South Balkan Development Initiative

East-West

Transport Corridor Feasibility Study Phase I

Volume I
EXISTING CHARACTERISTICS

FINAL REPORT

Presented to:
Ministry of Transport of Bulgaria
Ministry of Transport and Communications of Macedonia
Ministry of Public Works and Transport of Albania

Bechtel International, Inc.

April 1998

In Association with:
Transportation and Economic Research Associates
Wilbur Smith Associates
Transproekt S.A.R.L. – Sofia
Economic Institute – Skopje

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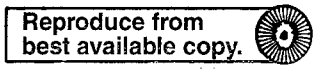

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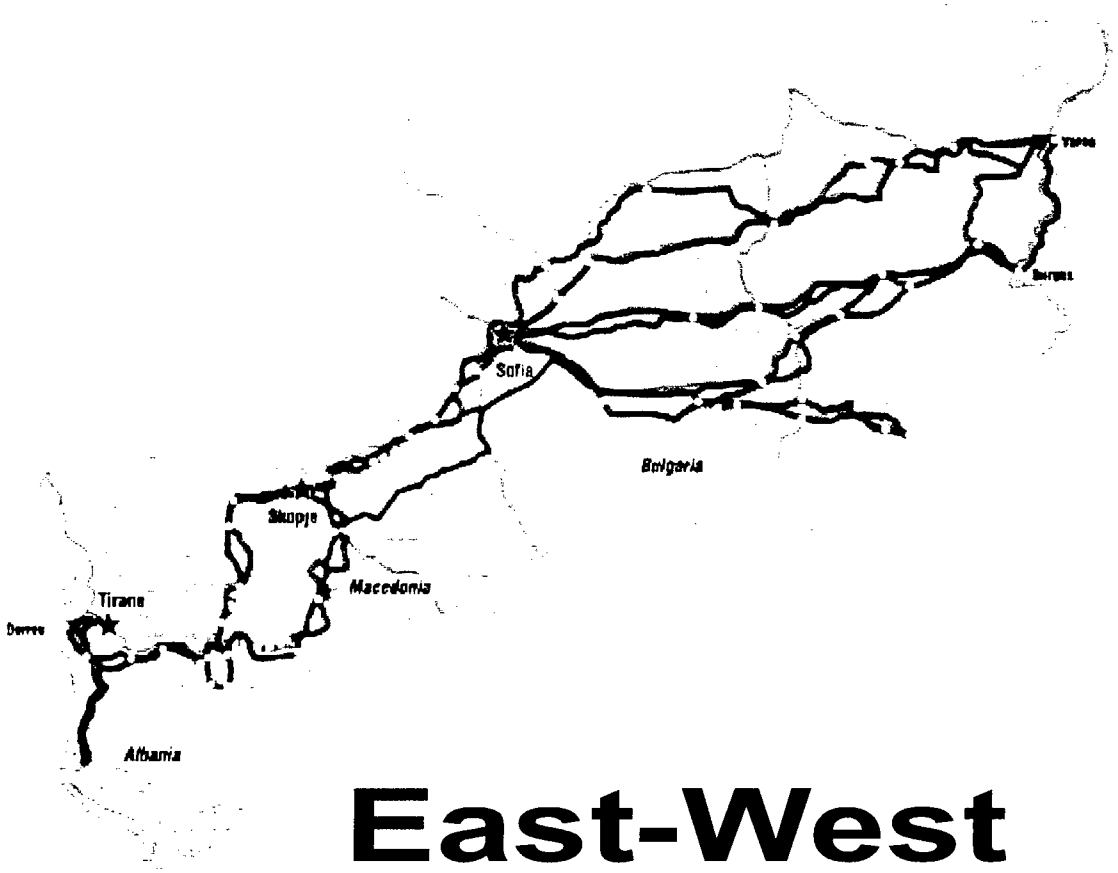
South Balkan Development Initiative



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On December 30, 1996, the Bulgarian Ministry of Transport – on behalf of the Bulgarian Ministry of Transport, the Macedonian[1] Ministry of Transport and Communications, and the Albanian Ministry of Industry, Transport, and Trade – entered into a US Trade and Development Agency (TDA) funded contract with Bechtel International Inc. (Bechtel) to conduct a feasibility study of the Transport Corridor No. 8 East-West, Phase 1. The contract was approved officially by the TDA on February 27, 1997.

This study is funded by a TDA grant under the U.S. Government's South Balkan Development Initiative (SBDI). The 4-year SBDI program, established in fiscal year 1996, provides assistance to the governments of Bulgaria, Macedonia,[1] and Albania to strengthen their transportation infrastructure links and improve the level and quality of transportation services along Corridor 8 (the East-West Corridor). The East-West Corridor is one of the nine priority transportation corridors of Europe, designated in the Pan-European Second Conference held in Crete on March 14-16, 1994. The Crete Conference Declaration, executed by 21 European nations, stipulates that there should be cooperation among nations in identifying missing links, bottlenecks, and poorly integrated regions along the nine priority corridors in cooperation with international financial institutions.

In performing this study, Bechtel is assisted by the following consulting companies:

- Transportation and Economic Research Associates, Inc.
- Wilbur Smith Associates, Inc.
- Transproekt S.A.R.L. – Sofia
- Economic Institute – Skopje

1.1 OBJECTIVES OF THE STUDY

The main objectives of the study are as follows:

- Survey and summarize existing characteristics of transport modes along the corridor
- Develop transportation forecasts for the corridor
- Develop and prioritize a conceptual list of projects for East-West Corridor implementation
- Develop possible approaches to project financing
- Recommend specific courses of action for TDA's and SBDI Coordinating Group's consideration

1.2 OVERVIEW OF THE SOUTH BALKAN DEVELOPMENT INITIATIVE

The SBDI was established in 1996 to assist Bulgaria, Macedonia, and Albania develop and integrate their transportation infrastructure. The objectives of the SBDI are threefold:

- To help the three countries upgrade their transportation infrastructure in order to increase trade and stimulate economic development
- To encourage the three countries to develop a regional approach to transport planning and use regional synergies to leverage new public and private capital

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- To use the concrete experience of regional cooperation on transport infrastructure development to foster more regional cooperation and economic integration

To achieve the SBDI objectives and facilitate better coordination in transportation infrastructure development and rehabilitation activities, the three governments have established a Coordinating Group (CG) at the Deputy Transportation Ministerial level and a SBDI CG Secretariat office in Sofia.

Ten projects were begun with first-year (Fiscal Year 1996) funding under the SBDI 4-year program. These projects were based on an assessment carried out by TDA, and in consultation not only with the governments of the three countries, but also with international financial institutions. This economic prefeasibility study of the East-West Corridor No. 8 is one of these projects.

1.3 OVERVIEW OF THE EAST-WEST TRANSPORT CORRIDOR

The East-West Corridor comprises highway and railway routes that connect the Port of Durres on the Adriatic Sea with the Ports of Varna and Burgas on the Black Sea through the countries of Albania, Macedonia, and Bulgaria. The total distance of the corridor varies between 1,220 and 1,350 km depending on the specific highway/railway route taken along the corridor. During the fourth Coordinating Group Meeting held in Skopje on March 27, 1997, the group approved the expansion of the definition of the corridor to include the 160 km highway and rail segment between Plovdiv and Svilengrad up to the Turkish border. This allows the corridor to capture traffic that moves between Turkey, the Middle East, and parts of Southeast Asia, via Bulgaria and Macedonia, and the European countries. The Port of Vlore on the Adriatic Sea was added as a second gateway to the corridor during the seventh Coordinating Group Meeting held in Tirana, Albania on December 9 - 10, 1997.

Figure 1-1 depicts the highway corridor and Figure 1-2 shows the railway corridor through the three countries of Albania, Macedonia, and Bulgaria.

1.3.1 Corridor Description through Albania

Starting with Albania, there are two alternate highway routes and a single railway route that connect the Port of Durres with the capital city of Tirana. Each of these routes is approximately 40 km in length. Also, there is a single highway route and a single parallel railroad route, along the East-West Corridor, that connects the Port of Durres with the Albanian/Macedonian border through the towns of Rrogozhine, Elbasan, Kafasan, and Pogradec. The road has a total length of 150 km. The rail line has a total length of 138 km and ends at Lin, 2.6 km short of the Macedonian border. A 25-km road segment connects Tirana with Elbasan and shortens the length of the corridor to 120 km. The Port of Durres is linked with the Port of Vlore via the Albanian major north-south transport artery. This highway and railway route passes through the towns of Kavaje, Rrogozine, Lushnje, and Fier. Rrogozhine is the town link between the Port of Vlore and the route from Durres to the Macedonian border.

1.3.2 Corridor Description through Macedonia

Continuing through Macedonia, along the East-West Corridor, there are two alternate highway routes between the Albanian and the Bulgarian borders. These are the northern

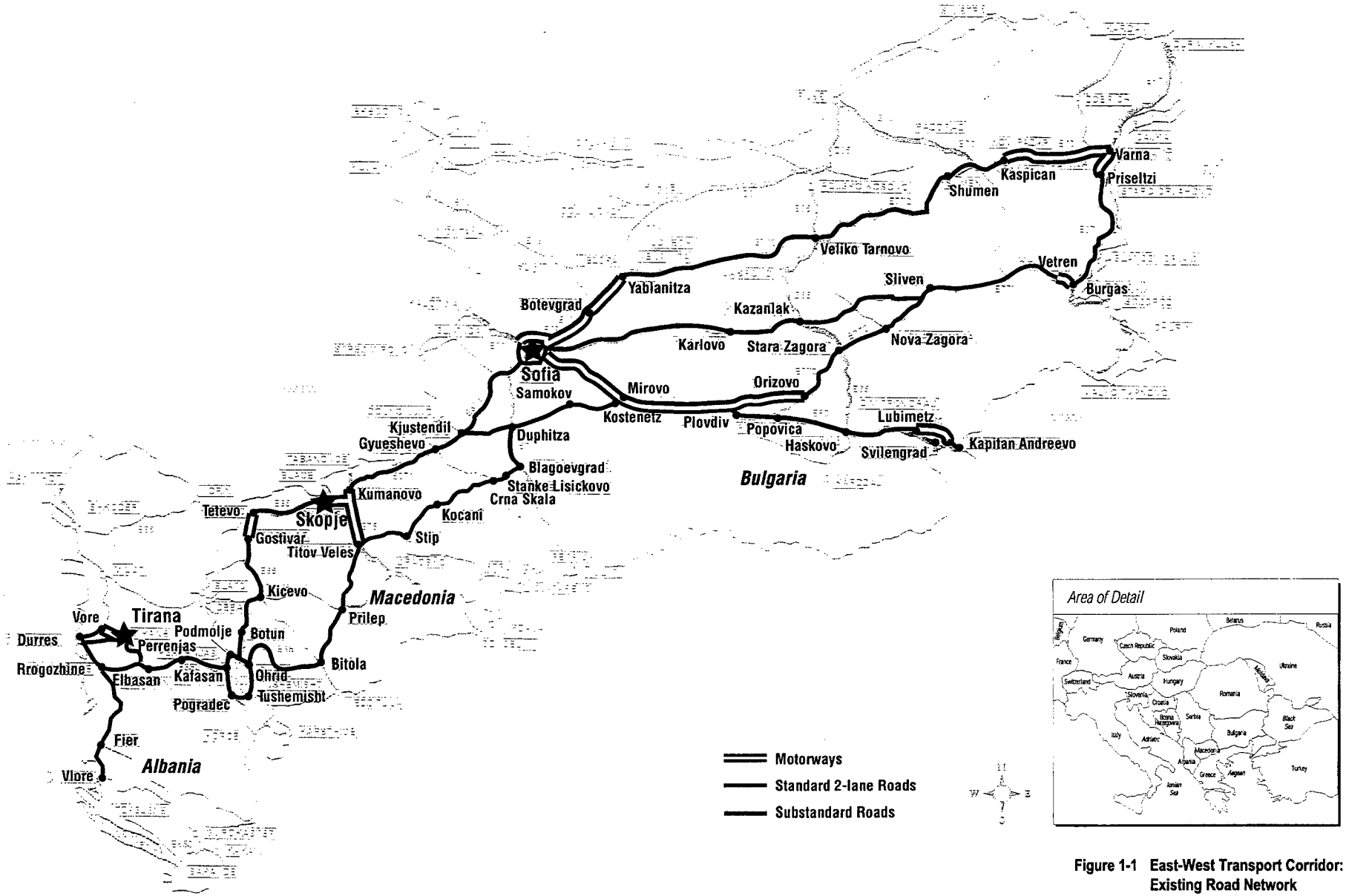


Figure 1-1 East-West Transport Corridor: Existing Road Network

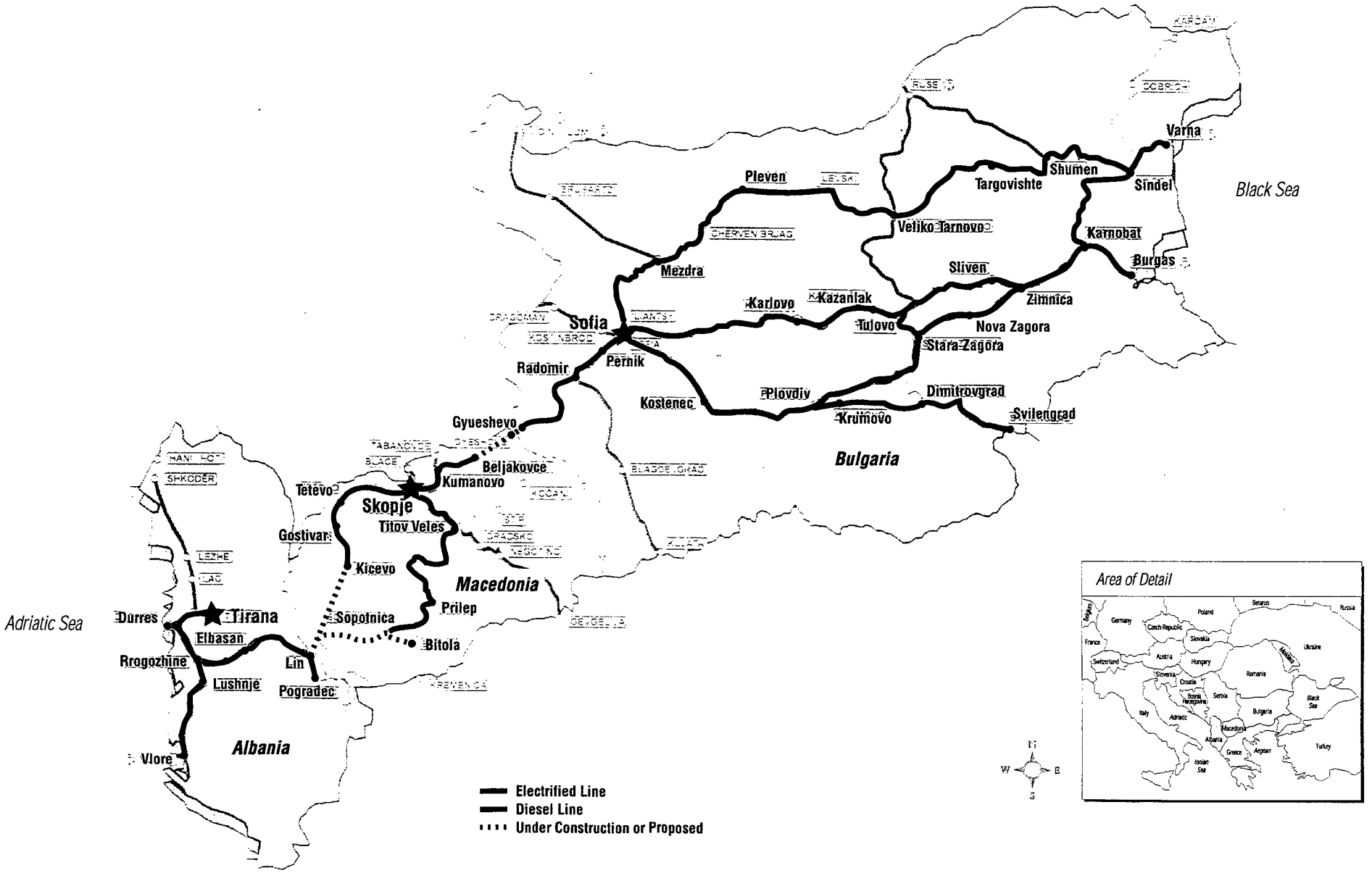


Figure 1-2 East-West Transport Corridor: Existing Rail Networks

route and the central route. The northern route, with a total length of 302 km, connects the Albanian town of Kafasan (or Tushemisht) with the towns of Podmolje, Botun, Kicevo, Gostivar, Tetovo, Skopje, Miladinovci, Kumanovo, Kriva Palanka, and Deve Bair at the Bulgarian border. The central route, on the other hand, with a total length of 339 km, connects the town of Kafasan (or Tushemisht) with the towns of Ohrid, Resen, Bitola, Prilep, Titov Veles, Kocani, Delcevo, and Crna Skala at the Bulgarian border. Both routes pass mostly through mountainous and hilly terrain. The routes are interconnected with a highway between Miladinovci and Titov Veles, which is part of the European north-south route (Corridor No. 10).

There are also two potential alternate railroad routes along the East-West Corridor between the Albanian border town of Lin and the Macedonian capital of Skopje. The northern route would go from Lin through Kicevo, Gostivar, and Tetovo to Skopje, with a total length of 182 km. The segment between the Albanian border town of Lin and Kicevo has not been built yet; therefore, it represents a 66.7 km gap in the continuity of the rail corridor (65 km of this gap is in Macedonia). The central route, on the other hand, would have a length of approximately 240 km and would connect the town of Lin with the towns of Sopotnica, Prilep, Titov Veles, and Skopje. Also, the segment from Lin to Sopotnica has not been built yet, and represents another gap in the continuity of this rail corridor. Between Skopje and the town of Gyueshevo, on the Bulgarian border, there is one railroad that passes through Kumanovo and Beljakovce. This route has a total length of 123 km, with a 55-km section between Beljakovce and the Bulgarian border currently under construction.

1.3.3 Corridor Description through Bulgaria

Within Bulgaria, there is one major highway/railway route along the East-West Corridor between the towns of Deve Bair/Gyueshevo and the capital city of Sofia. These routes, passing through Kjustendil, Radomir, and Pernik, have a total length of 112 and 160 km, respectively. There is a 2.5-km missing railroad link between the Macedonian border and Gyueshevo.

Between Sofia and the Ports of Varna and Burgas, there are three alternate highway routes. The northern highway route, with a length of 463 km, connects the city of Sofia with the Port of Varna via the cities of Botevgrad, Koritna, Veliko Tarnovo, and Shumen. The central route, with a length of 385 km, connects Sofia with the Port of Burgas via the cities of Karlovo, Kazanlak, Sliven, Karnobat, and Ajtos. There is a 134-km road connecting the Ports of Varna and Burgas. The southern route, with a length of 432 km, connects Sofia with the Port of Burgas via the cities of Ihtiman, Plovdiv, Stara Zagora, Nova Zagora, Sliven, Karnobat, and Ajtos. The East-West Corridor also includes the road connecting the city of Plovdiv with the Bulgarian/Turkish border via the cities of Haskovo, Harmanli, Ljubimetz, Svilengrad, and Kapitan Andreevo; the total length of this road is 151 km. There is a road connection between the southern route at Mirovo (near Kostenetz) and the Macedonian central route at the Macedonian/Bulgarian border town of Crna Skala. This road, starting at the Macedonian Border, passes through the cities of Blagoevgrad, Dupnitza, and Samokov; its total length is 140 km. A 42-km section connects this road with the town of Kjustendil on the Deve Bair – Sofia segment.

There are also three alternate railway routes that connect Sofia with the two Ports of Varna and Burgas. The northern railway connects Sofia and Varna through the towns of Mezdra, Pleven, Levski, Veliko Tarnovo, Shumen, and Sindel; its total length is approximately 532 km. The central railway connects Sofia and Burgas through the towns of Karlovo, Kazanlak, Sliven, Karnobat, and Ajtos; its total length is 340 km. The southern railway connects Sofia and Burgas through the towns of Kostenec, Plovdiv, Stara Zagora, Nova Zagora, Iyambol, Karnobat, and Ajtos; its total length is 437 km. There is a railroad link, with a total length of 174 km, between the Ports of Varna and Burgas through the towns of Sindel, Karnobat, and Ajtos. The corridor also includes the railroad connecting the city of Plovdiv with the Turkish border via the towns of Dimtrovgrad, Harmanli, Svilengrad, and Kapitan Andreevo; its total length is about 163 km.

1.4 STRATEGIC SIGNIFICANCE OF THE EAST-WEST CORRIDOR

The importance of a transcontinental East-West Corridor across the Balkans connecting the Black Sea to the Adriatic has long been recognized as an important undertaking for integrating the economies of the South Balkan region with Europe, the Middle East, the Caucasus, and Central Asia. The land connection between the Albanian Adriatic coast and western Black Sea shores had been an active trading route during the Roman Empire. Since the break-up of the U.S.S.R. and transition of central and eastern European nations to market-oriented economies, this corridor has been recognized by the European Union as an effective means of achieving economic integration within the region, as well as between the South Balkan region and neighboring regions.

The Pan-European second Transport Conference held in Crete between March 14 and 16, 1994, designated the East-West Corridor as one of the nine priority transportation corridors of Europe. The Conference Declaration emphasized the need for social market economy and free and fair competition; development of sustainable mobility while respecting environmental protection; compatibility of institutional, regulatory, and administrative frameworks to ensure a coherent transport system across Europe; facilitation of transit at border points; reduction of obstacles and delays; coordination in the planning and financing of trans-European networks and transport infrastructure to ensure interoperability and interconnection; and geographically balanced development between central and peripheral regions.

Recognizing the importance and potential for the East-West Corridor, the governments of Italy, Albania, Macedonia, Bulgaria, and Turkey executed a Memorandum of Understanding (MOU) on February 18, 1994, in Sofia confirming their commitment and willingness to put their efforts together in connecting Durres to Varna and Burgas. The signatories to the MOU noted that this project is of utmost interest and would be a substantial contribution to the development of transport infrastructures in the Black Sea Economic Cooperation Agreement region, the membership of which extends to the Caspian region.

The strategic importance of the East-West Corridor has been reiterated and confirmed in subsequent conferences and bilateral meetings notably, and most recently, the Black Sea Conference in Kiev in May 1997, and the Meeting of the Ministers of Transport for the Development of the Corridor VIII – Asia Transcontinental Link held in the Bulgarian Port of Burgas September 1-3, 1997.

The region's strategic importance must be viewed from the larger context of transport and trade developments within and outside the region. These include the proposed construction of a trans Balkan oil pipeline paralleling the East-West Corridor.

1.5 DEVELOPMENT OF AN INTEGRATED CORRIDOR TRANSPORT PLAN

The economic and strategic significance of the East-West Corridor mandates that a unique approach to its development be adopted. This unique approach departs from the traditional basis of project justification that is demand driven and relies more on the provision of modern well equipped port gateways on the Black and the Adriatic seas connected by transcontinental highway and railway corridors that meet international and European standards.

1.5.1 Objectives of the East-West Corridor Development

The overall objective of the East-West Corridor Plan is the development of a safe, continuous, operationally efficient transport corridor that conforms to the applicable European and international design standards. Such an objective needs to be translated in spatial terms, in physical terms, and in diurnal terms. The specific spatial components of the corridor presented in this report comprise the following:

- The Ports of Burgas and Varna serving as the Black Sea shipping gateways to the corridor
- Northern, central, and southern highway and railroad routes that link the port cities of Varna and Burgas with the city of Sofia
- A main highway and railroad route between the cities of Sofia and Skopje
- A northern and a central highway and railroad routes between the city of Skopje and the Albanian border
- A main highway and railroad route between the Macedonian/Albanian borders and the capital city of Tirana and the port cities of Durres and Vlore
- The Ports of Durres and Vlore serving as the Adriatic Sea shipping gateway to the corridor

In physical terms, the provision of a world class corridor translates into:

- Modern and well-equipped ports that can adequately and efficiently handle all types of commodities, including containerized traffic
- Highway routes that conform to the Trans-European Motorway (TEM) design standards; that are completely access-controlled and with cross-sections that include at least two lanes in each direction and profiles that have a maximum grade of 6 percent or less
- Railroad routes that conform to the International Union of Railroads (UIC) standards for intercontinental trunk lines

In terms of time, three time frames have been designated for the implementation of the improvement program:

- A short-term action time frame that spans the period between 1998 and 2003

- An intermediate-term strategic time frame between 2003 and 2010
- A long-term vision time frame between 2010 and 2020

1.5.2 Technical Approach to Corridor Development

Each transport sector on the East-West Corridor (highways, railroads, and ports) has a unique development history, spatial characteristics, growth potential, competitive advantages and disadvantages, developmental requirements, and financial (financing) requirements (constraints) for operation and capital improvement. As such, a unique and tailored approach has been developed for the identification and development of future improvement requirements for each sector.

Underlying assumptions have been made in this study about how transport demand in the corridor will grow as the economies of Albania, Macedonia, and Bulgaria develop. These assumptions are well rooted in the experience of other European countries. A straight-forward methodology was used to factor traffic demand for highways, and to assume capacity and design improvements needed for railways and the development of ports. The methodology is based on strategic objectives and realistic optimism, regarding the importance of the South Balkan countries in terms of economic potential as stability is sustained in the region, domestically, regionally, and internationally.

The study effort has recognized the simple fact that economic development along the East-West Corridor is interdependent on the strategic and phased improvement to infrastructure, primarily transportation systems. This study outlines the specific transportation improvements to meet immediate capacity needs and long-term "vision" of the corridor over a 20-year time frame. It is consistent with the direction and emphasis placed upon the corridor in other recent independent studies. It comprehensively presents the immediate, strategic, and long-term improvement framework that must be implemented to make the vision a reality.

Following is a summary of the development approach for each sector:

Highways

The following multi-step approach has been formed for the development of highway improvement needs:

1. Identify highway improvement requirements that emanate from capacity constraints in the short-, intermediate-, and long-terms. Improvements accomplished in a specific time frame are carried over to the following time frame.
2. Superimpose on the above, improvements that realize the strategic objectives of the East-West Corridor development in accordance with the justification criteria outlined in Section 2.1.
3. Adjust improvement projects within each time frame to take into consideration on-going national plans, priority designation discussed above, and coordination between the three member countries' plans.

Railroads

The method adopted for the development of the railroad improvement program relies mainly on the realization of the strategic objective of the East-West Corridor; that is to develop an efficient, safe, continuous rail route that conforms to International Union of Railroads (UIC) standards. Railroad improvement projects have been identified in accordance with this strategy.

Ports

Master plans for the improvement and expansion of the ports of Varna, Burgas, and Durres have been recently developed. The Port of Vlore will soon be the subject of a master planning effort for its development as well. The Bechtel team has packaged individual components of these master plans and grouped them for implementation within each of the three identified time frames.

1.5.3 Future Transport Development Time Frame

Implementation of future transport improvement programs along the East-West Corridor has been grouped into one of three time-frames:

1. **A Short-Term Time Frame (1998-2003).** Projects to be implemented within this time frame would have the following characteristics:
   - Relieve obvious capacity bottlenecks within the transport "pipeline" linking the Black Sea ports with the Adriatic Sea ports.
   - Enhance operational safety features of various transport links along the corridor.
   - Put in place important strategic building blocks towards the realization of an efficient, safe, continuous international East-West Transport Corridor.

2. **An Intermediate Term Strategic Time Frame (2003-2010).** Projects selected for implementation within this time frame would have the following characteristics:
   - Complete a primary highway route conforming to international design standards that links the Ports of Varna and Burgas on the Black Sea with the Ports of Durres and Vlore on the Adriatic Sea
   - Provide a continuous rail/highway primary link between the Black and Adriatic seas using intermodal transfers to bridge the missing rail links along the corridor
   - Provide modern container terminals in at least one port on each sea
   - Add strategic building blocks towards realization of the corridor's objectives

3. **A Long-Term Vision Time Frame (2010-2020).** Characteristics of projects slated for implementation within this time frame include:
   - Complete at least one secondary highway route linking the east and west ports of the corridor
   - Provide a primary and continuous railroad link between the two ports on the Black Sea and the two ports on the Adriatic Sea

- Implement full-service, modern, and efficient ports at Varna, Burgas, Durres, and Vlora

1.5.4 Prioritization of East-West Corridor Improvement Projects

The physical conditions of the transport facilities comprising the East-West Corridor vary considerably and are explained in detail in Volume 1 of this report. It is obvious that substantial investment in new improvement projects will be required to bring up these conditions to the levels stipulated in the overall objective of the corridor development. Limited resources however dictate that a measure of prioritization be introduced that can be used to match improvement projects with available resources.

Prioritization in this context addresses allocation of defined and limited resources to one of a number of alternative projects along the East-West Corridor. Bechtel recommends, however, proceeding with master plan development; assessment of technical and financial feasibility for specific projects; and necessary rehabilitation, modernization, and improvement projects for all segments of the Corridor, regardless of priority ranking.

Ideally, project prioritization should be based on detailed analysis of financial viability, economic soundness, functional role in the overall transport infrastructure, and the project's contribution to the achievement of the strategic objectives of the East-West Corridor. The following criteria are presented to help guide the prioritization process:

Financial Viability and Financing

- Projects than can be financed by the private sector
- Projects that can be financed through outright grants from donor countries and organizations
- Projects that can be financed through public/private partnerships without placing any additional claims on the debt capacity of national governments
- Projects that can be financed through user charges.

Economic Soundness

- Projects with positive benefit/cost ratios
- Projects with significant job creation potential
- Projects with significant impacts on economic development

Functional Role in the Transport Network

- Completion of projects currently under way
- Projects that promote traffic safety
- Projects that relieve existing serious capacity bottlenecks.

Contribution to the Corridor's Strategic Objectives

- Projects that help achieve the strategic objectives of the development of the East-West Corridor
- Projects that provide for a continuous uninterrupted corridor
- Projects that link the region with trade partners, particularly in the Middle East and Central Asia

Information available and developed through the course of this study do not permit prioritizing individual projects for each mode of transport and for each of the three member countries. As each group of the recommended projects undergo due diligence, prioritization ought to be addressed, at each country's level, then coordinated through the SBDI Coordinating Group for the three member countries.

Based solely on achieving the strategic objectives of the East-West Corridor, the major facilities and transport links have been prioritized as follows:

First Priority

- The Port of Burgas as the primary Black Sea gateway to the corridor.
- The Port of Durres as the primary Adriatic Sea gateway to the corridor
- The highway and railroad routes that link Varna, Burgas, Orizovo, Kapitan Andreevo, Plovdid, Sofia, Gyueshevo, Kumonovo, Skopje, Kicevo, Ohrid, Kafasan, Elbasan, Tirana, Durres, and Vlore as the primary highway and railroad routes.

Second Priority

- Port of Varna as the second Black Sea gateway to the corridor
- Port of Vlore as the second Adriatic Sea gateway to the corridor.
- The northern highway and railroad routes that directly link Varna with Sofia and the rest of the corridor

Third Priority

- The central highway and railroad routes that link the Port of Burgas with Sofia and the rest of the corridor.

1.6 CORRIDOR IMPROVEMENT PROJECTS

Following is a summary of the major projects recommended for implementation along the East-West Corridor during the short-, intermediate-, and long-term time frames.

1.6.1 Short-Term Projects – 1998-2003

1.6.1.1 Short-Term Highway Projects

Albania

- Construct 4-lane motorways on a separate alignment, parallel to the following highway segments:
  - Durres - Vore (25 km)
  - Tirana - Elbasan (38km)
- Increase capacity by expanding the following segments of 2-lane highways into 4-lane expressways:
  - Durres - Ndog - Tirana (41 km)
- Increase capacity and safety conditions by rehabilitating the following highway segments to meet international standards for 2-lane highways:
  - Durres - Rrogozhine - Elbasan (83 km)
  - Rrogozhine - Fier (49 km)
  - Kafasan - Pogradec (16 km
  - Elbasan - Kafasan (71 km)

Macedonia

- Widen and upgrade existing 2-lane highway into a 4-lane motorway:
  - Skopje - Tetevo (36 km)
- Increase capacity by widening the following segments of 2-lane highways into 4-lane expressways:
  - Pogradec - Ohrid (30 km)
- Upgrade the following highway segment to meet international standards for 2-lane highways:
  - Titov Veles - Prilep (73 km)
- Construct a new standard 2-lane highway at an elevation higher than that of existing alignments:
  - Kriva Palanka - Deve Bair (11 km)

Bulgaria

- Construct 4-lane motorways on a separate alignment, parallel to the following highway segments:
  - Varna - Burgas (87 km)
  - Orizovo - Kapitan Andreevo (108 km)

- Increase capacity by widening the following segment of 2-lane highways into 4-lane expressways:
  - Karnare - Kazanlak (60 km)

1.6.1.2 Short-Term Railway Projects

Albania

- Renew existing track and structures, and implement radio block communication system for the following railway sections:
  - Durres - Rrogozhine - Pogradec (156 km)
  - Rrogozhine - Vlore (86 km)
  - Build a new rail line between Lin and the Macedonian Border (2.6 km)

Macedonia

- Complete the construction of the rail line between Beljakovce and the Bulgarian border (55 km)
- Reconstruct the section of railway between Kumanovo and Beljacovice (31 km)
- Implement radio block communications systems between D. Petrov and Kicevo
- Build a new rail line of approximately 1.4 km to connect with the Albanian Railroad at the border
- Build a TTOFC intermodal terminal at the end of the above new rail line

Bulgaria

- Complete double track on railway sections between Sofia - Radomir (7 km), and between Stara Zagora - Zimnica (61 km)
- Install automatic block signal system between Sindel and Varna (35 km)
- Upgrade track on section of railway between Sofia, Mazdra and Varna (61 km)
- Build a new rail line between Gyueshevo and the Macedonian Border (2.5 km)
- Re-align railway, complete trackwork, install automatic block signal system and electrify line between Plovdiv and Svilengrad (143.8 km)

1.6.1.3 Short-Term Port Projects

Albania

Port of Durres

- Modernize physical facilities – rehabilitate operational areas, and relocate administration buildings

- Improve protection and safety standards – rehabilitate breakwater, re-align and widen access channel
- Construct a new passenger ferry terminal

Port of Vlore

- Develop a comprehensive master plan
- Upgrade and modernize facilities and equipment

Bulgaria

Port of Burgas

- Build and expand Terminal 1 – general and liquid cargoes
- Build and expand Terminal 2 – bulk cargoes
- Build and expand Terminal 3 – ro-ro ferry terminal
- Construct new Terminal 4 – container terminal

Port of Varna

- Consolidate facility capacity into passenger ferry and container terminal operation
- Expand facilities through addition of grains terminal and other improvements
- Upgrade and rehabilitate the Varna breakwater
- Dredge Channel 2 to a depth of 12.5 meters

1.6.2 Intermediate-Term Strategic Projects – 2003-2010

1.6.2.1 Intermediate-Term Highway Projects

Albania

- Construct 4-lane motorways on a separate alignment, parallel to the following highway segments:
  - Durres - Rrogozhine (39 km)
  - Rrogozhine - Kafasan (106 km)
  - Rrogozhine - Vlore (83 km)
  - Kafasan - Pogradec (16 km)

Macedonia

- Construct 4-lane motorways on a separate alignment, parallel to the following highway segments:
  - Gostivar - Podmolje (99 km)

- Podmolje - Pogradec (35 km)
- Kumanovo - Deve Bair (79 km)

- Upgrade the following highway segment to meet international standards for 2-lane highways:
  - Titov Veles - Bulgarian Border (128 km)

Bulgaria

- Construct 4-lane motorways on a separate alignment, parallel to the following highway segment:
  - Burgas - Orizovo (190 km)

1.6.2.2 Intermediate-Term Railway Projects

Albania

- Upgrade signalling system to centralized traffic control system between Durres and Pogradec

Macedonia

- Install automatic block signal and centralized traffic control systems between Komanovo and the Bulgarian border (86 km)
- Install automatic block system between D. Petrov and Kicevo, and extend centralized traffic control system from Skopja to Kicev (86 km)

Bulgaria

- Re-route and re-rail locally between D. Petrov and Kicevo
- Complete double track (7 km) and install centralized traffic control, and automatic block signal systems between Sofia and Radomir
- Install centralized traffic control, and automatic block signal system between Plovdiv and Burgas (290 km)
- Reconstruct and upgrade line, and install centralized traffic control and automatic block signal systems between Gyueshevo and Radomir
- Re-align track, install new rail, and re-space ties between Sofia and Plovdiv
- Continue the project to renew track, electrify line, and install centralized traffic control and automatic block signal systems between Plovdiv and Svilengrad-143.8 km

1.6.2.3 Intermediate-Term Port Projects

Albania

Port of Durres

- Design and construct a new 140 meter quay
- Design and construct a new 670 meter, 11.5 meter deep quay
- Reconstruct navigational channel, to 12.5 meter deep, 60-80 meters wide, and 4.8 km long
- Design and contruct an intermodal container terminal

Port of Vlore

- Implement phased development of the port according to master plan

Bulgaria

Port of Varna

- Build new container terminal at Varna Lake site.

Port of Burgas

- Continue with implementation of master plan

1.6.3 Long-Term Vision Projects – 2010-2020

1.6.3.1 Long-Term Highway Projects

Albania

- Complete motorway construction program started during the intermediate time frame
- Continue with highway upgrading and modernization to meet service requirements

Macedonia

- Construct 4-lane motorway on a separate alignment, parallel to the following highway segment:
  - Ohrid - Titov Veles (187 km)

Bulgaria

- Construct 4-lane motorway on a separate alignment, parallel to the following highway segment:
  - Dupinitza - Macedonian border (55 km)

1.6.3.2 Long-Term Railway Projects

Albania

- Upgrade signalling system to centralized traffic control between Durres and Vlore and between Rrogozhine and Pogradec
- Electrify line between Durres and Lin

Macedonia

- Electrify line between Gyueshevo - Skopje - Kicevo - Kafasan.
- Install centralized traffic control and automatic block signal system between Kumonovo and the Bulgarian border, and between Skopje and Kicevo.
- Construct new line between Kicevo and Kafasan (65 km)

Bulgaria

- Upgrade the remainder of corridor lines to UIC standards

1.6.3.3 Long-Term Port Projects

Albania:

Port of Durres

- Develop commercial opportunities on port properties/services.

Port of Vlore

- Develop commercial opportunities on port properties/services

Bulgaria:

Port of Burgas

- Develop commercial opportunities on port properties/services.

Port of Varna

- Develop commercial opportunities on port properties/services.

1.7 COST ESTIMATE FOR IMMEDIATE ACTION PROJECTS

Order of magnitude cost estimates have been assembled for short term action projects and are presented in Section 7 of this report. Table 1-1 is a summary of these estimates by mode of transport and by country.

