

## **CHAPTER 2 OVERVIEW OF BULGARIAN TRANSPORT**

### **2.1 THE BULGARIAN NATIONAL TRANSPORT SYSTEM**

#### **2.1.1. International transport system**

##### **(1) Geographical Location**

Bulgaria is on the strategic location for developing the international transport route, though located at the south eastern fringe of Europe. The locational advantages are summarised as follows:

1. Connecting link between the three (3) continents - Europe, Asia and Africa;
2. Bridge between the West and the East;
3. Main route of the Trans-European corridor in Central and Eastern Europe
4. Central location on the Balkan Peninsula region

Those geographical factors must be considered very important when envisaging Bulgarian transport development as well as the economic / industrial development.

##### **(2) Regional economic group and linkage**

Bulgaria belonged to a particular regional economic group, the so-called COMECON Region and it is shifting to the internationally free economic zone.

The trading pattern represented by the export and import of Bulgaria from 1985 to 1994 shows a dramatic change in the trading partners and volumes due to a change of the economic group to which it belongs to.

The former USSR had the predominant share of Bulgarian exports, as large as 56.6% in 1985 and 64.0% in 1990. However, by 1994 it was reduced to only 19.1%. Instead Germany, Greece, Italy, the Republic of Macedonia and the USA emerged as the main trading partners recording more than 5% of Bulgarian exports in 1994.

It must be stressed that the existing transport infrastructure was shaped so as to meet the transport demand in the former regime, that is mainly export and import with the USSR and with related countries through the Black sea. The traffic movement in the transitional period of Bulgaria at present should be interpreted as a mixture of the declining traffic demand of the old regime and the increasing traffic demand in the emerging new regime. It is very difficult to

interpret the current traffic movement because the former traffic has neither completely disappeared, nor has the latter traffic yet shown clear shape.

### **(3) International Transport System**

#### **1) Present International Transport System of Bulgaria**

Since in principle the arterial transport networks of Bulgaria are connected with those of the neighbouring countries - Romania, Greece, Turkey, former Yugoslavia, it may be said that they are used by the international traffic or included in the international transport system in Central and Eastern Europe. The major international routes are enumerated as follows, reflecting the geographical characteristics of Bulgaria as discussed above.

#### **(A) Land transport**

##### **1. Continental transport route**

Western Europe - the Czech Republic (Prague) - Hungary (Budapest) - Former Yugoslavia (Belgrade) - Bulgaria (Sofia) - Turkey (Istanbul) and Asia / Africa

##### **2. Eastern European route**

Russian Federation ( Moscow, St. Petersburg) - The Ukraine (Kiev) - Romania (Bucharest) - Bulgaria (Rousse) - Turkey (Istanbul) and beyond.

##### **3. Regional transport routes connecting the neighbouring countries.**

Bulgaria (Sofia, Kulata) - Greece (Thessaloniki);

Bulgaria (Sofia) - Macedonia (Skopie) - Albania (Tirana, Duares)

#### **(B) Water transport**

##### **1. Black Sea transport route**

The maritime transport system on the Black sea has been developed so as to connect the Black sea coastal countries - Romania, The Ukraine, Georgia, the Russian Federation, and Turkey with each other and the international transport through the Bosphorous strait. The major sea ports on Bulgarian land are Port Bourgas and Port Varna.

##### **2. The Danube River transport route**

The Danube River running from Western Europe through Eastern Europe up to the Black Sea has developed the European inland water transport system covering such countries as Bulgaria, Romania, Yugoslavia and Hungary.

## 2) Pan-European Transport Development

The Pan-European Conference Crete 1994 ( European Commission, European Conference of Ministers, United Nations Economic Commission, Countries of Central and Eastern Europe) set forth TOWARDS INDICATIVE GUIDELINES FOR THE FURTHER DEVELOPMENT OF PAN-EUROPEAN TRANSPORT INFRASTRUCTURE to assist the integration of the European continent. It was agreed that it might be useful to provide the Governments and International Institutes with a planning tool for investments in transport projects of common interest. A three (3) LAYER concept was proposed as follows:

Layer 1: The long term perspective for Pan-European infrastructure development of common interest. No time horizon is set for the achievement of the network.

Layer 2 : The priorities of common interest for medium term development. For the European Community, these could be the Trans-European Network. For Central and Eastern Europe , these could be a number of priority corridors covering all modes of transport for development within a time horizon up to 2010.



Layer 3: The short term priorities of common interest located in Layer 2 expected to be under implementation within a shorter time period, of about 5 years.

The possible Layer 2 corridors in Central and Eastern Europe(Figure 2.1.1-1 ) emerged as follows:

1. Tallin - Riga - Kaunas - Warsaw
2. Berlin - Warsaw - Minsk - Moscow
3. Berlin - Wroclaw - Katowice - Lvov - Kiev
4. Dresden - Prague - Bratislava - Gyor - Budapest - Arad - Craiova - Sofia - Thessaloniki / Plovdiv - Istanbul
5. Trieste / Coper - Postojna - Ljubliana - Budapest - Uzgorod - Lvov
6. Gdansk - Katowice - Zilina
7. The Danube : Including all the ports located on this axis in the Central and Eastern European countries
8. Durres - Tirana - Skopje - Sofia - Plovdiv- Bourgas / Varna
9. Plovdiv - Bucharest - Kishinev - Ljubasivks - Kiev - Vitebsk - St. Petersburg - Helsinki

# THE CRETE CORRIDOR

- The Pan-European Conference Crete 1994
- Toward Indicative Guidelines for the Further Development of Pan-European Transport Infrastructure
- The Third Pan-European Transport Conference 1997

 Balkan Region  
 Visegrad Region

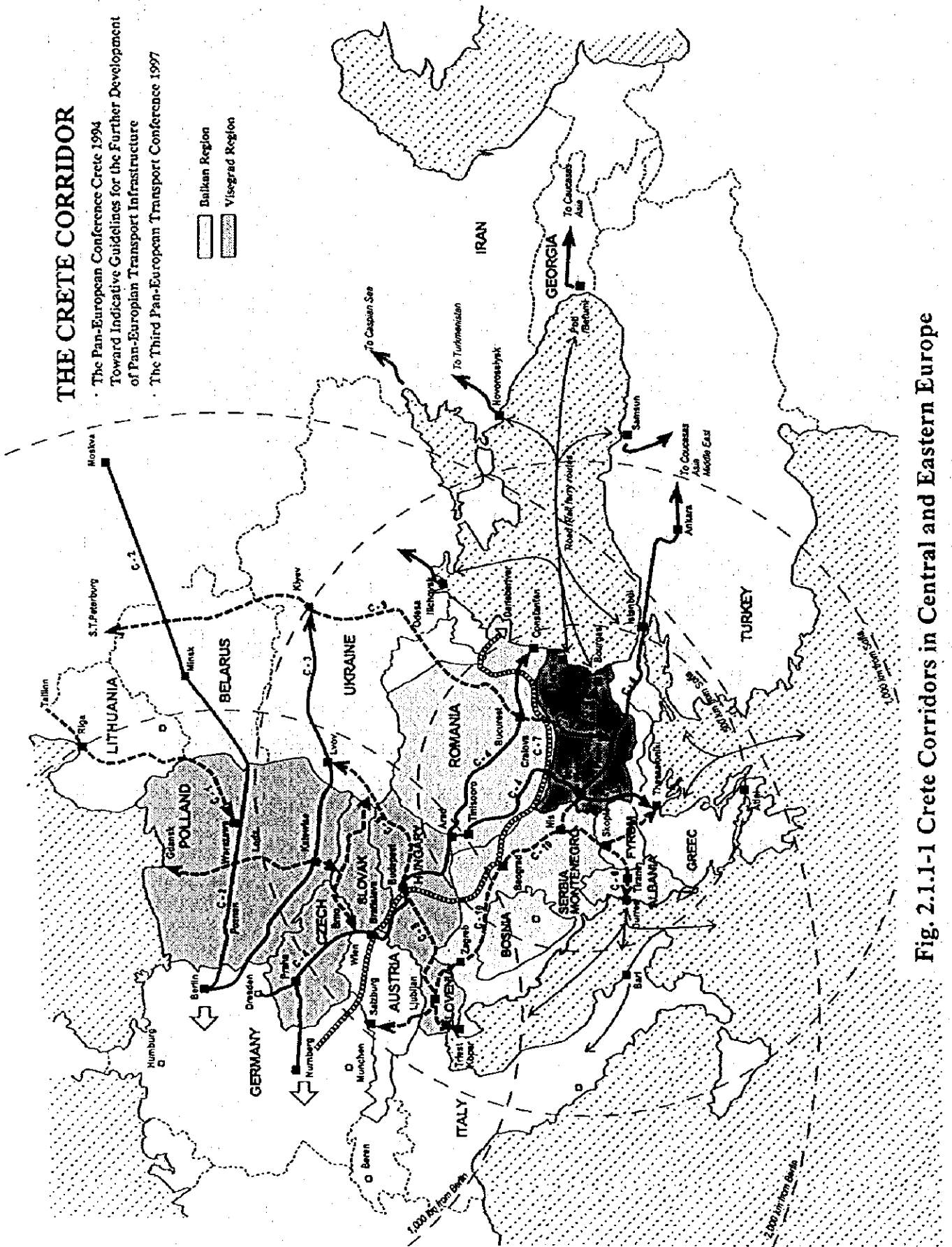




Fig. 2.1.1-1 Crete Corridors in Central and Eastern Europe

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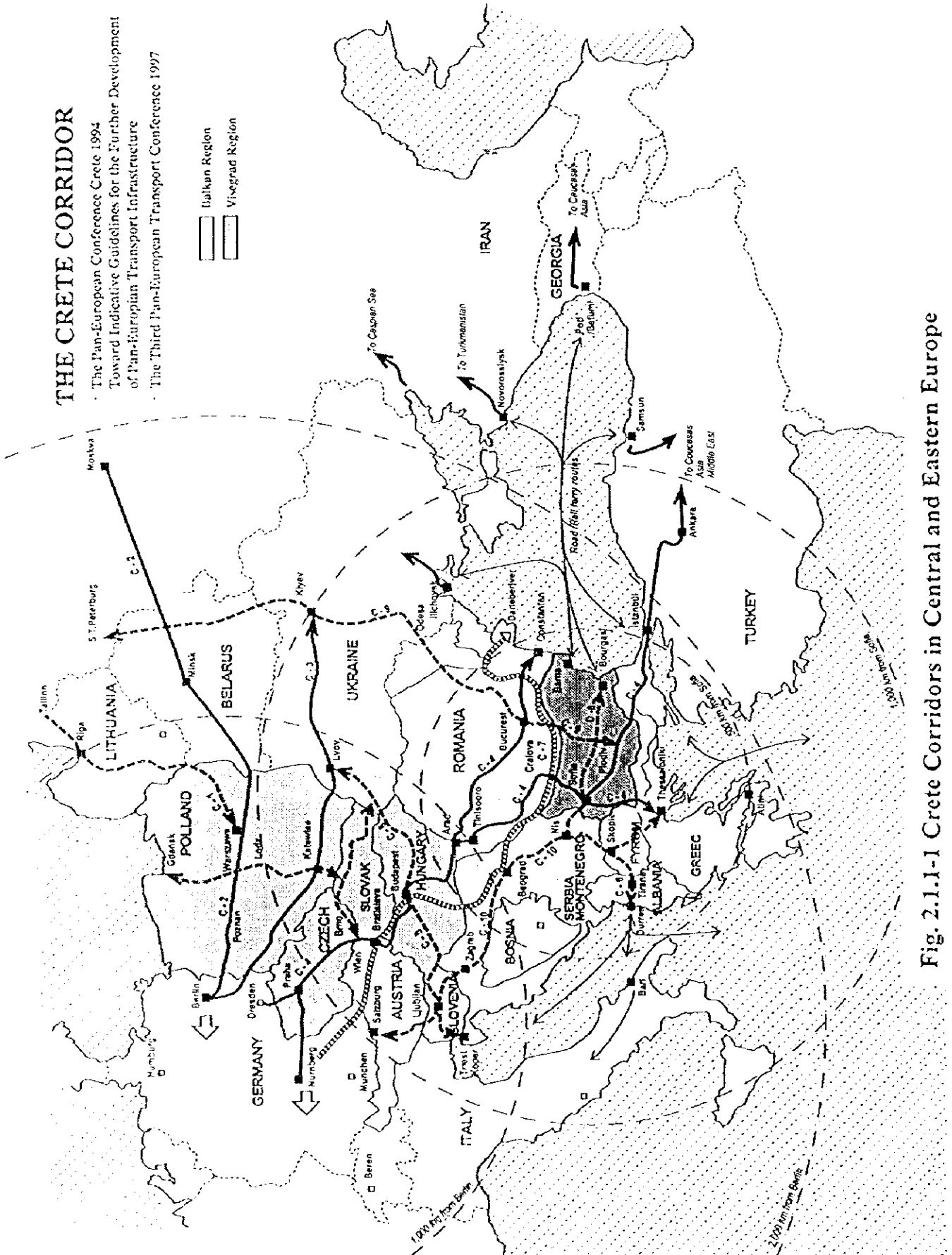


Fig. 2.1.1-1 Crete Corridors in Central and Eastern Europe

It is stressed that the corridor concept should be an evolutionary process to be refined as appropriate to developing a balanced approach to the Pan-European multimodal transport network .

Of the above mentioned corridors, those that relate to Bulgaria are Corridor 4, 7, 8 and 9.

Its main purpose is to strengthen the North-South international transport system consisting of two routes, one from South Europe (Greece, Turkey, Bulgaria) to the West and Central Europe - Corridor 4 and the other to East Europe (Russian Federation) - Corridor 9, as well as East-West transport across the Balkan Peninsula bridging the Black and the Adriatic Seas.

The international transport system in and around Bulgaria has started to develop with the initiative of the Pan or Trans- European corridor concept.

In June 1997 the Third Pan-European Transport Conference was held in Helsinki in order to make adjustment to Crete Corridors. The major points of adjustment are listed as follows;

- Inclusion of corridor 10 : Saizburg-Ljubljana-Zagreb-Beograd-Nis-Skopje-Veles-Thessaloniki ( Broadly traditional transport route to South Eastern Europe )  
Branch C : Nis-Sofia-(Dimitrovgrad-Istanbul via Corridor IV)
- Adoption of Pan-European Transport Area : More comprehensive approach to the areas influenced by the sea (Barents Euro-Arctic Area, Black Sea Basin Area, Mediterranean Basin Area, Adriatic/Ionian Seas Area)

## **2.1.2 National Transport System**

### **(1) Regional Development Structure in Bulgaria**

It can be said that the Bulgarian regional structure has been shaped by the combination of the following three major factors:

#### 1. Natural / topographical situation

Bulgaria features parallel mountain ranges stretching from the Western inland area (Sofia) to the Eastern Black Sea coastal area (Bourgas and Varna). Communities and industrial activities have been distributed on the narrow plains between the mountain ranges to the Black Sea. The East-West alignment of the Danube River also seems to have contributed to the East-West alignment of the Danube River coastal region. One of the major features of Bulgaria is that the

regional development pattern or structure is orientated in East-West direction, including land use and transportation.

## 2. Influence of the international transport

It is not unlikely that the emergence of the international transport routes might have developed certain regions in the route-passing country, irrespective of the national configuration.

From this viewpoint Bulgaria can be divided into three main regions historically developed along the international transport routes as follows:

<b>Inland Region:</b> (Sofia-Plovdiv-Haskovo Region)	On the continental land transport system (National Road E 80 and Railway)
<b>Black Sea Coastal Region:</b> (Bourgas-Varna Region)	On the Black Sea maritime transport system
<b>The Danube River Coastal Region:</b> (Rousse-Lovetch-Montana Region)	On the Danube inland water transport system

## 3. Influence of trading / industrial system

The regional structure which concentrates on the East-West direction was promoted not only by the topographical conditions as discussed above, but also by the concentration of trade on the Black Sea coast. As highlighted in the macroeconomic analysis, the raw materials and natural resources are imported through the Black Sea ports of Bourgas and Varna from former the USSR countries and transported mainly by BDZ to the manufacturing enterprises in the hinterland of the ports or the inland areas like the Sofia region. The produced commodities are exported back along the same transport route. Thus industries and communities are likely to develop in East-West alignment with transport and communication infrastructure similarly constructed to serve them.

### **(2) Basic National Transport System**

#### **1) Basic Transport Structure**

The basic Bulgarian transport network comprised of land, sea, river and air transport can be clearly interpreted by classifying their roles and functions and structured in an integrated transport system as follows:

#### **(A) Combination of International and National Land Transport**

Land transport (Road and Railway) in Bulgaria works as sections of the international routes and national trunk lines. It should be noted that the railway and road in Bulgaria run in parallel

most sections of the international and national transport trunk lines. However, the international and national lines seem to have developed in different directions.

International land transport: Mainly NORTH-SOUTH

First line: (Former Yugoslavia) - Sofia - Plovdiv -(Istanbul)  
-(Thessaloniki)

Second line: (Plovdiv - Rousse - Bucharest - Kiev - Helsinki)

National trunk line: Mainly EAST-WEST

1. North line along the national road E 83 and 771

2. Middle line

3. South line along the national road E 80 (A1) E 772

The roles and functions of the national trunk lines including both road and railway in the Bulgarian transport network are summarised as follows:

1. Branch lines of the international land transport routes connect with the major industrial areas and transport nodes, such as those of Bourgas and Varna ports.
2. Distribution / collection line of international passengers and goods over the country.
3. Main service line for domestic traffic.

## **(B) Combination of Land and Water Transport**

Bulgarian water transport consists of the Black Sea transport and the Danube inland water transport. They handle the international, as well as domestic (coastal) passengers and cargo. However, the domestic river and the international passenger traffic is at present quite marginal in volume.

The international cargo carried from the Black Sea coastal countries or beyond, and the Danube River coastal countries are unloaded at Bourgas and Varna ports and Vidin and Rousse respectively. The unloaded cargo at the ports is transported and distributed mainly by the national (domestic) land trunk transport within the countries. Thus, land and water combined transport systems have been established.

## **2) Transport Demand Situation**

The national statistics show that the freight volumes in 1995 was only 24% of the 1985 level. If the private sector is included, the figure is estimated at 30%. The passenger volumes were



reduced to 68%, roughly in proportion with the reduction in GDP. The larger cut back of freight may be attributed to the larger reduction in the manufacture production than GDP. In addition to the industrial set-back, the major reasons for the stagnant transport demand situation are reported as follows:

1. Lessened mobility of people caused by their reduced real incomes during the economic recession. The indicator of passenger trip rate per person p.a. representing the people's mobility decreased from 323 in 1985 to 235 in 1995.
2. Freight volume reduced in accordance with the transition from heavy industry to light industry.
3. Transport blockage caused by the political situation in the neighbouring countries (Former Yugoslavia).
4. Others

**Table 2.1.2-1 Indicators of transport & socio-economy of Bulgaria**

	1985	1990	1995
Freight Volume(in tonnes)	100	86	24(30)
Passenger Volume	100	95	45(68)
Population	100	97	93
Employment	100	100	81
GDP I)	100	99	72
Passenger trip rate per person	323	318	235

National Statistical Institute

(Figure) : Including Private Sector JICA Estimation

The implications on transport demand for transport planning are summarised as follows:

1. Over-capacity of transport infrastructure at present.  
(Effective transportation operation of the existing infrastructure for low level demand and necessity of maintenance / rehabilitation).
2. Changing transport demand structure in accordance with the transition to free economy
3. Shifting and redeveloping of the existing systems toward the new transport system and network.

### 3) Basic Structure of Transport Industry

#### (A) Freight Transport

The basic structure of the Bulgarian freight cargo transport industry could be seen in the transport performance in 1985 or 1990 when the effects of the change to the new regime and the economic recession had not been so considerable. Road transport accounted for 75% of the total volume of the goods in tonnage in 1990, followed by 16% by railway and 5% by sea transport. Inland transport by water, air and pipeline are all marginal. However their major market shares or roles are depicted through the examination of the average transport distance by mode, that is around 30 km by road, 200 km by railway, 500 km by inland water, 2 to 3000 km by sea transport. This suggests a hierarchical structure of freight transport where road transport covers mainly short distances, the railway medium distances within the country (judging from the transport distance and the size of the country) and the inland waterways (The Danube) medium distances with the neighbouring countries. Sea transport covers long distances, especially with the Black Sea countries and also the integrated / combined cargo transport system - the feeder transport by road to railway, the domestic transport by railway to the ports and the export / import transport by sea transport.

Each transport mode lost a great volume of freight between 1990 and 1995, especially in 1992, resulting in a loss of almost to 1/4 of the total freight transport in 1990. With half and less than 10% down of cargo volume in railway and sea water / pipeline respectively, the biggest loser was road transport, even taking into account the effects of privatisation of the land transport industry, which started in full swing after 1992

(The share of the public sector in freight road transport is estimated at 66%). It is supposed that this may be the result of the economic recession which most badly affected the local manufacturing industries such as the construction assembly industries and others, which most needed the short distance cargo transport - average 50 km by road transport as discussed above. In contrast, railway and sea transport still have the patronage of the state owned enterprises. Basic heavy and bulk materials, needed even in the economic recession period are transported by rail and sea.

Another tendency of the transport performance, common to all modes through the period from 1990 to 1995 is the increasing average transport haulage distance. The reasons for this must be analysed in detail. This may be due not only to the decrease of the domestic transport demand but to a new initiative for expanding the international transport market in response to the diversification of the trading pattern as discussed in Regional Economic Group and Linkage.

## **(B) Passenger Transport**

Similar to the freight transport in the preceding section, the basic structure of passenger transport industries in the former regime of Bulgaria can be seen in the performance of transport mode between 1985 or in 1990. As much as 75% of the passenger market was served by bus/coach transport and only 4% by railway. The average transport by mode suggests that the passenger transport structure consists of intra-urban transport, urban-suburban and inter-urban transport. These are respectively served by trolleys / tramways with the average trip length of 2-4 km, road bus transport with around 10 km and railway with 74 km.

Although the total level of passenger traffic was more than halved in the early 1990's, the share by mode did not change very much.

### **4) International / Domestic Transport by Mode**

Around 22% of the total freight volume carried was international cargo in 1994. In this statistic the freight transport to/from the ports for export/import within the territory of Bulgaria was counted as domestic transport, while the freight directly exported/imported by train or road from/to Bulgaria was included as international freight.

Sea transport enjoys the biggest share of the international cargo transport (55%). This reflects Bulgaria's trading pattern concentrated on the side of the Black Sea and its industrial structure concentrated on heavy industry which sea transport is suitable for. With a considerably high share of road transport in the international freight (30%), rail transport has a quite low proportion for export/import traffic. In contrast, the railway recorded comparatively high performance reaching 26% in the domestic cargo. This is mainly due to the present role of the railway that carries the bulky and heavy industrial materials and products to the ports (Bourgas, Varna and others) for export and import. The railway plays a supplemental role in international transport. The international trading statistics appear to indicate a tendency that imports exceed exports in sea transport but exports exceed imports using railway and road transport. This may show a tendency that industrial materials are imported by sea transport from the Black Sea area and manufacturing products using imported materials are exported by land transport towards the European countries on the continent.

