In order to obtain the **Total Score per Project**, we must find a way to integrate the $TS_{Project/Country}$ for all countries involved in the project. This will be done by using **Country/ Spatial Weights (SW)**.

$SW_{Country}$ = % of projects length in the country/ total project's length.

So the Total Score per project will be:

$T.S._{Project} = T.S._{Project/Country} * SW_{Country}$

2. Projects' priorities

The combination of the criterions scores and priorities puts each project in one of the four priority categories.
If the project scores between 4-5 then it belongs to priority category **I**.
If the project scores 3 then it belongs to priority category **II**.
If the project scores 2 then it belongs to priority category **III**.
If the project scores 1 then it belongs to priority category **IV**.

The classification of priorities was:

- **I**: projects, which may be funded and implemented rapidly, including on-going projects up to 2010.
  *(The corresponding priority class in Van Mierts' Classification is **Priority A**- Priority project to start before 2010, or which are in the process)*
- **II**: projects requiring some additional investigations for final definition before likely financing, or planned for implementation up to 2015.
  *(The corresponding priority class in Van Mierts' Classification is something between **Priority A & Priority B**- Priority project that will surely start before 2020 and could start even before 2015)*

- **III**: projects requiring further investigations for final definition and scheduling before possible financing, or planned for implementation up to 2020.
  *(The corresponding priority class in Van Mierts' Classification is **Priority B**- Priority project to start before 2020)*
- **IV**: projects to be implemented in the long run, including the projects where insufficient data existed.
  *(The corresponding priority class in Van Mierts' Classification is **Priority C**- Longer term priority project).*

Annexes:

Annex 14: CONVERSION OF PHYSICAL SCALE TO ARTIFICIAL SCALE
Annex 15: PAIR COMPARISON METHOD
Annex 16: ROAD PROJECT EXAMPLE OF METHODOLOGY IMPLEMENTATION FOR DERIVING CRITERIA AND SCORES (available to the participating countries only)
Annex 17: EXPLANATORY NOTE PREPARED BY PROFESSOR D. TSAMBOULAS

5. PRIORITY INFRASTRUCTURE NEEDS IN CENTRAL AND EASTERN EUROPEAN COUNTRIES

5.1. TEM Master Plan Detailed Traffic Forecast

5.1.1.

Taking into account the results of the projection of transport demand, performed in the Chapter "Socio-economic Framework", it was necessary to deepen them in order to obtain specific data for every network section and/or every proposed project as well as to transform them by replacing the passenger and freight figures by total numbers of passenger cars and trucks, needed for road/motorway capacity calculations and identification of bottlenecks. In accordance with the approved TEM Master Plan Terms of reference, the detailed forecasting procedure consisted of two main steps:

5.1.2. STEP 1

(i) transformation of the UNECE 2000 AGR census of motor traffic on main international traffic arteries in Europe (E-roads) to the adjusted uniform Master Plan mapping reference system (Annexes 18 and 19) using the dynamic segmentation approach; this is done separately for all vehicles and for trucks and coaches (T&C) on the basis of the annual average daily traffic figures (AADT). The example showing the process of transformation is given below:

Table 37

No. of TEM section	From	**To**	Length of TEM section	AGR counting post number	Length of AGR counting section	Adjusted length of AGR section	Average AGR traffic	AGR % of heavy vehicles	Average (weighted) TEM traffic	TEM % of heavy vehicles (weighted)	TEM No. of heavy vehicles
PL 04-07-01	Piotrków	Częstochowa	68	91501	27	24	23467	26	23392	26	6082
				91502	17	15	20727	24			
				91503	7	6	22263	23			
				40201	5	5	22771	30			
				40202	14	13	23344	30			
				40203	6	5	33128	25			

(ii) analysis and processing of the 2000 road traffic data from the countries' national Master Plans and from the TEMSTAT 1 and 2 databases and comparing and correlating them with the transformed AGR census data separately for all vehicles and for trucks and coaches.

(iii) analysis and adjustment of the available corresponding base year 2000 road traffic data from the TEN-STAC study elaborated for the European Commission by consortium led by NEA Transport Research and Training BV from the Netherlands separately for all vehicles and for trucks and coaches in order to verify the 2000 traffic data obtained from the above two sources.

5.1.3. STEP 2

(i) making use of the transformed and analyzed UNECE 2000 census data to elaborate the TEM Master Plan section-by-section road traffic forecast for the years 2005, 2010, 2015 and 2020, taking into account the TEN-STAC study basic assumptions concerning the GDP growth in the past EU and acceding countries, as shown below. The respective computations were performed for all vehicles and for trucks and coaches separately (T&C), too;

(ii) making use of the available data from the countries' national Master Plans and from the TEMSTAT 1 and 2 databases to elaborate the TEM Master Plan section-by-section forecast for the year 2005, 2010, 2015 and 2020, expressed in the vehicle units in order to be compared with and to verify the forecasting results of the TEN-STAC study and those based on the UNECE 2000 census of motor traffic, treating again all vehicles and trucks and coaches separately (T&C);

(iii) analysis of the available corresponding road traffic forecast data from the TEN-STAC study for the years 2005, 2010, 2015 and 2020 in order to verify and calibrate the elaborated TEM Master Plan traffic forecast based on the UNECE 2000 census, countries' national Master Plans and TEMSTAT data.

5.1.4.

Results of the transformation of the UNECE 2000 census of motor traffic on main international traffic arteries in Europe to the adjusted uniform Master Plan mapping reference system are annexed to this report. They consist of 13 tables and maps covering 12 TEM member countries and Slovenia and include more than 600 TEM network sections (Annex 20). It should be noted that for a few TEM sections the data are not available, since the UNECE 2000 census does not cover non-E road sections of TEM and contains no traffic data in Bosnia and Herzegovina.

The other set of 14 tables presents country-by-country results of traffic forecasting (Annex 21). The tables summarize all available traffic data for the year 2000 from all three sources (transformed UNECE 2000 census, TEN-STAC study as well as countries' national Master Plans and TEMSTAT databases) and contains the countries' forecast data for the years 2005, 2010, 2015. Finally, it shows the 2020 forecast data obtained from all three databases listed above (UNECE census, TEM countries and TEN-STAC). These traffic data were available:

Austria	-	UNECE census (AGR), TEN-STAC, 2001 country data, GDP ratio 2020/2000 = 1,51
Bosnia and Herzegovina	-	2000 country data, growth rates (4,25% annually) and GDP ratio 2020/2000 derived from REBIS study
Bulgaria	-	AGR, TEN-STAC, 2000, 2005, 2010, 2015 country data, GDP ratio 2020/2000 = 2,08
Croatia	-	AGR, TEN-STAC, 2000, 2005, 2010, 2015 country data (all vehicles only), GDP ratio 2020/2000 used = 2,3
Czech Republic	-	AGR, TEN-STAC, country data for 2000 and 2005, traffic growth ratios 2020/2000, GDP ratio 2020/2000 = 1,89
Georgia	-	AGR, country data for 2005, 2010, 2015 (all vehicles only), GDP ratio 2020/2000 used = 3,0
Hungary	-	AGR, TEN-STAC, country data for 2000, GDP ratio 2020/2000 = 1,92
Italy	-	AGR (all vehicles only), TEN-STAC, GDP ratio 2020/2000 = 1,58
Lithuania	-	AGR, TEN-STAC, country data for 2000, 2005, 2010, 2015 and 2020, GDP ratio 2020/2000 = 2,31
Poland	-	AGR, TEN-STAC, country data for 2000, 2005, 2010, 2015 and 2020, GDP ratio 2020/2000 = 2,21
Romania	-	AGR, TEN-STAC, 2000, 2005, 2010, 2015 country data (all vehicles only), GDP ratio 2020/2000 = 2,47
Slovakia	-	AGR, TEN-STAC, 2000, 2005, 2010, 2015 and 2020 country data, GDP ratio 2020/2000 = 2,11
Slovenia	-	AGR, TEN-STAC, country data for 2000, GDP ratio 2020/2000 = 1,77
Turkey	-	AGR, 2000, 2005, 2010, 2015 and 2020 country data, GDP ratio 2020/2000 = 2,50.

In most cases, the 2000 forecast figures, resulting from the first two sources (UNECE, countries) are relatively well correlated; in some countries (e.g. Czech Republic) the national forecasted traffic data for the year 2020 are generally lower then those based on the assumptions of the GDP development. With respect to comparable TEN-STAC data, the differences are sometimes more pronounced, especially regarding the border sections

between the past and new EU member countries (e.g. Poland-Germany or Slovakia-Austria).

5.1.5.

The results of the TEM Master Plan forecasting process are presented in the format to be directly used for the identification of bottlenecks and for the assessment of possibilities of stage construction of the TEM network motorway sections.

The direct comparison of the detailed forecast data thus obtained with those presented in the projection of transport demand above is difficult since:

- the projection of demand indicates general forecast figures for groups of countries having in fact quite different development expectations (according to the TEN-STAC study, the GDP 2020/2000 ratios vary from 1,77 for Slovenia to 2,50 for Turkey);
- the transformation of the passenger transport demand (in billion passenger-kms) and freight transport demand (in billion tonne-kms) to the traffic volumes expressed in numbers of passenger cars, buses and trucks not knowing the development of car occupancy and composition of the truck flow until 2020 is quite problematic;
- even on the territory of one country, the development of road traffic volumes would probably differ regionally and also according to various road/motorway classes.

For these reasons, the comparison of the results of the projection of transport demand and section-by-section detailed traffic forecast was possible for 3 countries only (Czech Republic, Hungary and Poland), the specific data of which are contained in Annex 13 of the Socio-economic Framework (Traffic Forecast for Individual Countries).

According to this Annex, these are the 2020/2000 passenger and freight demand forecast ratios:

Table 38

Country	Demand	Moderate scenario	Optimistic scenario
Czech Rep.	passenger freight	1,47 1,57	1,59 1,71
Hungary	passenger freight	1,53 1,60	1,67 1,80
Poland	passenger freight	1,52 1,66	1,58 1,74

These values are generally lower than the GDP forecast values used in the TEN-STAC study, i.e. 1,89 , 1,92 and 2,21 for the Czech Republic, Hungary and Poland respectively, which seems to indicate that the GDP growth is expected to be generally faster than that of the transport demand.

The corresponding figures derived in the framework of the detailed section-by-section forecast (see the tables Summary of Traffic Forecasting on TEM Network) are:

for the Czech Republic: 1,52 (country forecast) – 1,89 (GDP based)
for Hungary: 1,92 (GDP based – country forecast not available)
for Poland: 1,95 (country forecast*) – 2,21 (GDP based)

From comparison of the results of both approaches above, it is obvious that they are quite well correlated, with the detailed forecast's results generally about 15% higher than those of the projection of the transport demand, i.e. nearer to the optimistic scenario approach.

On the other hand, the traffic forecast volumes indicated by the participating countries on the templates used for project evaluation are generally almost the identical with the country forecast data in the tables, summarizing traffic forecasting on the TEM network (see Annex 22 to this report), taking of course into account the differences in the lengths of the projects/TEM sections and the fact that the templates' data reach to the year 2010 only.

5.2. Identification of TEM Network Missing Links and Connections

5.2.1. TINA countries

Out of the 13 TEM member and associate member countries, seven – Bulgaria, the Czech Republic, Hungary, Lithuania, Poland, Romania and Slovakia –were participating in the TINA activity (Transport Investment Needs Assessment), elaborated for the European Commission in 1999. Based on the comparison of the TEM and TINA networks, the following differences and conclusions regarding the TEM missing links and connections can be drawn:

BULGARIA
TINA non-TEM links
E 871 Sofia – FYROM border (Gjusevo)
E 79 Sofia – Greek border (Kulata)
E 79 Botevgrad – Romanian border (Vidin)
Haskovo – Makaza
E 773, E 87 Orizovo – Stara Zagora – Burgas – Varna
Novo Selo (Svilengrad) – Burgas

CZECH REPUBLIC
TINA non-TEM links
E 48 Praha – German border (Pomezi)
E 55 Praha – Austrian border (D.Dvoriste)
E 65 Praha – Turnov

* in Poland, the country forecast ratios are specific for each section

E 442 German border (Hradek) – Turnov – Hradec Kralove – Svitavy – Olomouc – Lipnik
E 67 Jaromer – Polish border (Beloves)
E 461 Svitavy – Brno – Austrian border (Mikulov)
E 462 Vyskov – Olomouc
Breclav – Hulin
E 442, E 462 Lipnik – Polish border (C. Tesin)
TEM non-TINA links
Jaromer – Polish border (Kralovec)
Lipnik – Polish border (Vernovice)
Hulin – Slovak border (H. Lidec)

HUNGARY
TINA non-TEM links
Letenye – Slovenian border (Tornyiszentmiklos)
E 75 Szeged – Yugoslav border (Roszke)
TEM non-TINA link
E 65 Mosonmagyarovar – Szombathely – Nagykanizsa

LITHUANIA
TINA non-TEM links
Vilnius – Belarusian border (Salcininkai)
Vilnius – Marijampole – Russian border (Kybartai)
Kaunas – Ukmerge – Latvian border (Smelyne)
Panevezys – Siauliai – Palanga
Russian border (Panemune) – Siauliai – Latvian border (Sarkiai)
Klaipeda – Pagegiai

POLAND
TINA non-TEM links
Warszawa – Lublin – Plaski – Ukrainian border (Hrebenne)
Plaski – Ukrainian border (Dorohusk)
E 77 Warszawa – Plonsk – Elblag – Gdansk
Plonsk - Torun
Elblag – Russian border (Braniewo)
E 261 Swiecie – Poznan
E 28, E 65 German border (Kolbaskowo) – Szczecin – Swinoujscie
E 65 Bolkow – Czech border (Jakuszyce)
E 75 Bielsko Biala – Czech border (Cieszyn)
TEM non-TINA links
Bolkow – Lubawka
Czestochowa – Gliwice – Czech border (Gorzyczki)

ROMANIA
TINA non-TEM links
E 79 Craiova – Bulgarian border (Calafat)
TEM non-TINA link
Sabaoani – Iasi – Moldavian border (Bosia)

SLOVAKIA
TEM non-TINA link
E 50 Chocholna – Czech border (Drietoma)

The above list shows that the TEM and TINA networks are almost identical in Hungary, Romania and Slovakia. In Bulgaria, the Czech Republic, Lithuania and Poland there exist substantial differences (TINA network being generally more dense than the TEM one), partly due to the fact that in these countries the TINA network comprizes more non-motorway links.

In order to achieve the better compatibility of the TEM and TINA networks and the desirable homogeneity of the TEM system, the remaining existing and/or future motorway links might be added so that the TEM system could represent all the future motorway network in the region.

In accordance with the above principles, the respective Governments of the countries involved may wish to consider the following extensions of the TEM network:

BULGARIA
to be added:
- southern part of the Sofia ring
- Sofia – Greek border (Kulata)
- Orizovo – Burgas – Varna
- Varna – Sumen – Bjala

CZECH REPUBLIC
to be added:
- Praha – Austrian border (D. Dvoriste)
- Brno – Austrian border (Mikulov)

HUNGARY
to be added:
- Szeged – Yugoslav border (Roszke)
- Letenye – Slovenian border (Tornyiszentmiklos)

POLAND
to be added:
- Warszawa – Lublin – Ukrainian border (Hrebenne)
- Szczecin – German border (Kolbaskowo)

ROMANIA
to be added:
- northern part of the Bucuresti ring

5.2.2. Non-TINA countries

In order to comply with the principle outlined above (homogeneity of the TEM system) the Government of Croatia may also wish to consider adding to the TEM network the following links:

CROATIA

- Zagreb – Slovenian border (Macelj)
- Bosiljevo – Otocac – Maslenica
- Rijeka – Matulji – Slovenian border (Rupa)
- Matulji – Kanfanar – Pula
- Kanfanar – Slovenian border (Plovanija)

Following the same principle, there is no need to extend the present and approved TEM network of Bosnia and Herzegovina. No change is needed, too, in Austria and Italy since the TEM links in both countries form integral parts of the European Union's TERN (Trans-European Road Network).

5.2.3. EURO-ASIAN links

In addition to the following considerations, it is necessary to take properly into account the linkages to the Asian Highway Routes (Euro-Asian links in Turkey and Georgia).

To reach the desirable compatibility, addition of these links to the TEM network may be considered:

TURKEY

- Dogubayazit – Diyarbakir – Sanliurfa
- Suluova – Amasya – Refahiye

GEORGIA

- Akhaitsikhe – Zdanov (Armenian border).

All these possible missing links (potential extensions) are shown on the map of the TEM missing links, connections and extensions (Annex 22).

5.3. Identification of interconnections, multimodal corridors and transfer points

5.3.1.

As a result of the analysis of the interconnections between the TEM network and the railway network serving the international combined transport as listed in the UN ECE European Agreement on Important International Combined Transport Lines and Related Installations (AGTC Agreement), these interconnected (i.e. generally parallel) TEM and AGTC links (multimodal corridors) have been identified (Annex 23):

Table 39

TEM link	AGTC link number
AUSTRIA	
Wien-Hungarian border	C-E 50
Wien-Bratislava	C-E 63
Wien-Wiener Neustadt	C-E 65
Graz-Italian border	C-E 65
BOSNIA AND HERZEGOVINA	
Bos. Samac-Sarajevo-Croatian border	C-E 771
BULGARIA	
Dragoman-Sofia-Turkish border	C-E 70
Ruse-V. Tarnovo-Dimitrovgrad	C-E 95
Ruse-Pleven	C-E 680
CROATIA	
Slovenian border-Zagreb-Serbian border	C-E 70
Zagreb-Hungarian border	C-E 71
Zagreb-Rijeka	C-E 71, C-E 753
Hungarian border-Osijek-Slav. Samac	C-E 773, C-E 771
BIH border-Ploce	C-E 771
Gracac-Knin-Split	C-E 751
Ogulin-Gracac	C-E 753
CZECH REPUBLIC	
Plzen-Praha	C-E 40
German border-Praha	C-E 55
Praha-Turnov	C-59/1
Praha-Brno-Slovak border	C-E 61
Breclav (Brno)-Ostrava-Polish border	C-E 65, C-E 40

GEORGIA	
no link included in the AGTC Agreement	
HUNGARY	
Austrian border-Budapest	C-E 61
Slovak border-Hegyeshalom	C-E 61
Croatian border-Szekesfehervar-Budapest	C-E 69, C-E 71
Budapest-Croatian border	C-773
Budapest-Szeged-Serbian border	C-E 85
Budapest-Miskolc-Slovak border	C-E 50
Miskolc-Zahony	C-E 50
ITALY	
Austrian border-Bologna-Brindisi	C-E 55, C-E 45
Venezia-Trieste-Slovenian border	C-E 70
Padova-Brescia	C-E 70
Voghera-Genova	C-E 25
LITHUANIA	
no link included in the AGTC Agreement	
POLAND	
German border-Warszawa-Belarussian border	C-E 20
Szczecin-Wroclaw	C-E 59
Zgorzelec-Wroclaw-Katowice-Ukrainian border	C-E 30
Warszawa-Katowice-Czech border	C-E 65
Gdansk-Katowice	C-E 65
Wroclaw-Klodzko	C-59/1
ROMANIA	
Arad-Timisoara-Craiova	C-E 56
Timisoara-Serbian border	C-E 66
Halmeu-Satu Mare	C-54
Oradea-Cluj-Sebes	C-54, C-54/1
Deva-Sebes-Sibiu	C-E 54
Brasov-Bucuresti-Ruse	C-E 54, C-E 95
Bucuresti-Constanta	C-E 562
Bucuresti-Bacau-Ukrainian border	C-E 95, C-E 851
Pascani (Sabaoani)-Iasi-Moldovan border	C-E 95
SLOVAKIA	
Austrian border-Bratislava-Zilina	C-E 63
Czech border-Bratislava-Hungarian border	C-E 61
Cadca-Zilina-Kosice-Ukrainian border	C-E 40
Kosice-Hungarian border	C-E 50

SLOVENIA	
Italian border-Ljubljana-Croatian border	C-E 65, C-E 70
TURKEY	
Bulgarian border-Istanbul-Adapazari	C-E 70
Izmir-Balikesir-Bursa	C-E 74
Izmir-Afyon-Ulukisla-Tarsus	C-E 74, C-E 97
Mersin-Tarsus-Gaziantep-Nusaybin	C-E 97, C-E 70
Toprakkale-Iskenderun	C-E 97
Polatli-Ankara-Yerkoy	C-E 70

5.3.2.

As far as the transfer points (terminals of importance for international combined transport) are concerned, these terminals in the TEM member countries (except of Bosnia and Herzegovina, where no information was available) have been identified using the AGTC Agreement and countries' data as well as the data from the UN ECE – UN ESCAP Project on Developing Euro-Asian Transport Linkages (serial numbers correspond to those on the map):

AUSTRIA
1 Villach Sud
2 Wien Freudenau Hafen
3 Wien Nordwestbahnhof

BULGARIA
4 Burgas
5 Dimitrovgrad Sever
6 Filipovo
7 Gorna Oriahovitza
8 Vidin
9 Ruse
10 Sofija
11 Stara Zagora
12 Varna
13 Lom

CROATIA
14 Osijek
15 Varazdin
16 Rijeka
17 Slavonski Brod
18 Zadar
19 Vukovar
20 Sisak
21 Split
22 Zagreb
23 Ploce

CZECH REPUBLIC
24 Brno
25 Ceske Budejovice
26 Cheb
27 Jihlava
28 Kolin
29 Lovosice
30 Pardubice
31 Zlin
32 Ostrava
33 Plzen
34 Praha Uhrineves
35 Praha Zizkov
36 Prerov
37 Klatovy

GEORGIA
38 Tbilisi
39 Poti-Port
40 Khashuri
41 Kutaisi
42 Veli

HUNGARY
43 Budapest
44 Debrecen
45 Miskolc-Gomori
46 Sopron
47 Pecs
48 Baja
49 Bekescsaba
50 Szeged
51 Szolnok
52 Zahony
53 Szekesfehervar
54 Gyor
55 Szombathely
56 Nagykanizsa
57 Nyiregyhaza

ITALY
58 Bari-Lamasinata
59 Bologna-Interporto
60 Brindisi
61 Padova-Interporto
62 Pescara-P.N.
63 Trieste
64 Verona-Q.E.

LITHUANIA
65 Vilnius-Panjuriaj
66 Kaunas
67 Klajpeda
68 Sestokai

POLAND
69 Gdansk
70 Gdynia
71 Gliwice
72 Krakow
73 Lodz
74 Malaszewicze
75 Poznan
76 Slawkow
77 Trakiszki
78 Skandawa
79 Pruszkow
80 Sosnowiec
81 Swinoujscie
82 Szczecin
83 Warszawa
84 Wroclaw
85 Hrubieszow
86 Zurawica

ROMANIA
87 Galati
88 Cluj-Napoca
89 Bucuresti
90 Constanta
91 Brasov-Triaz
92 Timisoara-Semenik
93 Ploiesti
94 Craiova
95 Oradea
96 Iasi

SLOVAKIA
97 Bratislava
98 Cierna nad Tisou
99 Kosice
100 Zilina
101 Ruzomberok

SLOVENIA
102 Celje
103 Koper
104 Maribor
105 Ljubljana

TURKEY
106Bandirma
107Derince
108Iskenderun
109Istanbul
110Izmir
111Mersin
112Samsun
113Gaziantep

Note: In Austria and Italy only the terminals located on the TEM network are indicated.

Annexes:

Annex 18	TEM NETWORK ADJUSTED REFERENCE SYSTEM – TABLES (available to the participating countries only)
Annex 19	TEM NETWORK ADJUSTED REFERENCE SYSTEM (MAPS)
Annex 20	TRANSFORMED UNECE 2000 AGR CENSUS OF MOTOR TRAFFIC – TABLES (available to the participating countries only)
Annex 21	RESULTS OF TEM TRAFFIC FORECASTING – TABLES (available to the participating countries only)
Annex 22	MAP OF TEM MISSING LINKS, CONNECTIONS AND EXTENSIONS
Annex 23	MAP OF TEM BORDER CROSSINGS, INTERCONNECTIONS AND MULTIMODAL CORRIDORS TRANSFER POINTS

6. ELABORATION OF TEM MASTER PLAN

6.1. TEM Backbone Network and Additional Links

6.1.1.

To identify the TEM backbone network and its additional links, the most logical and generally acceptable approach may be based on the Pan-European Transport Corridors approved in 1997 at Crete, on the Trans-European Road Network of the European Union and on the Euro-Asian links.

Following this approach, these TEM links could be identified as parts of the backbone network:

AUSTRIA
Nickelsdorf (H/A)-Wien
Berg (SK/A)-Fischamend
Wien-Graz-Arnoldstein (A/I)

BOSNIA AND HERZEGOVINA
Bos. Samac (HR/BIH)-Sarajevo-Visici (BIH/HR)

BULGARIA
Kalotina (SIM/BG)-Sofia-Kapitan Andreevo (BG/TR)
Ruse (RO/BG)-Bjala-Haskovo

CROATIA
Bregana (SLO/HR)-Zagreb-Lipovac (HR/SIM)
Gorican (H/HR)-Zagreb-Karlovac-Rijeka
Knezevo (H/HR)-Osijek-Slav. Samac (HR/BIH)
Metkovic (BIH/HR)-Ploce

CZECH REPUBLIC
Cinovec (D/CZ)-Praha-Brno-Lanzhot (CZ/SK)
Rozvadov (D/CZ)-Praha
Brno-Ostrava-C. Tesin (CZ/PL)

GEORGIA
Leselidze (RUS/GA)-Senaki-Tbilisi-Tsiteli Khidi (GA/AZ)
Sarpi (TR/GA)-Poti-Senaki
Larsi (RUS/GA)-Tbilisi-Sadakhlo (GA/AR)

HUNGARY
Hegyeshalom (A/H)-Budapest-Szeged-Roszke (H/SIM)
Rajka (SK/H)-Level
Szeged-Nagylak (H/RO)
Letenye (HR/H)-Budapest-Zahony (H/UA)
Budapest-Udvar (H/HR)

ITALY
Genova-Padova-Palmanova-Trieste (I/SLO)
Coccau (A/I)-Palmanova
Padova-Bologna-Bari-Brindisi

LITHUANIA
Klajpeda-Kaunas-Vilnius-Medininkai (LT/BY)
Kaunas-Sangruda (LT/PL)
Salociai (LV/LT)-Sitkunai

POLAND
Swiecko (D/PL)-Poznan-Warszawa-Terespol (PL/BY)
Gdansk-Lodz- Piotrkow Tr.-Katowice-Zwardon (PL/SK)
Katowice-Cieszyn (PL/CZ)
Olszyna (D/PL)-Wroclaw-Katowice-Krakow-Medyka (PL/UA)
Jedrzychowice (D/PL)-Krzywa
Budzisko (LT/PL)-Warszawa-Piotrkow Tr.