Table 1-1
Short-Term Projects
Estimated Cost by Country, Mode, and Total
(Million US$, 1997)

	Highways (US$ M)	Railways (US$ M)	Ports (US$ M)	Total (US$ M)
Albania	456	85	100	641
Macedonia	229	266	-	495
Bulgaria	645	386	421	1,452
Total	**1,330**	**737**	**521**	**2,588**

1.8 FINANCING OPTIONS

Financing options identified for the implementation of the recommended projects include:

- Public financing through the establishment of a transport trust fund or directly through national budget allocation
- Private financing through granting concessions to build, operate, and transfer to the government specific transport facilities
- Public/private partnerships through the formation of special purpose transport authorities, and the institution of shadow tolling schemes, or granting of operating concessions.
- Direct borrowing from international financial institutions, commercial banks, and/or other governments
- Grants from donor countries

The selection of one or more of the above financing options will need to be made for any specific transport project along the East-West Corridor in consideration of the following features:

- Mode of transport and the unique requirements of highways, railways, and ports
- Engineering features which may require special services and equipment
- Financial viability of the project to attract equity partners
- Economic viability to spur business activity in a region
- Strategic significance in serving the broader corridor needs
- Operational performance of existing sector infrastructure

1.9 NEXT IMPLEMENTATION STEPS

The following next steps are recommended for immediate consideration by the SBDI Coordinating Group in order to further the development of the East-West Corridor:

1. Engage a Financial Advisor to develop specific financing proposals for the implementation of the immediate action projects for each of the three member countries.
2. Consider the formation of a public/private transport authority as the vehicle for the implementation of each country's motorway program.
3. Commission the following specific prefeasibility studies:
   - Linkage of Albania and Macedonia railroads and the provision of a TOFFC inter-modal transfer terminal on the Macedonian side
   - Assess Albania's existing transport infrastructure, particularily relating to the connectivity of the Ports of Durres and Vlore to the East-West Corridor
   - Rehabilitation, upgrading, and electrification of the Plovdiv - Svilengrad railway route
   - Prioritization of development projects at the Port of Varna
4. Commission the following specific feasibility studies:
   - Rehabilitation of the Durres - Lin railway (feasibility study underway)
   - Technical and financial feasibility of the Tirana - Elbasan motorway and railroad route
   - Rehabilitating and widening of the highway sections between Durres - Tirana, Durres - Rroghozine, and Rroghozine - Fier to standard 2-lane highways
   - Development of the Port of Burgas Container Port - Terminal No. 4.
5. Commission the following specific master planning studies:
   - Updated master plan for the Port of Durres
   - Development of a new master plan for the Port of Vlore
6. Commission preliminary engineering and final design work for the following projects:
   - Titov Veles - Prelip highway
   - Varna - Burgas motorway
   - Orizovo - Kapitan Andreevo motorway
   - Development of Terminals Nos. 1, 2, and 3 at the Port of Burgas
7. Complete the following construction projects:
   - Rehabilitation of the Durres - Tirana - Elbasan - Kafasan highway
   - Construction of the Kriva Palanka - Deve Bair highway
   - Construction of the Beljacovice - Bulgarian border railway
   - Rehabilitation of the Kumanovo - Beljakovce railway
   - Construction of the Gyueshevo - Macedonian border railway
8. Begin construction on the following projects:

- The Port of Durres rehabilitation and modernization project
- The Port of Durres passenger ferry terminal
- Skopje - Tetevo motorway

1.10 COVERAGE OF VOLUME 1

Volume 1 of the East-West Corridor Feasibility Study summarizes and synthesizes the physical, operational, and institutional conditions of transport routes and terminals comprising the corridor. It is based on a careful review of more than 40 recent documents and reports addressing various elements of the corridor from the planning and engineering viewpoint. A listing of these documents is provided in Appendix A. The report is also based on the Bechtel team's field visits and interviews of transport officials in Bulgaria, Macedonia, and Albania. Transport routes and terminals visited include: the highways connecting Sofia with the ports of Varna and Burgas; the highway connecting Sofia, Skopje, and Ohrid to the Albanian border; railway construction sites between Kumonovo and the Bulgarian border; and the ports of Varna, Burgas, and Durres. Due to the civil unrest in Albania, no site visits were conducted for the highway and rail routes south and east of Tirana.

In addition, the Bechtel team interviewed several of the transportation officials and operators of Bulgaria and Macedonia in the highway, railroad, and port fields. Information was also sought from representatives of other U.S. and international organizations active in the South Balkan region. A listing of those officials and representatives is provided in Appendix B.

1.11 COVERAGE OF VOLUME 2

Volume 2 presents the planning framework for the development of the East-West Corridor, traffic forecasts for all highway routes along that corridor, and the process by which transport improvement projects are identified, selected, and prioritized. This volume also includes an order of magnitude cost estimate for the immediate action (short-term) projects and options for financing them.

Albania, Bulgaria, and Macedonia are strategically located in the Balkan Peninsula in southeast Europe between the Black Sea and the Adriatic. All three have recently emerged from a centrally planned autocratic political system, isolated from the western world either completely (in the case of Albania) or substantially (in the case of Bulgaria and Macedonia). One emerged as an independent state from the remnants of the former Republic of Yugoslavia. All three have suffered financially and have not yet fully recovered from the adverse effects brought about by the U.N. sanctions against Serbia. Along with Hungary and Romania, they make up the five-country Balkan Beltway (BB), part of a U.N. Serbian sanctions initiative intended to relieve the pressure of economic losses to front-line states.

They have all experienced and are still experiencing the endemic problems of transforming their political and economic system into democratic market economies. The democratically elected governments in all three nations have been somewhat successful in implementing structural reforms, including privatization, enterprise, and financial sector reform; creation of a legal framework for a market economy; and encouragement of economic activity by the private sector. Although selected economic indicators for recent years indicate that the downward spiral of the last 7 years has been somewhat arrested, the level of economic activity in all three countries is still significantly lower than the 1989-1990 period. Political unrest in Albania and Bulgaria and the smaller scale banking crisis in Macedonia also reflects the relative instability principally caused by economic and financial problems associated with transition to a market economy.

The importance of an East-West Transport Corridor across the Balkans connecting the Black Sea to the Adriatic has long been recognized as an important undertaking for integrating the economies of the South Balkan region with Europe, Middle East, Caucasus, and Central Asia. The land connection between the Albanian Adriatic coast and western Black Sea shores had been an active trading route during the Roman Empire. Since the break-up of the U.S.S.R. and transition of central and eastern European nations to market-oriented economies, this corridor has been recognized by the European Union as an effective means of achieving economic integration within the region, as well as between the South Balkan region and neighboring regions.

2.1 ALBANIA

2.1.1 Geographical Setting

Albania is located in southeastern Europe, on the Balkan Peninsula between the Adriatic and Ionian seas. It is bordered by Serbia and Montenegro on the north, Macedonia on the east, and Greece on the south. Italy is 100 kilometers (km) to the east across the Adriatic and Ionian Sea.

Albania's total area is 28,750 sq km, slightly larger than Maryland. Its land boundaries are 720 km and its coastline, along the Straits of Otranto, is 362 km long. The country's terrain is mostly mountainous with narrow plains along the rivers and the coast permitting agriculture. Its natural resources include petroleum, natural gas, coal, chromium, copper, timber, and nickel.

The climate of Albania can be characterized as mild temperate with cool, cloudy, and wet winters and hot, clear, and dry summers. Inland areas are cooler and wetter than coastal plains. Some 21 percent of the total area (6,038 sq km) is arable, 70 percent of which (4,230 sq km) is irrigated. Meadows and pastures comprise 15 percent of the total land area and another 38 percent is forests and woodlands.

2.1.2 Socioeconomic Conditions

The estimated mid-1996 population of Albania is 3.25 million with an annual growth rate of 1.34 percent. The average density of the population is about 113 citizens per square kilometer. Birth and death rates are 22.21 and 7.64 per 1,000, respectively. With 49.2 deaths/1,000 live births, Albania has one of the highest infant mortality rates in Europe. The net migration rate is -1.17/1000 which is mainly illegal emigration by boat to Italy across the Adriatic. However, the largest concentrations of Albanians abroad are in neighboring Macedonia with more than 460,000 people (which comprises almost 22 percent of Macedonia's population), and in Serbia with approximately 2 million people.

The ethnic distribution of the population is somewhat homogeneous: ninety percent Albanian, eight percent Greek and two percent other minorities including Vlachs, Gypsies, Serbs, and Bulgarians. Seventy percent of Albanians are Muslim, making Albania the only Muslim nation in Europe. Twenty percent of the population is Greek Orthodox and ten percent Roman Catholic. From 1967 to November 1990 all places of worship were closed and religious observances were prohibited. Public religious practice is now allowed and is widely followed.

2.1.3 History and Recent Political Developments

Today's Albanians, primarily descendants of the ancient Illyrian tribes who settled in the region in the seventh century B.C., are a non-Slavic people with Indo-European roots. Albania became a part of the Ottoman Empire in the 1470s and remained as Ottoman territory until 1912 when the London Conference on the Balkans created an independent Albanian state.

The years between the two World Wars were fraught with internal political instability as a result of regional tensions within the country and foreign influences on domestic politics. In the mid-1920s, the Italian government signed economic and foreign relations treaties with Albania and provided large financial subsidies, ensuring a dominant position for Italy in Albania. In 1939, Italy annexed Albania which was later invaded by Germany when Italy surrendered the territory on September 1943. When the German forces left Tirana in 1944, a brief civil war ensued which led to the formation of a new government with Enver Hoxha as its leader.

Hoxha instituted a government system based on orthodox Marxist ideology and Stalinist practices and allied Albania with the former U.S.S.R. Close Soviet-Albanian relationships disintegrated when Khrushchev departed from strict Stalinist ideology. Albania broke off diplomatic relations with Moscow in the mid-1960s and sided with China in the Sino-Soviet dispute. After the death of Chairman Mao Ze-Dong in 1976, Hoxha severed relations with China in 1978 because of China's overtures to the U.S.

1978 to his death in 1985, the Hoxha regime became increasingly autocratic, asserting extreme isolationist policies and stressing national self-reliance. A total of 700,000 small concrete bunkers (one for every two people) were built all around the country to guard against an ill-perceived foreign invasion. Albania became one of the highest per capita consumers of cement in the world for a few years. Even after Hoxha's death, the country remained totally isolated until the late 1980s, when Hoxha's hand-picked successor President Alia reestablished political and economic relations with Austria, Germany, and Italy. The refugee crisis in the summer of 1990, when Albanians attempted to escape to Italy and Greece, exposed Albania's internal problems to the international community. In early 1991, production began to collapse in both agriculture and industry; consequently, in May 1991, following extensive labor strikes, the Alia government fell. A caretaker government came into power as the economy entered a period of even greater crisis, which was marked by mass destruction of state-owned property, including factories, schools, transport and electrical systems, food warehouses, and hospitals.

After the fall of the previous regime, a complete breakdown of public order occurred. The first fully democratic elections in Albania were held in March 1992, and Dr. Sali Berisha, of the Democratic Party, was elected president. The new government, formed by Prime Minister Aleksander Meksi, launched ambitious political and economic reform programs. The basic aims of the economic reform measures were to stop emerging hyperinflation, to reestablish control over the budget, to privatize agriculture, and to mobilize foreign economic support. The president was reelected in national elections in June 1996. This has provided a degree of political stability. However, the recent breakdown of law and order, caused primarily by the failure of private savings institutions operating a pyramid scheme, forced the president to appoint a caretaker government until new elections were held in late July 1997. Albania's precarious political institutions and the safety of its citizens are being stabilized by a U.N. force headed by Italy.

2.1.4 Transition to Market Economy

Albania, which can be considered an extremely poor country by European standards, has been making the difficult transition to a more open-market economy. A severe depression occurred after the collapse of the previous centrally planned system in 1990, but after large setbacks in 1991 and 1992, the economy started recovering in 1993.

Albania recorded the strongest real GDP growth rate in Europe in 1995. However, the recent banking crisis and breakdown of law and order are expected to reverse the gains of 1993-1996 and result in a flat (if not negative) GDP growth in 1997. (See Figure 2-1.)

Another factor that supported the recovery process has been the stabilization policies, including a strict monetary policy, public sector layoffs, and reduced social services. These actions have improved the government's fiscal situation and reduced inflation in 1995 remittances of some 20 percent of the labor force which works abroad, mostly in Greece and Italy. These remittances make up almost one-third of the overall GDP and help offset the large foreign trade deficit. Foreign assistance and humanitarian aid also supported the recovery from 1993 to 1996. Large segments of the population, especially those living in urban areas, continue to depend on humanitarian aid to meet basic food requirements.

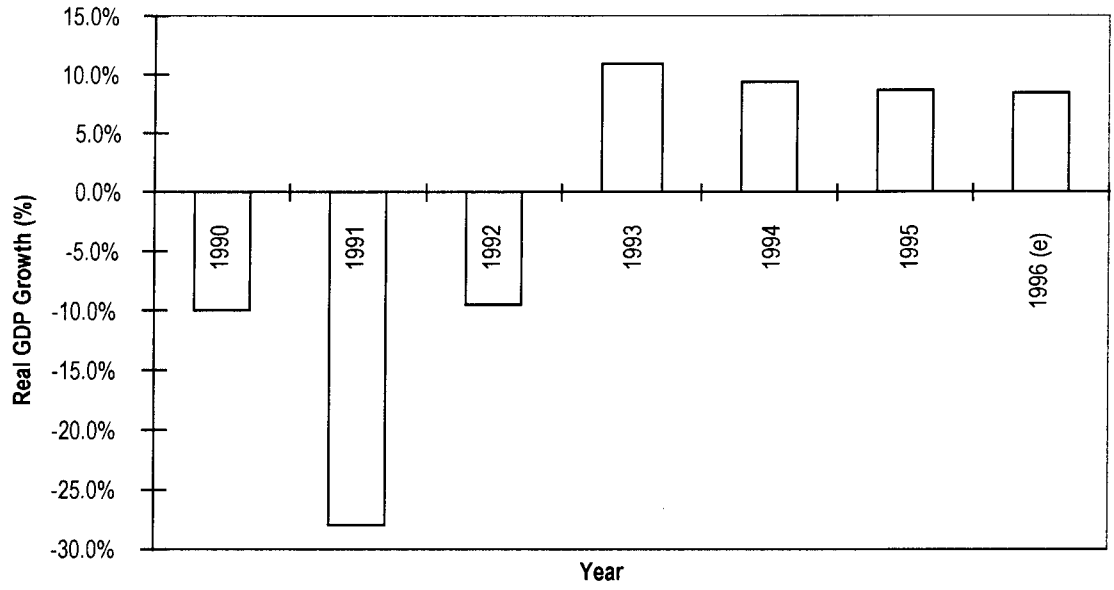


Figure 2-1 Real GDP Growth Rate for Albania

A progressive price liberalization policy helped push the inflation rate in the wrong direction in 1996 (the year-on-year rate rose to 19 percent in October 1996). Wild price rises in 1997 were due to lack of economic controls. More troubling are the growing trade and budget deficits, both of which need to be handled. Basic restructuring has taken place, but the banking sector in particular needs to be restructured. (See Table 2-1 and Figure 2-2.)

The recent advances in stabilization and economic growth are being undermined by the deteriorating infrastructure. Roads, for example, are worse than anywhere else in post-communist Europe, with a third of the population cut off from major markets, because of poor feeder roads; water supply is precarious, interrupting production and affecting public health; hundreds of municipalities cannot be reached by phone and electricity outages are still frequent, especially in the winter.

Table 2-1
Key Economic Indicators for Albania

Description	1989	1990	1991	1992	1993	1994	1995	1996
GDP (billion Leks at current prices)	18.7	16.8	16.5	49.5	113.0	-	-	-
GDP Growth (%)	N/A	-10.0	-28.0	-9.5	11.0	9.4	8.6	8.5
Inflation (%)	N/A	0.0	36.0	225.0	85.0	23.0	8.0	18.0
Unemployment (%)	N/A	N/A	11.1	26.9	17.5	19.2	13.0	11.0
Total Exports (million $)	302.0	231.0	101.0	70.0	84.5	141.0	187.0	270.0
Total Imports (million $)	385.0	381.0	409.0	524.0	411.0	519.0	603.0	850.0
External Debt (million $)	121.0	377.0	606.0	748.0	904.0	771.0	N/A	N/A

Source: 1989-1993 data from Ministry of Finance and Economy, Tirana and International Monetary Fund estimates; 1994-1996 data from Business Central Europe, *The Annual*, December 1996.

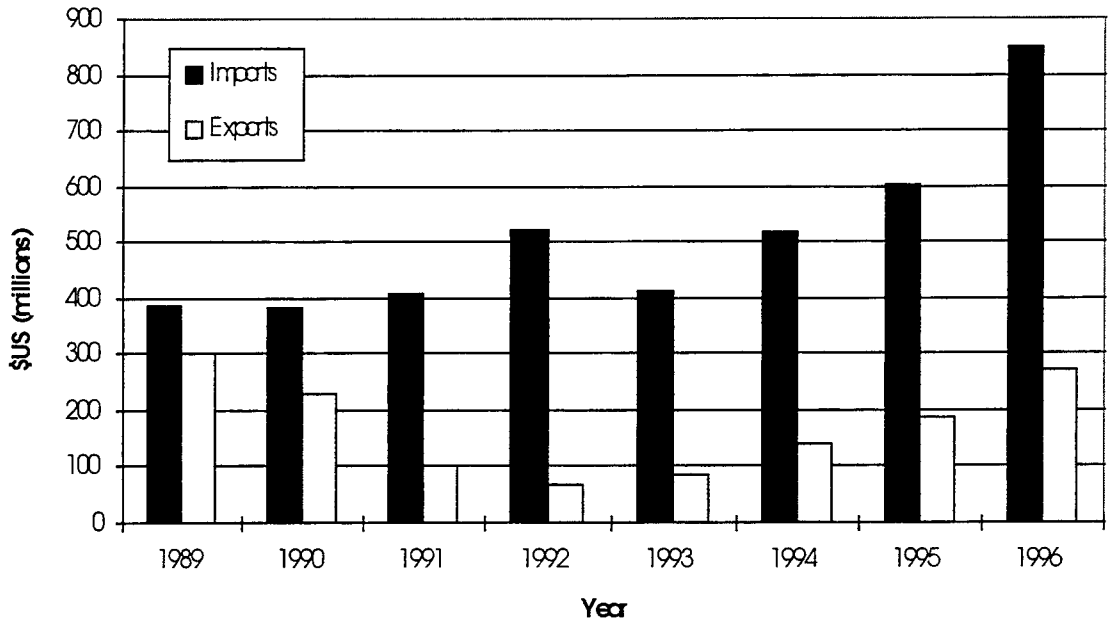


Figure 2-2 Merchandise Trade for Albania

Notwithstanding its very low level of income, Albania has good economic potential. The arable land is rich and fertile; the country is well endowed in mineral and energy resources; the climate and the coastline are ideal for tourism; and wages are a fraction of those in neighboring countries. If concerted international and bilateral assistance continues, Albania could achieve sustained economic growth.

2.1.5 Legal and Regulatory Framework

Albania's regulatory framework may be attractive, but it still lacks organization and open competition. Water supplies, electricity, and transportation networks all need to be improved.

During the transition, President Berisha represented the hope of an end to an intolerable life imposed by the country's former Stalinist dictator, Enver Hoxha, but his commitment to democracy has not been as strong as his party's name suggests. The old secret police, the SHIK, remains as a state within a state; recently, its chairman was appointed as chief of the armed forces. This has been taken as a sign that President Berisha is ready to put down the armed resistance ruthlessly. Interior Ministry forces and SHIK units have also been merged in an attempt to restore order. Also, attempts to control the local media indicate that the freedom of the press will be restricted.

A recent development in Albania's political arena is the general disappointment and anger of the people against the government for not taking action against the deceitful pyramid investment schemes, which resulted in the loss of many people's life savings. However, the demonstrations, which began as protests, took on a much more political hue causing widespread disruption of law and order, rummaging of military arms and ammunition depots, and necessitating a U.N. force to stabilize the country's political, social, and economic institutions. Many regard the schemes as having funded President Berisha's election campaign. Mr. Aleksander Meksi was accused of profiteering from the Bosnian war and funding some of the schemes, he has been deposed.

2.2 MACEDONIA

2.2.1 Geographical Setting

The Republic of Macedonia is located in the southern Balkan Peninsula. With a completely landlocked total surface area of 25,713 sq km, it is slightly larger than Vermont. The country is bordered by Bulgaria in the east, Greece in the south, Albania in the west, and former Yugoslavia (Serbia) in the north. Mostly a country of hills and mountains, Macedonia has a continental Mediterranean climate characterized by long, dry and hot summers and short, cold, and wet winters. The Vardar River divides the country along the north-south axis into two roughly equal parts. In spite of its small size, Macedonia is richly endowed with ores and minerals, principally lead-zinc, copper, iron, chromium, nickel, antimony, manganese, and gold. Twenty-seven percent of the country's area is arable land. Pastures occupy approximately an equal area and forests cover about 35 percent of the territory.

2.2.2 Socioeconomic Conditions

Macedonia's mid-1996 population was 2.1 million with an annual growth rate of 0.46 percent. Skopje, Macedonia's capital, is the largest city with a population of 564,000. About 58 percent of the people live in cities. After Skopje, other large cities are Bitola (85,000), Kumanovo (70,000), Prilep (70,000), Tetovo (51,000), and Ohrid (43,000).

The ethnic diversity of the population is composed of 65.3 percent Macedonians, 21.7 percent Albanians, 3.8 percent Turks, 2.5 percent Romanians, 2.2 percent Serbs, and 4.5 percent other minorities. Some 67 percent of Macedonians are Christian Orthodox and 30 percent Muslim. Almost half the population is under 30 years old.

2.2.3 History and Recent Political Developments

The name of Macedonia was permanently established at the time of Alexander the Great (of Macedon). Following the collapse of Alexander's Empire, Macedonia fell under the rule of Romans, Bulgarians, Greeks, Byzantines, and Ottoman Turks. At the end of World War II, Macedonia won the status of state in the form of a constituent Republic of Yugoslavia.

In a referendum held on September 8, 1991, Macedonia became a sovereign and independent republic. On November 17, 1991, a new constitution was adopted confirming the results of the referendum and establishing a democratic state. The principles adopted by the 1991 constitution establish division of political powers into legislative, executive, and judicial; political pluralism and free elections; legal protection of private property; freedom of the market and entrepreneurship; and respect for standards of international law. On April 8, 1993, Macedonia became a member of the U.N. Macedonia is also a member of EBRD, IBRD, and IMF.

The major source of political tension is the question of the minority rights for the Albanian population. Nevertheless, the Social Democratic Party (SDP) is managing to govern with the support of the main ethnic Albanian political force, the Party of Democratic Prosperity.

2.2.4 Transition to Market Economy

Macedonia, although the poorest among the six republics of the dissolved Yugoslav Federation, can meet basic food and energy needs through its own agricultural and coal resources. It will, however, move down toward bare subsistence levels unless economic ties are enlarged with its neighbors and unless the Serbian-Bosnian conflict is resolved.

After independence, the new government quickly adopted a program of political and economic reform aimed at creating a western-style democracy with a liberal market economy. Since then, Macedonia has made considerable advances towards these objectives despite very difficult economic and political circumstances.

From the start, Macedonia had to cope with a difficult economic transformation. The break-up of the former Yugoslavia, the U.N. sanctions on Serbia, and a Greek embargo imposed on Macedonia (in a dispute over the country's name) deprived it of over 60 percent of its former markets and suppliers. The economic isolation of Macedonia in 1992 came at a really bad time, just when the economy was undergoing a tremendous change from a centrally planned to a market-oriented economy.

This process of transition had the same effects in Macedonia as in other central and eastern European economies: high unemployment, rampant inflation, shortage of foreign reserves to support critical imports, large budget deficits, and low productivity. Additional economic dislocation was generated not only by the reforms but also by the general slowdown in trade with the eastern European countries. Macedonia was also deprived of needed European Union technical and financial assistance because of its dispute with Greece.

In 1994, Macedonia began to move forward with privatization and banking reforms. A severe financial austerity program stabilized the Macedonian Denar and brought inflation down to low double digits. In early 1995, the government began restructuring and privatizing its largest socially owned industries. New foreign investment, revenue collection, and banking laws were also introduced to try to stimulate new economic growth.

With the end of the Greek embargo in October 1995, and with the suspension of the U.N. sanctions on Serbia in late November 1995, stronger prospects for an economic upturn were observed in the first quarter of 1996. Figures 2-3 and 2-4 and Table 2-2 provide quantitative and diagrammatic information on GDP growth, inflation rate, and export/import volume.

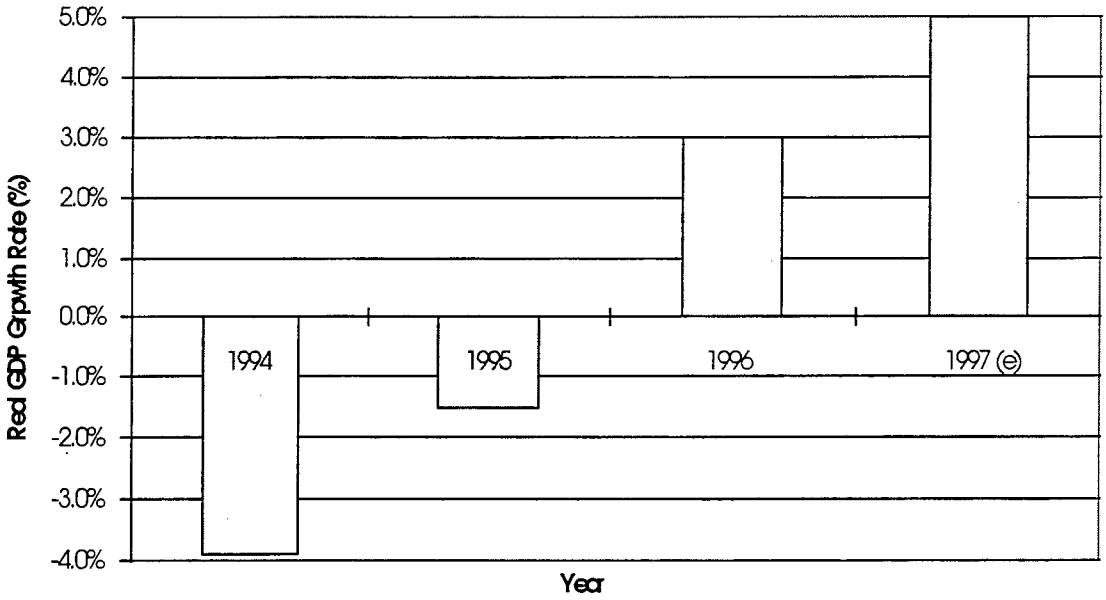


Figure 2-3 Real GDP Growth Rate (%) - Macedonia

Table 2-2
Key Economic Indicators - Macedonia

Description	1994	1995	1996 (e)	1997 (p)
GDP Growth (%)	-3.9	-1.5	3.0	5.0
Inflation (%)	122	16	3	3
Exports ($ mil)	1,086	1,205	900	N/A
Imports ($ mil)	1,272	1,437	1,600	N/A

Source: Business Central Europe, *The Annual 1996/97*, December 1996.

Macedonia's geographic isolation, relatively small market size, and potential political instability, mainly due to the problems in the neighboring north, are offset by the country's strategic location, natural resources, and a keen interest in foreign investment.

2.2.5 Legal and Regulatory Framework

Macedonia has made considerable progress in structural reform. The country is in the process of privatizing its socially owned capital, rehabilitating its banks, and restructuring its 25 largest loss-making companies.

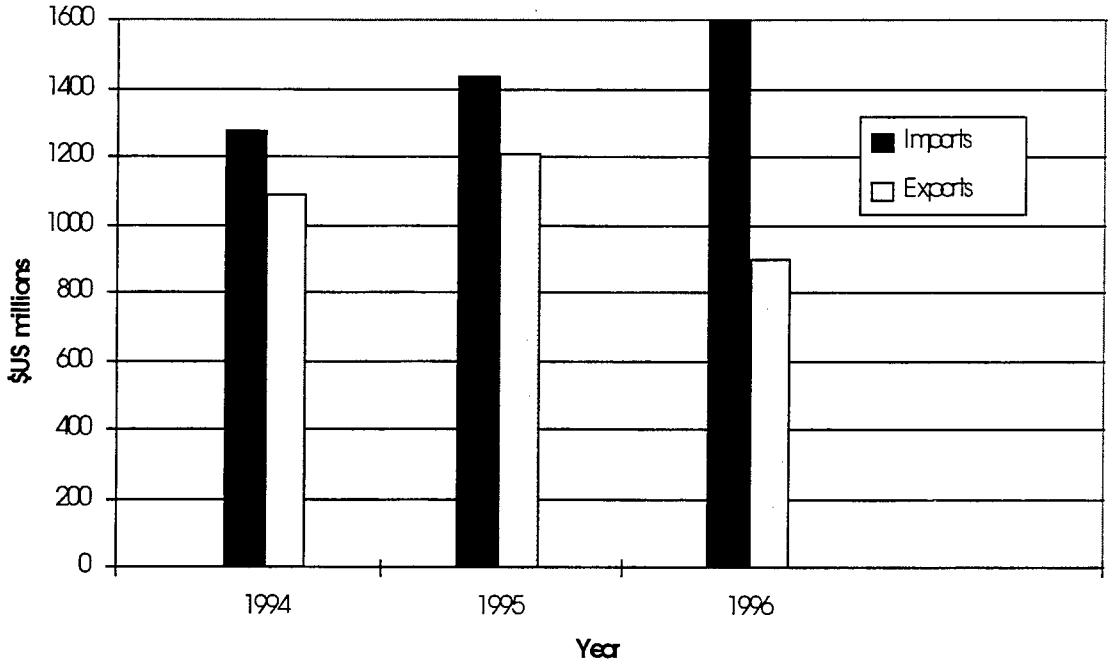


Figure 2-4 Merchandise Trade - Macedonia

The underlying philosophy of the Macedonian privatization process is that it is not intended to be an end in itself, but rather part of the process towards, and part of the mechanism for an increasingly efficient economy. Emanating from this central rationale are several consequent benefits including the following:

- More stable evolution of the economy
- Development of a capital market
- Attraction of foreign capital
- Enhanced credibility for the total reform program

The privatization process involves approximately 1,200 enterprises. Most are defined as small (usually fewer than 50 employees), but there are also approximately 300 medium-sized (fewer than 250 employees) and 115 large (more than 250) enterprises.

Macedonia seems to have had a well-planned privatization process and was progressing as well as could be expected under the pressure of two trade embargoes until mid-October 1995, and the general perception that the former Yugoslav republics are a dangerous place in which to invest.

However, there has been little success in attracting foreign investors so far. Two medium-size companies were bought by long-standing foreign partners – a textile company and a wood-processing firm. Other foreign buyers have so far been scarce. This has had the effect of lowering the price companies can bring in the market and helping to increase worker perceptions of unfairness. As in most former socialist countries, the former elite is taking the leadership as the new capitalists running the economy.

2.3 BULGARIA

2.3.1 Geographical Setting

Bulgaria, located on the Balkan Peninsula, extends from the western shore of the Black Sea to Serbia and Macedonia in the west. In the north, the Danube River forms the greater part of Bulgaria's common boundary with Romania. Greece and Thrace (European Turkey) lie to the south and southeast. The total territory of the country is 110,100 sq km, about the size of Ohio, divided into 9 regions comprising 280 municipalities.

The country is divided roughly into three parallel East-West zones: the Danubian tableland in the north, the Stara Planina (Balkan) Mountains in the center, and the Thracian Plain and Rhodope and Pirin Mountains in the south and southwest. About 75 percent of the country's territory is occupied by lowlands and the remaining area by hills and mountains. The average elevation is 480 meters above sea level. Nearly 29 percent of the area is forests.

Bulgaria's climate is moderate continental with dry, hot summers and cold, wet winters. The weather varies considerably from year-to-year. However, the varied landscape and climate favor development of summer, as well as winter resorts.

2.3.2 Socioeconomic Conditions

Bulgaria's population was 8.38 million in December 1995, with an annual growth rate of 0.46 percent. The largest city is Sofia, the capital, which has a population of 1.1 million. Other large cities are Plovdiv (346,000 residents) in the central plains; Varna (304,000) and Burgas (200,000) on the Black Sea; and Ruse (169,000) at the Romanian border in the north central region.

The largest ethnic group is Bulgarian with 85.3 percent of the population. Other ethnic groups are as follows: Turks make up 8.5 percent of the population, Gypsies 2.6 percent, Macedonians 2.5 percent, and others, including, Armenians, Jews, and Greeks about 1.1 percent. The largest religious community is Christian Orthodox (86 percent), followed by Muslims (13 percent), Jews, Catholics, and Protestants.

2.3.3 History and Recent Political Developments

Bulgaria was established as a kingdom in 681 A.D. The Ottoman Empire ruled Bulgaria for about 500 years, from 1396 until 1878. A fully independent Bulgarian Kingdom was proclaimed in 1908. It existed until 1944 when, at the end of World War II, during which Bulgaria was allied with Germany, a Communist-dominated coalition seized power. The Bulgarian Communist Party ruled Bulgaria as a single party for 47 years. In 1991, the Parliamentary elections, held under the newly adopted democratic constitution, resulted in a victory for the Democratic Party, which was followed by the Bulgarian Socialist Party, the successor to the former Communist Party. For a 20-month period (from February 1993 to September 1994), a nonpartisan coalition, headed by Prime Minister Lyuben Berov,

introduced a number of reform packages aimed at Bulgaria's foreign debt, privatization, tax reform, and other measures for transition to a market economy.

1996 was an interesting year for Bulgaria's post-Communist history. Since the 1994 elections, the Bulgarian Socialist Party (BSP) had full control of the government and the parliament. However, in November 1996, Peter Stoyanov of the Union of the Democratic Forces was elected as the president of Bulgaria. Although the president does not possess executive powers, these elections were adequate to heat up the political arena, as discontent within the BSP had come to a head. As a result of mass protests against the BSP's dominance of the political arena, the general elections were moved to April 19, 1997, from 1998. The April 1997 elections resulted in a decisive victory for the Democratic Party, which is scheduled to form a new government in the upcoming months.

2.3.4 Transition to Market Economy

At the end of World War II, Bulgaria was among the least industrialized European countries. In 1948, only 18 percent of the work force was employed outside the agricultural sector. During the Communist regime, the government aggressively pursued a policy of rapid industrialization so that by 1989, about 80 percent of the work force was employed in non-agricultural sectors. The dominant sector of the economy in 1989 was industry which accounted for 70 percent of output, 59 percent of net material product, 63 percent of total investment, and 37 percent of employment.

Since 1989, Bulgaria suffered from the same effects of transition to market economy as the rest of the former CMEA nations. High inflation and budgetary deficits, rapid erosion of foreign exchange earnings due to dislocation of traditional export markets, low productivity, and high unemployment resulted in a shrinking economy. (See Figure 2-5.)

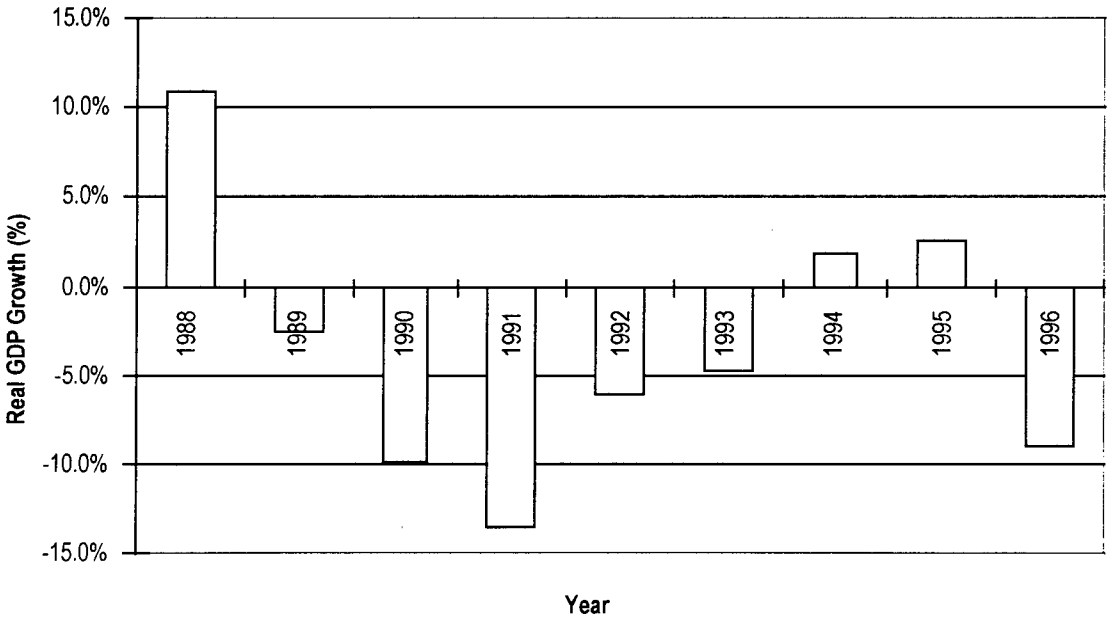


Figure 2-5 Real GDP Growth Rate – Bulgaria

After several years of negative growth, the economy finally started to recover and a modest, but positive GDP growth was achieved in 1994 and 1995. In 1995, GDP rose a moderate 2.6 percent; inflation was down considerably; and unemployment fell from 12.8 percent to 10.5 percent (see Table 2-3).

Table 2-3
Key Economic Indicators - Bulgaria

Description	1988	1989	1990	1991	1992	1993	1994	1995	1996 (p)
GDP ($ billion)	23.0	21.7	20.7	10.6	10.5	10.4	10.9	11.2	12.0
GDP Growth Rate (%)	10.9	-2.5	-9.9	-13.5	-6.1	-4.7	1.8	2.6	-9.0
Foreign Debt ($ billion)	8.9	10.1	10.9	11.9	12.2	12.2	10.5	9.5	9.7

Source: Business Central Europe, ***The Annual 1996/97***, December 1996; National Institute of Statistics; Bulgarian National Bank; International Monetary Fund; and U.S. Embassy, Sofia.

Despite this progress, structural reforms necessary to underpin macroeconomics stabilization were not pursued vigorously. Mass privatization of state-owned industry continued to move slowly although privatization of small-scale industry, particularly in the retail and service sectors, accelerated. However, the economic growth was unable to maintain its momentum in 1996. Major problems that the Bulgarian economy faced in 1996 were high inflation, depreciation of the national currency, and a large decrease in trade revenues. These factors combined resulted in a negative GDP growth rate of 9 percent in 1996. Economic and political uncertainties resulted in triple-digit inflation in the first quarter of 1997.

Exports and imports make up a major portion of the Bulgarian GDP (about 40 percent each). As a matter of fact, the industrial and economic growth achieved during 1994 and 1995 was mostly export-led. However, Bulgaria was unable to keep up its exports as it lost most of its foreign markets, such as the former CMEA countries. The major industries affected by the loss of export markets were the machinery, electrical, and electronics manufacturers. These industries are highly export-oriented, so a downward trend in these industries resulted in an increase in unemployment and, more important, a considerable decrease in foreign currency earnings. Tables 2-4 and 2-5 and Figure 2-6 provide quantitative and diagrammatic information on key trade indices.

Table 2-4
Key Trade Statistics (US$ billion) - Bulgaria

Description	1988	1989	1990	1991	1992	1993	1994	1995	1996
Exports	9.3	8.3	6.1	3.7	3.8	3.5	3.9	5.1	4.5
Imports	9.9	8.9	7.4	3.8	4.2	4.3	3.9	4.7	4.0
Annual Change (%):									
Exports	N/A	-10.8	-26.5	-39.3	2.7	-7.9	11.4	30.8	-11.9
Imports	N/A	-10.1	-16.9	-48.6	10.5	2.4	-9.3	15.4	-14.9

Source: Council of Ministers, Foreign Investment Commission; Sofia, Bulgaria; Bulgarian National Bank; and U.S. Embassy.

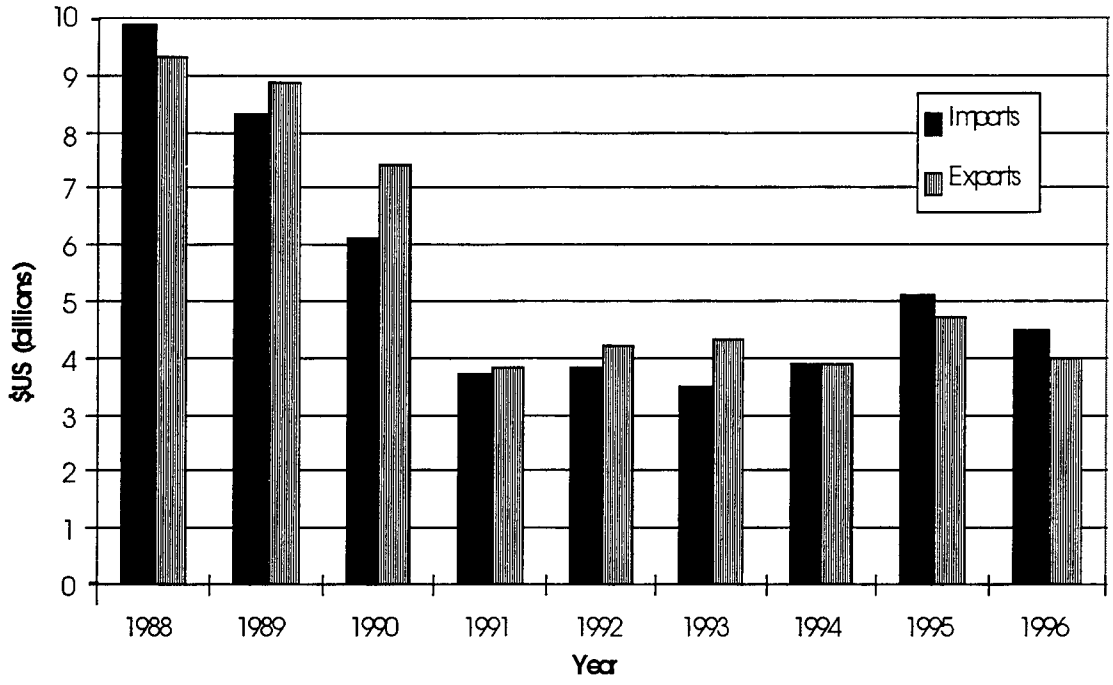


Figure 2-6 Merchandise Trade ($US million) - Bulgaria

Before 1989, most of the Bulgarian export activity, accounting for 83 percent, was with the former Republics of the Soviet Union. With the economic liberalization, however, Bulgaria's exports to these countries decreased. However, Bulgaria has diversified its trading partners. Now the country exports 46.7 percent to Western Europe.