### **5) Traffic Movement**

#### **(A) Passenger traffic**

Passenger trip OD matrix fabricated through the integration of the existing data and the survey data on the traffic, reveals the following important features of passenger traffic in Bulgaria at this moment.

**a. Great share of railway in passenger trip**

As large as 73.8 % of person trip is carried by railway (Railway : 355,000 Others : 126,000 trips). However it must be noted that this figure excludes the short distance trips such as those within the cities because of the scope of this transport study aiming at the potential passengers for the regional and national train for BDZ. High share of railway must be analysed in consideration of the irregular economic situation of the country when the survey was conducted. It must be stated that the shortage and unaffordable high price of gasoline for fuel of vehicles at that moment completely discouraged the road transport including passenger vehicles and buses. Therefore it is not the consequence of the fair competition between rail and road transport. Rather important is the competitiveness of the railway when the competition conditions, especially high fuel cost for vehicle which will be surely addressed in the course of the national economic growth of Bulgaria are equalised. In this situation it may be interpreted that people are forced to take railway because of no economic alternatives for their transportation.

**b. Local function of railway**

For the transportation analysis, the land territory of Bulgaria is divided into 15 zones (Figure 3.2.2-1). The Railway passenger trip OD matrix reveal the current roles of the railway in Bulgaria. The larger volume of railway passenger trips are shown in the OD pair between the neighbouring zones, and within each zone, rather than inter-city trip like those between Sofia, Bourgas and Varna. Unlike the idea that the railway serves the longer distance trips, relatively shorter trips between and within the zones, that is Local passenger trip, are major client of the railway operation. This is for either the following reasons. The current worst economic recession, especially in the period of traffic survey, compressed the business and tourist trips between the major cities. It is due to the dispersed land use pattern common to the socialist countries. It should be noted that this is definitely not the result of the tough competition with the road transport like buses and cars because the OD matrix of the passenger trip other than railway has the same tendency with the railway.

Based on the discussions of the above item a. and b. it may be concluded that the railway is an transport system essential for the local peoples in the local economic areas, especially in the time of the worst economic recession probably because of the low transportation cost of

railway. There seems to be no base of competition for road transport against the railway because of least availability and high cost of the fuel, if available.

The passenger traffic volume on the railway network indicates some basic features of the passenger transport of railway in Bulgaria as follows;

The passenger traffic flow tends to center on Sofia with relative large volume on no.2 line. On the other hand it keeps volume on the Sofia-Bourgas line ( no.1, 8,4 line) up to Stara Zagora. This is because of passenger flow between local cities , not bound for Sofia.

### **(B) Cargo movement**

Cargo transport volume by commodity group on the rail network show 3 types of distribution pattern as follows;

<u>Concentration on no.3 line</u>	<u>Dispersion on network</u>	<u>Concentration on no.4 line</u>
01 Coal,	05 Machinery & Equipment	08 Timber
02 Crude oil & Petroleum	07 Bricks & Roof tiles	10 Non Metalliferous Minerals
03 Ores & Concentrates	09 Quarry Stone	
04 Metals	14 Sugar Beet	
06 Cement	15 Fertilisers	
12 Grain & Fodder	16 Alcoholic & Soft drinks	
	17 Other Products	

Pattern of cargo movement on the rail network is dependent upon the geographical distribution of resources and consumption. One of the distinctive characteristics of Bulgarian cargo railway is the concentration of heavy/ bulky cargo transport on no.3 connecting Sofia and Bourgas. These cargo are exported/ imported through Black sea ports, mainly Bouras. Less cargo volume of this kind is handled through Varna. As discussed above cargo transport system on Bulgarian railway is networked with no.3 line of bulk transport being the main route.

### **(3) Outline of transport system by mode**

#### **1) Road transport**

In Bulgaria the national road network has been well developed with the total length of 36,911 km, which is classified by category, as follows:

**Table 2.1.2-2 - National road network by category**

Road category	1980	1990	1994
Motorway	108	273	277
Category I road	2352	2933	2924
Category II road	4360	3798	3789
Category III road	6319	6263	6261
Category IV road	23308	23655	23660
	36447	36922	36911

The national road network may be basically viewed as a grid pattern comprised of East-West and North-South connecting arterial roads. The major East-West roads connecting Sofia and Bourgas / Varna are E 83, E 772, E 773, E 6 and E 80, while the major North-South roads consist of E 85, E 70 to Rousse, E 79 to Vidin, E 79 to Kulata and etc. As discussed before, East-West roads mainly carry the domestic traffic and North-West roads do the international services. However E 80 national road carries both of the domestic (East-West) traffic and international (North- South ) traffic as well.

It is interesting to state that 98,7% of the total road length was constructed before 1980 and little development of road network has been made in the past 15 years up to date.

The arterial road consists of the motorway and first class to third class road accounting for 35,9% of the total road length. The paved road constitutes 91,9%. Bulgarian experts rated the general conditions of the roads as 67,8% good, 18,0% medium and 14,2% bad.

The General Road Administration (GRA) of MOT defined the road sections listed in Table 2.1.1-3 as international road, which covers most arterial roads of Bulgaria.

The main tasks of the road administration are upgrading those international roads in response to the international trading diversified in the transition to the free market economy, especially in those sections under standard, as listed in the table.

MOT has been improving the road network under the programme of reconstruction and modernisation of roads I, II, III category for 1991- 2005 as shown in Table 2.1.2-4.

The Bulgarian Government has a national motorway development plan, which is designed to develop the highway network in Bulgaria, in the form of a circuit connecting the major cities - Sofia, Plovdiv, Bourgas and Varna. Some sections of the network have been already constructed and they are in operation. However the construction schedule of the highway network is not officially announced.

**Table 2.1.2-3 International road defined by (GRA)**

Road number	Route	Total	Motor way	High speed	Normal road	Not fitting the 3 cat.	Border crossing points
E 70	Rousse-Varna	190	44	-	113	33	Varna-Rousse
E 79	Vidin-Sofia-Kulata	439	45	15	259	120	Vidin-Kulata
E 80	Yugoslavia-Sofia-Andreevo-Istanbul	365	133	20	186	26	Kalotina-Andreevo
E 83	Sofia - Rouse	233	62	-	169	7	Rouse
E 87	Varna-Durankulak	365	-	12	213	140	Durankulak
E 772	Turnovo-Shoumen	250	-	-	210	40	-
E 773	Popovitsa-Bourgas	215	8	-	147	60	-

**Table 2.1.2-4 Reconstruction & modernisation of roads 1991 - 2005**

ROAD SECTION	LENGTH (KM)
<b>CATEGORY I</b>	
Vladaya- R. Daskalovo	8.3
Dupnitsa - Blagoevgrad	22.0
Mezdra - Botevgrad	32.0
Rousse - Byala	53.0
Kalotina - St. Zagora	11.0
M. Turnovo - Debelt	7.0
Radomir - Pernik	10.0
Zlatni Piasatsi -	9.0
<b>CATEGORY II</b>	
Lovetch - Pleven	35.0
Sevlievo - Gabrovo	28.0
Debelt - Bourgas	18.0
Plovdiv	15.0
<b>TOTAL</b>	<b>248.3</b>

The vehicle registration system is different from that in the Western countries. Therefore, the statistics on the vehicle registration is elusive. However the registered transport vehicles by type are reported as follows:

**Table 2.1.2-5 Registered transport vehicles by type ( 1995 )**

MOTORCYCLES	518,000
PASSENGER CARS	1,587,873
TRUCKS	195,786
BUSES	40,610
TRACTORS, TRAILERS & OTHERS	305,154
<b>TOTAL</b>	<b>2,647,423</b>

## 2) Railway Transport

The railway transport system in Bulgaria is to be presented in detail in the following chapter. In this section the outline of the Bulgarian State Railways is briefly shown as one of the major transport means in the country.

The railway network , as well as the road network has been well developed in the country, in terms of the coverage of terrains including the communities, industrial areas and other major land uses, with the total length s of 4294 km of BDZ , complemented by 2644 km of industrial tracks and others run by different administrations.

The major characteristics of BDZ are summarised as follows:

### 1. Construction period

The construction of the national rail network was made mainly in the period 1890-1960. Therefore, investments are geared mainly toward reconstruction , duplication and electrification of the existing railway lines.

### 2. Electrification and double - tracking

2650 km or 64,7% of the total length of the rail lines have been electrified and 960 km or 23,4% double-tracked.

### 3. Structure



The BDZ rail lines are characterised with great percentages of curves with radius under 300 m, and gradient over 15/1000 and a number of engineering installations - tunnels, bridges, drain - pipes, supporting walls, etc., which all have been built according to the old technical standard.

#### 4. Train speed

The maximum design speed is 130 km/h. However, it is possible only on 93 km of the BDZ railway lines. The greater part of the railway are designed for speed between 80 and 100 km/h.

#### 5. International standard

Some railway lines which were minor branch lines of BDZ are highlighted in light of the Crete Corridor development, for instance - Sofia - Kulata on Corridor 4, Sofia - Gyueshevo on Corridor 8 and Sofia - Vidin on Corridor 4.

In addition to the improvement of the existing track lines, upgrading or reconstruction of the minor lines became necessary in order to meet international standard..

### **3) Sea Transport**

#### **(A) Sea ports and sea lanes in the Black sea.**

The major export and import sea ports are Bourgas and Varna. Regular sea lanes have been established between Bourgas - Istanbul (224 km) and beyond, Novorosiisk (869km), and Varna - Ilitchovsk ( 440 km ), Odessa ( 445 km ), Potti (Georgia) including ro-ro service, container service and others.

#### **(B) Port facilities of Bourgas and Varna.**

The port facilities of Bourgas and Varna are outlined. They are divided into some specialised harbours and ports. It seems that the port of Varna was more developed than the port of Bourgas in terms of the variety of port facilities probably due to the connection with the Danube inland water transport by rail and by road, and the existence of the large industrial complex adjacent to the port.

#### **(C) Traffic**

The loaded and unloaded cargoes at the sea harbours have fallen to 2/3 of the 1985 volumes. However, among the cargoes, the volume of export remained steady.

The freight volume in the ports of Bourgas and Varna show their characteristics.

1. As much as 88,9% of the total freight volume of Bourgas is occupied by the combination of the three items - coals, ores, and metals, while the freight volume of Varna is somewhat more diversified, centering around the coal transport. This illustrates the different port functions of Bourgas and Varna. Due to the large industrial complex developed adjacent to Varna port, it works as the industrial port.
2. The Port of Varna lost almost half of the freight volume from 1985 to 1994 mainly due to the decrease of coal transport.
3. Ores and concentrates reduced drastically their volume at Bourgas in 1991, but this was reversed in 1994.

**Table 2.1.2.-6 Loaded & unloaded freight at the sea harbours**

	1985	1990	1994
Import	27,462	19,006	13,034
Export	5,454	4,169	6,926
Coastal	1,275	851	-
Total	34,197	24,026	19,960

**Table 2.1.2-7 Freight volume in ports Bourgas and Varna**

1,000TONS

CARGOES	PORT OF BOURGAS			PORT OF VARNA		
	1985	1991	1994	1985	1991	1994
COALS	1492	1084	1738	4456	2303	1953
ORES & CONCENTRATES	1453	189	1347	194	-	-
METALS	1909	751	2074	462	35	98
CEREALS	209	188	16	1748	672	641
FERTILIZERS	175	478	128	557	289	338
SUGAR	36	16	98	447	56	214
MINERALS	315	-	28	510	205	196
SODA ASH	-	-	-	199	236	223
UREA	-	-	-	-	237	241
CLINCKER	-	-	-	13	182	218
CONTAINERS	-	-	-	371	282	257
OTHERS	792	330	330	639	357	282
TOTAL	6381	3036	5800	9596	4854	4661

**Table 2.1.2-8 Outline of port facilities of Bourgas & Varna ports**

<b>BOURGAS PORT</b>	<b>VARNA PORT</b>
<b>EAST HARBOUR - GENERAL CARGO</b> 9 berths with max depth of 10,0 m	<b>VARNA EAST - BULK CARGO</b> (Transferred to Varna West), General Cargo and Container/ro-ro traffic 13 berths (2000m) with the depth of 6,4 -10,6m
<b>BULK HARBOUR - BULK CARGO</b> 5 berths with max. depth of 11,0m	<b>VARNA WEST - BULK CARGO</b> General Cargo / container terminal constructed.( Adjacent to the large industrial complex) 180 berths (3000m) with the depth of 10m
<b>WEST HARBOUR - STEEL PRODUCTHANDLING &amp; CONTAINER / RO-RO TERMINALS</b> <b>OIL HARBOUR - OIL PRODUCTION</b> 3 berths with max. depth of 13,7m	<b>RAIL FERRY TERMINAL</b> (especially to Ilitchovsk in the Ukraine) 2 berths, marshalling yard/ shed, changing rail gauge
	<b>POWER STATION &amp; COAL TERMINAL</b> (for power station) max. depth of 8,5m
	<b>OIL TERMINAL (3 berths)</b> <b>LES PORT - TIMBER TERMINAL</b> Specialised for handling timber originating from the Komi Republic in Russia.

**(D) Development Plan / Project**

A master plan for the development of the Port of Bourgas up to 2015 has been prepared , which includes several projects for the rationalisation of facilities within the existing port. A Draft Master Plan of Varna Port, funded by EBRD was also prepared.

The development projects for implementation were slated in both Varna and Bourgas ports as shown in table 2.1.2-9.

**(E) Future Prospects**

The Balkan transport study presents the future prospects of the ports of Bourgas and Varna, which should be taken into consideration , as follows:

< Bourgas>

1. A deep sea port serving the natural hinterland of the Sofia region, possibly FYROM.
2. Possibly developing as a hub port for container shipments to the Black Sea.
3. A ferry port providing links from Europe to Georgia (to Iran), Russia and Central Asia.
4. A regional import center for goods from the Far East to Eastern and Central Europe.
5. A transshipment point for oil from Central Asia.

**<Varna>**

The capacity of the port facilities in the Varna area exceeds the anticipated demand in the medium term.

1. The decision to improve container facilities at Varna East should be delayed until new trading patterns are well established (Competition from neighbouring ports, Bourgas and Thessaloniki).
2. In spite of the links to the port of Rousse and hence to the Danube, it will face strong competition for the Danube traffic with other routes that offer advantages other than price (e.g. access to a larger port at Constantza, faster transit times via Thessaloniki).
3. Development of port facilities at Varna are constrained by depth limitation.

**Table 2.1.2-9 Development project of the ports of Bourgas and Varna**

THE PORT OF BOURGAS		THE PORT OF VARNA	
Terminal 1	General & liquid cargoes	Container terminal - Varna East Grain terminal - Varna West	
Terminal 2	Bulk cargoes, crete corridor project		
Terminal 3	Ro-ro ferry terminal, Road & rail ferries to Potti (Georgia) with onward transport to Iran		
Terminal 4	Container terminal, Pipeline from Bourgas to Alexandropolis(Greece)		

**4) Inland Water Transport**

**(A) The Danube River Port Complex**

Currently on the Bulgarian part of the Danube, there are 8 public ports, which are organized into three port complexes as follows:

### Port Complex Rousse

1. The port of Rousse - general cargo, chemicals, metals, fertilisers and grain.
  - 20 berths for cargo, 7 berths for passengers
  - Ro-ro and ferry terminal trucks and cars
2. The port of Somovit - crude oil and oil products; general and bulk freight.
3. The port of Svishtov - general / bulk freight (mainly construction materials)
4. The port of Silistra
5. The port of Tutrakan

### Port Complex Lom

1. The port of Lom - coal, metals, chemicals and general cargo.
2. The port of Oriahovo - building materials and Ro-ro service.

### Port Complex Vidin

1. Combined transport (loading and unloading of trailers and lorries).

### **(B) Traffic**

The traffic carried by Bulgarian river shipping has sharply declined. It is due to the disappearance of the export market in the former Soviet Union and other related countries and in general by the recession of the economy. In addition, the imposition of trade sanctions on the former Yugoslavia prevented international trade between Europe and the Balkan states using the Danube navigation.

**Table 2.1.2-10 Freight and passengers in river ports**

	1985	1990	1994
Total freight	8,489	9,543	3,804
(thousand tons)			
Import	4,126	3,138	1,612
Export	919	479	139
Transit	-	154	838
Coastal	3,444	5,772	1,215
Passengers	285	26	10
(thousands)			

### **(C) Development Projects.**

The following projects have been proposed by the port authority for funding under the PHARE Programme.

1. Water area and Ro-ro terminal works.
2. Warehouse for toxic chemicals.
3. Crane rails - expansion and modernisation.
4. Ferro - concrete warehouse ( 1400 sq. m).
5. 20 and 40 feet container repair complex.
6. Cereal terminals.

### **5) Air transport**

After the considerable organisational change of the air transport carrier, three state companies are in operation - Balkan joint-stock company, Hemis Air and Heli Air. There are also 8 private air companies.

Balkan carries about 80% of the flights at Sofia Airport and operates 56 destinations. Hemus Air performs scheduled charter flights and operates lines to Bratislava, Bucharest, Leipzig, Oslo, Skopje and Tirana.

#### **(A) Airports**

International airports registered by the Civil Aviation Law are Vrajdebna (Sofia), Aksakovo (Varna), Sarafovo (Bourgas) and Krumovo (Plovdiv). In 1993 Gorna Oriahovitsa airport was registered as an international airport. The remaining 5 airports - Vidin, Rousse, Silistra, Turgovishte and Stara Zagora are airports for domestic flights.

The civil airports in Bulgaria were built at an earlier period and they are not up to international standards. They are all subject to upgrading.

#### **(B) Traffic**

According to the results of Data collection and compilation of the available existing data and information on Bulgarian transport and traffic, which was sub-contracted to the Bulgarian consultant--CTC-Engineering, Ltd, the passenger and freight flights have sharply declined in Bulgaria. It must be noted that the local international airports Varna and Bourgas share half of the international passengers during the tourist season at the Black Sea coast.

**Table 2.1.2-11 Existing conditions of airports in Bulgaria**

Airport	Track Length (m)	Carrying Capacity (tons)
Sofia	2800	up to 144
Varna	2500	up to 379
Bourgas	3200	up to 379
Plovdiv	2500	up to 319
Vidin	2100	up to 73
Gorna Oriahovitsa	2450	up to 110
Turgovishte	2200	up to 98
Rousse	2000	up to 18
Silistra	2500	up to 73
Stara Zagora	2200	up to 68

**Table 2.1.2-12 Air passengers and freight in Bulgaria**

		Passengers			Cargo(Tons)		
		1985	1990	1995	1985	1990	1995
Sofia	Total	2,000,000	2,400,000	2,100,000	24,400	22,200	11,600
	Domestic	1,000,000	1,000,000	100,000	-	-	-
	Internat'l	1,000,000	1,400,000	1,100,000	-	-	-
Bourgas	Total	1,363,000	921,000	526,559	16,000	12,000	6,886
	Domestic	733,000	420,000	559	-	-	-
	Internat'l	630,000	501,000	526,000	-	-	-
Varna	Total	907,000	750,000	426,000	9787	10,086	448
	Domestic	280,000	290,000	21,000	-	-	-
	Internat'l	627,000	460,000	405,000	-	-	-
	(Charter)	390,000	390,000	405,000	-	-	-
	(Schedule)	237,000	70,000	0	-	-	-
Bulgaria	Total	4,270,000	4,071,000	3,052,559	50,187	44,286	18,934
	Domestic	2,013,000	1,710,000	21,000	-	-	-
	Internat'l	2,257,000	2,361,000	2,031,000	-	-	-

CTC-Engineering, Ltd

## **2.2 CURRENT NATIONAL TRANSPORT DEVELOPMENT POLICY AND PLAN / PROGRAMME**

### **2.2.1. DEVELOPMENT POLICY OF THE GOVERNMENT**

The national policy of transport development and improvement, covering and integrating all transport modes has not yet been officially established in the national development plan of Bulgaria.

It is reported that transport development/improvement projects have been prepared by each sector and are scheduled to be incorporated into the medium national transport development plan covering the period up to 2010. During the transition to the free market economy, the Government (in particular the Ministry of Transport) has been in the process of establishing new transport development management and operating systems, as well as new development policies. In view of the unstable and unpredictable nature of this transition several issues on transport development have emerged from the review of literature and during interviews with the agencies concerned. The main points are summarised as follows:

#### **1. Maintenance and rehabilitation to sustain the existing transport system.**

As discussed earlier, the transport network of railway and road routes has been well developed in Bulgaria. However the extensive transport infrastructure has deteriorated due to insufficient maintenance. Repair and rehabilitation requirements have increased rapidly. Within the financial and other constraints, maintenance and rehabilitation are now important policies of the Government.

#### **2. Streamlining and effectuating the transport infrastructure and operation.**

The enlarged transport infrastructure developed during the past regime must be streamlined to make it economically and financially viable in the free market economy in the forthcoming decades.

#### **3. Harmonisation and integration with the European transport system.**

This is the international commitment of Bulgaria. The Trans-European corridor with the purpose of promoting interconnection and interoperability of the network in Europe must be developed within a time horizon up to 2010. Development and improvement of the Bulgarian sections of these corridors are the priority policy of the Government. This includes upgrading, standardisation and constructing missing links.



#### **4. National integrated transport system in future.**

In addition to the urgent policy matters as discussed above, attention must be paid to the establishment of a national integrated transport system in future. The Crete Conference recognises that infrastructure development must also address the needs of transport at local, regional and national, as well as Pan-European level.

The primary concern is the modal split of land transport between railway and road transport, which the government should guide the freely competitive transport market to achieve.

There is a trend in many countries in the world that industrial and economic growth is accompanied by high road traffic usage, resulting in traffic congestion and environmental deterioration that threaten the further sustainable development of the country. Therefore, assuming that the transport market is liberalised, the government policy measures and intervention become of great importance to achieve an economically and environmentally sustainable transport system.

In formulating the national transport development policy the functional share between rail and road, traffic usage perspective and measures, environmental preservation and energy saving and other factors must be examined. At this moment before the full scale economic development and traffic usage it seems that these policies have not officially been declared.

#### **2.2.2 CURRENT DEVELOPMENT PLAN/PROJECT**

In line with the agreement of the Crete Conference on Trans-European corridors project preparation works at both international and national levels have started to implement the corridor development concept. The development project studies can be classified into international transport studies covering several countries along the corridors and feasibility studies on the specific projects located on the corridors.