ROMANIA
Nadlac (H/RO)-Timisoara-Sebes-Bucuresti-Constanta
Timisoara-Craiova
Albita (RO/MO)-Marasesti-Bucuresti-Giurgiu (RO/BG)

SLOVAKIA
Kuty (CZ/SK)-Bratislava-Rusovce (SK/H)
Petrzalka (A/SK)-Bratislava-Zilina-Kosice-V. Nemecke (SK/UA)
Skalite (PL/SK)-Zilina

TURKEY
Kapikule (BG/TR)-Istanbul-Gerede-Ankara-Askale-Gurbulak (TR/IRN)
Gerede-Samsun-Trabzon-Sarp (TR/GA)
Trabzon-Askale
Izmir-Afyon-Ankara
Ankara-Adana-Toprakkale-Gaziantep-Habur (TR/IRQ)
Toprakkale-Iskenderun-Yayladagi (TR/SYR)
Tarsus-Mersin.

6.1.2.

Remaining outside thus defined backbone network, these are the additional TEM network links:

BOSNIA AND HERZEGOVINA
Neum West (HR/BIH)-Neum East (BIH/HR)
Izacic (HR/BIH)-Bihac-Sarajevo-Bolanic (BIH/SIM)

BULGARIA
Sofia-Bjala
Svilengrad – Novo Selo (BG/GR)

CROATIA
Rijeka-Split-Dubrovnik-Debeli Brijeg (HR/SIM)
Karlovac-Grabovac-Knin-Split
Grabovac-Vaganac (HR/BIH)

CZECH REPUBLIC
Praha-Turnov-Harrachov (CZ/PL)
Praha-Hradec Kr.-Beloves (CZ/PL)
Holubice-St. Hrozenkov (CZ/SK)

GEORGIA
Ureki-Samtredia
Khashuri-Naohrebi (GA/TR)
Marneuli-Guguti (GA/AR)

HUNGARY
Budapest-Parassapuszta (H/SK)
Mosonmagyarovar-Nagykanizsa
Tornyosnemeti (SK/H)-Miskolc-Debrecen-Biharkeresztes (H/RO)

LITHUANIA
Panevezys-Vilnius

POLAND
Szczecin-Z.Gora-Legnica-Jakuszyce (PL/CZ)
Kudowa Zdr. (CZ/PL)-Wrocław-Piotrkow Tr.
Rzeszów-Barwinek (PL/SK)

ROMANIA
Craiova-Bucuresti
Timisoara-Moravita (RO/SIM)
Bors (H/RO)-Oradea-Cluj Napoca-Sebes
Halmeu (RO/UA)-Satu Mare-Cluj Napoca
Siret (UA/RO)-Suceava-Sabaoani-Marasesti
Sculeni (RO/MO)-Iasi-Sabaoani
Cluj Napoca-Brasov-Bucuresti

SLOVAKIA
Drietoma (CZ/SK)-Chocholna
Ruzomberok-B.Bystrica-Zvolen-Sahy (SK/H)
Kosice-Milhost (SK/H)
Presov-Vys. Komarnik (SK/PL)

TURKEY
Horasan-Kars-Turkozu (TR/GA)
Afyon-Konya-Ulukisla
Izmir-Aydin-Antalya
Izmir-Cesme
Izmir-Balikesir-Bursa-Gebze

6.1.3.

Finally, these are the TEM extensions to the non-TEM Master Plan participating countries:

BELARUS

Brest (PL/BY)– Minsk – Krasnoje (BY/RUS)
Kamenny Loh (LT/BY) – Minsk - Gomel
Jezjarysca (RUS/BY) – Orsa – Gomel – Novaja Guta (BY/UA)

BULGARIA

Sofia – Kjustendil – Gjusevo (BG/FY)

FYROM

Tabanovce (SIM/FY) – Kumanovo – Titov Veles - Gevgelia (FY/ GR)
Titov Veles – Bitola – border (FY/GR)
Kriva Palanka (BG/FY) – Kumanovo – Skopje – Debar (FY/AL)

GREECE

Igoumenitsa – Kipi (GR/TR)

Alexandroupoli – Ormenio (GR/BG)

Thessaloniki – Promachonas (GR/BG)

Kozani – Niki (GR/FY)

Siatista – Ieropigi (GR/AL)

Patra – Athens - Thessaloniki - Evzoni (GR/FY)

Rio – Kakavia (GR/AL)

Corinthos – Tripoli – Sparti

Corinthos – Tripoli – Kalamata

North Creta Road Axis

MOLDOVA

Leuseni (RO/MO) - Chisinau – Dubasari – border (MO/UA)
Chisinau – Tiraspol – border (MO/UA)

POLAND

Warszawa – Lublin – Dorohusk (PL/UA)

RUSSIAN FEDERATION

St. Peterburg – Pskov – Nevel – border (RUS/BY)
Krasnoje (BY/RUS) – Smolensk – Moskva – Nižnij Novgorod
St. Peterburg – Moskva – Borisoglebsk – Volgograd
Jaroslavl – Moskva – Brjansk – Kalinovka (RUS/UA)
Krupec (UA/RUS) – Kursk – Voronez – Borisoglebsk – Saratov – Dergachi (RUS/KAZ)
Border (UA/RUS) – Kamensk Sachtinskij – Volgograd- Astrakhan
Novosachtinsk (UA/RUS) – Rostov na Donu – Pavlovskaja – Novorossijsk – Adler (RUS/GA)
Pavlovskaja – Armavir – Vladikavkaz - Makhackala
Mayaral (KAZ/RUS) – Astrakhan – Makhackala – Orudzhaba (RUS/AZ)

SERBIA AND MONTENEGRO

Kelebia (H/SIM) - Novi Sad – Beograd – Nis – Strezovce (SIM/FY)
Batrovci (HR/SIM) –Beograd
Nis – Dimitrovgrad (SIM/BG)

SLOVENIA

Fernetici (I/SLO) – Ljubljana – Obrezje (SLO/HR)

UKRAINE

Starovojtovo (PL/UA) – Kovel – Korosten –Kiev – Charkiv – Debalceve – Antracit – border (UA/RUS)
Seginie (PL/UA) – Lvov – Zitomir –Kiev
Kipti – Hluchov (UA/RUS) - Cervone (UA/RUS)
Border (RUS/UA) – Ripki – Kipti – Kiev – Uman - Ljubasivka – Odessa
Krasni Okni (MO/UA) – Ljubasivka
Limanske (MO/UA) – Odessa
Cop (H/UA) – Uzhorod (SK/UA) – Mukacevo – Stryj – Lvov
Djakove (RO/UA) – Mukaceve
Stryj – Tarnopol – Vinnicja – Uman - Dnipropetrovsk – Doneck – Debalceve – Krasnodon (UA/RUS)
Tarnopol – Cernivci – Porubne (UA/RO)

6.1.4. Conclusions

Backbone network presents a high density, especially in CEE countries. If one considers CEE countries as the center of the "crossroad" between West Europe and – Asia as well as between North Europe – Mediterranean (therefore Middle East also), the connection between East-West and South – North is served by a complete backbone network.

The connections between TEM network and other networks (TEN, TINA, Pan-European Corridors, EATL, MEDA TEN-T links etc.) as well as critical transport nodes (ports, airports, logistic centers etc.) and urban centers, are very satisfactory.

The identified missing links is a small number and some of them can be "replaced" by existing links of other networks e.g. as the proposed TEM missing links in Turkey that are in parallel with existing EATL.

The most important prerequisite for the TEM network design was the guiding principle that this network should be seen as the possible future extension of the TEN, in an enlarged Union as well as the connection of Union with Asia and Mediterranean. This prerequisite was succeeded.

The map of the TEM backbone network, extensions, additional and missing links is attached to this report as its Annex 24. Annex 25 shows the TEM Master Plan backbone network, covering the TEM backbone network proper as well as its extensions to the east and west on the territory of all the Master Plan participating countries.

Concerning the realization of the TEM Master Plan backbone network, details can be found in Chapter 7, but some additional comments can be made here regarding the network operation. For the proper operation of the network, two separate options appear:

- Technical tools to be introduced on the network to improve the level of its services and to make it more attractive. The introduction of the Intelligent Transport Systems (ITS) on the TEM network can serve this objective.
- The sufficient legislative – institutional framework to ensure access under the best conditions, eliminating any administrative obstacles and barriers, and thus improving its exploitation.

6.2. Elaboration of the TEM Region Master Plans and alternative scenarios

6.2.1. Socio-Economic Scenarios

It has been mentioned that only two alternative scenarios of growth will be developed. This is due to the fact that many uncertainties exist concerning the socio-economic environment of transport for the next 20 or 30 years. When studying the enlargement of Europe these uncertainties increase because of the political decision to be taken concerning accession of new members to the EU, and the new situation created by transition, which has never been experienced before. This environment does have an impact on transport, which may be very important as regards transport policy decision.

However the purpose of TEM Master Plan is not to concentrate on the possible evolution of this socio-economic environment but to develop an evaluation methodology for TEM network development.

Therefore it is proposed to frame this socio-economic environment using a few credible assumptions, which should be sufficient for this methodological exercise, keeping in mind that the purpose is not primarily to build scenarios for assessment of a policy or a project but to introduce the scenario approach as a necessary element of an evaluation methodology on a macro scale.

Concerning EU member countries before 01/05/2004 it could be possible to take only one "trend" scenario, which will be a moderate one. Nonetheless, an optimistic scenario for the EU member countries before 01/05/2004 is also provided. This latter scenario is not expected to be significantly different from the moderate one, for this group of countries.

Concerning the EU member countries after 01/05/2004 and the acceding and the non-acceding countries it appears better to initially consider some contrasting hypotheses, which will be characterized by a significant difference in GDP growth (high and low), and two options for the transition period, in order to form the "borders" of scenario development area.

Following this analysis, two axes of the scenario development have been defined (Figure 17), and the two possible combinations have been created. The red-shadowed area represents our moderate (medium) scenario, while the blue shadowed area the optimistic (high) scenario.

Blue represents the lower limit of the combination of "High Growth – Quick Transition", green represents the exact opposite, the upper limit of "Low Growth – Slow Transition" and purple and light blue represent the two other combinations, "High Growth – Slow Transition" and "Low Growth – Quick Transition", respectively. Red stands for the "Medium Growth – Medium Transition".

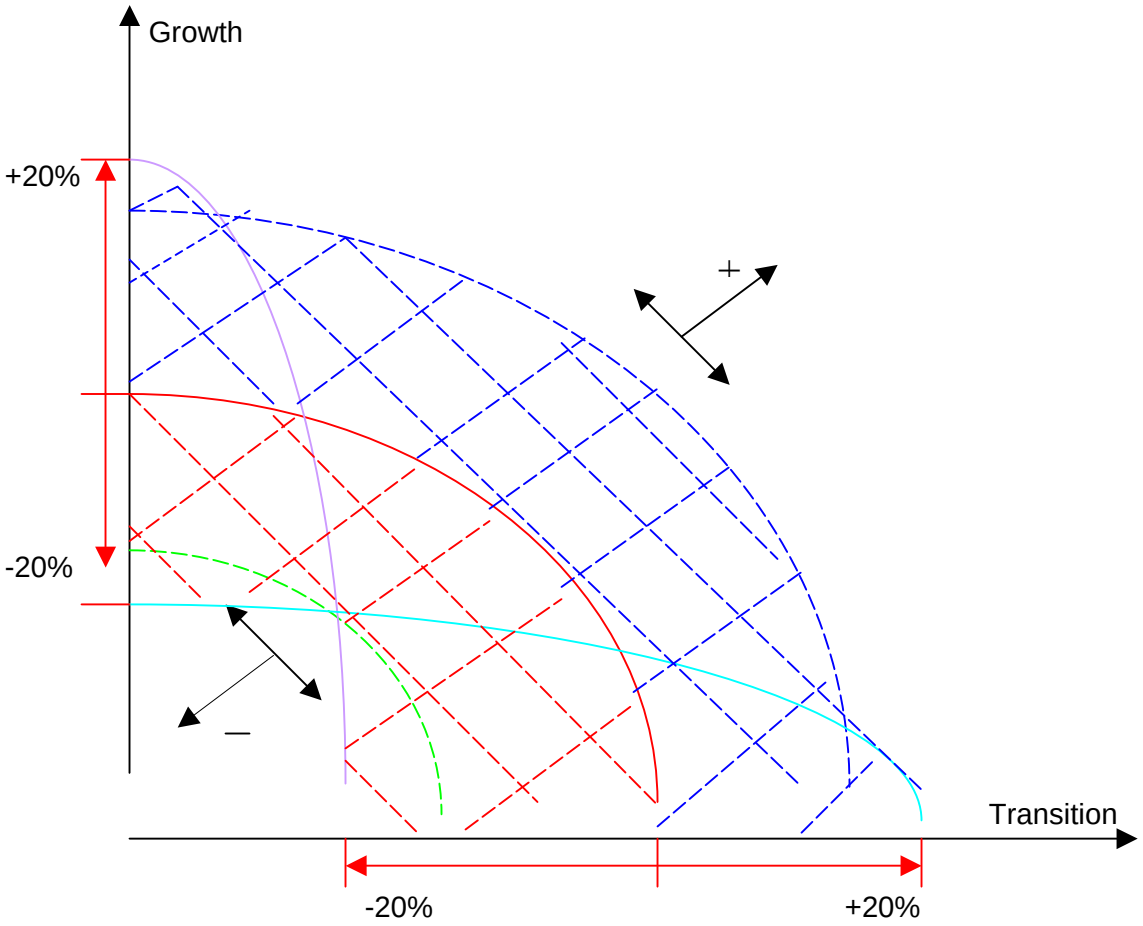


Figure 17 Scenario Development

6.2.2 Transport Scenarios

6.2.2.1 Transport Policy Scenarios

Market scenario

This scenario is characterized by an emphasis on liberalization and deregulation and on increasing cross-border or international traffic. It also places an emphasis on infrastructure development. As the free market principles are favored, road pricing for external costs and restricting road traffic are given a lower emphasis. This scenario assumes that the market will decide the kind of projects to be funded, whereby road takes priority.

The perquisite for such a scenario would be that reforms are promptly implemented: liberalization and market competition but also structural changes in production and adaptation of the institutional framework (legal, financial, administrative framework).

This is an idealistic situation, which is not impossible to reach when we refer to the history of integration in European Union. Difficulties of integration have been overcome more easily than what has been feared initially.

Macrobiotic scenario

This scenario lays emphasis on the management of supply and demand hence on regulation or management rather than deregulation, which is in fact what distinguishes this scenario from the previous one. Other goals are the promotion of intermodal and interoperability and the structural goals of increasing accessibility and promoting regional development. Infrastructure development is still considered a means to achieve these goals. Rail projects or a network approach are more likely to be prioritized under this scenario.

Practical scenario

This scenario shares a number of features with the market scenario with a greater emphasis on deregulation. It however does not place such a strong emphasis on infrastructure development and considers this also as being guided by the market. Instead it is in favor of measures promoting interoperability.

Repressive scenario

In this scenario emphasis is placed on decoupling with the specific objective of promoting environmental sustainability, hence the strategic importance assigned to the application of environmental regulation and the restriction of local traffic. Overcoming structural deficiencies, hence promoting regional development, is still thought of as important, however not at the expense of environmental damage, hence also the absence of increasing accessibility as a significant goal.

6.2.2.2.Transport Demand Scenario

The moderate transport demand scenario, consists of the following elements:
- Moderate economic growth
- Existing infrastructure
- No harmonization effects on mode choice in passenger or freight transport (Existing modal split per spatial level/group-countries level)

The optimistic transport demand consists of:
- High economic growth
- Existing towards Moderate infrastructure development
- No harmonization effects on mode choice in passenger or freight transport (Existing modal split per spatial level/group-countries level)

Differentiations in these forecasts are expected in case of a different transport policy scenario, like the four presented in previous section. For a better understanding, Table 40 and Figure 18, summarize the possible differentiations in the two transport demand scenarios.

Table 40 Transport Policy Scenarios – Transport Policy Framework

Demand / Infrastructure	*Regulation*	*Deregulation*
Strong Development	*Macrobiotic Scenario (MC)*	*Market Scenario (M)*
Moderate Development	*Repressive Scenario (R)*	*Practical Scenario (P)*

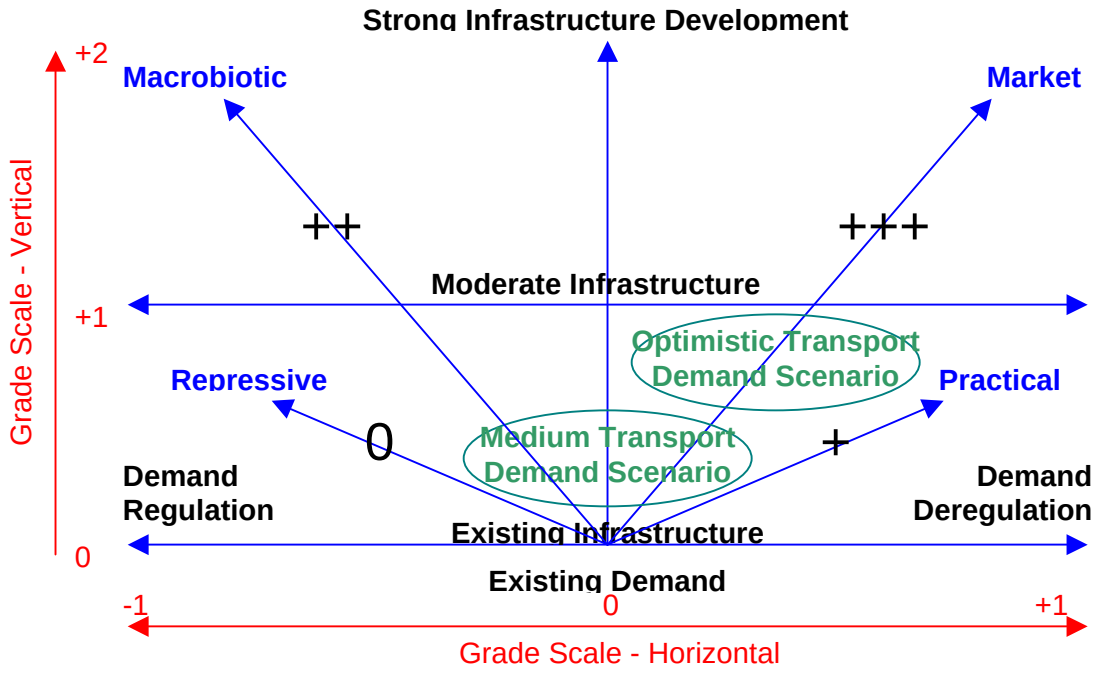


Fig. 18 Transport Demand Scenarios Differentiations according to Different Transport Policy Scenarios

** It has to be noted that the final "grade" of each scenario results by adding vertical and horizontal grades.*

(a) Hence: the demand in the Moderate Transport Demand Scenario is expected to:
- Be the same with the Repressive Transport Policy Scenario,
- Have a normal increase with the Practical Transport Policy Scenario
- Have a high increase with the Macrobiotic Transport Policy Scenario
- Have a very high increase with the Market Transport Policy Scenario

(b) Hence: the demand in the Optimistic Transport Demand Scenario is expected to:
- Have a normal decrease with the Repressive Transport Policy Scenario,
- Be the same with the Practical Transport Policy Scenario
- Have a normal increase with the Macrobiotic Transport Policy Scenario
- Have a high increase with the Market Transport Policy Scenario

6.3 Inventory of capacity bottlenecks

6.3.1.

The methodological approach to identify the capacity bottlenecks with a special respect to the effects of the truck and bus transport is based mainly on the US Highway Capacity Manual, on the Methodological Basis for the Definition of Common Criteria Regarding Bottlenecks, Missing Links and Quality of Service of Infrastructure Networks, elaborated by the UNECE Inland Transport Committee Working Party on Transport Trends and Economics in 1994 and on the document Bottlenecks in Road Networks – Definitions, Causes and Strategies for their Removal, prepared by the Conference of Directors of Roads of the EU countries in 2003.

All these documents confirm, that there exists no uniform, generally accepted definifion of bottlenecks. Agreed is that bottlenecks are a consequence of some form of congestion, but again, the definition of the exact traffic conditions involved in traffic congestion is so far not agreed upon. On the other hand, despite their different duration and causes for them, two types of congestions which characterize them could be distinguished.

The first is the temporary one which can arise from certain traffic situations on motorways – i.e. low to average traffic density, high share of heavy traffic (movement of columns of lorries) and comparably high passenger car speeds – which normally automatically dissolves after a short period of time. Other type of congestion occurs on two-lane highways with high amount of lorries which prevent passenger cars from moving at desired speed.

The other one is the regular congestion characterized by capacity-related traffic jams which come about if the traffic demand exceeds – usually temporarily, but regularly – the capacity of a section of road which either leads to congestion in that section (**primary bottleneck**) or – additionally – to congestion in other sections (**secondary bottleneck**).
To make an inventory of the TEM network capacity bottlenecks, the factors leading to regular congestions were taken into account. For the purpose of identifying the bottlenecks, therefore, the level of service concept of the Highway Capacity Mannual and the relation between the capacity of the infrastructure and quality of transport service represented important indicators. The HCM distinguishes these 6 levels of service:
Level A:
Free flow, low volumes, high speeds, freedom to manoeuvre in the traffic stream is high.
Level B:
Stable flow, freedom to select speed is relatively unaffected; slight decline in the freedom to manoeuvre within the traffic flow.
Level C:
Stable flow, high volumes, operation of individual users becomes significantly affected by interaction with each other.
Level D:
Approaching unstable flow, fluctuatuing and relatively low volumes, speed and freedom to manoeuvre are severely restricted.
Level E:
Operating conditions are at or near the capacity level, speeds are reduced to low but relatively uniform value.

Level F:
Forced or breakdown flow, formation of queues, operations within the queue are characterized by stop-and-go waves, which are extremely unstable.

For the identification of bottlenecks in the framework of the TEM Master Plan, level of service C was chosen as still acceptable.

6.3.2.

Furthermore, in accordance with the findings of the above mentioned UNECE Inland Transport Committee document, a quantifiable and practical bottleneck criterion which is to be found in all European countries is that of road capacity, which permits to compare internationally the bottlenecks in various countries.

For individual road categories, the following maximum capacities in terms of number of vehicles as the average daily traffic were recommended:

4-lane motorway	60,000 PCU/24 hrs
road of 2 lanes	12,000 PCU/24 hrs

These capacity limits were used to identify the bottlenecks in the TEM Master Plan. When stating the capacity, it is also necessary to evaluate differently the vehicle types according to their influence on the traffic flow. The most important role here play the trucks and buses, the influence of which is the highest. To take it into account properly, their weights (passenger car equivalents) have to be chosen, depending on the type of terrain, through which the road (motorway) passess.

For two-lane highways, the HCM proposes these average passenger car equivalents:

Table 41

Vehicle type	Level of service	Type of terrain		
		flat	hilly	mountainous
Truck	A	2,0	4,0	7,0
	B and C	2,2	5,0	10,0
	D and E	2,0	5,0	12,0
Bus	A	1,8	3,0	5,7
	B and C	2,0	3,4	6,0
	D and E	1,6	2,9	6,5

Since the results of the TEM Master Plan traffic forecast present the total number of trucks and buses only and in view of the fact that the share of buses in the traffic flow is practically always much lower then the one of the trucks, these values of trucks and buses passenger car equivalents were chosen for bottleneck identification on two-lane highways:

Table 42

Type of terrain	flat	hilly	mountainous
truck and bus passenger car equivalent	2,1	4,5	9,0

Similarly, in order to identify the capacity bottlenecks on four lane TEM motorway (to be removed by adding two or more lanes), the following HCM passenger car equivalents were taken as a basis:

a) Extended general multilane highway segments

Table 43

Vehicle type	Type of terrain		
	flat	hilly	mountainous
Truck	1,7	4,0	8,0
Bus	1,5	3,0	5,0

b) Extended general freeway segments

Table 44

Vehicle type	Type of terrain		
	flat	hilly	mountainous
truck and buses	1,5	3,0	6,0

Option b) as more corresponding to the TEM motorway standards was chosen for bottleneck identification on them.

6.3.3.

Having thus established a methodological approach principles, the final tables of TEM Master Plan traffic forecast (Annex 21) were adjusted to its requirements by adding the column, indicating the respective terrain type for each TEM section. Furthermore, the time periods, when the individual motorway sections will be in operation, were indicated in the corresponding cells of these tables according to the motorway development national master plans or information obtained from the TEM member countries through the Project Central Office in Warsaw (see also TEM network status maps – Annex 26).

On the basis of the traffic forecast tables adjusted in such a way, it was possible to identify the expected bottlenecks in the respective five-year periods until 2020 using these equations:

a) for two-lane highways

$x + 1{,}1y \geqq 12000$ PCU in flat terrain

$x + 3{,}5y \geqq 12000$ PCU in hilly terrain

$x + 8{,}0y \geqq 12000$ PCU in mountainous terrain

b) for four-lane motorways (motorways having 6 lanes and more were not taken into account when identifying bottlenecks, their capacity being considered sufficient)

$x + 0{,}5y \geqq 60000$ PCU in flat terrain

$x + 2{,}0y \geqq 60000$ PCU in hilly terrain

$x + 5{,}0y \geqq 60000$ PCU in mountainous terrain

where:
PCU – are passenger car units (equivalents)
x – number of all vehicles (first column for each year)
y – number of trucks and coaches (second column for each year).

The potential bottlenecks thus identified are positioned on the interurban (rural) TEM network sections only (i.e. urban areas are excluded

6.3.4

The TEM sections with bottlenecks expected to appear until 2020 are made available to the participating countries only.

6.4. Specification for Trucks and Coaches

6.4.1. Scope

This chapter aims primarily in presenting the specificities of trucks and coaches in the framework of TEM Master Plan elaboration in order to identify (a) possible benefits attributed to truck and coach traffic from the implementation of TEM Master Plan and (b) possible impacts to truck traffic from the rail infrastructure developments.