Table 2-5
Bulgaria's Foreign Trade Partners, 1995

Exports	Share (%)	Imports	Share (%)
CIS	17.0	CIS	33.1
Russia	10.1	Russia	28.2
Germany	8.5	Germany	12.6
Macedonia	8.3	Italy	5.9
Italy	8.2	Greece	4.7
Turkey	7.3	Ukraine	3.4
Greece	6.9	Macedonia	3.4
Ukraine	3.6	Austria	2.8
United States	3.0	France	2.8
France	2.8	United Kingdom	2.5

Source: Republic of Bulgaria and Japan International Cooperation Agency, ***The Master Plan Study for Long Term Management of Bulgarian Railways, Progress Report***, March 1997.

2.3.5 Legal and Regulatory Framework

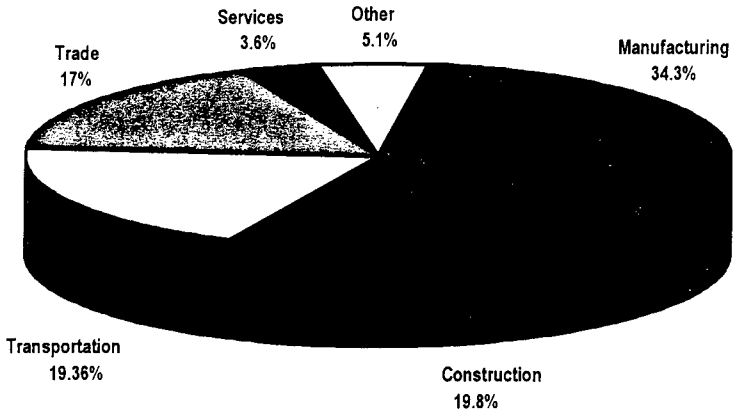
Bulgaria's trade regime was liberalized in early 1991, when most import restrictions were dismantled and the number of items requiring import licenses was greatly reduced. Bulgaria reduced duties shortly thereafter with the introduction of a new tariff nomenclature. Bulgaria is currently engaged in negotiations to accede to the World Trade Organization. Its accession to the World Trade Organization should lead to even greater market liberalization following a transition period.

Currently, there are no restrictions on foreign direct investment except for acquisition of land in Bulgaria. Direct foreign investment in Bulgaria increased rapidly from 1991 to 1994. Due to economic uncertainties, foreign investment decreased to $50 million in 1995. Total foreign direct investment by September 1996 was $718 million, which is almost 50 times more than when compared to 1991. See Table 2-6 and Figure 2-7 for level of foreign investment by country and by economic sector, respectively.

Table 2-6
Foreign Direct Investment by Country (1995)

Country	Investment ($ Million)	Share (%)
Germany	202.9	39
Switzerland	39.8	8
Greece	36.4	7
Belgium	35.7	7
Netherlands	31.2	6
USA	29.7	6
Austria	25.7	5
UK	23.4	5
CIS	13.2	3
Others	76.4	15
Total	514.3	100

Source: U.S. Department of Commerce, *Country Commercial Guide*



Source: Foreign Direct Investment by Market Sector, 1995

Figure 2-7 Foreign Direct Investment by Sector, 1995

2.4 RECENT REGIONAL DEVELOPMENTS AND TRENDS

The East-West Transport Corridor (both rail and road) recently became an important regional potential because of a number of developments both within and outside the Balkan region. An overview of regional developments follows.

- In 1992, Albania, an extremely isolated nation in the past, repealed the law which forbade movements of transit cargo across its territory. This allowed movements of traffic along the East-West Corridor to/from Macedonia and increased the prospects for the Port of Durres to grow from a port serving domestic needs of Albania to an international port whose hinterland reaches points in Macedonia and beyond.
- The Bosnia-Serbia-Croatia conflict in former Yugoslavia has seriously disrupted freight movements across their territory to central and eastern Europe. The Greek blockade of Macedonia restricted access to the Aegean Sea and significantly reduced the traffic along the North-South axis in Macedonia. As a result, traffic along the East-West axis increased substantially, reaching a record 600 tanker trucks per day across the Bulgarian-Macedonian border for crude oil shipments alone to the refinery in Skopje.
- Since the abatement of Serbian hostilities in Bosnia and removal of the Greek blockade against Macedonia, traffic along the North-South axis has gradually increased. Despite these positive developments, the Macedonian government has maintained its resolve to construct a new rail link to Bulgaria and has already spent in excess of $100 million from its limited financial resources in civil works. It appears that construction of this link, which is considered vital for national security and afforded a high priority by the Government of Macedonia, will continue with or without foreign financial assistance.
- The Turkish Government, concerned about safety issues associated with increased maritime traffic along the Bosphorus, announced its resolve to limit such traffic in the future, thus forcing Black Sea trades to alternative routes. In 1995, maritime traffic in the Bosphorus reached an all-time record of more than 60,000 vessels, almost twice the traffic across the Panama Canal. New Turkish government rules that went into effect on July 1, 1994, allow passage through the Bosphorous and

Dardanelles for large vessels only during daylight and require 24-hour advance notification before making the transit. On November 25, 1994, the Russian government claimed that during the 4-month period after the new rules became effective, as many as 249 Russian vessels were detained, and this resulted in substantial losses to ship owners and shippers. The Russian government complained to the United Nations that these rules are a violation of the Montreaux Convention. Despite these pressures to relax the rules of passage, the Turkish Government is determined to restrict vessel traffic along the straits due to safety and environmental concerns affecting one of the most populous metropolitan areas of the world. The already congested Turkish straits will become serious bottlenecks in the future forcing the Black Sea waterborne trades to search for alternative routes. One such project is a pipeline link between Burgas and the Greek Aegean port of Alexandropolis to transport Russian oil. Discussions on this project between the Greek and Bulgarian governments, which were tabled during the recent political crisis in Bulgaria, were resumed during Bulgarian Foreign Minister Stoyan Stalev's visit to Athens in the last week of April 1997.

Extra-Regional Developments

Developments that are taking place in areas which seem remotely connected to the Balkans are also affecting the importance of the East-West Transport Corridor.

- Delegates of both Azerbaijan and Armenia, two warring nations of the Caucasus, in the TRACECA Conference held in Brussels in May 1993, accepted the importance of the Trans-Caucus railroad and declared their willingness to work together to complete its construction.
- Sea-Land Services recently completed a new container terminal and started a container feeder service to/from Poti in Georgia. With similar container service to Varna, Bulgaria, and Illichivsk, Ukraine Sea-Land is becoming an active container line in the Black Sea. An inland intermodal terminal is under construction in Tbilisi to serve as a staging area supporting the Poti operations. Sea-Land's Georgian partner, Trans-Caucus Forwarder, already has operations in Baku, Yerevan, and other cities in the Caspian region. The company is also evaluating the feasibility of inland terminals in Sofia and Skopje under two separate TDA grants. Sea-Land's newly established regional offices in Almaty and Tashkent represent the company's strategic interest in serving Central Asian customers through the Caspian Sea-Caucasus-Black Sea-East-West Corridor intermodal transport routes.
- In 1995 Turkmenistan completed the last 20 km rail link from Tedzhen to Serakhs on the Iranian border. In September 1996, Iran completed a new 50 km rail alignment from the border to Meshed. With the completion of these new rail links, a continuous rail link between China and Western Europe through south of the Caspian Sea is made possible for the first time in history. The current alignment between the Russian gauge Turkmen Railways and the Iranian standard gauge is handled through costly and time-consuming wagon unloading and loading operations. However, with the completion of the intergauge transfer station currently under construction by Mitsubishi in Serakhs, this rail link is expected to be actively used for all rail shipments via Turkey and the Balkans.

- Under a recent TDA grant, Turkmenistan completed a feasibility study in 1996 to modernize port facilities in Turkmenbashi (Graznovodsk), the largest port in the eastern Caspian. The Turkmenbashi port modernization project currently under EBRD evaluation for funding is intended to establish intermodal container service between Central Asia and Europe through the existing rail car ferry service to Baku, Azerbaijan and TTOFC service between Baku and the Georgian ports of Poti and Batumi or Russian and Ukrainian ports in the Black Sea. Before the break-up of the Soviet Union, rail car ferry service across the Caspian was quite active with as many as 19 sailings per week between Baku and Graznovodsk. Due to lack of traffic the service was reduced to as low as one or two sailings per week in 1994. The Baku-based Caspian Shipping Company, which ended up with the bulk of the USSR Caspian ro/ro rail car ferry fleet of 21 vessels, is poised to resume service when traffic recovers.
- The newly independent states of the former U.S.S.R. in the Caucuses and Central Asia are all interested in breaking away from their economic dependence on Russia and establishing new ties with the West. It is no longer attractive for these nations to trade with the ruble zone (CIS) and the West is where hard (convertible) currency can be earned to pay for critical imports needed for economic development. The Central Asian transport networks of the past which resembled a cul-de-sac are now under serious evaluation to move away from the North and reach new markets in the West via alternative routes. Kazakhstan completed its rail alignment with China in 1993 by opening its new line at Druzhba. The Russian and Chinese gauge rail transfer capability at Druzhba, which was limited to one million tons annually, has been increased to 5 million tons in 1996 by opening a new intergauge transfer facility in Ala Shankou on the Chinese side of the border.
- The Romanian National Railways (SNCFR) took over the ownership of two rail/truck ferries (*m/s Eforie* and *Mangalia*) in 1995 and after repairs started limited ro/ro service between Samsun, Turkey, and Constantza. SNCFR and the Turkish Railways have agreed to cooperate in the development and operation of this service. The 22,500 DWT twin diesel-powered vessels can carry up to 108 wagons or 76 truck-trailers on three decks. Pending on-shore improvements principally in Samsun and traffic to be developed along the new Serakhs-Meshed alignment between Turkmenistan and Iran, SNCFR is poised to become an active player in intermodal rail-water and road-water traffic in the Black Sea region.

European Interest

The MOU acknowledges the necessity for further cooperation between the five countries in the following areas:

- Study the regional, infrastructural, environmental, social, and economic problems and related transport needs
- Develop prospective users of the existing transport infrastructure and encourage construction of the corridor
- Study future transport needs by taking into consideration the flow of goods and passengers between the territories of Bulgaria, Albania, and Macedonia as well as

those which might be directed to/from Europe through Italy towards Turkey, the Near and Middle East, as well as Ukraine, Russia, Caucasian, and other CIS Republics

- Explore forms and sources of financing for the project in the respective stages of its implementation, i.e., feasibility, design, construction, and operation

The signatories agreed to establish a permanent coordinating office in Sofia, which was recently accomplished.

Establishing new economic links with the West poses challenges caused by geography, and these challenges must be overcome. Large bodies of water such as the Caspian and the Black Sea are natural barriers that must be overcome to reach the West from Central Asia. One way to accomplish this is to go around the barrier (which is what is taking place by building the new rail link from Turkmenistan to Iran). Another way is to traverse the water by vessel. This alternative is less costly than the all-overland routes because of two main reasons: first, water transport is generally less circuitous (i.e., more direct), second, because it utilizes the principle of buoyancy (flotation), it is less costly than fighting against friction caused by gravity. Therefore, transport by water is almost always cheaper than overland modes of transport per unit distance. However, shipments by water almost always involve intermodal transport by rail or truck. This is the type of intermodal shipping intended between Central Asia and Europe via the East-West Transport Corridor. Figure 2-8 depicts the regional and international connections to and from the East-West Corridor.

Rail-truck ferry service across the Caspian and Black Sea has been extensively used in the past. It is still being used and plans are underway to expand it in both inland seas. Intermodal rail-water shipments between Central Asia and Caucuses on one hand, and Europe, North Africa, and even North America, on the other, will be the most preferred shipping alternative in the future.

The East-West Transport Corridor across the Balkan region will be one of the key routes in this shipping pattern. When cargo-handling facilities are in place at the ports on the two ends of the corridor (Durres on the Adriatic and Burgas and Varna on the Black Sea), and when overland facilities are improved, fast general cargo and container ships which prefer calling at very few ports and operate on a quick port turn-around schedule will favor calling at an Adriatic port rather than taking the more circuitous and time-consuming route of reaching the Black Sea ports through the Aegean, Dardanelles, and Bosphorus. Therefore, on trade routes along the East-West axis intermodal transport operations between the Black Sea and Adriatic ports would favor using the East-West Transport Corridor.

A second, less obvious potential of the East-West Corridor is in the Far East, Western, and Central Europe trade routes via the Suez Canal. Especially for Central European markets, an intermodal routing through a Black Sea port such as Burgas would be less costly than the current routing through the southern Mediterranean or western European ports. The feasibility of this type of routing via Constantza and Burgas is being studied by the Japanese.

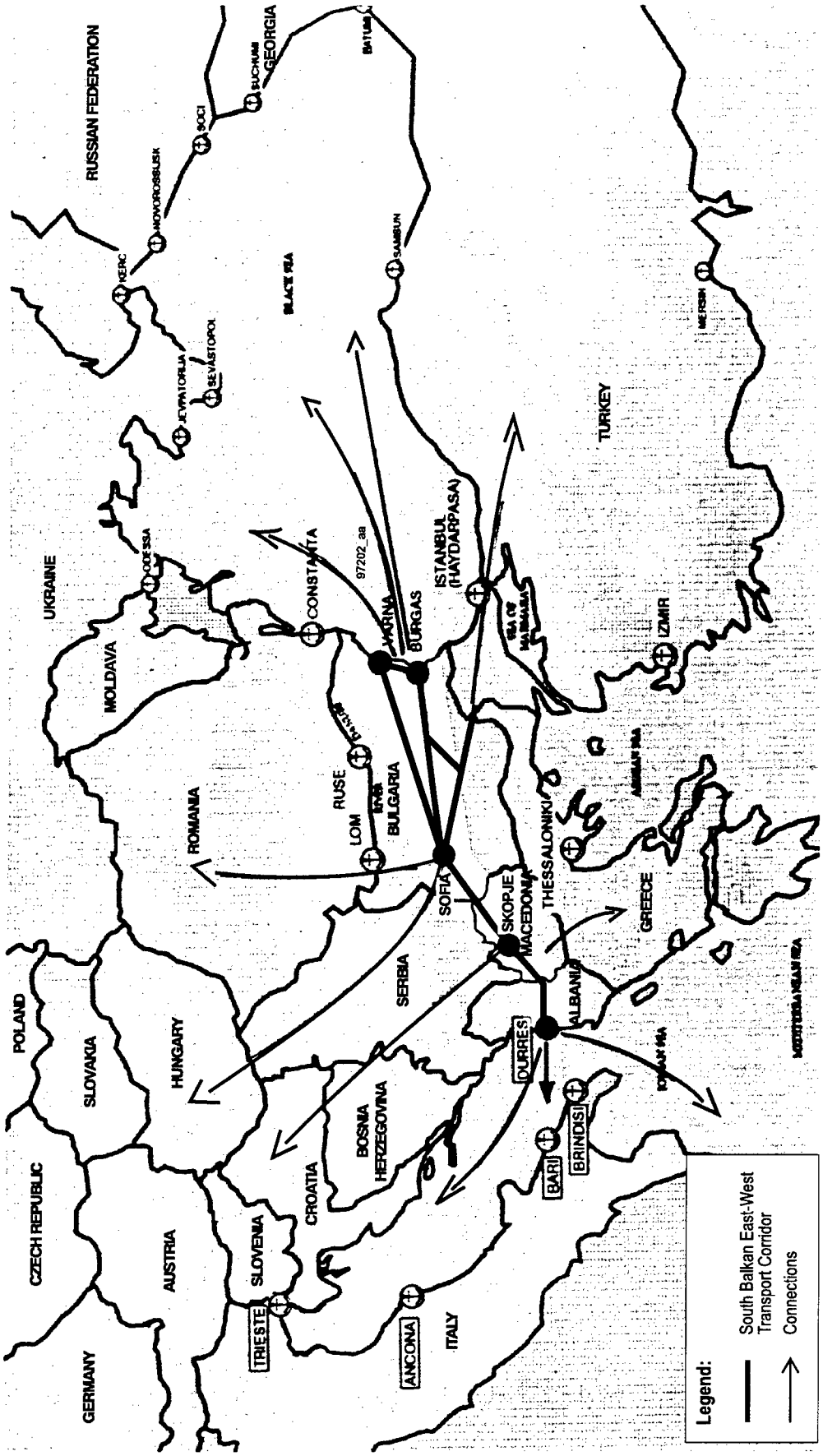


Figure 2-8 Regional and International Connections of the East-West Transport Corridor

3.1 PHYSICAL CHARACTERISTICS

3.1.1 Roads

This section is an overall perspective of the national road network for Albania, Macedonia, and Bulgaria with emphasis on a more detailed description of the current conditions in the East-West Corridor. "East-West," of course also implies "West-East." In the discussion that follows, all route descriptions are based on west-to-east travel even though the term "east-west" may be used.

3.1.1.1 Albanian Roads (Physical Charachteristics)

There is little readily available information about Albania's highway system. A review of probable sources produced two past reports: *Study of the Future Role of Albanian Railways* for the World Bank (no date given) and *Road and Railway Transport Corridor West - East* prepared in January 1995 for the Republics of Albania, Macedonia, and Bulgaria. Both reports indicate that Albania's road system is in a serious state of neglect. It is apparent from these two reports and discussions held with people who have been there recently, that the Albanian road system has had little, if any, upgrading or maintenance for quite some time. As a result, the outdated, overworked system is deteriorating.

As depicted in Table 3-1, Albania's road network of 18,000 km consists primarily of local roads, maintained by district authorities or belonging to private enterprises such as mining firms. Major roads, 2,900 km of paved and 4,900 km of unpaved, are administered by the Ministry of Transport, Trade, and Tourism. Approximately 400 villages, with a population of 1.4 million, are inaccessible by motor vehicles for at least part of the year. The network was not originally constructed to a high technical specification, and the deterioration of the pavement has accelerated due to the following:

- Increase in road traffic following a deregulation of surface transport surfaces and growth in private vehicle ownership
- Increase in transit traffic to the ferry port of Durres

As a result, almost half of the main paved network and most of the principal gravel roads now require substantial reconstruction and rehabilitation.

Recent domestic budget allocations have permitted resurfacing of only about 100 km per year. Current unrest within the country has certainly not improved this situation. No reliable statistics are available to support or refute this contention.

Historically, the primary trade corridor through Albania has been north-south, connecting the ports of Vlore and Durres and northward to Montenegro. With the opening of Albania's borders to the rest of the world, east-west movement has becoming increasingly important and this was especially so during the years that the Macedonian-Greek (north-south) border was closed. The existing east-west route, Road E852, is inadequate to serve current traffic movements due to its physical condition. This situation will only worsen with increased traffic as a result of improved port operations, new border crossings, and increased private vehicle ownership.

Table 3-1
Albania's Road Network*

Roadway Type	Kilometers
Major paved	2,900
Major unpaved	4,900
Minor	10,200
Total	18,000

* CIE Consult – undated but about 1995

East-West Corridors

The mountainous nature of Albania restricts the road transport corridor to the river valleys and the present precipitous crossings of the mountain ranges. Route E852 is a significant east-west major road route across Albania, traversing the country between the Adriatic port of Durres in the west and the border crossing from Macedonia at Qaf Thanë (Kafasan) in the east. An alternative road from Durres to the midportion of E852, at Elbasan, passes through Tirana. Two road routes run between Durres and Tirana, one via Vore and another via Ndrog. There are other east-west roads but none of them was considered to be possible routes for major east-west traffic flows in either of the reports that were studied. The existing East-West Transport Corridor roads in Albania are shown in Figure 3-1.

Photo 3-1 Road West of Tirana

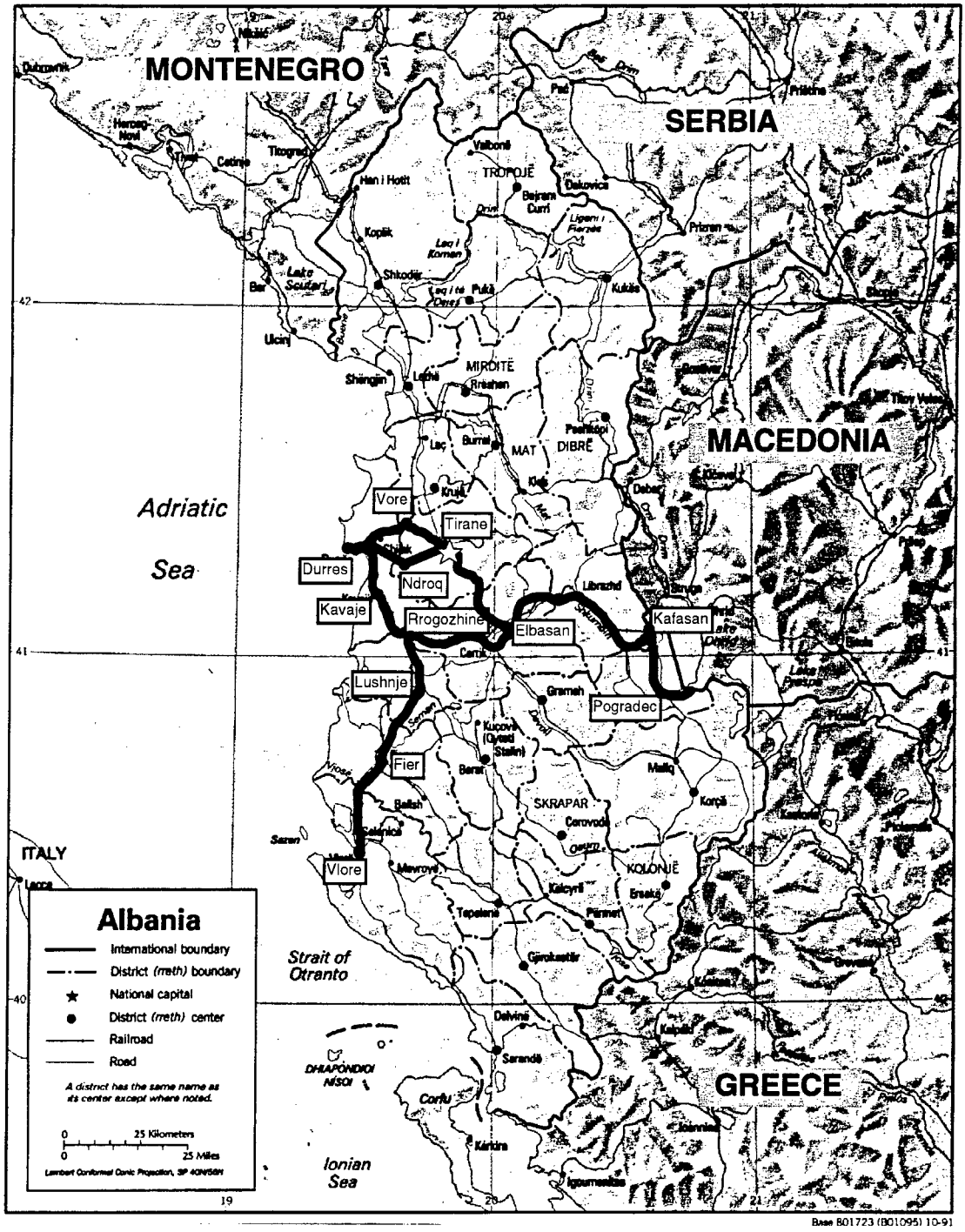


Figure 3-1 Existing East-West Roads in Albania

Route E852

Route E852 is approximately 150 km long; it is covered with asphalt and its width at most is only 6–7 meters in the region of Durres. Near the coast the average daily traffic volume is about 12,000 vehicles. Traveling eastward, volumes drop to less than 7,000 near Elbasan, and to nominal traffic at the Macedonian border. The road is in dire need of repairs now, and this need will certainly intensify as traffic volume increases due to the reconstruction of the port of Durres. International truck traffic is expected to increase, not only because of the improved port facilities at Durres but also due to new border-crossing facilities recently under construction at Qaf Thanë. However, unconfirmed reports advise that some of the newly constructed facilities have been vandalized and will have to be reconstructed. The maximum possible speed is 60 km/hr in the coastal areas and 35 km/hr in the mountainous sections, where the minimum radii of the curves are 30 meters and the maximum inclines are 8 percent.

Durres to Elbasan

Heavy goods vehicles enter and leave through the port of Durres – southeast of the main town en route to and from E852. This eliminates the need for these heavy vehicles to pass through the town center. After leaving Durres, the road goes south close to the shoreline, passing through a region where there are several hotels and holiday residential areas before coming to the town of Kavaje.

As the road continues south and slightly southeast through flat, open agricultural land, it turns due east when it reaches the Shkumbin River valley; after some kilometers it passes through the centers of the towns of Rrogozhinë and Pëqin, where the inevitable conflicts exist between through-traffic and local traffic and pedestrians.

For the next 15 kilometers or so, the road continues up the Shkumbin River valley passing through mostly agricultural land, but following the irregular river alignment. In many sections the pavement is in poor condition. Shortly before reaching Elbasan, a road cutting through the mountains from Tiranë joins E852.

The town of Elbasan stretches along the river valley for several kilometers, with the main industrial areas and factories siutated west of the town center. The road passes through the center of the town itself; however, the heavy goods vehicles are directed by signs to routes that keep them away from the main town center. The Shkumbin River valley is sufficiently wide near the town to accommodate a potential bypass.

Elbasan to Qaf Thanë

East of Elbasan the road continues up the Shkumbin River valley. The gradient is still rising toward the east, and the road continues to wind. The pavement is particularly bad in the several small towns through which the road passes. Just before reaching the town of Librazhd, the road passes through a narrow gap in the north-south mountain range that the Shkumbin River has cut in the ancient past. Here the pavement of the road has almost totally failed, according to available information.

East of Librazhd and traveling generally in a southeast direction, the road still follows the Shkumbin River valley as well as the railway line (since this is the only logical place in the

region to locate a transport facility in order to pass through the north-south mountain ranges). The road leads to and passes through the town of Perrenjas where the alignment and road widening is restrained on both sides by urban development. The poor state of the pavement, the absence of street lighting and pedestrian refuges, and numerous local street intersections create hazardous travel for both vehicles and pedestrians.

The road continues out of Perrenjas still in the Shkumbin River valley, but finally the road and the Shkumbin River as well as the railroad, take different paths. The road turns eastward to go up and over the last of the mountain ranges before reaching Lake Ohrid. This leg is on a continuous ascent with about a 10 percent gradient. In this area the road is narrow and twisting, and there are many blind curves that reduce traffic speeds to a crawl in both ascent and descent. When heavy goods vehicles are present, there are little or no safety measures to protect vehicles from the steep drops, and especially with the pavement in a state of disrepair.

After crossing the mountain, the main road turns south toward the town of Pogradec, but just at the turning point there is a spur that goes off to the north to the border crossing at Qaf Thanë. This spur from the Perrenjas-Pogradec road to the border at Qaf Thanë is a surfaced, single-track road that is totally unsuitable for cross-border traffic. It is understood that plans exist to improve this road link and were to be a part of the border crossing construction work previously discussed.

The following bottlenecks are identified on the Albanian East-West Corridor section between Durres and Kafasan:

- Mountainous sections and poor pavement
- Insufficient bypassing of towns
- Exposure to harsh winter weather conditions at the Macedonian border

3.1.1.2 Macedonian Roads (Physical Characteristics)

Macedonia's highway system is of a reasonably high quality for the region, with many paved roads. As reflected in Table 3-2, 60 percent of the 8,200 km system is paved. More important, 85 percent of the main roads (highways, arterials, or regional roads) are paved. It is estimated that there is a total of 10,600 km of roadway, but details are available for only 8,200 km of these. These statistics are from the *South Balkan Transport Initiative Desk Study* prepared for U.S. Trade and Development Agency (no date).

Table 3-2
Macedonia's Road Network

Class	Total Length (km)	Paved Carriageway (km)	Earth Carriageway (km)	% Paved
Highway	104	104	---	100
Arterial with single carriageway	811	784	27	97
Regional	2,611	2,094	517	80
Subtotal	**3,526**	**2,982**	**544**	**85**
Local	4,690	1,958	2,732	42
Total	**8,216**	**4,940**	**3,276**	**60**

Historically, Macedonia has been at the crossroads of trade throughout the region. A north-south route connects the Greek port of Thessaloníki in the south to Europe, and in the north through Skopje and Belgrade. Historically, an east-west route never fully developed, mainly because of Albania's isolationism before 1991. Nestled between Albania and Bulgaria, Macedonia is at the center of both east-west and north-south movements, if political influences do not disrupt the normal flow of trade and traffic. The most heavily traveled road in all of Macedonia is the Skopje-Tetovo road that carries a maximum of 8,500 vehicles per day.

East - West Corridors

Figure 3-2 depicts the East-West Corridor roads within Macedonia.

Two East-West Corridor roads were identified through discussions with representatives of the Ministry of Transport in Skopje. These comprise a northerly route through Tetevo, Skopje, and Kumanovo, and a route through the center of the country via the towns of Prilep, Titov Veles, and Kocani.

These two routes are connected via the section of highway running between Miladinovci and Titov Veles, which is part of the north-south route, Corridor No. 10; this link provides a full road traffic connection for the transports of the regions from the two routes.

These two routes are a part of the magistral road network of Macedonia; moreover, one is part of the European road network – "E" roads and it includes the following:

- E-65 Skopje - Tetevo - Gostivar - Kicevo - Botun - Ohrid - Resen - Bitola
- E-871 Kumanovo - Kriva Palanka - Deve Bair
- E-852 Kafasan (at the Albanian border) - Struga - Ohrid
- E-75 Titov Veles - Skopje

A greater part of the two sections have been modernized for speeds of up to 80 km/hr, with the exception of the mountainous sections where the roads are designed for speeds of up to 30-40 km/h.

Figure 3-2 Existing East-West Roads in Macedonia

Photo 3-2 Section of Route E-65, Ohrid-Kicevo

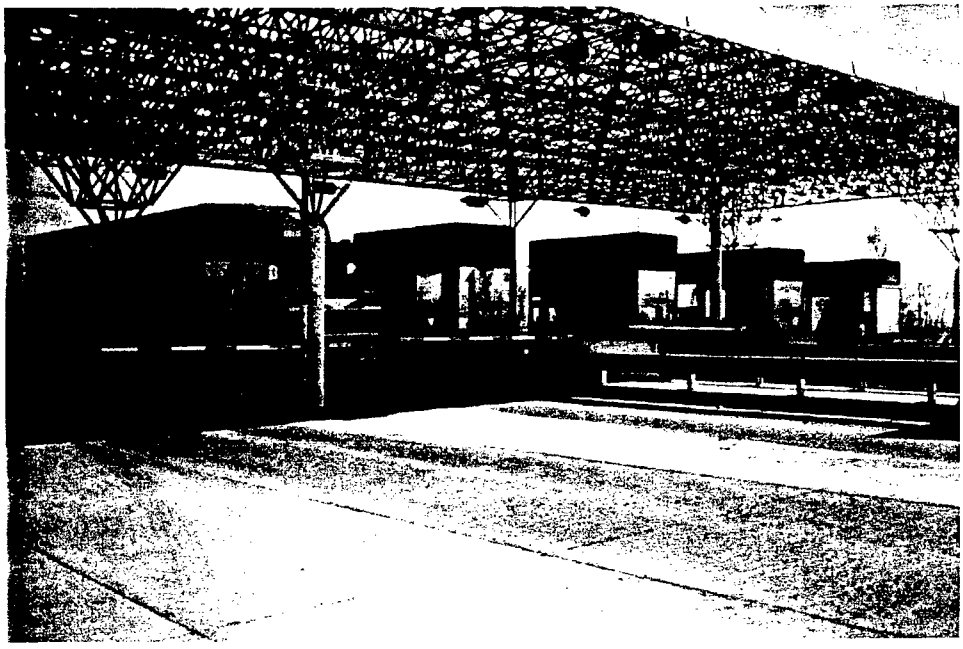


Photo 3-3 Toll Plaza on Route E-65, Gostivar-Tetovo Motorway

Northern Route (302 km): Kafasan-Botun-Kicevo-Tetovo-Skopje-Kumanovo-Deve Bair (Gyueshevo) Bulgarian Border

The Northern Route road is generally of an acceptable standard in terms of alignment and design.

There are two ways to access this road from Albania. International heavy goods vehicles are required to use the shorter E852 route (north of Lake Ohrid) from the Macedonia/Albania border crossing at Kafasan (Qaf Thanë), while light vehicles must use the crossing point at Sveti Naum (Tushemisht) and follow the road to the south of, and up the east side of Lake Ohrid to a point between the towns of Struga and Ohrid.

From the common Podmolje junction between Struga and Ohrid, where the two routes meet, the road heads north towards Kicevo. There are numerous sections where there are speed restrictions, particularly in the vicinity of the frequent towns and villages. Before reaching Kicevo there is the first of several mountain ranges to cross, but in spite of this the road has been engineered to good standards and reasonable gradients. However, only a single carriageway is available in this section and this continues to a point south of the town where the rail line from Skopje terminates. Within the urban area of Kicevo, the road comprises a dual carriageway as it passes through the outskirts of the town.

After leaving Kicevo there is another mountain to cross with long, steep grades on both sides. These have been provided with climbing lanes since the gradients are steep in places, and traffic speeds low. Safety standards along the mountain sections are good, with adequate signing, road markings, and crash barriers.

As the road approaches Gostivar the width reduces to a single carriageway to bypass the town. A new section of a tolled two-lane dual carriageway has been completed between Gostivar and Tetovo. This section of road is almost dead straight, along level terrain, with excellent standards of pavement. Here high speeds are possible and junctions have been grade-separated throughout.

From Tetovo to Skopje, the road follows the narrow valley of a river, and whereas engineering standards are generally good, the road curves and the frequent application of overtaking restrictions reduce overall traffic speeds. The road passes through the outskirts of Skopje with many at-grade junctions.

The road continues east until its junction with the north-south E75 toll highway. The east-west route is then congruent with the north-south route until it reaches Kumanovo. The highway is a two-lane dual carriageway across rolling terrain. The highway is tolled, with toll plazas 20 km south of Kumanovo, and on a recently completed section of highway branching west to the city of Skopje.

After leaving the highway at Kumanovo and again heading east to Kriva Palanka, rolling terrain is encountered. The road has long, sweeping, horizontal curves, and there are climbing lanes on the longer, steeper gradients. Pavement conditions are good. Widening would be possible if needed, but traffic conditions experienced did not appear to justify such measures. The gradient of the road slackens through the town of Kriva Palanka after a steady ascent along the river valley. Visibility and general standards through the town are good.

In the final section to the Bulgarian border, the road rises steeply for several kilometers along the river valley. This section is provided with climbing lanes but it also has sharp changes of direction which limit traffic to very low speeds. However, this border approach is engineered to good standards and the pavement is in good condition. The detailed technical characteristics of this road are presented in Table 3-3.

Central Route (339 km): Ohrid - Bitola - Prilep - Titov Veles - Stip - Kocani - Delchevo - Crna Skala (Bulgarian Border)

This southerly route will provide direct connection to the agricultural and industrial regions of Macedonia, and will also be used by traffic that bypasses the city of Skopje. Throughout its length, it has an asphalt surface with two driving lanes. The lane width varies between 3.0 and 3.75 m. This route passes mostly through mountainous and hilly terrain. Because of the poor geometric standards, it does not serve international traffic well. Currently, in order to improve the traffic characteristics of this route, a new 72 km road section is under construction between Prilep and Titov Veles over the Babuna Mountain. The link to the border with Bulgaria, from Titov Veles, comprises minor roads, and is not used by international freight traffic. Detailed technical data for this road are given in Table 3-4.

The following bottlenecks or sections are identified in Macedonia along the East-West Corridor:

- Delays occur at many at-grade junctions on the outskirts of Skopje
- Mountainous sections on E870 (Kumanovo-Gyueshevo) and on sections of E65
- Inadequate facilities and procedures at the Bulgarian border
- Exposure to harsh winter conditions at both borders

Table 3-3
Macedonia's Northern Route, Technical Data

Road Number	Section	Length (km)	R min. (m)	% of Direction	Number of Drive Lanes	Width of Lanes	% Maximum Longitudinal Gradient	Avg. Speed Max. Speed	Level Crossing	Two-Level Crossing
M-4	(Albanian border) Kafasan - Struga	12.0	40	38.1	2	3.00	6.00	40 / 60	2	-
M-4	Struga - Podmolje	7.7	40	-	2	3.00	0.26	40 / 60	2	1
M-4	Podmolje - Kicevo	53.7	70	16.7	2 (3)	3.00	6.60	50 / 80	6	1
M-4	Kicevo - Gostivar	45.8	60	16.4	2 (3)	3.00	7.70	50 / 60-80	8	1
M-4	Gostivar - Tetovo	21.2		-	4	3.75	-	80 / 100	-	10
M-4	Tetovo - Skopje	42.8	250(70)	15.1	2	3.50	6.10	80 / 80	8	4
M-1	Skopje - Miladinovci	25.6		-	4	3.75	-	120 / 120	-	4
M-1	Miladinovci - Kumanovo	16.5		-	4	3.75	-	120 / 120	-	2
M-2	Kumanovo - Stracin	37.1	250	11.0	2 (3)	3.50	6.00	80 / 80	3	2
M-2	Stracin - Kriva Palanka	26.6	60	12	2	3.00	6.00	40-60 / 60-90	4	-
M-2	Kriva Palanka - Deve Bair (Bulgarian Border)	13.3	60	-	2 (3)	3.00	6.70	40-60 / 40-60	2	-
	Total Length	302.3								

Table 3-4
Macedonia's Central Route, Technical Data

Road Number	Section	Length (km)	R min. (m)	% of Direction	Number of Drive Lanes	Width of Lanes	% Maximum Longitudinal Gradient	Avg. Speed Max. Speed	Level Crossing	Two-Level Crossing
M-4	(Albanian border) Kafasan - Struga	12.0	40	38.1	2	3.00	6.00	40 / 60	2	-
M-4	Struga - Podmolje	7.70	40	-	2	3.00	0.26	40 / 60	2	1
M-5	Podmolje - Ohrid	4.90	70	32.0	2	3.50	6.50	50 / 80	1	1
M-5	Ohrid - Resen	36.9	70	31.0	2	3.50	6.50	50 / 80	6	-
M-5	Resen - Bitola	28.7	200	-	2 (3)	3.50	6.50	80 /100	4	-
M-5	Bitola - Prilep	39.4	350	13.0	2	3.75	1.10	100 / 100	4	
M-5	Prilep - Titov Veles	81.2								
M-1	Titov Veles - Stip	36.4	100	40.0	2	3.0-3.5	8	50 / 80	5	4
M-2	Stip - Kocani	27.7	120	48.0	2	3.0-3.5	4.20	60 / 60	10	2
M-2	Kocani - Makedonska Kamenica	28.4	40		2	3.0	6	50 / 80	6	1
M-2	Makedonska Kamenica - Delchevo	24.7	40		2	3.0	8	50 / 60	6	1
M-2	Delchevo - Crna Skala (Bulgarian border)	11.0	40		2	3.0	6	50 / 60	10	-
	Total Length	339								

3.1.1.3 Bulgarian Roads (Physical Characteristics)

In December 1994, a *Transport Sector Memorandum for Bulgaria* was published. This document, prepared by the Bulgarian Institute of Transport and Communications with assistance from consultants, contains a complete description of the Bulgarian road system and is the major source of statistics in this section.

Bulgaria has a well-developed and well-maintained road transport network. There are three main road classifications, namely: Republican (state-owned), local, and departmental, serving separate enterprises, plants, and others. The state-owned network, summarized in Table 3-5, consists of 36,951 km of roadways, 92 percent of which are paved (81 percent are paved asphalt roads). This is a much higher percentage than in Albania and Macedonia combined. The density of the road system in Bulgaria is 33.2 km/km^2.