##### **(1) International Transport Network Development Proposal**

The most important studies proposing the international transport network development and most affecting the Bulgarian transport system, among others, are the following:

a) Feasibility study for the development of railway and combined transport on international Trans-European Axes in Central and Eastern Europe: Commission of the European Community 1994.

b) Balkan transport study: European Commission - PHARE 1996

## **2) International Transport Development Projects Proposal On The Corridors**

Indicative Guidelines for the further Development of Pan-European Transport Infrastructure was the agreement of the Crete Conference as presented in the preceding section. This set up the following criteria for selecting the individual development projects of the third layer which are to be implemented within a short term and on the corridors of the second layer which are expected to be undertaken up to 2010.

**Interconnection/Interoperability** : Improve the geographical and technical interconnection and interoperability of international and interregional links which show a significant amount of existing or potential international traffic. As a general rule, no project should carry less than 10% of international traffic. Common European technical standards such as those laid down in the various UN/EC agreements and Community instruments should be respected as necessary to ensure interoperability.

**Practical** : Able to be implemented within 5 to 6 years.

**Modal** : Be selected with a view to striking an appropriate modal balance and minimising environmental impact whilst allowing sustainable mobility.

**Financial** : Potential availability of financing must be shown, realistically sharing contributions from national governmental budgets, foreign grants and aid, and private financing.

**Economic**: As a general rule the rate of return should be at least in the order of 10%.

Finally, the indicative guidelines stressed that in the light of the current and foreseeable traffic flows, maintenance, rehabilitation and upgrading should be given preference over constructing new infrastructure. Where appropriate, projects should be phased over time and with regards to quality, according to economic criteria. In terms of potential travel time gains cross-border traffic facilitation, including from improved customs staffing and procedures along with other possible regulatory measures, should be compared to potential gains from infrastructure improvement within a country in order to determine priorities for action. In compliance with those guidelines and criteria as stated above, the international transport development projects in Bulgaria have been studied and proposed.

Under the national transport programme PHARE from 1992 to date, the Ministry of Transport has prepared and implemented several transport development schemes including the organisational restructuring of the Ministry itself in response to the transition to the market

orientated economy. The priority investment projects along the Crete corridors are recognised by the Ministry of Transport. Judging from the priority project lists the first priority seems to be Corridor 8. (The East - West corridor across Bulgaria), followed by Corridor 4, (the Pan-European corridor connecting the Northern area of West/Central Europe with the Southern area of the Near and Middle East/ Asia.

**Table 2.2.2-1 Priority investment projects along the CRETE Corridors in Bulgaria - (Ministry of transport)**

	SHORT TERM	MEDIUM TERM	LONG TERM
RAILWAY	Construction of railway from Macedonia's border to Gyueshevo-2km (Corridor No. 8)	Electrification & reconstruction, upgrading to max. 160 km/h	Combined transport terminal in Sofia & Dimitrovgrad (Corridor No. 4)
	Reconstruction & upgrading of railway up to 120-140 km/h Gyueshevo-Radomir-80 km (Corridor No.8)	Plovdiv-Dimitrovgrad-Svilengrad - 150 km (Corridor No. 4) River Danube crossing - new road & railway bridge Lom-Rast/Vidin-Kalafat (Corridor No. 4)	
ROAD		Road upgrading Vidin-Sofia -Kulata (Corridor No. 4)	
PORT		Improvement & modernisation of the Danube ports of Rousse and Lom (Corridor No.7)	Bulk terminal-Port of Bourgas(Corridor No. 8)
		Container terminal -Port of Varna	
		Container terminal-Port of Bourgas Grain terminal- Port of Varna (Corridor No. 8)	
AIRPORT	Reconstruction & upgrading of Sofia International Airport		
	Reconstruction of Bourgas Airport		

## **2.3 LONG TERM STRUCTURE PLAN OF BULGARIAN TRANSPORT AND RAILWAY SYSTEM**

### **2.3.1 Planning policies**

It may be safely said that formulating planning policies for the national transport development encounters difficulties due to such present transport situations as outlined below;

1. The transport activities are very stagnant, possibly at the lowest level of transport intensity (minimum level of generated / attracted traffic).
2. The conditions stated above reflect the diminishing transport activities developed during the past regime with no clear picture yet emerging for the future of Bulgarian transport, commerce and industry.

Apparently it is not an appropriate planning approach to make long term transport development plans aiming at the future transport situation predicted based on the past and present unfavourable trends of the transport ,economic and industrial development of Bulgaria, even though without clear future picture of them in sight at present. The proposed transport development policy and structure plan presumes that Bulgaria will be a well developed country in 2020. As forecast in the macro-economy section GDP will grow by 250%. The transport development plan should be designed to facilitate the prosperity of Bulgaria.

The proposed transport developments assume that the following transport conditions exist by the year 2020:

1. The traffic demand will increase at the same or greater pace than the forecast increase of the GDP.
2. As a result of the internationalisation of Bulgaria's trade and industry in line with the change to free market economy and the integration with the European economy, the international traffic will predominate within the national transport traffic and market.
3. The railway and road transport will compete hard to gain a share of the increased demand both in terms of passengers and freight.

On these premises the following transport development policies are developed :

- 1. Transport development strategically orientated towards Bulgarian trade and industrial development.**

Bulgaria has committed itself to improve and develop the international transport corridors which pass through her territory : Sofia - Kulata to Greece, Sofia - Gyueshevo to Macedonia, Sofia - Vidin to Romania etc. This represents a significant transport development and hence raising funds to implement these projects is requested. Although the improvement of these international corridors is a responsibility of Bulgaria, the concrete development policies and priorities should be established in accordance with the strategic economic, industrial and trade policy of Bulgaria. The priority of developing the East-West and North-South corridors which are expected to open the new horizon of the international trade and industrial growth for Bulgaria should be placed on in networking the national transport system.

## **2. Internationalisation of the transport system and operations**

It is anticipated that the international and domestic traffic will be indistinguishable in the progress of integrating of Bulgaria into the European society. It will be very important to plan and develop the national transport system in accordance with international relations with neighbouring countries and with Central and Eastern Europe.

This implies that the international influence will encroach on the Bulgarian national transport. More importantly the international market will become open to Bulgarian national transport operators, including the road and rail transport. Thus the development policy should be towards a more internationalised transport system and operations.

## **3. Public Transport (Railway) Orientated System .**

Such advantages as environmental preservation, energy saving and transport safety and the best usage of the existing well developed railway network could provide a basis for a railway orientated national transport system. This system has been a world-wide aspiration, but it has never been materialised in its true sense. The JICA Study Team believes that a railway orientated transport system should be developed in Bulgaria in co-operation and co-ordination with neighbouring countries, Central and Eastern Europe and the Black Sea economic region.

## **4. Integrated and combined transport system.**

More serious attention should be paid to the integration and combination of transport modes, since every country integrated into the unified economic zone has developed its own transport system. Therefore, it is very important to combine the different modes by countries in order to create the international transport corridors envisaged by the European countries.

These policies are defined as the long term policies for Bulgarian transport improvement/ development , which should be achieved through the forthcoming several decades, not limited to the period up to the target year of 2020. The long term structure plan of Bulgarian transport system is proposed to achieve those long term policies as set above.

### 2.3.2 International corridor development

The international corridor system, which is incorporated into the long term structure plan, should be developed as shown in the figure 2.3.2-1 and outlined as follows;

- The Bulgarian economy should target at East-West trade, anticipating great development in the Southern countries of the CIS and at North-South, anticipating increased trade with Western and Central Europe.
- The transport infrastructure has been well developed in East-West direction. It is recommended that this corridor be used to enhance international trade and industrial development.
- Bulgaria is located on the Pan or Trans-European corridor. However it is located only at one of the passing points. If Bulgaria opens up to East-West trading, the country can enjoy a special position on the Trans-European corridor and it can become a cross-road of the East-West and North-South corridors.

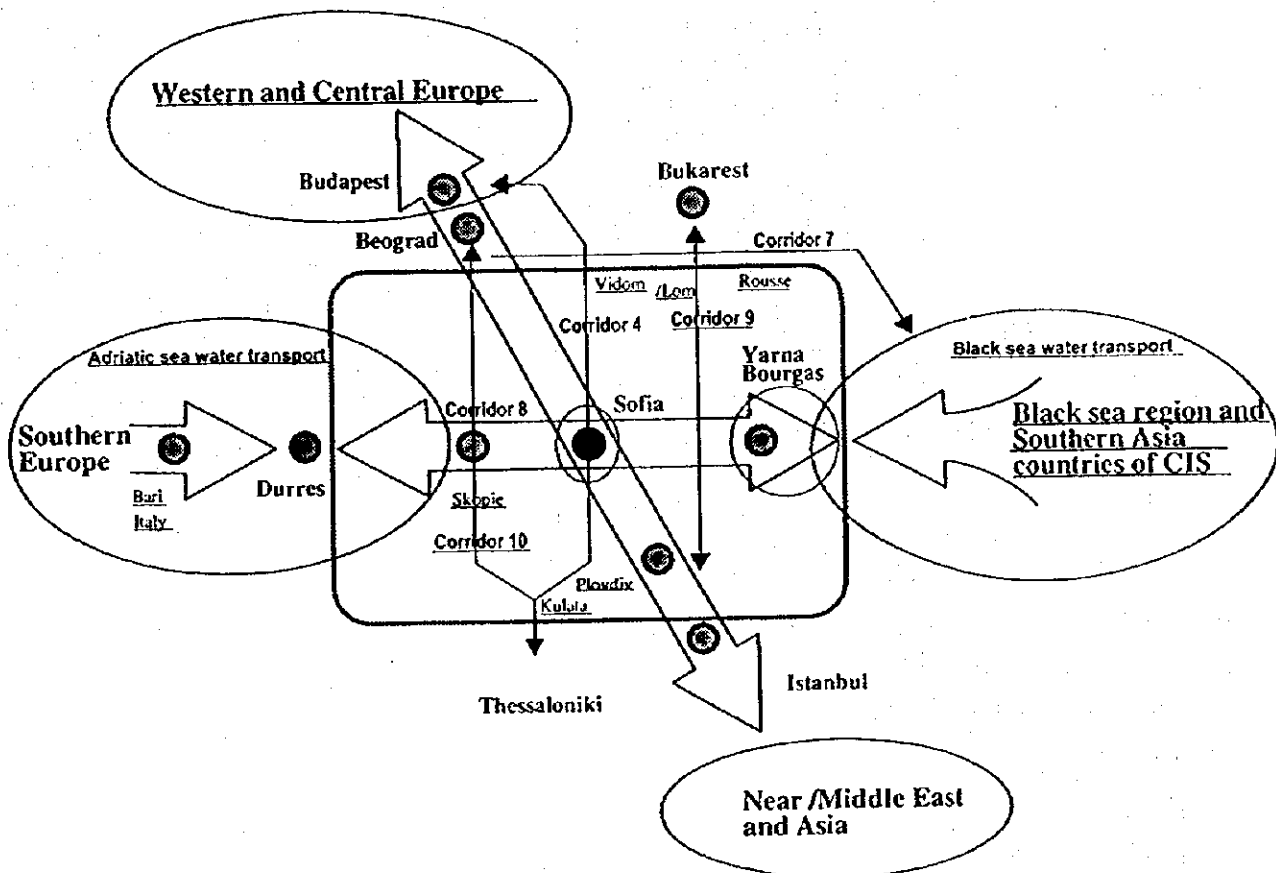


Figure 2.3.2-1 International Corridor Development

### **2.3.3 Long Term Structure Plan of Bulgarian Transport System**

#### **(1) Regional Structure of Bulgaria**

##### **< 2 belts and 4 zone of development >**

Regional structure of Bulgaria will consist of two development belts and four development zones (Figure 2.3.3-1 ). Two(2)East-West development belts lie from Sofia to Varna and Bourgas, along which the main plain areas of Bulgaria are concentrated ,and agricultural land, population and industries have been accumulated. Major development activities are also supposed to take place mainly along those 2 belts in future, playing the leading role as the prop and stay of Bulgarian regional structure. In addition 4 regional development zones in the Trans-border co-operation with the neighbouring countries are planed to cluster around the development belts.

##### **< Land use and railway-oriented transport system >**

It must be stressed that in order to develop the railway oriented transport system ,which is one of the policies of this transport planning , land use and regional structure also must be shifted to increase the patronage of the railway by means of developing the high density area along the selected rail-lines ,rather than dispersing population and industries along the length of all the railway network. The proposed regional structure tends to improve the Sofia-Varna line and Sofia-Durgas line so as to encourage the regional development along these selected lines. In turn the high volume of transport demand tapped through the regional development is to support the high service rail operation.

#### **(2) Long Term Structure Plan of Bulgarian Transport System**

Long term structure plan aims at the establishment of the transport system and network outlined as follows;

##### **1. National transport corridors**

Bulgarian national transport system shall be established with the national transport corridors as its backbone. National transport corridor shall consist of National trunk rail-lines and express ways circularly linking Sofia,Plovdiv,Burgas and Varna , running through the development belts as defined above. The Bulgarian main growth belts are designed to be served by both of the railway and road system. The appropriate functional share and relationship must be made between them.

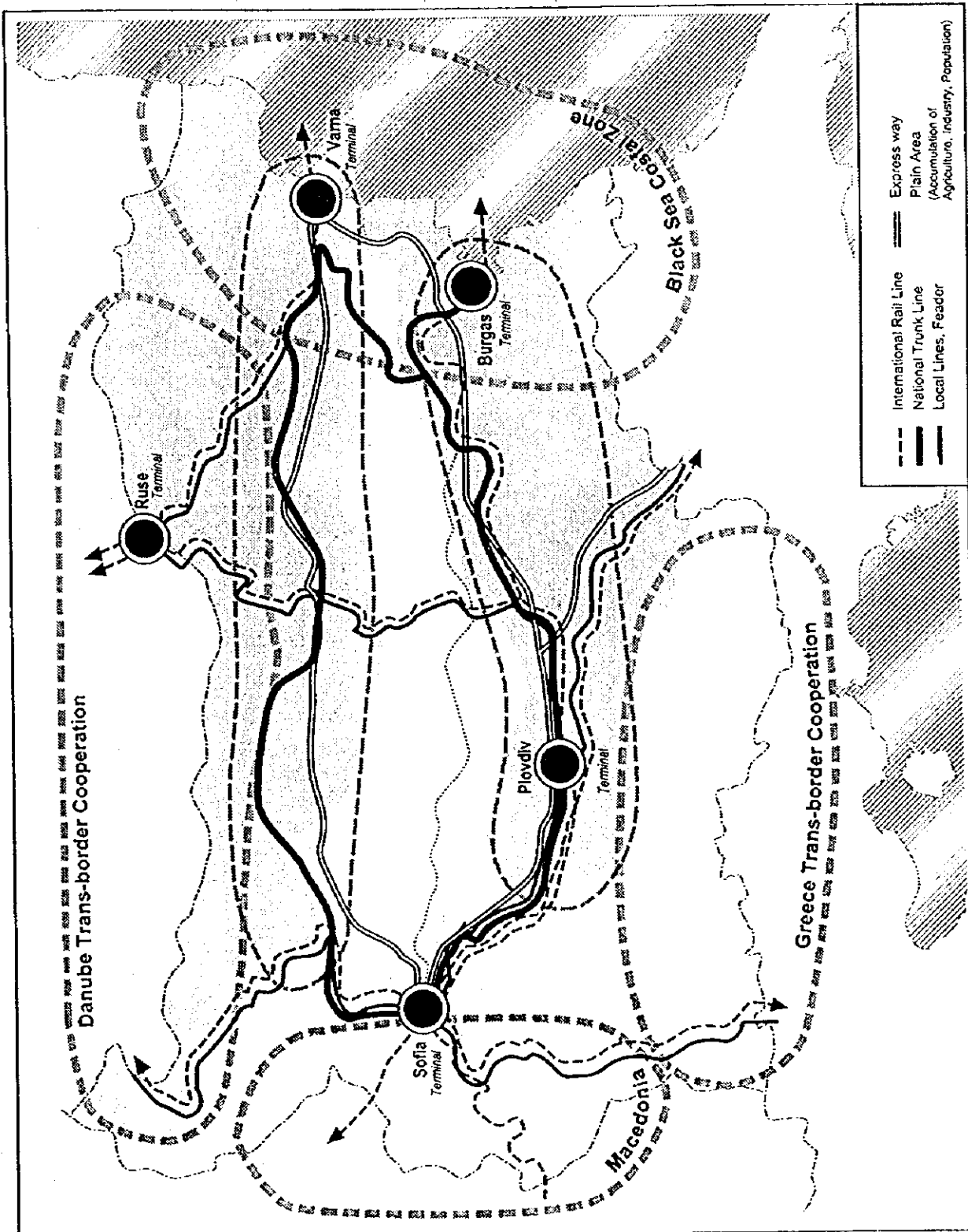


Figure 2.3.3-1 Long Term Structure Plan



## **2. Overall transport system**

The national transport corridors are national trunk lines to connect the major parts of development areas of the country as well as work as the national main distributor / collector of the international transport over the country. Other railway and road lines are linked to the national corridors so as to work as their feeder system

## **3. Basic system of road network**

Bulgaria Government is constructing the circular express way between Sofia and Varna /Burgas .When completed, this express way shall be the main national trunk line which is to systematise Bulgarian road network and road traffic.

## **4. Basic system of railway network**

Railway lines in Bulgaria are functionally classified into International rail line, National trunk line, Local line/ Feeder line which constitute the total railway network. However the actual rail-lines/sections are combination of them with different degree. For instance some sections of the rail-line are used by the local train and the international train as well. The national trunk line also accommodates the international train and local train and works as the feeder or distributor of the international train as well. Railway terminal shall be developed at the connecting points of the international line and the national trunk line, railway and water transport.

What is most important for establishing the rail network of Bulgaria is , first of all, functional/ physical improvement and strengthening of the national trunk line specified in the figure. Once the national trunk line is improved , it seems rather easy to flexibly respond to the international transport requirement ,when necessary, through expanding and improving the rail-lines from the trunk line toward the border with the neighbouring countries.

The train speed, capacity and service of the rail way lines/sections must be determined in accordance with the classifications set above.

## **CHAPTER 3 TRAFFIC DEMAND FORECAST**

This chapter describes the methodology, process, and results of a traffic demand potential forecast for the railways for the years 2010 and 2020.

### **3.1 SURVEY CONDUCTED IN WINTER 1996**

Traffic surveys were conducted in winter 1996. Conducted traffic surveys were as follows;

#### **3.1.1 Traffic data collection and compilation survey**

##### **(1) Purpose**

The purpose of this survey was to collect and compile the data and information on the transport and traffic conditions of Bulgaria, including those with the other countries, for the past 10 years. The data and information available were collected from the Bulgarian government agencies concerned, research institutes, information centers and others.

##### **(2) Survey Items**

###### **1) Railway**

- A. Passenger number
- B. Freight transport
- C. Rail network structure
- D. Rolling stock
- E. Fare structure

###### **2) Arterial (Inter-city) Road Network**

- A. OD table of road traffic by type of car
- B. Number of registered vehicles and driving licenses
- C. Public transport
- D. Network description
- E. Fare structure

###### **3) Water Transport**

- A. Seaport OD traffic
- B. Seaport international sea lane/line and traffic volume of ship
- C. Number of ships registered by seaport
- D. Seaport facilities and capacities
- E. Seaport combined transport volume by cargo
- F. Seaport fare structure
- G. Seaport development projects
- H. Inland water transport OD traffic
- I. Inland water transport network and structure
- J. River port structure and capacity
- K. Inland water transport fare structure

- L. Development projects of inland water transport and river ports
- 4) **Airport**
  - A. OD table of passenger
  - B. Airport facilities and capacities
  - C. International/domestic air routes and traffic
  - D. Domestic fare structure
- 5) **Statistics of Migration and Goods Export/Import**
  - A. In and out migration at the major ports and immigration points on the land transport
  - B. Export and import at the major ports and customs on the land transport
- 6) **Statistics on shipments of the major manufacturing industries and transport industries**
- 7) **Statistics on goods demand and supply balances**
  - A. Agriculture production/consumption amounts
  - B. Industrial production/consumption amounts
  - C. Mining production/consumption amounts
  - D. Goods exports and imports amounts
- 8) **Available studies and research**
  - A. List of reports and studies for the above items
  - B. Available demand projection for the above items

### 3.1.2 Traffic field survey

#### (1) Purpose

The purpose of this survey was to grasp present inter-city traffic conditions in Bulgaria and present rail utilization conditions.

#### (2) Survey items

##### 1) Railway traffic at 10 stations

- A. Passenger OD survey
- B. Cargo OD survey

##### 2) Arterial (Inter-city) Road Network traffic at 20 locations

- A. Roadside OD survey
- B. Roadside traffic counting

##### 3) Water Transport at Burgas and Varna ports

- A. Port Passenger OD survey
- B. Port Cargo OD survey

##### 4) Airport Transport at Sofia, Burgas and Varna airports

- A. Airport Passenger OD survey
- B. Airport Cargo OD survey

##### 5) Borderline traffic

- A. Borderline Passenger OD survey

- B. Borderline Cargo OD survey
- C. Borderline transport survey

Fig. 3.1.1-1 shows present rail passenger and freight movement.

## **3.2 METHODOLOGY AND RESULTS OF THE 1997 FORECAST**

### **3.2.1 Methodology**

#### **<Division into international and domestic traffic>**

Traffic is divided into international and domestic, and demand forecast was carried out respectively. This is because they differ in their transportation behavior and conditions as well as there are limitations on data capture of the international traffic by the traffic survey in Bulgaria only. Regarding the domestic traffic, the regular forecast model ( 4 step model ) was elaborated based on the traffic survey conducted in this study. International traffic was forecast using the transport models developed in the Balkan Transport Study (GIBB Ltd., UK)

#### **<4 step forecast model for domestic traffic>**

Trip Generation/Attraction model, trip distribution model, trip assignment model were established and trip and freight transport forecasts were made through procedure shown in the Fig. 3.2.1-1, -2.