The report is divided in two parts. The first –and main part- deals with the alternative transport growth scenarios on the TEM network related to truck and coaches. The second part deals with the possible benefits attributed to truck and coach traffic from the implementation of TEM Master Plan and the effects on truck traffic from the rail infrastructure developments.

In the first part the analysis is presented separately for the EU member countries before 01/05/2004 (Group 1), the EU member countries after 01/05/2004 and the acceding countries (Group 2) and finally for the non-EU, non-acceding countries (Group 3).

Table 46 TEM and TER Countries

EU member countries before 01/05/2004	**EU member countries after 01/05/2004 and acceding countries**	**Non-EU non-acceding countries**
Country Group 1	***Country Group 2***	***Country Group 3***
Austria, Greece, Italy	Bulgaria, Czech Rep., Hungary, Lithuania, Poland, Romania, Slovakia, Slovenia, Turkey and Croatia*	Belarus, Bosnia & Herzegovina, Georgia, Serbia and Montenegro, F.Y.R.O.M, Russian Federation, Ukraine, Rep. Of Moldova

*** Just recently entered the group of acceding countries**

6.4.2. Part I - Truck and Coaches Traffic on TEM Network

Analytical data on trucks and coaches traffic are available for countries in Groups 1 and 2. For Group 3 countries no analytical data for trucks and coaches exist, but a general hypothesis says that these countries will probably follow Group 3 countries "behavioural" changes in traffic growth.

Next, we will summarize the characteristics of truck and coaches past, existing and future demand, as already presented WP3, and draw some conclusions regarding these two modes of transport.

6.4.2.1. Coaches

Past, Present and Future Trends

In Group 1, the last 20 years, the share of the more environment friendly modes (bus/coach, rail and tram/metro) declined slightly. More specifically, the share of passenger transport by bus or coach has decreased by 3 % between 1980 and 1998. This share is expected to slightly increase the period 2000 – 2020. A moderate forecast on coaches' traffic predicts an average annual increase of 0,1% (starting with 0,03% in the year 2000 and reaching a 0,16% increase in 2020). The optimistic scenario does not change the scene dramatically for coach traffic (*See Table 47*).

Table 47 Group 1 Countries - Bus/coaches traffic (Moderate and Optimistic Scenarios)

Years	Moderate Scenario		Optimistic Scenario	
	Traffic*	Annual Growth	Traffic*	Annual Growth
2000	382	-	382	-
2001	382	0,03%	382	0,03%
2002	383	0,03%	383	0,04%
2003	383	0,04%	383	0,05%
2004	383	0,04%	383	0,05%
2005	383	0,05%	383	0,06%
2006	383	0,06%	383	0,07%
2007	384	0,06%	384	0,08%
2008	384	0,07%	384	0,09%
2009	384	0,08%	384	0,09%
2010	384	0,08%	385	0,10%
2011	385	0,09%	385	0,11%
2012	385	0,10%	386	0,12%
2013	386	0,11%	386	0,13%
2014	386	0,11%	387	0,13%
2015	386	0,12%	387	0,14%
2016	387	0,13%	388	0,15%
2017	387	0,13%	388	0,16%
2018	388	0,14%	389	0,17%
2019	389	0,15%	390	0,18%
2020	389	0,16%	391	0,19%

Source: Data up to 2010, based on growth and modal split data and projections of European Commission (2000)
** Billion Passenger-kms*

In Group 2, rail and bus/coach transport, which historically dominated the transport system, have lost a great deal of their shares during the first years of transition. The share of rail and bus/coach transport is still higher in these countries than in Group 1 countries, but this difference is becoming smaller. Furthermore, traffic of coaches was decreasing until the year of 2003, and we can expect minor increases the next 16 years (up to 2020). More specifically, a moderate forecast on coaches' traffic predicts an average annual increase of 0,1% (starting with -0,03% in the year 2000 and reaching a 0,23% increase in 2020). The optimistic scenario does not change the scene dramatically for coach traffic (*See Table 48*).

Table 48 Group 2 Countries - Bus/coaches traffic (Moderate and Optimistic Scenarios)

Years	Moderate Scenario	Optimistic Scenario
	Annual Growth	Annual Growth
2000	-	-
2001	-0,03%	-0,01%
2002	-0,01%	0,00%
2003	0,00%	0,01%
2004	0,01%	0,02%
2005	0,03%	0,04%
2006	0,03%	0,05%
2007	0,05%	0,06%
2008	0,06%	0,07%
2009	0,07%	0,09%
2010	0,09%	0,11%
2011	0,10%	0,12%
2012	0,12%	0,14%
2013	0,13%	0,15%
2014	0,14%	0,17%
2015	0,15%	0,18%
2016	0,17%	0,21%
2017	0,18%	0,22%
2018	0,20%	0,24%
2019	0,21%	0,25%
2020	0,23%	0,28%

Source: Data up to 2010, based on growth and modal split data and projections of European Commission (2000)

For Group 3 countries specific data for coach traffic do not exist, but we can assume that a present decline in public transport demand can be expected (present as now and the next couple of years) corresponding to the high increases in car ownership in these countries. Then, probably a similar course with that of Group 2 countries can be expected.

6.4.2.2. Trucks

Past, Present and Future Trends

In Group 1, there is no sign as yet of a shift of freight from road to rail: rail's share dropped from 10.4 % in 1991 to 8 % in 1999. Road haulage and short sea shipping remain the main freight transport modes, with a share of respectively 43 % and 42 % of the tonne-kilometres.

This share of road freight traffic (mainly trucks and some LDV) is expected to increase the period 2000 – 2020. More specifically a moderate forecast on trucks traffic predicts an average annual increase of 2,7% (starting with 2,67% in the year 2000 and reaching a 2,82% increase in 2020). The optimistic scenario gives an average annual increase of 3,29% (starting with 3,2% in the year 2000 and reaching a 3,38% increase in 2020) (*See Table 49*).

Table 49 Group 1 Countries – Trucks Traffic (Moderate and Optimistic Scenarios)

Years	Moderate Scenario		Optimistic Scenario	
	Traffic*	Annual Growth	Traffic*	Annual Growth
2000	1.299	-	1.299	-
2001	1.333	2,67%	1.340	3,20%
2002	1.369	2,67%	1.383	3,21%
2003	1.405	2,68%	1.428	3,22%
2004	1.443	2,69%	1.474	3,23%
2005	1.482	2,70%	1.521	3,23%
2006	1.522	2,70%	1.571	3,24%
2007	1.563	2,71%	1.622	3,25%
2008	1.606	2,72%	1.675	3,26%
2009	1.650	2,73%	1.729	3,27%
2010	1.695	2,73%	1.786	3,28%
2011	1.741	2,74%	1.845	3,29%
2012	1.789	2,75%	1.906	3,30%
2013	1.838	2,76%	1.969	3,31%
2014	1.889	2,77%	2.034	3,32%
2015	1.942	2,77%	2.102	3,33%
2016	1.996	2,78%	2.172	3,34%
2017	2.052	2,79%	2.245	3,35%
2018	2.109	2,80%	2.320	3,36%
2019	2.168	2,81%	2.399	3,37%
2020	2.229	2,82%	2.480	3,38%

Source: Data up to 2010, based on growth and modal split data and projections of European Commission (2000)
** Billion tone-kms*

In Group 2, freight intensity dropped markedly, but this was mostly due to the collapse of rail. Rail transport dominated freight transport at the beginning of the 1990s (with an average share of around 57 % in 1993), but lost this position to road by the end of the 1990s.

For this group of countries, the share of road freight traffic (mainly trucks and some LDV) is expected to increase the period 2000 – 2020. More specifically a moderate forecast on trucks traffic predicts an average annual increase of 2,32% (starting with 2,19% in the year 2000 and reaching a 2,44% increase in 2020). The optimistic scenario gives an average annual increase of 2,63% (starting with 2,49% in the year 2000 and reaching a 2,77% increase in 2020) (*See Table 50*).

Table 50 Group 2 Countries – Trucks traffic (Moderate and Optimistic Scenarios)

Years	Moderate Scenario	Optimistic Scenario
	Annual Growth	Annual Growth
2000	-	-
2001	2,19%	2,49%
2002	2,21%	2,50%
2003	2,22%	2,52%
2004	2,24%	2,53%
2005	2,25%	2,55%
2006	2,27%	2,57%
2007	2,28%	2,58%
2008	2,29%	2,60%
2009	2,31%	2,62%
2010	2,32%	2,63%
2011	2,33%	2,64%
2012	2,35%	2,66%
2013	2,36%	2,67%
2014	2,37%	2,69%
2015	2,38%	2,70%
2016	2,40%	2,71%
2017	2,41%	2,73%
2018	2,42%	2,74%
2019	2,43%	2,76%
2020	2,44%	2,77%

Source: Data up to 2010, based on growth and modal split data and projections of European Commission (2000)

For Group 3, current or future modal shares are not analytically available but the underlying trend shows a more rapid growth in road than in rail freight transport.

6.4.3. Part II –Benefits of TEM Network on Trucks and Coaches Traffic &Effects of Railway Infrastructure on Trucks Traffic.

6.4.3.1. Benefits of TEM Implementation on Coaches

In general transport investment have traditionally focused on the quote that "better networks can further boost transport". The same stands for TEM as well as TER network development.

The investment on TEM is expected to boost road transport in general, but it needs further discussion on how it will affect trucks and coaches traffic specifically. Simultaneously investment on TER is also expected to boost rail transport but differently the passenger than the freight transport.

For Group 1 TEM-countries, growth in road passenger transport by coach has been lower than overall growth in personal mobility for many years, mainly as a result of the growth in the share of travel by private car. It appears unlikely that this trend can be reversed in the short term, despite efforts by national governments, local authorities and others. This is largely because of the ineffectiveness of many of the traditional measures adopted in bringing about the changes in attitude and lifestyle required. The liberalization of the market, the increased competition within the same mode of transport, mergers and acquisitions, governmental cost-increasing measures, increased bureaucratic market entry and the discrepancies in the regulations regarding fuel taxes and VAT returns, constitute additional burdens to this field of activity.

For Group 2 TEM-countries, membership of the Union will exert an influence on the demand for international passenger transport, in both western and eastern directions. On the one hand, the anticipated economic growth after accession and the gradual improvement in living standards in Group 2 may lead to lowered demand, due to competition from air transport and perhaps railways. On the other hand, though, the potential opening of the western European labor market will cause an intensified movement of persons employed in western Europe (at first, mainly in low-paid jobs), who will generate new demand for inexpensive coach transport.

Accession to the Union will entail significant simplification in organising the international lines. Instead of obtaining licences from the destination and transit countries it will be sufficient to have an authorisation (licence) from the domestic decision making body.

It can be assumed, though, on the other hand, that admission to the European Union will not drastically influence the demand for long-distance domestic bus connections. The slow decline in this demand will presumably persist, in relation to the growing numbers of cars and this latter stands also for Group 3 TEM-countries. At the same time, even the appearance of a greater number of western European transport agents on the market, offering high-quality service, will not cause a perceptible increase in the competitiveness of long-distance bus transport.

A positive boost to coach services could be deregulation. Although deregulation is well underway in the transport sector, regular coach services are still largely regulated. On the whole, it is true that the coach service industry does not have a great deal of economic

freedom. Perceived as competing with rail transport, still largely protected by governments, interurban coach services are regarded as a threat to the latter.
So the extension of TEM network is more likely to increase car traffic than coach traffic. More analytically, **passenger traffic in total is expected to grow but bus/coach modal share and traffic volumes are not expected to change dramatically up to 2020, for none of the countries participating in TEM.** Regarding the minor increases expected in the future, these would probably be a result of the EC policy objectives that have been defined for TEM countries of Group 1 and 2, in order to diminish the environmental consequences of transport and bring about a shift in transport use from road to rail, water and public passenger transport..

6.4.3.2. Benefits of TEM Implementation on Trucks/ Impacts of TER Implementation on Trucks

Opening up of the borders between Group 2 and Group 1 has to a great extent shifted transport flows from and to the former Soviet Union towards the EU. Between 1988 and 1995 a marked increase in trade flows was observed, which have resulted in increasing freight transport demand, something that will be boosted with the implementation of both TEM and TER networks.

The upward trend in freight transport due to trade between Group 2 with Group 1 will continue as GDP keeps growing. Fortunately, it is also likely that freight transport intensity will decrease generally, reflecting the changes in production structure and the efficiency improvements, which are expected to be brought about by the transition to a market economy. In other words: the growth in freight transport — measured in tonne-kilometres — will probably be lower than the increase in GDP (IVM, 1998).

There are significant differences in modal split between intra- Group 1, intra- Group 2 and Group 1– Group 2 freight transport. In Group 2, rail transport was the dominant mode in 1995, while, for intra- Group 1 and Group 1– Group 2 trade, road was the dominant mode.

The expectation for 2020, after the implementation of TEM and TER master plans, is that the modal split for Group 1– Group 2 trade will be similar to that of intra - EU-15 trade in 1995, mainly due to the following reasons (IVM, 1998).

- The shift in composition of output away from lower-value bulk commodities towards higher valued products and the location of new production facilities that takes account of transport costs will lead to a fall in the transport intensity of output.
- With the shift towards higher-value products, road will become more competitive for freight transport in terms of cost and service compared with rail.
- The road haulage sector will be operating in the private sector and will tend to be more responsive to customer demands.

In the EU member states (of Group 1 and Group 2), it is expected that government policies will aim at a shift from road freight to rail and water transport. This should reduce pollution, accidents and congestion in urban areas. Such policies will try to reverse the current trend towards an increasing market share for road freight transport.

However, it will be difficult to reverse this trend. Several economic analyses showed that the performance – or price-quality ratio - of each transport mode determines its

competitive position. Costs, speed and reliability are the most important factors. So, the question is whether rail freight and inland waterways can improve their performance strongly, to catch up with the quality road freight can offer. During the last decades the opposite has happened. Road transport has improved its price-quality ratio (or generalized costs) substantially by technical and logistical innovations. In the same period rail freight and inland waterways did not improve their performance so much and they managed to follow the price cut of road freight by concentrating on long distance and large volume hauls, thus losing market share.

Unlike coaches, freight traffic by trucks is expected to significantly grow in absolute numbers but simultaneously present a very slight decrease as a modal share up to 2020, for most of TEM countries.

6.4.4. Conclusions –Recommendation for Coaches and Trucks Enhancement

6.4.4.1. Coaches

Ensuring adequate competition in coach transport is not easy. It is not unusual for established operators to dominate certain services, partly due to government intervention through entry and fares controls and through state ownership of major coach companies. Even without government intervention competition is not assured on every route, because dominant operators or groups of small operators can adopt anti-competitive practices to deter small independent operators from offering alternatives.
Three important issues commonly arise when seeking to improve regulation:

- What should be the basis of competition, either free competition (or 'competition in the market') or some kind of contracting or franchising (or 'competition for the market')?
- What rules should apply for accessing and developing coach stations, both to allow equal access by operators to main stations and to allow operators to establish alternative facilities?
- How is a government to monitor services and control anti-competitive abuses?

6.4.4.2. Trucks

Raising professional standards in trucking is important if road transport is to play its full role and offer high quality services. Two approaches (not mutually exclusive) are possible here: regulation by government through some form of operator licensing, or self-regulation by the trucking industry through setting of professional standards of certification. Enforcement constraints limit the scope for using operator licensing, although this is common practice in European and other developed countries. Accreditation can be used by qualifying operators to attract potential customers, can increase the creditworthiness of operators, and provides the practical basis in the longer term for incorporating effective professional standards into operator licensing and gaining support in the industry for enforcement efforts.

For road transport to play its full role in international transport, particular attention must be given to minimizing border delays due to customs and other procedures. These cause significant impediments to trade in regions such as Europe, where transit movements are

common, and become an issue where trade facilitating measures are proposed in other regions, such as by SADC in Africa and ESCAP in South East Asia. Although international treaties or agreements, such as the TIR road transit agreement, are being adopted increasingly in such areas, implementation is far from easy due to the need to build up trust and appropriate safeguards among operators and customs. Furthermore governments are often concerned about their national trucking industries being unable to compete with foreign companies from more developed economies with higher technical and professional standards. However, protection of national operators only increases impediments to trade and does not encourage efficiency - so the preferred solution is to enable the operators to adapt to the higher international standards. See International Transport for a description of how international road transport agreements are being introduced in a phased way in the SADC region and how border delays can be reduced through introducing the TIR system. See European Community Legislation on Road Transport in Accession Candidate Countries for information on what laws, etc. countries aspiring to join the EU will have to adopt.

Annexes:

Annex 24 TEM BACKBONE NETWORK, EXTENSIONS, ADDITIONAL AND MISSING LINKS

Annex 25 TEM MASTER PLAN BACKBONE NETWORK

Annex 26 TEM NETWORK STATUS MAPS (available to the participating countries only)

Annex 27 MAPS OF TEM SECTIONS WITH BOTTLENECKS (available to the participating countries only)

7. ADDRESSING FUNDING QUESTIONS

7.1 Projects' Technical Priorities, Financing Priorities and Feasibility and Funding Considerations

7.1.1. Scope

This chapter refers to the following sub-tasks:

- Identification of specific projects for the implementation based on the proposed TEM Master Plan
- Estimate of budget for the implementation of the proposed TEM Master Plan
- Estimate of financial resources available
- Identify possible sources of funding (e.g. EUROPAID, World Bank, EIB, EBRD, Japanese Development funds, other countries development funds) and the required procedures

This chapter is developed in three parts. The first part presents the results of the "technical" prioritisation phase of the methodology, else the direct application of the methodology, which provides the scores for projects. The second part presents the results of the "financial" prioritisation phase, which examines the financial capability of the country to implement all the projects -and, which might force some projects to shift implementation over time-, and finally provides the short-term, mid-term and long-term investment plan. The third part identifies possible sources of funding for country projects that have not yet secured funding, the eligibility criteria for the respective countries to receive funds as well as the required procedures.

7.1.2. Technical Prioritisation Phase

The ultimate goal of the technical prioritisation phase was to identify project's categorization -into the four pre-defined priority categories- according to their scores, in order to further support the elaboration of a short, medium and long-term investment strategy in each country concerned and encourage the realization of projects that have good chances of implementation and fall within the TEM Master Plan objectives.

In total 319 projects were included in this phase. Most of these projects were submitted by countries with sufficient information in order to be evaluated and some found in relevant studies such as REBIS, TIRS, Euro-Asian Linkages, Van Miert etc. This large

number of road and rail projects was evaluated and a first prioritisation of the projects was undertaken.

The evaluation was based on a multi-criteria method. In close co-operation with national representatives of the TEM countries, a comprehensive assessment was undertaken of each TEM project. The assessment included a total of 15 criteria, and for each criterion a score was given. The evaluation assigned weights to these scores and a total score for each project under study was arrived at. The 15 criteria used in the multi-criteria analysis are presented in previous chapters. Projects for which the evaluation did not apply were assessed on an individual basis, in close co-operation with the responsible countries..

Each project was identified with a unique **Project ID** specifying the country, the transport mode and a specific number.

The **score** column was a scale between 1 and 5, where 5 represented the highest possible score and 1 the least possible score.

The **category** column was the project's priority, which resulted from the score. If the project scores were between 4-5 then it belonged to priority category **I** (*projects, which may be funded and implemented rapidly, including on-going projects up to 2010*). If the project scores were 3-4 then it belonged to priority category **II** (*projects requiring some additional investigations for final definition before likely financing, or planned for implementation up to 2015*). If the project score was 2 then it belonged to priority category **III** (*projects requiring further investigations for final definition and scheduling before possible financing, or planned for implementation up to 2020*). If the project score was 1 then it belonged to priority category **IV** (*projects to be implemented in the long run, including the projects where insufficient data existed*).

The **comments** column indicated if there was any difference in each project regarding the evaluation/ prioritisation phase, in comparison with the rest.

The results of projects evaluation/technical prioritization are made available to the participating countries only.

7.1.3. Financing Feasibility Prioritization Phase

7.1.3.1. Description of the Phase

The first problem that needs to be solved when selecting investment projects is the size of the budget that can be afforded. Therefore, based on the technical prioritisation phase results, an examination shall be made as to whether each country can theoretically afford financing the projects selected in each priority category, within its boundaries.

In recent years, International Funding Institutions have considered that the acceptable proportion that internationally-relevant transport investment costs represent, compared with GDP for a country, should not be higher than 1.5 per cent per year in the long term, in order to limit the risk of over-indebtedness. This level was recommended by the ECMT Resolution n° 97/1 on Transport and Infrastructure Development adopted in Berlin on 21-22 April 1997. It was also used by the TINA project and it will be used here as well.

Therefore, the Consultant has accordingly tailored –following certain steps- and classified all projects into the four pre-defined priority categories by a process of trial and error, to arrive at the respective budgetary limits determined for each year.

The certain steps that were followed are:

1. Rank all projects in each country first by priority and then in each priority category by score, following a top-down approach. The projects in Priority I are identified from the beginning as CLASS 1. The projects in Priority II are identified from the beginning as CLASS 2. The projects in Priority III are identified from the beginning as CLASS 3. The projects in Priority IV are identified from the beginning as CLASS 4.
2. Projects that are UNDER CONSTRUCTION or CROSS-BORDERS ones are moved in CLASS 1 regardless their initial Priority Category. The rest remain in same CLASSES.
3. Check projects in CLASSES 2, 3 and 4, according to Van Miert, REBIS and TIRS. So if a project results i.e. to be in priority category II according to TEM and TER Methodology but according to i.e. Van Miert prioritization belongs in another Priority Category (i.e. A, B or C) then Van Miert's prioritization will be followed. SO IF: (a) the projects present higher priorities in Van Miert, REBIS or TIRS are placed in CLASSES according to the priorities identified in these studies (b) the projects present lower priorities in Van Miert, REBIS or TIRS are placed in CLASSES according to the priorities identified in TEM and TER study and (c) the projects present same priorities in Van Miert, REBIS or TIRS they remain in their initial respective CLASSES.
4. Projects of CLASS 1 are then checked for threshold in IRR. If IRR < 4,5% or no IRR is available then their CLASS is lowered from CLASS 1 to CLASS 2.
5. The results of the first 4 steps are used as follows: CLASS 1 is the first investment/implementation class in the time horizon and projects belonging in

CLASS 1 will start before 2010. Respectively, projects of CLASS 2 will start before 2015, projects of CLASS 3 will start before 2020 and projects of CLASS 4 will start after 2020.

6. Put all the projects in the timetable, splitting their investment costs among the implementation years and in the first trial put the first payemtn of each project of each CLASS in the first year of the time horizon of the respective CLASS.
7. Then - following a process of trial and error - for EACH YEAR in the time horizon up to 2030 check if the sum of all investments per year is less or equal to 1,5% of country's GDP. If it is more, then start moving projects at a later year and possibly stage.

Following the 7 steps above a time-investement plan in each country was obtained. The results per country are made available to the participating countries only.

7.1.3.4. TEM and TER Network Implementation Plan

Summarizing all the results presented, the implementation of TEM and TER network as a whole will need 100.562,86 million € and will follow the time plan in FINAL TEMPLATE next. In this TEMPLATE the available/secured percentage of funding is shown as well.

Table 51 FINAL TEMPLATE – TEM & TER NETWORK

Country	***Projects***	***TEM and TER Network Implementation Progress***					***TEM and TER Network Funding***		
		Up to 2010	**2010-2015**	**2015-2020**	**After 2020**	***Unknown***	**Secured**	**Unsecured**	***Unknown***
AT	7	14%	86%	-	-	-	100%		-
BL	4	100%	-	-	-	-	100%	-	-
BH	15	14%	40%	6%	40%	-	25%	75%	-
BG	18	33%	27%	22%	18%	-	38%	62%	-
CR	43	56%	30%	12%	2%	-	70%	-	30%
CZ	13	69%	8%	23%	-	-	100%	-	-
Ma	8	25%	-	-	-	*75%*	25%	-	*75%*
GE	6	66%	-	-	33%	-	83,4%	16,6%	-
GR	17	29%	29%	35%	7%	-	29%	71%	-
HU	43	44%	26%	5%	2%	*23%*	44%	9%	*47%*
IT	0	-	-	-	-	-	-	-	-
LT	32	47%	28%	3%	22%	-	78%	-	*22%*
MD	3	66%	-	-	33%	-	-	100%	-
PL	97	33%	-	-	-	*67%*	1%	-	*99%*
RO	45	18%	16%	18%	52%	-	56%	44%	-
RU	31	100%	-	-	-	-	-	-	*100%*
SM	41	90,2%	9,8%	-	-	-	12,1%	-	*87,9%*
SK	24	4%	8%	42%	46%	-	100%	-	-
SL	14	36%	43%	7%	14%	-	50%	50%	-

TU	24	50%	29%	21%	-	-	54%	46%	-
UKR	6	50%	-	50%	-	-	100%	-	-
Whole Network	***Projects***	***TEM and TER Network Implementation Progress***					***TEM and TER Network Funding***		
		Up to 2010	**2010-2015**	**2015-2020**	**After 2020**	***Unknown***	**Secured**	**Unsecured**	***Unknown***
	492	45,1%	16,7%	10,0%	11,9%	*16,3%*	41,1%	16,3%	*42,6%*

7.1.4. Funding consideration/ eligibility criteria and required procedures.

This part identifies possible sources of funding for country projects that have not yet secured funding, the eligibility criteria for the respective countries to receive funds as well as the required procedures. It is not concentrated on each country separately, but on the funding sources.

7.1.4.1. European Investment Bank (EIB)

Projects Eligible For Bank Financing

Within The European Union, projects considered for EIB financing must contribute to one or more of the following objectives:

- Balanced economic development of the Union and its less favored regions;
- Enrichment of human capital: health and education;
- Information technology and communications networks
- Research and development;
- Diffusion of innovation;
- Transport, telecommunications and Trans-European Networks (TENs);
- Environment: protection and improvement of the natural and urban environment,
- Projects with a positive impact on the regional or global environment (sustainable development and prevention of climate change);
- Increasing the competitiveness and integration of European industry;
- Development of small and medium-scale enterprises (venture capital funding aimed at stimulating innovation by SMEs and entrepreneurship is undertaken by the European Investment Fund).
- Securing the energy supply base and conserving energy.

In the *Accession Countries*, the EIB underpins development of basic infrastructure, the creation of new activities, protection of the environment and transfer of the existing body of Community legislation.