Table 3-5
Condition of the Bulgarian Road Network

DESCRIPTION		STATE-OWNED ROADS (KM)		
	Expressways	Classes I-IV	Interchanges	Total
Stage of Construction				
Surfaced	295	33,441	189	33,925
Not Surfaced	0	3,026	0	3,026
Total	**295**	**36,467**	**189**	**36,951**
Condition of Surface				
Good	267	25,570	175	26,012
Average	21	4418	6	4445
Bad	7	3,453	8	3,468
Total	**295**	**33,441**	**189**	**33,925**
Type Surface				
Concrete-Asphalt	278	29,507	189	29,973
Other	17	3,935	1	3,953
Total	**295**	**33,442**	**189**	**33,925**
4- or 3-Lane Roads				
4 lanes	0	360	0	360
3 lanes	0	**238**	0	238
Total	**0**	**598**	**0**	**598**

As a result of good conditions and good location, a part of the Bulgarian road system is included in the European road network for travel between eastern and western Europe. These routes include the following:

- E871 Macedonian border-Gyueshevo-Sofia
- E80, E773 Sofia-Orizovo-Nova Zagora-Sliven-Burgas
- E773 Sofia-Kazanlak-Sliven-Burgas
- E79, E83, E772, E70 Sofia-Yablanitsa-Veliko Tarnovo-Shoumen Varna
- E87 Varna-Burgas
- E80 Sofia-Plovdiv-Haskovo-Kapitan Andreevo
- 62, 82, 8 Macedonian border-Blagoevgrad-Dupnitza-Samokov-Mirovo
- E85 Romania-Russe-V. Tarnovo-S. Zagora-Haskovo-Makaza-Greece
- E87 Romania-Durankulak-Varna-Burgas-Malko Tarnovo-Turkey
- E83 Romania-Russe-Pleven-Sofia
- E79 Romania-Vidin-Sofia-Kulata-Greece
- E70 Romania-Russe-Varna
- TEM (E80) Kalotina-Sofia-Plovdiv-Kapitan Andreevo

East - West Corridors

The East-West Corridor through Bulgaria can conveniently be divided into the sections between Sofia and the Black Sea, and between Sofia and the border with Macedonia. Figure 3-3 depicts the alternative east-west roads along the corridor.

Macedonian Border - Sofia

The major route for existing east-west traffic west of Sofia is E871 between the Macedonia border at Gyeshevo and the Sofia Ring Road, through Kjustendil and Pernik. The distance from the Sofia Ring Road to the border is 112 km. In the sections from Gyueshevo to Kjustendil and Kjuestendil to Pernik, there are parts with clearance below the tolerance limits (which are from 30.75 to 51.0 percent). A super-elevation above the tolerance limit exists in the Kjustendil-Pernik section, which is 17.5 percent. A 400-meter visual range is provided to the whole length except for 20 percent of the Kjustendil - Pernik section.

At the border, facilities for vehicles are limited; both trucks and cars queue along the approach road for immigration and customs formalities. Heading east through the mountains the road is a single carriageway and generally down hill in that direction. In the opposite direction, climbing lanes are provided in the steep locations where the gradients are 10 percent or more. Steep climbs along twisting alignments reduce traffic speeds to a crawl, where overtaking of heavy vehicles is not possible. Pavement conditions along the road vary from good to poor. Pavement rehabilitation works are in progress at a few segments of this road.

Figure 3-3 Existing East-West Roads in Bulgaria

As the road approaches Sofia, at a distance of 35 km from the city, it becomes a dual carriageway until it reaches the Sofia Ring Road. Sofia is bypassed by an orbital ring road system. Parts of this Ring Road are dual carriageways, but other sections, particularly to the west of the city are single carriageways and heavily congested. It is in this area that the road from the Macedonia border connects with the Ring Road. This junction is a signal-controlled intersection, and considerable delays are experienced by through traffic using this route.

Sofia - Black Sea

There are several east-west road corridors across Bulgaria from the two major Black Sea ports of Varna and Burgas to Sofia. Some are more developed than others. The characteristics have been determined on the basis of site visits and local knowledge.

Sofia - Plovdiv - Stara Zagora - Sliven - Burgas

This route is the major east-west link across Bulgaria and comprises E80 in the western portion of the country and E773 in the eastern portion. The western section also provides the main route between Sofia and Turkey. The total route distance along this corridor from the Sofia Ring Road to Burgas is 432 km.

The northern part of the Sofia Ring Road is 7 km long, a 6-lane highway A-6-36.5m, and has a planned speed of 140 km/h.

This route to Burgas leaves the Ring Road on the E80 Expressway. The E80 extends all the way from the Sofia Ring Road to Plovdiv, a distance of 156 km. This section of the road is also a part of the Transeuropean highway north-south, which is also of major importance for both the country and the West Europe-Near East transportation link.

The Sofia-Plovdiv highway has a planned speed of 140 km/h and has a 133 km A4 clearance. The highway has two lanes in each direction. It leaves the mountainous area after traversing a section with long gradient sections and tunnels at the summit; then it crosses flat country north of Plovdiv, and it leads to the recently completed extension of the E80 highway near the town of Orizovo, approximately 40 km east of Plovdiv.

West of Stara Zagora, the road crosses hilly/rolling terrain on a single carriageway, with climbing lanes on gradients. Pavement rehabilitation works are in progress along certain sections of this road. Dualing would be possible in the rural areas, but a preferable solution would be the extension of the E80 highway to the north. Fifty km (87 percent) of the Popovitza - Stara Zagora section (62 km) has substandard clearance.

On leaving the major town of Stara Zagora, the route traverses a section of a southerly, single, carriageway bypass. This bypass crosses a flat terrain, with several major junctions; then the route becomes a dual carriageway road.

Continuing on to Sliven, the road reverts to a single carriageway alignment. Sight distances are generally good. (Ten km of the section Stara Zagora - Sliven are without visual range.) However, the large volume of heavy traffic makes overtaking hazardous, and traffic is in most cases limited to the speeds of the heavy goods vehicles. The major town of Sliven is bypassed to the south. On-line dualing would be the most cost-effective method of improving the capacity of this road in this section.

Traffic conditions on the section of road after Sliven are busy in both directions, and the general observation is that there would be considerable benefit from dualing, which could easily be accomplished by the addition of a second parallel carriageway, as the road passes through mostly flat, open country.

The remainder of the route into Burgas is across level or rolling open country south of the mountain range. Climbing lanes are provided on the longer gradients of the route. The road passes through the center of several towns and villages, some of which could be easily bypassed. Traffic conditions within the towns are congested, with numerous at-grade junctions, and the hazard of pedestrian movements. Evidence of a new dual carriageway road partially constructed was noted near the village of Vetren, 15 km west of Burgas, but work on the construction has been suspended. General pavement conditions on the road were satisfactory, although certain sections were showing signs of distress. Pavement rehabilitation works were in progress, and in some areas resurfacing operations were underway along with the formation of new road shoulders. A short section of dual carriageway road is the final leg which carries the route into Burgas.

Macedonian Border - Mirovo /Kostenetz

This is a two-lane road in relatively good condition, which is used, primarily, by local traffic. It is understood that this road connection, between the Macedonian Central route and the Bulgarian Southern route, is used also by truck traffic involved in illegal import and export.

The section between Crna Skala and Blagoevgrad, with a total length of 25 km, is the only segment of the East-West Corridor on the territory of Bulgaria that is a Class III or IV road. After crossing the Macedonian border, the road descends from its mountainous region for approximately 11 km; the rest of this section, to Blagoevgrad, is across level terrain.

The segment between Blagoevgrad and Dupnitza, with a total length of 30 km, is part of the north-south route Vidin/Kalafat (Romanian border) - Kulata (Greek border). This road crosses mostly flat terrain, with less than 20 percent across rolling country. The lane widths are standard with clearances varying from 0 to 2 meters; widening would be possible. On leaving Dupnitza, the road continues northeast-east through mostly level terrain until it reaches Saparevo (20 km from Dupnitza). This section is in good condition.

East of Saparevo, the road continues on the northern outskirts of the Rila Mountain. It ascends through Samokov and Borovetz for 22 km on a standard width road with no clearance, many turns, and no climbing lanes. After leaving Borovetz, the road descends for 19 km until it reaches Dolnja Banja. This segment is also a standard width road with no clearance and many turns; there are no climbing lanes for the westbound traffic. The next 7 km from Dolnja Banja to Kostenetz follow a flat terrain.

After the road passes through the city of Kostenetz, it ascends north for 11 km on Road 8 (a Class I road) to Mirovo. The connection between this road and the southern route (Sofia-Plovdiv Motorway) is 4 km north of Mirovo.

Sofia - Karlovo - Kazanlak - Sliven - Burgas

Total route distance along this corridor from Burgas to the Sofia Ring Road is 385 km. This route represents the shortest link from Sofia to Burgas. However, the roads along this route are mostly single carriageways, and in places follow winding alignments through mountainous areas. Therefore, heavy truck traffic would not be attracted to this route.

The road has a prevailing clearance of 7/10.5 m. Only about 16 percent of the total length has a clearance below the norm; approximately 5 percent has super elevation above the tolerance limits; and 7 percent is without guaranteed visual range. There are curves on this road with 4.5-km total length with radii below tolerance. A bearing capacity of 10 tons per axle is provided except for a 700-m section. The sections Kazanlak-Sliven, Sliven-Ajtos, and Ajtos-Burgas have clearances according to standards. Above the tolerance limits, super elevations in the Srednogorie-Karlovo and Karlovo-Kazanlak sections are 11.8 and 4.5 percent, respectively. A 400-m visual range is provided to the whole length except for 11 percent of the Karlovo-Kazanlak section.

Sofia-Botevgrad-Veliko Tarnovo-Shumen-Varna

The total route distance along this corridor from Varna to the Sofia Ring Road is 463 km. From the Sofia Ring Road to Yablanitza (102 km), the route follows the dual carriageway alignment of a motorway on Routes E79 and E83 across the mountains. Between Yablanitza and Shumen the road runs east along the north side of the Balkan Mountain range along a single carriageway designated E772. The last section of this route into the port of Varna comprises the two-lane dual carriageway E70, which has recently been extended from the town of Kaspichan, approximately 70 km from Varna.

The E772 road (Koritna-Veliko Tarnovo-Targovishte-Shumen) is 250 km long, and it is in comparatively good condition. Super elevations exceeding the tolerance limits are found in 3.3 percent of its length; 17 percent are without guaranteed visual range and 5 percent have a bearing capacity of less than 10 tons per axle. There are 79 horizontal curves of 16.16 km total length with radii below the tolerance.

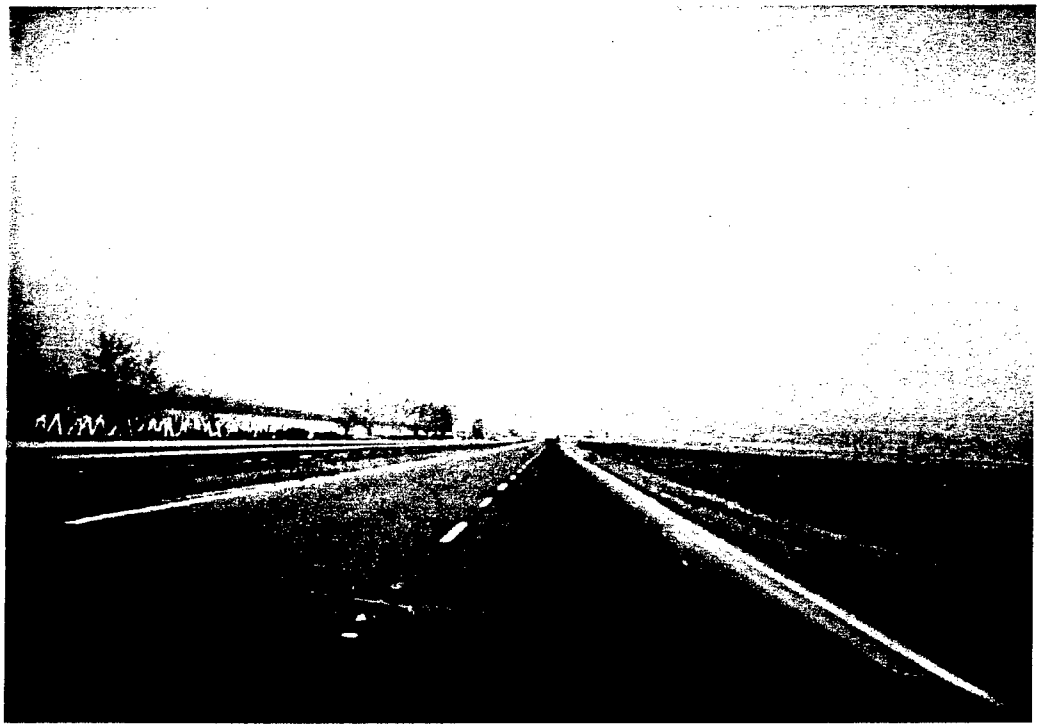


Photo 3-4 Section of Route E-80, Sofia - Plovdiv

Photo 3-5 Section of Route E-773, Burgas - Stara Zagora

Photo 3-6 Elevated Section of Route E-83 Under Construction

Photo 3-7 Segment of Route E-772, Sofia – Varna; A4 Lane Divided with Good Geometrics

Sofia-Pleven-Ruse-Varna

A possible alternative route for traffic between Varna and Sofia utilizes this route to the north between Shumen and Koritna. However, the distance is greater than any southerly alternative. Total route distance along this corridor from Varna to the Sofia Ring Road is 523 km.

Varna-Burgas

This link is discussed since it would be a possible route for any traffic that connects any one of the northern or southern routes with either or both ports.

The distance between Varna and Burgas is 143 km and approximately 10 percent of it has substandard clearance for a first-class road. The Varna-Staro Orjahovo section (34 km) is in the poorest condition with only 19 percent of its length meeting the requirements and 43 percent with a longitudinal slope above the tolerance limit. The Staro Orjahovo-Slancev Brjag section (62 km) is in poor condition in terms of the longitudinal slope – 33 percent of its length is above the tolerance limit. Thirty-two percent of the length is without guaranteed visual range. There are parts of the Staro Orjahovo-Slancev Brjag (43 percent) and Slancev Brjag-Burgas sections (82 percent) where a bearing capacity of 10 tons per axle is not provided.

The northerly section of the road linking the ports of Varna and Burgas comprises a three-lane dual carriageway south of Varna. This road crosses the harbor along a major structure before climbing to higher ground along a well-engineered alignment. The dual carriageway extends some 13 km from the port, beyond which it reverts to a single carriageway. The terrain in this area is mountainous, and the road is winding with climbing lanes on some of the longer grades.

A high range of hills is crossed before the steep drop to the north coast of Burgas. The road in this section follows a twisting alignment, with hairpin turns on the descent. The pavement is in poor condition and unsuited to the passage of heavy vehicles.

On-line improvements to this section of road between Varna and Burgas would be costly, and disrupt the numerous villages along the route. A preferable route for a new link between the two ports would be inland, thus avoiding the need to pass through the urban areas of the two port cities.

Plovdiv - Haskovo - Svilengrad - Kapitan Andreevo (Turkish border)

This road is of major importance as it connects the East-West Corridor with the Middle East via Turkey.

This highway is 160 km long. The section between Ljubimetz and Svilengrad (A1) is a motorway with good standards. A motorway has been proposed to connect the Sofia-Plovdiv motorway with A1.

The following bottlenecks are identified in Bulgaria along the East-West Corridor:

- Exposure to harsh winter weather conditions at the border
- Congested traffic conditions in towns along E773
- High traffic volumes on single carriageway sections of E773

- Heavy congested single carriageway sections on the Ring Road west of Sofia
- Poor pavement and alignment on E87 north of Burgas
- Congested signalized crossroads connecting E79, E80, and E871 with Sofia Ring Road
- Steep gradients and poor pavement sections of single carriageway road on E871 to Gyueshevo
- Excessive customs examination and documentation

3.1.2 Railways (Physical Characteristics)

The East-West Corridor is endowed with an extensive network of national railways, namely: the Albanian, Macedonian, and Bulgarian. (See map in Figure 2-1.) The Albanian Railways are situated entirely in Albania and link the western end of the corridor with the Port of Durres on the Adriatic Sea. The Bulgarian State Railways, within the territory of Bulgaria on the eastern end, link the corridor to the Black Sea ports of Varna and Burgas and the Macedonian Railways are located entirely in the former Yugoslavian Republic of Macedonia, in the center of the East-West Corridor, as the land bridge to both Albania and Bulgaria. Although these national railways lack interconnectivity, their strategic importance and potential transport cost advantage, particularly the Bulgarian State Railways, cannot be stressed enough. Freight movements along the East-West Corridor, especially general cargo and container traffic from the Near East, Middle East, and Asia, as well as from the Black Sea region, southern Asia, and the CIS countries to southern, western, and central Europe are expected to increase dramatically in the future. This increased traffic is expected as a result of operational efficiencies in both rail and road transport now contemplated for the corridor and other European transport corridors. Additionally, the combination of new investments in road infrastructures, container terminals, port facilities, and railway infrastructure improvements, as well as traction and rolling stock upgrades are expected to attract new traffic to the corridor. Table 3-6 shows the three rail networks in terms of their general rail length and line density.

Table 3-6
Rail Networks

Country	Rail Length (km)	Line Density (km per 1,000 people)	Line Density (km per 1,000 sq km)
Albania	447	0.11	12.5
Macedonia	699	0.32	27.6
Bulgaria	4,300	0.49	38.8

An inventory of the infrastructure, traction fleet, and rolling stock of the three railways operating in the East-West Corridor is presented in Table 3-7. As the table indicates, the Bulgarian Railways by far is the largest of the three railway systems in the corridor. Both in terms of the size of its infrastructure and in the total equipment fleet of locomotives and rolling stock, the Bulgarian Railways dwarfs the Albanian and Macedonian Railways combined.

Table 3-7
Infrastructure and Equipment of East-West Corridor Railways, 1995

	Albanian Railways	Macedonian Railways	Bulgarian Railways
Total Route Kilometers	447	699	4, 300
Standard gauge	447	466	2,718
Narrow gauge	0	0	245
Electrified lines	0	233	2, 640
Total Traction Stock	61	92	961
Diesel locomotives	5	31	547
Electric locomotives	0	13	319
Shunting locomotives	10	23	325
Motor trains	0	20	89
Rail busses		5	
Total Rolling Stock	1, 117	2, 608	30, 946
Passenger cars	117	177	1, 768
Freight cars	1,000	2,431	29, 178
Freight car carrying capacity (tons)	N/A	102, 064	N/A
Total Employment	4,845	4, 997	257, 28

3.1.2.1 Albanian Railways (Physical Characteristics)

Albanian Railways (HSH - Hekurudhat Shqiptare) was established in 1947. By 1994, HSH had a rail network of 447 km of main lines. The railway traction is diesel and the lines are single with a standard gauge of 1,435 mm. There are 51 operational railway stations and depots. The rail network extends from the Port of Durres, on the Adriatic Sea, in three directions as follows: first, to the Albanian/Serbian border at Hani Hotit in the north; second, to Vlore and Ballshi in the south; and third, eastward, to Pogradeci, near the Macedonian border (see Figure 3-4). Large sections of the country have no railway, but the railway does cover the more populated and industrial areas.

The Albanian Railways network consists of 447 route kilometers of 36 to 49 (mostly 43) kg/m rail laid on wooden sleepers. This is inadequate for higher speeds and heavier axle loads. Some rail sections are over 50 years old. Design speeds are unsatisfactory for a modern railway. These design speeds are noncompetitive with other modes of transport. They permit maximum speeds of up to 80 km/h for passenger and freight operations. Some 50 percent of the railway is signalized with conventional relay interlocking controlled from local panels. Train control is by radio, which is the main means of communication between train operators and stations.

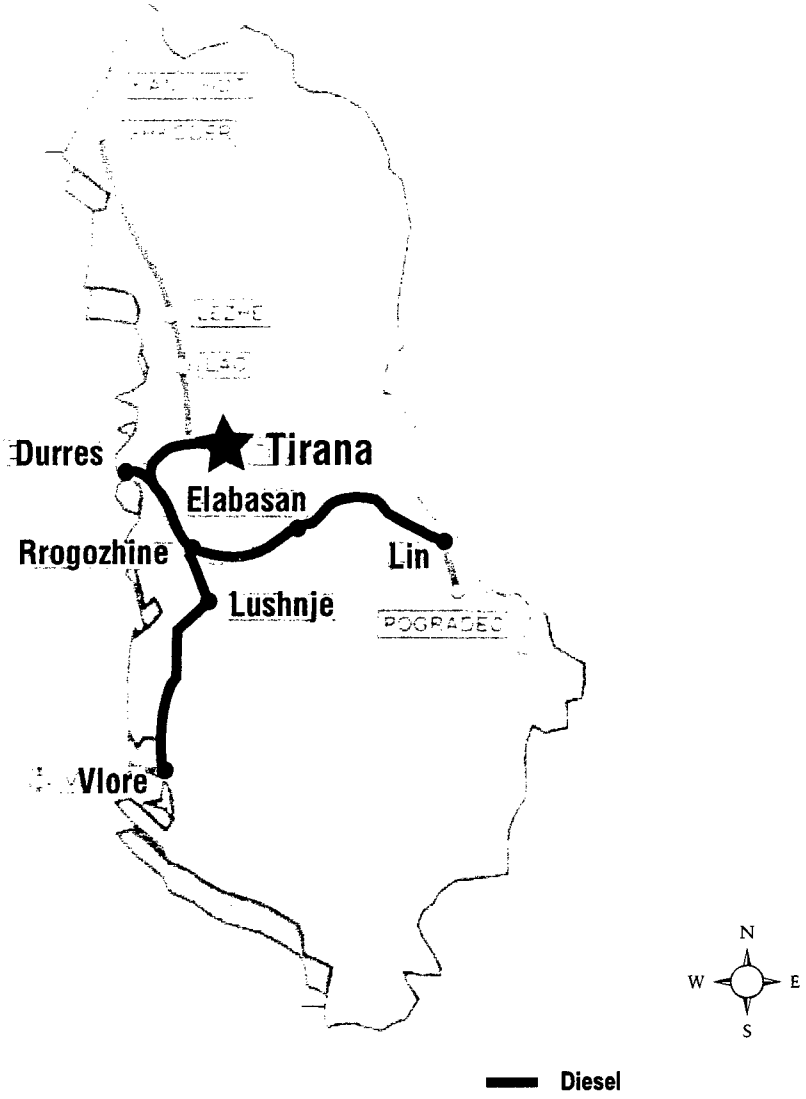


Figure 3-4 Existing East-West Albanian Railways

Although designed for maximum axle loads of 24 tons, higher loads of up to 30 tons are run at considerably lower speeds. The railway's height clearances at several tunnels limit certain types of wagons and containers on those sections. This characteristic, unless corrected, will have an adverse impact on through container movements in the East-West Corridor.

Durres - Lin

The railway route from Durres to Lin is 143 km long along the East-West Transport Corridor. The tracing parameters of the railway (R,min of 300 m and maximum incline of 9 to 18 percent) allow for relatively high designed speeds of 100 km/hr in the lowlands and 60-65 km/hr in the mountainous areas; however, with the bad condition of the railway and its base, as well as the bad signalization and safety equipment, the speed in many sections is limited to 25-30 km/hr.

Along this section of the corridor, 12 of the 19 stations are signalized. Traffic on the rest of the rail network is operated on a train dispatching basis with VHF radio communication between stations, paper tickets for entrance to the block stations, and points in station areas hand-operated, fitted with keylock and point indicators but without any interlocking.

Durres - Tirana

This route has a total length of 40 km. All 7 stations are signalled.

Rolling Stock

According to an independent study conducted in 1995 by World Bank consultants, the capacity of HSH's rolling stock fleet exceeds present and future levels of operation. The rolling stock is being maintained under the same maintenance schedule established when traffic levels were much higher. This not only creates excess capacity but also generates unnecessarily high maintenance costs for HSH. The rolling stock includes 117 passenger cars (carriages), 18 luggage vans, and about 1,000 freight wagons. The freight wagons include a variety of wagon types.

The passenger car fleet includes 63 Italian-built passenger cars of 1960 vintage that were acquired in 1990. Overall, the railway's passenger car fleet is in poor condition due to the age of the fleet.

Traction Fleet

In 1995, HSH had a traction fleet of 62 diesel locomotives of Class T-669 with 1,350 horsepower and six axles built between 1968 and 1990 by a Czechoslovakian company. In 1996, only 36 locomotives (59 percent) were available for service. The fleet also includes five DL-221 German-built diesel hydraulic locomotives (one operating) with 2,700 horsepower built between 1957 and 1964. HSH also has eight T-435 and eight T-458 shunting locomotives. These have four axles and a 750 horsepower rating. They were built between 1959 and 1972.

The traction fleet has been severely affected by the persistent lack of spare parts because HSH cannot finance their purchase.

3.1.2.2 Macedonian Railways (Physical Characteristics)

The Macedonian Railways (MZ - Makedoneski Zeleznici), before the break-up of the former Yugoslavia, was one of the six separate operating units of Yugoslav Railways. Although system-wide tariffs, train operating rules, and accounting and finance functions were centralized in Belgrade, asset management and day-to-day operating functions were undertaken separately from the Yugoslav Railways. MZ was founded as a public enterprise in 1995 by the Assembly of the Republic of Macedonia.

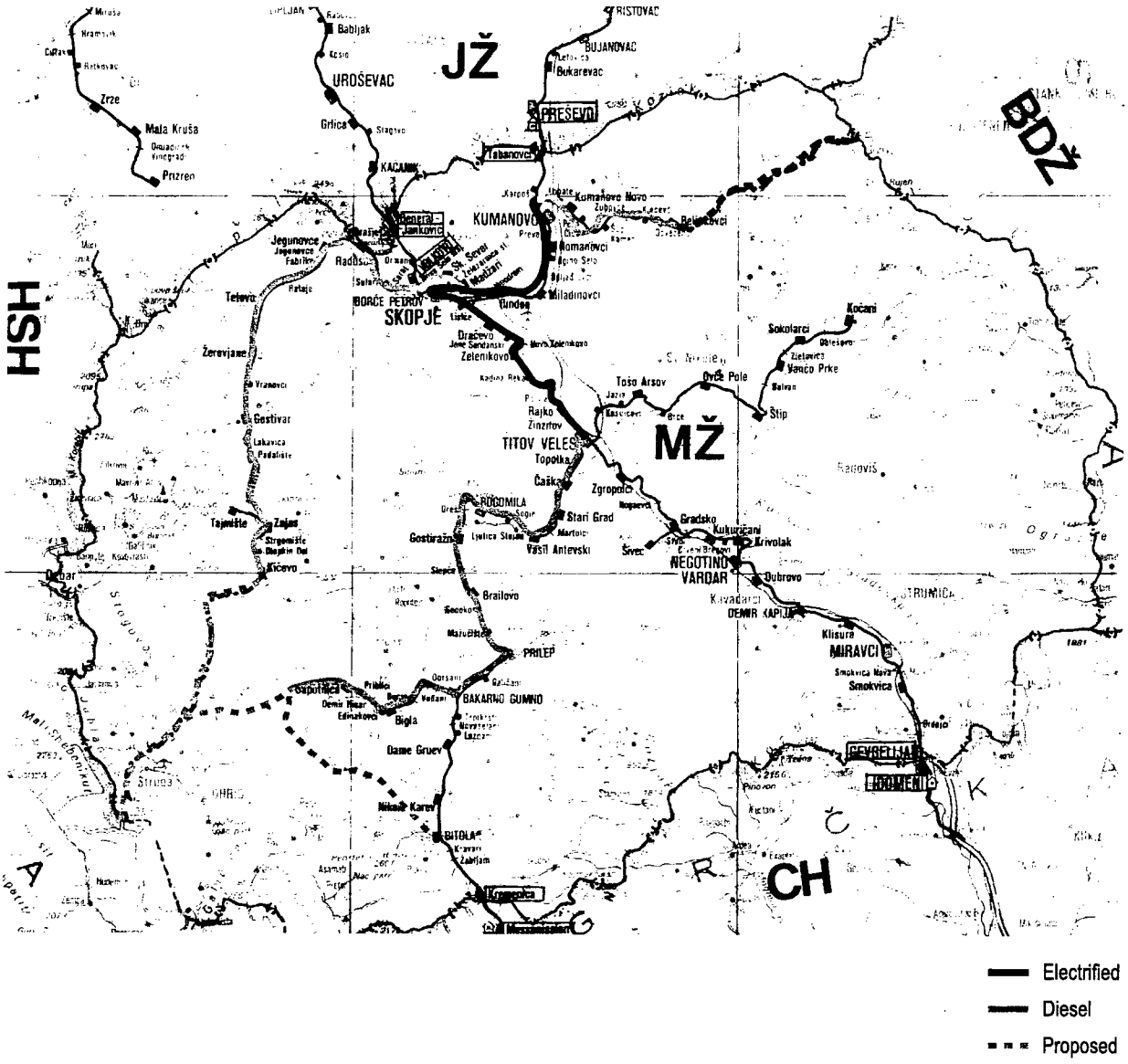
Figure 3-5 shows the existing east-west Macedonian railways including the connection gaps to the Albanian and Bulgarian railway systems.

MZ is strategically located between Albanian railways to its west and Bulgarian railways to its east. At present, no direct connections exist between the Macedonian and the Albanian and Bulgarian railways. The railhead between Albania and MZ is 65 km apart. Similarly, there is no connection between the railhead at Beljakovce in Macedonia and Gyueshevo in Bulgaria. The railhead between Beljakovce and Gyueshevo is 56 km apart. However, because of its east to west direction, MZ does hold out the promise for providing increased access to the Adriatic and the Black Sea coasts in the future. The section most relevant to the East-West Corridor runs a distance of 220 km from Skopje to Kicevo and from Beljakovce to Skopje via Kumanovo.

The rail network consists of 699 km of open lines and 226 km of station lines with standard gauge track. About 232-route-kilometers of track are electrified. The rail network has 102 sidings. The largest part of the railway network, approximately 600 km, is capable of permitting speeds of 60-100 km/hr (and speeds of up to 100-120 km/hr can also be achieved on some sections); the remaining 100 km allow maximum speeds of 60 km/h. Track conditions on MZ tend to be unsatisfactory as they are in poor to fair condition. Most sections are in need of repair and upgrading. The capacity for axial loads are 20t/axle and 18t/axle at 550 km and 150 km of line, respectively. On the 138.6 km section between Skopje and Kumanovo, the track is 49 kg/m rail laid on wooden sleepers. From Kumanovo to Beljakovce the track is 45 kg/m rail, laid on wooden sleepers, and it is in poor condition according to an independent survey conducted in 1996 and a recent site visit. Some of the track on this segment has been removed for use elsewhere in MZ's system. MZ estimates that 30-35 km of track per year requires major upgrading.

Traction Fleet

MZ's traction fleet is equipped with 92 traction units, 67 of which are locomotives; 13 of the locomotives are electric and 54 are diesel with a total power of 56,060 and 55,685 kW, respectively. There are also 16 diesel motor trains, 5 rail busses, and 4 electric trains. About a third of MZ's traction units are diesel electric locomotives, 23 are diesel shunting, 13 are electric, and 4 are EMU units. Table 3-8 presents a complete inventory of the MZ locomotive fleet.



Electrified
Diesel
Proposed

Figure 3-5 Existing East-West Macedonian Railways

Table 3-8
MZ Locomotive Fleet

Traction Units	No. of Units	No. of Units/Year of Production	Average Age (Years)
Electric Locomotives	13	1/70, 4/74, 5/78, 2/87, 1/80	18
EMU	4	1/85, 3/86	9
Diesel Locomotives	31	4/61, 5/66, 8/70, 12/72, 2/80	26
DMU	16	5/75, 5/77, 5/79, 1/83	17
Buses on Rail	5	1/60, 1/62, 3/65	31
Diesel Shunting Locomotives	23	1/60, 2/61, 3/62, 4/66, 3/67, 3/70, 1/56, 3/57, 3/59	26-37
Total	92		

Rolling Stock

MZ's rolling stock includes four types of passenger cars and three types of freight wagons. The wagon fleet is categorized as 2-axle, 4-axle, and 6-axle wagons and a total of 2,432 units. Of this amount 846 are closed wagons, 1,129 are open wagons, 167 are plato wagons, and the remaining 290 are wagons of various types. The freight car carrying capacity is 1,022,064 tons.

The passenger car fleet comprises a total of 177 units, which includes 64 classic cars, 74 motor cars, 18 sleeping cars, and 21 couchette cars. The fleet ranges in age from 16 to 33 years.

3.1.2.3 Bulgarian Railways (Physical Characteristics)

Bulgarian State Railways (BDZ-Balgarski Darzavni Zeleznitzi) is strategically located on the eastern end of the East-West Corridor. BDZ extends (see Figure 3-6) from Gyueshevo near the border with Macedonia eastward to the Bulgarian capital of Sofia and further eastward to the Black Sea, Port of Varna (through Pleven, Veliko Tarnovo, and Shumen), and the Port of Burgas via the cities of either Karlovo and Sliven or Plordiv and Nova Zagora.

BDZ's railway network was constructed over a 70-year period beginning in 1860. It consists of approximately 4,300-route-kilometers that include 245 km of narrow gauge track. The rail network also includes 960 km of double track (22 percent of its route km) and 2,640 km (or 61 percent of its route km) of electrified track (25 kV and 50 Hz). As indicated in Table 3-9, the rail network is classified into two categories, main lines and secondary lines. Of this network classification, some 2,718 km (67.4 percent) comprise nine of BDZ's main lines; the remaining 1,313 km make up the secondary lines.

Photo 3-8 Railroad Station at the Town of Kicevo

Photo 3-9 Railroad Station at the Town of Kumanovo

The track consists mainly of 49 kilograms per meter (kg/m) rail laid on concrete sleepers, but there are some exceptions. The exceptions are at crossing points, switches, and on curves where timber sleepers are used. About 13 percent of the track kilometers have welded joints. Only 9 km of BDZ's tracks use heavier 60 kg/m rail.

For most trains operated by BDZ, speed restrictions, ensuring safe operations, permit maximum speeds for passenger trains of 80 to 100 km/h. A 93 km route allows safe speeds of up to 120 km/hr.

The section between Gyueshevo and Radomir is 96 km. The line is single diesel with maximum speeds of 65 km/hr between Gyueshevo and Kjustendil, and 90 km/hr between Kjustendil and Radomir. The average speed of passenger trains is 55 km/hr. More than 35 km of this section have radii of less than 450 m. The maximum gradient is 25 percent which restricts trailing loads to 290 tons. Between Radomir and Sofia the line is electrified.

From Sofia, along the central route, to Burgas/Varna, the maximum speed is generally 120 km/hr for passenger trains and 60-80 km/hr for freight trains. This speed is reduced to 100 km/h over a 100 km section between Tulovo and Zimnitza, and increased to 130 km/h over the 34 km section between Zimnitza and Karnobat.

This section is generally in good technical condition and is electrified to 25 kV AC. The average age of rails and sleepers (most of which are concrete) is 11 years.

The Karnobat-Burgas section is 60 km long and the maximum line speed is 110 km/hr for passenger trains and 60 km/hr for freight trains. The line is in good condition and is double track electrified to 25 kV AC standard and is designed for an axle load of 22.5 tons. Rails are standard 49 kg/m supported on concrete sleepers throughout. Rails and sleepers are 13 years old.

The line between Sofia and Krumovo consists of a double track 25-kV electrified railway with a maximum speed of 100 km/hr; the maximum gradient is 25 percent (1 in 40) with approximately 25 km being steeper than 18 percent (1 in 56). Between Krumovo and Svilengrad (on the border with Turkey) the line is single track and trains are hauled by diesel locomotives; this is a relatively flat section with a maximum gradient of 8 percent (1 in 25).

Traction Fleet

BDZ's traction fleet consists of 872 locomotives. Approximately 63 percent (547 of these locomotives) are used for main line operations and 37 percent are used in shunting operations. As shown in Table 3-10, 44 units are electric locomotives with 5,100 kW power ratings and design speeds of 130 km/hr. Additional fleet units include 274 electric units with power ratings in excess of 3,000 kW and design speeds of 110-130 km/hr. Of BDZ's locomotive fleet, 554 (63.5 percent) are diesel hydraulic and diesel electric locomotives.

As of early January 1996, BDZ's fleet also consisted of 83 locomotives of Electric Multiple Units (EMU). These units, most of which (about 66 percent) are between 20 to 25 years old, are deployed mainly in urban passenger operations.

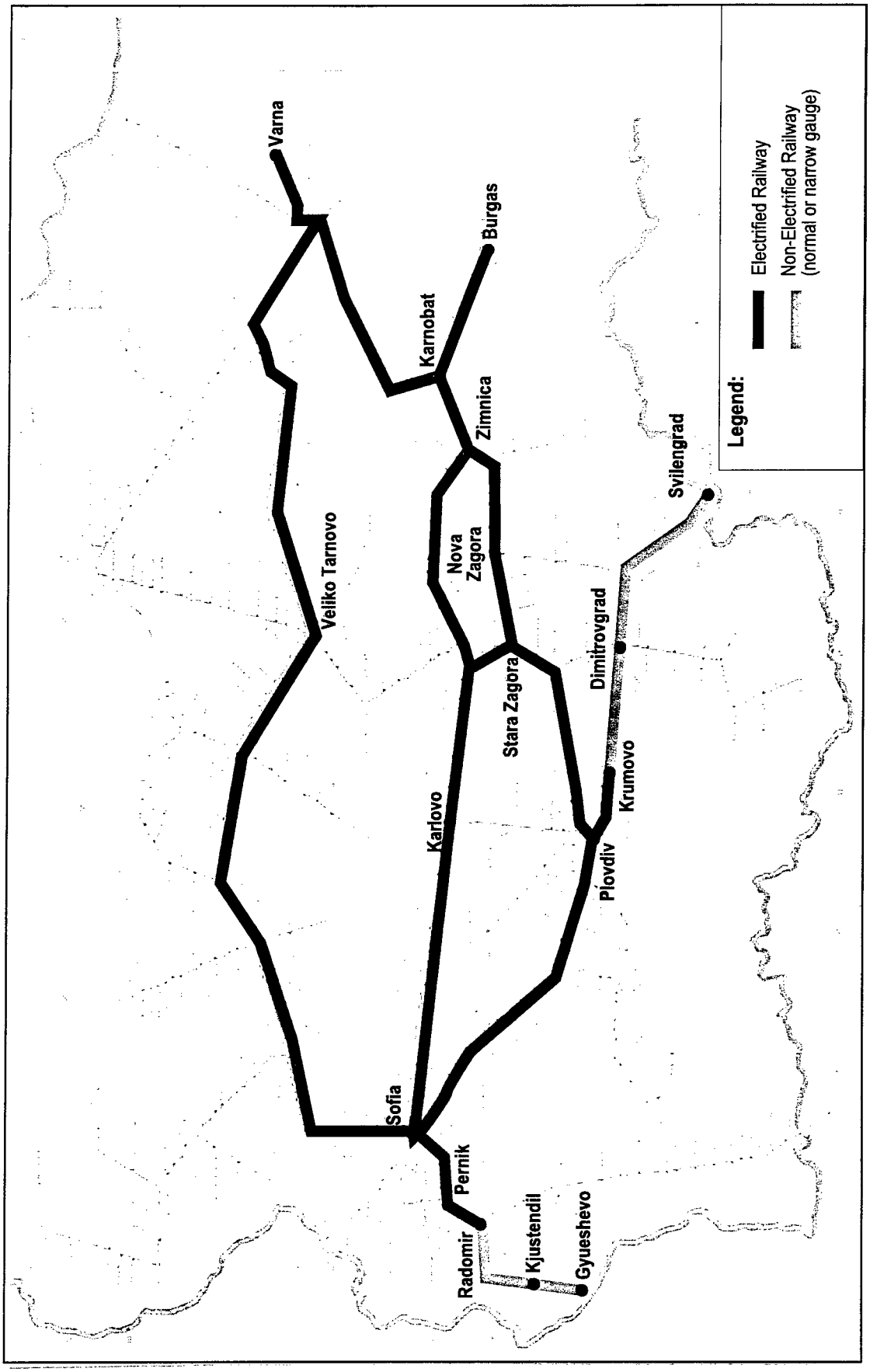


Figure 3-6 Existing East-West Bulgarian Railways

Table 3-9
Network of Bulgarian Railways

Line	Main Lines	Length (km)	No. of Stations	Single Track	Double Track	Track Electrification
1	Sofia-Provdiv-Dimitrovgrad-Svilengrad	362.55	53	196.6	171.95	171.95
2	Sofia-Mezdra-Varna	532.03	76		532.0	532.03
3	Iliantzi-Karlovo-Tulovo-Yana	503.77	73	405.89	97.89	503.77
4	Russe-Tulvo-Stara Zagora-Podkova	418.90	49	396.55	22.34	296.32
5	Sofia-Pernik-Radomir-Dupnitza-Kulata	193.86	26	190.61	3.30	75.23
6	Voluyak-Pernik-Radomir-Gyueshevo	151.06	19	143.40	7.66	62.46
7	Mezdra-Vidin	179.47	21	162.01	17.46	179.47
8	Plovdiv-Stara Zagora-Nova Zagora-Burgas	237.07	30	126.55	107.52	234.07
9	Ruse-Samuil-Kaspichan	142.40	16	142.40	0.00	142.40
Total		2,718.12	363	1,758.02	960.05	2,197.71
	Secondary Lines	1,313.08	128	1,269.1	0.00	279.97
	BDZ Rail Network	4,031.2	491	3,027.2	960.05	2,477.68
	Narrow Gauge Lines	243.55		243.55	0	0

Rolling Stock

BDZ's rolling stock includes a wide variety of freight wagons and passenger cars as indicated in Table 3-11. At the beginning of 1996, BDZ's inventory of freight wagons included 29,178 wagons representing eleven different wagon types of various ages. Approximately 50 percent of BDZ's wagon fleet is in need of some form of repair.