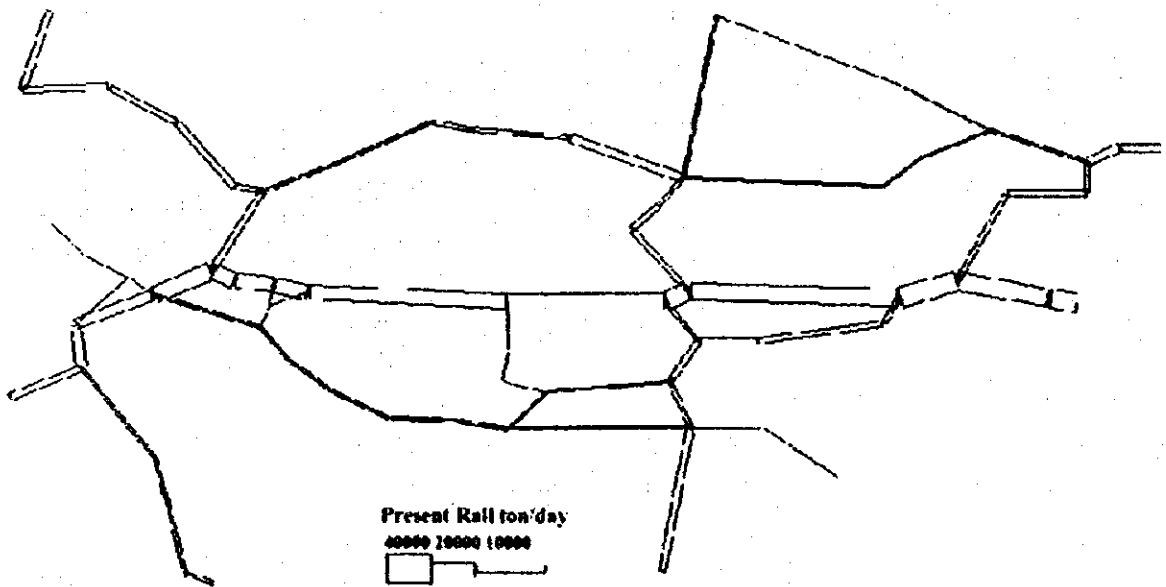
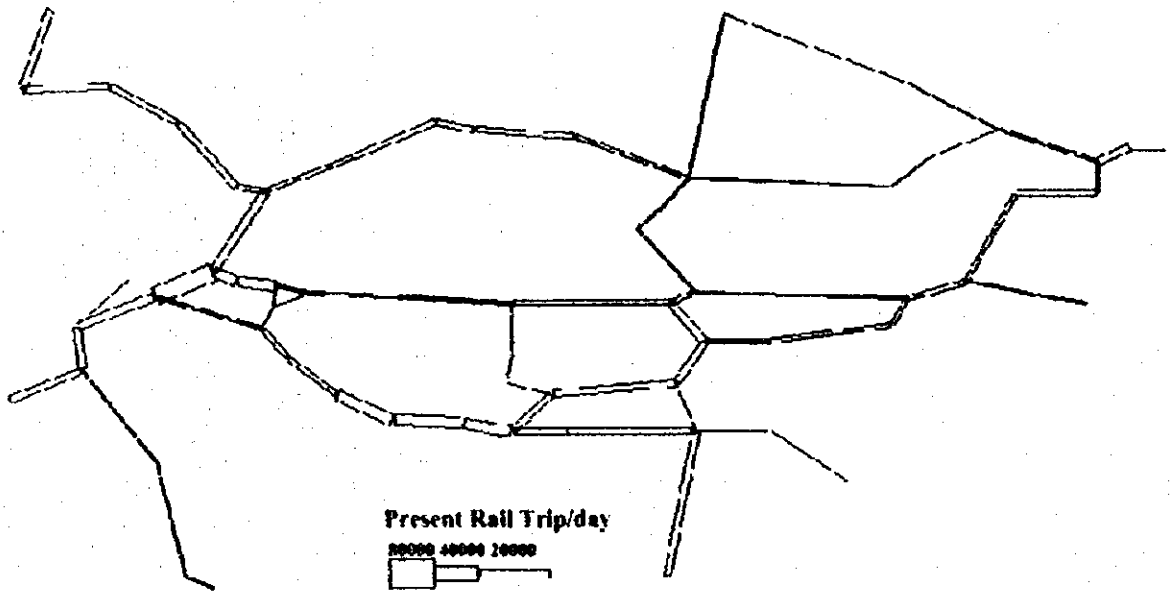
#### **<GIBB model for international traffic>**

International transport demand forecast was subcontracted to GIBB Ltd., which ran the computer models developed for the Balkan Transport Study on the conditions provided by JICA study team (Ex. Commodity group, Network conditions, Socio-economic framework, and so on). The results were incorporated into the Bulgaria transport forecast.

### **3.2.2 Domestic transport demand potential forecast**

#### **(1) Trip demand potential forecast**

A. The volume of trip Generation/Attraction were estimated with the socio-economic framework and tariff framework set forth in the preceding chapter of socio-economy as inputs in the trip Generation/Attraction model. Using the gravity model, future daily average trip OD matrix were distributed. The parameters of the trip Generation/Attraction model are shown in Table 3.2.2-1, and regression result is shown in Fig. 3.2.2-1 between actual survey value and estimation value. These values were estimated by purpose, and total value was controlled by



**Fig. 3.1.1-1 Present Rail Movement**

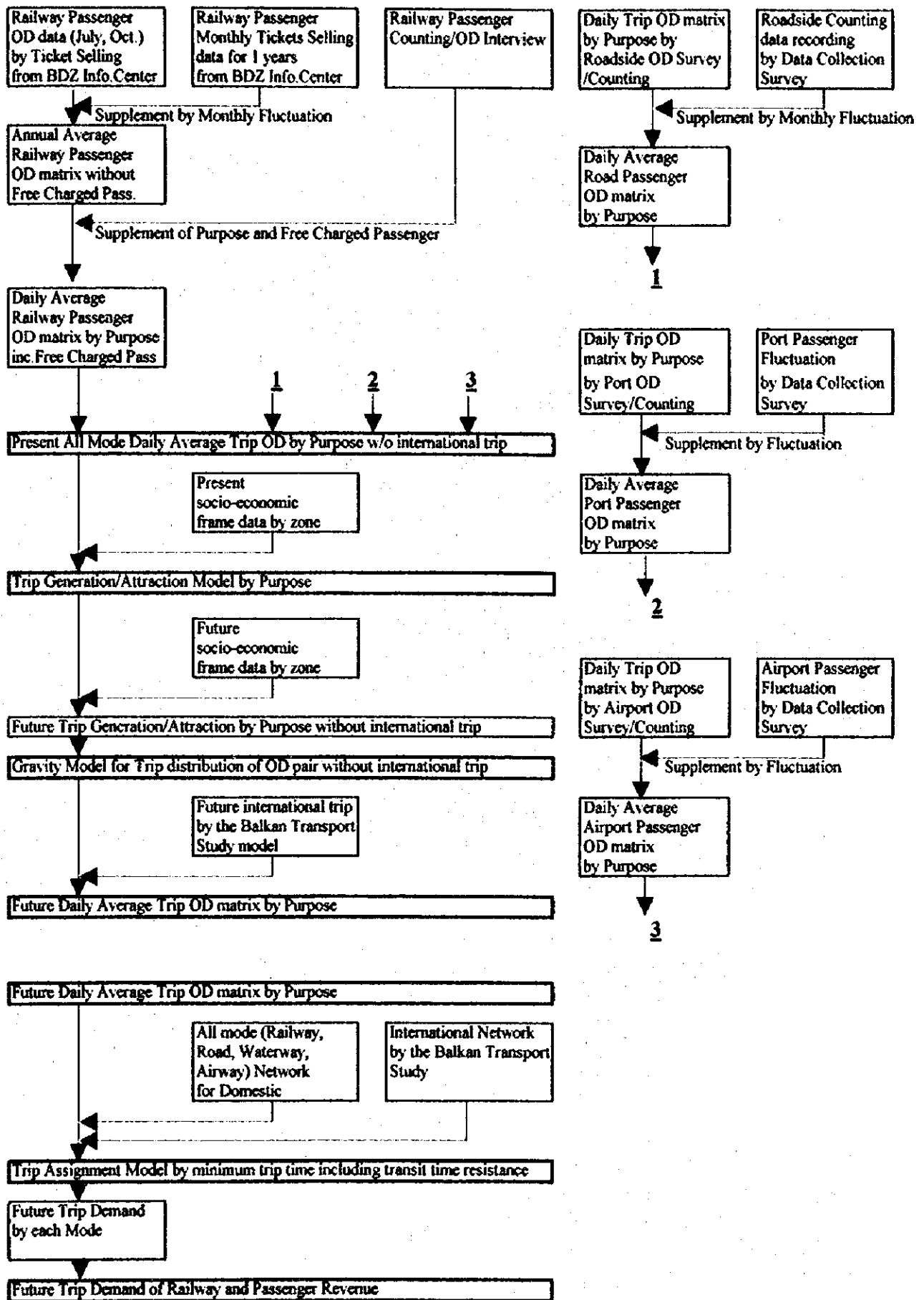


Figure 3.2.1-1 Passenger transport demand forecast procedure

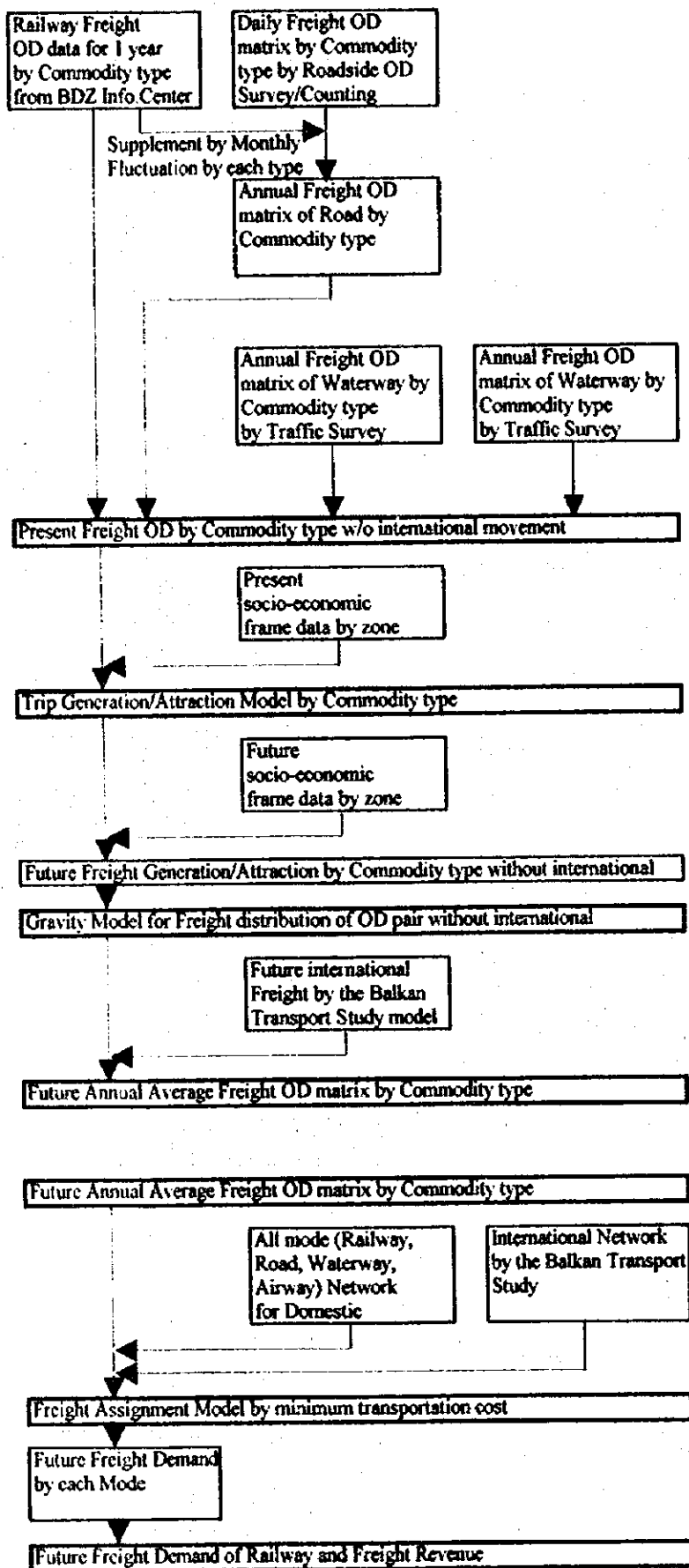
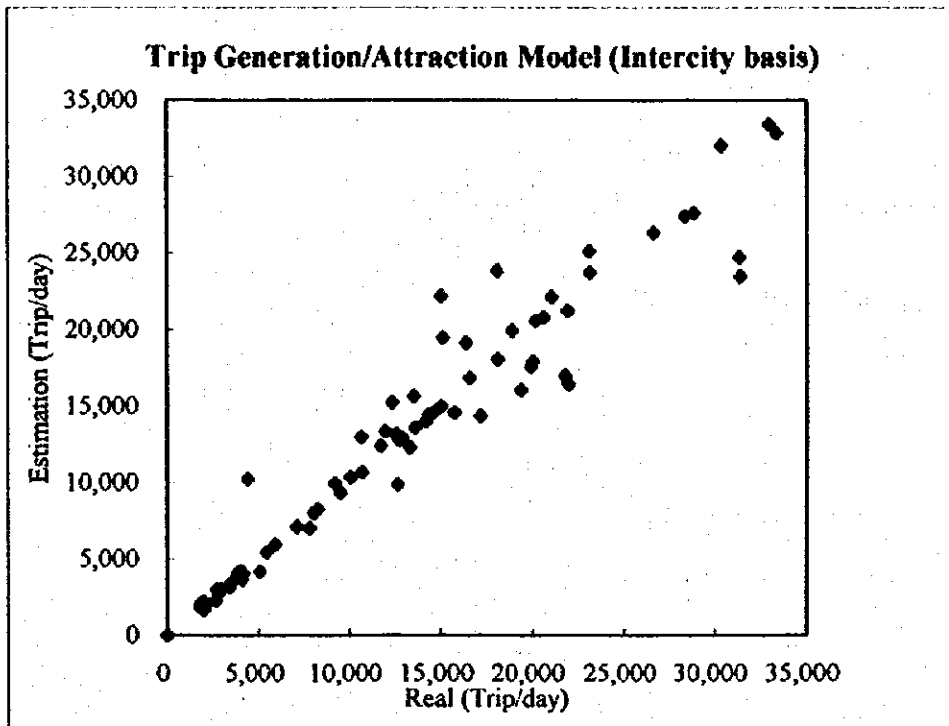


Figure 3.2.1-2 Freight transport demand forecast procedure

**Table 3.2.2-1 Parameters of the Trip Generation/Attraction Model (Intercity basis)**

G/N	Purpose	Population	Primary Employee	Secondary Employee	Tertiary Employee	Student	delta	R <sup>2</sup>
Generation	Study	-0.1109			-0.6202	1.1356	28781	0.787
	Work	0.0058	-0.0185	0.0036	-0.0163		939	0.974
	Business	0.0645		-0.0033	-0.0774		-31799	0.815
	Other	-0.0026		0.2415	-0.0247		-5757	0.803
Attraction	Study	-0.0467		0.2157	-0.2739	0.4134	2307	0.959
	Work	0.0069	-0.0121	-0.0048	-0.0168		512	0.890
	Business	0.0537		0.0073	-0.0540		-25250	0.832
	Other	0.0329		0.2113	-0.0521		-33317	0.871



**Fig. 3.2.2-1 Trip Generation/Attraction Model (Intercity Basis)**



annual daily average trip model which is shown in Table 3.2.2-2, Fig. 3.2.2-2 and Fig. 3.2.2-3.

B. Through the trip assignment model, estimate of transport demand potential of rail mode is shown in Fig. 3.2.2-4 for domestic Generation/Attraction by zone.

#### **(2) Freight demand potential forecast**

A. The volumes of freight Generation/Attraction were also estimated with the socio-economic framework and tariff framework set forth in the preceding chapter of socio-economy as inputs in the freight Generation/Attraction model. Using the gravity model, future daily average freight OD matrix were distributed. The parameter of the freight Generation/Attraction model are shown in Table 3.2.2-3, and regression result is shown in Fig. 3.2.2-5 between actual survey value and estimation value. These value were estimated by 17 BDZ commodity group.

B. Through the freight assignment model, estimate of transport demand potential of rail mode was estimated as shown in Fig. 3.2.2-6 for domestic Generation/Attraction by zone.

### **3.2.3 International transport demand potential forecast**

Scope of work and specification for the international demand potential centering around Bulgaria were prepared for GIBB Ltd. The results of international trip demand potential in 2010 and 2020 are shown in Fig. 3.2.3-1 as rail mode international demand potential. The result of international freight demand potential is shown in Fig. 3.2.3-2 as rail mode international demand potential.

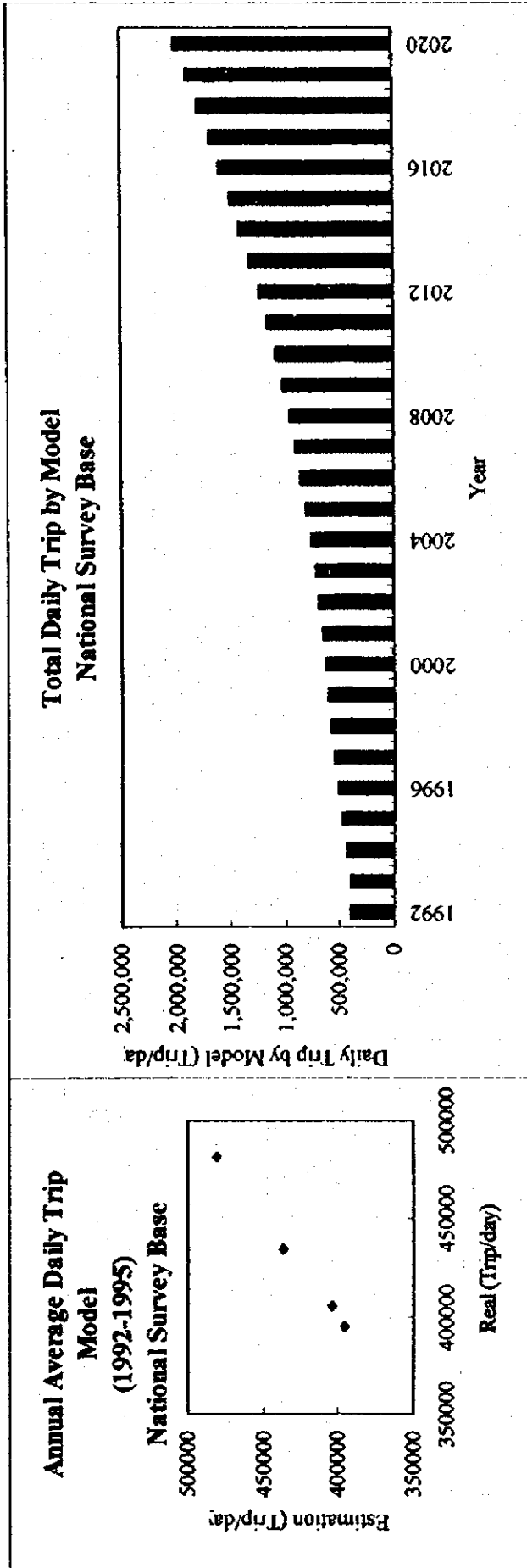
### **3.2.4 Overall rail transport demand potential forecast**

Overall result of the rail demand potential forecast is the integration of the domestic result and international results. Overall rail demand potential of passengers shown in Fig. 3.2.4-1, and overall rail demand of freight in Fig. 3.2.4-2. The "Do Maximum Case" result of international demand forecast was chosen to calculate the overall demand potential forecast. This was chosen for the following reasons;

- (1) Socio-economy sector estimates show a high GDP increase, almost 2.5 times the present at 2020. Therefore due to the economy it is assumed that all the transport projects of "Balkan Transport Study" shall be carried out.
- (2) Border condition shall not be changed with the present such as waiting time, charge and tax, etc. This assumption was made under the observation that it is difficult to assume that all

**Table 3.2.2-2 Parameters of the Annual Average**

Total Daily Trip Model			
GDP	Population	Delta	R2
Trp/day	6633.2	-0.8651	7084093 0.996



**Fig. 3.2.2-2 Annual Average Daily Trip Model**

**Fig. 3.2.2-3 Total Daily Trip by Model (Inter-city All Mode Trip)**

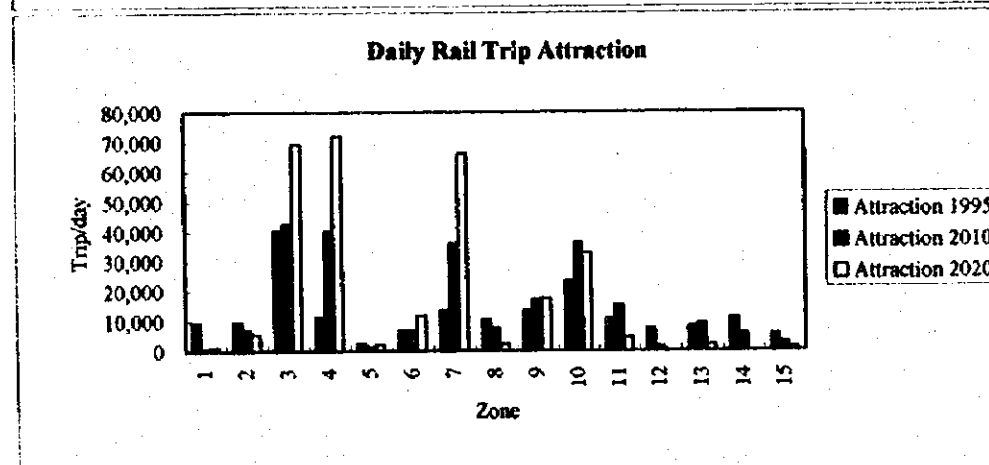
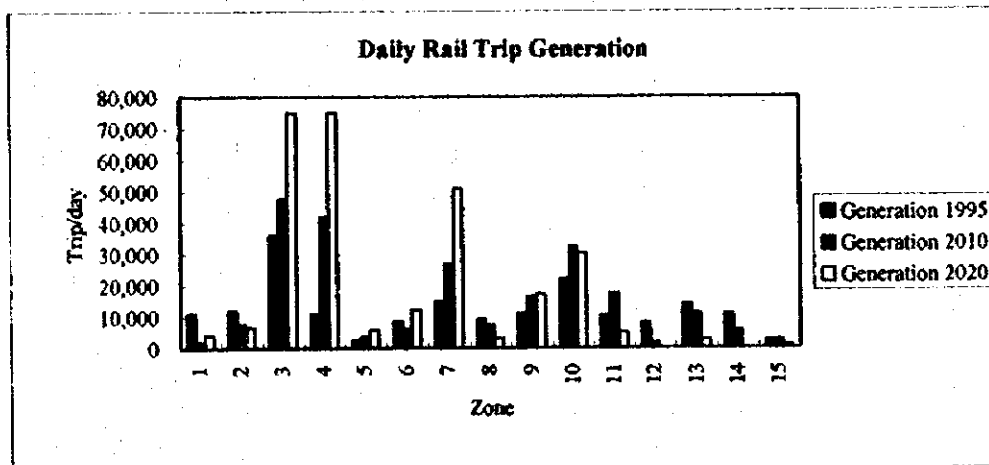