Outside The Union, the Bank participates in implementing the Union's development aid and cooperation policies through long-term loans from own resources or subordinated loans and risk capital from EU or Member States' budgetary funds. It operates in:

- The **non-member Mediterranean countries** by helping to attain the objectives of the Euro-Mediterranean Partnership with sights set on the establishment of a Customs Union by 2010;
- The **African, Caribbean and Pacific States (ACP), South Africa and the OCT**;
- **Asia and Latin America**, where it supports certain types of project of mutual interest to the Union and the countries concerned;

- The **Balkans**, where it contributes to the goals of the Stability Pact by directing its lending specifically towards reconstruction of basic infrastructure and projects with a regional dimension.

Table 52 Loans Activity Breakdown by region

Region	***Current year (in EUR)***	***Past 5 years (in EUR)***
European Union	26,174,501,924	169,033,777,103
Article 18	188,834,298	991,223,790
Accession Countries	103,000,000	2,739,700,000
Mediterranean countries	821,498,958	7,096,205,558
Africa, Caribbean, Pacific countries + OCT	219,872,073	2,038,240,185
South Africa	100,000,000	751,800,000
Balkans countries	311,000,000	1,330,000,000
Asia and Latin & Central America	207,943,995	1,898,548,436
Commonwealth of Independent States	0	25,000,000
Total Amount	28,126,651,248	185,904,495,072

Project appraisal

As a borrower on the markets whose remit is to support viable projects helping to achieve the objectives of the European Union, the EIB attaches special importance to appraisal of projects put to it. Projects are examined by the EIB's teams of engineers, economists and financial analysts cooperating closely with the promoter. This examination focuses on the eligibility of the project, i.e. whether it conforms to those EU objectives, which the EIB is responsible for promoting.

Eligibility

Within the European Union, projects considered for EIB financing must contribute to one or more of the following objectives:

- Strengthening economic and social cohesion: promoting business activity to foster the economic advancement of the less favoured regions;

- Improving infrastructure and services in the health and education sectors, key contributors to human capital formation;
- Developing transport, telecommunications and energy transfer infrastructure networks with a Community dimension;
- Preserving the natural and urban environment, notably by drawing on renewable energy;
- Securing the energy supply base by more rational use, harnessing of indigenous resources and import diversification;
- Assisting the development of SMEs by enhancing the financial environment in which they operate:
  - Through medium and long-term loans;
  - Through venture capital support.

Outside the Union, the Bank participates in implementing the Union's development aid and cooperation policies through long-term loans from own resources or subordinated loans and risk capital from EU or Member States' budgetary funds.

The EIB is mandated to conduct operations in:

- The Central and Eastern European Countries and certain Mediterranean Countries which have applied for membership of the EU;
- The Euro-Mediterranean Partnership Countries;
- The African, Caribbean and Pacific States (ACP), South Africa and the OCT;
- Asia and Latin America;
- The Western Balkans.

This examination evaluates the project's economic, technical and financial characteristics. This confidential appraisal enables the promoter to benefit from the experience and know-how acquired by the EIB in dealing with a wide range of projects in all Member States of the Union.

Evaluation

Working closely with the promoter, the EIB's departments make a documentary and on-site evaluation of the practical viability, economic benefits and scheduled implementation of the proposed project. Careful account is also taken of protection of the environment and compliance with procurement procedures.

The evaluation also looks at the cost of a project, its finance plan and the standing of its financial and technical partners. The financial situation of the promoter, the projected cash flow and the security offered are also examined. After completion of the appraisal the decision to grant a loan is taken by the EIB's Board of Directors.

Decision-making

The EIB, bearing in mind wider considerations of common benefit, seeks the opinion of the Member State concerned and of the European Commission.

The project is then submitted for examination and approval firstly to the Management Committee of the EIB and then to its Board of Directors.

Once the finance contract has been signed with the promoter the loan is disbursed in one or more installments in keeping with requirements and progress on the works. Once finance has been provided for the project its progress is monitored regularly. The Bank can thus assist with any of the project's or promoter's additional requirements, while ensuring compliance with the aims of its financing decision.

Project monitoring

The EIB monitors the project until completion as well as during the loan repayment period.

In particular, it verifies regular servicing of the loan, checks that the funds are used in line with corresponding objectives and forecasts and keeps abreast of developments concerning the promoter and his partners. Finally, the Bank ensures that the project is implemented in accordance with the contract and evaluates its results.

Project Cycle

Introduction

The mission of the European Investment Bank is to further the European Union's objectives by granting long-term loans in support of viable capital investment. The Bank's lending:

- has grown to an annual volume of nearly EUR 36 billion,
- committed in support of almost 300 operations;
- is accomplished with a workforce remaining stable at around 1 000;
- is set against a background of increasing complexity and diversity of operations, both within and outside the Union.

Geared towards the long-term financing of productive projects, of both a tangible and intangible nature, the Bank performs its remit:

- in direct contact with the market, including a growing number of private enterprises;
- after careful analysis of projects, borrowers and guarantees.

As a bank, the EIB:

- Assesses the viability of projects from four points of view: economic, technical, **environmental and financial**;

- Evaluates each capital project and follows it through to completion;
- Subjects each project, both within and outside the Union, to a process of appraisal and monitoring designed to ensure that its operations are in line with its role as the Union's financing institution and contribute value added in conjunction with other lenders; for projects outside the Union, fosters the transfer of the existing body of Community legislation and regulations.

The standard procedures described are, of course, tailored to each individual project.

Initial Approach To The EIB

Projects can be submitted to the Bank, officially or informally, by:

- Potential promoters (private or public companies);
- Commercial banks wishing to involve the EIB in their finance plan;
- Public authorities, international or national development finance institutions.

It is desirable for projects to be presented to the Bank at the earliest possible stage, especially in the case of infrastructure schemes and projects mounted under public-private partnerships.

In all cases, the EIB gives promoters a rapid response based on its knowledge of each country's economic and financial context. At this stage the Bank checks whether the project envisaged meets its fundamental criteria, notably regarding eligibility, scale, sources of additional finance (the EIB acts as a complementary source of finance) and economic sector. This initial examination may already lead the Bank to:

- Suggest improvements to the technical, economic or environmental specifications of the capital projects submitted for financing;
- Draw the promoter's attention to certain procedures to be followed (award of contracts, compliance with environmental requirements, etc.)
- Request modifications to the loan application.

Examination Of Projects

If a project appears to meet the Bank's criteria and the EIB's financial involvement seems likely to generate value added:

- The appraisal procedure is launched by the Directorate General for Lending Operations, on the basis of a file compiled by the promoter
- The **Management Committee is informed** of the main features of the planned project and the principal aspects on which the appraisal will focus;
- An **appraisal team** composed of representatives of all Directorates concerned is set up to prepare the appraisal. A timetable is established;
- A **site visit** to the promoter is organized by the Directorate General for Lending Operations.

Depending on the project, an engineer and/or economist may join the loan officer in discussing in detail with the promoter the project's parameters and the Bank's potential support.

Information Provided By The Promoter

The form and content of documents in the project file submitted to the EIB are the responsibilities of the borrower, who may, if necessary, seek internal or external technical assistance with their preparation. The diversity of projects makes it difficult in practice to standardize the documents needed for the appraisal. For this reason, the Bank does not require potential borrowers to complete set forms or questionnaires. **The following list is therefore intended as a guide** since during the appraisal the EIB will liaise closely with the enterprise or administrative body concerned in order to identify jointly the main problems likely to arise before and after commissioning of the project.

The documentation submitted to the Bank **(which must of course be tailored to the nature of each individual project)** should cover the following points:

- General and legal information about the borrower.
- Financial data.
- Technical data: general design and technical description of the project; study and implementation; detailed estimate of investments; operation.
- Environmental data: environmental design of the project; measures taken to comply with or exceed applicable national, European and international standards; where necessary, environmental impact assessment as well as measures taken to ensure public consultation; where appropriate, planned provisions of an "Environmental Management Plan" for the project.
- Economic data: for calculating the project's economic rate of return, in particular: market, sales policy and organization, impact on employment, etc.

Project Appraisal

After returning from the site visit, if its findings are positive, the Bank's team conducts a detailed project appraisal, following which the Management Committee examines the financing proposal and passes it on to the Board of Directors for decision.

Each project is also referred by the EIB to the Member State concerned and the Commission for their opinions. These opinions are a precondition for the signing of the finance contract.

The Commission has a period of two months to make its opinion known to the EIB.

The following criteria form the basis of a standard EIB appraisal but are tailored to each individual project. These points are all covered by the report submitted to the Board of Directors for a financing decision

Rationale for Bank financing: eligibility, value added of the operation.

The project's contribution to European Union objectives supported by the EIB2 is ascertained. The analysis also reveals how the Bank's input brings **"value added"** to the project: this may be apparent in the financial terms offered, in the EIB's active and "catalytic" role in structuring the finance plan, or in the improvement of the project's technical specifications

Market and sector

This analysis is based on the information gathered during project appraisal and on the **sectoral studies** regularly carried out by the Projects Directorate. It looks at the sector in question, establishes worst and best-case scenarios based on reasonable projections and assesses the promoter's qualities in relation to the project and the project's ability to meet existing demand.

Technical description, capacity

The Bank's analysis looks at the project's technical soundness and the promoter's ability to implement the technical solutions adopted. It also examines the technical risks and measures taken to attenuate these.

Investment cost

The EIB examines the total investment cost, the main project costs compared with those of similar schemes financed by the Bank, the margins for contingencies and price inflation adopted and the impact of taxes on the project and promoter

Implementation

The Bank's analyses cover the following points:

- Technical: establishment of a "technical description" of the project, to be **appended to the contract** and serve as a basis for future monitoring.
- Procurement: compliance with current procedures; percentage of project cost subject to international competitive bidding; acceptability to the Bank of procedures envisaged.

Operation

Management; measures taken to meet particular risks; evaluation of operating costs; employment.

Environmental impact

Environmental situation with and without the project; where appropriate, review of studies of alternative solutions; project's impact on the natural and human environments; definition of the measures adopted to prevent, reduce or mitigate any adverse effects; compatibility with current or proposed environmental legislation; existence of an

environmental management plan and promoter's ability to implement and manage it; examination of environmental aspects over the life of the project; project's compatibility with sustainable development objectives - including prevention of climate change - to which the European Union is committed.

In performing the environmental part of its appraisal, the Bank makes use of the variety of studies carried out by the promoter or by independent consultants on its behalf EIAs, SEAs, SISs, etc,. The Bank examines the mitigating measures proposed, reserving the right to ask for further studies to be undertaken by competent external consultants. **In any event, the EIB ensures compliance with adequate project related conditionality**.

Prices, tariffs and financial return from the project

- Calculation of the expected cash flow in real terms.
- Where appropriate, the forecasts and analyses of certain financial ratios may serve as a basis for formulating appropriate tariff policies.
- Sensitivity and/or risk analysis

Economic benefits

Economic justification of the project; economic appraisal of value added of the project and the Bank's input; calculation of the project's economic rate of return; estimation of external costs/benefits, such as environmental protection, regional development, etc; sensitivity analysis

Financial and credit risk analysis

The Directorate General for Lending Operations performs a **detailed financial analysis of the borrower** - as well as of **the guarantor** if the operation is backed by a commercial guarantee. This can of course be simplified for the EIB's repeat borrowers.

Where public borrowers promoting infrastructure projects are concerned (e.g. regions or municipalities), a different type of financial analysis is performed, based on documents of a budgetary nature. The Credit Risk Department casts an objective eye on the **financial viability of the borrower and guarantor**, with whom it has no business relationship

Appraisal of global loans

Global loans are credit lines, which the EIB makes available to financial intermediaries for financing small and medium-scale projects; either ventures mounted by SMEs or small-scale infrastructure schemes. This type of loan enables the Bank to contribute indirectly to the long-term financing of projects, which, because of their size, are not eligible for direct EIB funding. The volume of such lending varies from country to country. In total, both within and outside the European Union, the Bank has dealings with nearly 400 banks and financial institutions, which are or have been its partners in deploying this type of instrument.

The appraisal of global loans essentially entails an examination of the intermediary bank from two main angles:

- Financial robustness and ability to enter into a lasting relationship with the EIB;
- Ability of the financial intermediary to channel EIB funds swiftly to customers targeted by the global loan (SMEs or promoters of small-scale infrastructure): specialization, size of portfolio, appraisal methods for this type of project, procedures for monitoring borrowers and projects, etc

The appraisal team seeks to define precise criteria in discussions with the intermediary, so as to optimize the impact of the long-term resources made available by the EIB.

Project Approval

The overall results of the appraisal are summarized in a report to the Board of Directors. The Management Committee conducts a prior examination of this report and its various annexes covering technical, environmental, economic, financial, legal and credit risk aspects. Once the draft report is approved, it is passed on to the Board of Directors for decision. The Board decision may be taken while there are still a number of points to be finalized (e.g. in the case of a public-private partnership project). Approval by Directors conditional upon the resolution of any outstanding issues, thus plays a decisive catalytic role and speeds up the project's launch. The Board's decision to approve the loan does not take effect until the finance contract is signed.

The **financing decision is subject to**:

- The opinions of both the EU Member State on whose territory the project will be located and the European Commission;
- Receipt of a formal loan application from the promoter;
- Contractual finalization of any points still unresolved when the financing decision was taken by the Board.

Finance Contract Signature

Responsibility for this process lies with the Legal Affairs Directorate, working in conjunction with all other Directorates concerned. **The finance contract** incorporates all the key elements forming the basis for the Bank's decision and studied during appraisal. It includes an appended technical description and any necessary technical, economic or environmental conditions. Where appropriate, it is supplemented by one or more guarantee contracts.

Draft contracts are also submitted to the Credit Risk Department, which has to endorse the main financial clauses.

The approval is valid for one year. Where duly warranted, however, this period may be extended.

Following contract signature, the project is usually announced in a press release. Information on all projects financed by the Bank is published on the EIB's website

(www.eib.org) as well as in the statistical supplement accompanying the Bank's Annual Report.

7.1.4.2. European Bank for Reconstruction and Development (EBRD)

Introduction

The European Bank for Reconstruction and Development was established in 1991 when communism was crumbling in central and Eastern Europe and ex-soviet countries needed support to nurture a new private sector in a democratic environment. Today the EBRD uses the tools of investment to help build market economies and democracies in 27 countries from central Europe to central Asia.

The EBRD is the largest single investor in the region and mobilizes significant foreign direct investment beyond its own financing. It is owned by 60 countries and two intergovernmental institutions. But despite its public sector shareholders, it invests mainly in private enterprises, usually together with commercial partners.

It provides project financing for banks, industries and businesses, both new ventures and investments in existing companies. It also works with publicly owned companies, to support privatization, restructuring state-owned firms and improvement of municipal services. The Bank uses its close relationship with governments in the region to promote policies that will bolster the business environment.

The mandate of the EBRD stipulates that it must only work in countries that are committed to democratic principles. Respect for the environment is part of the strong corporate governance attached to all EBRD investments.

Every EBRD investment must

- Help move a country closer to a full market economy: the transition impact
- Take risk that supports private investors and does not crowd them out
- Apply sound banking principles

Through its investments, the EBRD promotes

- Structural and sectoral reforms
- Competition, privatisation and entrepreneurship
- Stronger financial institutions and legal systems
- Infrastructure development needed to support the private sector
- Adoption of strong corporate governance, including environmental sensitivity

Functioning as a catalyst of change, the EBRD

- Promotes co-financing and foreign direct investment
- Mobilizes domestic capital
- Provides technical assistance

Apply for financing

The EBRD is the largest single investor in central and Eastern Europe and the CIS. The Bank has committed more than €20 billion to over 800 large projects. Small projects are almost always financed through financial intermediaries. By supporting local commercial banks, micro-business banks, equity funds and leasing facilities, the EBRD has helped finance around 200,000 smaller projects.

The EBRD provides loan and equity finance, guarantees, leasing facilities and trade finance. The Bank also finances professional development through support programmes.

Finance for large projects

EBRD investments in private sector projects range from **€5 million - €250 million**; the average amount is €25 million. The Bank takes a flexible approach and tailors solutions to the needs of private investors. The Bank finances privatisations and restructures. It also supports municipal services and the infrastructure that underpins the private sector.

These guidelines are for the private sector. Public sector projects are initiated directly through dialogue with governments.

Criteria and structure - large projects

EBRD funding criteria for projects from €5 million - €250 million

- The project must be located in an EBRD country of operation

Table 53 Countries of operations

Albania	Georgia	Romania
Armenia	Hungary	Russia
Azerbaijan	Kazakhstan	Serbia and Montenegro
Belarus	Kyrgyz Republic	Slovak Republic
Bosnia and Herzegovina	Latvia	Slovenia
Bulgaria	Lithuania	Tajikistan
Croatia	FYR Macedonia	Turkmenistan
Czech Republic	Moldova	Ukraine
Estonia	Poland	Uzbekistan

- It must have good prospects of being profitable.
- Significant equity contributions in cash or in kind are required from the project sponsor.
- The project must benefit the local economy.
- It must satisfy EBRD's environmental standards as well as those of the host country.

Smaller projects are almost always financed through financial intermediaries. In exceptional circumstances, the EBRD can consider financing smaller projects.

Project structure

The Bank tailors solutions to client and project needs and to the specific situation of the country, region and sector. It assigns a dedicated team of specialists with expertise in project finance, the region and sector, law and environment.

- The EBRD funds up to 35% of the total project cost for a greenfield project or 35% of the long-term capitalisation of an established company.
- Additional funding by sponsors and other co-financiers is required. The EBRD may identify additional resources through its syndications programme
- Typical private sector projects are based on at least one-third equity investment.
- Significant equity contributions are required from the sponsors. Sponsors should have a majority shareholding or adequate operational control. In-kind equity contributions are accepted.

Excluded sectors the EBRD does not finance

- Defence-related activities
- Tobacco industry
- Substances banned by international law
- Stand-alone gambling facilities.

In addition, the Bank may not finance certain products or processes due to their environmentally harmful nature or if adverse impact cannot be adequately mitigated.

Loans for large projects

The EBRD's loans are structured with a high degree of flexibility to provide loan profiles that match client and project needs. This approach determines each loan currency and interest rate formula.

The basis for a loan is the expected cash flow of the project and the ability of the client to repay the loan over the agreed period. The credit risk can be taken entirely by the Bank or may be partly syndicated to the market. A loan may be secured by a borrower's assets and/or it may be converted into shares or be equity-linked. Full details are negotiated with the client on a case-by-case basis.

Loan features

- Minimum €5 - 15 million, although this can be smaller in some cases.
- Fixed or floating rate.
- Senior, subordinated, mezzanine or convertible debt.
- Denominated in major foreign or local currencies.
- Short to long-term maturities, from 5 to 15 years.
- Project-specific grace periods may be incorporated.

Interest rates

EBRD loans are based on current market rates and are priced competitively. Financial terms can be discussed in detail with banking staff once a project has been presented to the Bank. The EBRD does not subsidise projects, nor does it offer soft loans.

The Bank offers both fixed and floating interest rates:

- Fixed rate basis, linked to a floating rate such as LIBOR.
- Floating rate basis with a cap or a collar.

As the type rate directly affects profitability, a project's financial structure should preferably include both floating and fixed rate loans. The mix is evaluated with respect to client and project sensitivities to interest rate movements.

Fees and charges

A margin is added on to the base rate. The margin is a combination of country risk and project-specific risk. This information is confidential to the client and the Bank.

In addition to the margin, the Bank may charge some of the following fees and commissions:

- Front-end commission, paid up-front.
- Commitment fee, payable on the committed but undisbursed loan amount.
- Loan conversion fee, paid at the time of interest rate or currency conversion on the amount which is to be converted.
- Prepayment, cancellation and late payment fees are also charged if necessary.

In line with commercial practice, sponsors will be obliged to reimburse the Bank for out-of-pocket expenses, such as fees for technical consultants, outside legal counsel and travel expenses.

Other lending terms

Full lending terms are negotiated with the client for each project.

Recourse

Recourse to a sponsor is not required. However, the EBRD may seek specific performance and completion guarantees plus other forms of support from sponsors of the kind that are normal practice in limited-recourse financing.

Insurance

The Bank requires project companies to obtain insurance against normally insurable risks. Examples include theft of assets, outbreak of fire, specific construction risks. The

EBRD does not require insurance against political risk or non-convertibility of the local currency.

Security

The EBRD usually requires the companies it finances to secure the loan with project assets. These can include:

- Mortgage on fixed assets, such as land, plant and other buildings.
- Mortgage on movable assets, such as equipment, other business assets.
- Assignment of the company's hard currency and domestic currency earnings.
- Pledge of the sponsor's shares in the company.
- Assignment of the company's insurance policy and other contractual benefits.

Covenants

Typical project finance covenants are required as part of the loan package. Such covenants, limiting indebtedness and specifying certain financial ratios and various other issues, will be negotiated.

Loan repayment

Repayment is normally in equal, semi-annual installments. Longer maturities may be considered on an exceptional basis, for example, up to 15 years for large infrastructure operations.

Hedging possibilities

The Bank can help manage financial risks associated with a project's assets and liabilities. This covers foreign exchange risk, interest rate risk and commodity price risk. Risk hedging instruments include currency swaps, interest rate swaps, caps, collars and options and commodity swaps.

Large project guarantees

The EBRD provides various types of guarantees. These range from all-risk guarantees whereby the Bank covers lenders against default regardless of the cause, to partial risk-specific contingent guarantees covering default arising from specified events.

In all cases the maximum exposure must be known and measurable and the credit risk must be acceptable. Precise legal definitions of the events guaranteed and pricing are handled on a case-by-case basis.

Illustration of generic products

- Debt guarantees
- Equity guarantees
- Local currency loan guarantees
- Guarantees for capital market products
- Guarantees for trade facilitationContact.

Project stages

When the EBRD has all the necessary information, a deal typically takes three to six months from initial contact to signing. In some cases, however, this can be shorter. The total project cycle, from initiation to repayment, can range from one year for working capital or trade financing projects to 15 years for long-term sovereign infrastructure projects.

The EBRD project cycle consists of the following stages:

Concept Review – The EBRD's Operations Committee (OpsCom) approves the project concept and overall structure, including proposed financing structure and supporting obligations. At this stage, the EBRD and the client sign a mandate letter, which outlines the project plan, development expenses and responsibilities.

Final Review – Once the basic business deal (including a signed term sheet) has been negotiated and all investigations have been substantially completed, the project receives a Final Review by OpsCom.

Board Review – The EBRD President and operation team present the project to the Board of Directors for approval.

Signing – The EBRD and the client sign the deal and it becomes legally binding.

Disbursements – Once repayment conditions are agreed and the Bank's conditions met, the funds are transferred from the Bank's account to the client's account.

Repayments – The client repays the loan amount to the EBRD under an agreed schedule.

Sale of equity – The Bank sells its equity investments on a non-recourse basis.

Final maturity – The final loan amount is due for repayment to the Bank.

Completion – The loan has been fully repaid and/or the EBRD's equity investment divested.

Fig. 19

Small and medium finance

Many projects are too small to be funded directly by the EBRD. To give entrepreneurs and small firms greater access to finance, the EBRD supports financial intermediaries, such as local commercial banks, micro-business banks, equity funds and leasing facilities.

Investment criteria are consistent with EBRD policy, but financial intermediaries make independent decisions about which small and medium exterprises (SMEs) they fund

Small and medium loan funding requirements

The EBRD's financial intermediaries consider sound and sensible projects that support private sector development. Each bank or programme has its own requirements and investment limits. For detailed financing information, contact the intermediary directly.

SME requirements for obtaining loans through local banks

- Sound business plans for establishing or expanding a company's business.
- Solid management with a proven track record.
- Products that are competitive in the marketplace.
- Information on owners/partners.
- Financial history.
- Security in the form of pledges, mortgages, etc.
- Funds provided must be used in strict accordance with the aims stated in the original business plan.

- In line with the EBRD's mandate, banks ensure that all proposals pay due regard to environmental issues.
- Funding cannot be provided to majority state-owned companies or for government-guaranteed projects.
- In addition, equity contributions, either in existing or new business, of around 35% are often required.

Municipality requirements for obtaining loans through local banks

Funding for infrastructure projects is available to small and medium-sized municipalities and their utility companies in the EU Accession countries. Requirements:

- Population served by the municipality of under 100,000 people. For Bulgaria and Romania, under 150,000 people.
- Able to repay the loan through the municipality's cash flow and to meet specified financial ratios in loan agreements.
- Competent financial management and budgetary control procedures.
- Willing to apply EBRD procurement and environmental requirements.
- Willing to provide visibility for the EU's contribution.
- Commitment to publicize any EU technical cooperation support received through events or press releases.

Transport Sector

The EBRD has invested €3.16 million in the transport sector as of 31 December 2003. These investments are spread across a total of 97 projects. In the following paragraphs, some case studies are presented.

Improving the road system in Kazakhstan

In a country bigger than western Europe but with a population of little more than the Netherlands, roads provide a vital link for Kazakhstan's dispersed communities. But for Kazakh drivers, tight state budgets in the 1990s have meant that some 65 per cent of the country's 23,000 km of highways are in poor repair.

In the west of the country near the Caspian coast, road quality will improve dramatically following an EBRD loan of €95 million to the Kazakh Government. The financing, expected to be bolstered by a loan of around €40 million from the Asian Development Bank, will fund the upgrading of a 900km road, improving links between Kazakhstan's main port of Aktau and the regional centre of Atyrau.

Work on the route started in the 1960s but was never completed and much of the road is currently in poor condition. The new road will improve access to Kazakhstan's oil-rich western region and the Caspian Sea. With oilfield development vital to the country's economic growth, the road provides an important route for the transport of equipment and personnel.

"With EBRD support, this project will play an important part in the upgrading of an important international transport corridor linking Turkmenbashi, Atyrau and Astrakhan, which is vital for the countries of Central Asia and Russia," said Erik Khamsinovich Sultanov, Chairman of the Kazakh Government's Roads Committee.

The project will also lead to greater recovery of road costs from drivers, with fees for road use linked to the type of vehicle. This will result in more sustainable financing for the road sector in the future. A grant from the EU's Tacis programme funded part of the project's preparation costs

Russia: Take-off for Russian aircraft makers

Russia has a proud heritage in aerospace technology. During the soviet era, Russian companies were world leaders in the manufacture of both civil and military aircraft. But following the collapse of the Soviet Union, investment in this hi-tech sector fell sharply, leading to a dramatic decline in Russia's ability to compete in the international aerospace market.

In the EBRD's first venture in the aircraft manufacturing business, we are helping to revive this sector by providing Sirocco Aerospace Russia with a €36 million loan to finance construction of a new export-oriented version of the Tupolev cargo aircraft, which is currently undergoing European certification. The Rolls-Royce powered aircraft will be built at Aviastar's advanced assembly facility in the Volga region, which employs some 7,000 people.