BDZ's passenger car fleet in 1996 included 1,768 units of eight different passenger car types (Table 3-12). Twenty percent of the passenger cars are over 25 years old. BDZ's passenger car availability was less than 65 percent during 1995/96.

Table 3-10
BDZ Traction Fleet

Locomotive Type	Power Capacity	No. of Units	10 Years Old	15 Years Old	20 Years Old	25 Years Old	Over 25 Years Old	Max. Speed km/h	Source Origin
EL(Main line)	2,880 kW	1					1	110	Czech
EL(Main line)	3,020-3,040 kW	274		59	73	66	76	110-130	Czech
EL(Main line)	5,100 kW	44	44					130	Romania
Sub-Total		319	44	59	73	66	76		N/A
DL(Main line) Narrow gauge	1,500-2,200 kW	193		1	15	115	62	110-120	N/A
DL(Main line)	280-810 kW								
Total		512	44	60	88	181	138	110-120	

Table 3-11
BDZ Freight Wagon Fleet

Freight Wagon Type	No. of Wagons	10 Years Old	15 Years Old	20 Years Old	25 Years Old	Over 25 Years Old
Covered 2 axles	2,772			865	1,178	729
Covered 4 axles	2,145	605	1,534	6		
Flat	5,636	200	3,886	1,305	184	61
Open	8,400	2,996	2,485	2,395	255	269
Grain carrier	1,505	543	767	195		
Ore carrier	672					
Saddle shaped	1,878	1,588	290			
Hopper	451	38	243	57	69	44
Tank	4.337	530	515	753	1,474	1,065
Refrigerator	121		50			71
Cement carrier	1.261	374	346	375	166	
Total	29,178	7,546	10,116	5,951	3,326	2,239

Table 3-12
BDZ Passenger Car Fleet

Passenger Car Type	No. of Cars	10 Years Old	15 Years Old	20 Years Old	25 Years Old	Over 25 Years Old
1st Class	129	3	45	2	46	33
2nd Class	1,274	316	19	354	331	254
1st & 2nd Class	8				3	
Couchette	121	37		19		65
Sleeping Car	75		56		19	
Buffet	43			36	7	
Restaurant	17		17			
Baggage	101			48	53	
Total	1,768	356	137	459	464	352

3.1.3 Ports - Physical Characteristics

3.1.3.1 Albanian Ports

Port of Durres

Durres (with a population of 85,000) is the home of Albania's largest and most important maritime port. The Port of Durres, located at 41N 19E, is a key transport node in the South Balkan East-West Corridor, as it represents a significant link between the Mediterranean and the Balkan region.

The port is distinguished from others in the region for the two following reasons: the need for new capital investments and increased maintenance expenditures reflected by the overall state of existing facilities and equipment, and the underutilization of the port's facilities which is made obvious by the high number of berths dedicated to minor maintenance activities. Other characteristics of this port include an existing breakwater with a single entrance to a relatively large basin; a quay length of 2,004 meters with additional space for fishing vessels, ship repair, and construction; and adjacent storage facilities. Water depths adjacent to the berths range from 7-10 meters. The navigational channel to the port is 12.5 m deep, 60-80 m wide and 4.8 km long. The port has 23 cranes with lifting capacities of 5 tons and 6 cranes with lifting capacities of 15 tons. The warehouses have a covered surface area of 27,273 sq m and open storage areas of 381,000 sq m.

Activities at the port are divided into either cargo handling (west of the harbor) or ferry services (east of the harbor). Berths 0 through 8 are located west of the harbor and accessible through three separate alignments. These berths are served by older, lower-capacity cranes with grabs of a maximum capacity of 5 metric tons. The port does experience its share of container traffic, however, existing facilities cannot efficiently accommodate the ship/shore

transfer. Berths 6 through 8 are dedicated to the handling of bulk cargoes and are equipped with metal hoppers and other specialized equipment.

To the east of the harbor, Berth 9 is used as the ferry terminal complete with its customs and truckdrivers' facilities. In general, the facilities are not structurally sound. Currently, the ferry terminal is the most important section of the Port of Durres. Given the levels of traffic through this facility and expected future demand, it has been forecast that two additional berths will be needed sometime before 2000-2003.

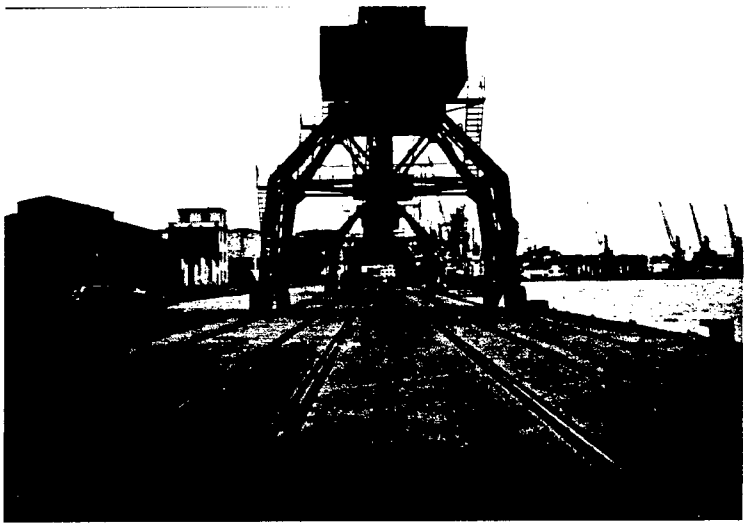


Photo 3-10 Port of Durres, Container Berth

3.1.3.2 Bulgarian Ports (Physical Characteristics)

Bulgaria has two major ports located on the Black Sea, the Port of Varna and the Port of Burgas. Both ports represent the maritime gateway of the East-West Corridor in the Black Sea and link that corridor with seaports worldwide. Both port complexes are integrally constructed commercial and transport systems, which function all-year-round for carrying out loading and unloading, load transfer, bunker loading, pilotage, maneuver, and other activities and services. Following is a general description of the physical facilities of both ports.

Port of Varna

The Port of Varna was inaugurated in 1906. Its complex extends inland from the Varna Gulf over a large area that is 30 km in length. It is located at 43N 27E 117 km north of the Port of Burgas and 169 km south of the Port of Constanta. The port is strategically important to Bulgaria because of its proximity to the nation's major industrial plants and road and rail transport infrastructure systems. It is also important to central Europe because of its road and rail links to the Port of Ruse on the Danube. The Port of Varna is a strategic junction between Europe and both the Middle East and Central Asia. Therefore, the area of the city of Varna must be considered a major industrial and transportation conglomerate, which is not only of local, but national and international economic importance.

The Port of Varna performs the following functions: conventional loading and discharging of vessels and modern door-to-door and plant-to-port cargo handling of bulk cargoes; handling of heavy and very heavy 20- and 40-ft containers, pallets, bags and ro-ro type of cargoes; managing of containers destined for, or originating from, municipal factories, plants, companies, and enterprises; transshipment of soda ash, saltpeter, and caustic soda; and containerization, decontainerization, and palletization of different parcel units.

The Port of Varna consists of two separate ports: the Port of Varna East and the Port of Varna West. The Port of Varna East is located at the mouth of the Black Sea – Varna Lake Canal, which is immediately to the south and adjacent to the city of Varna. The Port of Varna West is located at the far west end of the Varna Lake. Both ports are connected by a navigable channel, "Black Sea-Varna West Port", which is 23 kilometers long, of which Channel 1 is 6 km long and Channel 2 is 10 km long. Channel 1 and 2, leading to the Port's hydro-electric power plant, were deepened in 1996-97 to 12.5 meters, while their depth in other sections is shallower because of congestion.

The general location of the Port of Varna East and the Port of Varna West is depicted in Figure 3-7. The general layouts of both ports also follow in Figures 3-8 and 3-9.

Varna East

At present, the port handles general cargoes, containers, machines, technical equipment, metal, fertilizers, and grain.

There are 13 berths, 2201 m in length, which are used for cargo handling, 2 berths for passenger ships, and one berth that is used by the port fleet. The depth alongside the berths varies from 7.5 to 11.5 m. The port has a total of 11,560 m^2 of open storage areas for the container terminal and 4,800 m^2 of covered storage areas.

There are 30 various port cranes in operation with lifting capacities of 5 to 30.5 tons plus a floating crane of 100-ton capacity. In addition to the cranes, the port has the following various supporting equipment: 46 different tractors, tug units, lorries, and semi-trailers; 11 mobile cranes of varying capacities; 8 front and bucket loaders; 22 motorcars; 7 cradle lifts; and 15 freight and special vehicles. Also, the port has a wide range of grabs for handling bulks and scrap metal, such as claw grabs, spreaders, and other specialized devices.

Varna East has a container terminal on Berth No. 5, offering 8.0 meters depth of water along its length of 169 m.

Shipside operations are served by one container gantry and two multipurpose cranes. Landside operations are carried out by two further multipurpose cranes.

Ro-ro vessels berth "stern-to" on a normal berth, using low anchors. This arrangement is adequate for the low volume and small-size vessels currently used.

The container park is not deep by normal standards. There are about 650 TEU ground slots with containers stacked up 4 high.

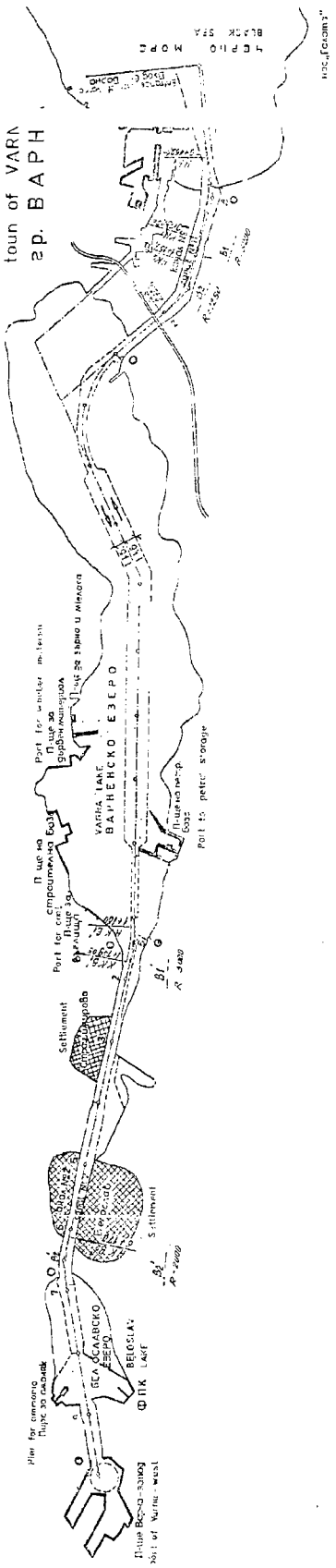


Figure 3-7 General Location of the Ports of Varna East and Varna West with Connecting Channel

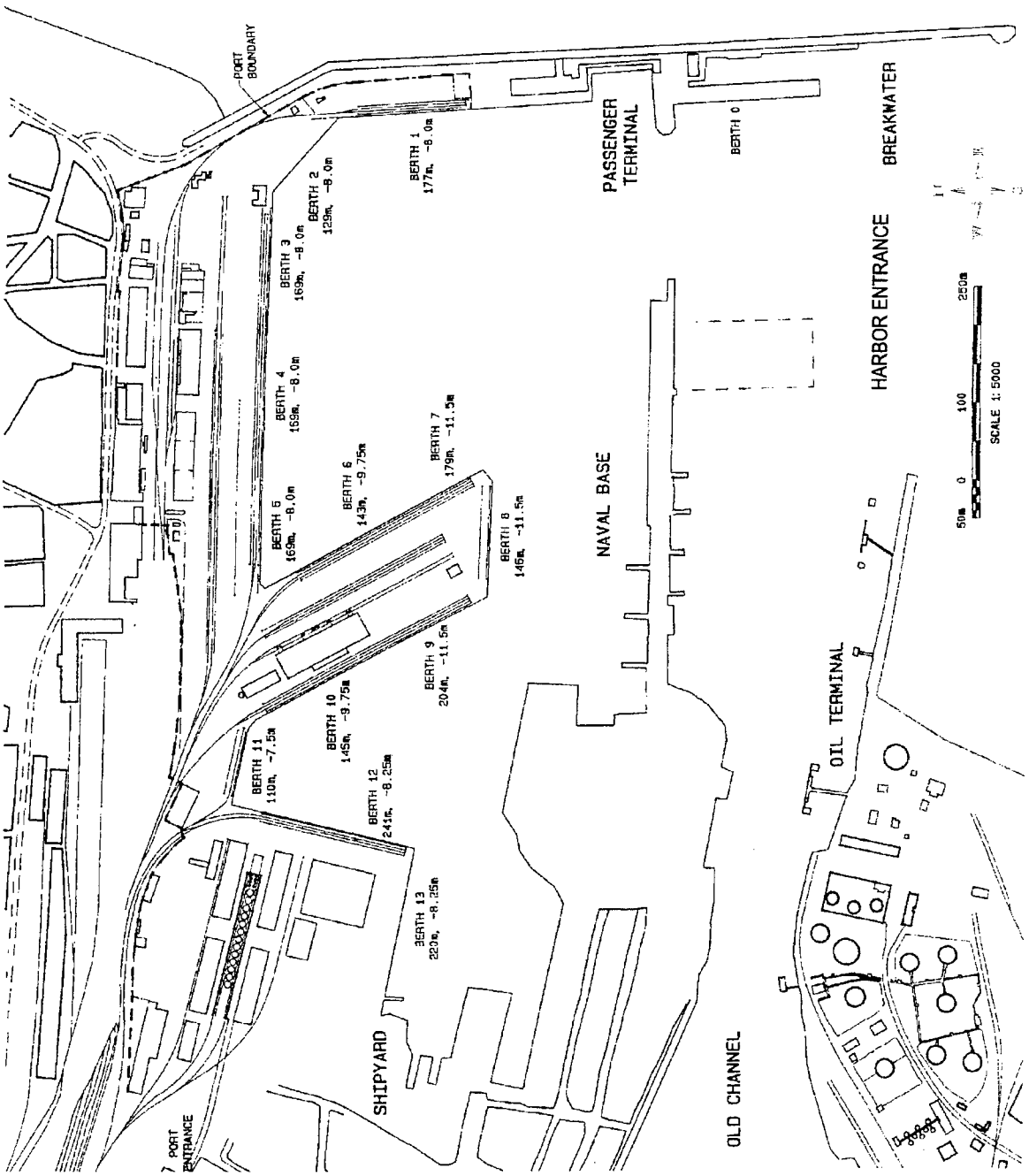


Figure 3-8 General Layout of Port of Varna East

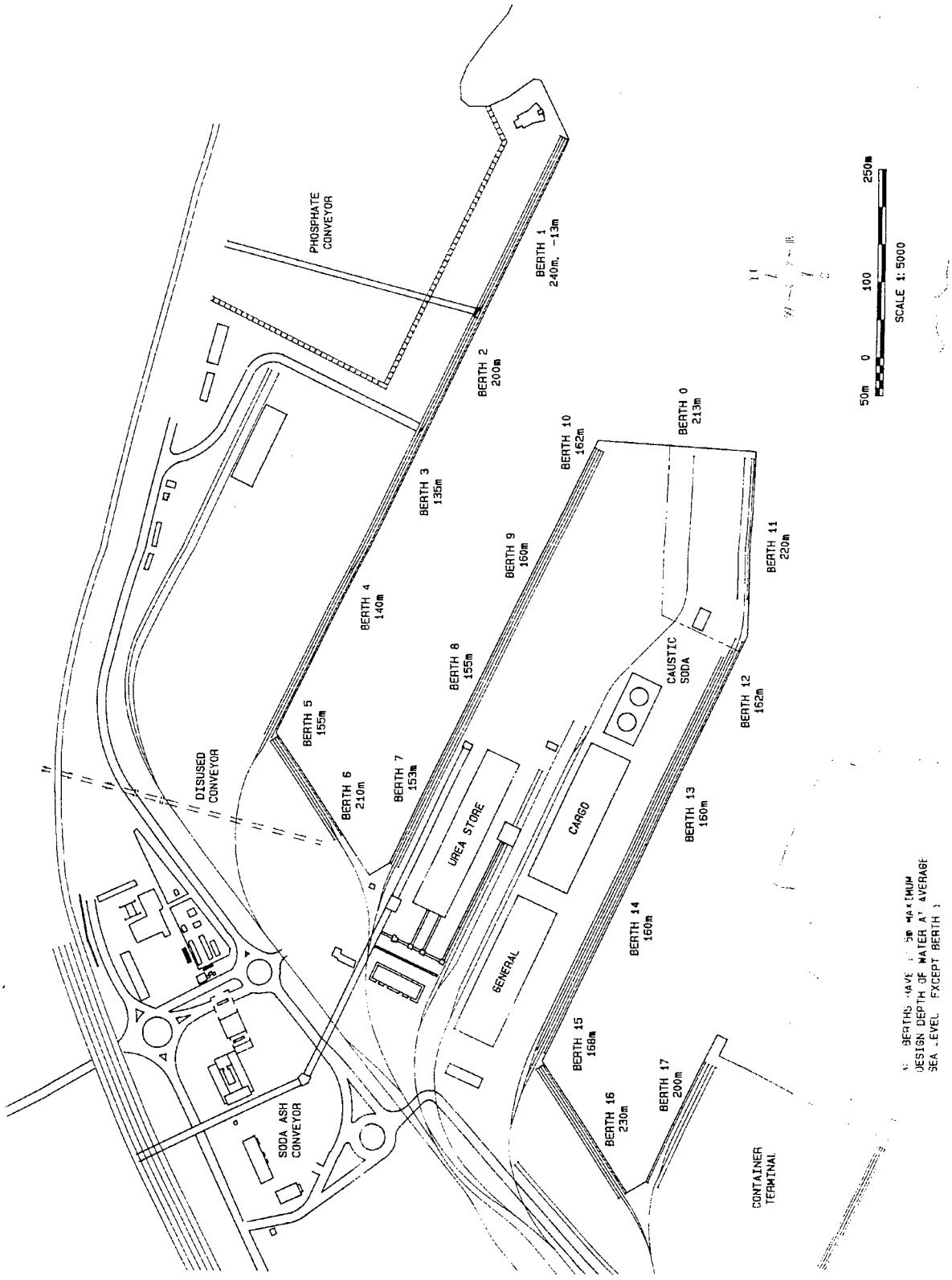


Figure 3-9 General Layout of Port of Varna West

Varna West

The port is suited and used for handling bulk cargoes, such as coal, coke, phosphorite, apatite, ores, chemicals, sugar, and cement. There are mechanized units utilized for handling calcinated soda and urea. Cargoes in bags, packages, and pallets are also handled, as well as liquid cargoes.

There are 17 berths; the total wharf length is 3,223 m with a maximum design depth of 11.5m. (See Figure 3-9 for the general layout of the port.) The port has about 155,000 m^2 of open storage areas and 13,800 m^2 of covered storage areas.

The port handles ships by means of 30 electric quayside cranes with lifting capacities between 10 and 16 tons and two portainers with lifting capacities of 30.5 tons. In addition, there are conveyor systems and two PWH loaders for handling bulk cargoes and stacks on berth No. 7. The port has nine Volvo front-end loaders; 5 KALMAR heavy duty forklift trucks; 12 BOBKETI forklift trucks; nine Bolgar tractors used as tug units for the 12-ton trailers; six traction engines for containers; and Belarus tractors used for moving wagons. Also, the port has 13 forklift trucks with loading capacities of 1.4 tons, 2.0 tons, and 3.0 tons. When it is necessary, three mobile cranes are used. The port cranes are equipped with grabs, spreaders, and other handling devices.

Berth No. 17 is a specialized container terminal that is up to 11.5 meters deep. Shipside operations are carried out by two quayside gantries. Also, two multipurpose cranes are available for shipment receipt and delivery by train. There are five toplifters, which are very space-inefficient.

There is a deep container park with adequate surfacing. In the past, the terminal has handled up to 40,000 containers per year. An operation based on straddle carriers or gantries would create about 1,400 TEU ground slots.

There are four key problems with a container terminal at the Port of Varna West:

- First, a major problem is the lack of suitable handling equipment, such as transtainers at the rear facilities. Instead of transtainers operating on block storage of containers, heavy duty Kalmar fork lifts and low density surface storage of containers are used. The use of the Kalmar heavy lift trucks with their large axle loads (up to 100 tons on the front axle) has resulted in damage to areas of the stacking area pavement, which were not originally designated for such loads.
- Second, an operational problem is the division of cargo between this port and the Port of Varna East. Varna West is an additional 2.5 hours steaming from Varna East, where a small container terminal is operated for Bulcon. The port costs for vessels using the Bulcon terminal are lower than the costs for Varna West, and the Varna East terminal is more easily reached by vessels entering from the Black Sea.
- Third, current rules impose mandatory use of expensive tugs and pilots. Some reductions in charges have been made for some vessels.

- Fourth, there are delays in the channels due to adverse weather conditions, particularly fog, and to the scheduling of vessels to avoid having them pass in the channels. Recent measurements indicate that there has been fog for an average of 14 hours per month. Such delays can adversely affect container vessel schedules.

Therefore, it is because of these reasons that even in the long-term, a container terminal located in Varna West will never be sufficiently commercially attractive to shipping companies for it to flourish and be able to attract additional cargoes. In the long term, Varna West cannot be considered as the principal container terminal.

Previous consultants' studies have concluded that both Varna East and Varna West have some drawbacks. These studies recommended that a new container terminal at a more attractive location should be established in the long-term. Operations would be transferred to the new terminal from Varna West, and most likely from Varna East as well.

Rail and Ferry Terminal

The terminal is located on the south side of Varna Lake, near Varna West. It was constructed as a dedicated facility to operate rail ferry service to Ilitchovsk (Ukraine). The operation started in 1975 using 4 vessels (capacity 108 wagons). The ferry is still operating, although at a reduced frequency due to the change in traffic patterns.

The terminal has two berths for ferries, which are designed specifically for the boats used on this service. The land facilities stretch for a distance of 5 km, and include extensive marshaling yards and sheds where the wagon bogies are changed to accommodate the differing rail gauge. The wagons that are used are all Russian, and can only be used in Bulgaria due to the modified bogies. Thus transit cargo for destinations beyond Bulgaria (Macedonia, for example) has to be transferred to other wagons.

Power Station Coal Terminals

Two jetties, on the north side of Varna Lake, serve as dedicated coal terminals for the power stations. The maximum draught for vessels at the coal jetties is 8.5 m, which severely limits the size of vessels that can be used for coal transport. The power stations are no longer used as base-load stations, and hence the demand for coal imports is considerably reduced.

Oil Terminal

The oil terminal is located near the entrance of Varna Lake. It has three berths, capable of handling vessels up to 25,000 dwt. The storage tanks have a capacity of 60,000 dwt, and are used for oil and oil products. There is also tankage for the import of molasses.

Timber Terminal

This port was constructed by the Committee for Woods, to serve the timber-operating concession in the Komi region of the Soviet Union. The terminal is on the north side of Varna Lake and has three berths, with a depth of 8.75 m.

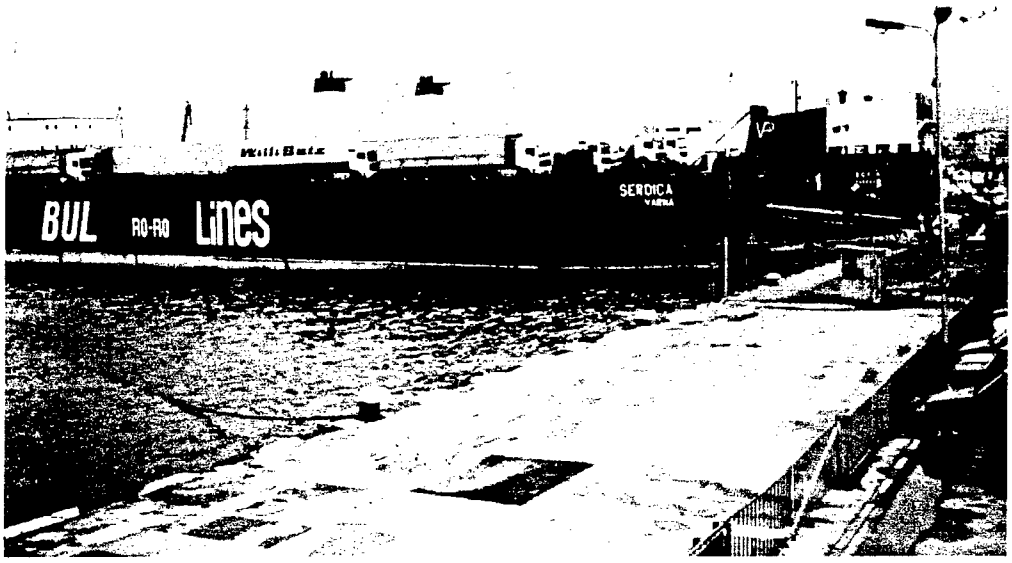


Photo 3-11 Port of Varna, Ro-Ro Berth

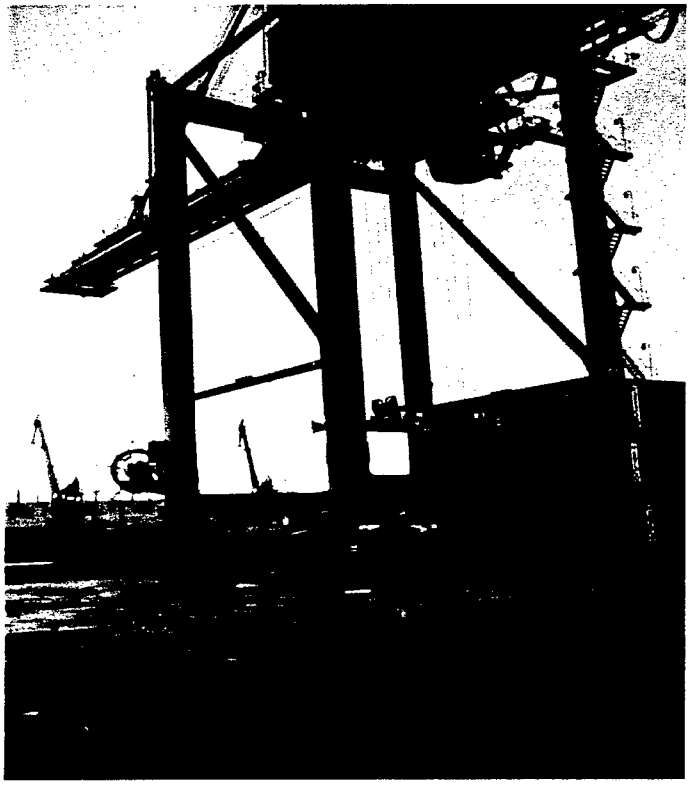


Photo 3-12 Port of Varna, Container Berth

The Port of Burgas

The Port of Burgas was built and inaugurated in 1903. Situated in the center of Burgas Bay, the Port of Burgas is the first seaport for ships entering the Black Sea from the Bosphorous, and is located at 42N 27E. Its natural geographic position and well-established communications network connect the port not only with South Bulgaria but also with the countries of Eastern and Central Europe. The Port of Burgas is an important and strategic junction between Europe and the Middle East, as well as between Central Asia and Europe via the Caucasus.

Every year, from 1,300 to 1,900 vessels call at the port, in addition to oil tankers. In terms of volume, the port's historical peak was reached in 1989 with 21.1 million tons. However, from 1989 to 1992, the 3-year period following the collapse of the communist rule, the port's traffic decreased to an annual average cargo output ranging between 6.5 and 9.5 million tons of general and bulk cargo in addition to 12 to 18 million tons of petroleum products.

With the available material assets, different cargoes can be handled and stored through the whole year. The port's specialization is as follows:

- Berths 1 to 6 specialize in general cargo handling of metals in bands, rolls, bags, cases, and palletized cargo, to name a few
- Berths 7 to 10 are for passenger shipment
- Berths 11 to 13 specialize in handling of metals, equipment, bulk cargo, where bagged fertilizers predominate, as well as cargo in cases, bands, metal strap, and others
- Berths 14 to 16 are used by the port fleet vessels and the ships of the controlling authorities
- Berths 17 to 20 are used for general cargo handling requiring covered storage, such as sunflower, flour, and palletized cargo; up to 300,000 tons per year of chemicals and petro products are also handled
- Berths 21 to 25 are mainly used for handling of wooden materials, animals, containers, salt, and metals with a weight of up to 20 tons

The port of Burgas has a total quay length of 4,905 m and a total of 28 berths (of which 24 are operative); the water depth varies from 7.3 to 13.7 meters in both the aquatoria and the seaship berths. There is a total of 311,600 m^2 of open storage areas and 74,900 m^2 of covered storage facilities. The land transportation network comprises 22.4 km of roads and 12.4 km of railways. Figure 3-10 shows the Master Plan of the Port of Burgas indicating existing as well as planned future facilities.

The Port of Burgas includes the following facilities:

- General stock exchange and trading harbor of Burgas
- Oil Harbor
- East Harbor
- Bulk Cargoes Harbor
- West Harbor
- Lozovo buffer warehouse base

The engineering characteristics of the port are summarized in Table 3-13.

The port can handle ships with a deadweight up to 25,000 t, 40,000 t, 60,000 t, and 100,000 t for the East Harbor, Bulk Cargoes Harbor, West Harbor, and Oil Harbor, respectively. The Port of Burgas has the mechanization shown in Table 3-14.

Every year the port invests between $2.5 million and $3.2 million for the renovation and modernization of technological equipment.

The principal restrictions at the Port of Burgas are as follows:

- Lack of land adjacent to the port for expansion of storage areas
- Lack of refrigerated storage (for meats, fresh fruits, vegetables)
- Bonds required for transit cargoes are frequently set at a high level
- Bulk berths are too close to residential areas to satisfy environmental criteria
- Depth limitations at the bulk and container berths
- The port can only handle ships with a deadweight of up to 100,000 tons
- Lack of dedicated container and ro-ro facilities

Absence of a clear legal framework for the Port Authority to enable it to form joint ventures for future projects

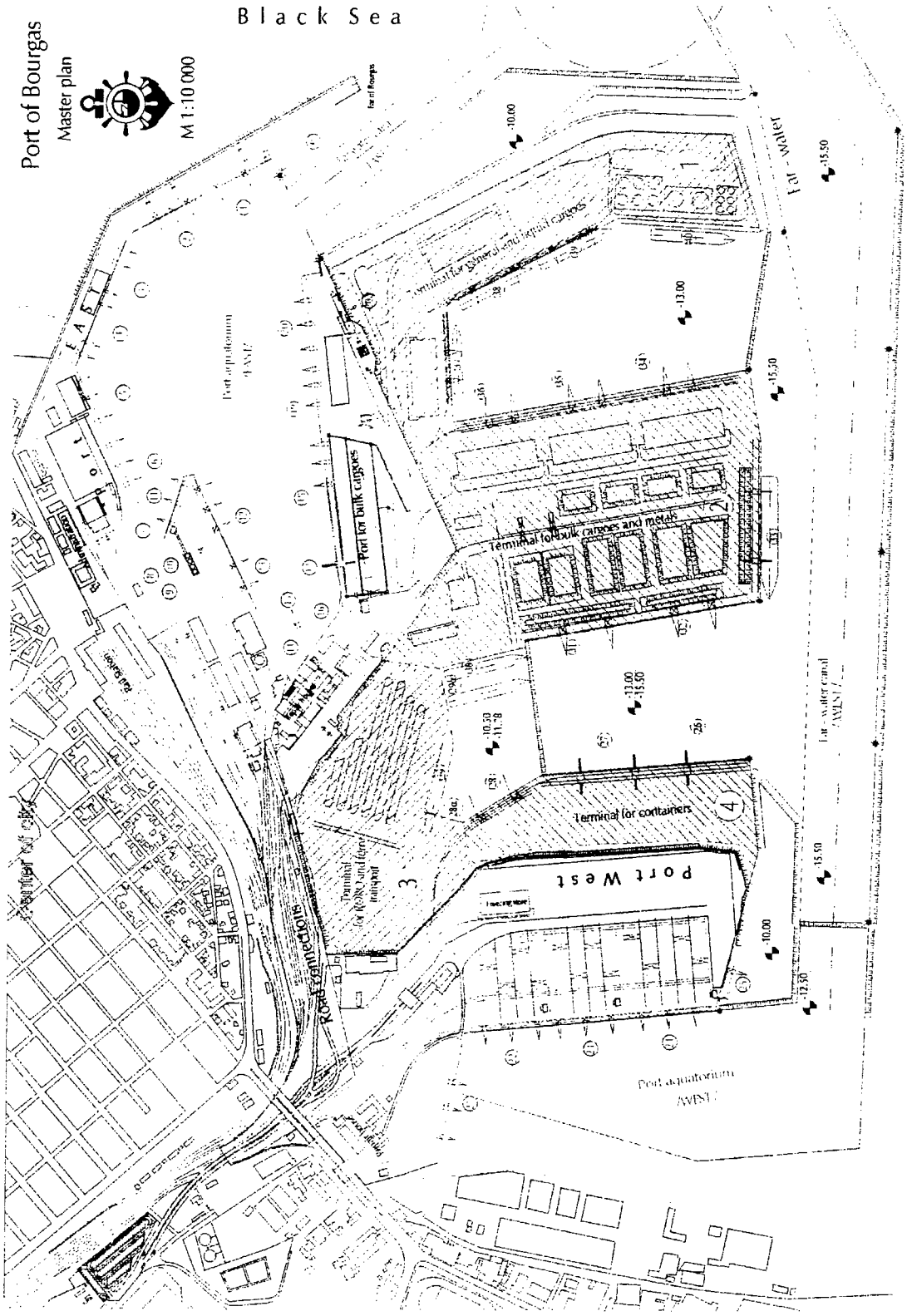


Figure 3-10 Port of Burgas – Master Plan

Table 3-13
Port of Burgas Engineering Characteristics

	East Harbor	Bulk Cargoes Harbor	West Harbor	Oil Harbor	Lozovo Base - House
Quay length (m)	1,965	750	890	300	-
Total number of berths	14	5	6	3	-
Operative berths	10	5	6	3	-
Water depth (ft)					
at the port mouth	41	41	41	41	41
in the aquatoria	29-36	36	36	24-45	-
in the seaship berths	24-33	36	36	24-45	-
Storage areas (sq m)	94,500	54,000	202,000	-	36,000
covered areas	44,500	5,000	11,000	-	14,400
open areas	50,000	49,000	191,000	-	21,000
Road network (m)	2,500	1,800	2,100	3,000	13,000
Rail network (m)	4,500	4,600	1,500	-	1,800

Table 3-14
Port of Burgas Mechanization

Type of Equipment	Quantity
Universal seaport cranes (up to 40 t)	50
Landside portal cranes (5-20 t)	9
Bridge cranes (20-32 t)	8
Magnet cranes (up to 20 t)	4
Quay unloaders (up to 18 t)	1
Coal unloader (1500 t/h siwertell)	1
Floating cranes (up to 100 t)	1
Chain cranes (12-50 t)	15
Frontloaders	20
Fork lift trucks (1-20 t)	70
Reach stacker (41 t)	2
Terminal tractors (30 t)	16
Tractors with trailers (3-12 t)	50
Weighbridges (up to 50 t)	8
Railway loading station for bulk cargoes	9
Port fleet: tugboats with a towage capacity (600- 2400 hp)	11
Barges (500-1500 t deadweight)	8

Photo 3-13 Port of Burgas, General View

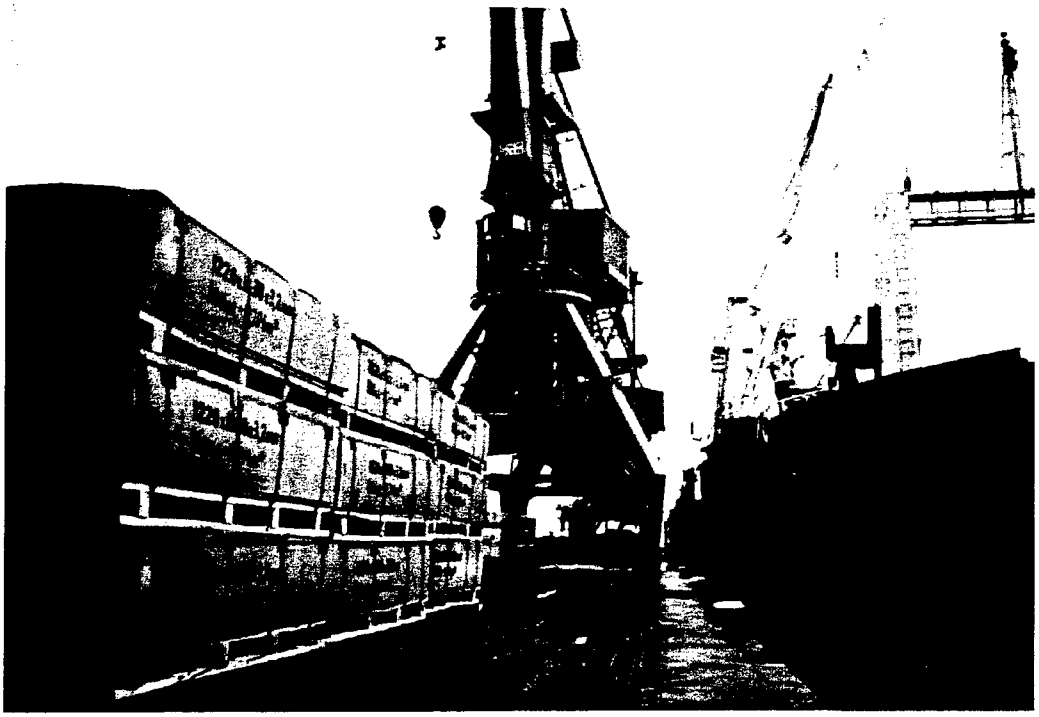


Photo 3-14 Port of Burgas, Ship-Loading Activities

Four harbors exist within 60 km of Burgas and are also under the jurisdiction of the Port of Burgas. The loading and unloading activities are rather limited at these four harbors. They include:

- **Nessebar Harbor**. This harbor has a 410-m-long fishing wharf with a water depth of 6 to 8.5 meters.
- **Pomorie Harbor.** Pomorie Harbor is located south of Nessebar Harbor and 18 km north of the Burgas port complex. The facilities consist of the northern and eastern wharves protected by a common breakwater. The northern wharf is 280 m long and 8 m wide. It is designed to serve as a mooring facility for passenger ships. The eastern wharf has a length of 150 m and width of 30 m. It is principally used as a cargo berth with limited open storage capability.
- **Sozopol Harbor.** This harbor is located 25 km south of the Port of Burgas and is mainly used by passenger ships and local fishing boats. The wharf has a water depth of 4.5 m.
- **Tzarevo Harbor.** Tzarevo Harbor is situated about 20 km south of Sozopol. It handles small cargo ships. The two berths have a water depth of 3.5 and 4.4. meters.

3.2 OPERATIONAL AND PERFORMANCE CHARACTERISTICS

3.2.1 Roads

Highway Vehicle Fleets

The study nations (Albania, Macedonia, and Bulgaria) are undergoing major economic restructuring as a result of their change from state-regulated to free economies. Travel patterns are constantly changing due to political events that dictate the opening and closing of borders. The U.N. sanctions against Serbia skewed Macedonian north-south road movements, formerly the dominant traffic pattern. The east-west road and rail links between Macedonia and Albania to the west and Bulgaria to the east are in disarray and there are several cases where rail links across borders do not exist. The Greek embargo against Macedonia, which has now been lifted, resulted in severe economic difficulties for Macedonia.