Fig. 3.2.2-4 Daily Rail Trip Generation/Attraction

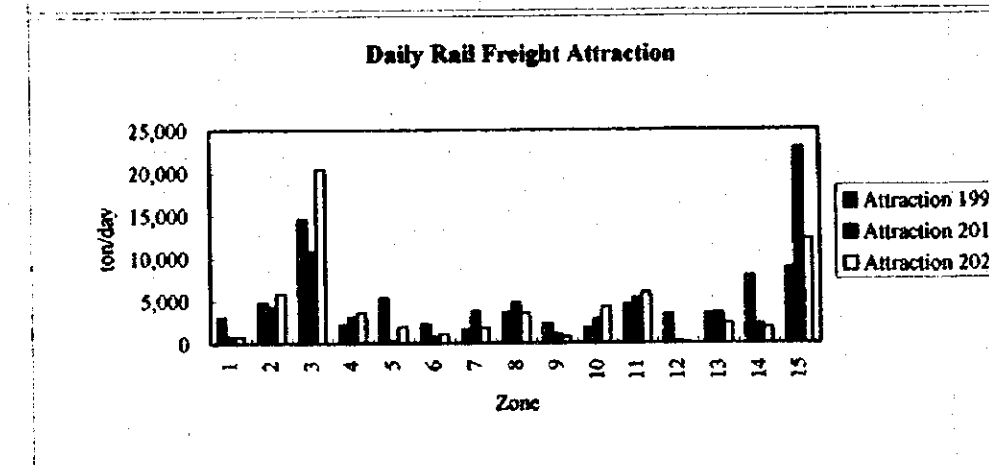
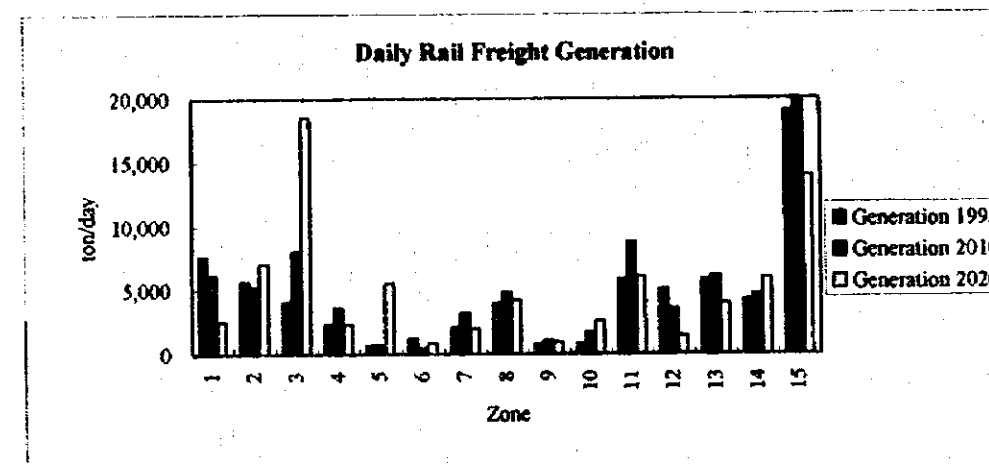
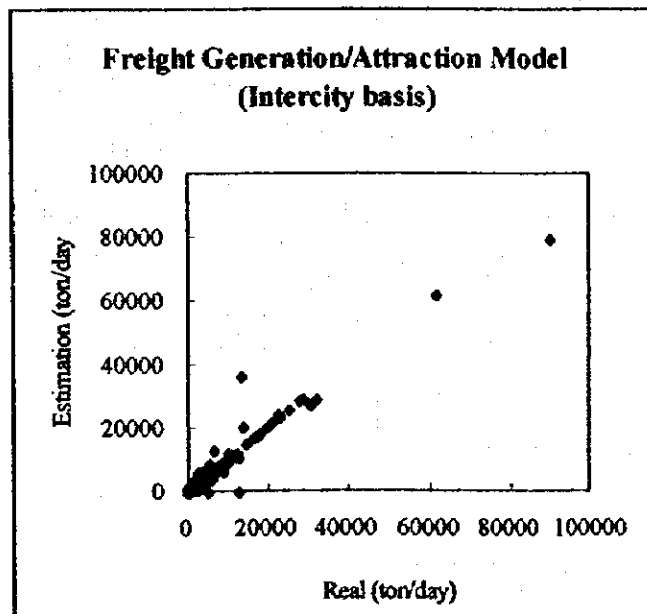


Fig. 3.2.2-6 Daily Rail Freight Generation/Attraction

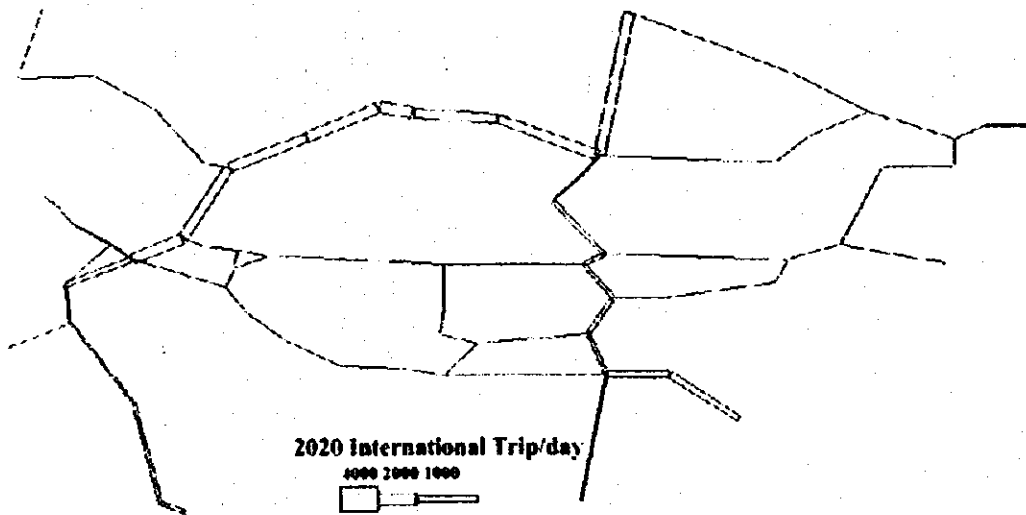
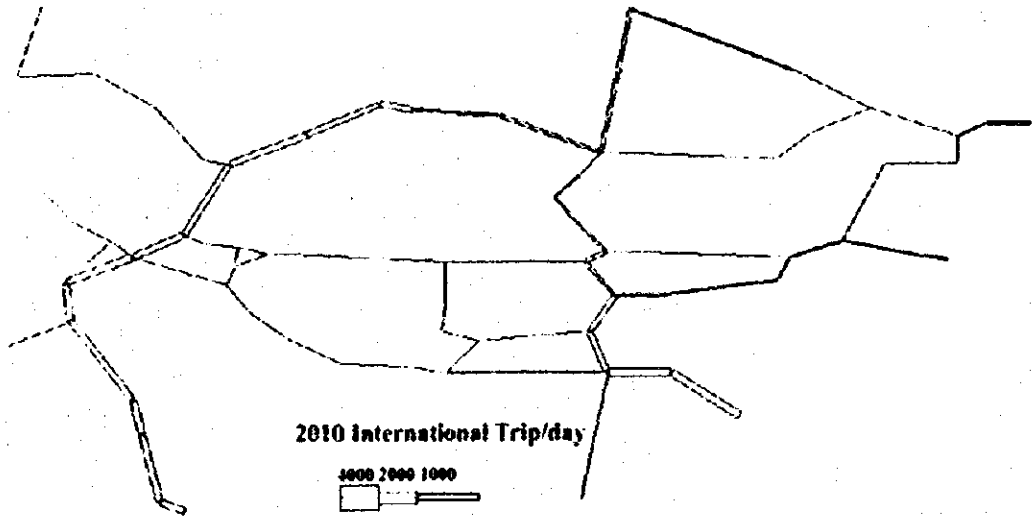
**Table 3.2.2-3 Parameters of the Freight Generation/Attraction Model (Intercity Basis)**

G/A	Commodity Group	GRDP	Population	Primary Employee	Secondary Employee	Tertiary Employee	delta	R2	
Generation	Group 1	6175.8					-185.9	0.679	
	Group 2	-1509.6 *1					2886.8	0.808	
	Group 3	708175672	-8429.957	0.01837	0.0080248	0.00464	3344.5	0.701	
	Group 4	1171395610	-13944.03		0.0714319	0.01795	16890.8	0.922	
	Group 5	-2540148.1	30.237301		0.0000165		5.1	0.990	
	Group 6	2797.0					118.0	0.741	
	Group 7	791.4					-146.6	0.709	
	Group 8	705.6					-154.2	0.730	
	Group 9	298.9					99.3	0.708	
	Group 10	10.1					0.00073	-143.3	0.819
	Group 11	-	*2	-	-	-	-	-	-
	Group 12	1083.6					-342.0	0.705	
	Group 13	-	*2	-	-	-	-	-	-
	Group 14	199.1					-58.0	0.787	
	Group 15	2667.7					-2901.6	0.872	
	Group 16	1234.9					-421.3	0.686	
	Group 17	21504.4					-3402.8	0.825	
Total		59629.9				-9036.6	0.811		
Attraction	Group 1	2523.1		-0.0621		-0.0855	-5780.3	0.859	
	Group 2	21879.0	-0.053175				22374.3	0.722	
	Group 3	194502730	-2315.322		0.0264496	0.03469	565.6	0.842	
	Group 4	7754.2					-6586.2	0.737	
	Group 5	0.7					-1.8	0.935	
	Group 6	-2230.9	0.0019432			0.02535	-646.1	0.737	
	Group 7	36.5					-237.6	0.703	
	Group 8	83.9					-639.1	0.853	
	Group 9	24.0					-0.0018	222.0	0.763
	Group 10	-		0.00391			-63.7	0.837	
	Group 11	-	*2	-	-	-	-	-	-
	Group 12	30.2				0.00199	-239.0	0.774	
	Group 13	-	*2	-	-	-	-	-	-
	Group 14	13.1				-0.000458	0.00025	-83.2	0.733
	Group 15	75347245.0	-896.9188		0.0123064	0.01245	118.0	0.941	
	Group 16				0.00332	0.0017033		-156.2	0.771
	Group 17	4320.5				0.2667767	-0.2383	-28999.4	0.980
Total		3054.6				-16286.3	0.795		

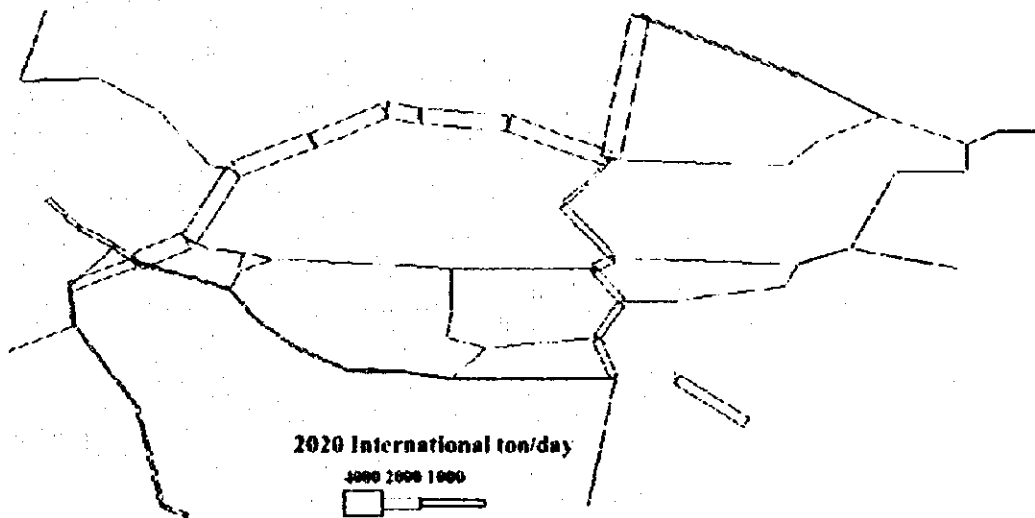
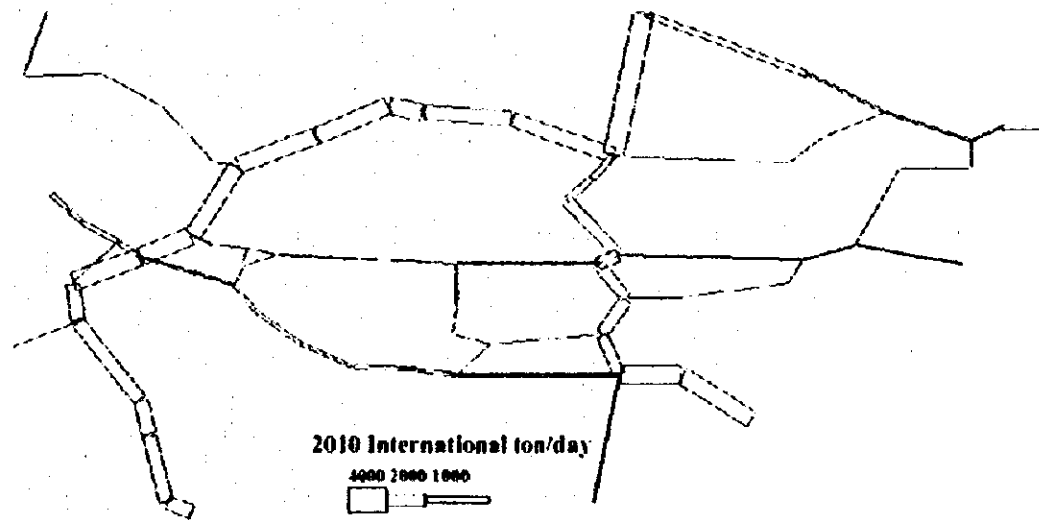
Note : \*1 GRDP Primary Sector  
 \*2 There is none present volume.



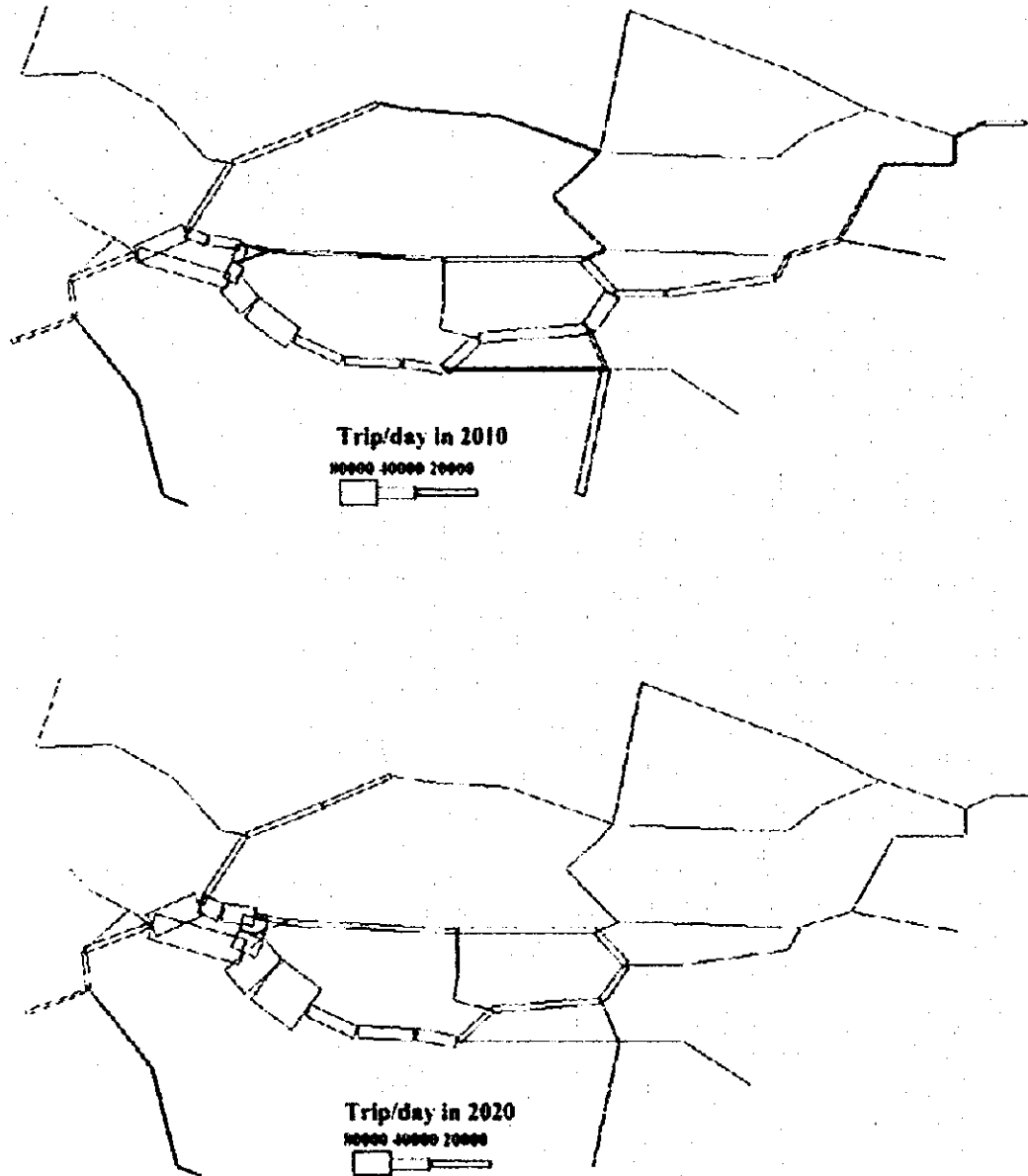
**Fig. 3.2.2-5 Freight Generation/Attraction Model (Inter-city Basis)**



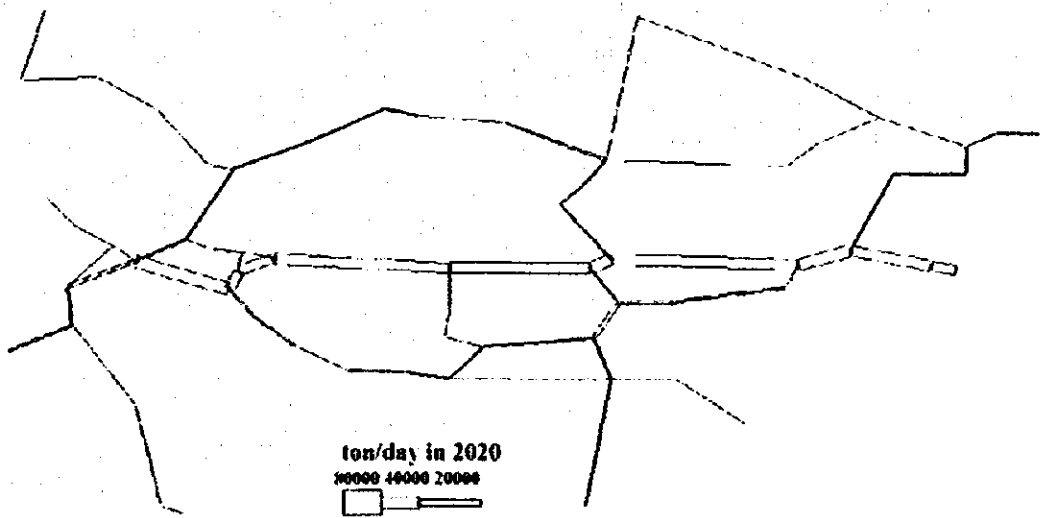
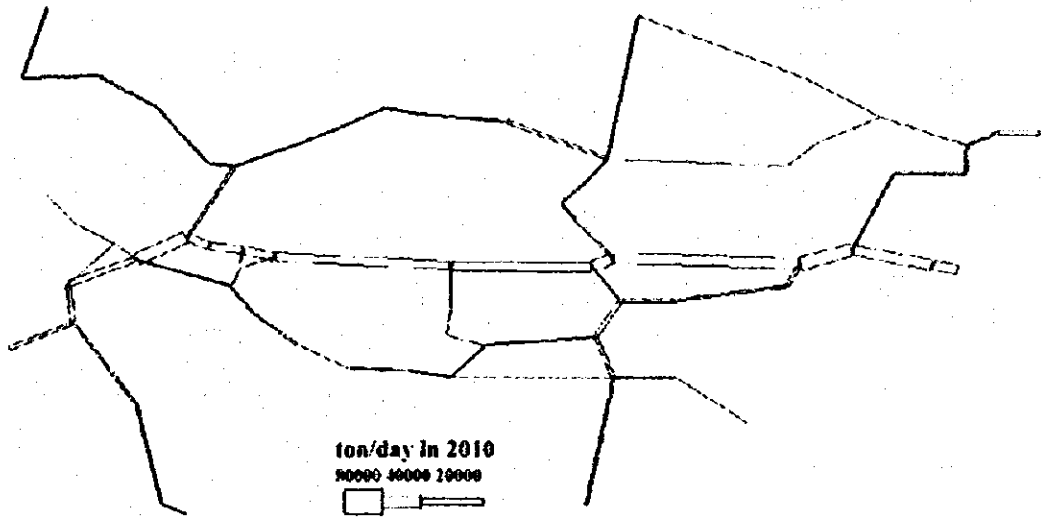
**Fig. 3.2.3-1 International Rail Passenger Movement  
(Do Maximum Case)**



**Fig. 3.2.3-2 International Rail Freight Movement  
(Do Maximum Case)**



**Fig. 3.2.4-1 Overall Rail Passenger Movement  
(Do Maximum Case)**



**Fig. 3.2.4-2 Overall Rail Freight Movement  
(Do Maximum Case)**



EU nations including all Balkan nations shall become border-less due to above described conditions and technical matters by the year 2020.

The "Do Maximum Case" of international demand forecast is the most reasonable, on which to make the overall demand forecast.

### **3.3 GENERAL EVALUATION OF BDZ TRAFFIC TREND**

The basic features of future transport demand are outlined based on the result of the demand potential forecast as shown in Table 3.3.1-1, Fig. 3.3.1-1 and 3.3.1-2 for inter-city base overall result.