The company's first export contract is to supply five aircraft to two airlines in China, the world's fastest growing aviation market. The loan will also help to re-establish Russia as an effective, low-cost competitor in the aircraft markets in Africa, the Middle East and the Pacific Rim.

"The Tupolev is a proven aircraft, well-positioned to compete internationally. With EBRD support, we can move more quickly into these new markets," said Dr Kamel, Chairman of Sirocco Aerospace.

The project is also expected to develop skill levels as Tupolev will benefit from the expertise of Western aircraft companies involved in the supply of parts and the certification process.

New road link to Russia's far east and less traffic for St Petersburg

During the long winter months, people living in remote settlements in Russia's Far East are completely cut off and can be reached only by air. At the other extremity of this huge country, trucks thundering through the centre of St Petersburg create congestion and pollution. With the EBRD's help and a 15-year loan of €218 million, two new road projects will transform the quality of life for these distinctly different communities.

Our first loan to the Russian road sector will help build a section of the first-ever East-West road link to the Russian Far East. When completed in 2005, a new two-lane road, covering 2,165 kilometres (between Chita and Khabarovsk) will run parallel to the Trans-Siberian railway and provide the first road connection between Moscow and Vladivostok.

As well as opening up this remote region, the road will speed the movement of goods and provide an alternative to rail freight, resulting in increased availability of essential commodities and lower transport costs.

Environmental damage arising from such an enormous construction project is minimised because of strict construction regulations. The project has passed all environmental requirements and was met with overwhelming approval during the public consultation period. Igor Slyunyaev, the head of the Russian Road Administration, Rosavtodor, comments: “The financing of the EBRD is an absolute necessity for us in order to be able to construct the Chita-Khabarovsk road and the St Petersburg bypass. Both roads are a priority for my country and I am very pleased that the EBRD is bringing its expertise to assist us with the construction and the reform of the road sector.”

Construction starts in 2003 on the EBRD-financed section of the St Petersburg eastern bypass, which will take heavy trucks away from the historic city centre. This will reduce noise and pollution, and improve road safety and air quality for St Petersburg residents. Reform of how the road sector is financed is an integral part of the project. The EBRD is providing technical assistance to Rosavtodor to develop a road management system, to improve road safety and to upgrade quality control. This follows on from proposals (developed by consultants and now implemented) to recover some of the costs of road use by charging road users via dedicated taxes.

This project depends on close cooperation between the EBRD and the Russian Ministry of Transport, which will act as a model for future collaboration.

Railways recovery project, Bosnia and Herzegovina

The main railway network in Bosnia and Herzegovina is to be made safer and more reliable with the help of an EBRD investment of €21 million.

The loan will be used to repair an important 395 km stretch of rail track that provides a link to Hungary and Croatia through largely inaccessible terrain. Damage sustained during the war, political divisions and economic disruption have led to a rapid deterioration in Bosnia and Herzegovina's transport infrastructure. In the railway sector, this has resulted in low operating speeds, bottlenecks and concerns about safety.

To tackle this challenge, the railway companies approached the EBRD to finance investments identified in a priority investment plan. EBRD financing will help to support the economic recovery of the rail system and to improve the infrastructure on a key stretch of rail track for international business. It will assist with labour restructuring and strengthening management in the railway sector. In particular, it will help to meet the requirements of a new railway law, introduced in compliance with EU directives.

The EBRD's sovereign loan will finance the purchase of track maintenance machines, the restoration of the signalling system and a programme of labour severance. Parallel financing is being provided by the European Investment Bank. The EBRD has also mobilised grant funding from Canada, Japan and the United States to finance infrastructure work and other improvements.

7.1.4.3. World Bank

Transport Sector Overview

Why is the Transport Sector Important

- Value added by transport is estimated to account for 3 to 5 percent of GDP.
- Public investment in transport typically accounts for between 2.0 and 2.5 percent of GDP and may rise as high as 3.5 percent in countries modernizing outdated transport infrastructure or building new transport infrastructure.
- Transport likewise commonly accounts for 5 to 8 percent of total paid employment.
- Demand for freight and passenger transport in most developing and transition countries is growing 1.5 to 2.0 times faster than GDP the bulk of this increase is for road transport.
- Although demand for freight transport in industrialized countries grows less rapidly than GDP, in developing and transition countries the growth rate is closer to that for passenger transport.
- In 1994 foreign aid accounted for 12 percent of total infrastructure financing in developing countries (including transport), while private financing of infrastructure accounted for 7 percent and was rising. In 1996 private sector lending to emerging markets peaked at $196 billion. Since then it has fallen sharply and estimates for 1999 are just over $17 billion.

Sector Issues at a Glance

- Globalization of trade. Advances in international logistics (for example, multi-modal transport technology, electronic documentation, streamlined customs procedures, etc.) have greatly expanded the scope for international trade in goods and services
- Congestion and pollution: Growing road congestion, particularly in cities, generates pollution and increases road accidents (about 500,000 persons per annum are killed in road accidents in the Bank's developing member countries and about 70 percent of these fatalities are pedestrians)
- Transport sector deficits: Poorly managed public transport services impose a heavy burden on public finance (for example, until recently, the transport sector deficit in Zambia absorbed 12 percent of the government's total current revenues)
- Expenditure needs: Large sums of money are required to maintain and modernize existing transport infrastructure (for example, road spending alone often accounts for 10 percent to 20 percent of the government's development budget)
- Private capital flows: In 1996, lending to emerging markets by private sector creditors totaled $196 billion (about 15 percent of this went to the transport sector). The current global financial crisis has sharply reduced these private capital flows which are estimated to have fallen to $17 billion in 1998.

Transport Sector Policies

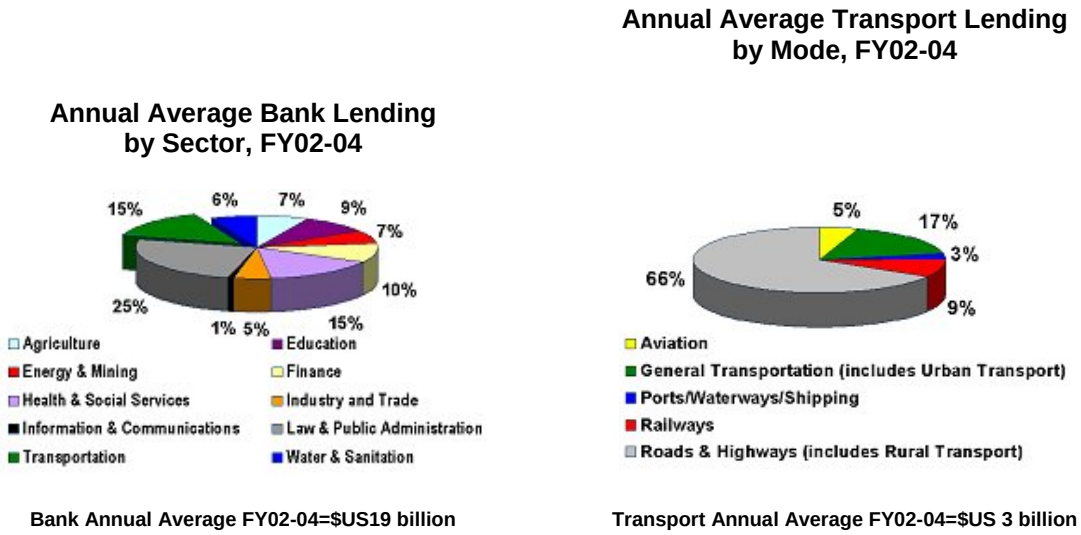
World Bank Sector Mission

- Access: Improve access to markets, employment and services to promote social and economic development of our developing member countries
- Public and private sectors: Assist clients to make best use of the public and private sectors in the provision of transport services
- Institutional and financial development: Promote institutions which can manage and finance the transport sector on a sustainable long-term basis

World Bank Sector Strategy

- Re-inventing government: Focus is on restructuring publicly-owned transport enterprises, privatizing where feasible, and commercializing/concessioning elsewhere to subject provision of transport services to the discipline of the market place
- Cutting public sector deficits: Railway concessioning has produced spectacular results: it has turned Brazil's $500 million rail deficit into an annual $160 million payment to the Treasury (Brazil Railways restructuring Project); likewise it has reduced Argentina's annual net deficit by $700 million (Argentina Public Enterprise Reform Adjustment Loan).
- Managing roads like a business: The vast majority of the Bank's road projects deal with maintenance and rehabilitation, and commercialization of road management and finance. Commercialization is moving ahead in all the Bank's regions with an increasing number of countries deciding to finance their roads on a fee-for-service basis (e.g., Jordan Third Transport Project, Zambia Road Sector Investment Program, Pakistan Highways Rehabilitation Project).
- Rural accessibility: There are several innovative projects in this area which are attempting to establish sustainable institutional arrangements for managing and financing rural roads (e.g., Guatemala Rural and Main Roads Project, Zambia Road Sector Investment Program).

World Bank Lending for Transport



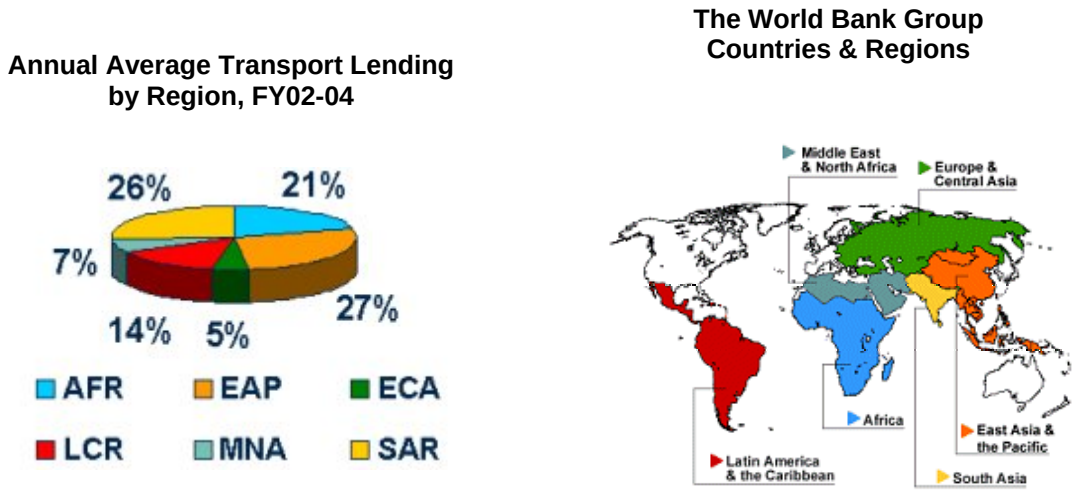


Fig. 20 The World Bank lending

The World Bank finances two types of projects to eligible member countries: long-term investment (5 to 10 years) and short-term adjustment (1 to 3 years) projects. Currently, the Bank's lending portfolio consists of some 1,900 active projects, representing annual disbursements of approximately $21 billion. The Bank's on-line projects database provides data and information on the current portfolio of pipeline, active, dropped, and closed projects

Roads and Highways

The Bank's Highway Design and Maintenance (HDM-III) model is recommended forbasic analysis, including economic evaluation, in assessing optimum works program, phasing, choice of technological options, etc. Even where HDM is not being used as the evaluation tool, it can be used as a basis for assembling operating cost estimates for a range of vehicle types using local input at different operating speeds, for which HDM-VOC software is available. In cases where HDM is not being used the assessment of the benefits to "base load" or "normal" traffic should be complemented by a consideration of the benefits to "generated" traffic, including traffic diverted from other routes, modes or destinations, as well as any forecast increase in the total number of trips or movements being made. The analysis should allow for the savings of cost on other routes, modes or O/D pairs in order to avoid overestimation of total benefit. Generated traffic (or associated degenerated traffic where diversions are involved) should normally be assigned a value half that of the base load traffic effects ("the rule of half"). However, generated freight traffic may in some circumstances require more careful analysis. For discussion of the evaluation of benefits to generated freight traffic, click here. Benefits for normal or base load traffic should be calculated at the resource cost of inputs, that is net of any taxes or subsidies. Special care should be taken to assess the impact on project returns of any distortion of input prices. For generated traffic the gross value should be calculated as the area under the demand curve as perceived by the user, less the total resource cost of the extra traffic. This will involve valuing traffic at the cost to users including fuel taxation, but also adjusted appropriately for any other well founded misperception of the user costs of transport.

The Roads and Highways section of the bank’s knowledge base will be expanded in the near future to address the following additional issues:

- secondary benefits
- modal interactions
- pricing effects - tolls and shadow tolls
- phasing / stage construction
- low volume roads and social benefit evaluation
- road safety

Railways

The Bank has invested heavily in the rail sector in the past, and continues to do so in some countries (for example, China). Experience with rail investment has never been fully satisfactory. One reason for this failure has been over-optimistic traffic forecasting, naively based on "trend-breaking" assumptions. It is therefore important that rail traffic forecasts should realistically model qualitative, as well as simple price, comparisons between modes, and should be based on a careful assessment of future changes in

industrial structure and a realistic view of trends in competing modes. A further source of failure of rail lending has been the continued inefficiency of parastatal rail corporations. For this reason the question of whether a rail project should be in the private or public sector is particularly important. Concessioning of rail undertakings to the private sector has been successful. Concessioning of operations to the private sector can be effectively combined with continued public contribution to investment finance. The possibilities of "unbundling" rail operations, to secure private participation should always be considered. A critical requirement of successful concession is the treatment of labor redundancy. Severance payments may now be financed through Bank loans, and should be subject to an economic evaluation

Economic Analyses in Transport Project and Program Appraisal

Purposes and Uses

The purpose of economic appraisal of investment projects is to ensure that selected projects are worthwhile (yield benefits with a value in excess of their costs); are well designed (are better value than alternative projects directed to the same end); and are practicable (the responsible agency has the capability and incentive to realize those benefits). The basic form of economic evaluation recommended for public sector investment project appraisal within the Bank is social cost benefit analysis. A social cost benefit analysis attempts to add together the effects on all affected parties, and brings together results of fiscal, financial, user benefit and third party impact analyses. It also attempts to value all costs and benefits to society, irrespective of to whom they accrue, in the calculation of a single indicator, the net present value (NPV) or the economic rate of return (ERR).

Wherever possible a project should be divided into separable components which can each be subject to economic testing. It is also important to ensure that alternative solutions are subject to comparable and consistent analyses. In particular, the comparability of the requirements made of road and public transport investments should be carefully established. While the calculation of a single indicator such as the ERR is a useful barometer in making "go/no-go" decisions, it is much more important for economic analysis to have been used in project design to inform such decisions on program composition, choice of technology, project timing and program phasing, infrastructure management, pricing and policy reforms. A quite common fear about the emphasis on the project ERR is that funds are essentially fungible, at least within sector budgets, so that what the Bank ought to be testing is not a specific project presented for finance, but the marginal project within the sector. This is rarely possible, and is best addressed by being satisfied that financing a specific project is not making space for a clearly unacceptable project. The issue of whether a project should be in the public or private sector should also be addressed as an economic issue.

Basic Appraisal Format

The economic evaluation of a transport project attempts to compare the benefits resulting from the investment with the costs of the investment. Ideally this would measure the total benefits in increased output across all final product sectors in a spatially and sectorally identified input output model. Such a model would also ideally pick up all external effects, including environmental impacts. In practice such models do not work at the necessary degree of refinement for project evaluation. More partial equilibrium approaches have been adopted in some rural transport project cases by estimating the increase in agricultural and other outputs associated with a project. Even this is not generally tractable with the result that appraisals generally concentrate on the "first round" impacts on transport users and producers. The comparison made in the analysis is between the situation "with project" and "without project", which must not be confused with a simplistic "before and after" comparison. In practice, however, the "do-nothing" alternative may be difficult to define. The costs and benefits considered should include all elements which contribute to individual welfare. On the cost side these include purchased inputs (for example, fuel), non-purchased inputs (time) and quality of service characteristics (such as comfort, convenience, reliability, flexibility, etc.) Thiw is referred to as the “generalized cost” of transport. The total benefit measurement includes benefits both to existing users and producers of transport services, and to those who are new users generated by an improvement, picked up in the "rule of half" measure. Effects on non-users (for example, noise or air pollution impacts on residents adjacent to a road or airport) should also be included. All values should be stated in constant price terms (i.e., 1998 dollars), except where changes in relative real prices can be confidently forecast. To allow costs and benefits accruing at differing points in time to be aggregated a discounting process is used, for which the specification of an appropriate discount rate is necessary. The relative merits and uses of the alternatives indicators used to represent the merit of the project (either a net present value (NPV) or the internal economic rate of return (ERR)) are discussed in detail in the OPR evaluation handbook.. As many of the elements of the rate of return or net present value estimation are subject to error, calculations of the sensitivity of the calculated net benefit indicator to ranges in individual parameters (capital cost, traffic growth rate, etc.) and calculation of "switching values" of individual parameters at which the project NPV or ERR becomes sub-marginal are a minimum requirement. Monte Carlo simulations can be used to explore more complex risk distributions.

Generic Valuation Conventions

The calculated economic value of a project depends critically on a small number of parameters, which have to be assumed or estimated. National economic growth rates are the main basis for most future demand forecasting. These should always be consistent with the rates adopted in the CAS, and advice on these should be sought from the country economist. The impact of growth on transport demand will then depend on the income elasticity of demand (the rate of change of quantity of transport services demanded with respect to rate of changes in income). This varies between passenger and freight, by mode, and by country type. Where possible local experience should be analyzed. For freight, the elasticity of ton kms with respect to GDP appears to lie between 1.05 and 1.25, with the higher values more appropriate for developing countries. Values around 1.25 appear to be appropriate conservative default values for road freight, while those for rail appear to be somewhat lower. For passenger transport, the elasticities of passenger

kilometers demanded with respect to income are usually substantially below 1 for bus transport, between 1 and 2 for rail and auto transport, and may be above 2 for air transport. Price elasticities show even greater variability. For land freight transport estimated price elasticities mostly fall in the range fall in the range from 0.4 - 1.2, suggesting a default value of about 0.8. For passenger transport elasticities are typically higher: for leisure than for business trips, for off-peak than for peak, and for air and rail than for bus or urban transit

Operating cost savings estimation are dealt with under the modal sections of this knowledge base. Shadow prices of resource inputs, of labor and of foreign exchange should always conform to country team norms and advice on these should be sought from the country economist. Values of time should usually distinguish at least between working time and non-working time, and wherever possible should be based on local data.

Valuing savings in accident costs should also be based on local estimates of accident incidence rates in different conditions as well as local values for both the resource impacts (loss of net output, repair and medical costs) and the human costs

Project Cycle

Overview

Each year the World Bank lends between US$15-$20 billion for projects in the more than 100 countries it works with. Projects range across the economic and social spectrum in these countries from infrastructure, to education, to health, to government financial management. The projects the Bank finances are conceived and supervised according to a well-documented project cycle. Documents produced as part of the project cycle can be valuable sources of information for interested stakeholders wanting to keep abreast of the work the Bank is financing and for businesses wishing to participate in Bank-financed projects. Below is a step-by-step guide to the project cycle, the documents that are produced as part of the process, and how to access them.

Fig. 21

The Bank recognizes that many past assistance efforts, including some of its own, failed because the agenda was driven by donors rather than by the governments it was trying to assist. Under its current development policy, the Bank helps governments take the lead in preparing and implementing development strategies in the belief that programs that are owned by the country, with widespread stakeholder support, have a greater chance of success.

In low-income countries, the Bank uses the Poverty Reduction Strategy (PRS) approach which involves widespread consultation and consensus building on how to boost development. Under this process, a national poverty reduction strategy is prepared by the country, creating a framework for donors to better co-ordinate and align their programs behind national priorities. The government consults a wide cross-section of local groups and combines this with an extensive analysis of poverty in the country's society and its economic situation. The government determines its own priorities from this process and produces targets for reducing poverty over a three to five year period. These are outlined in a Poverty Reduction Strategy Paper (PRSP). The Bank and other aid agencies then align their assistance efforts with the country's own strategy - a proven way of improving development effectiveness.

The Bank's blueprint for its work with a country is based on a Country Assistance Strategy (CAS) which, in the case of low income countries, is derived from the priorities contained in the country's Poverty Reduction Strategy Paper. The CAS is produced in co-operation with the government and interested stakeholders. The preparation of the CAS may draw on analytical work conducted by the Bank or other parties on a wide range of economic and social sectors, such as health, education, agriculture, public expenditure and budgeting, fiscal management, or procurement, among others.

The Identification Phase

The Bank's Country Assistance Strategy (CAS) forms the blueprint for its assistance to a country. In low-income countries, the CAS is based on the priorities identified in the country's Poverty Reduction Strategy Paper (as outlined above). The goals outlined in the CAS guide the priorities of the Bank's lending program and are a useful source of information for interested stakeholders and businesses wishing to identify potential future areas of Bank lending. During the identification phase, Bank teams work with the government to identify projects which can be funded as part of the agreed development objectives. Once a project has been identified, the Bank team creates a Project Concept Note (PCN) which is an internal document of four to five pages that outlines the basic elements of the project, its proposed objective, likely risks, alternative scenarios to conducting the project, and a likely timetable for the project approval process.

Useful public documents

- The Project Information Document (PID) is prepared after an internal review of the PCN and is released publicly through the Bank's InfoShop It is usually four to five pages long and contains the information mentioned above - the objective, a brief

description, etc. It also contains the name of the World Bank Task Manager or Team Lead who is supervising the project, a useful contact for companies interested in bidding for work on the project. The PID is an essential resource for tailoring bidding documents to the project concerned.

- The Integrated Safeguards Data Sheet (ISDS) is also prepared for the first time after the project's first formal review and made available publicly. It identifies key issues under the World Bank's safeguard policies for environmental and social issues, and provides information about how they will be addressed during project preparation.

The Preparation Phase

This part of the process is driven by the country that the Bank is working with and can take anything from a few months to three years, depending on the complexity of the project being proposed. The Bank plays a supporting role, offering analysis and advice where requested. During this period, the technical, institutional, economic, environmental and financial issues facing the project will be studied and addressed - including whether there are alternative methods for achieving the same objectives. An assessment is required of projects proposed for Bank financing to help ensure that they are environmentally sound and sustainable (Environmental Assessment). The scope of the Environmental Assessment depends on the scope, scale and potential impact of the project.

Useful public documents

- An Environmental Assessment Report (EA) analyzes the likely environmental impact of a planned project and steps to mitigate possible harm.
- An Indigenous Peoples Development Plan identifies potentially adverse effects on the health, productive resources, economies, and cultures of indigenous peoples.
- The Environmental Action Plan describes the major environmental concerns of a country, identifies the main causes of problems, and formulates policies and concrete actions to deal with the problems.

The Appraisal Phase

The Bank is responsible for this part of the process. Bank staff review the work done during identification and preparation, often spending three to four weeks in the client country. They prepare for bank management either Project Appraisal Documents (investment projects) or Program Documents (for adjustment operations) and the Financial Management team assesses the financial aspects of the project. The PID is updated during this phase. These documents are released to the public after the project is approved (see below).

The Negotiation and Approval Phase

After Bank staff members have appraised the proposed project, the Bank and the country that is seeking to borrow the funds, negotiate on its final shape. Both sides come to an agreement on the terms and conditions of the loan. Then the Project Appraisal Document (PAD) or the Program Document (PGD), along with the Memorandum of the President and legal documents are submitted to the Bank's Board of Executive Directors for approval. The appropriate documents are also submitted for final clearance by the borrowing government which may involve ratification by a council of ministers or a country's legislature. Following approval by both parties, the loan agreement is formally signed by their representatives. Once this has occurred, the loan or credit is declared effective, or ready for disbursement, after the relevant conditions are met, and the agreement is made available to the public.

Useful public documents

- The Project Appraisal Document (PAD) presents all the information the Board needs to approve Bank financing of the proposal. Before 1999, this document was called the Staff Appraisal Report. The Program Document (PGD) describes adjustment-lending operations, and sets out the Bank's appraisal and assessment of the feasibility and justification for the program.
- The Technical Annex supplements a Memorandum and Recommendation of the President for freestanding technical assistance loans, which do not require Project Appraisal Documents.

The Implementation and Supervision Phase

The implementation of the project is the responsibility of the borrowing country, while the Bank is responsible for supervision. Once the loan is approved, the borrowing government, with technical assistance from the Bank, prepares the specifications and evaluates bids for the procurement of goods and services for the project. The Bank reviews this activity to ensure that its procurement guidelines have been followed. If they have, the funds will be disbursed. The Bank's Financial Management Team maintains an oversight of the financial management of the project including periodically requiring audited financial statements.

Useful public document

Report on the Status of Projects in Execution provides a very brief summary of all projects that were active during the previous fiscal year. Previously an internal communication to the Board of Executive Directors, the SOPE Report now is available to the public. Projects that closed during the fiscal year are no longer included in the SOPE, since their Implementation Completion Reports are also publicly disclosed.

The Implementation Completion Report

At the end of the loan disbursement period (anywhere from 1-10 years), a completion report identifying accomplishments, problems, and lessons learned is submitted to the Bank Board of Executive Directors for information purposes.

Useful public document

Implementation Completion Reports review the results and assess an operation on completion of each loan financed by the Bank. Operational staff prepares these self-evaluations for every completed project.

The Evaluation Phase

Following the completion of a project, the Bank's Operations Evaluation Department conducts an audit to measure its outcome against the original objectives. The audit entails a review of the project completion report and preparation of a separate report. Both reports are then submitted to the executive directors and the borrower. They are not released to the public.

Useful public documents

- Project Performance Assessment Reports rate project outcomes (taking into account relevance, efficacy, and efficiency), sustainability of results, and the institutional development impact. One in four completed projects (or about 70 a year) is chosen for a Project Performance Assessment Report, which takes Operations and Evaluation Department staff about six weeks to produce and normally includes a visit to the project in the borrowing country.
- Impact Evaluation Reports assess the economic worth of projects and the long-term effects on people and the environment. These "second looks" at projects are performed five to eight years after the close of loan disbursements.
- Inspection Panel Reports review claims by affected parties that the Bank failed to follow its operational policies and procedures with respect to the design, appraisal and/or implementation of a Bank-financed operation.

Projects may be dropped at any point in the project cycle from preparation to approval. For these projects, which never achieve active status, Project Information Documents, described above, are effectively the final documents.