Macedonian government economists estimated the combined cost to the economy from the U.N. sanctions against Serbia and the Greek embargo to be US$ 100-160 million per month. In Bulgaria, the cost was estimated at $220 million per month, and for Albania, $80 million per month.[1]

It is against this chaotic and dynamic background that highway conditions and the growth of the vehicle fleets in the three study nations must be considered. For nations with nominal traffic volumes, yet positive economic growth forecasts, changes in fleet sizes can be a first indication of the potential magnitude of traffic growth that can be expected.

[1]USTDA South Balkan Transport Initiative Desk Study, Final Report (TDA 95-756A), pp. 1, 2.

As with most countries experiencing increased economic development and potential, private vehicle ownership is rapidly increasing. These trends have occurred time and again in Asian countries where increased economic activity has resulted in more truck traffic, as well as more personal wealth and therefore more personal travel via private automobiles or taxis.

Table 3-15 summarizes vehicle growth trends for the three study countries. As can be seen, there has been significant growth, especially in passenger cars and buses which constitute the "other" category.

Table 3-15
Vehicle Fleets

Country	Year	Total Vehicles (thousands)					
		Goods Vehicles		Others[1]		Total	
		No.	% Increase	No.	% Increase	No.	% Increase
Albania	1989	16		20		36	
	1994	38	138	104	420	142	294
Macedonia	1984	13		189		202	
	1994[2]	25	92	375	98	400	98
Bulgaria	1985	104		1,558		1,662	
	1994[3]	145	39	2,233	43	2,378	43

1 Includes passenger cars, buses, and others

2 Estimated from 1993 data

3 Estimated from 1992 data

Albania's fleet has grown at a phenomenal rate in a relatively short time. This is due to the 1992 lifting of the decades-old ban on private vehicle ownership. The bulk of the subsequent increase in vehicles has been made up of second-hand cars from all over Europe. Used Greek buses have also been imported in mass quantity.

Macedonia started the period with a substantial number of vehicles and has almost doubled its size, with generally the same percent increase in truck and car fleets.

Bulgaria has experienced slower growth, due in part to its already established car fleet and a largely stagnant Gross Domestic Product.

With the lifting of the artificial restraints against trade which have existed in the study area and an expected acceleration in the movement towards free trade, a continuing increase in road vehicle population in the study nations can be expected, with attendant pressure on national road construction and maintenance funding.

Border Crossings

To identify the international traffic-flow characteristics within the study corridor, six roadside origin-destination surveys were conducted in October 1995 by the Balkan Transport Study Team. The average daily flows at the sites surveyed are summarized in Table 3-16.

Table 3-16
Average Daily Flow of Vehicles in East-West Corridor

Site	Westbound Vehicles		Eastbound Vehicles	
	Cars & Buses	Commercial Vehicles	Cars & Buses	Commercial Vehicles
Bulgaria/Macedonia Border				
Gyueshevo	268	194	283	265
Stanke Lisichkovo	114	145	101	92
Zlatarevo	370	147	338	128
Subtotal	752	486	722	485
Albania/Macedonia Border				
Blato	27	11	24	11
Qaf Thanë	1	54	2	55
Tushemisht	38	3	47	5
Subtotal	66	68	73	71

Source: Balkan Transport Study Interim Report, Volume A, Issue 2, December 1996.

The main traffic movements are between Macedonia and Bulgaria, with an average daily volume of approximately 2,450 vehicles crossing the border, as shown in Table 3-16. Approximately 40 percent of this traffic consists of commercial vehicles.

The Albanian/Macedonian border flows recorded are much smaller with 139 commercial vehicles per day, and a similar number of cars/buses.

This would suggest that there is little through-traffic from Bulgaria to Albania, with the majority of traffic being made up of bilateral trade between Bulgaria and Macedonia as well as between Macedonia and the rest of Europe. The origin-destination surveys of vehicles crossing these borders confirms this finding. Figure 3-16 depict the origin-destinations for the Bulgarian/Macedonian border (westbound only) and the Albanian/Macedonia border (westbound and eastbound) for passenger vehicles and commercial vehicles, respectively.

These movements suggest that the critical link in east-west travel is between the center of Macedonia and Bulgaria. Although current through-movements are small between Albania and Macedonia, as port and road facilities in Albania improve, it is possible that travel demands will increase.

East - West Corridor Constraints or Bottlenecks

Three different types of constraints or bottlenecks to east-west travel were identified: (1) condition of existing roads; (2) physical conditions making new or improved roads difficult to construct; and (3) weather.

3.2.1.1 Albanian Roads (Operational and Performance Characteristics)

The road between Durres and Kafasan is in dire need of repair, widening, and otherwise improving its geometrics and safety characteristics. The World Bank, EBRD, and the Kuwait Fund have embarked on a major improvement program of this highway.

The traffic-counting program, performed in 1995/1996, shows that the average annual daily traffic volume on the Durres-Tirana and on the Durres-Lushnje sections are heavy. Reports of up to 25,000 vehicles per day, in this section of the road, were made before last year's hostilities began. Traffic, however, falls off in the road between Durres and Kaffasan on the Macedonian border. Traffic patterns along this east-west road section will probably take some time to stabilize after conditions in the country return to normal.

The poor pavement conditions of Albania's road network prevent it from being able to accommodate increased truck traffic. These poor road conditions are compounded by exposure to snow and ice, which limit movements during the winter months. Therefore, the main constraints to good east-west travel in Albania are:

- Mountainous sections and poor pavement between Durres and Kafasan
- Insufficient bypassing of towns along the corridor
- Exposure to harsh winter weather conditions at the Albanian/Macedonian border

The following Table 3-17 shows the average annual daily traffic for various classes of vehicles for the road section between Elbasan and Kafasan.

Table 3-17
Average Annual Daily Traffic (AADT) Statistics for Elbasan-Kafasan Highway, 1995

Segment	Cars/Vans < 2 T	Vans/Trucks 2 - 6 T	Trucks > 6 T	Trucks with Trailer	Semi-trailers	Buses	Total
Elbasan - Kafasan:							
Elbasan - Librazhd	579	250	300	215	141	65	**1,550**
Librazhd - Elbasan	580	265	315	210	150	60	**1,580**
Total	**1,159**	**515**	**615**	**425**	**291**	**125**	**3,130**
Librazhd - Kafasan	695	300	250	123	182	68	**1,613**
Kafasan - Librazhd	695	290	288	130	180	69	**1.557**
Total	**1,390**	**590**	**538**	**253**	**262**	**137**	**3,170**

SOURCE: INSTAT (Instituti I Statistike), Tirana, Albania; Feb. 1996

3.2.1.2 Macedonian Roads (Operational and Performance Characteristics)

Overall, east-west travel is not severely constrained in Macedonia. There are some spot problems that if corrected would improve conditions. These include:

- Mountainous sections on E870 (Kriva Palanka to E75) and on sections of E65 in Macedonia
- Delays occur at many at-grade intersections on the outskirts of Skopje
- Inadequate facilities and procedures at the Bulgarian/Macedonian border
- Exposure to harsh winter weather conditions at both borders

Traffic is counted on the magistral and regional roads either manually or automatically. Table 3-18 gives a detailed Average Annual Daily Traffic (AADT) volume count for key sections of the East-West Corridor roads for various classes of vehicles.

Figure 3-11 depicts the AADT for all major roads in Macedonia. AADT values for the East-West Corridor roads range between a low of 2,159 to a high of almost 16,000 vehicles on the outskirts of Skopje.

The major roads of the east-west route in Macedonia are the Northern Route and the Central Route. Between 1995 and 1996, both routes were supplied with signalization and facilities needed to make them safe. This program was based on construction-performance projects and conform to US standards, regulated by the Traffic Signalization Rules, the Traffic Signal Law, and site inspections. All projects were reviewed by the Magistral and Regional Roads fund of Macedonia.

This signalization project identified three types of signals – danger signs, expressed orders, and signs for obligations and information. The danger signs are indicated for curves, uphill and downhill sections, recesses, slippery sections, and others. Signs for expressed orders govern the permitted road speed, driving directions, emergency pull out, and parking. The information signs indicate roadside objects, such as petrol pumps, motels, and mountain passes. The form, dimension, and color of the signs conform to the Traffic Signs Law.

In 1994, a uniform system of traffic flow on the magistral and regional roads was approved. The law covers all elements necessary to promote safe driving.

Table 3-18
Average Annual Daily Traffic (AADT)
Macedonian Main East - West Road Network - 1996

Road No.	Road Section	Length (km)	Light Vehicles	Jeeps Vans	A A Busses	D T Trucks	Truck/Trailer Combinations	TOTAL
NORTHERN	ROUTE							
M-4	(Albanian border) Kafasan - Struga	12.0	2,273	64	16	112	88	2,553
M-4	Struga - Podmolje	7.7	5,792	122	49	260	76	6,299
M-4	Podmolje - Botun	14.9						4,306
M-4	Botun - Kicevo	38.8	2,034	97	75	145	43	2,394
M-4	Kicevo - Gostivar	45.8						3,913
M-4	Gostivar - Tetevo	21.2	8,250	411	253	1,245	476	10,635
M-4	Tetevo - Skopje	42.8						8,218
M-4	Skopje Ring Road							15,818
M-1	Skopje - Miladinovci	25.6						4,448
M-1	Miladinovci - Kumanovo	16.5						4,979
M-2	Kumanovo - Stracin	37.1	3,321	173	154	493	232	4,373
M-2	Stracin - Kriva Palanka	26.6						2,159
M-2	Kriva Palanka - Deve Bair (Bulgarian border)	13.3	1,733	166	176	491	234	2,800
	WEIGHTED AADT	**302**	**3628**	**175**	**130**	**463**	**193**	**4781**
CENTRAL	ROUTE							
M-4	(Albanian border) Kafasan - Struga	12.0	2,273	64	16	112	88	2,553
M-4	Struga - Podmolje	7.7	5,792	122	49	260	76	6,299
M-4	Podmolje - Ohrid	4.9	8,093	319	247	533	219	9,411
M-5	Ohrid - Resen	36.9						2,647
M-5	Resen - Bitola	28.7						2,564
M-5	Bitola - Prilep	39.4						2,806
	Prilep - Titov Veles	81.2						2,192
M-5	Titov Veles - Stip	36.4						3,369
M-5	Stip - Krupishte	11.3						2,536
M-5	Krupishte - Kocani	16.4						5,069
M-5	Kocani - Makedonska Kamenica	28.4						1,295
M-5	Makedonska Kamenica - Delcevo	24.7	1,211	68	59	193	201	1,732
M-5	Delcevo - Bulgarian border	11.0						2,000
	WEIGHTED AADT	**339**	**2869**	**100**	**66**	**218**	**159**	**2718**

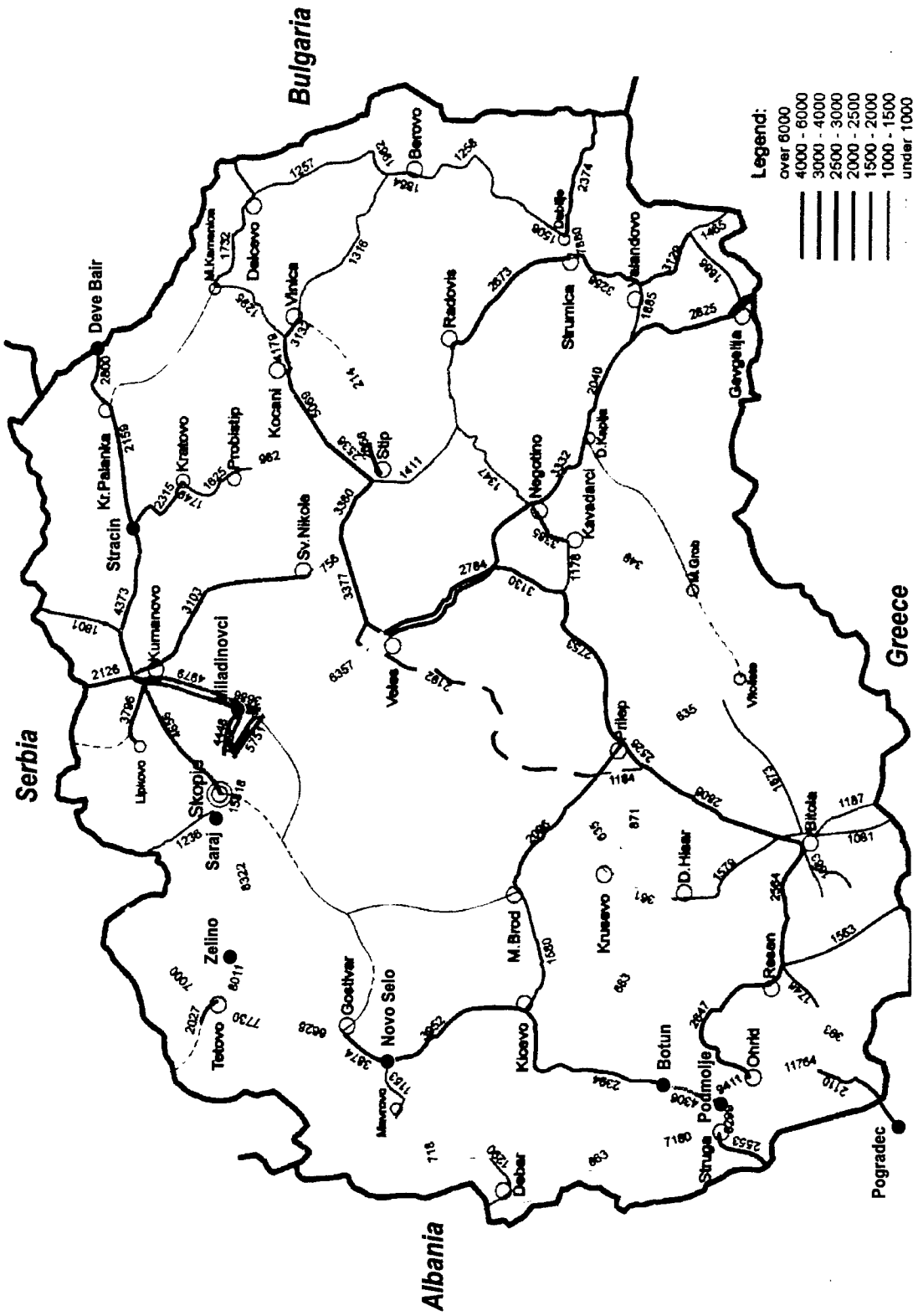


Figure 3-11 1996 Average Annual Daily Traffic on the Existing Roads in Macedonia

3.2.1.3 Bulgarian Roads (Operational and Performance Characteristics)

In Bulgaria the capacity of the existing road system is beginning to be a constraining factor. Whereas overall pavement conditions are fairly good nationwide, there are some problems on east-west routes. A list of major constraints or bottlenecks include:

- Congested traffic conditions in towns along E773 west of Burgas
- High traffic volumes on single carriageway sections of E773
- Heavily congested single carriageway sections on the ring road west of Sofia
- Poor pavement and alignment on E87 north of Burgas
- Congested signalized crossroads junction connecting E79 (E871) with Sofia Ring Road

There are steep gradients and poor pavement sections of single carriageway on E871 to Gyueshevo.

Table 3-19 gives the average daily traffic volume for both the external and the domestic flows for light and heavy vehicles along the East-West Corridor in Bulgaria. The AADT, of both light and heavy vehicles, on all road sections along the East-West Corridor is provided in Section 4.2 of Volume 2.

Table 3-19
Average Annual Daily Traffic (AADT) for East-West Corridor Highway Routes in Bulgaria (1995)

		EXTERNAL FLOWS				DOMESTIC FLOWS				TOTAL FLOWS			
Segment	Length (km)	Cars	Trucks	Buses	**Total**	Cars	Trucks	Buses	**Total**	Cars	Trucks	Buses	**Total**
NORTH ROUTE													
Varna - Shumen	90	721	76	18	**815**	2013	1197	210	**3420**	**2734**	**1273**	**228**	***4235***
Shumen -Targovishte	41	792	84	22	**898**	3400	1705	110	**5215**	**4192**	**1789**	**132**	***6113***
Targovishte - V Tarnovo	99	777	84	19	**880**	1005	712	69	**1786**	**1782**	**796**	**88**	***2666***
V Tarnovo - Ablanitza	79	919	100	23	**1042**	1938	1277	91	**3306**	**2857**	**1377**	**114**	***4348***
Ablanitza - Yablanitza	49	1056	115	26	**1197**	76	614	0	**690**	**1132**	**729**	**26**	***1887***
Yablanitza - Botevgrad	39	1842	196	64	**2101**	2742	1995	152	**4889**	**4584**	**2191**	**216**	***6990***
Botevgrad - Sofia	63	2520	271	89	**2880**	7739	2650	283	**10672**	**10259**	**2921**	**372**	***13552***
	460												
CENTER ROUTE													
Burgas - Sliven	114	353	45	22	**420**	882	1962	345	**3189**	**1235**	**2007**	**367**	***3609***
Sliven - Kazanlak	62	508	52	14	**574**	1077	949	113	**2139**	**1585**	**1001**	**127**	***2713***
Kazanlak - Karlovo	47	815	83	22	**920**	7138	3077	610	**10825**	**7953**	**3160**	**632**	***11745***
Karlovo - Karnare	13	815	100	41	**956**	7138	3264	186	**10588**	**7953**	**3364**	**227**	***11544***
Karnare - Sofia	129	684	72	19	**775**	1097	1073	222	**2392**	**1781**	**1145**	**241**	***3167***
	365												
Varna - Burgas	134	524	46	36	**606**	3058	828	188	**4074**	**3582**	**874**	**224**	**4680**

Table 3-19 (cont'd)
Average Annual Daily Traffic (AADT) for East-West Corridor Highway Routes in Bulgaria (1995)

		EXTERNAL FLOWS				DOMESTIC FLOWS				TOTAL FLOWS			
Segment	Length (km)	Cars	Trucks	Buses	**Total**	Cars	Trucks	Buses	**Total**	Cars	Trucks	Buses	**Total**
SOUTH ROUTE													
Burgas - Sliven	114	353	45	22	**420**	882	1962	345	**3189**	**1235**	**2007**	**367**	***3609***
Sliven - Stara Zagora	71	84	7	4	**95**	5286	1376	263	**9295**	5370	1383	267	***7020***
Stara Zagora - Popovitza	62	234	22	9	**265**	1435	1306	18	**2759**	1669	1328	27	***3024***
K. Andreevo - Haskovo	78	3401	432	301	**4134**	1589	1043	95	**2727**	**4990**	**1475**	**396**	***6861***
Haskovo - Popovitza	45	2677	379	235	**3291**	1119	686	101	**1906**	**3796**	**1065**	**336**	***5197***
Popovitza - Plovdiv	28	2911	401	244	**3556**	2554	1992	120	**4666**	**5465**	**2393**	**364**	***8222***
Plovdiv - Kostenec	83	2706	399	201	**3306**	3385	2144	477	**7243**	**6091**	**2543**	**678**	***10549***
Kostenec - Sofia	74	1586	164	102	**1852**	8861	3481	360	**12702**	**10447**	**3645**	**462**	***14554***
	308												
Sofia-Macedonia													
Sofia - Pernik	31	2290	255	77	**2622**	10399	4905	835	**16139**	**12689**	**5160**	**912**	***18761***
Pernik - Kustendil	58	58	6	2	**66**	2682	714	272	**3668**	**2740**	**720**	**274**	***3734***
Kustendil - Kriva Palanka	35	2003	333	122	**2458**	-	-	-	-	-	-	-	-
	124												
Pernik - Dupnitza	50	2089	244	65	**2398**	3877	3155	342	**7374**	**5966**	**3399**	**407**	***9772***
Dupnitza - Kustendil	42	2148	355	131	**2634**	1130	1218	822	**3170**	**3278**	**1573**	**953**	***5804***

Source: Bonifica Report, Volume I, from Fig. 1, 2, 3, 10, 11, 12

3.2.2 Railways

A summary comparison of the 1995 operational and performance characteristics for the three railways of the East-West Corridor are presented in Table 3-20. These characteristics are discussed in more detail in the following sections.

Table 3-20
East-West Corridor - Railways Performance Indicators, 1995

	Albanian Railways	Macedonian Railways	Bulgarian Railways
Passengers (million)	3.74	0.11	0.66
Passenger-km (million)	215	64.9	5,059
Net Tons (million)	0.5	1.9	30
Net Ton-km (million)	53	168.9	7,773
Traffic Units (thousands)	268	233.8	12,832
Traffic Unit/Km (thousand)	599	335	2,990
Passenger-Km as % of Traffic Units (percent)	80	28	39
Freight Car Turnaround Time (days)	3.9	3.8	N/A
Traffic Units/Employee (thousand)	53	47	254
TKMS/Wagon (thousand)	25	70	192

Financial Performance

The financial ratios presented in Table 3-21 for each of the corridor's railways indicate the extent to which the railways are: (1) generating sufficient revenues to meet operating expenses in the case of the working ratio; and (2) generating sufficient revenues to meet both current operating expenses and an allowance for depreciation for fixed assets based on the asset replacement value. In the case of the former, a working ratio of under 100 is considered satisfactory. Conversely, an operating ratio lower than 100 is taken as meeting both the fixed and variable costs of the railway plus the cost of replacing fixed assets.

In the sections that follow below, additional information on the financial performance of each of the corridor's railways is presented.

Table 3-21
East-West Corridor Railways Financial Performance, 1995

Financial Ratios	Albanian Railways	Macedonian Railways	Bulgarian Railways
Working Ratio (percent)	–	.93	.94
Operating Ratio (percent)	270	130	109

3.2.2.1 Albanian Railways (Operatinal and Performance Characteristics)

Each of the countries that the East-West Corridor traverses has experienced declining economic output as a result of the collapse of trade between the Council of Mutual Economic Assistance (COMECON) member nations. This is most evident in the macroeconomics data of the individual countries. Additional evidence of economic contraction is found in the sector-specific data, particularly in the transport sector. For example, the Albanian Railways (HSH) transported a total of 7.7 million tons in 1987 and peaked at 8.1 million tons in 1989. By 1993, HSH's freight traffic had declined to only 600,000 tons. In 1995 further declines in HSH's traffic base were experienced to approximately 500,000 tons. The continued erosion in HSH's traffic base is attributed to the poor economic fortunes of the former eastern bloc countries, whereby interindustry transactions had previously dominated transport demand, particularly heavy industry. And, as these heavy industries declined, so did the rail transport market. Additionally, HSH also experienced a modal shift in transport demand from rail to road transport as the number of trucks increased.

Correspondingly, net-ton-kilometers (ntkms) also experienced a substantial reduction. Ntkms were 629 million tons in 1987, and peaked at 674 million ntkms in 1989. By 1993, ntkms had dropped by 92 percent of HSH's peak level in 1989 to 54 million.

Passenger traffic also dropped precipitously between 1987 and 1995. Before the political transition, HSH transported approximately 12 million passengers. By 1991, passenger traffic had declined to 2 million passengers. Such decline was, in part, attributed to suspension of operations due to political instability in the country. Since 1991, the declining passenger traffic base has turned around. In 1995, HSH transported approximately 4 million passengers and produced 215 million passenger kilometers.

HSH produced only 398,000 traffic units per 1,000 kilometers in 1995. Average wagon turnaround time, for HSH, was 3.9 days in 1994. From 1989 to 1995, the decline in HSH's traffic base effectively reduced employee productivity from 162,000 to 53,000 traffic units.

Financial Performance

HSH's financial position has been largely affected by the decline in its traffic base; this affected its revenue generating ability, inflationary pressures, escalating costs, and its inability to revise tariffs in line with costs. These factors have combined to produce poor financial results and threats to the viability of the railway as an ongoing transport enterprise. This, in turn, has important regional implications for the East-West Corridor–whether the railways should be forced to discontinue operations.

The most recent financial data indicate that in 1994 HSH generated revenues in excess of 500 million Leks. This was against operating costs of 1.35 billion Leks. As the cost and revenue positions indicate, HSH operated at a loss in 1994 of 835 million Leks.

Tariffs and Costs

Passenger fares on HSH are controlled by the national government. These fares are periodically revised. The standard fares are charged on a zonal-basis. In 1995, passenger fares varied from 10 Leks for zone 1 to 168 Leks for zone 26.

3.2.2.2 Macedonian Railways (Operational and Performance Characteristics)

In 1994 and 1995, MZ transported slightly under 2 million tons of freight at 1.92 and 1.93 million tons, respectively. This is substantially down from its 1989 level when MZ carried about 7.9 million tons. MZ carried approximately 76 percent more traffic in 1989 than in 1994 and 1995. Since 1989, MZ's traffic base has been on a continuous decline.

Net ton kilometers were approximately 151.2 million in 1994 and by 1995 increased by 11.6 percent to 168.8 million ntkms. This is considerably lower than the 910 million ntkms MZ produced in 1989. International or transit traffic amounted to 100,387 tons in 1994 and 125,852 tons in 1995, an increase of 25.4 percent. This traffic accounted for 5.2 and 6.6 percent of total freight traffic transported by MZ in 1994 and 1995, respectively.

The volume of passenger traffic carried by MZ was approximately 1.25 million passengers in 1994. One year later (1995) passenger traffic had decreased by 13.9 percent to just over one million passengers (1.073 million). Correspondingly, MZ experienced a reduction in passenger kilometers (pkms) over the same period. Passenger kilometers were respectively 67.1 million pkms and 64.9 million pkms in 1994 and 1995. Transportation of international passengers by MZ is insignificant. During the period under review, international passengers comprised less than one percent of MZ's passenger traffic market.

In 1989, MZ produced 1.8 million traffic units per kilometer of track. By 1995, the number of traffic units per kilometer had fallen to 335,000. Although MZ's operational performance and capacity utilization, particularly its freight operations, were uneven, they were relatively stable between 1994 and 1995. However, there were areas where MZ's operational performance could have been improved. MZ's train speed showed a modest improvement of 1.5 percent in 1995 over 1994. However, commercial speeds of 33.5 km/h are well below acceptable international standards. Wagon detentions, as measured by turnaround times, were 6.8 days in 1995, which represented an improvement of approximately 5 percent over 1994 but remains high for a railway of less than 700 kilometers. Average wagon detention time in 1989 was 2.5 days, which suggests that MZ's wagon productivity has declined by 63.2 percent. Additionally, average train loads were slightly down in 1995 to 727 tons from 751 in 1994. MZ has also experienced a noticeable drop in tkms/wagon from 372,000 in 1989 to 70,000 in 1995.

Gross ton kilometers (gtkms) were 885 million in 1995. This, again, is indicative of MZ's declining productivity. In 1989 the gtkms were approximately 2.4 billion. MZ's train kilometers per day at 127 km also represent an area where substantial productivity improvement is warranted. The minimum average train kilometers should not be less than

300 km/day. Maintenance operations of traction power also calls into question MZ's performance. Overall locomotive availability was 48 percent in 1995. MZ attributed such poor performance to lack of spare parts.

Financial Performance

MZ's financial performance for the year 1995 indicates an operating loss of 678 million Macedonian Denars against revenues of 2.27 billion denars. These operating losses are believed to be attributed to two factors. First, the MZ indicates the national government failed to compensate the railway for infrastructure maintenance in accordance with the 1996 Railway law. Second, the revenues, which decreased by 9.5 percent, were not sufficient to cover costs, which increased by 10 percent. In the preceding year (1994), MZ sustained an operating loss of 590.4 million Denars against revenues of 2.04 billion.

It is not surprising that MZ's financial position is so precarious. During the same period MZ sustained operating losses, the railway undertook financing the construction of the 56-km section between Beljakovce and Deve Bair on the Bulgarian border. The construction is being carried out by Macedonian contractors. The project cost MZ about 2.94 billion Denars between 1994 to 1995.

Tariffs and Costs

Following the acceptance of the Action Plan of the Restructuring Program and the passage of the 1996 Railway law, MZ was given more flexibility to revise its tariffs. After the United Nations lifted the sanctions against Serbia in 1995, tariffs were to be deregulated and increased by 30 percent.

3.2.2.3 Bulgarian Railways (Operational and Performance Characteristics)

The transition to market-oriented economies by the former member countries of the Council of Mutual Economic Assistance (COMECON) in the early 1990s has had a dramatic impact on BDZ's traffic performance. The impact has been felt in all areas of BDZ's traffic profile, i.e., international (transit), import/export, and domestic traffic. BDZ's total freight peaked at 82.9 million tons and 18.2 billion tkms by late 1985. Between 1985 and 1996 BDZ lost approximately 64 percent (52.8 million tons) of its peak freight traffic. By 1996 freight traffic had declined to about 30.1 million tons and 7.5 billion tkms.

An analysis of BDZ's total freight traffic reveals that international, or transit traffic, does not command a large share of total traffic. In the period from 1986 to 1996, international traffic accounted for less than 10 percent of the total traffic. The most recent data (1996) indicate that transit traffic accounted for 8.9 percent, or about 2.7 million tons, or 758 million tkms of the freight transported. Domestic freight, by contrast, accounted for approximately 62 percent, or about 18.6 million tons, and 3.7 billion tkms (48.9 percent) of BDZ's total freight traffic in 1996. The remaining freight share consists of export traffic representing 8.6 million tons (29.4 percent) or about 3.1 billion tkms (41.1 percent) of the total freight traffic carried by BDZ.

BDZ's passenger traffic also experienced a precipitous decline following the transition to a market-oriented economy, the successive economic contractions that followed it, and an

increase in automobile ownership. Passenger traffic volumes were reduced by 68 percent. Such a reduction is comparable to the reduction in size of the GDP over the same period. In 1985, passenger traffic by rail was 105.4 million passengers representing 7.6 billion passenger kilometers. By 1995, passenger traffic had decreased to 58.9 million passengers or to approximately 4.7 billion pkms. Additionally, passenger mobility as measured by average kilometers per passenger decreased from 323 in 1985 to 235 in 1995. Figure 3-12 depicts passenger and fright traffic for the 1986-1996 year period.

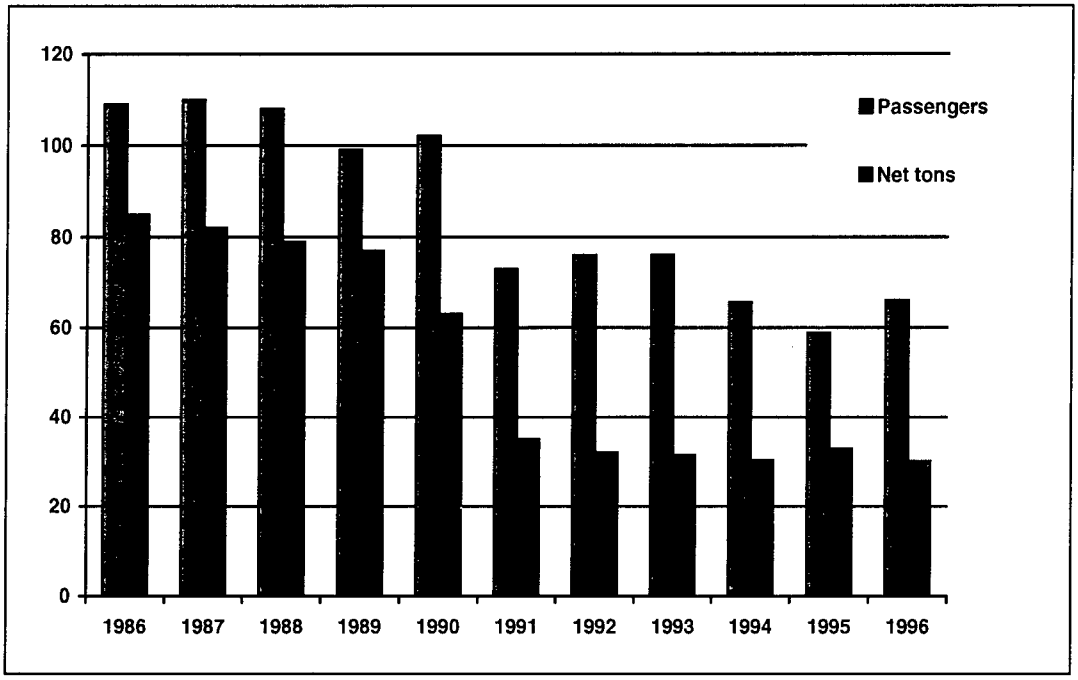


Figure 3-12 Traffic Operational Indicators (in millions)

BDZ's operational performance since 1990 indicates a persistent pattern of decreasing output. Despite a number of encouraging indicators, whereby BDZ has experienced either marginal reductions or improvements in unit performance, the fact remains that the overall trend has been consistently down since 1990. As revealed in Table 3-22, BDZ's operational performance in almost every performance category indicates either decreasing or stagnating output, placing a downward pressure on the railway. Such performance translates into poor financial profitability and sustainability of BDZ as a reliable provider of transport services for domestic and international markets. Tables 3-22 and 3-23 provide respectively the operational and performance indicators for BDZ.

Financial Performance

Not surprisingly, BDZ was always profitable under the former centrally planned economic system. However, the situation changed drastically in 1991 with the collapse of the trade between Bulgaria and the centrally planned economies of Central and Eastern Europe.

Between 1991 and 1994, BDZ sustained net operating losses ranging from 60 million Bulgarian Leva in 1991 to more than 1.9 billion Bulgarian Leva in 1994. This continuing poor financial performance and poor financial outlook prompted the national government to subsidize BDZ beginning in 1992. The subsidies were intended to partially compensate BDZ for losses resulting from uneconomic passenger tariffs and declining revenues from freight operations.

Table 3-22
BDZ Operational Indicators

	Units	1993	1994	1995	1996
TRACTION STOCK					
STANDARD GAGE					
DIESEL LOCOMOTIVES	num.	217	192	192	181
availability	%	66.0	62.0	53.7	45.9
ELECTRIC LOCOMOTIVES	num.	343	325	319	312
availability	%	74.5	62.0	65.1	66.0
EMU	num.	90	93	83	83
availability	%	79.0	75.0	71.0	65.1
SHUNTERS	num.	330	325	321	288
NARROW GAUGE					
DIESEL HYDRAULIC LOCOMOTIVES	num.	42	36	35	28
availability	%	55.3	47.0	52.0	53.6
BROAD GAUGE					
DIESEL HYDRAULIC LOCOMOTIVES	num.	4	4	4	4
availability	%	86.3	85.0	50.0	50.0
ROLLING STOCK					
Passenger Cars	num.	1,992	1,800	1,708	1,626
Standard gauge	num.	1,900	1,721	1,629	1,548
Narrow gauge	num.	92	79	79	78
No. of seats	thous.	125.9	119.0	115.9	104.0
No. of seats s.g.	thous.	122.5	115.6	112.5	100.6
No. of seats n.g.	thous.	3.4	3.4	3.4	3.4
Freight Cars	num.	37,125	31,560	25,911	21,898
Total capacity	tons	1,984,389	1,727,603	14,22,180	1,327,940
Standard Gauge	num.	36,138	30,807	25,182	21,195
Total capacity	tons	1,965,833	1,712,662	1,407,673	1,313,880
Average car capacity	tons	54.4	55.6	55.9	60
Narrow gauge	num.	987	753	729	703
Total capacity	tons	18,652	14,941	14,507	14,060
Average car capacity	tons	18.2	19.8	19.9	20

Table 3-22 (cont'd)
BDZ Operational Indicators

UTILIZATION OF TRACTION AND ROLLING STOCK					
Engine-km per engine-day available (main line)					
Passenger traffic s.g.					
Diesel locomotives	km/d	352	348	349	351
Electric locomotives	km/d	730	738	731	736
Freight Traffic s.g.					
Diesel locomotives	km/d	285	258	272	290
Electric locomotives	km/d	389	417	429	427
Passenger-km per passenger car	mil. km/car	2.9	2.8	2.7	3.1
Passenger-km per seat	thous.	46.1	42.5	40.5	48.7
Net ton-km per freight wagon	thous.	208	246	332	345
Net ton-km per ton cap. of fleet	thous.	3.9	4.5	6.0	5.7
Average load per wagon loaded	tons/wagon	47.4	48.7	49.7	50.0
Turnaround time of s.g. wagons of which:	days/wagon	7.80	6.80	5.95	6.41
Trains	days/wagon	0.64	0.62	0.59	0.57
Technical operations	days/wagon	2.25	2.16	1.98	2.25
Locos waiting time	days/wagon	2.53	2.86	2.40	2.54
Other	days/wagon	2.38	1.13	0.97	1.05
STAFF					
Employees - total	number	64245	60961	57332	56622
Traffic units per employee	thous.	210.0	210.6	231.8	222.5
Employees - operational	number	54664	49975	48045	47445
Traffic units per employee (operational)	thous.	247.0	256.9	276.6	265.6
Employee per km of line	empl/km	13	12	11	11

The initial subsidy to offset the operating losses was for 701 million Leva. In the following year, 1993, the subsidy was more than doubled to 1.8 billion Leva against operating losses totaling 2.7 billion Leva on revenues of 6.9 billion Leva. In 1994, the subsidy to BDZ was decreased to one billion Leva against net operating losses of 1.9 billion Leva. Despite the intervention by the national government, the subsidies only partially compensated BDZ. They were not adequate to keep pace with BDZ's deteriorating financial situation.

Recent financial performance data have further indicated a deterioration in BDZ's financial position although a modest improvement was observed towards the end of 1996. By 1995 and 1996's 3rd quarter, the net operating losses were respectively 2.7 billion and 575.2 million Leva. The short- to medium-term financial outlook for BDZ poses a significant challenge for the railway's management to return the railway to profitability. Without

substantial reductions in operating costs and improvements in its revenue position through increased freight traffic, BDZ's deteriorating financial position is likely to continue.

Table 3-23
BDZ Performance Indicators

Indicator	Unit	1990	1991	1992	1993	1994	1995	1996
Passengers	mill.	102	73	76	76.1	65.7	58.9	
PKM	bill.	7.8	4.9	5.4	5.8	5.1	4.7	
Net tons	mill.	63	35	32	31.4			
NTKM	bill.	14.1	8.7	7.3	7.7			
Traffic units	bill.	21.9	13.6	13.2	13.5			
Average passenger-trip	km.	76.1	66.9	71	76.7			
Average freight-haul	km.	223.4	246.5	240.5	245.2			
Passenger- GTKM	bill.	12.71	12.08	11.92	11.06			
Freight-GTKM	bill.	28.65	15.56	14.21	14.71			
GTKM/route km	mill.	9.62	6.43	6.08	6.08			
GTKM by Traction								
Diesel	bill.	7	4	4	4			
Electric	bill.	34	23	22	22			
Train-Km								
Passenger	mill.	35.3	34	34.5	33.3			
Freight	mill.	22.5	13.3	12.6	11.8			
Traction Stock								
Diesel locomotive availability	%	80.7	77.6	78.2	66.0			
Electric locomotive availability	%	85.7	85.1	84.3	74.5			
EMU locomotive availability	%	85.2	85.4	86.0	79.0			

Tariffs and Costs

The laws governing BDZ operations give the railways autonomy to establish the structure and level of freight tariffs and passenger fares. Nonetheless, BDZ acting through its Director General, must follow established procedures before tariff revisions can be authorized. Passenger fare revisions require the agreement of the Ministry of Transport. Additionally, changes to fares and tariffs must be cleared by the National Pricing Commission before implementation. Despite its autonomy to set tariffs, BDZ's tariffs have not kept pace with the rate of inflation.

Compensation to BDZ for providing passenger services below cost is provided for in the Contract Plan which is discussed elsewhere. These compensation payments have not been adequate to cover the full costs of passenger service. The most recent data indicate the cost per passenger kilometer is 1.5846 Leva against a tariff rate of 0.7332 Leva per passenger kilometer. This indicates that BDZ is able to recover only 46 percent of its costs through passenger fares. This places BDZ in a precarious situation because it is required by law to offer passenger service under the Contract Plan. However, full cost recovery is highly unlikely, thereby resulting in continuing operating losses for BDZ.

Although both of BDZ's tariffs and fares are based on distance, they differ in their underlying structure. For example, import and export tariffs differ from tariffs for transit traffic. Transit tariffs, understandably so, are levied in foreign currency, e.g., Swedish francs. Conversely, domestic and import-export tariffs are levied in Leva. More important, the tariff structure underlying tariff rate per ton-kilometer is based on a step function ranging from 120 to 500 km; 500 to 1,000 km; 1,000 to 2,000 km; and over 2,000 km.