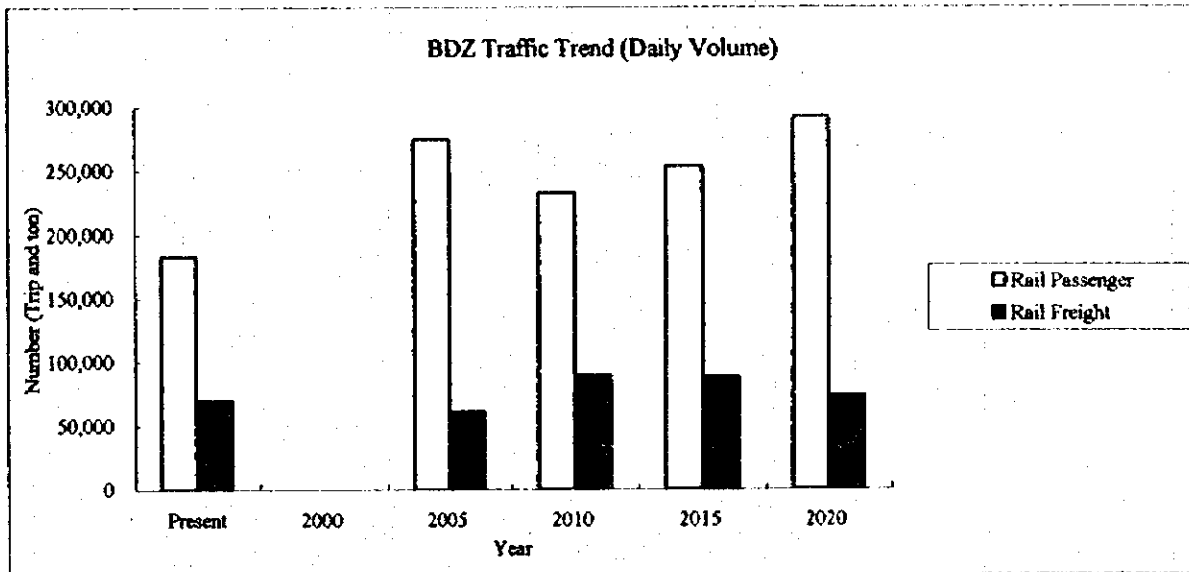
### **3.4 COMPETITIVENESS ANALYSIS**

Main competitor of rail is road vehicular transport such as inter-city bus for land public transport for passengers, and trucks for freight. Future competitiveness analysis results are shown in Fig. 3.4.1-1 for passenger competitiveness and Fig 3.4.1-2 for freight competitiveness. Up to 2010 passenger competition is almost evenly divided between rail and inter-city bus. In the long term range, in 2020 as road network service improves, the passenger volume of rail is expected to fall to almost 50 % of inter-city bus. This condition is also anticipated for freight traffic.

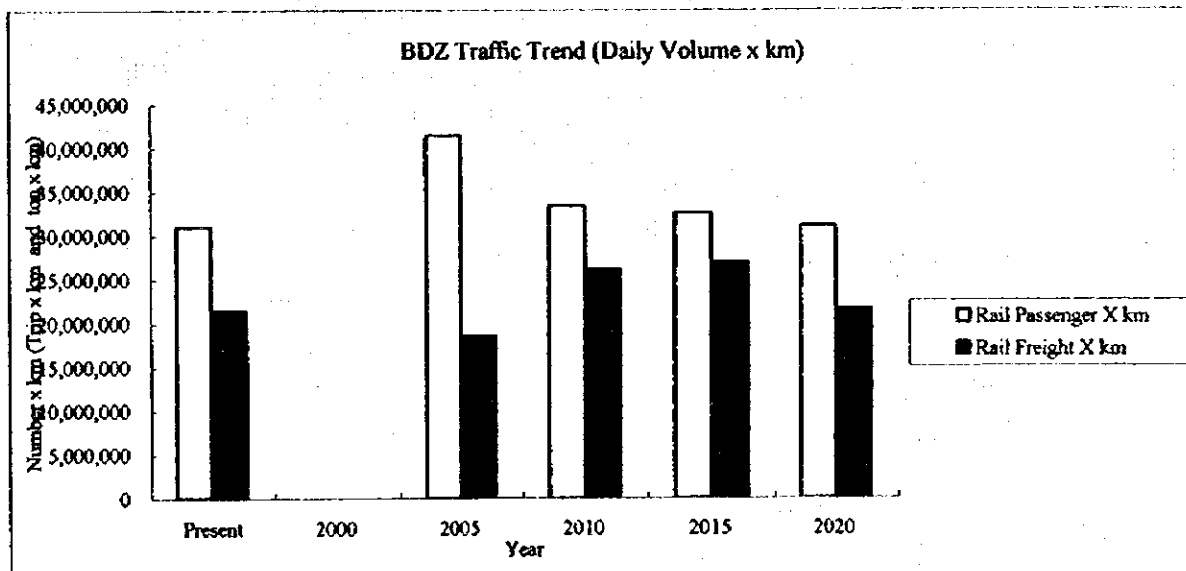
**Table 3.3.1-1 Overall Rail Demand Potential Forecast Result**

Item	Unit	Present	2005	2010	2015	2020
(Intercity basis)						
Rail Passenger	Trip/day	182,847	274,977 *1	232,506	253,534 *1	292,381
	%	100%	150%	127%	139%	160%
Rail Passenger X k	Trip X km/day	31,004,740	41,475,860 *1	33,438,550	32,559,120 *1	31,098,310
	%	100%	134%	108%	105%	100%
Average Distance	km	170	151	144	128	106
	%	100%	89%	85%	76%	63%
Rail Freight	ton/day	69,327	61,112 *2	89,213	88,096 *2	73,572
	%	100%	88%	129%	127%	106%
Rail Freight X km	ton X km/day	21,499,710	18,543,470 *2	26,105,120	26,911,870 *2	21,590,110
	%	100%	86%	121%	125%	100%
Average Distance	km	310	303	293	305	293
	%	100%	98%	94%	99%	95%

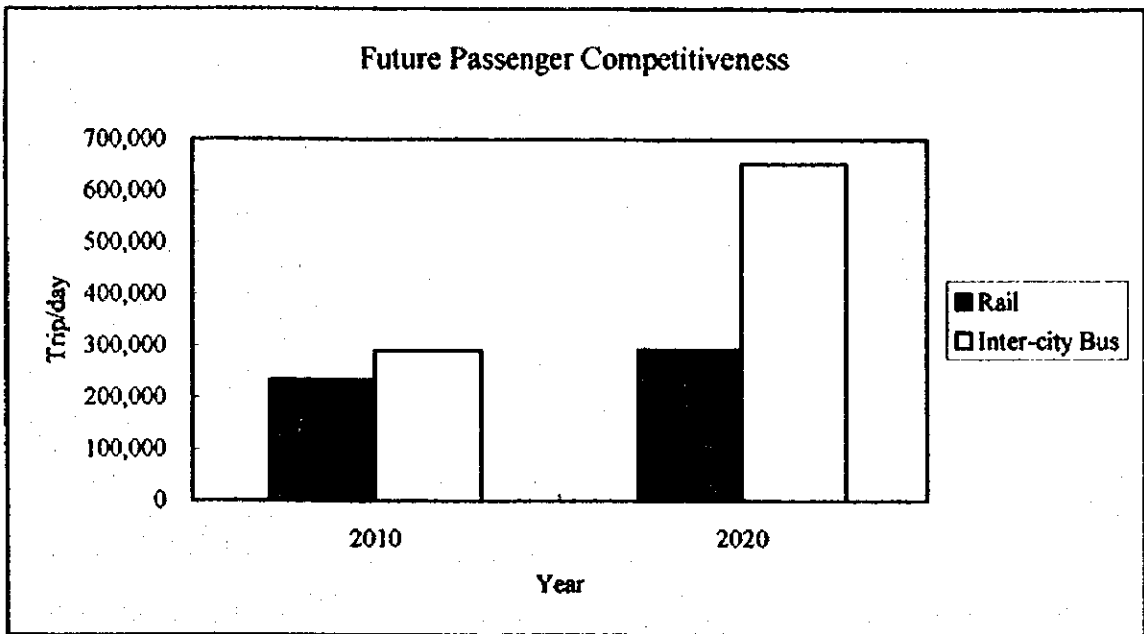
Note : \*1 Domestic passenger only  
\*2 Domestic freight only



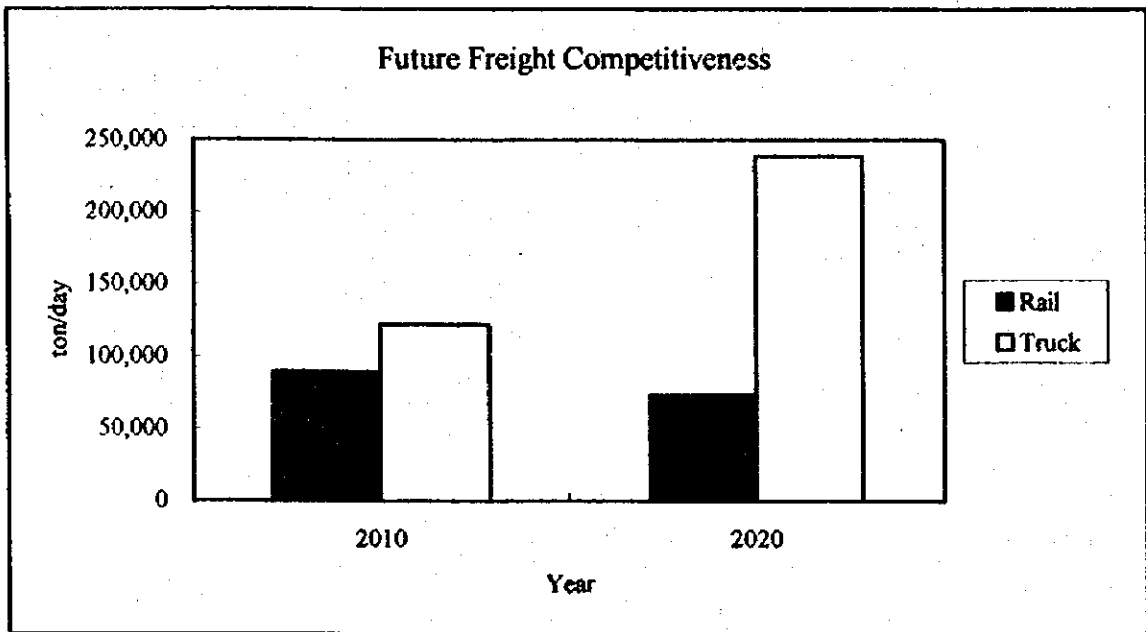
**Fig. 3.3.1-1 BDZ Traffic Trend by Daily Volume (Passenger and Freight)**



**Fig. 3.3.1-2 BDZ Traffic Trend by Daily Volume x km (Passenger and Freight)**



**Fig. 3.4.1-1 Future Passenger Competitiveness between Rail and Bus**



**Fig. 3.4.1-2 Future Freight Competitiveness between Rail and Truck**

## CHAPTER 4 TRANSPORT AND RAILWAY DEVELOPMENT IN THE EU AND CEECs, AND THE IMPLICATIONS FOR BULGARIA

It is obvious that transport and railway development in the EU, CEECs and Balkan/Black sea areas is significant for the development and improvement of the railway network in Bulgaria. Progress in international cooperation in this field will greatly influence the improvement of Bulgaria's railway. Information on the existing and proposed European transport policies, regulations and systems, into which the Bulgarian transport system will be integrated, is vital for the country's railway improvement. European experience, especially the developed EU countries and Visegrad countries (Poland, Hungary and Czech) that follow EU free market and transport policies in the CEECs, may provide lessons and suggestions to Bulgaria. In this section the progress of railway development/reform in the EU and CEECs is outlined.

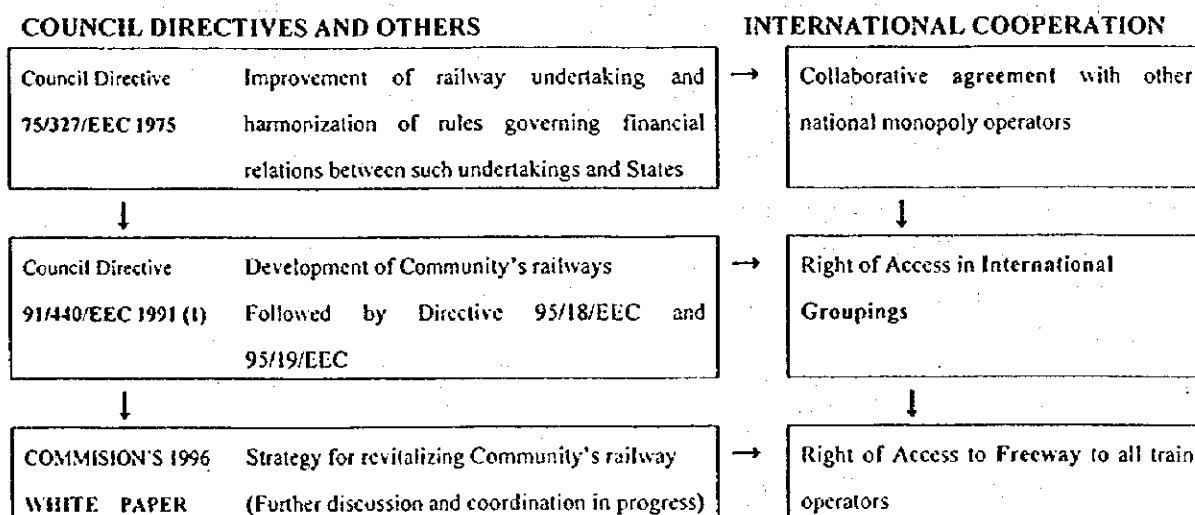
### 4.1 TRANSPORT AND RAILWAY DEVELOPMENT OF THE EU

#### 4.1.1 Railway Reform

##### (1) General

The development efforts of EU railway policies can be roughly traced to the EU Council directives issued and the recent proposals to the Council as shown in the time sequence below.

**TABLE 4.1.1-1 Sequence of EU Railway Reform Policies**



(1) Council Directive 91/440/EEC to be implemented by January 1993, Council Directive by June 1997

9 Countries applied - Austria, Denmark, Finland, France, Germany, Ireland, Holland, Sweden and Britain.

5 Countries still not completely applied - Belgium, Italy, Luxembourg, Spain, Portugal and Greece.

An outline of the Council directive 91/440/EEC and the 1996 White Paper are shown in Table 4.1.1-2.

The progressive changes of railway reform policies in the EU can be found in the level of the international cooperation, liberalization and right of access for rail freight amongst the Member States. Accordingly, other related rules and regulations have been progressively improved.

Of greatest significance is Council Directive 91/440/EEC 1991 which set out for the first time in Community law rights of access to railway infrastructure in the Member States where the national monopoly operators have collaborative agreements with other national operators. This was followed by two further directives, 95/18/EC and 95/19/EC, which set out requirements relating to licensing, charging and train path allocation in order to facilitate the exploitation of the rights established in the directive 91/440/EEC. The Community's 1996 White Paper also proposed the Freeway concept which goes wider than the limited definition of access rights in Council Directive 91/440/EEC whereby the same generally agreed licensing principles will apply to the wider range operator.

## **(2) Basic Concepts underlying the EU Railway Reform**

### **1) Recognition of rail problems by the EU**

The recognition by the European Commission of the rail freight situation formed the basis for the EU's railway reform is stated below.

"Between 1970 and 1995 freight carried by Europe's railways declined by nearly a quarter from 281 to 221 billion ton kilometers. In itself this would have serious consequences, but when it is put in the context of an increase in the overall freight market of 70% it means that rail's market share has halved from some 32% to 15%. The majority of this increase in freight traffic has been carried out by road which has led, over the same period, to an increase of 150% in road freight. If this trend continues for the next ten years the railway's share of the market will drop from 15 to 9% while the overall market expands by a further 30%."

And it concludes as follows;

"If the predictions are borne out they suggest a serious increase in congestion, pollution, and accidents. And also if present trends continue it is likely that rail freight will disappear from the major segment of the market."

**Table 4.1.1-2 EU Railway Transport Reform Policies and Measures**

	<b>Council Directive 91/440/EEC</b>	<b>Commission's 1996 White Paper and Recent Proposals</b>
<b>Title</b>	Development of Community's railways	Strategy for revitalizing Community's Railways
<b>Access Right For Expanding International Transport services</b>	International grouping-Association of railway undertakings in different member states (Granted access and transit right in the groups ) Regulating traffic control and safety issues	Open access on Freeway to all train operators licensed in all Member States (voluntary basis)
<b>Control supply and marketing of service and fixing Pricing for Facilitation /simplification of the use of rail infrastructure</b>	Right to apply License of community railway undertaking -Directive 95/18/EC Criteria for issue or refusal of license	Generally agreed Licensing principle Criteria for licensing same as Directive 95/18/EC
	Common rule for Charging of rail infrastructure - Directive 95/19/EC	One-Stop-Shop (OSS) marketing the freeway to licensed operators and undertaking Charging and Train path
	Train path allocation -Directive 5/19/EC Fair and optimal use of rail capacity	allocation (Rule and criteria are same as Directive 95/19/EC)
<b>Organizational /management</b>	Independent status in management, administration, economic, account	
<b>Improvement for competitive railway undertakings</b>	Separation between infrastructure management and transport operation Account separation compulsory and organizational/ institutional optional	OSS - Contact point for contracts between train operators and infrastructure managers
	Free competitive market principles applied to railway undertaking including PSO (Commercial companies Rule)	Competition between train operators with performance incentives and with road hauliers- Road user charge for covering External cost ( 1 )
	States -Railway infrastructure development and safety standard/ rule -General need of community	
<b>Financial Improvement for sound management</b>	Financial Mechanism for reducing indebtedness for sound management (separate debt amortization)	
<b>Legal and Administrative arrangement</b>	Adoption of laws and regulation, and administrative provision to comply with this directive not later than Jan.1993	Improvement of administrative Border checking for customs, safety, phytosanitary purposes - Check in the originating State

( 1 ) Commission's Green Paper "Towards Fair and Efficient Pricing in Transport" COM(95)691

Proposal for a Council Directive on the charging of heavy goods vehicles for the use of certain infrastructures COM(96)331

Due to the decreased use of railway, as indicated above, the financial position of the EU's railways has worsened, resulting in a net loss of 112,543 billion ECU. It is emerging as a social issue.

Taking into consideration the seriousness of the environmental and financial conditions the European Commission has maintain its commitment and applied the various measures as listed above to improve and revitalize the Community's railway.

## 2) Targeted Market

Again the European Commission is quoted as saying as follows;

“While it is clear that rail cannot solve all freight needs, it can make a real contribution to the Community's need for sustainable freight transport, particularly over long distance. In fact , even though some 85% of goods by tonnage transported within the Community are within a range of less than 150 km and most of this is not a market for rail freight , more than 50% of ton-kilometers are transported over 150 km and this clearly illustrates the relative importance of long distance freight traffic within the EU.”

On these premises it concluded that this specific market - long distance freight traffic - could make a valuable contribution to reversing the trend of declining market share for rail freight.

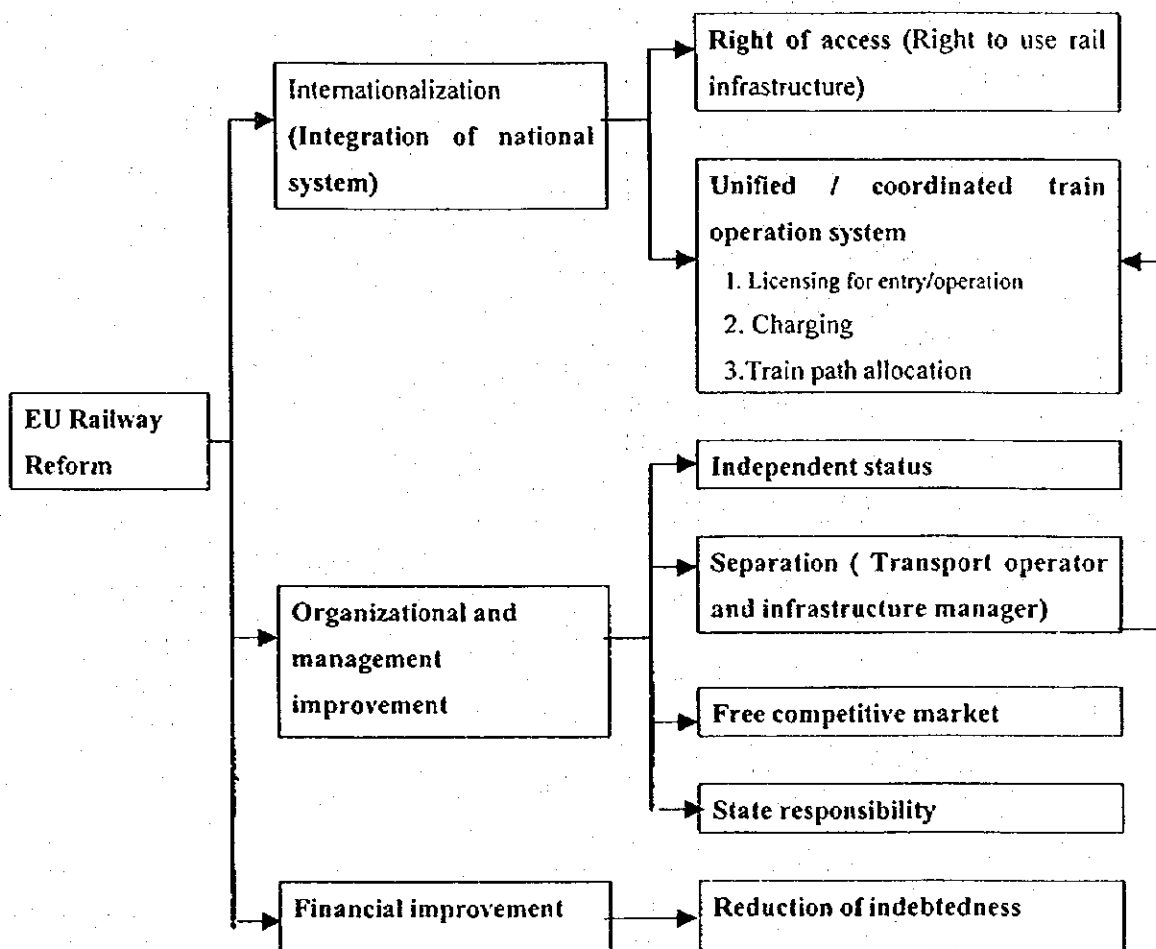
It can be noted that the railway's greater share at ton-kilometres rather than tonnage transported makes a greater contribution to the environmental improvement of the whole region.

## 3) Challenges and Problems to be tackled

The commission stated that the basic problem underlying the failure of the railway is that “ Railway management has neither the freedom nor the required incentives to address the challenge facing it and do not operate like a business”. The problems identified to be tackled are the international operational constraints - problems of cross-border rail freight and organizational constraints (non-commercial base management). These limit the freedom of railways to develop the market defined above. In this line the Commission launched the measures for the **better integration of national systems and the introduction of market forces**. It must be stressed that these two issues are not separated, rather interrelated to each other to exploit the targeted market. Therefore the Commission required a variety of measures, as listed in the Table 4.1.1-2.

**(3) The Council Directive 91/440/EEC, 95/18/EEC and 95/19/EEC ( International Grouping Concept)**

According to the Council Directive 91/440/EEC, 95/18/EEC and 95/19/EEC measures for railway improvement must be simultaneously taken in the following three major areas as shown in Figure 4.1.1-1.