7.1.4.4. European Union

7.1.4.4.1. Introduction to EU funding

Most EU funding is not paid directly by the European Commission but via the national and regional authorities of the Member States. This is the case for payments under the Common Agricultural Policy and most payments under the structural policy financial instruments (European Regional Development Fund, European Social Fund, European

Agricultural Guidance and Guarantee Fund and Financial Instrument for Fisheries Guidance), which make up, in money terms, the great bulk of EU funding.

The Commission pays direct grants to beneficiaries (public or private legally constituted bodies - universities, businesses, interest groups, NGOs - and, in some exceptional cases, individuals) in pursuance of other common policies in such fields as research and development, education, training, the environment, consumer protection, and information. It also pays direct grants in pursuance of EU external policies.

All EU funding is channeled towards precise objectives and priorities under the various common policies, which, in turn, are based on provisions of the Treaties. Grants are awarded on the basis of specific EU legislation, except those for pilot schemes, preparatory actions and certain tasks carried out by the Commission as an institution. The award and payment principles and procedures of EU grants (of all types) are governed by the Financial Regulation and its implementing Rules in particular Title VI of Part 1.

The Financial Regulation also requires all grants awarded to beneficiaries in the course of a financial year to be published each year, including the names and addresses of the beneficiaries and the relevant amounts awarded.

Financial and legal information

Nature of Community contribution

Grant on the basis of new Financial regulation (1605/2002), its rules for the implementation (2342/2002) and the Vade-mecum on grant management.

Level of Community contribution

Grant limited from 10% up to 50% of the total amount of eligible costs.

Successor to other programs

Call for proposals with a view to obtaining grants in the field of transport (OJ C 202 of 18 July 2001, p. 20).

Budget Line

B2-702; B2-704; A-7041.

Total available budget

The total amount of grants to be awarded in 2002-2003 is estimated at € 7 400 000 for transport, and at € 200.000 for organising conferences in the fields of energy and transport.

Legal Basis for the funding

Articles 70 to 80, 154 to 156, 157 and 174 to 176 of the Treaty establishing the European Community and regarding legislation.

Recent Developments Concerning Funding from EC

The European Commission has just granted €620 million for the assessment and construction of trans-European transport network projects (TEN-T). More than 65% has been allocated to rail projects and 20% to innovative and intelligent transport systems

(ITS), such as those concerning interoperability in the railway or aviation sectors. Among the projects and studies receiving significant support are GALILEO, the new Perpignan-Figueras rail link or indeed the future Lyons-Turin and Brenner transalpine rail crossings. "The construction of the trans-European transport network is a major element of European competitiveness and the balanced and sustainable development of the European Union" said Mr Jacques Barrot, Vice-President of the Commission responsible for transport.

€515 million has been granted to projects which had already been identified in the 2001-2006 Multiannual Indicative Programme (MIP), which mainly covers the 30 priority projects approved by the European Parliament and the Council in April 2004. More than half of the funds are to support works (at a maximum rate of 10%). The remainder has been allocated to technical, economic, financial and environmental studies and to the other formalities required for obtaining planning permission (up to a maximum of 50%).

€105 million has been allocated to projects selected following a call for proposals open to all project promoters, whether public or private entities. This aid is for projects other than those financed by the MIP and which are smaller in scale. For the first time, the call for proposals for the co-funding of projects was open to the new Member States: €52 million has been allocated to them for this year, around half of which is for projects in the railway sector.

Community financing has significant advantages over national schemes. It offers stability of funding over time. It has a multiplier effect, encouraging Member States to invest in projects with a high European added value and cooperate with each other on transnational routes. It helps to implement transport policy by focusing on the more sustainable modes, including support for cross-border railway links. It can also serve as a catalyst for the establishment of public/private partnerships.

It should be noted that the 30 priority projects of the trans-European network alone represent investments of €225 billion up to 2020. Given their importance in improving the competitiveness and cohesion of the Union, the Commission, under the 2007-2013 financial perspectives, has proposed a significant increase in the budget for trans-European networks.

In order to compensate for the national funding "shortfalls" identified on transnational routes, the Commission proposal favours an increase in aid rates (up to 30% and in exceptional cases up to 50% of the total project cost) and the targeting of funding on cross-border projects.

7.1.4.4.2. Evaluation of EU Activities

Commission Evaluation System & Regulatory Requirements

The European Commission has a policy of regularly evaluating its programmes and activities. In this context, **evaluation functions** have been established within the individual Directorates General in order to coordinate and carry out evaluations. The central services of the Commission provide support and coordination.

The basic regulatory requirements on evaluation are set out in the Financial Regulation and Communications of the Commission.

The Financial Regulation and its Implementing Rules

The Financial Regulation provides basic rules on evaluation in its articles 27, 28 and 33 and these are further detailed in articles 21 and 22 of the Implementing Rules.

The Financial Regulation

Article 27(4): "in order to improve the decision-making, institutions shall undertake both ex ante and ex post evaluations in line with guidance provided by the Commission. Such evaluations shall be applied to all programmes and activities which entail significant spending and evaluation results disseminated to spending, legislative and budgetary authorities".

Article 28(1): "any proposal submitted to the legislative authority which may have an impact on the budget, including changes in the number of posts, must be accompanied by a financial statement and the evaluation provided for in the article 27(4)".

Article 33 (2d): "the Commission shall attach to the preliminary draft budget…information on the achievement of all previously set objectives for the various activities as well as new objectives measured by indicators. Evaluation results shall be consulted and referred to as evidence of the likely merits of a proposed budget amendment".

The Implementing Rules to the Financial Regulation

Article 21 (1): "all proposals for programmes or activities occasioning expenditure or a reduction in revenue for the budget shall be subject of an ex ante evaluation, which shall identify:

a) the need to be met in the short or long term;

b) the objectives to be achieved;

c) the results expected and the indicators needed to measure them;

d) the added value of Community involvement;

e) the risks, including fraud, linked with the proposals and the alternative options available;

f) the lessons learned from similar experiences in the past;

g) the volume of appropriations, human resources and other administrative expenditure to be allocated with due regard for the cost-effectiveness principle;

h) the monitoring system to be set up".

Article 21(2): "all programmes or activities shall then be the subject of an **interim and/or ex post evaluation** in terms of the human and financial resources allocated and the results obtained in order to verify that they were consistent with the objectives set, as follows:

a) The results obtained in carrying out a multiannual programme shall be periodically **evaluated** in accordance with a timetable which enables the findings of that **evaluation** to be taken into account for any decision on the renewal, modification or suspension of the programme;

b) Activities financed on an annual basis shall have their results **evaluated** at least every six years".

Communications on evaluation

The Commissioner for Budget together with the President of the Commission have issued several Commission Communications which set out the Commission's evaluation policy and provide rules for the services on how to implement it.

The basic elements and the development of the Commission evaluation system are described in:

- Focus on Results: Strengthening Evaluation of Commission Activities, Communication to the Commission from Mrs Schreyer, July 2000

The Commission has subsequently established a set of standards and good practices in evaluation to be applied within its services.

- Evaluation Standards and Good Practice. Communication for the Commission from the President and Mrs Schreyer, December 2002

The Commission also carries out a number of cross cutting evaluations examining strategic issues, which embrace activities within several policy areas:

- Putting Strategic Evaluation into Practice within the Commission Communication of the President with the agreement of Mrs Schreyer, November 2001

7.1.4.4.3. ISPA

Introduction

ISPA is one of the three financial instruments (with Phare and Sapard) to assist the candidate countries in the preparation for accession. Over the period from 2000 to 2006, a total of EUR 1 040 million a year (at 1999 prices) will be made available for infrastructure projects in the field of environment and transport.

Its main priorities in preparing the applicant countries for accession will be:

- Familiarizing them with the policies and procedures of the Union
- Helping them catch up with EU environmental standards
- Expanding and linking with the trans-European transport networks

Who can apply for Ispa grants - how are Ispa grants decided

The candidate countries can propose, via the National Ispa Co-ordinator, projects in the sectors eligible to Ispa. The projects must be part of an Ispa sector investment plan adopted by the candidate countries and endorsed by the Commission.

Applications must be sent to the Ispa directorate of DG Regio. The application will be examined by Commission services and (when necessary) discussed with the applicant country.

When the Commission considers the project acceptable, she will submit the project for opinion to the Management Committee, composed of representatives of the Member States.

After having received the positive opinion of the Management Committee the Commission will adopt the project and submit a Financing Memorandum for signature to the applicant country.

Sectors receiving assistance

- The environment bringing the applicants up to EU standards
- Transport expanding the trans-European transport networks
- Technical assistance directly related to the projects being funded

Transport: expanding the trans-European transport networks

Agenda 2000 stresses the urgent need to build and repair transport infrastructure in the new Member States and applicant countries and to link it to the Union's transport networks. For the countries concerned, improving their transport infrastructure is a crucial part of their economic development strategies. Developing efficient transport systems is thus an essential component in the pre-accession strategy.

Assistance should go to transport infrastructure projects which encourage sustainable forms of moving people and goods, in particular projects which are of Community interest, identified at the Helsinki and Crete conferences, and also projects which enable the countries concerned to meet the objectives of the Accession Partnerships. This will include expanding the TENs to provide good connections between the Union and the applicant countries and interconnections between national networks and links from them to the TENs.

Bringing transport infrastructure in the applicant countries up to the standards of the Union to meet the expected growth of traffic will call for major investments. ISPA will be contributing therefore to funding the development of railways, roads, ports and airports, taking into account requirements for sustainable transport and modal change.

Eligibility of measures

Following the pattern of the Cohesion Fund for which funding is granted on a project-by-project basis; ISPA will fund the following type of measures:

1. Project: a project is an economically indivisible series of works for a precise technical function and with identified objectives.
2. Stage of project: a technically and financially independent stage shall be a stage, which can be identified as operational in its own right.
3. Group of projects: projects meeting the following three conditions may be grouped:
    a. They must be located in the same area or situated along the same transport corridor;
    b. They must be objective oriented under an overall plan for the area or corridor;
    c. They must be supervised by a single body responsible for coordinating and monitoring.

Such projects must be of a high quality and on a sufficient scale to have a significant impact in the field of environmental protection or improving transport networks. In light of the experience with the Cohesion Fund, and in particular to avoid disproportionate administrative burdens, projects will need to have a minimum size of EUR 5 million. For the start up period of ISPA, the Commission will, however, restrict itself to supporting large projects only.

Projects are to be selected and approved on the basis of national programmes for transport or the environment, which form part of the central elements of the Accession Partnerships, the national programmes for adopting the 'acquis communautaire'. These programmes must contain strategies specifically aimed at transport and the environment, and take the transnational dimension into account when developing future trans-European networks.

Financial provisions per country

Over the period from 2000 to 2006, a total of EUR 1 040 million a year (at 1999 prices) is to be divided evenly between environmental and transport infrastructure projects. The allocation of ISPA resources among the recipient countries has been decided by the Commission using criteria based on population, per capita GDP (in purchasing power parity terms) and land surface area. In order to encourage the beneficiary countries to propose high quality projects and to have some flexibility in the management of ISPA funding, the allocation is given as a range:

Table 54

8.0% - 12.0%	Bulgaria
5.5% - 8.0%	Czech Republic
2.0% - 3.5%	Estonia
7.0% - 10.0%	Hungary
4.0% - 6.0%	Lithuania
3.5% - 5.5%	Latvia

30.0% - 37.0%	Poland
20.0% - 26.0%	Romania
1.0% - 2.0%	Slovenia
3.5% - 5.5%	Slovakia

The rate of assistance will be up to 75% of eligible public expenditure, but in exceptional cases up to 85%. The actual rate will depend on the following criteria: the matching funds available, any potential revenue generated from projects and application of the 'polluter-pays' principle.

How to apply for Ispa co-financing of projects

The recipients of ISPA assistance will be the central governments of the candidate countries. Only applications received via the National Ispa Co-ordinator will be examined by the Commission services. Applications must be introduced following standard application forms

Implementation of projects receiving Ispa grants

The beneficiary countries are responsible for the implementation of projects receiving Ispa grants. This means that they, while respecting the rules of the Commission, have to launch call for tenders, to attribute contracts and to follow up the implementation. Commission's services are at all stages consulted on the proceedings.

Procurement rules

Contracts for technical assistance, services, supplies and works are awarded following the usual procedures (i.e. after publication in the Official Journal and on the internet). The detailed procedures for tendering and contracts are laid down in the Practical Guide to Phare, Ispa & Sapard contract procedures of the Commission.

However, the following exceptions will apply:

1. In the case of works, tenders can be invited on the basis of open tendering procedures or restricted tender after pre-qualification, depending on which procedure is most suitable to the case in question. The procedures of the manual should be applied in conjunction with the contract provisions, except for Annex D to be replaced by contract arrangements of the International Federation of Consulting Engineers (FIDIC);
2. For all types of contracts:
   - Pre-qualification option can be used extensively

- Pricing can be specified in national currency.

Tendering and contracting will be subject to ex-ante approval (endorsement) by the Commission as laid down in the manual for each type of procurement and procedure followed (e.g. tender dossier, evaluation procedure, evaluation report, contract etc.).

How can companies take part in projects with Ispa grants

Companies can react to tender publications launched by the candidate countries. The information on tenders can be found on the EuropeAid cooperation office website Replies to the invitation for tenders have to be sent to the countries concerned.

Public Private Partnerships

Recent years have seen a marked increase in co-operation between the public and private sectors for the development and operation of infrastructure for a wide range of economic activities. Such Public-Private Partnerships (PPP) arrangements were driven by limitations in public funds to cover investments needs but also by efforts to increase the quality and efficiency of public services.

The efforts of the Accession Countries and the new Member States to reform and upgrade infrastructure and services could potentially benefit from the PPP approach. However, PPPs should only be considered (1) if it can be demonstrated that they will achieve additional value compared with other approaches, (2) if there is an effective implementation structure and (3) if the objectives of all parties can be met within the partnership.

DG Regional Policy has undertaken a wide consultation process within the Commission, involving the EIB, EBRD, PPP units and task forces of the Member States and Candidate Countries. The result can be found in "Guidelines for Successful Public-Private Partnerships", published in March 2003.

As a natural follow up and in the effort to address the knowledge gap in a practical way, DG REGIO has produced (June 2004), with the same effective collaboration from partners, a repertory of PPP case studies across countries and across sectors, called "Resource book". The Resource book was presented at a Workshop "Building a valuable approach to PPPs" which took place on 5 July 2004.

How are Ispa grants disbursed

On the signature by the Commission the beneficiary country receives 10% of the total grant. Another 10% is paid on the signature by the beneficiary country of the first contract for the project. The rest of the grant is reimbursed on evidence of payment of invoices, of which 20% after the acceptance of the final report. Exceptions on the above-

described procedure are possible for technical assistance projects for the Extended Decentralisation (EDIS).

7.1.4.4.4. INTEREG

How to apply for INTERREG IIIC funding

The fourth call for project proposals is still open in East zone. The deadline for submission of East zone applications is 19 November 2004. In North and West zone the fourth call closed on 8 October 2004. The North zone received 27 applications, the West zone 57. The extended third call for Regional Framework Operations in the South zone, which closed on 8 October 2004 also, resulted in 25 applications.

All documents important for the development of an application can be found in the Application Pack.

Application Pack

The **Application Pack** - consists of the following documents:

- Application Form
- Programme Manual :The Programme Manual provides an overall view of the planning, managing and follow-up to the INTERREG IIIC operation, from the preparation of the application to the implementation, reporting and finalisation
- Co-financing Statements
- Programme documents (Community Initiative Programmes and Programme Complements)
- Relevant EU regulations
- Model authorisation letter for Regional Framework Operations : The model authorisation letter is relevant for Regional Framework Operations only. In cases where regional authorities at a geographically lower level or bodies other than the governing authority of the respective region shall represent the territorial unit listed in the Community Initiative Programme, a written authorisation of the governing authority of the respective region is required
- Map :A map showing the location of all partners involved in the operations has to be attached to the application form

Total available budget for INTERREG IIIC

For the EU Member States the total ERDF budget available for co-financing operations for all four INTERREG IIIC programme zones amounts to EUR 315.4 million. This total has to be matched with national co-financing from project partners of the EU Member

States. Most national co-financing will be made up of public funds. For partners from Norway, the Norwegian government has provided a separate budget of EUR 2.7 million for co-financing interregional co-operation throughout Europe. These Norwegian national funds have to be matched with regional co-financing from Norwegian project partners. The co-financing rate is up to 30% of the total eligible budget.

Contributions from third countries, including EU funds for Non-Member States, will also play an essential role in financing operations.

General rate of INTERREG IIIC co-financing

The ERDF co-financing rate for the operations is 75% of the eligible costs for partners in Objective 1 areas and 50% of the eligible costs for partners in other areas. For partners from outermost regions (French Oversea Departments, Canary Islands, Azores and Madeira) and being involved in operations financed by the South Programme the ERDF co-financing rate is 85% of the eligible costs.

Regions having dual Objective status (partly Objective 1) that are involved in RFOs must calculate an average co-financing rate varying between 50% and 75% taking into account an estimated involvement of each region's institutions in the RFO sub-projects.

Financial models that can be applied in INTERREG IIIC operations

Each operation is free to apply the financial model that fits best to the operation, partnership or objectives. Note that the financial model has to be in line with Commission Regulation 438/2001 (available for download on our website in the download section). Examples can be found in the Programme Manual

Advance payments avalable in INTERREG IIIC

No advance payments are provided in the INTERREG IIIC Programme. All payments from the Paying Authority to the Lead Partner must be based on expenditure actually paid out and recorded. Payments are linked to reports - as soon as report is accepted, the payment is authorised

7.1.4.4.5. The Green Paper on Public-Private Partnerships and Community law on public contracts and concessions

Presentation of the Green Paper

Public private partnerships (PPPs) are forms of cooperation between public authorities and the world of business, which aim to ensure that infrastructure projects can be carried

out or that services of use to the public can be provided. These forms of partnership have been developed in several areas of the public sector, such as transport, public health, education, public safety, waste management and water distribution.

Various factors explain the increased recourse to PPPs. In view of the budget constraints confronting Member States, it meets a need for private funding for the public sector. Another explanation is the desire to benefit more in public life from the know-how and working methods of the private sector. The development of PPPs is also part of the more general change in the role of the state in the economy, which is moving from a role of direct operator to one of organizer, regulator and controller

On the basis of a Green Paper, the European Commission has launched a debate on the desirability of adapting the Community rules on public procurement and concessions to accommodate the development of public-private partnerships (PPPs). The main objective is to see whether it is necessary to improve the current rules in order to ensure that economic operators have access to PPPs under conditions of legal clarity and real competition. Over the last ten years PPPs have been developing in several member states. They are now used in many areas of the public sector. The choice of a private partner by a public authority must be made in accordance with Community rules on the awarding of public contracts. However, there is no specific system under Community law for PPPs and the Community rules on awarding public contracts are applied to PPPs with differing degrees of intensity. The Green Paper sets out the scope of Community rules, with a view to identifying any uncertainties and assessing to what extent Community intervention might be necessary.

This Green Paper analyses the phenomenon of PPPs with regard to Community law on public procurement and concessions.

Under Community law, there is no specific system governing PPPs.

PPPs created for contracts that qualify as "public contracts" under the Directives coordinating procedures for the award of public contracts must comply with the detailed provisions of those Directives. However, "works concessions" are covered only by a few scattered provisions of secondary legislation and "service concessions" are not covered by the "public contracts" Directives at all.

Nevertheless, all contracts in which a public body awards work involving an economic activity to a third party, whether covered by secondary legislation or not, must be examined in the light of the rules and principles of the EC Treaty, and particularly those on the freedom of establishment and the freedom to supply services (Articles 43 to 49 of the EC Treaty). These principles include in particular the principles of transparency, equal treatment, proportionality and mutual recognition.

The EU rules governing the choice of a private partner have therefore been coordinated in the Community at various levels and to various extents, so that a wide variety of approaches are still possible at national level.

The aim of this Green Paper is to launch a wide ranging debate to find out whether the Community needs to intervene to ensure that the economic operators in the Member States have better access to the various forms of public private partnership in a situation of legal certainty and effective competition.

It therefore describes the ways in which the rules and the principles deriving from Community law on public contracts and concessions are applied when a private partner is being selected, and for the subsequent duration of the contract, in the context of different

types of PPP. The Green Paper also asks a set of questions intended to find out more about how these rules and principles work in practice, so that the Commission can determine whether they are sufficiently clear and suitable for the requirements and characteristics of PPPs.

The Green Paper thus addresses various topics: the framework for the procedures for selecting a private partner (competitive dialogue procedure for certain PPP operations qualifying as public contracts, minimal framework for secondary legislation, no framework for works and service concessions), privately initiated PPPs, the contractual framework and contract amendments during the life of a PPP, and subcontracting. The Green Paper addresses both PPPs created on the basis of purely contractual links ("contractual PPPs"), and PPPs involving joint participation of a public partner and a private partner in a mixed capital legal entity ("institutional PPPs").

This Green Paper is one of the priorities identified by the Commission in its internal market strategy for 2003 2006, and contributes to the measures planned as part of the initiative on growth in Europe

Source: http://europa.eu.int/comm/internal_market/publicprocurement/ppp_en.htm

7.2. Addressing funding questions for the implementation of the TEM and TER Region Master Plans

7.2.1. Estimation of Financial Resources Available for TEM and TER Network Implementation

The implementation of TEM and TER network as a whole will need approximately **89.662,86 million €** and will follow the time plan presented in FINAL TEMPLATE (Table 81). In this TEMPLATE the available/secured percentage of funding is shown as well.

As it can be seen in the TEMPLATE the financial resources available differ from country to country from the 25% to 100%. Of course we should bear in mind that some of these percentages can change if more information were available from the countries, since for most of them it is unknown if funding is secured or not.

So, as it concerns the financial resource available for TEM and TER Network Implementation, in brief and based on the TEMPLATE below:

(a) 36.134,13 million € are readily available/secured

(b) 53.528,17 million € are not readily available/secured, out of which

(b_1) the 14.973,69 million € are for sure not available/secured

(b_2) the 38.554,48 million € is unknown (no information given/existent) if they are available/secured or not.

7.2.2. Remarks on the perspectives to construct the TEM and TER Region Backbone Networks

Concerning this task the following issues were examined:

- Identified gaps in the process and future work to address/overcome them
- Completion for the networks and associated time (for all 21 countries) – *Possibility of Success and Risks*

<u>Identified gaps</u>

Gaps in the process, and especially in evaluation/prioritisation method as well as in financial planning, occurred due to lack of data.

The evaluation/prioritisation methodologies as well as the financial planning process, even in the simple forms they were developed, were heavily based on the data collected from the countries. Unfortunately most of the countries didn't send any data, or they have send data in inconvenient format. Nonetheless, the consultants through their own-research they have managed to complete most of the "gaps".

Therefore, in the future will be better if these "gaps" were properly completed, especially for projects that are supposed to start in the near future but have not started yet.

Another "gap", but on a more policy/theoretical level, is the lack of regional approach in the TEM & TER Master Plans. For several important issues, such as designing investments - through prioritization of transport links, ensuring compatibility of regulation and facilitating border crossing – a regional approach to Backbone Network management instead of several national ones is expected to bring about substantial benefits.

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 worldwide basis, organisations such as the EU Commission and IFIs, e.g. 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.

Completion of Networks – *Possibility of Success and Involved Risks*

An important task for the completion of the networks will be to secure funding for all the projects, that so far have not secured funding. Another task will be to monitor traffic and physical conditions of the Backbone Network, and to oversee how projects are planned and implemented. This latter 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.

Regarding the involved risks, they can be divided under broad categories:

(a) Unsecured funding
(b) Over-investment problems

The first is self-explainable.

As it concerns the second: TEM and TER Member Countries, according to the timeplan and costs they have submitted for projects implementation, in order to complete their TEM and TER projects until 2020 are currently -and will be- investing nearly 1,5% of their gross domestic product in building road & rail transport infrastructure only (without considering investments in other kind of infrastructure -transport or not). This can be considered as an over-investment, which may in the near future prevent a fair number of the network projects, notably some priority projects, to be completed within the desired time frames, despite their positive repercussions on the economy.

7.3 Considerations regarding the optimum road user charges trucks and coaches

7.3.1. Scope

This chapter aims, based on UNITE methodology on marginal cost calculation, to examine optimum road user charges for trucks and possibly coaches, and in continuance to discuss possible implications between theory and practice.

There will be no application in this chapter of real costs and derivation of real road use charges for trucks and coaches, since the necessary data –according to UNITE methodology- are not available. The chapter presents the marginal cost calculation methodology on which optimum charges should be based according to EU Commissions' White Paper.

7.3.2. Marginal Cost Principle

7.3.2.1. Definition and Policy Background

As regards the use of transport infrastructure, marginal costs are costs that occur from any additional user of any part of the transport infrastructure (roads, rail tracks, etc). Marginal costs are costs such as costs for the extra wear caused by an additional user.

In July 1998, the EU Commission introduced its White Paper, "Fair Payment for Infrastructure Use" with the aim, amongst others, of achieving two objectives:

- Harmonize the calculation and imposition of infrastructure user charges for the different modes of transport (*fair* pricing);
- Avoid excessive use of parts of the transport infrastructure and of certain modes of transport, particularly road transport (*efficient* pricing).

In the White Paper, the Commission refers to what is known in academic circles as the "social marginal cost principle". We already explained marginal cost. Social costs are all costs that occur from an economic activity. As regards road transport, the social costs comprise infrastructure costs, congestion costs as well as the costs of traffic accidents and air pollution. In other words, the social marginal costs are those infrastructure, congestion and environmental costs that are caused by any additional user of the respective transport infrastructure.

The Commission is convinced that the implementation of this principle would lead to an efficient use of transport infrastructure and would promote fair competition between the different modes of transport. The social marginal cost principle stems from neo-classical welfare economic theory according to which the imposition of the social marginal costs for all goods and all markets would maximize the economy's welfare.

7.3.2.2. Marginal Cost Calculation

Following the principles of the White Paper, UNITE project was designed to support policy-makers in the setting of charges for the transport sector by providing appropriate methodologies and empirical evidence on the marginal cost calculation.

7.3.3. UNITE Methodology

7.3.3.1. Cost Categories to be Included

The decision which cost elements are within or out of the scope of the marginal cost analysis has in case of infrastructure costs to be made along two lines: The first line has to be drawn along the type of costs (or cost elements) while a second line has to be identified along asset types.

To start with the type of costs it is obvious that total infrastructure costs consist of

a. Capital costs for
   - new investments
   - replacement of assets
b. Running Costs for
   - maintenance
   - operation
   - administration.