More recent developments for freight tariffs include a unified tariff rate for international traffic based on UIC rates. The new tariff rate was agreed to between Bulgaria and eight other countries in Central and Eastern Europe and the Middle East. As regards to domestic tariffs, rates which became effective on January 1, 1997, are based on the weight of the consignment rather than wagon-load capacity as was previously the case.

3.2.3 Ports

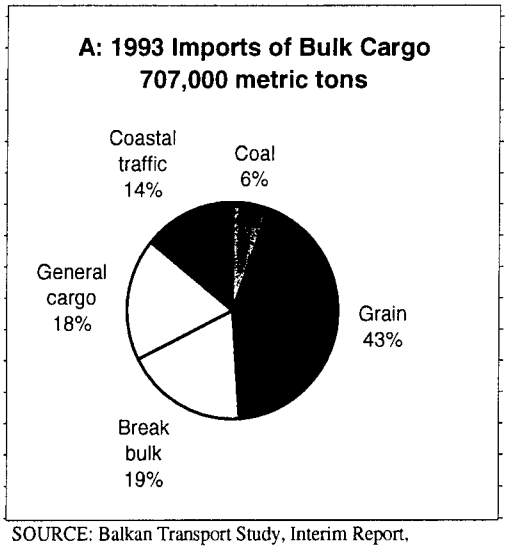
3.2.3.1 Albanian Ports (Operational and Performance Characteristics)

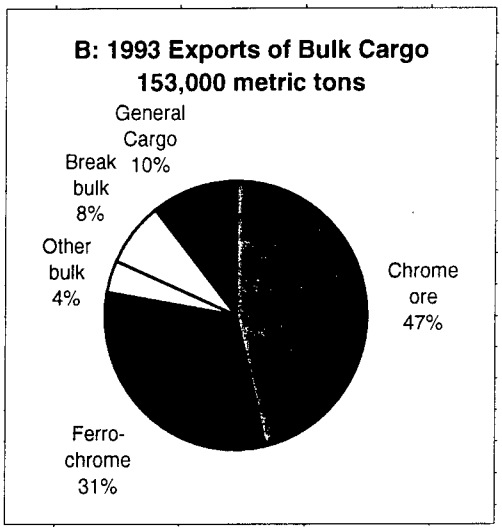
During the 1980s, annual cargo traffic ranged between 2.6 and 2.8 million tons (1.6 million tons of which were in bulk). However, in recent years these figures have fallen considerably – current annual tonnage is estimated at less than 0.9 million. The decrease in exports of raw materials is largely a result of high extraction costs, the inability to compete successfully with a global marketplace, and the elimination of state support. Bulk cargo traffic – import and export – through the Port of Durres in 1993 is depicted in Figure 3-13. Projections through 1997 are expected to vary minimally.

Total ferry traffic at the Port of Durres in 1993 was broken down into the following components:

- Passengers 187,000
- Trucks 15,200
- Cars 25,000

In total, trucks carried approximately 160,000 metric tons of cargo, establishing this mode of transport as a significant factor in non-bulk cargo movement in the port. About 60 percent of the truck traffic was en route to/from Italian ports. By August 1995, the percentage of total truck traffic with origins or destinations in Italy was 73 percent. This inward truck traffic imbalance stems from increasing sales abroad of previously owned vehicles with Albanian registrations. It is estimated that approximately 5,000 used vehicles per year are sold abroad.





SOURCE: Balkan Transport Study, Interim Report, Volume B, Specific Maritime and Port Development Study

Figure 3-13 Port of Durres Bulk Cargo Import/Export Totals by Commodity

3.2.3.2 Bulgarian Ports (Operational and Performance Characteristics)

Port of Varna

The port complex at Varna has a capacity to handle about 9,000 tons of loads per annum and more than 1,200 ships.

Available information for throughput at the port of Varna is dated.

Port of Burgas

Annual Throughput

Since 1992, there has been a reversal in the downward tendency of the port's business. The last 2 years witnessed a steady and upward trend in the port's throughput. Oil tonnage accounts for the largest share of the port's throughput at about 50 percent. Imports account for about 70 percent of the port's throughput while the remaining 30 percent is export traffic. This is depicted in Table 3-24 and Figures 3-14 and 3-15.

The Port of Burgas is frequently overloaded due to operational inefficiencies. The total number of processed ships and the gross tonnage are shown in Figure 3-15.

Table 3-24
Port of Burgas – Annual Commodity Throughput
(in thousands of tons)

COMMODITY	1989	1990	1991	1992	1993	1994	1995	1996
Crude oil	14,856	9,375	7,818	6,051	8,083	8,621	8,846	8,470
Coal	2,077	1,896	1,084	1,313	1,289	1,738	1,893	1,728
Ores & concentrates	812	1,247	189	295	1,349	1,486	2,191	1,860
Metals	663	674	699	963	1,648	1,982	1,853	1,319
Cast steel	791	337	39	35	29	93	115	21
Timber	328	318	75	71	71	18	8	47
Fertilizers in bags	262	267	402	299	67	128	467	599
Liquid cargoes				182	33	75	56	
Total	**19,789**	**14,314**	**10,306**	**9,209**	**12,569**	**14,141**	**15,429**	**14,044**

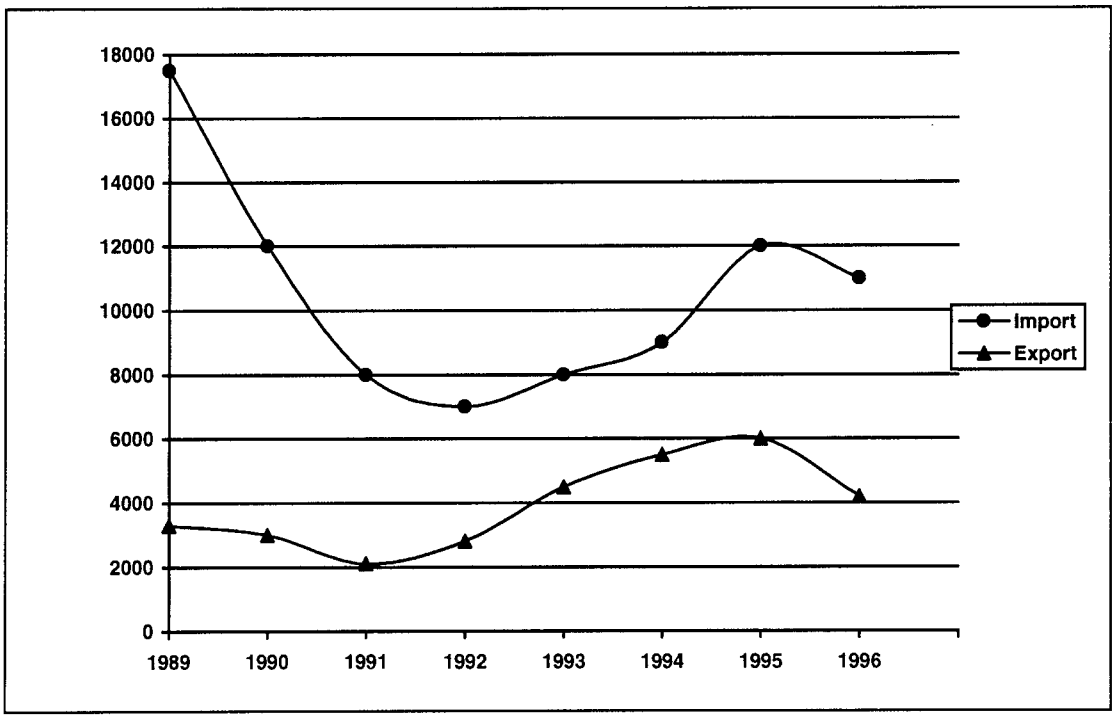


Figure 3-14 Port of Burgas, Annual Export/Import Traffic (in thousand tons)

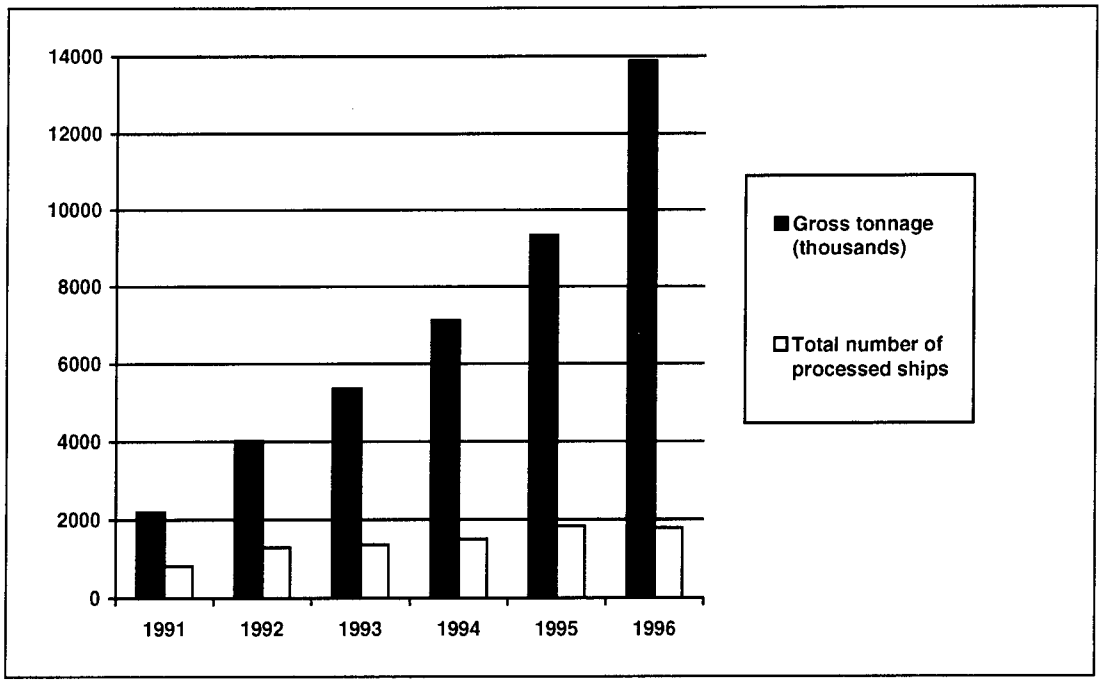


Figure 3-15 Port of Burgas, Number of Ships and Gross Tonnage

Container Handling Methods

A variety of methods are now in existence to handle containers in and through ports. The more recent advancements made in this area, commonly known as the roll-on/roll-off system, permits faster ship turnaround at port. In the ro/ro system the vessel carries the container on a trailer which is driven on or off the ship. In the load-on/load-off (lo/lo) system, containers are loaded on or off the ship by use of shore-based cranes or ship's gear. Lo/lo systems require more investment in shore-based container handling equipment than ro/ro systems.

Both ro/ro and lo/lo systems are used for port-to-port and door-to-door containerized shipping operations with ro/ro offering the best possible reduction in transit time and cost when used in conjunction with door-to-door operations. Three different kinds of ro/ro operations can be distinguished:

- Both the trailer and tractor remain in ship during its voyage and are driven off at the other end. The operation requires the driver of the vehicle to remain onboard, thus necessitating passenger facilities, particularly on long voyages. This type of service is common in the Black Sea and the port has included plans to build three ro/ro berths in Terminal 3 to accommodate this type of traffic. The service is economical, particularly on short sea voyages, which reduces the distance (and time) in circuitous overland routes. No shore-based special facilities are required, except sufficient land for parking and prepositioning vehicles while waiting for the next ship's arrival.

- The trailer unit remains on ship during the voyage and shore-based tractors are used to tow trailers between the ship and the trailer storage area. This type of operation increases the ship's cargo-carrying capacity and improves the efficiency of tractors. However, it requires a coordinated operation allowing the use of standard equipment and close coordination of shore-based tractor workload with yard pick-up and delivery operations.
- Neither the trailer nor the tractor remain in ship during the voyage. A straddle type carrier is used to drive the container on to the ship and stack it, or the ship's gear is used to stack containers. This operation is similar to conventional container ships, except loading/unloading is performed by ro/ro equipment.

Despite clear economic advantages, the second and third type ro/ro operations are not yet planned by the port. As operations mature and shipper requirements become more heavily weighed in the future, the port must consider the type of improvements in its service offering in Terminal 3.

The port plans to use Terminal 4 exclusively for conventional container lo/lo operations. Specially designed rail-mounted gantry cranes are generally used to load/unload containers to/from container ships. Two variants of this type of operation are:

- The yard-chassis operation where transfer to storage yard and inland carrier are effected by keeping the container on trailer. This type of operation is faster but it requires considerably more backland area. Given the limited size of Terminal 4 in relation to the anticipated traffic, this operation is not considered appropriate for Burgas.
- The grounded area operation where containers are stacked (2 or 3 high) in the yard and ship apron-yard transfer is accomplished by a shuttle chassis. This type of operation is planned for Terminal 4.

Containers by Rail

Rail access to all berths in Terminal 4 is included in the Master Plan. There are different types of container movements by railway which will define the type of most suitable port facility to be used:

- Trailer on Flat Car (TOFC) or Tractor-Trailer on Flat Car (TTOFC) operations involve movement of wheeled vehicles on railway equipment. The wagon is carried on board a ro/ro vessel. This type of operation is more suited for Terminal 3. However the gage difference between the FSU railways and Bulgarian standard gage (1,520 mm versus 1,435 mm), requires an intergauge transfer facility. Burgas does not have such a facility at this time. The intergauge transfer facility in Varna can effect this type of transfer. Central Asian rail movements via the newly opened Sarakhs-Meshed link between Turkmenistan and Iran will soon benefit from such a facility, which is being constructed near Sarakhs in Turkmenistan. This facility will allow wagons arriving in Samsun, Turkey via Iran to be shipped by ro/ro vessels to Burgas. However, TOFC and TTOFC traffic to/from Caucasus, Russia, and Ukraine will still need an intergauge transfer station in Burgas. Figure 3-16 shows a simple concept design of such a facility. The design is adopted from a recently built

station to effect intergauge transfer inside the Chinese border across Druzhba, Kazakstan. The facility has a capacity of 4.2 million tons/year (approximately 50,000 wagons), which is considerably higher than the more elaborate facilities in Varna. Given the limited area for shore-based facilities, it will be desirable to build such a facility inland from the port with a dual gage rail line connection from Terminal 3. The Chinese transfer station is considerably simpler and less expensive than the facility in Varna to build and operate.

- Container on Flat Car (COFC) operation. This type of operation involves conventional shipping of containers on flat railway cars. The port's planned rail links to Terminal 4 will allow this type of operation.

Container Ship Service Schedules

Currently, container ship service to/from major Black Sea ports is effected by small vessels which are limited to a steaming speed of 18 knots. With the emergence of Burgas as a container superport, it will be possible to serve the Black Sea with a trunk liner service in faster third-generation container ships calling at the Port of Burgas and feeder service between Burgas and other Black Sea ports in smaller ships. A preliminary analysis has been conducted to estimate the transit time differential between different types of service alternatives and schedules. Table 3-25 shows the transit times for a one-way length of 2,000; 4,000; and 8,000 nautical miles to Rumeli, Turkey for the following service alternatives:

- Existing operations which can be typically characterized as either direct shipment from the port of origin to individual Black Sea ports or transshipment via a Mediterranean port such as Pireaus, Marseilles, Brindizi, or Thessaloniki. A first- or second-generation container ship with a full speed of 18 knots is assumed for the entire voyage.
- Direct service to Burgas by a third-generation ship with a full speed of 25 knots with feeder service to other Black Sea ports would follow a ring pattern similar to Figure 3-17. The feeder service is assumed to be provided by small container ships with an average speed of 18 knots and average stay of 24 hours at each port of call. There are numerous variants of ring service such as a half ring serving north Black Sea ports separately. The ring service assumed for this analysis should, therefore, be viewed as a representative alternative.
- Direct service to Burgas similar to the second service alternative and direct feeder service are shown in Figure 3-18.

As shown in Table 3-25, in terms of transit time, the third service alternative provides the maximum advantage for all ports. Undoubtedly, this advantage increases as the voyage length is increased. Beyond the second port of call the ring service results in the highest transit time for one-way voyage lengths of more than 4,000 nautical miles. In other words, the transit time savings due to the use of faster container ships in trunk-line service to Burgas is more than offset by the increase in transit time for feeder service.

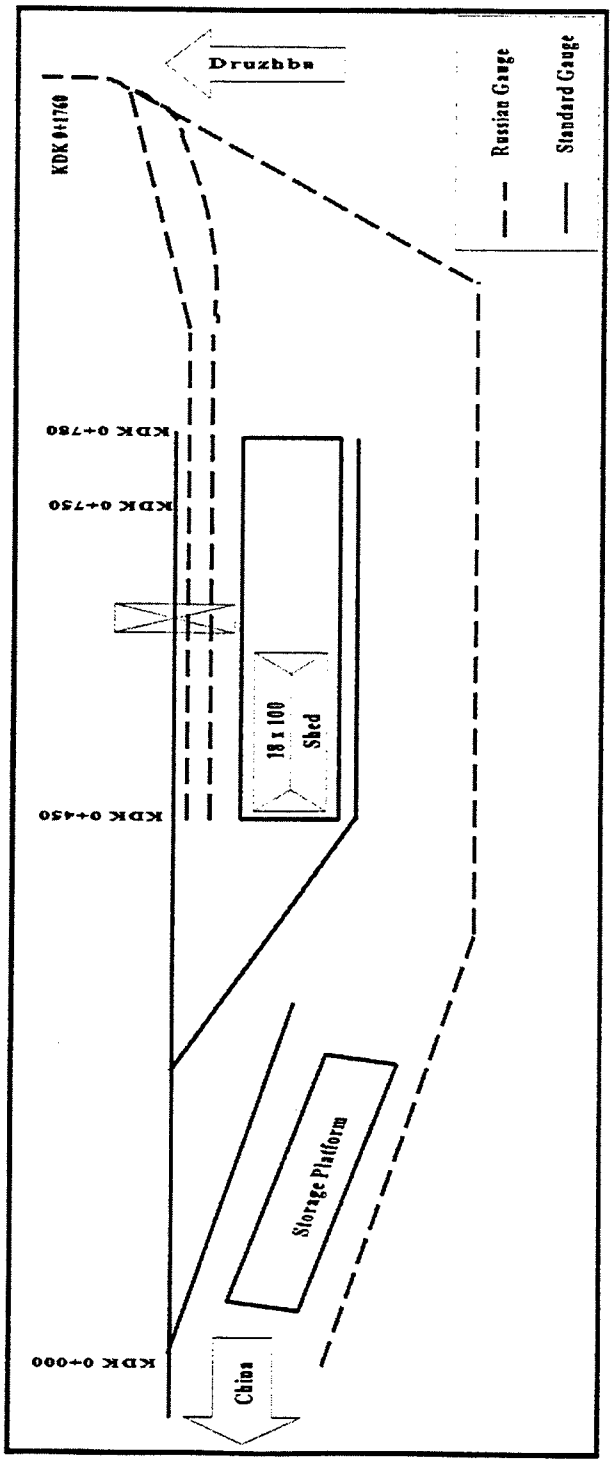


Figure 3-16 Russian Gage - Standard Gage Transfer Facility at Ala Shankou, China

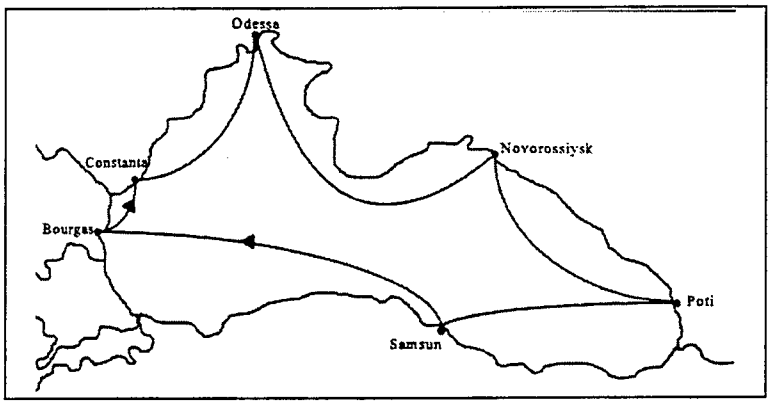


Figure 3-17 Ring-Feeder Service

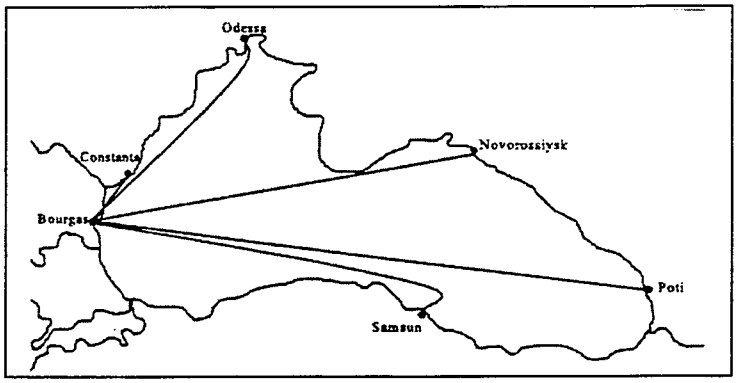


Figure 3-18 Direct-Feeder Service

Table 3-25
One-way Transit Time Differentials

To/From	One-way Voyage Distance to Rumeli (Nautical Miles)	Transit Time (Hours) by Service Alternative		
		1	2	3
Burgas	2,000	119	86	86
	4,000	230	166	166
	8,000	452	326	326
Constantza	2,000	125	92	92
	4,000	236	172	172
	8,000	458	332	332
Odessa	2,000	134	125	108
	4,000	245	205	188
	8,000	467	365	348
Novorosiysk	2,000	142	171	121
	4,000	253	251	201
	8,000	476	411	361
Poti	2,000	152	214	134
	4,000	263	294	214
	8,000	485	454	374
Samsun	2,000	136	257	120
	4,000	247	337	200
	8,000	469	497	360

3.3 INSTITUTIONAL CHARACTERISTICS

3.3.1 Roads

The objective of an institutional component in this report is to produce information on the current status of the institutions that will be required to carry out any improvements or modifications to the road system in the three countries.

This subsection would normally outline, for each of the three countries, the Road Department organization; the number of personnel in various categories in each part of the organization; the qualifications of the key personnel; the budgets that are available for new construction, rehabilitation, and maintenance of various types, including routine maintenance and periodic maintenance; the manner of carrying out work; and the relationship between the capabilities of the staff; the funding available, and the probable needs. However, due to the breadth of institutional information on a country-by-country basis (only Bulgaria has provided information on the institutional aspects of its road department) this subsection will present first the information that is available on a three-country combined basis (the bulk of which is very general and grossly lacks any significant statistics), then follow that with the more detailed information that is available.

Three Nations Combined

Most of the reports that have been reviewed seem to confuse, or at least very closely relate, the infrastructure of the road system to the term "institution." The reports that have been reviewed and contain some information that gives a small insight into the institutions that are available in the three countries are: *Road & Railway Transport Corridor West-East*, written by experts from the three countries in January 1995, "Transportation Project Opportunities" by USTDA in 1996, and *Study of the Future of Albanian Railways*. The following few paragraphs briefly summarize the consultant's interpretation of what they mean.

Each of the three nations has been reasonably successful in implementing structural reforms to accommodate its entry into privatization, financial reforms, legal modifications, and encouragement of private activities. These activities will almost certainly continue, and the institutions that are responsible for overseeing the activities will have to continue to develop their organizations and the capability of their staffs.

In the road sector, with the help of various lending agencies, more emphasis is being placed on road improvement, whereas previously, emphasis was placed on rail which was necessary due to the political decisions that had been made many years earlier. Now with the changes in the political structure, decisions are being made taking other factors into consideration, such as overall efficiency for the good of the nation (or the region) and economic values. The rates at which these changes take place will interact with regional economic growth and availability of funds both internal and external.

All three countries have gone into privatization of various industries, so the privatization concept is taking hold. Roads have not yet reached that stage in two of the three corridor countries though Macedonia does have a toll road.

Some of the countries' road departments (or branches of the road departments) have entered into associations with foreign contractors for specialized work. There is no information on any of the countries that would indicate that road maintenance is being let out to private contractors except through association with a government entity.

If a unified transport corridor is to function as it should, special statutes will be required (which in turn will require a revised institutional establishment in each country to implement those statutes) in such areas as easier frontier passage, common customs, technological improvements, a duty-free corridor, and possibly a duty-free port that would have direct access to the duty-free corridor.

3.3.1.1 Albanian Roads (Institutional Characteristics)

The Government of Albania has taken a number of steps to improve the road sector since 1991. In 1992, private automobiles and transportation services were authorized, with the truck and bus fleets becoming privatized. Most land transport regulations have also been removed.

Routine highway maintenance is carried out by the Road Directorate which employs about 3,500 persons.

About 14 percent (or the equivalent of about US$ 41 million annually, based on a 1994 exchange rate) of Albania's public investment funds for the period 1994 to 1996 were programmed for "Transport," and practically all of those were allocated to the highway sector.

3.3.1.2 Macedonia Roads (Institutional Characteristics)

The transport sector is administered by the Ministry of Transport and Communications. The roads' portion of that sector is under the sponsorship of the Republican Road Organization. Among the many issues that the Ministry considers to be a priority is the development of an east-west road route. This is due, in part, to the increased traffic on the less-developed east-west roads caused by the diversion of traffic from the north-south route due to UN sanctions against Serbia.

There are no institutional statistics available for Macedonia at this time.

3.3.1.3 Bulgarian Roads (Institutional Characteristics)

The Ministry of Transport (MOT) administers the Bulgarian program for road funding, construction, maintenance, operation, and policing by providing policy guidance and overseeing 349 state organizations that provide transport services and support.

The General Road Administration is an agency within the Ministry of Transport. It has approximately 8,500 people on its staff and its functions include:

- Monitoring and supervising traffic surveys and forecasts, studies, planning, design, construction, maintenance, operation, and protection of roads
- Preparing annual plans for construction and modernization of the network and carrying out construction

- Monitoring transport modes, preparing tariff scales, and organizing collection of tariffs, installing signing, and approving regulations
- Designing roads except for those portions passing through cities with a population over 30,000
- Being responsible for the payment of the appropriate compensation for land
- Monitoring compliance with environmental standards and requirements
- Monitoring proper use of roads, facilities, funds, and safety

The General Road Administration is comprised of the following components:

- 1 Central Road Administration
- 27 Regional Road Administrations
- 1 Central Roads and Bridges Laboratory
- 1 Road Charges and Permits Division
- 6 Field Stations

The Central Road Administration is headed by a Director General who has three divisions, seven departments, and one Board of Experts reporting directly to him. However, he does have two Deputy Directors as assistants.

A Road Fund was established by the 1995 national budget, based on a 7 percent levy on the ex-refinery price of road fuels, but leaving enabling legislation to be provided.

3.3.2 Railways

3.3.2.1 Albanian Railways (Institutional Characteristics)

Organization, Management, and Staffing

HSH is headed by a seven-member Board of Management appointed by the Minister of Transport. The Chairman of the Board of Management is the General Director of HSH who also serves as the chief executive officer of the railway. The General Director reports to the Minister of Transport. Although the General Director can propose members for the Board of Management, it is the Minister of Transport who appoints board members. All board members perform routine technical functions, which may be unrelated to their service on the Board of Management.

Board members with executive, operational, and administrative responsibilities, in addition to the General Director, include: the Deputy General Director who is responsible for technical services; the Head of the Infrastructure Department; the Head of the Finance Department; the Director of Wagon Depots; and the Directors of the Skhodra and the Fier Regions.

In addition to the executive functions indicated above, the HSH organizational structure also includes six Regional Directorates each headed by a Director. The Regional Directors report to the General Director. Each Regional Directorate has specialized staff capable of performing all of the accounting and finance, personnel, commercial, and operational functions necessary for the railway. Although infrastructure and mechanical operations are

part of the Regional Directorates, the specialized staff in the regions report to Regional Directors. They also maintain technical relationships with appropriate departments of the General Directorate. The staff of the Regional Directorates vary from 10 to 65 persons. Also, a Regional Directorate consists of one major and two or three minor stations.

HSH's organizational structure appears cumbersome in the manner in which executive policy decisions are formulated and carried out. Railway activities in many areas are duplicative, particularly at the level of the Regional Directorate.

In 1990, HSH had 8,435 employees. By 1994, the HSH's staffing complement had fallen by about 59 percent (just under 4,800 employees) of the 1990 level. While this has been a significant reduction in HSH's employment rolls, the reductions have not kept pace with both the decline of the railway's traffic and the prospects for future traffic.

Railway Restructuring Program

With the assistance of the World Bank, Albanian Railways began to study and evaluate the future of the railways. In connection with this effort, the World Bank contracted with an international consulting engineering firm which was to conduct the study. The consultant's report examined all aspects of HSH including: traffic and operations; rolling stock and traction fleet; infrastructure; administration, organization, and finance; transport demand forecasts; and financial analysis of alternative investments and operational scenarios.

3.3.2.2 Macedonian Railways (Institutional Characteristics)

Organization, Management, and Staffing

MZ, as a public enterprise, is administered by an 11-member Management Board. Seven board members are appointed by the national government and the remaining four are appointed by MZ. The executive management is headed by a Director General. The Director General is assisted by the Deputy on Technical Issues, the Assistant on Economic and Financial Affairs, the Assistant on Coordination with Limited Companies, and six Depot Directors at the operations level. The Depot Directors are responsible for one of the following: track maintenance, traction and rolling stock, traffic, track repairs, rail vehicles, and electrical and technical equipment.

As of the end of 1995, MZ had 4,997 employees. This was down by 278 employees over the previous year in accordance with the restructuring program of the World Bank. Total employment peaked at 6,633 employees in 1989. MZ's current staff complement is approximately 75 percent of its peak levels. This indicates that staff reductions have not kept pace with reductions in MZ's traffic base. While staff levels have shown a modest decline, MZ's large staff levels have contributed to decreased productivity.

Railway Restructuring Program

In January 1995, MZ submitted the recommendations of a World Bank-funded study for a Restructuring Program to the Government of Macedonia and the Agency for Restructuring. The Restructuring Program was accepted and MZ undertook steps to implement the program in the following areas:

- Reduction of personnel by 1,500 employees through divestiture of non-core operational units
- Divestiture of rail vehicles and maintenance depots to limited companies with 100 percent capitalization
- Tariff increases of 30 percent
- Payment system for accounts payable
- New investment to be terminated except those needed to complete construction of the railway line connecting to Bulgaria
- Reduction of debt through asset divestiture
- Establishment of a system of cost accounting
- Report of financial results on a monthly basis; and reduction of infrastructure costs

Although these measures were agreed to by the Government of Macedonia, for a variety of reasons, MZ has not been able to fully implement them. For example, MZ has not been able to reduce its staff by the margins agreed to in the restructuring program. Also, with the passage of the railway law, MZ has not received the national government's contribution for maintaining the railway's infrastructure.

3.3.2.3 Bulgarian Railways (Institutional Characteristics)

Organization, Management, and Staffing

Although BDZ was founded in 1888 as a state-owned enterprise, it was not until 1989 that the Bulgarian Council of Ministers established BDZ as an independent legal entity and registered it as a state-owned company. The relationship between BDZ and the government as owner was set forth in a new railway law promulgated in 1996. The Government of Bulgaria, as owner of BDZ, exercises control through a Governing Council and a Management Board. The Management Board consists of nine members appointed by the Minister of Transport. The executive management of BDZ is headed by a General Director who is appointed by the Management Board and answerable to the Governing Council.

The Ministry of Transport is responsible for overseeing and regulating the transport sector, including formulating transport policy. The regulations governing BDZ were promulgated in 1995. These regulations provide for mandatory public services obligations (PSO) under a typical European-style Contract Plan (CP). The CP is an agreement between the Ministry of Transport, BDZ, and the Ministry of Finance. It is updated annually and runs from 1996 to 1998. The CP defines the full range and level of service to be provided by BDZ, the capacity of transport and associated tariffs, and the compensation mechanisms for railway services.

The organizational structure of BDZ reflects its mission, which is to provide goods and passenger transport by railway. BDZ's aim is to develop a modern railway organization based on commercial principles with a commercial/marketing focus. The railway is administered under a three-tier structure consisting of the following: (1) a head office; (2) regions; and (3) economic performance units. The head office is directed by the Director General and five Deputy Director Generals. Each Deputy Director General is assigned responsibility for supervising either operations, rolling stock, and plant; infrastructure; commercial; economic; or strategic development. Other senior personnel reporting directly to the Director General's office include the Chief Inspector for Safety, the Head of Finance, the Chief Accountant, and the Chief Legal Advisor, as well as the Head of Communications and Control.

The railway regions comprise Sofia, Gornya Oryahovista, Plovdiv, and Varna. Each region has its own railway district that includes the main city of that district. The railway districts comprise a central station, a marshaling yard (in the case of Sofia), and a transport district. The transport district includes the locomotive depot, railway section, the car and wagon depots, signaling and telecommunications, power, information and computing center, as well as other facilities such as canteens, recreation facilities, and boarding houses.

Although BDZ's staffing complement has been steadily declining since the mid-1980s, the most significant staffing reductions occurred between 1991 and 1995. Recent staffing data indicate that BDZ employment rolls remain relatively high. In 1996, BDZ had 56,623 employees. The sustained decrease in BDZ's traffic (since 1991), and in turn its productivity, does not appear to have been matched by a reduction in the number of employees. Productivity, as measured by traffic units per employee, was 25 percent lower in 1994 than in 1989. In order to improve its labor productivity, BDZ will have to bring its staff level in line with the present and projected traffic demands, and reorganize and train its staff in skills (such as finance, marketing, MIS, and management) that would be consistent with its new commercial mission. BDZ's most recent plan, in this regard, is staff reduction of its current employment level by 1998. While this is in the right direction, these results are unlikely to achieve significant productivity gains expected of a modern commercial railway.

Railway Restructuring Program

The Governing Council of BDZ approved a reorganization plan in 1995 to restructure BDZ with the assistance of the World Bank and the EBRD. The main objective of the World Bank's assistance is to support the restructuring process initiated by BDZ.

Under the agreement with the Government of Bulgaria, the World Bank and the EBRD agreed to a 4-year Action Plan that began in 1995 and ends in 1998. The following project components will be financed under the Action Plan: (1) track renewal and maintenance on priority routes; (2) a Management Information System; signaling and telecommunications; traction and rolling stock improvements and rehabilitation of passenger coaches; and (3) technical assistance and training to support the restructuring process. The total cost of this restructuring program is US$ 298 million over 4 years. The restructuring program is in its third year of funds disbursement and is being implemented by BDZ.

3.3.3 Ports

3.3.3.1 Albanian Ports (Institutional Characteristics)

The Port of Durres is, and will more than likely continue to be owned by Albania's public sector. However, most of the port's 15,000 trucks, which comprised the country's road haulage fleet, are now in private hands. The government will retain partial ownership of this fleet until the funds needed to complete the privatization process are found.

Like all the country's public transport properties, the port falls under direct jurisdiction of the Ministry of Transportation and Communications (MTC). Direct management of the port is the responsibility of General Transport Directorate, one of the four directorates under the MTC. In recent years, the MTC has begun managing the port and its activities as more of a commercial enterprise than a traditionally not-for-profit public institution. The result has been a drop in port charges. However, these reductions in port charges have not been as significant as the MTC had planned. In an attempt to reduce charges further, the MTC has attempted to impose ceilings on the fees charged by agents. The result has been raised opposition from agents, not an increase in traffic as had been hoped.

The organization charts have not been defined clearly for the Port Authority, Harbor Master, Customs and Immigration, and Port Health. Consequently, there is a general lack of understanding of the responsibilities granted to each. Procedures are often duplicated, resulting in system-wide inefficiencies which ultimately affect operations and production.

3.3.3.2 Bulgarian Ports (Institutional Characteristics)

Port of Bargas

The Port of Burgas is an independent Joint Stock Company reporting to the Ministry of Transport. Its physical assets include the Merchant Harbor, the Oil Harbor, the Lozova Warehouse complex in the City of Burgas, and the four smaller harbors at Nessebar, Pomorie, Sozopol, and Tzarevo.

A seven-member Board of Directors provides overall supervision and control of the port's assets, operations, and development (Figure 3-19). Day-to-day management of the port's activities is undertaken by the General Director, who is assisted by a Deputy General Director and two Directors, one responsible from technical and development activities and the other from operations. The following seven departments report to the Directors and the top management: Repair and Maintenance, Power Supply, Investment and Construction, Supply, Administration, Transport, Storage, and Warehousing.

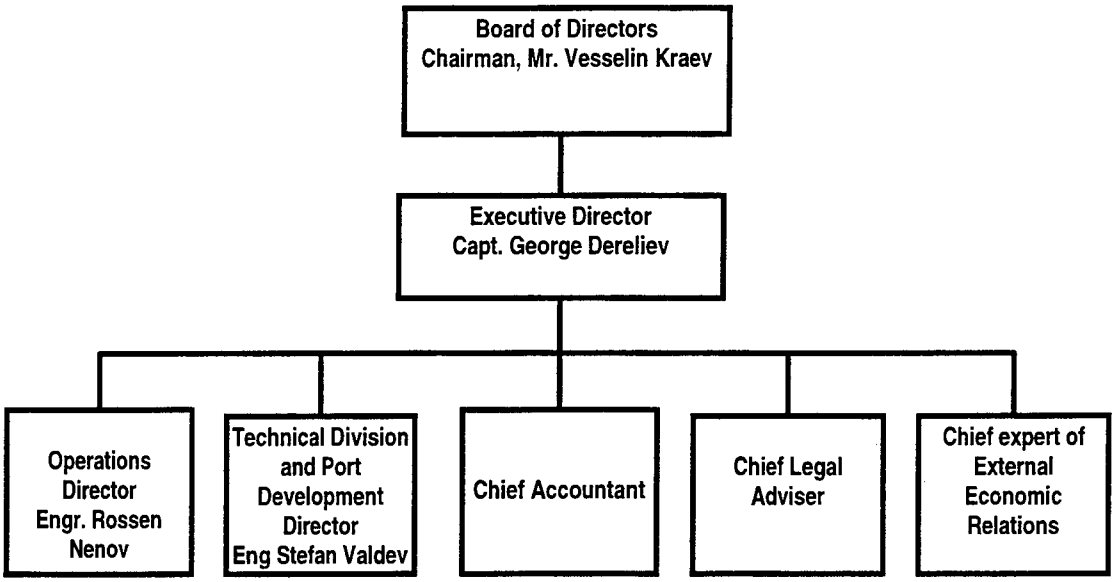


Figure 3-19 Organizational Chart of Port of Burgas

Financial data for the most recent year are available for 1993 at this time. Table 3-26 shows the operating income statement for 1993. The largest expense item is salaries including "social costs," which account for almost 50 percent of total expenses. Considering that another 23.6 percent of expenses is for contracted services, it is clear that the labor-intensive nature of the port's operations causes a serious drain on its financial resources.

Table 3-26
Operating Income Statement, 1993 ($ 000)*

Total Revenues		Percent
Import/Export Cargo-Handling Charges	6,084	21.9
Vessel Fees	12,234	44.1
Port Fleet Charges	5,754	20.7
Storage Fees	1,883	6.8
Other Revenues	1,803	6.5
Total Revenues	27,758	100.0
Operating Expenses:		
Materials	2,518	9.8
Services	6,039	23.6
Salaries & Fringe Benefits	12,530	49.1
Repair & Maintenance	3,382	13.2
Other Expenses	1,108	4.3
Total Expenses	25,577	100.0
Operating Income	2,181	

Source: Port of Burgas Joint Stock Company report on *Preliminary Research Appendix for Terminal 1,* January 1995, p.2/5

(*) Original data reported in Leva has been converted to U.S. dollars using the annual average conversion rate of 27.594 reported by The World Bank in *World Tables 1995,* Washington, D.C., May 1995, p.175.

Although it appears that a positive operating income (representing about 7.9 percent of total revenues) has been realized, it is important to note that the accounting procedures and financial reporting practices in Bulgaria are not directly comparable to the generally accepted accounting practices in the West. Specifically, depreciation of equipment and other fixed assets are not formally included in the port's operating income statement.

As of the end of 1992, the book value of fixed assets was $60.1 million, broken down into the following asset categories:[2]

Land and forest	$6.62 million
Buildings	2.43 million
Machinery and equipment	45.14 million
Transport equipment	5.59 million
Materials inventory	0.30 million

The port reported a total depreciation expense of $4.66 million for 1993 with no acquisition of fixed assets during the same year. Therefore, the book value of fixed assets as of the end of 1993 amount to $55.4 million. Inclusion of the 1993 depreciation expense would result in an operating loss of $2.5 million for the year.