**Figure 4.1.1-1 EU Railway Reform Measures**

**(A) Internationalization ( Integration of national system )**

Mutual connection or integration of the national railway systems in the individual member states is the first requirement for the international rail freight traffic. For achieving this



requirement the following coupled measures are vital;

It is obvious that any integration cannot be made possible without **right of access or right to use the railway infrastructure**. At present access to the railway systems of the other States is possible through bilateral and collaborative agreements with other national operators. However the Commission claimed that these agreements result in a lack of clarity about the responsibility or liability for cargo and poor service is often the result. In this respect the Commission pursued an effective and efficient system of international or cross-border rail freight through the establishment of the multilateral agreements which allow free access in the grouping countries. This is the International Grouping stipulated in the Directive. Thus rail operators can freely use rail infrastructure beyond the national borders of the grouping.

**Unified / coordinated train operation system** throughout the member States is the main concern after the establishment of the right of access to develop an effective and efficient international rail freight service. Facilitation and simplification of the use of rail infrastructure are essential parts for unified/coordinated train operations to develop the integration of railways and create a single market. For this purpose the directives require the establishment of 1. Licensing system 2. Charging system 3. Train path allocation system. It is stressed that these systems must be established and operated on the grounds of safety, fairness, equality and non-discrimination, in addition to that of market forces which enhance competition.

#### **(B) Organizational and management improvement**

In parallel to the integration measures as defined above, measures for organizational and management improvement are required to the States and railway undertakings. The main aim is deemed to create self-determining railway organizations, which are responsive to the free competitive market of the integrated railway. The measures mainly include 1. Independent status, 2. Separation (Transport operator and infrastructure manager), 3. Freely competitive market, and 4. State responsibility (Infrastructure development). Separation of accounts is compulsory with organizational or institutional separation being optional.

#### **(C) Financial Improvement**

It is apparent that a sound financial base is imperative to start and continue the railway undertaking on this new horizon. An appropriate mechanism must be set up to help reduce the indebtedness to a level which does not impede sound financial management and which improves the financial standing of the railway undertaking.

#### **( 4 ) 1996 White Paper and Subsequent Discussions ( Trans European Rail Freight Freeways )**

Whilst implementing the Council Directives as listed above, the White Paper presented " Trans European Rail Freight Freeway Concept" - A strategy for revitalizing the Community's railways. Subsequently discussions<sup>1)</sup> on this topic are in progress. The concept implies that Member States and infrastructure managers would provide open access on a voluntary basis, without waiting for changes to Community legislation. Existing infrastructure will be used and trains will continue to operate on the basis of existing, but where easily possible simplified, procedure and technical requirements. Freeways are a short to medium measure to facilitate the development and implementation of the long term policy that the Commission set out in its White Paper.

Existing railway companies are already subject to very effective competition from road transport. Therefore the purpose of Freeway is to enable rail freight to become a more attractive option in the face of this severe competition.

The Freeway concept aims to overcome the purely organizational issues which hamper international freight. This will be achieved in two ways. Firstly through the removal of artificial obstacles to international rail freight. Secondary through the improvement of the service offer ( for instance quicker, cheaper or more punctual ) by the creation of competition in the provision of rail freight services.

Freeways are intended to improve the international rail freight product quickly and cost effectively. Infrastructure managers will collaborate to ensure better cross border co-ordination of train paths as well as access charges for the whole route. This will be achieved by the creation of a one-stop-shop to carry out these activities for the whole Freeway. The participants will, on a voluntary basis, open access to all licensed operators. Existing infrastructure will be used and trains will continue to operate on the basis of existing procedures and technical requirements.

The Transport Council ( 1996 in Luxembourg ) subscribed positively to the concept of Freeway which was seen as a practical measure to improve the supply of freight services and also a positive measure to answer a number of the challenges regarding freight transport

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<sup>1)</sup> Communication from the Commission to the European Parliament ,the Economic and Social Committee, the Committee of the Regions and the Council TRANS EUROPEAN FREIGHT FREEWAY

outlined in Council Directive 91/440/EEC. A number of Member States are now engaged in discussion on the creation of Freeways.

### 1) The principal elements

The Commission proposal contained the following principal elements:

#### a. Open access for all operators.

Both existing railway enterprises wishing to operate beyond their national borders and companies new to rail transport.

#### b. Facilitation and simplification of the use of rail infrastructure

By establishing one-stop-shops for access to the Freeway

- creating simple, attractive, transparent charging system
- ensuring that path allocation is fast and simple
- seeking ways of providing adequate priority to freight
- seeking to eliminate or reduce border delays.

### 2) The operational system of Freeways

The operational system of Freeway and One-Stop-Shop are outline as follows, and shown in Figure 4.1.1-2.

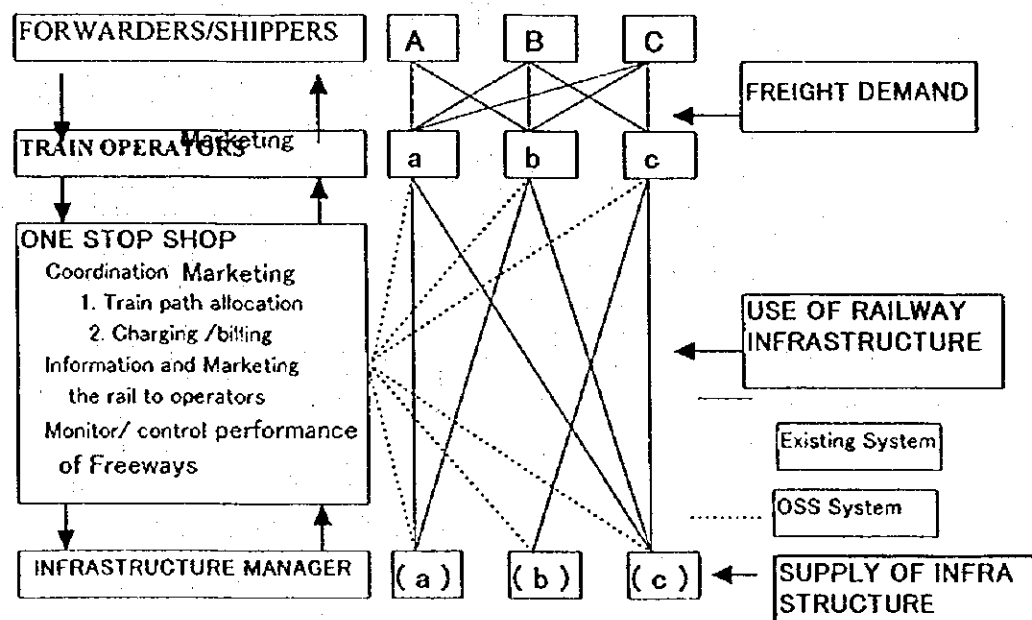


Figure 4.1.1-2 Freeway System and One Stop shop (OSS)

#### **a. Generally agreed licensing system**

Access should be open to all licensed Community railway undertakings, who comply with the necessary conditions which are established on safety grounds and on a non-discriminatory basis. What is essential is that railway undertakings may acquire business in a Member State other than the one in which they are licensed, and operate train services into that second Member State without being obliged to enter into a classical co-operation agreement with a railway undertaking from that second Member State. The Commission concludes "A Freeway including freight terminals should be open for fair, equal and non-discriminatory access to all train operators licensed in the Community".

#### **b. One-stop- shops**

Reviewing the Commission' documents on Freeway and One Stop Shop (OSS), the importance and roles of OSS can be interpreted as follows;

##### ***Coordination and adjustment***

Train operators who run the international trains through many States have to negotiate with many infrastructure managers on train path allocation and charges. This hinders a quick response to freight demand/ needs, and the efficient transport services throughout the Freeway. On the other hand the infrastructure managers have to handle trains operated from many other countries. If they are coordinated and adjusted among the train operators more efficient use of rail infrastructure will become possible . OSS is designed to facilitate the coordination of train path allocation and timetables, charging and others issues between the train operators and the infrastructure managers. OSS' efforts may influence the performance of the operators and managers. Therefore incentives should be given to the OSS.

##### ***Systematization of Rail undertakings and Increase of Competition***

Convergence of market information on both sides of the train operators and infrastructure managers (demand and supply) will help systematize rail undertakings and market, and increase competition.

#### **c. Issues for improving Freight Train Operation**

Issues for improving freight train operation on the Freeway are summarized as follows;

### *Train path allocation*

As stated, the current poor international rail freight performance is frequently due to gaps between the national timetables. This problem is exacerbated by sub-optimal path allocation and the low priority given to freight traffic. The Community of European Railways(CER) simulation illustrated that the time spending at borders can be reduced by between 15%-80%.

### *Capacity*

In response to increasing traffic, capacity may be increased through adjustment to the timetable, enhanced command and control. European Rail Traffic Management System (ERTMS) offers the potential to reduce direct operating cost, maximize track capacity and optimize fleet operation.

### *Priority*

It is possible to better exploit the present infrastructure while taking account of the need to provide adequate paths for international freight traffic. It is important to ensure greater flexibility to guarantee a satisfactory path allocation for passenger and freight traffic, both international and domestic.

### *Appropriate path*

The category of freight traffic which needs high speeds and reliability has not been as well served by rail as it has by road. In order to break into this market, rail must be able to offer the potential for average freight speeds of 50 kph or more. The CER simulation was able to provide a number of paths with an increase in average speed of some 20%. The resulting paths were certainly competitive, being some 6 hours shorter than the journey time for a lorry with a single driver.

### *Border issues*

The CER points to the sub-optimization of marrying national timetables as a major reason for excessive border crossing times within the Community. The creation of end to end international freight train paths tackles this issue. Member States should give commitment to suppress border checks for customs, safety and phytosanitary purposes. There should be mutual recognition of checks which have been carried out in the originating state.

#### d. Extending Freeways to Central and East European Countries (CEEC)

The Commission expects that Freeways will sooner or later link all Member States. Furthermore, the Documents of Communication from the Commission says that there are significant opportunities for expanding the Freeway concept beyond the borders of the Community. Indeed, the special factors which may exist on routes beyond the Community borders, such as very long journeys and existence of widespread rail networks, may make Freeways even more attractive. The key issue to be solved is likely to be the extent to which different train operators will be able to operate across the borders of the Community.

#### 4.1.2 Key development in Transport Pricing in the EU

The Commission transport policy aims at achieving sustainable mobility. The Commission's Green Paper<sup>1)</sup> states that for this, transport decisions must be rationalized, taking account of all the consequences including their environmental and safety impacts. If decision making is not to be distorted by incorrect price signals it is necessary that the charge of services is aligned with the full cost of that transport to society i.e. they should cover external costs, such as congestion, pollution, and accidents, as well as direct costs. At present these costs are largely not paid directly by transport users but paid by society, and this leads to a distortion of transport decisions both within and across modes.

Subsequently the Commission proceeded with the proposal<sup>2)</sup> for a revision of Directive 93/89/EC, which set a framework for road user charges and tolls for heavy goods vehicles. The Commission's proposal seeks to relate charges for road use of these vehicles more closely to the actual cost of road usage caused by different trucks, principally through greater differentiation of charges relating to road damage, emission and location. The Commission believes it is desirable that, before the full cost should be charged, an alternative to road transport is available with open access to infrastructure thus providing a competitive choice for the movement of goods.

The current rules stipulate that Member States may impose either toll or user charges across the road network, but not both. In the Commission's proposal, differentiation of vehicle taxes on environmental grounds is introduced. Moreover, the Commission also proposes a number

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<sup>1)</sup> Commission's Green Paper "Towards Fair and Effective Pricing in Transport COM(95)691

<sup>2)</sup> Proposal for a Council Directive on the charging of heavy goods for the use of certain infrastructures COM (96)331

of provisions to ensure that the total tax burden on identical vehicle types does not differ too greatly between Member States. These provisions include the setting of maximum vehicle tax rates and so on.

#### **4.1.3 Combined Transport ( CT ) Development**

Combined transport has been identified as an effective and practical instrument in the innovative railway systems. It supports the railway reforms backed by the above-mentioned Council Directives and transport pricing, aimed at fair competition between railway and road, especially for long distance freight traffic. A chief executive of a CT company is quoted as saying that in the beginning of the 1990s, it seems as if the period of unlimited growth of combined rail/road transport was over. On one hand bottlenecks began to develop at terminals and transshipment centers, and on the hand the overall competitive situation was experiencing important changes. These new market conditions placed combined transport in an entirely different context, which led to rethinking the approach to this transport technique, revise its structures, and develop alternative logistical concepts. As such, many CT operations with different types and systems have been emerging throughout the EU countries.

##### **( 1 ) Definition and System of Combined Transport**

According to the UIRR's report<sup>1)</sup> Combined Transport (CT) can be defined as the combination of at least two modes of transport in a single transport chain, without a change of container for goods. Most of the journey is by rail, inland waterway or ocean-going vessel, with the possible shortest initial and final journeys by road. A characteristic feature of CT is that it links the advantages inherent in two modes of transport. On one hand the efficiency of rail transport in moving bulk freight, making it ideal for long distance operations. On the hand unrivaled advantages of the lorry in bulk and distribution transport over short and medium distances. The report continues as follows;

There are two (2) types of CT- Unaccompanied Transport and Accompanied Transport

##### *Unaccompanied transport*

The most common is transport with containers, swap bodies and semi-trailers (80% market share). The road hauliers and freight forwarders must have special loading containers which

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<sup>1)</sup> Focus on Combined Transport with the support of the European Commission 1995 International Union of Rail-Road Transport Companies (UIRR)

are "craneable", i.e. which can be loaded with a mobile or gantry crane (This is called vertical transshipment). A haulier must also ensure that the container is collected at the destination terminal and is delivered to the final destination. Many hauliers, including medium-sized firms have extended their operations at the "other end".

#### *Accompanied Transport*

The complete lorry drives over a ramp under its own power onto a special low loader wagon. (Horizontal transshipment) During the journey the driver remains on the train in a separate wagon. At the destination the driver continues to the customer. Rolling Motorway trains can be loaded and unloaded in a relatively short space of time. The RoMo has proved to be a great success in trans-Alpine traffic. It can be implemented quickly. It does not require any special retrofitting or adaptation of the existing lorries or any expensive infrastructure terminal equipment. This form of transport is therefore especially suitable for short and medium distances (200 km to 400 km) and where fast train turnaround times are required. It can be said that the RoMo technique could be the trailblazer for CT. The advantage is that the driver can rest during the journey, while the obvious drawback is the heavy "dead weights" of the lorries.

#### *Rolling stock and Terminals*

The European railway undertakings now have several thousands special wagons suitable for the transport of the various types of containers. Very many CT companies also have extensive stocks of private wagons. In most West European countries a dense network of terminals for unaccompanied CT has now been established and is being upgraded. In many cases an investment of up to ECU 3 million will be enough to create the nucleus of a CT transshipment operation.

### **(2) CT Operators and Railway Undertakings**

It is interesting to know that freight forwarders and road hauliers, against which the railway transport is the main competitor, positively promote Combined Transport using the railways to do their own business.

It is the hauliers and freight forwarders themselves who continue to be the carriers, who invest in the swap bodies and craneable semi-trailers for combined transport. Thousands of road hauliers and freight forwarders have set up combined road-rail companies. The formation of combined transport companies structured on cooperative lines organized at the initiative of



freight forwarders and road hauliers and their organizations. Well over 1,000 freight forwarding and haulage firms, most of them of medium size, have joined the seventeen combined transport companies within the International Union of Combined Road-Rail Transport Companies (UIRR). There are also a number of other private hauliers who operate CT services on their own account either on certain routes or for specific categories of goods, e.g. chemicals and liquid products requiring tanker transport.

Further liberalization is taking place in the rail transport market. A change is now taking place as regard the traditional main categories under which marine containers were transported by the container- and railway companies, while road vehicles and their loading units were transported mainly by the combined transport companies. All operators are now seeking to enter every available market.

Cooperation with various partners is vital for combined transport. The railway undertakings provide their operating systems, i.e. the rail network, locomotives and personnel required for transport operation. The operators purchase rail traction from the railway undertakings. Around one half of the wagons used in CT are procured through the railway companies, while the other half is procured through operators. Terminals are operated by both the railway undertakings and operators. The operators prepare their range of services on this basis and market either a complete transport chain for shippers or terminal to terminal services for road hauliers and freight forwarders.

### **(3) CT Development**

Many of the medium-sized freight forwarders have actively participated and heavily invested in combined transport to exploit this market. Accordingly CT network has been developed covering EU countries. UIRR highlighted the some examples of the CT developments in EU as follows.

a. The Humberg international freight forwarder of Hoyer -45,000 container and semi-trailer shipment per year

The firm have developed a special multimodal container for liquid products. Rail transport is in many cases better for liquid products containers, as two heavy containers can often be carried in one wagon, whereas they would have to be transported separately by road because of the total weight requirement of 40 t or 44 t. This firm uses CT on the main routes where they have return freight.

b. Rouch Group of Paris

This medium-sized firm has invested heavily in swap bodies for CT, which reach Italy and Spain. It achieved a higher turnover in CT than in road alone.

c. Hangartner AG -1,900 swap bodies

A European-wide support base was set up with the company's own employees at the main CT terminal. The firm has the greater loading capacity of swap bodies. With CT it saves on the high cost of transshipment. Using road haulage with a maximum lorry weight of 40 tons would require two lorries to be used with a maximum of 28 tons each.

d. Italian operator, Cemat

It started up a direct first-time CT link from Greece, via Italy, to Central and Northern Europe. Cemat operates fast daily through-trains to the ports of Ancona, Bari, and Brindisi where the containers are loaded onto a ferry for Patras or Piraeus.

e. Holland Rail Container (HRC)

It developed a fast container transport service by train to Prague. (Three departures per week and per route)

f. Intercontainer-Interfrigo (ICF)

A one-day A/B shuttle-train connection was introduced for traffic between Rotterdam and Switzerland. The firm developed the Hansa -Hungaria Container Express which provides an "antenna train" at the Sopron terminal in Hungary for services to/ from other countries such as Romania, Ukraine, Greece, Bulgaria and Turkey.

g. Dutch operator

Mediterranean Shuttle ( Rotterdam-France, Italy) was marketed by the Dutch operator

The UIRR report finally states that, as these examples show, CT is not a static service. Wherever a market potential develops, the appropriate connections will be established.

#### (4) EU Policies and Promotional Measures for CT

The EU Council Directive 91/440/EEC stipulates "With a view to encouraging combined

transport, it is appropriate that access to the railway infrastructure of the other Member States should be granted to railway undertakings engaged in the international combined transport of goods." It is interpreted that one of the purposes of the Directive is to promote combined transport and in the implementation of the Directive's rules and regulations ( including right of access) are the essential pre-conditions to the full scale development of combined transport in the EU countries. UIRR says that combined transport has become the best hope of international transport policy. The EU Commission has raised development status of a European CT network to a project with top-priority Community interest.

It must be stressed that the basic reason for promoting CT development by the EU Commission is closely related to the EU's transport policy - all the modes of transport should pay the cost which they have generated, including social cost, economic cost of accidents and environmental pollution. The Commission believes that CT will provide vital assistance to reduce those costs. If/when the CT with the lower social costs and a high level transport service equivalent to, or more than that of road transport becomes popular, road user charges covering the external cost as well as direct cost will be the practice. In this context EU Commission has been supporting CT development and taking a number of measures to remove the systematic disadvantages for CT -equalization of disadvantage.

Some of the promotional measures are shown below;

- a. The approval given for higher total lorry weight in initial and final journey by road with ISO containers. The permissible total weight can be as high as 44 tons in EU countries which normally permit only 40 tons. This is because of the greater tare weight of the container used in CT. Some countries allow the higher weights for swap bodies and semi-trailers. This regulation has had a particular favourable impact on the transport of liquid commodities, as it is dangerous goods which are mainly involved.
- b. Abolition of the prohibition on cabotage (national freight operations abroad) for CT
- c. Tax refund. A CT operator acquires a right to a corresponding tax refund in respect of non-use of road infrastructure.
- d. Exemption from certain driving prohibition ( e.g. on weekends and holidays)
- e. Recognition of travel time by rail as a rest period for the driver in the case of RoMo-Labour law.

f. Government subsidy for the procurement of wagons and other special equipment needed to engage in CT operations.

In some cases the EU allows Member States to provide grants towards operating expenses during the startup phase of a specific CT project.

Further more in order to promote CT in EU, “**European Agreement on Important International Combined Transport Lines and Related Installation**”, which has been signed by around twenty European states, summarized important objectives in the field of CT infrastructure as follows;

- a. Increasing speed of CT trains to 100 km/h or even 120 km/h.
- b. An increase in train length to at least 600 m, and preferably 750 m
- c. Increasing train weight up to 1,200 or 1,500 tons

The European Conference of Ministers of Transport and ECMT supports coordinated promotion of CT throughout Europe among 31 Member States. ECMT declared that subsidies are a good investment “if positive transport policy results can be achieved by means of the relevant combined transport services”.

The EU Council has also been supporting CT development through PACT granting of the Community financial assistance for the action to promote combined goods transport.

#### **( 5 ) Future Prospects**

In order to ensure that freight can be transshipped from one mode of transport to another safely, economically and at reasonable cost, the innovative systems have been developed and are being researched. The main objective is extensively automated and computer assisted transshipment from one mode of transport to another and from one train directly to another.

Some examples are shown below;

- a. “Commutor” The French SNCF project for the rapid loading of containers and swap bodies.
- b. “Rapid transshipment installation” Germany Krupp Fordertechnik GmbH
- c. “Combilifter” Mercedes-Benz for horizontal transshipment.
- d. “Bimodal system” used in the USA under the name of Road Railer

Technological development on loading unite are also taking place. An increasing number of hauliers and freight forwarders are using jumbo- and mega-containers for the transport of bulk goods

It is reported that CT is no longer feasible without modern electronic data processing. As industrial firms are to an increasing extent considering the transport of goods to be a part of the actual production process, relevant transport-related data must also be rapidly available. Modern electronic data processing technology makes it possible to track shipments, even in international traffic. This can be done through automatic identification, a technology which is already in everyday use on railways in the USA.

The EU Commission is assisting in this field through the PACT pilot programme for transshipment techniques, information technology and telecommunications.

#### **(6) Implication of CT Development in the EU**

UIRR recognizes that CT is essential to road hauliers now and in future. It also claims that CT is considered to be the best solution for overland freight transport. It is an inherent feature of CT that it promotes mutual cooperation between several modes of transport. Proof of this can be found in the fact that freight forwarders and road hauliers and relevant sectoral organizations have participated in many European CT companies, and continue to do so.