7.3.3.2. Cost Categories Out of Scope

The following items are out of the scope of the marginal cost analysis:

- Fixed costs (capital costs for new investments, overhead costs),
- Certain assets such as parking houses, which can be assumed to have fixed costs only (e.g. not much cost variability with traffic volume),
- Assets costs which relate to supplier operating costs (f.e. ticket selling facilities),
- Non-transport related assets such as shops, restaurants etc. in terminals and stations.

7.3.3.3. Methodology

<u>Preferred Methodology for Econometric Approach</u>

The mainstream of literature is based on cost function research for whole industrial branches or for final products. The cost functions which are derived by the duality assumption from the production function describe typically the relation between costs C, an output vector Y, a factor price vector P and vectors of input factors like capital K, labour L and (eventually) additional factors Z, e.g.

$$C = f(Y, P, K, L, Z) \qquad (1)$$

In contrast to this formulation of a cost function, UNITE identified a functional relationship between cost behaviour, traffic volume (which corresponds with the output vector Y in the traditional cost function) and **impact** factors, rather than **input** factors.

Obviously this is another question than the one answered in traditional cost function research. Although we formulate an output vector Y consisting of traffic volume of different vehicle categories we do not explore the rule of production factors for producing this output vector but analyse the rule of other factors influencing infrastructure costs. These impact factors have to be identified first on a conceptual level (see paragraph 2.3.1.1). It has then to be clarified whether these factors are available in quantitative form as data for the estimation procedure. Just to give an idea on the cost function we seek, impact factors could be for example infrastructure characteristics (I), vehicle weight (W) and speed (S), weather conditions (Z), e.g. all cost drivers identified in paragraph 2.3.1.1. This would lead to a function

$$C = f(Y, P, W, S, I, Z) \qquad (2)$$

Identification of Main Cost Drivers

It should be noted in advance that the following list of cost drivers include all factors which can from existing studies and literature be identified to have an impact on cost behaviour. However, whether this a priori information can be confirmed by in-depth analysis at all and the question to what degree the respective drivers influence costs remain open for the actual cost function estimation. It should also be noted that it is at that stage of the project not clear whether, how and to what extent these drivers can be filled in the estimation procedure as data sets. Having said this, so far the following lists of potential cost drivers can be compiled for roads.

- Vehicle type,
- Axle weight,
- Infrastructure characteristics: type of road, number of lanes (partly correlated with road type), number and type of bridges, tunnels, road sections with specific features (mountainous areas), soil etc.
- Speed (both design speed and actual speed),
- Number of crossings (braking/starting of vehicles which damages road surface),
- Weather conditions.

Some thoughts on the functional form

The type of cost function can be specified for road infrastructure costs with two general approaches/philosophies:

In a first approach, a functional form is pre-defined and its parameters will be specified. Popular choices are first and second order approximations to a general cost function such as the translog functional forms or the Cobb-Douglas form as the special case of the translog function. The cross-relationships among the variables are to be reduced by theoretical considerations whether the complete theoretical function includes not meaningful relationships between impact factors. One could call this a rather theory-based approach since we would start with hypotheses and assumptions on the functional form and on the variables derived from theory, and would than elaborate whether these hypotheses can be statistically confirmed.

A second, rather empirical approach would be to use techniques of explorative data analysis (generation of empirical distributions by Kernel estimation, data transformation

procedures) and to test than different functional forms such as Cobb-Douglas forms or translog forms.

We suggest the translog function due to several advantages. First, it is a theory-based, systematic approach, which enables us to analyse cost behaviour starting with the general case and specialising the function stepwise to our field of application. Second, this form is a flexible mathematical tool, a second order approximation of an unknown production function. It imposes only few restrictions on the underlying production technology and it contains all relevant properties of neoclassical production theory such as factor substitution, economies of scale and technological change. The translog cost function has the following general form:

$$\ln C = a_0 + \sum a_i \ln Y_i + \sum b_j \ln W_j + 1/2 \sum\sum a_{ij} \left(\ln Y_i \ln Y_j\right) + 1/2 \sum\sum b_{ij} \left(\ln W_i \ln W_j\right) + \sum\sum d_{ik} \ln Y_i \ln W_k \quad (3)$$

with: C : total costs
Y_i : i^{th} output
W_k : k^{th} input
a, b, d: constant variables

As we can see the first row gives the special case of a Cobb-Douglas function provided that all second-order parameters are zero while the following rows specify the cross-relationships within the output and input vectors themselves an amongst each other. Symmetry conditions for the second-order coefficients are imposed. Normally, the translog function is estimated jointly with the cost-minimising input cost share functions.

We have now to decide how to apply this general form to cost functions for road. This requires as a first step to define our output vectors, the vectors of impact factors and to set hypotheses on negligible cross-relationships between variables and reducing the terms from the second row of the general formula onwards.

We show this for the case of road infrastructure. Starting on the basis of the cost drivers identified above and considering the vehicle-km driven by vehicle categories j=1 ...m as output vector Y we obtain the following formulation of a full translog function for road infrastructure costs:

$$\ln C_i = a_0 + \sum_{j=1}^{m} a_{ij} \ln Y_{ij} + \sum_{j=1}^{m} b_{ij} W_{ij} + \sum_{j=1}^{m} c_{ij} S_{ij} + \sum_{k=1}^{r} d_{ik} I_{ik} + \sum_{l=1}^{s} e_{il} Z_{il} + 1/2 \left(\sum_{j=1}^{m}\sum_{p=1}^{m} f_{ijp} \ln Y_{ij} \ln Y_{ip} + \sum_{j=1}^{m}\sum_{p=1}^{m} g_{ijp} \ln W_{ij} \ln W_{ip} + \sum_{j=1}^{m}\sum_{p=1}^{m} h_{ijp} \ln S_{ij} \ln S_{ip} + \sum_{k=1}^{r}\sum_{\acute{u}=1}^{r} k_{iku} \ln I_{ik} \ln I_{iu} + \sum_{l}^{s}\sum_{z}^{s} l_{ilz} \ln Z_{il} \ln Z_{iz} \right) + \quad (4)$$

$$\sum_{j=1}^{m}\sum_{p=1}^{m} m_{ijp} \ln Y_{ij} \ln W_{ip} + \sum_{j=1}^{m}\sum_{p=1}^{m} n_{ijp} \ln Y_{ij} \ln S_{ip} + \sum_{j=1}^{m}\sum_{k=1}^{r} o_{ijk} \ln Y_{ij} \ln I_{ik} + \sum_{j=1}^{m}\sum_{l=1}^{s} p_{ij} \ln Y_{ij} \ln Z_{il} +$$
$$\sum_{j=1}^{m}\sum_{p=1}^{m} q_{ijp} \ln W_{ij} \ln S_{ip} + \sum_{j=1}^{m}\sum_{k=1}^{r} r_{ijk} \ln W_{ij} \ln I_{ik} + \sum_{j=1}^{m}\sum_{l=1}^{s} S_{ijl} \ln W_{ij} \ln Z_{il} + \sum_{j=1}^{m}\sum_{k=1}^{r} u_{ijk} \ln S_{ij} \ln I_{ik} +$$
$$\sum_{j=1}^{m}\sum_{k=1}^{r} u_{ijk} \ln S_{ij} \ln I_{ik} + \sum_{j=1}^{m}\sum_{l=1}^{s} v_{ijl} \ln S_{ij} \ln Z_{il} + \sum_{k=1}^{r}\sum_{l=1}^{s} w_{i} \ln I_{ik} \ln Z_{il}$$

with:
i : index for road sections (i=1, ..., n)
j : index for vehicle categories (j=1, ..., m)
k : index for type of infrastructure characteristics such as bridges, tunnels, etc. (k=1, ..., r)
l : index for type of climate and weather factors such as temperatures, rain/snow (l=1, ..., s)
C : road infrastructure costs
Y : vehicle-km
W : Axle-loads
S : Speed
I : Infrastructure characteristics
Z : Climate and weather factors
a, b, d, f, g, h, k, l, m, n, o, p, q, r, s, t, u and v: constant variables

Methodology for Engineering approach

Short-run marginal cost estimates

The short-run marginal cost in relation to road wear and tear consists in principle of *two* cost components. When a vehicle uses a road it causes damage to the surface and advances the date at which the road need to be repaired, i.e. it imposes cost on the *a) road producer*. At the same time, when a vehicle increases the roughness it also increases the vehicle operating costs of subsequent vehicles, the *b) user cost* increases.

The relationships between road use and the following marginal maintenance cost and road use and increased user costs (due to reduced quality) are difficult to estimate. However, a number of convenient shortcuts have been developed. It can be shown that the user cost under some circumstances is irrelevant and that the marginal maintenance cost equals the average maintenance cost, also under some circumstances. And of course, that the short run marginal cost equals the long run cost with an optimal investment policy.

a) Producer cost

The dominant element in road maintenance is the periodic overlay that is required after a pavement has deteriorated to a too low standard. The pavement is designed to withstand a certain number of „standard axles„ after which a major road work has to be done. As more „standard axles„ passes the road the period between these overlays will be reduced. The cost of this shortening of periods is one of the marginal cost components of road wear.

In principle the maintenance cost may be calculated as a present value over an infinitive horizon. The present value of these overlays will depend on the time left until next overlay and will thus vary cyclical. The marginal cost is the change in this present value due to the shortening of the intervals as the number of standard axles increases. Let C be the cost of an overlay and Θ_T the number of standard axles that has passed since the surface was new and which is the number of axles that the surface was planned for. Assume that a constant stream of Q standard axles passes the road segment each year. The pavement will also be affected by ageing where (m) is the annual increase in roughness due to the climate. The length of the period between the overlays can then be written as T.

$$T = [\ \Theta_T / Q\ ] * e^{-mT} \qquad (5)$$

If each of these overlays has a cost of C the present value (PVC) of an infinite number of overlays can simple be written as in (6) where r is the interest rate[8].

$$PVC = C / (e^{rT}-1) \qquad (6)$$

However, the present value will depend on the time left until next overlay and will vary cyclically. The same is true for the marginal cost. With two separate assumptions these cycles can be smoothed. The first is that we look at an average marginal cost over a time period and the second is that we consider an average marginal cost over an evenly age distributed road network. We can therefore use the annualised present value.

$$ANC = r * PVC \qquad (7)$$

Differentiating the annualized maintenance cost with the annual traffic loading will give us the marginal cost per standard axle. As a convenient shortcut we may note that the effect of increasing the number of cumulative axles is the same as an increased age.

$$MC = r * dPVC/dQ = r * dPVC/dT * dT/dQ = - r^2 * e^{rT} * C/(e^{rT}-1)^2 * dT/dQ \qquad (8)$$

where:

$dT/dQ = -T^2/\Theta_T * (e^{mT}/(1+mT)$.

$\alpha = [(rT)^2 * e^{rT}/(e^{rT}-1)^2$

$\beta = (e^{mT}/(1+mT)]$

The marginal cost can then be written as a simple function related to the average cost (AC). The parameter α depends on the interest rate (r) and the length of the pavement cycle (T). The parameter β depends on the weather effect (m) and the pavement cycle (T). If the product of these parameters equals one the marginal cost will equal the average cost.

$$MC = C/\Theta_T * \alpha * \beta = AC * \alpha * \beta. \qquad (9)$$

[8] The cost can be written as a geometric serie, PVC = $C + Ce^{-rT} + Ce^{-rT2} + ...+ Ce^{-rTn}$ which equals PVC = $C(e^{-rTn} - 1)/(e^{-rT}-1)$ and if n approaches infinity PVC = $C / (1-e^{-rT})$. This has to be discounted over the remaining lifetime of the pavement (τ-z) and thus PVC = $e^{-r(\tau-z)} C / (1-e^{-rT})$. If the time τ and T will coincide the present value can be written PVC = $e^{-rT}C / (1-e^{-rT}) = C / (e^{rT}-1)$.

Table 85 Necessary parameters to estimate short-run producer marginal cost

C	the cost of an overlay (Euro per km)
Θ_T	the number of standard axles the surface is planned for
m	the annual increase in roughness due to weather
r	the interest rate

b) User Costs

As the pavement deteriorate the cost increases for subsequent road users; the vehicle operating cost increases and the comfort decreases. However, as the road authority responds to the deterioration with resurfacing, the increased user cost will be limited. In fact, it may be shown that the *average* user cost over a whole pavement cycle, under some approximation, is independent of this increased wear. The increased wear only shorten the period before the pavement will be renewed and the „average„ between the level of service of a new pavement (S_O) and the trigger value (S_T) just before the road is paved will be constant given that the same maintenance strategy is used.

Nevertheless, when the user cost is estimated as a present value (PVU), and thus the high cost at the end of the period are discounted heavier than the low cost at the beginning of the period, the reduction of the period's length will increase the cost. The present value of all future vehicle costs (PVU) on a road, which was restored (z) years ago and has since experienced Θ_z cumulative axles, is the user cost until the resurfacing time (τ) and the present value of all the further user costs of an infinitive number of cycles of the length T.

$$PVU = Q \{ \int_z^{\tau} v(S(\Theta_t))\, e^{-r(t-z)}\, dt + e^{-r(\tau-z)}/(1-e^{-rT}) * \int_o^{T} v(S(\Theta_t))\, e^{-rt}\, dt \} \quad (10)$$

For a given road the marginal cost of an additional axle at a given time (z) will affect the cumulative axles at time (z). The marginal cost can thus be found by differentiate PVU with the number of cumulative axles at time (z) Θ_z.

$$MC = dPVU/d(\Theta_z) = Q * e^{rz} \int_z^{M} \{dv/dS * (dS/d\Theta_z + dS/dT * dT/d\Theta_z)\}\, e^{-rt}\, dt + e^{-r(M-z)} Q \int_o^{T} v\{S(\Theta_t)\}\, e^{-rt}\, dt) / (1-e^{-rT}) \quad (11)$$

Most road authorities have road user cost models relating road surface standard, to fuel consumption and to vehicle maintenance cost.

A long run marginal cost control

In the previous section it has been assumed that the road itself is fixed. This gives us an estimate of the short-run marginal cost. However, we know that under the assumption on optimal investment policy the short and long run marginal cost will be equal. Consequently, to control the magnitude of the estimated short-run marginal cost a long run approach should be attempted.

The better the road, the smaller the cost of use and future maintenance cost. Optimal investment policy focuses on this trade-off: capital is initially invested in the design and construction of the road up to the point where any future investment would cost more than the resulting savings. For HGV the most relevant investment decision is the „durability„ of

the road. The form of the „durability„ production function will determine the relationship between the average cost and the marginal cost, as well as the expected cost recovery.

The road's thickness is the primary determinant of its ability to accommodate numerous heavy axle loads. Making the road thicker is expensive, but it saves road-wear maintenance costs and user costs. Design manuals enables engineers to match the anticipated traffic loading with the thickness of construction, and the strength of the sub-base material, to give a desired life in terms of the number of standard axle passes that the road can sustain. A flexible road construction may be divided into sub-grade and the „construction/pavement„ or upper layer. The thickness and the corresponding cost of the upper layer is dependent on the accepted cumulative number of heavy axles. It seems to be an empirical fact that the required thickness is an increasing but digressive function of the number of standard axles. At the margin, a highway designer wanting to minimise total life-cycle cost would add thickness until the *incremental capital cost of additional durability* equalled *the incremental saving in maintenance* and *road user costs* for any *given level of traffic*.
If the number of Heavy Goods Vehicles increases the deterioration will go faster and the optimal durability will increase. When costs are minimised in the way described above the producer will be indifferent between accommodating a higher level of traffic by increasing investments in durability or increasing the maintenance and user cost. The effect on total cost is the same whichever input is varied so as to increase the accepted traffic level by one unit. This means that the *long-run marginal cost* may be estimated as the increased cost due to increased investment in durability or increased cost due to increased maintenance and user cost - the result will be the same. As the latter expression, the „increased cost due to increased maintenance and user cost„ also is the *short-run marginal cost* it is obvious that, with an optimal design, the long- and short-run marginal costs are equal. The control will thus take its starting point in the durability production function found in road design manuals.

7.3.4. Considerations of Using Marginal Cost Approach

As attractive as the principle might be in theory, its practical implementation is problematic:

a. Its perspective is purely static.

The setting of social marginal costs does not consider any differences in the quality of transport services from different modes nor does it take into account the various developments in an economy due to new technologies or organizational structures. In fact, there are significant, market relevant differences in the quality of service between road and rail, and Europe is part of an ever faster changing global economy.

b. Who pays for the “non-marginal” costs?

Indeed, this is an interesting question. As said before, the marginal cost principle, if implemented, would lead to user charges, which would only cover the marginal costs, i.e. costs that are caused by any additional infrastructure user. However, any transport infrastructure includes significant non-marginal costs, i.e. costs which exist regardless the number of users. For example, the capital costs to build a road do not vary in the case of an extra user once built.

Hence, the question remains, who will pay for these investment costs, which are a substantial part of the overall social cost and, in fact, often constitute the major part of it. There is no clear answer to this key question. Charging marginal costs for infrastructure use means deficits, since, by definition, user charges do not cover the non-marginal costs.

c. Distortion of modes competition

Cost structures for the modes of transport differ. Consequently, the various modes of transport, such as rail and road, are affected differently by the marginal cost principle.
For example, the majority of the overall costs for railways are capital costs, i.e. they are non-marginal. The major part of the overall costs of road transport is marginal.

Consequently, user charges that correspond to only the marginal costs cover a smaller part of the overall costs for rail than for road. This is a clear advantage for rail and would lead to distortions in competition between the two modes.

7.4 Definition at the macro-scale of necessary technical and institutional actions for assisting implementation of the proposed TEM Master Plan

Although the principal concern addressed in this task has been that of funding and ways in which approaches such as staged construction may offer opportunities both to ameliorate budgetary difficulties and to give some further element of robustness to future uncertainties within the plans proposed, it is important not to over look other ways in which the realisation of those plans may be supported. Some issues appertaining to these matters are discussed in outline in what follows.

An important feature of the thinking embedded in the proposals developed for the elaboration here of the TEM Master Plan has been the careful and simultaneous consideration of both national and international perspectives. By seeking to bear in mind both perspectives, the aim has been to move towards plans that acknowledge shared international needs and goals while at the same time recognising the reality that national needs were themselves also important and that much, though not necessarily all, of the funding for implementation would probably have to be secured from national sources, or at least would need the inclusion of the relevant projects in lists of identified national priorities.

Furthermore, in supporting the type of collaboration and degree of mutual interdependence that is implicit in this approach, thought needs to be given to related issues that directly influence the likely ease with which such collaboration may be secured. In particular, there are a range of concerns where failure properly to secure co-ordination could significantly interfere with the approach that the current work seeks to encourage.

One issue that needs careful attention in the motorway sector is the extent of convergence in thinking regarding technical standards is secured. For example with regard to maximum vehicle axle weight and similar specifications and also to various safety issues in relation to drivers' hours and working conditions, maximum speeds, highway design, etc. A particular concern is where there are proposals for shared cross-border infrastructure. Safety in road tunnels is a topic that, for understandable reasons, has attracted a good deal of attention in recent years. There are also important needs for co-ordination of standards and infrastructure design at border crossing and customs facilities.

The demands put on transport infrastructure planning from the perspective of environmental planning have grown out of all recognition since the original thinking that underpinned the development of the TEM Organisation. It is important that these changes are understood and embedded in not only the proposals that are brought forward, but also in the detail of individual proposals. With active environmental lobbies operating in most European states, failure to take environmental matters properly into account is not only unacceptable in itself, but also, in purely practical transport-driven terms, is likely to be counter-productive. Proposals that engender significant national or international opposition are almost certain to be delayed by court enquiries or by direct action. Delays of this type are not only costly in the micro sense of holding up the specific project concerned, but also from the macro, overall perspective of the development of the European networks. To the extent that key individual links are

missing, or not brought up to the required standards to be part of the international infrastructure, the overall effectiveness and rate of return on investment in other components of the TEM network will be jeopardised.

In the original screening that was undertaken to ensure that only projects that had a realistic prospect of implementation were considered in developing the TEM elaboration proposals, one of the key questions addressed the extent to which any land that the projects would demand had already been acquired or offered a strong prospect of being available. In general, one of the more important considerations to be borne in mind, especially for new road developments, border crossings, etc. is the ability of a state's legal system to handle development needs in a timely way and to facilitate appropriate land acquisition. Some states may need to address this issue. Similarly, it should not be overlooked that, increasingly, opportunities exist to seek to link improved road access for local land holders and industrial organisations to an expectation that they, as potential beneficiaries, should contribute a proportion of the 'development gain' they receive, thus supporting the funding of such schemes, at least to a degree.

Another area of activity that the increasingly international nature of funding and building of major networks such as the TEM elaboration proposals highlight is the need to ensure that state laws with respect to tendering and construction are appropriately harmonised with emerging European good practice. Failure to do so can restrict interest in taking on the work concerned which in turn is likely to lead to undermine cost-effectiveness and technical innovation in construction. However, such legislation, if not already in place, can take some considerable time to be drafted for and agreed by parliaments. It needs to be set in place some time ahead of any plans for implementation.

Ensuring the interoperability among the identified road, rail and combined transport priority projects, as well as between them and the other parts of the respective networks is a major element for the successful implementation of the TEM Master Plan. The development of the TEM Master Plan should follow commonly accepted standards and practices recommended for use by all the countries involved. The UNECE International Agreement AGR, as well as the TEM Standards and recommended practices provide the technical and institutional framework for it. Assisting the implementation of these standards by all concerned countries, as well as monitoring of the progress in bringing the TEM Master Plan backbone network up to the required standards could be among the permanent tasks of the TEM Project in future.

This brief section has sought to point out that more than just a transport planning action is needed to support the successful implementation of the nature and scale of planning implicit in the proposals that this report is seeking to instigate. There are also important enabling actions required that take time to set in place, that sometimes require changes ways of thinking and attitudes, and that themselves need to be planned with the same degree of rigour and care that underpin the network planning itself.

8. ADDRESSING BORDER CROSSING QUESTIONS

8.1. Inventory of TEM border crossings

The following list of all TEM border crossings contains the data on countries involved, names of border points on both sides of the border and their present and future (if defined) status (see also Annex 24).

Table 86 TEM border crossings

COUNTRY	Border points	Status (control type)
A/I	Arnoldstein/Coccau	no control
A/H	Nickelsdorf/Hegyeshalom	passport only
A/SK	Berg/Petrzalka	passport only
BIH/HR	Visici/Metkovic	passport and custom
BIH/HR	Bos. Samac/Slav. Samac	passport and custom
BIH/SIM	Bolanic/Kotroman	passport and custom
BIH/HR	Izacic/Vaganac	passport and custom
BIH/HR	Neum/Neum West	passport only
BIH/HR	Neum/Neum East	passport only
BG/SIM	Kalotina/Gradina	passport and custom
BG/TR	Kapitan Andreevo/Kapikule	passport and custom (future: passport only)
BG/RO	Russe/Giurgiu	passport and custom (future: passport only)
HR/SLO	Bregana/Obrezje	passport and custom
HR/H	Gorican/Letenye	passport and custom
HR/H	Knezevo/Udvar	passport and custom
HR/SIM	Lipovac/Batrovci	passport and custom
HR/SIM	Debeli Brijeg/Sutorina	passport and custom
HR/SIM	Batina/Bezdan	passport and custom
HR/BIH	Slav. Samac/Bos. Samac	passport and custom
HR/BIH	Metkovic/Visici	passport and custom
HR/BIH	Vaganac/Izacic	passport and custom
HR/BIH	Neum West/Neum	passport only
HR/BIH	Neum East/Neum	passport only
CZ/D	Rozvadov/Waidhaus	passport only
CZ/D	Cinovec/Zinnwald	passport only
CZ/PL	Harrachov/Jakuszyce	passport only
CZ/PL	Nachod/Kudowa Slone	passport only
CZ/PL	C.Tesin/Cieszyn	passport only
CZ/PL	Vernovice/Gorzyczki	to be open in 2008
CZ/SK	Lanzhot/Kuty	passport only
CZ/SK	St. Hrozenkov/Drietoma	passport only
GA/TR	Sarpi/Sarp	passport and custom

GA/TR	Naohrebi/Turkozu	passport and custom
GA/RUS	Larsi/Verhnij Lars	passport and custom
GA/RUS	Leselidze/Adler	passport and custom
GA/AZ	Tsiteli Khidi/Syhly	passport and custom
GA/AR	Guguti/Tasir	passport and custom
GA/AR	Sadakhlo/Ajrum	passport and custom
H/A	Hegyeshalom/Nickelsdorf	passport only
H/SK	Rajka/Rusovce	passport only
H/SK	Parassapuszta/Sahy	passport only
H/SK	Tornyosnemeti/Milhost	passport only
H/UA	Zahony/Chop	passport and custom
H/RO	Nagylak/Nadlac	passport and custom (future: passport only)
H/RO	Artand/Bors	passport and custom (future: passport only)
H/SIM	Roszke/Horgos	passport and custom
H/HR	Letenye/Gorican	passport and custom
H/HR	Udvar/Knezevo	passport and custom
I/A	Coccau/Arnoldstein	no control
I/SLO	Trieste Villa Opicina/Fernetici	passport only
LT/PL	Kalvarija/Budzisko	passport only
LT/LV	Salociai/Grenctale	passport only
LT/BY	Medininkai/Kamenny Loh	passport and custom
PL/D	Swiecko/Frankfurt	passport only
PL/D	Olszyna/Forst	passport only
PL/D	Jedrzychowice/Ludwigsdorf	passport only
PL/CZ	Jakuszyce/Harrachov	passport only
PL/CZ	Cieszyn/C. Tesin	passport only
PL/CZ	Kudowa Slone/Nachod	passport only
PL/CZ	Gorzyczki/Vernovice	to be open in 2008
PL/SK	Barwinek/Vysny Komarnik	passport only
PL/SK	Zwardon/Skalite	passport only
PL/LT	Budzisko/Kalvarija	passport only
PL/BY	Terespol/Kozlovichi	passport and custom
PL/UA	Medyka/Mostyska	passport and custom
RO/H	Nadlac/Nagylak	passport and custom (future: passport only)
RO/H	Bors/Artand	passport and custom (future: passport only)
RO/BG	Giurgiu/Russe	passport and custom (future: passport only)
RO/SIM	Moravita/Vrsac	passport and custom
RO/UA	Siret/Porubne	passport and custom
RO/UA	Halmeu/Djakove	passport and custom
RO/MO	Sculeni/Sculeni	passport and custom
RO/MO	Albita/Leuseni	passport and custom
SK/A	Petrzalka/Berg	
SK/CZ	Kuty/Lanzhot	passport only

SK/CZ	Drietoma/St. Hrozenkov	passport only
SK/PL	Skalite/Zwardon	passport only
SK/PL	Vysny Komarnik/Barwinek	passport only
SK/H	Rusovce/Rajka	passport only
SK/H	Sahy/Parassapuszta	passport only
SK/H	Milhost/Tornyosnemeti	passport only
SK/UA	Vys. Nemecke/Uzhgorod	passport and custom
TR/BG	Kapikule/Kapitan Andreevo	passport and custom (future: passport only)
TR/GA	Sarp/Sarpi	passport and custom
TR/GA	Turkozu/Naohrebi	passport and custom
TR/IRN	Gurbulak/Maku	passport and custom
TR/IRQ	Habur/Zakhu	passport and custom
TR/SYR	Yayladagi/Yayladag	passport and custom

8.2. TEM network border crossing problems

8.2.1. Situation before 1 May 2004

Border delays prolong transport times and hence increase the cost both of transport and of the goods transported. They are therefore an important factor in the relative competitiveness not only of transport modes but also of national economies in an increasingly global and competitive marketplace. According to the World Economic Forum, costs in connection with border crossings amount to some 85 billion USD per year worldwide, representing 1.2 percent of the total value of international trade and between 5 and 10 percent of the end price of goods.