The advantages, among other things, of CT are summarized as follows;

- a. CT helps a haulier to reduce variable costs relating to fuel, tyres, and repairs. Lorry life is extended. The size of the fleet can be effectively reduced. Traction vehicles used only in the initial and final journeys will then be able to move a number of swap bodies and craneable semi-trailers, leading to the expansion of their businesses as a haulier.
- b. Neither should the potential for savings on personnel be underestimated. CT makes it possible to move more goods with a smaller number of direct employees. Due to the strict labour law, one driver alone is no longer able to deliver a shipment by road over a distance of more than 700 km in one day.
- c. During the past few years legislatures have increasingly tightened up the regulations on dangerous goods. If a higher safety level is established for road transport. This will enhance the attractiveness of combined transport.
- d. Combined transport is suitable in principle for the transport of all types of goods which are also carried by road over longer distances.

Taking into consideration these advantages of CT, the EU seems to have decided to promote CT development not only for the prosperous future of road hauliers and freight forwarders themselves, but also for the implementation of EU transport policy of the sustainable transport, thereby reducing the social cost.

In this context it must be understood that the EU's strategy or aim regarding CT is to make it a popular and common transport mode for the freight transport. It is not limited to the field of the traditional container transport which is operated by a few special companies and railway undertakings. As shown above the major players in CT development are medium-sized road hauliers and freight forwarders. This indicates that CT is widely becoming a popular and social transport system for long distance freight traffic, making it the third land transport mode after road and railway.

It seems that EU's railway reform measures including right of access, targeting at the long distance freight traffic to revitalize the railways finally leads to the development of the combined transport. In other words, as stated above, such measures are indispensable for the full scale development of CT.

The development of combined transport from and to South-Eastern Europe is discussed in the following section.

## **4.2 TRANSPORT DEVELOPMENT IN CENTRAL AND EASTERN EUROPEAN COUNTRIES(CEECs)**

There are two streams of international cooperation in the transport development in EU-CEECs. One is "The structured framework and dialogue with CEECs ( Meeting of Transport Ministers )". The other is the " Pan-European Transport Conference". In addition development of combined transport in South-Eastern Europe is of great importance.

### **4.2.1 The structured framework and dialogue with CEECs**

The strategy outlined at the European Council in Essen in 1994 confirmed the central importance of the structured framework and dialog with the CEECs in preparing the way for accession into the European Union. It was also agreed that a meeting of Transport Ministers should be held on an annual basis. The most recent one ( as of August 1997 ) was the second meeting of Transport Ministers held in the margin of Transport Council at Luxembourg in 1996, and attended by the 10 Associated States<sup>1)</sup>. It focused on the following issues;

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<sup>1)</sup> Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Slovak Republic and Slovenia.

### *Rail and Combined Transport*

The further enlargement of the Community into Central Europe could provide considerable opportunities to expand the role of rail and combined transport, given the rail network in those countries. This would however require significant efforts at developing rail and combined transport service provision. Reducing delays due to border administrative formalities were seen as of particular relevance. In addition, the potential social problems associated with increasing the efficiency, through rationalization programs, were seen as a particular difficult issue to tackle.

### *Pricing*

The importance of pricing in determining the use of the transport system and its relationship to infrastructure development was recognized by all. All ministers also shared the view that transport pricing should fully respect proportionality and non-discrimination. Possible charging instruments ( tolls, user charges, excise duties, vehicle taxes, etc.) should be reviewed.

### *Financing Infrastructure*

It was recognized that with regard to both the current and potential way of financing infrastructure, (in particular private involvement and charges for use of infrastructure ) the specificities of each country and project may lead to the choice of different solutions. Each of them must however respect certain basic principles such as economic viability.

The second Ministers' meeting was followed by the Senior Official Meeting in 1997 which set forth the future priorities as follows;

#### **a The Rail Sector.**

### *Trans European Rail Freight Freeways*

As already mentioned there are significant opportunities for expanding the Freeway concept beyond the borders of the Community. The key issue to be solved is likely to the extent to which different train operators will be able to operate across the border of the Community. This requires further consideration. The Commission has been informed by the Transport Ministries of Switzerland, Hungary and the Czech Republic that they are interested in

exploring further the potential for Freight Freeways.

### ***Financing***

Clear financial objectives and a proper division of responsibilities between the State and the railways must be established and, in addition, the burden of past debt must be lifted by the Member States. With the exception of compensation for public services, exceptional social cost and support for specific infrastructure investment, the railway should finance their operations without transfer from the State. Community legislation already foresees the application of State aid rules to this sector.

### ***Market Forces and Access Rights***

The Commission intends to make access rights more effective e.g. by a further segregation of infrastructure management and transport operations, and through community principles for charging and capacity allocation. Most Member States and some CEECs have adopted Directive 91/440, and the application of Directives 95/18 and 95/19 is under preparation.

### ***Social Implication***

It is essential to alter the procurement of public transport so as to raise its quality and lower its cost. Firstly, the Commission intends to propose the generalized use of public service contracts agreed by the State and the operator. Secondly, they will introduce market forces in an appropriate way.

Greater rail competitiveness may require a significant reduction in the workforce. The implementation of appropriate personnel policies, including substantial programs to retrain redundant workers, will require substantial efforts in particular by the Member States. However greater competition is the key to maintaining employment in the long term.

### ***Greater Integration***

The Community has to develop an appropriate policy, particularly for conventional rail, to remove the national bureaucratic and technical barriers at an acceptable cost and so improve performance.

One of the major technical barriers is incompatibility of national railway signaling systems. Efforts have been made by the Commission towards the development of an integrated railway



traffic management system (ERTMS) inside the Union and its extension on a pan-European scale.

#### **b. The Combined Transport Sector**

*PACT*<sup>1)</sup> --The granting of Community financial assistance for actions to promote combined goods transport.

The Council agreed that financial support could be available through PACT for projects between the European Union and the CEECs, but this funding will only be available for those parts of the operations which fall within the European Union itself. Possibilities at this stage include PHARE, TACIS and DGVII budget for developing combined transport in the CEECs.

#### *Infrastructure*

Attention must be given to the development of transshipment points and facilities in the expanded TEN(Trans-European Network). It should be noted that some Community funding could be made available, possibly through the PHARE program. They are also suitable for the Public-Private Partnership. The potential need for upgrading the transshipment operation in the CEECs to those of the EU, in order to achieve balanced traffic flows and avoid bottlenecks, is likely to be substantial.

Funding for the transport network in the CEECs should also be available for investment in specific combined transport equipment (including rolling stock) used to overcome infrastructure constraints.

#### *Operation and Administration*

As terminals can be used both for East-West and East-East connection it will be necessary to develop criteria for terminal financing. Further difficulties result from unreliability due to delays, and the absence of real time information on the location of shipments. This is compounded by unnecessary delays at the Community's external borders, some of which are due to government formalities and others to administrative operating problems.

#### *Legislative Framework*

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<sup>1)</sup> Pilot Action for Combined Transport

It will be necessary for the CEECs to bring their legislation on combined transport into line with the EU, principally as regards Regulation 1107/70 on State aid, ( to avoid distortion of competition), and Directive 92/106 (on fiscal advantages for combined transport operations). Thought will also have to be given to introducing measures similar to those operating in the Community that permit road vehicles operated for combined transport to carry up to 44 tons, as well as certain exemptions from restrictions on normal road traffic.

### **c. Transport Pricing**

It is necessary to avoid incompatible pricing systems or wide differences across Europe which could undermine the efficient functioning of the transport system. Charging instruments have to respect certain fundamental principles such as the proportionality of charges to the costs, the non discrimination on the basis of nationality, the territorialal principle, and the non-proliferation of charging instruments.

Substantial resources are required for infrastructure investment in the CEECs, and revenues from a pricing scheme can be used to recover some of these. The challenge for the CEECs is to consider which type of charge( or combination of charge) will best suit their economies and transportation requirement while respecting the fundamental principles. A brief assessment was made on vehicle taxes, tolls, user charges, and fuel taxes. Common guidelines on charging principles for rail will also be developed taking account of the comparative costs for the use of the infrastructure by different transport modes, road and rail in particular.

### **d. Other Developments in Transport**

#### *Air Transport*

The Commission was authorized by the Council in 1996 to open negotiate with 10 CEECs including Bulgaria, to establish an air transport market access agreement.

The opening of the air transport market between the Community and the CEECs will be based on a phased approach, with each phase being conditional upon the progress made by individual CEECs in terms of adoption of the "acquis communautaire -Regulations"

#### *Road Transport*

*( Road Passenger Transport Negotiation )*

Following authorization from the Council in 1995, the Community opened negotiation with 14 Central and Eastern members of the ECMT (10 Countries within the "Europe Agreement" plus Bosnia-Herzegovina, Croatia, Moldova and Turkey ) about the European Agreement on International Occasional Carriage of Passengers by Coach and Bus (INTERBUS agreement). Negotiations will define the methods according to which Partner Countries will adopt legislation equivalent to that of the Community licensing road passenger transport operators, as well as technical, social and fiscal requirements linked to the provision of occasional services.

#### ***(Road Freight Negotiation )***

Following authorization from the Council in 1995, the Community opened negotiation with Bulgaria, Hungary and Rumania with a view to improving land transit by road between Greece and the rest of the Community. In exchange, the Community will offer transit rights through individual Member States to each of the three partner states.

#### ***Inland Waterways Transport***

Following authorization from the Council in 1992, the Community initiated an agreement on inland water transport with the Czech Republic, Poland and Slovakia. The proposed agreement lays down common rules for transport between the Community and the three countries concerned. The agreement will serve as a model for further negotiations with the other Danube states.

#### ***Maritime Transport***

The Commission approved a communication on the Union's " External Relations in the Field of Maritime Transport", which is in line with the Community's maritime policy established with the package of Council Regulations adopted in 1986.

### **4.2.2 Pan-European Transport**

#### **( 1 ) Pan-European Transport Conference**

Until now the Pan-European Transport Conference has been held three times - Prague in 1992, Crete in 1994 and Helsinki in 1997.

The first conference in Prague declared " All European cooperation in the field of transport

should be put into practice by means of [.....] assembling and where necessary refine existing knowledge and schemes in the sphere of all European transport infrastructure and further developments of existing agreements with a view to indicating the most important major transport routes linking the European countries and regions to be considered for improvement and modernization”

In this context, the second conference in Crete presented “ Toward indicative guidelines for the further development of Pan-European Transport infrastructure<sup>1)</sup> ” as outlined in the preceding section 3.1.1. Nine Pan-European transport corridors were identified for further work. These transport corridors were selected in order to facilitate trade and the mobility of people across the European continent.

In the third conference in Helsinki adjustments to the Crete corridors were made as follows;

#### *Corridor X*

The report says that in light of the consolidation of the peace process in the successor states of the Socialist Federal Republic of Yugoslavia, it seems appropriate to propose the establishment of a new corridor ( Corridor X ) which broadly follows the traditional route to South Eastern Europe which was widely used before the outbreak of hostilities.

#### *Pan-European Transport Area*

It is reported that in some areas, (those surrounding or linked to sea basins), the corridor concept does not 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 needs to be adopted. This complementary concept of Pan-European Transport Area was endorsed by the countries concerned. Four areas are proposed and includes the Black Sea Basin Area. It is intended that the countries concerned and the appropriate regional co-operation organization should work on an infrastructure development plan for each area. This will include its links with the Pan -European Corridors and the Union’s Trans-European Networks as well as eastward to Central Asia.

#### *Euro-Asian Connection*

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<sup>1)</sup> Submitted by the Commission of the European Communities, the Secretariat of the European Conference of Ministers of Transport (ECMT) and the Secretariat of the United Nations Economic Commission for Europe

It is reported that the importance and use of the links between Europe and Asia are expected to grow. This shows the necessity of the ongoing extension of the European networks to the trans-Caucasian and Central Asian members of the UN/ECE. Five trans-continental links are proposed, including the Black Sea shore connection to the Caucasus.

Finally further works are specified as follows;

1. An appropriate body at a working level to refine and adjust for each corridor, e.g. the Transport Infrastructure Needs Assessment Group (TINA)
2. Preparatory measures to identify transport infrastructure projects of a reasonable size, with appropriate economic efficiency and financial viability. Cooperation with international institutions. A consistent approach to charging policies along corridors,
3. Surveys for the development of traffic flows. Technical and legal monitoring by the UN/ECE, policy monitoring under the ECMT, and coordination by EC.
4. The solution of border crossing problems.

**( 2 ) Conference of the Ministers of Transport of the BSEC and the CEI Countries on the Development of the Regional Transport Networks in the Context of the Pan-European Cooperation 1996**

In accordance with the decision of the Minister of Foreign Affairs of the Black Sea Economic Cooperation (BSEC) Participating States and of the Central European Initiative (CEI) Member States, this conference was held in Sofia in 1996. This was to assist the development of the regional transport networks in the context of the Pan-European cooperation and with regard to the Pan-European transport corridors development. BSEC and CEI are the regional cooperative organizations for developing the Trans-European corridor concept. The major items discussed at the conference were as follows;

a. It was acknowledged that the creation of a Pan-European transport system will contribute to the development of economic, business and commercial ties and tourism by facilitating the movement of goods and people.

b. The principles for the development of the transport network were set out as follows;

- The process of harmonization of technical, fiscal and legal transport regulations as a pre-condition for the gradual opening of access to the national transport markets will be developed on a mutually beneficial basis.

- Transport networks should be developed in accordance with national interests and the principles of market economy.

- Gradual simplification, optimization and harmonization of the customs and border crossing procedures for cargoes and passengers.

c. It was agreed to further proceed with a comprehensive study on the whole range of possible options for the transportation routes and further study to investigate possible areas of cooperation between the BSEC and the CEI countries.

d. It was agreed to establish the **Trans Regional Centre for Transport Infrastructure** in Sofia, at the initiative of countries of South-Eastern Europe.

### **(3) Combined Transport Development in CEECs**

As discussed in 3.5.1 (3), combined transport is becoming a common transport mode for road hauliers and freight forwarders in the EU. CT is also of great concern in CEECs. The studies have been made with a view to developing the CT system to the CEECs. Among others are "The study on the development of railway and combined transport on international Trans-European Axes in Central and Eastern Europe" under the PHARE program, and "The study on combined transport from and to South-Eastern Europe" by a group of CT operators.

#### **1) Railway and Combined Transport study by PHARE**

##### **(A) CT Network and Terminals**

Two axes corridors ( West-East, South-North) were selected among the ones to be given priority included in the T.E.R<sup>1)</sup> Agreement within the eleven countries participating in the PHARE Programme. CT railway network and terminals are shown in Figure 3.5.2-1.

Bulgarian lines included are four sections of Sofia to Vidin, Thessaloniki, Istanbul and Tirana respectively. It must be noted that the Crete corridor no.8 was not included in the axes corridors. The projects prioritized mainly from the viewpoint of the traffic volumes forecast are listed in Table 4.2.2-1.

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<sup>1)</sup> Trans-European-Railway Cooperation

**Table 4.2.2-1 List of Project Priority of Bulgaria Section**

<b>Time horizon : Year 2,000</b>	<b>Time horizon : Year 2,010</b>
<b>3<sup>rd</sup> Priority</b> Vidin Ferry-Vidin (6,000) Sofia- Kulata (5,000)	<b>1<sup>st</sup> Priority</b> Krumovo- Svilengrad (9,000)
<b>4<sup>th</sup> Priority (Project external to the corridors)</b> Rousse border crossing	<b>2<sup>nd</sup> Priority</b> Vidin- Sofia (6,000) Vidin- Carafat bridge (6,000)

( Daily traffic flow assigned-both direction)

The Bulgaria sections were given low priority at the time horizon 2,000, with the relatively high priority at the time horizon 2,010. This may suggest that the volume of traffic in and through Bulgaria will not sufficiently increase by the year 2,010. Around 13 CT international terminals throughout Bulgaria were also proposed, centering on the Sofia terminal.

**( b ) Conclusions**

The conclusions of the study are summarized as follows;

- a. A set of recommendations on railway upgrading to be implemented on selected lines along the corridors, in order to reach the required capacity and speed standard to attain an appropriate freight transport within Central Eastern Europe.
- b. A set of recommendations on terminal infrastructure upgrading to be implemented on selected terminals along the corridors.
- c. A set of recommendations on updating the institutional and legal framework of the freight transport within all the countries concerned in accordance with the EU Directives in force. The aim is to meet the requirement needed at the international and national level in order to achieve the necessary harmonization of the rules in the sector. Those recommendations are still being implemented in progressive achievement in EU Member Countries. They concern railway organization and management, freight transport marketing, and traffic operations with a special emphasis on combined transport.

These are the basic tools for freight transport development, according to the most updated criteria, within an enlarged market extended to the entire European Continent.

## **2 ) Expansion of CT Transport Connections to South-Eastern Europe**

UIRR has been exploring the South-Eastern Europe for expanding the CT transport connections. It showed its view on the development of CT in the document entitled "New Routes : Central and Eastern Europe" and coordinated in establishing "The strategy for creating a CT transport network in South-Eastern Europe".

### **( A ) New Route : Central and Eastern Europe**

#### ***Roles and Necessity of CT in Central and Eastern Europe***

The basic problems of road and freight transport which led to enhancing the CT development in the Central Europe are the transport problems caused by the large increase in the number of small and medium-sized hauliers and freight forwarders through the dissolution of former state monopoly suppliers of transport services. These are;

- a. Massive traffic jams and major damage to the environment
- b. A sharp fall in price for road transport due to its oversupply. This has also resulted in a further shift from rail to road, thus worsening the problems of above item a. This unduly low price competition never allows the small and medium sized road transport operators to invest in improving their obsolete vehicle fleets in terms of safety and environment ( anti-pollution measures) . It is threatened that if this vicious circle continues, the road transport industry may be destined to be demolished. The past three years have seen growth rates of 15-20% per year in the licensing of HGVs ( Heavy Goods Vehicles), imposing a permanent pressure on transport prices. Simultaneously, corporate costs were rising providing competition conditions which have in some cases proved ruinous.

UIRR says that an outlet of this situation is Combined Transport, which would provide a reliable and economic alternative to road transport pure and simple, which really could ease the burden on the roads of South-Eastern Europe.

#### ***Assessment of current CT Development and future prospect in South-Eastern Europe***

Most of the road hauliers are not yet equipped technically or financially for CT. Equipment which can be used in CT, such as craneable swap bodies and semi trailers, are available only in increasingly small amount. In other ways also, the general situation does not favour the development of CT. There are no efficient CT terminals, which can be easily reached by both lorry and rail transport. The few available CT installations lack the required transshipment



equipment in the form of either stationary cranes or mobile transshipment vehicles.

Despite this situation, own-account CT companies have now been formed in various countries and they have joined the UIRR. There have already been some promising signs. These are, for instance, RoMo between the Austrian city of Wels and Budapest- Hungarian combined-transport company, Hungarokombi, RoMo between Dresden and Lovosice in the Czech Republic, Danube-Elbe Express between Hungary and the North German ports, Fast complete train (Prague shuttle) between Rotterdam and Prague and others.

Judging from these few examples UIRR concluded that there are enough ways and means of gaining a foothold in the East European countries. But they need the support of the various railway companies on a partnership basis and active support from transport policy. They are set forth in the Strategy of the Combi-Operators as described in the following section.

## **(B) Strategy of the Combi-Operators**

### **A) Impediments to CT market**

The study states that there are still a number of impediments to a consistent performance of Combined Transport between North-West and South-East Europe.

- a. The degree of familiarity of CT as an independent transport system is still very low in South-East Europe, and small to medium-sized companies are hard to find.
- b. Heavy-duty transfer cranes or mobile transfer equipment are often not available at the railway stations, or equipment is only able to handle containers.
- c. The condition of the railway infrastructure does not meet the requirements expected of modern freight forwarding services.
- d. Many transport concerns are short of equipment for using unaccompanied CT.
- e. The volume of transport frequently shows an unbalance which means that there is the risk of vehicles used for delivery not being used in a properly economic manner.
- f. There is a lack of peripheral political measures for promoting CT, such as tax waivers or reimbursement of road taxes and toll charges, the exemption of permission for weekend and public holiday movement bans, the approval of higher permissible gross weights for the

vehicles used in the initial and final stages of CT, and incentives for the procurement of equipment capable of being moved by crane.

g. There are insufficient wagons required for the forwarding of inter-modal equipment.

## **B ) Tasks and strategy for CT development**

In order that these impediments are removed, the governments, the railways and CT operators should cooperate as follows;

### *The task of Transport Policy and the Railways*

The report and the UIRR contend that Transport policy should create the general conditions for the development of combined transport. Included measures are listed below;

- a. Route costs to be set non-discriminately so that road and rail are equivalent.
- b. Exemption from permits for vehicles used for initial and final road transport.
- c. Exemption from weekend, night time and public holiday bans.
- d. Initial and final road journeys to CT terminals should not be seen as national transport ( Lifting of cabotage ban on CT)
- e. Shortening of depreciation periods for investments in equipment suitable for inter modal equipment and preferential interest rates policy for new acquisition.
- f. Higher maximum permitted loads for swap bodies, semi-trailers and containers.
- g. Border formalities to be dealt with at terminals.

The tasks of the railways are specified as follows;

- a. A clearly understandable tariff system that suits the market, and that can be calculated in the long term, incorporating productivity benefit savings.
- b. Sharing in the risks of non-utilization when CT links are being developed.
- c. Providing market-oriented, guaranteed train times and taking over cancellation liability if these times are not met.
- d. Simplified handling and safety standards when transport documents are also carried.
- e. Transport monitoring by safety staff and exchange of information by remote data transfer.
- f. Harmonization of loading gauges.
- g. Fitting out terminals with the requirements for the techniques used in CT ( cranes, storage areas, loading ramps for rolling motorway)

### *Marketing Strategy and operational concept for CT*

With the changeover to the market economy, attractiveness of South-Eastern Europe to Western investors is increasing all time, and deliveries are becoming more closely interconnected and the exchange of goods is growing. This increases the market potential for rail transport. The following marketing principles are established.

- a. Relieve the roads between North-West and South-East Europe up to a maximum limit.
- b. Produce a range of services equivalent to the quality provided by HGV transport.
- c. Efficiently organize CT between economic countries.
- d. Support the transport industry in developing national, private companies.

Under the operational concept that complete train-loads will provide the kind of price-performance ratio that meets customer requirement, the following strategies were recommended;

#### a. Rolling Motorway and unaccompanied CT

In view of the large number of small transport companies lacking equipment suitable for CT, the rolling motorway is the best way of significantly reducing the load on the roads the short term. The formation of rolling motorway chains will offer transport companies better utilization of their staff and vehicle resources and will guarantee railway and CT operators more efficient use of rolling stock.

Top priority will be given to the gradual development of unaccompanied CT. Where volumes suitable for whole trainloads do not yet exist, the companies will try to establish nodal points for gathering wagon groups from various directions.

#### b. Rolling stock and Terminals

The need for suitable rolling stock will be met by rolling stock companies that are associated with the Combi-companies. The necessary expansion of existing transfer station and the construction of new terminal should be implemented with the coordination between the railway companies, CT operators and the terminal operating companies.