The average border trucks waiting times in hours in years 1998 – 2003 according to IRU statistics in the region are shown in the table below (the TEM network border crossings are printed in boldface):

Table 87 Average border waiting times for trucks

ilis crossing	**Year**					
	1998	**1999**	**2000**	**2001**	**2002**	**2003**
Linken-Lubieszyn (D-PL)						
to Linken (D)	1.3	1.1	1.6	1.6	-	-
to Lubiszyn (PL)	2.6	1.5	1.5	1.5	-	-
Pomellen-Kolbaskowo(D-PL)						
to Pomellen (D)	2.1	1.7	2.6	2.6	1.3	3.2
to □ilistra□o (PL)	2.4	0.7	0.8	0.8	0.9	-
Schwedt- Krajnik Dolny(D-PL)						
to Schwedt(D)	5.4	0.6	3.0	2.6	2.1	-
to Krajnik Dolny(PL)	6.4	0.9	1.8	1.9	2.9	-
Frankfurt/Oder –Swiecko(D-PL)						
to Frankfurt/Oder Autobahn(D)	**11.6**	**9.6**	**13.8**	**12.0**	**5.7**	**10.4**
to Swiecko(PL)	**6.1**	**4.9**	**8.0**	**7.7**	**7.2**	**7.9**

Guben-Gubin(D- PL)						
to Guben(D)	8.9	7.2	10.6	10.6	2.5	-
to Gubin(PL)	4.5	3.9	4.4	4.4	2.4	-
Forst-Olszyna(D-PL)						
to Forst(D)	**9.9**	**9.9**	**12.1**	**12.1**	**1.8**	**-**
to Olszyna(PL)	**8.8**	**7.4**	**9.7**	**11.3**	**1.9**	**-**
Ludwigsdorf –Jedrzychowice(D-PL)						
to Ludwigsdorf Autobahn	**3.1**	**3.2**	**4.3**	**4.0**	**2.9**	**4.5**
to Jedrzychowice(PL)	**2.5**	**2.6**	**3.5**	**3.4**	**3.1**	**3.6**
Zittau – Sieniawka(D-PL)						
to Zittau(D)	0.7	1.3	3.2	3.0	1.4	2.9
to Sieniawka(PL)	0.7	0.9	2.2	0.8	1.8	2.6
Neugersdorf – Jirikov (D-CZ)						
to Neugersdorf(D)	3.3	1.6	4.0	3.0	4.0	3.0
to Jirikov(CZ)	2.3	2.3	3.7	2.9	3.6	2.3
Zinnwald-Cinovec(D-CZ)						
to Zinnwald(D)	**5.0**	**5.6**	**6.6**	**4.9**	**4.0**	**1.9**
to Cinovec(CZ)	**4.7**	**5.1**	**5.6**	**3.8**	**2.8**	**1.2**
Kudowa Slone-Nachod (PL-CZ)						
to Kudowa Slone(PL)	**10.5**	**8.2**	**8.2**	**8.0**	**6.8**	**6.3**
to ilistr(CZ)	**2.8**	**4.0**	**5.0**	**5.1**	**5.6**	**5.3**
Schönberg-Vojtanov(D-CZ)						
to Schönberg(D)	2.2	1.8	2.3	2.1	2.9	2.2
to Vojtanov(CZ)	1.8	1.5	2.3	2.1	2.7	2.4
Schirnding- Pomezi(D-CZ)						
to Schirnding(D)	2.3	2.0	2.7	2.9	4.3	3.6
to Pomezi(CZ)	2.0	1.9	2.3	2.8	3.5	2.7
Waidhaus-Rozvadov(D-CZ)						
to Waidhaus(D)	**3.1**	**3.6**	**4.1**	**4.3**	**5.4**	**5.0**
to Rozvadov(CZ)	**2.6**	**2.8**	**3.3**	**3.4**	**4.2**	**3.3**
Furth-im-Wald-Folmava(D-CZ)						
to Furth-im-Wald(D)	2.8	2.3	2.3	2.5	3.7	3.5
to Folmava(CZ)	2.0	1.9	2.1	2.2	2.8	2.3
Philippsreut – Strazny(D-CZ)						
to Philippsreut (D)	1.2	0.9	1.1	1.3	1.7	1.6
to Strazny(CZ)	0.4	0.4	0.6	0.9	1.7	1.2
Wullowitz- Dolni Dvoriste(A-CZ)						
to Wullowitz(A)	0.3	0.4	1.3	1.5	1.8	1.5
to Dolni Dvoriste(CZ)	0.1	0.3	1.1	1.2	1.7	1.3
ilistra – Novy Bohumin(PL-CZ)						
to ilistra(PL)	0.2	1.0	0.9	1.0	0.6	0.7
to Novy Bohumin(CZ)	0.2	0.8	1.0	1.0	0.4	0.4
Cieszyn-C.Tesin(PL-CZ)						
to Cieszyn(PL)	**6.6**	**7.5**	**8.3**	**8.2**	**4.9**	**3.6**
to C.Tesin(CZ)	**1.8**	**3.8**	**6.9**	**7.9**	**6.5**	**6.7**
Trstena – ilist(PL-SK)						
to Trstena(PL)	5.0	7.2	4.6	5.9	7.1	6.6
to ilist(SK)	4.2	5.3	4.6	6.4	7.7	9.1

Mosty u Jablunkova- Svrcinovec (CZ-SK)						
to Mosty u Jablunkova(CZ)	0.4	0.3	0.6	0.7	0.7	2.1
to Svrcinovec (SK)	0.4	0.6	0.9	0.9	0.8	1.5
Horni □ilis – □ilis (CZ-SK)						
to Horni □ilis(CZ)	1.1	0.6	1.5	1.4	1.7	2.5
to □ilis (SK)	0.8	0.7	1.2	1.2	1.3	1.7
□ilistr – Lysa pod Makytou(CZ-SK)						
to □ilistr(CZ)	0.4	0.3	1.1	1.3	2.0	1.7
to Lysa pod Makytou(SK)	0.5	0.3	0.7	0.9	1.5	1.6
Stary Hrozenkov – Drietoma (CZ-SK)						
to Stary Hrozenkov(CZ)	**1.6**	**1.1**	**1.7**	**1.8**	**2.3**	**1.9**
to Drietoma (SK)	**2.6**	**1.2**	**1.5**	**1.7**	**2.2**	**2.1**
Hodonin – Holic (CZ – SK)						
to Hodonin(CZ)	1.6	2.1	2.7	2.9	2.5	0.4
to Holic (SK)	3.2	3.2	3.6	3.9	3.1	0.3
Lanzhot (Breclav)-Kuty (CZ-SK)						
to Lanzhot (Breclav)(CZ)	**1.6**	**1.5**	**2.1**	**1.9**	**2.8**	**2.3**
to Kuty(SK)	**7.2**	**3.0**	**2.1**	**2.3**	**3.6**	**3.8**
Drasenhofen-Mikulov (A-CZ)						
to Drasenhofen(A)	0.3	0.5	1.5	1.1	0.8	0.5
to Mikulov (CZ)	0.1	0.1	0.3	0.3	0.7	0.3
Haugsdorf – □ili (A-CZ)						
to Haugsdorf(A)	0.4	0.1	0.4	0.4	0.8	0.8
to □ili (CZ)	0.2	0.2	1.0	0.7	0.9	0.3
Berg - Petrzalka (A-SK)						
to Berg(A)	**1.7**	**1.5**	**2.3**	**2.3**	**0.8**	**1.0**
to Petrzalka (SK)	**0.8**	**1.4**	**1.3**	**1.3**	**0.7**	**0.6**
Rajka – Rusovce (H-SK)						
to Rajka(H)	**0.7**	**0.4**	**1.2**	**1.1**	**2.2**	**2.0**
to Rusovce(SK)	**1.7**	**1.4**	**3.2**	**1.8**	**2.1**	**1.5**
Nickelsdorf – Hegyeshalom (A-H)						
to Nickelsdorf(A)	**1.8**	**2.0**	**3.7**	**2.8**	**3.1**	**-**
to Hegyeshalom (H)	**0.2**	**0.1**	**1.6**	**2.0**	**3.0**	**-**
Vámosszabadi – Medvedov (H-SK)						
to Vámosszabadi (H)	0.9	0.5	1.4	1.5	2.3	2.3
to Medvedov(SK)	0.8	1.1	2.7	2.0	1.5	1.5
Parassapuszta-Sahy (H-SK)						
to Parassapuszta (H)	**0.6**	**0.5**	**1.3**	**1.3**	**1.6**	**1.4**
to Sahy(SK)	**0.8**	**0.9**	**1.9**	**1.9**	**1.3**	**1.0**
Klingenbach-Sopron (A-H)						
to Klingenbach(A)	1.0	1.4	2.8	2.0	1.8	-
to Sopron(H)	1.2	0.4	2.2	1.4	2.8	-
Heiligenkreuz- Rabafüzes (A-H)						
to Heiligenkreuz(A)	0.3	0.4	1.6	1.4	1.7	-
to Rabafüzes (H)	0.5	0.3	1.5	1.0	2.2	-
Dolga Vas – Rédics (SLO- H)						
to Dolga Vas(SLO)	1.1	1.6	1.8	1.6	1.3	-
to Rédics(H)	0.8	0.5	1.0	1.1	1.8	-

Gorican - Letenye (HR-H)						
to Gorican(HR)	**0.7**	**0.5**	**0.5**	**-**	**2.0**	**-**
to Letenye(H)	**0.2**	**0.1**	**1.0**	**-**	**-**	**-**
Tompa- Srpski Sor (H-SCG)						
to Tompa (H)	-	-	-	-	-	-
to Srpski Sor(SCG)	0.7	-	-	-	-	-
Roszke- Horgos (H-SCG)						
to Roszke (H)	**0.3**	**-**	**0.3**	**0.3**	**-**	**-**
to Horgos(SCG)	**1.7**	**0.8**	**1.5**	**1.4**	**-**	**-**
ilist-Nadlac (H-RO)						
to ilist(H)	**-**	**0.1**	**1.1**	**1.5**	**2.4**	**2.6**
to Nadlac(RO)	**0.6**	**0.3**	**1.6**	**1.6**	**1.7**	**1.6**
GSCGla – Varsand (H-RO)						
to GSCGla(H)	-	-	2.5	2.3	1.3	1.4
to Varsand(RO)	0.9	-	2.0	1.6	1.3	1.2
ilist- Bors (H-RO)						
to ilist(H)	**0.3**	**-**	**2.0**	**2.1**	**1.6**	**1.6**
to Bors(RO)	**1.4**	**1.0**	**3.9**	**2.8**	**2.7**	**1.6**
Bezledy- Bagrationovsk (PL-RUS)						
to Bezledy (PL)	2.1	2.8	3.0	3.0	18.8	-
to Bagrationovsk(RUS)	2.3	0.7	2.2	2.2	14.6	-
Budzisko- Kalvarija (PL-LT)						
to Budzisko(PL)	**5.1**	**3.2**	**5.5**	**5.5**	**5.7**	**4.2**
to Kalvarija(LT)	**2.4**	**1.0**	**0.5**	**0.5**	**9.3**	**-**
Kuznica - Bruzgl (PL-BY)						
to Kuznica(PL)	5.0	5.9	4.4	4.4	-	-
to Bruzgl(BY)	8.1	2.0	0.5	0.5	-	-
Bobrowniki- Berestovica (PL-BY)						
to Bobrowniki(PL)	3.1	4.8	-	-	6.0	-
to Berestovica(BY)	8.4	1.0	-	-	3.3	-
Terespol- Kozlovichi (PL-BY)						
to Terespol (ilistra)(PL)	**9.5**	**10.3**	**5.6**	**6.3**	**10.5**	**-**
to Kozlovichi(BY)	**24.5**	**6.2**	**1.7**	**3.1**	**16.8**	**-**
Dorohusk – Iagodin (PL-UA)						
to Dorohusk(PL)	1.9	1.0	1.3	1.3	-	-
to Iagodin(UA)	2.1	2.7	3.5	3.5	-	-
Hrebenne – Rava-Russkaia (PL- UA)						
to Hrebenne (PL)	0.3	0.7	-	-	-	-
to Rava-Russkaia(UA)	0.4	2.1	1.2	1.2	-	-
Medyka – Mostyska(PL-UA)						
to Medyka(PL)	**0.3**	**0.2**	**0.5**	**0.5**	**2.9**	**-**
to Mostyska(UA)	**0.4**	**0.4**	**0.4**	**0.4**	**4.6**	**-**
Barwinek – Vysny Komarnik (PL-SK)						
to Barwinek(PL)	**0.4**	**1.9**	**2.0**	**2.2**	**1.5**	**1.4**
to Vysny Komarnik(SK)	**0.7**	**1.2**	**2.6**	**2.5**	**1.5**	**1.7**
Vysne Nemecke-Uzhgorod (SK-UA)						
to Vysne Nemecke(SK)	**2.8**	**2.2**	**-**	**-**	**0.7**	**1.2**
to Uzhgorod(UA)	**1.7**	**1.5**	**1.0**	**-**	**0.8**	**3.7**

Tornyosnémeti - Milhost (H-SK)						
to Tornyosnémeti (H)	**0.8**	**1.1**	**0.9**	**0.9**	**0.6**	**1.0**
to Milhost(SK)	**0.9**	**1.1**	**1.0**	**0.8**	**0.6**	**0.7**
Záhony- Chop (H-UA)						
to Záhony (H)	**-**	**-**	**-**	**-**	**-**	**-**
to Chop(UA)	**0.3**	**-**	**-**	**-**	**-**	**-**
Mokranaje – Bregovo (SCG-BG)						
to Mokranaje(SCG)	0.4	0.3	-	-	-	-
to Bregovo(BG)	0.1	0.1	-	-	-	-
Calafat- Vidin (RO- BG)						
to Calafat(RO)	0.4	1.0	0.4	0.3	0.6	0.7
to Vidin (BG)	0.3	0.6	0.1	0.1	0.7	0.7
Vrashka Tchuka-Vrashka Tchuka (SCG-BG)						
to Vrashka Tchuka(SCG)	0.2	0.6	-	-	-	-
to Vrashka Tchuka(BG)	0.1	0.2	-	-	-	-
Gradina- Kalotina (SCG-BG)						
to Gradina(SCG)	**0.1**	**0.1**	**0.1**	**-**	**0.1**	**0.2**
to Kalotina (BG)	**-**	**0.5**	**-**	**-**	**0.2**	**0.2**
□ili Bair-GSCGeschevo (MK-BG)						
to □ili Bair(MK)	0.1	1.3	0.1	0.1	0.1	0.1
to GSCGeschevo(BG)	0.1	0.4	0.1	0.1	-	0.1
Delcevo- Stanke Lissitchkovo (MK-BG)						
to Delcevo(MK)	0.1	0.9	0.2	0.3	0.1	0.1
to Stanke Lissitchkovo(BG)	0.1	0.3	0.1	0.1	0.1	0.1
Novo Selo- Zlatarevo (MK-BG)						
to Novo Selo(MK)	0.1	1.4	0.6	0.7	-	0.2
to Zlatarevo(BG)	0.8	0.6	0.1	-	-	0.1
Promahon- Kulata (GR-BG)						
to Promahon(GR)	0.8	0.8	0.6	0.7	1.0	1.5
to Kulata(BG)	1.3	1.5	0.3	1.8	1.2	1.1
Giurgiu- Russe (RO-BG)						
to Giurgiu(RO)	**0.2**	**-**	**0.1**	**0.1**	**0.9**	**1.1**
to Russe (BG)	**0.3**	**-**	**-**	**-**	**0.9**	**0.8**
Kalarash – □ilistra (RO-BG)						
to Kalarash(RO)	-	-	-	-	-	-
to □ilistra (BG)	-	-	-	-	-	-
Kapitan Andreevo – Kapikule(BG-TR)						
to Kapitan Andreevo(BG)	**0.1**	**-**	**0.1**	**0.1**	**-**	**0.6**
to Kapikule(TR)	**0.1**	**0.1**	**0.4**	**0.2**	**0.7**	**0.1**

Apart from the average waiting times at the border crossings shown, the crossing times were even higher at the CIS's external borders, where in extreme cases they could rise to as much as 72 hours (to 48h between Finland and Russia, to 24h between Ukraine and Belarus, to 72 between Latvia and Russia and between Latvia and Belarus, to 20h between Estonia and Russia). The situation was and still is also highly unsatisfactory in the Balkans, where the creation of several new states has resulted in the rapid introduction of customs and police controls carried out by inexperienced staff at ill-

equipped sites. Waiting times are also long at the borders of Georgia (up to 10 hours including 4 hours for the control process) and in the eastern part of Turkey, especially at the frontier with Iraq (up to 72 hours).

Border crossing times could increase enormously at certain times, i.e. on weekends and public holidays (especially as a result of driving bans in certain countries and the non-harmonisation of such bans and weekend leave for certain customs and border guard officials) and in holiday periods, again with the effects of certain driving bans. Crossing borders could be extremely difficult during the summer period in the Balkans.

8.2.2. Obstacles at border crossings

An examination of the obstacles observed at border crossings shows that the major ones have their origins in:

- **infrastructure** where, despite certain improvements financed by international programmes (EU funds, the World Bank TTFSE and TTFSC programmes, etc.):
  - border posts in certain recently created states and at some EU's external borders are under-equipped (problem is mostly not due to the insufficient infrastructure itself, but to the understaffing i.e. not all available control booths being in use);
  - systems for communicating and transmitting data between all players at border crossings, and especially between different countries' control agencies are insufficient;
  - there are many obsolete and poor quality facilities for phytosanitary and veterinary controls, which affects transport particularly in Balkans and in the CIS countries.
- **control procedures**, which were and at some borders still are without a doubt the main obstacle to free-flowing traffic for the following reasons:
  - the complexity of procedures and changes to current regulations made without prior notice;
  - insufficient use of controls based on risk analysis and of automated clearing systems;
  - lack of cooperation between control agencies and, all too often, the lack of joint controls;
  - insufficient computerization of control procedures, meaning that various paper forms have to be used;
  - procedures for weighing vehicles, especially when the equipment used to weigh them is unsuitable;
  - procedures linked to illegal immigration;

- non-compliance with TIR procedures with regular inspection at border crossings of consignments shipped under the TIR system, or even the unloading of vehicles (Belarussian authorities);

- failure to provide information to professionals about the procedures applied and documents required, sometimes also non-existence of publications in the appropriate languages containing the relevant commercial legislation, rules and procedures (e.g. in Caucasus states);

- proliferation of taxes, duties and fees and lack of transparency regarding rules for payment in some cases.

– **staff**, where the following shortcomings were frequently observed:

- shortage of control personnel i.e. staffing levels not adapted to the increase in traffic;

- lack of quality and training;

- insufficient motivation and hence very low productivity in many cases;

- questionable ethical conduct, resulting in widespread corruption and smuggling.

8.2.3. Situation after 1 May 2004

Upon the accession of the 10 Central and Eastern European states (out of them 5 – the Czech Republic, Hungary, Lithuania, Poland and Slovakia being member countries of the TEM) to the European Union, the trucks´ border waiting times at the respective new internal Union frontiers (i.e. between Lithuania and Poland, between Poland and the Czech Republic, Germany and Slovakia, between the Czech Republic and Austria, Germany and Slovakia, between Slovakia and Austria and Hungary, between Hungary and Austria and Slovenia) have substantially shortened. In most cases, waiting times at these borders are less than 1 hour for arriving and departing (transit) trucks and less than 3 hours needed for spedition procedures at the departure.

These generally positive changes have led sometimes also to certain unexpected or even unwanted consequences, such as:

- substantial increase of heavy vehicles´ transit traffic through some new EU member states; especially exposed in this respect are the Czech Republic and partly Slovakia because of their geographic position. For example, the number of trucks using in both directions the German/Czech motorway border crossing at Rozvadov/Waidhaus in 11 months of 2004 amounted to more than one million i.e. twice so much than in the whole year 2003. The average monthly traffic at all Czech border crossings in the period January to April 2004 was about 550 000 trucks, while in June 2004 their number reached 740 000 and in October even 811 000. Further increase (estimated at additional 20%) has been caused by the introduction of electronic motorway toll collection in Germany as from 1 January 2005.

- the under-exploitation of the big border crossing infrastructures, built in some cases even recently not taking into account the approaching EU membership;

- the reduction or even collapse (e.g. German/Czech link Dresden-Lovosice) of the railway trans-border truck transportation to certain destinations, having negative environmental effects.

8.2.4. Recommended actions

In view of the considerable obstacles that still exist at certain border crossings within the TEM region, it seems advisable to continue and develop actions to improve such crossings, focusing as a first step on border posts located on Pan-European transport corridors and TEM links. It is thus highly desirable to materialize the following recommendations :

Infrastructure

Investment should concentrate on:

- improving facilities at borders focusing on the equipment used in controls (computers, X-ray equipment and scanners, weighing machines, facilities for phytosanitary controls). In all events, infrastructure investment should focus primarily on the new borders of the EU. In the southern and eastern Europe, investment should seek to eliminate existing bottlenecks on major arteries, especially Pan-European corridors and TEM links. It is also desirable to open new border crossings (three between Bulgaria and Greece, one between Bulgaria and Turkey) and to build a new Danube bridge between Bulgaria and Romania (Vidin/Calafat), which should facilitate international transport;

- providing a sufficient number of queues and windows to cope with the real volume of traffic and the foreseeable increase;

- where desirable, improving access to border crossings by widening roads, creating additional lanes subject to space availability and special lanes for vehicles in transit or empty vehicles, that would do much to keep traffic fluid by allowing for differentiation of customs operations. Well-equipped, secure parking facilities at borders with sufficient capacity should be encouraged for environmental, security and road safety reasons. A great deal of corruption and illegal activity seems to take place in the queues of trucks, often several kilometres long, waiting on the highway.

Procedures

It is recommended to introduce the following procedures where not yet implemented:

- introduction of common controls carried out jointly by the authorities on either side of the border. If such a joint action should prove impossible, particular attention should be paid to harmonising opening times of control posts on both sides of the border;

- general use of sample checks using risk management techniques, electronic control procedures with scanners for containers and heavy loads, and the development of non-stop phytosanitary and veterinary controls;

- transfer of control procedures to sites inside the country (especially for transit) or to the places of destination. The introduction of an advance declaration system allowing for the pre-clearance of goods would also be a step in the right direction;

- harmonisation of procedures and legislation applicable to vehicle and consignment controls and promotion of the best practice. It is essential that as many states as possible ratify the respective international instruments (UNECE convention on harmonisation of frontier controls, ESCAP, ECLAC) and implement the measures they recommend. The necessary harmonisation and simplification measures should also concern the documents to be shown to controlling authorities, which should be standardised. They should also be accompanied by greater computerisation of procedures, especially customs procedures and by the introduction of a computerised control system for TIR carnets which an amendment to the TIR Convention could make compulsory;

- strict compliance with the provisions of the TIR Convention and respect of the freedom of transit as instituted by Article V of GATT;

- simplification and harmonisation of procedures for weighing vehicles, with mutual recognition of vehicle weighing protocols and adoption of an international weight certificate;

- better coordination between the customs authorities of neighbouring countries through the promotion of permanent contacts and exchange of information, that should include the conclusion of crisis management agreements. Cooperation could be fostered by greater use of modern means of communication such as satellites, vehicle tracking, NCTS for transit, EUCARIS for vehicle registration and driving licences and ASF for vehicle theft;

- greater cooperation between national administrations through a clear distribution of tasks, sharing of information and coordination between personnel representing the various authorities at border crossings so as to avoid duplication of checks and procedures;

- simplification and, if possible, reduction of taxes, fees and duties charged at border crossings while ensuring that they are administered transparently;

- improved communication with the private sector and public through measures such as the creation of a website providing information about current regulations and driving bans or the publication of booklets describing the procedures and rules applicable at borders;

- harmonisation and, if possible, reduction of the driving bans which increase journey times, cause route changes and considerable variations in traffic levels at borders, increase waiting times at border crossings and bring about great variations in the workload of control personnel;

- development of a coherent and harmonised multilateral strategy to fight illegal immigration and combat the organised crime lying behind it.

Staff

The following solutions are recommended:

- increase in the number of personnel, with the assignment of enough staff to cope with the increased workload resulting from the growth of international traffic;

- failing 24/24 opening, alignment of border post opening times with the pattern of traffic flows and consistent working hours between different countries and different control agencies within the same country;

- training of control personnel both in the use of transport and customs documents and in the organisation of the work. Staff training should include a specific module on ethical conduct, emphasising behaviour which is acceptable and which is not. Training measures should also apply to drivers and the managers of transport firms;

- motivation of control officials by increasing their qualification levels. Introducing productivity indicators and setting specific targets for reducing processing times could also arouse staff's interest in the more efficient organisation of the work, especially if accompanied by rewards or bonuses should the targets be met;

- fight against corruption: governments should take measures to prevent corruption and illegal practices at borders (e.g. by creation of mobile control units, limiting direct contacts between the border staff and users e.g. by computerisation of procedures and rotating the personnel on random basis, introduction of controls after clearance, creation of anti-crime units, etc.).