As of the end of 1993, the port's receivables amounted to $5.5 million, which represents about 20 percent of its total revenue or an average aging of receivables of 2.4 months. Accrued payroll payable (including social insurance) as of December 31, 1993, amounted to $3.68 million, which is equal to 29 percent of the total salaries and fringe benefits expense for the year. This represents an average salary arrears of 3.5 months. Although not critically high, these represent the slow collections and salary payment experience prevalent throughout the economies in transition.

Port of Varna

The Port Authority is responsible for all operations at Varna East, Varna West, and Baltckik (a small coastal port near Varna). The following terminals within Varna Lake have independent management, although the Varna Port Authority has responsibility for main operations and, in some instances, maintenance of the marine structures:

- Two coal jetties for power stations
- Rail ferry terminal
- Lesport (this small terminal was dedicated to timber, but now wishes to diversify)

As at Burgas, the Port Authority awaits the formulation of new port laws so that it can formulate a plan for a change in working practices. The port management has visited many

[2]Port of Burgas Joint Stock Company, report on *Preliminary Research on Terminal 1,* January 1995, p. 2/7.

European ports, and expects a gradual change in working practices over the next 5 years. Also, both ports are still undergoing institutional changes aimed at total or partial privatization.

This section addresses published committed projects, either planned or underway. The criteria to be used in selecting the specific projects along the corridor are as follows:

- Committed projects; planned or underway
- Development of a continuous, all-weather highway corridor that links the ports of Varna and Burgas on the Black Sea with the Port of Durres on the Adriatic Sea
- Development of a continuous, all-weather railroad that links the Ports of Varna and Burgas with the Port of Durres
- Conformance to European highway and rail design and operation standards
- Economic viability of the project as measured in a positive benefit to cost ratio
- Improvements in the safety standards
- Relief of highway or railway capacity bottlenecks
- Financial viability of the project
- Conformance to stated transport goals of each individual country
- Balanced distribution of projects among the three countries

4.1 ROAD IMPROVEMENTS

This section describes the identification of planned east-west road improvements, which section were identified in the Balkan Transport Study as part of the Crete Corridor No. 8 project. Although these improvements are planned, it is known that full funding has not been identified. These improvement projects were classified as either "short-term" (up to 2000), "medium-term" (2000 to 2007), or "long-term" (after 2007).

The indicated time frames refer those established by the South Balkan governments and they differ from these established for this study.

4.1.1 Road Improvements in Albania

The proposed projects detailed for Albania relate to Road E852, described in Section 3.1.1.1. From west to east, this corridor covers Durres, Kavaije, Rrogozhinë, Elbasan, Perrenjas, and Kafasan (Qaf Thanë). The present condition of this road is substandard, and unsuited for the passage of large amounts of heavy international truck traffic. The alignment of the road is poor, gradients are steep in the mountainous areas, and the pavement has deteriorated to levels approaching total failure in many places; in addition, the road is frequently impassible in the winter due to blockage by snow.

Short Term

A major program of road improvements is planned to be funded by various agencies (Phare, EIB, World Bank, and the Kuwait Fund), which will raise the standard of the road to acceptable levels by online improvements and the bypassing of larger towns.

In the period up to 1998, the deteriorating condition of the roads will continue to dissuade international truck traffic from using the corridor. Immediate works are therefore considered

essential in order that Corridor No. 8 begin to realize its potential. The following works are therefore recommended for implementation:

Durres-Tirana

Description: Construction of a 4-lane motorway
Length: 40 km (6.5 km already completed)

Durres-Kafasan-Tushemisht (Rehabilitation)

Description: Local road maintenance and repairs (potholes and resurfacing) that would raise the carriageway to a standard 2-lane road, acceptable for international traffic. The target would be to achieve adequate carriageway width and ride quality.
Length: 175 km (145 km on E852)
Effects: No adverse environmental effects
Duration: 1 year

Towns: Kavaje, Rrogozhine, Peqin, Elbasan, Librazhd, Perrenjas

Description: Improvements to the urban roads to accommodate through traffic. Works to include pavement repairs and overlays, construction of footpaths in town centers to provide acceptable vehicle/pedestrian separation, road marking, and junction signal controls and lighting. Creation of adequate carriageway width in urban areas to accommodate two-way truck traffic.
Length: 20 km
Effects: Long-term benefits to the urban environment. Segregation of vehicles and pedestrians would improve safety. No adverse environmental effects.
Duration: 1 year

Rest Houses and Parking Lots (at Elbasan and Durres)

Description: Construction of both rest houses and parking facilities (none of which presently exists) for international truck traffic. These would including fuel stations, secure areas for overnight parking of trucks, rest houses, and restaurants. Facilities to match those provided elsewhere on 'E' routes.
Location: At the port and midway along the corridor
Duration: 9 months

Winter Maintenance Equipment

Description: Provision of winter road maintenance equipment for clearance of roads blocked by snow
Location: At the present road maintenance facilities in the mountain sections
Duration: Provision of equipment required immediately

Long -Term Projects

The intermediate-term objective should be for the creation of a new four-lane motorway, which should segregate local and international traffic. Substantial and costly earthworks would be necessary in the mountainous areas where the road occupies much of the available space in the narrow sections.

Durres-Elbasan

Description: Construction of a 4-lane motorway, including bridges, culverts, crash barriers, signing, and others. A carriageway width of 7.5 m with surfaced inner and outer shoulders and median guard rail. Alignment to be chosen to provide shortest possible route and bypass all villages and settlements.

Length: 70 km

Effects: Segregation of local and international traffic would improve village conditions; loss of farmland in good agricultural country.

Duration: 2 years

Elbasan-Kafasan

Description: Construction of a 4-lane motorway, including bridges, culverts, crash barriers, signing, and others. Alignment to be chosen to bypass all villages and settlements.

Length: 67 km

Effects: Segregation of local and international traffic would improve village conditions; potential for disruption of residential areas.

Duration: 3 to 4 years

4.1.2 Road Improvements in Macedonia

The suggested projects detailed for Macedonia relate to the two east-west corridor routes, Kafasan-Skopje-Kriva Palanka and Kafasan-Titov Veles-Crna Skala. The present condition of the corridor across Macedonia varies from recently constructed two-lane tolled motorways, to mountainous sections of two-way single carriageway roads. Necessary road improvements include pavement rehabilitation in large stretches, climbing lanes in the mountainous sections, and the construction of rest houses and parking facilities for international truck traffic.

Short-Term Projects

Tetovo - Skopje (including Skopje round about)

Description: Construction of a motorway. The 36-km Tetovo-Skopje section is one of the most overloaded road sections in Macedonia; the increased traffic frequency imposes the need for transforming this section into a motorway.

Length: 36 km

Effects: Due to the transit traffic needs and environmental concerns, it is necessary to construct a roundabout just north of Skopje.

Prilep - Titov Veles

Description: Build a standard two-lane design road. This road would pass through the central area of the country, and represent the most suitable link between the southwest and east regions of the country.

Length: 72 km

Effects: Improve safety standards and decrease the exploitation costs in the transport of commodities.

Kafasan - Struga

Description: Addition of a third drive lane for movement of slow vehicles. This reconstruction would reduce the time needed for crossing the border at Kafasan. (The existing connection between the Albanian/Macedonian border crossing town of Kafasan and Struga is characterized by very poor horizontal and vertical elements.)

Length: 6 km

Struga-Gostivar

Description: Addition of full-width climbing lanes to certain sections of mountain crossings with pavement suitable for heavy traffic.

Length: 117 km

Effects: Negligible; minor land take only in open country areas.

Duration: 1 year

Kicevo-Gostivar

Description: Local road maintenance and pavement rehabilitation. A carriageway width of 7.5 m with 1.0 m shoulders.

Length: 53 km

Effects: No adverse effects. Local realignment may be required in certain areas.

Duration: 1 year

Rest Houses at Gostivar and Kriva Palanka

Description: Construction of rest house facilities for international truck traffic, comprising fuel facilities, secure overnight parking, rest houses, and restaurant and recreation facilities. Facilities to match those provided elsewhere on 'E' routes.

Location: Close to the towns of Gostivar and Kriva Palanka

Effects: Negligible

Duration: 9 months

Kumanovo-Deve Bair

Description: Local road maintenance and pavement rehabilitation. A carriageway width of 7.5 m with 1.0 m shoulders.

Length: 77 km

Effects: No adverse effects

Duration: 1 to 2 years

Medium-Term Projects

Struga-Kicevo Bypasses

Description: Construction of bypasses to the villages between Struga and Kicevo, including Kicevo. At grade junctions.

Length: 20 km (of 64 km section)

Effects: Certain villages occupy confined areas within valleys, so substantial earthworks may be necessary. Also, land take for new bypasses likely to create some disruption and possible severance of the townships.

Duration: 2 to 3 years

Kumanovo-Kriva Palanka Bypasses

Description: Construction of bypasses to the villages between Kumanovo and Kriva Palanka.

Length: 12.5 km

Effects: Certain villages occupy confined areas within valleys and substantial earthworks may be necessary. Land take for new bypasses is likely to create some disruption and possible severance of the townships.

Duration: 2 years

Long-Term Projects

Struga-Kicevo

Description: Construction of a 4-lane motorway by on-line dualing.

Length: 44 km (of 64 km section)

Effects: On-line dualing will minimize land take.

Duration: 3 years

Kumanovo-Deve Bair

Description: Construction of dual carriageway road by on-line dualing.

Length: 77 km

Effects: On-line dualing will minimize land take.

Kicevo-Gostivar

Description: Construction of a new surface route crossing the mountains with a tunnel section at the steep central section.
Length: 35 km (of 53 km section)
Effects: Tunnel route less environmentally intrusive than present road across the mountains. Road diverted away from Mavrovo National Parkland.
Duration: 4 years

Deve Bair Tunnel Crossing

Description: Construction of a tunnel border crossing amd 2-lane dual carriageway.
Length: 5 km
Effects: Tunnel route is less environmentally intrusive.
Duration: 3 to 4 years

4.1.3 Road Improvements in Bulgaria

Improvements planned in Bulgaria primarily include construction of new highways in the long-term and rehabilitation and junction improvements in the short-term.

Short-Term Projects

Gyeshevo- Radomir

Description: New road signs and road marking. Installation of warning, direction, and information signs to international standards.
Length: 68 km
Effects: None
Duration: 9 months

Sofia Ring Road

Project #1
Description : Dualing of existing single carriageway road. Completion of partially constructed grade-separated junctions to the city center. Addition of new traffic signals.
Length: 15 km
Effects: Negligible. Land space required, but vacant space available.
Duration: 2 to 3 years

Project #2
Description: Junction improvements to existing signal-controlled urban intersection. Junction remodeling, resurfacing, new signals, better pedestrian facilities.
Effects: Reduction in congestion and better facilities for pedestrians.
Duration: 6 months

Orizovo-Burgas

Description: Pavement rehabilitation (to the E773). Pavement repairs and strengthening, drainage repairs, and new road signs and road marking.
Length: 229 km
Effects: None
Duration: Transit roads project

Medium-Term Projects

Orizovo-Kapitan Andreevo

Description: Completion of the Sofia-Turkey TEM link.
Length: 108 km
Effects: Negligible; land take required, but vacant space available along the whole route.
Duration: 3 to 4 years

Sofia Ring Road

Description: Dualing of existing single carriageway between E79/E871 junction and the E79 junction to Botevgrad. Construction of grade-separated junctions at the major road intersections.
Length: 35 km
Effects: Negligible; land take required, but vacant space available.
Duration: 3 years

Orizovo-Burgas

Description: Construction of bypasses in the following towns: Stara Zagora, Nova Zagora, Karnobat, and Ajtos.
Length: 25 km
Effects: Local benefits would be the removal of through-traffic from town centers. No adverse effects.
Duration: 2 years

Long-Term Projects

Bulgarian/Macedonian Border Crossing Tunnel

Description: Construction of a tunnel border crossing (assuming surface route alternative is not feasible). Two-lane dual carriageway.
Length: 5 km
Effects: Tunnel route is less environmentally intrusive than surface alternatives.
Duration: 3 to 4 years

Gyeshevo-Radomir

Description: On-line dualing of existing road with major realignment at the town of Izvor. Two-lane dual carriageway and tunnels.
Length: 74 km
Effects: To be assessed
Duration: 3 to 4 years

Varna-Burgas

Description: Construction of a new two-lane motorway, "Cherno More"
Length: 87 km
Effects: To be assessed
Duration: 4 years

Orizovo-Burgas

Description: Construction of a new three-lane motorway "Trakiya"
Length: 190 km
Effects: To be assessed. Substantial land take required.
Duration: 5 years

E79 - E80 Link Road

Description: New road link between E79 and E80 south of Sofia.
Length: 60 km (alignment provisional)
Effects: To be assessed. Route crosses an area of natural significance.

4.2 RAILWAY IMPROVEMENTS

4.2.1 Railway Improvements in Albania

In Albania, rehabilitation of the existing line between Durres and Lin is required to increase line speeds from 25-40 km to 80 km. Essential work is required to completely renew the track and signaling. The doubling of the maximum speed would mainly result from improvements in track condition. Further speed increases would be possible with realignment of existing sharp curves.

For the realization of the haulages on the territory of Albania in the east-west direction, a 1.7 km railway section must be constructed between Kafasan and the Macedonian border.

Short-Term Projects

Durres-Lin

Description: Upgrade and rehabilitate. Renewal of track including reballasting, resleeping rerailing, and respacing sleepers. New radio-based train control system, concrete sleepers, 22½ t axle load, UIC 60 rail.
Length: 138 km
Effects: Minimal (dust/noise). Some land take required.
Duration: 4 years

Medium-Term Projects

Durres-Tirana

Description: Upgrade and rehabilitate. Renewal of track including reballasting, resleeping rerailing, and respacing sleepers. New radio-based train control system. Concrete sleepers, 22½t axle load, UIC 60 rail 22½ t axle load, UIC 60 rail.
Length: 40 km
Effects: Minimal (dust/noise). Some land take required.

Long-Term Projects

Lin-Macedonian Border

Description: Construct new line from Lin to the Macedonian border. Concrete sleepers, 22½ t axle load, UIC 60 rail.
Length: 2 km
Effects: Land take required.
Duration: 2 years

4.2.2 Railway Improvements in Macedonia

For the Macedonian Railways, the primary development on the East-West Corridor is the rail connection with both the Albanian and the Bulgarian Railways. The government of Macedonia and the governments of Albania and Bulgaria have undertaken a series of activities for the construction of railroad lines between the Albanian border and Kicevo (65 km), and between Kumanovo and the Bulgarian border (56 km).

Kumanovo - Deve Bair

In 1994, a general design for the Beljakovci-Kriva Palanka section was completed. Later that year, the Parliament of Macedonia passed a law on provision of resources for financing the rehabilitation of the 30 km Kumanovo-Beljakovci segment and the construction of a 55 km Beljakovci-Kriva Palanka-Deve Bair railroad line. The construction of the railroad line began in October 1994. The scope for the new railway line includes construction of base and upper structure as well as construction of a common tunnel at the Bulgaria border (which is 1325 m

in length in the territory of Macedonia). The railway line includes construction of 55 bridges with a total length of 8,675 m and 28 tunnels with a total length of 6,567 m.

So far, the construction of the railroad has been exclusively financed by the Macedonian government, for an estimated US$ 90 million. For 1997, the Macedonian government has allocated approximately US$ 9 million of its budget to this project. A project management report for the construction of the railroad line has been prepared by the German Technical Aid Association (GTZ), and published in November 1994, which estimates US$ 337 million for the total cost of the project.

The Macedonian Railroad Administration has informed the Bechtel team that the total project cost is now estimated at US$ 330 million.

Kafasan - Kicevo

The segment Kafasan-Kicevo is the west branch of the east-west railroad route in the territory of the Republic of Macedonia. In 1995, the Macedonian railways prepared a feasibility study for the construction of a Kafasan-Kicevo rail section via Struga. The estimated total costs for the construction of this 65 km railway line is estimated at US$ 440 million. Since the terrain through which this section passes is mountainous, it will require a significant number of engineering structures such as bridges, viaducts, and tunnels.

An alternative alignment for this connection to the Albanian border would connect Kafasan with Bitola/Sopotnica. A study of these two alternative alignments is recommended in order to select the most cost-effective approach.

Short-Term Projects

Beljakovce-Bulgarian Border

Description: Complete new railway. Concrete sleepers, 22½ t axle load, UIC 60 rail.
Length: 55 km
Effects: Land take, tunneling, and bridges through difficult terrain
Duration: Under construction

Medium-Term Projects

Kicevo-Kumanovo

Description: Upgrade, re-rail, UIC 60 rail.
Length: On 110 km
Standards: UIC 60 rail
Effects: Minimal (noise/dust)
Duration: 1 year

Kumanovo-Beljakovce

Description: Upgrade, reballast, resleeper and rerail, concrete sleepers, 22½ t axle load, UIC 60 rail.
Length: 31 km
Effects: Minimal (noise/dust)
Duration: 1 year

Long-Term Projects

Albanian Border-Kicevo

Description: Construction of a new line. Concrete sleepers, 22½ t axle load, UIC 60 rail.
Length: 65 km
Effects: Land take required
Duration: 8 years

Photo 4-1 **Macedonia has built over 80 km of access roads to the Beljakovce - Bulgarian border railway construction site**

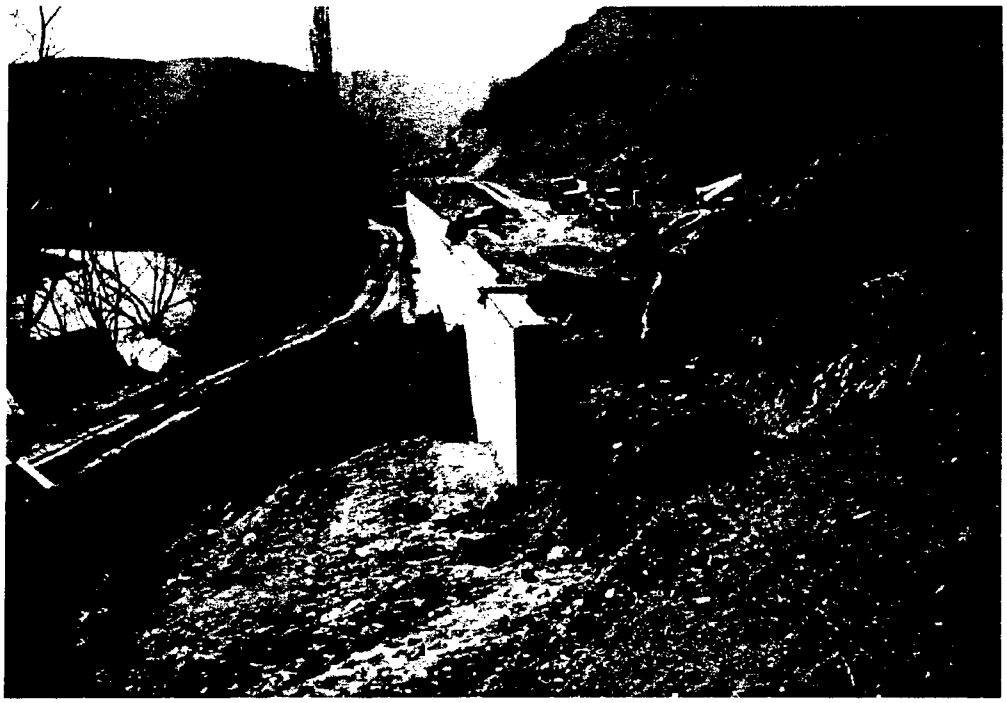


Photo 4-2 **Construction Activities Macedonian Rail Segment Beljacovce-Bulgarian border**

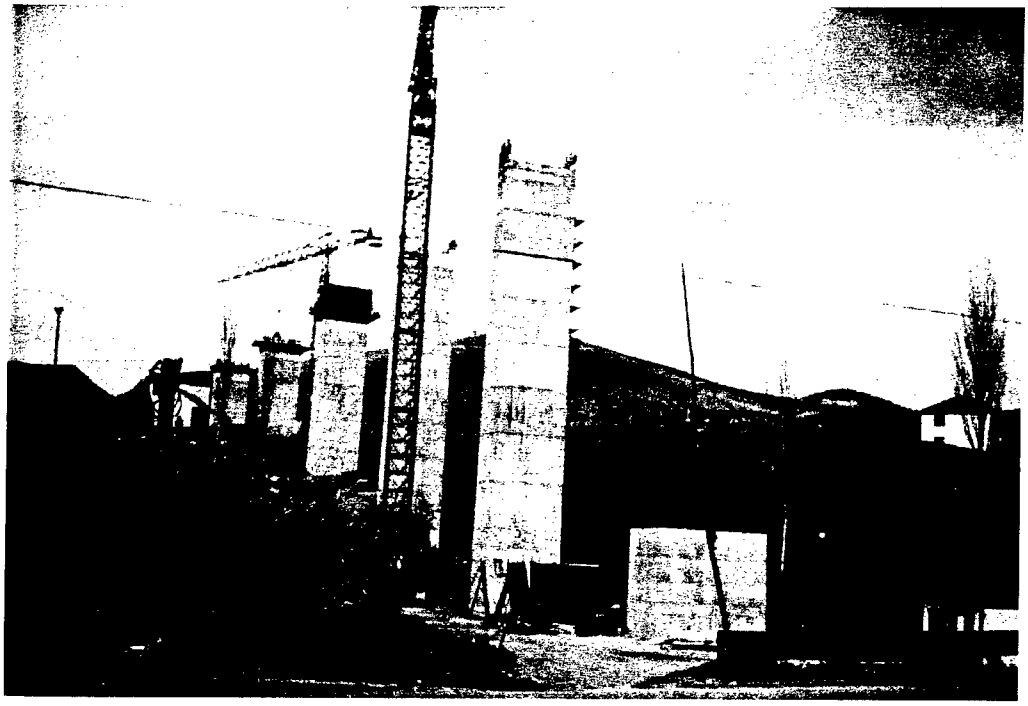


Photo 4-3 **Elevated Railway construction on the 56km section Beljacovce-Bulgarian border**

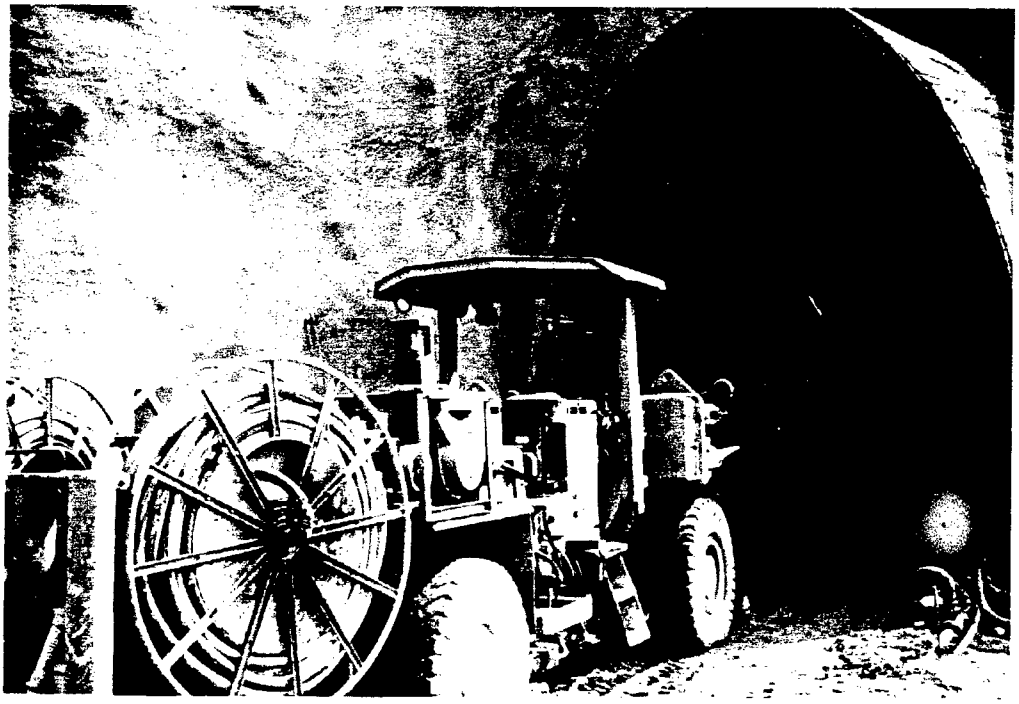


Photo 4-4 **Tunnel Construction**
Macedonian Rail Segment Beljacovce-Bulgarian border

4.2.3 Railway Improvements in Bulgaria

The planned priority infrastructure developments for the Bulgarian Railways include short-, medium-, and long-term investments. The short-term investment includes two projects in the East-West Corridor: construction of a 2 km railway section from the Macedonian border to Gyueshevo and reconstruction and upgrading to 120 to 140 km/hr of the 80 km portion of the Gyueshevo-Radomir section. The medium-term investment includes electrification, reconstruction, and upgrading to 160 km/h of the 150 km Dimitrovgrad-Svilengrad railway section. With regards to BDZ's long-term investment, container transport terminals in Sofia and Dimitrovgrad are proposed.

In addition to planned investments, in the Restructuring Program funded by the World Bank and EBRD that began in 1995, BDZ is also contemplating a medium-term investment plan, called the 2005 Plan. The 2005 Plan aims to modernize and commercialize BDZ, including restoring the railway's financial health. Planned investments under the 2005 Plan cover infrastructure, including the permanent way and safety equipment; rolling stock, including passenger cars, wagons, electric locomotives, EMUs, tilting train, and locomotive modernization; and train control systems. The investment plan is divided into two phases. Under the first phase, from 1996 to 2000, there will be a gradual build-up of investments. Phase I is expected to be financed mostly by international development agencies. During the second phase, from 2000 to 2005, external sources, such as EBRD, are expected to play a key role as this phase seeks to integrate with the European network. The total investment planned over the 10-year period is 107.1 billion 1995-Leva.

Macedonian Border - Gyueshevo

This project comprises the construction of a 2-km railway line that will link the Bulgarian and the Macedonian Railways at the border. The project also includes a 1,325-m tunnel, which is a part of the common railway tunnel between Macedonia and Bulgaria. The construction plans have been approved, and the total cost for this project is estimated at US$ 12 million.

Gyueshevo - Radomir

This project comprises the upgrading of the existing 80-km railway infrastructure, including electrification, which would raise the maximum speed from 60-75 km/hr to 120-140 km/hr. The parameters of the line will have to be improved in order to meet the international standards for rail traffic. The engineering designs have been completed, and the total cost is estimated at US$ 100 million.

Plovdiv - Dimitrovgrad - Svilengrad

This project includes electrification and reconstruction of the 150-km railway line between Plovdiv and Svilengrad. The reconstruction also includes procurement of signaling and telecommunications equipment aimed to raise maximum train speeds. The total cost is estimated at US$ 358 million. The electrification of the section Plovdiv-Dimitrovgrad is in progress.

Sofia Terminal

In the long-term, establishing a contemporary combined transport terminal near Sofia is a necessity. The project includes the construction of general and refrigeration storage areas and procurement of equipment and development of a service infrastructure. Preliminary technical and economic studies have been performed, and the total cost is estimated at US$ 50 million.

Dimitrovgrad Terminal

The objective of this long-term project includes the modernization and reconstruction of the existing combined transport terminal. It will include enlarging the storage areas, buying equipment, and upgrading the existing facilities. The estimated cost is US$ 30 million.

Short-Term Projects

Sofia-Varna

Description: Upgrade sections of track. Concrete sleepers, 22½ t axle load, UIC 60 rail
Length: On 61 km (of 508 km)
Effects: Minimal
Duration: 2 years

Shumen-Sindel

Description: Rerail, respace sleepers, UIC 60 rail.
Length: 45 km
Effects: Minimal
Duration: 1 year

Medium-Term Projects

Gyeshevo-Radomir

Description: Rerail, respace existing sleepers. Concrete sleepers, 22½ t axle load, UIC 60 rail.
Length: 96 km
Effects: Land take required
Duration: 3 years

Radomir-Sofia-Karnobat

Description: Rerail, respace existing sleepers, upgrade sections. Concrete sleepers, 22½ t axle load, UIC 60 rail.
Length: On 381 km (of 465 km)
Effects: Minimal
Duration: 4 years

Karnobat-Varna

Description: Rerail, respace existing sleepers. Concrete sleepers, 22½ t axle load, UIC 60 rail.
Length: 124 km
Effects: Minimal
Duration: 2 years

Karnobat-Burgas

Description: Rerail, respace existing sleepers. Concrete sleepers, 22½ t axle load, UIC 60 rail.
Length: On 50 km (of 60 km)
Effects: Minimal
Duration: 1 year

Sofia-Plovdiv

Description: Rerail, UIC 60 rail.
Length: 156 km
Effects: Minimal
Duration: 1½ years

Sofia-Dimitrovgrad

Description: Upgrade sections of track. Concrete sleepers, 22½ t axle load, UIC 60 rail.
Length: On 34 km (of 232 km)
Effects: Minimal
Duration: 1 year

Plovdiv-Karnobat

Description: Upgrade sections of track. Concrete sleepers, 22½ t axle load, UIC 60 rail.
Length: On 125 km (of 220 km)
Effects: Minimal
Duration: 3½ years

Tulovo-Stara Zagora-Samuilovo

Description: Rerail, respace existing sleepers, UIC 60 rail.
Length:
Effects: Minimal
Duration: 1¾ years

Macedonian Border-Gyeshevo

Description: Construct new line between the Macedonian/Bulgarian border and Gyueshevo, utilizing part-built alignment (1.3 km) and part-built tunnel. Complete works and lay track plus border station and infrastructure. Concrete sleepers, 22½ t axle load, UIC 60 rail.
Length: 2.5 km
Effects: Land take required
Duration: 3 years

Long-Term Project

Tulovo-Stara Zagora

Description: Track doubling. Concrete sleepers, 22½ t axle load, UIC 60 rail.
Length: 27 km
Effects: Land take required
Duration: 1 year

Plovdiv-Svilengrad

Description: Reconstruct and electrify. Concrete sleepers, 22½ t axle load, UIC 60 rail, 25 kV a.c.
Length: On 163 km (of 171 km)
Effects: Dust and noise during construction
Duration: 4 years

4.3 PORT IMPROVEMENTS

4.3.1 Port of Durres

The Port of Durres is the only port in Albania included in the East-West Corridor study, where reconstruction has begun. A 137-m-long quay is under construction; another quay, 670 m long and 11.5 m deep, has been designed. It is expected to handle containers and another 1.8 million tons of loads per annum. Silos will also be erected for the handling of 400,000 tons of wheat per annum.

Plans also include reconstruction of the navigational channel (12.5 deep, 60-80 m wide, and 4.8 km long) to the port. A ferry-boat berth is under construction for the processing of seven ferries per day.

During the last few years, master planning studies, for the Port of Durres, were performed by Spanish and Italian consultants. Follow-up work on these studies was interrupted by the recent civil unrest in Albania. It is anticipated that the development activities at the Port of Durres will resume soon.

4.3.2 Port of Burgas

The cornerstone, in the existing master plan of the Port of Burgas, is the creation of specialized, independent, and economically sustainable terminals. The plan envisages the development of the terminals as indicated below.

Terminal 1 General and Liquid Cargos

This terminal would be designated for the handling of liquid chemicals, fertilizers, and general cargo. It would have four berths with a total length of 750 meters and be built over three stages. When completed, this terminal will have a total annual throughput capacity of about 1 million tons.

Terminal 2 Bulk Cargo

Terminal 2 would specialize in handling bulk and general cargo. It would eventually have six berths with a total length of 1,580 meters, also built over three stages. The expected maximum annual throughput capacity is estimated at almost 6 million tons.

Terminal 3 Ro-Ro Ferry Terminal

This terminal would exclusively handle ro-ro and ferry transport. It would include three specialized berths, one for ferry traffic and the other two for ro-ro. The total length of the three berths is 380 meters. This terminal would be built in two stages. Anticipated cargo throughput is about 1.3 million tons.

Terminal 4 Container Terminal

This would become a 450-m container terminal with two berths; it will be built in two stages. The project also comprises the development of wharfside areas, and the acquisition of facilities to handle expected traffic volumes of 15,000 container units per year.

Between terminals 3 and 4, the plan calls for the construction of a refrigerated store with a capacity of 10,000 tons. The warehouse will have facilities to accommodate refrigerated trains and trucks, and refrigerated containers. It will have its own berth between the two terminals for the handling of refrigerated ships as well as feeder container ships.

Associated with the implementation of the four terminals would be the development of necessary infrastructure in the areas of ground transport, water, wastewater, power, communications, and safety systems.

Financing Alternatives

Two alternatives have been presented to finance the implementation of the Port of Burgas Master Plan:

- The Burgas Port Authority (a state-owned autonomous organization) would undertake all the design and construction activities with financing provided by a group of investors under a sovereign guarantee by the state. The investors would have the right to oversee design and construction activities and ensure a high quality of construction.

- One or more of the terminals can be franchised to a number of concessionaires on a build-own-transfer (BOT) basis, for a specific period of time. The concessionaire would raise financing for the project and be in charge of the design, construction, and procurement of the project, in coordination with Port Authority, representing the owner (state). The concessionaire would then operate the facility, again by integrating his own people with the Port of Burgas operational force.

- Recently the Japanese Government agreed to extend a loan to the Bulgarian Government through the Overseas Economic Corporation Fund of Japan for the expansion and improvement of the Port of Burgas. The loan envisages financing the construction of the East Breakwater and Terminal 2A for ore and coal.

Benefits of the Master Plan

The Master Plan would have the following benefits:

- Realization of an efficient and productive port operation with highly specialized terminals
- Shipping services all over the world using state-of-the-art technology with high quality and efficiency
- Improved environmental conditions in the city of Burgas and help toward a modern free trade zone
- Improved accessibility of the port to the country's highway and railway network bypassing the inner network of the city of Burgas

4.3.3 Port of Varna

In 1995, a general plan for the development of the Port of Varna was adopted in accordance with PHARE. First place is given to the specialized terminals for containers and grains. The current port developing projects are as follows:

- Reconstruction and development of container terminals in the Port of Varna, East and West
- Grain terminal in the Port of Varna West
- Rehabilitation of quay and back-up landside facilities
- Draft Ports Law in the Republic of Bulgaria
- Management model for privatization of ports' facilities
- Human resource model
- Sustainable competitive tariff policy
- Strategy for development of information systems
- Container operations at the Port of Varna
- Containers are presently handled both at Varna East and Varna West.

Appendix A

Over the past few years, a number of projects/studies have been commissioned by various international financial and development institutions as well as by the governments of the three South Balkan countries. Some of these projects/studies have been completed while others are currently under way. These projects/studies address one or more of our concerns on the East-West Corridor Study. Below is a summary of the information currently available for each pertinent project/study.

These transport projects/studies typically include descriptions of existing conditions, forecasts of future traffic movements, identification of one or more improvement project, conclusions and recommendations. Our East-West Corridor study builds upon work that has already been accomplished.

A. Regional Projects

A.1 Feasibility Study for the Development of Railway and Combined Transport on International Trans-European Axes in Central and Eastern Europe

Funded by: EC-PHARE
Scope: as described above
Consultants: TEAM S.r.l. Rome
Schedule: Study performed between the years of 1992/1993
Availability: One copy of the five-volume study with the Bulgarian Ministry of Transport (with Ms. Vessela Gospodinova)

A.2 Balkan Transportation Study - Albania, Bulgaria, Romania, Slovenia, Hungary, Greece, Turkey, Italy

Funded by: EC-PHARE
Scope: A strategic analysis of a transport infrastructure development program for the Balkan Region including roads, rail, ports, shipping, and inland waterways. The study includes an analysis of the current situation, demand forecasting and determination of transport costs, consideration of competition issues, and planning a cost-effective means of integrating the Balkans into the wider European transport network.
Consultants: Gibb Limited, UK
Schedule: Study started September 1995, completed February 1997
Availability: Bechtel will buy the 7-volume study from Gibb Limited. Copies should be available to our local consultant in Sofia, the Institute of Transport and Communications, as well as with the Ministries of Transport in the three countries.

A.3 Project Review : Rail Link Macedonia - Bulgaria

Funded by: EC-PHARE
Scope: A review of the status of the rail link project with respect to technical, economic, and organizational documentation, to check cost estimates and economics for plausibility and to propose measures for the coming stages of the project.
Consultants: GTZ, GmbH / Lahmeyer International GmbH
Schedule: Study completed December 1994
Availability: Bechtel has a copy of the study

A.4 Definitional Mission Report for Railway Rehabilitation Projects in Albania, Bulgaria, and Macedonia

Funded by: TDA
Scope: Identification of rehabilitation projects for the three railway systems in the following areas: railway software applications, locomotive rehabilitation, intermodal transportation, and telecommunications and computer hardware.
Consultants: Transportation and Economics Research Associates (TERA)
Schedule: Study completed November 1994
Availability: Copies are available at TERA

A.5 South Balkan Transport Initiative Desk Study

Funded by: TDA
Scope: An overview of transport issues in the countries of Bulgaria, Macedonia, and Albania
Consultants: CORE International
Schedule: Study completed 1996
Availability: Copies are available to Bechtel, TERA

B Bulgarian Projects

B.1 Railroad Restructuring and Rehabilitation Study

Funded by:	World Bank	$95 million
	EBRD	$45 million
	PHARE	$18 million
	Export Credit Agency	$12 million
	Bulgarian resources	$126 million
	Total	$296 million
Schedule:	Program started in 1995 and should run through to 1998	
Consultant:	Systra is coordinating the program for the sponsors	
Availability:	BDZ should have extensive documentation on this program	

B.2 The Master Plan Study for Long-term Management of Bulgarian Railways

Funded by: Japan International Cooperation Agency (JICA).

Scope: Analysis of the future alternative objectives and policies of the Ministry of Transport and the Bulgarian State Railways.
Preparation of a long-term plan for improvement of management efficiency and development of Bulgarian railways together with economic/financial analysis based on the mechanism of market economy.
Preparation of a time-phased plan including investment for integrating Bulgarian railways into the European railway system.

Consultants: Japan Railway Technical Service
Daiwa Institute of Research, Tokyo
Yachiyo Engineering Co. Ltd.
Halcrow/Transmark, London

Schedule: Study started October 1995 and is scheduled for completion end of 1997

Availability: Study in progress

B.3 Combined Transport Study for Bulgaria

Funded by: EC-PHARE

Scope: Traffic forecasts, investment program for 2000 and 2010 for the development of the Bulgarian transport system.

Consultants: Bonifica Spa (Italy), Doxiadis (Greece), and TECNIC, Institute of Transport and Communications (Bulgaria).

Schedule: Study is complete. Final report scheduled to be issued in March 1997

Availability: Final reports, 5 volumes, are available with Bechtel

B.4 Sealand Inter-Modal Container Terminal Study (Sofia, Bulgaria)

Funded by: TDA

Scope: Potential for private sector participation in the development of an inter-modal container terminal in Sofia, Bulgaria

Consultants : Sealand, Manalytics, Local Consultants

Schedule: Study started during February of 1997
Availability : Study is in progress

C Macedonian Projects

C.1 Macedonia Rail Sector Study

Funded by: TDA
Scope: Economic Viability of the Macedonian Railroad System
Consultants: WSA, Bechtel, and TERA
Schedule: Study scheduled to start during March 1997 and to be completed by September 1997.
Availability: Study is in progress

C.2 Sealand Inter-Modal Container Terminal Study (Skopje, Macedonia)

Funded by: TDA
Scope: Potential for private sector participation in the development of an inter-modal container terminal in Skopje, Macedonia
Consultants: Sealand, Manalytics, local Consultants
Schedule: Study started during February 1997
Availability: Study is in progress

C.3 Skopje and Ohrid Airports Investment and Revenue Generation Plan

Funded by: TDA
Scope: Determination of future facilities requirements and costs at Skopje and Ohrid airports and the viability of financing such improvements through the anticipated revenue generating potential of the two airports
Consultants: Wilbur Smith Associates
Schedule: Study completed November 1996
Availability: WSA has copies

D Albanian Projects

D.1 Development of Duress Port and Construction of Ferry Terminal

Funded by: Italy, EIB, IDA, and Kuwait Fund
Scope: Rehabilitation of port facilities, upgrade of customs facilities, and construction of a ferry terminal
Consultants:
Schedule: Work in progress
Availability: The Ministry should have documentation

D.2 Study of the Future Role of Albanian Railways

Funded by: World Bank
Scope: Study of the short- and long-term future of Albanian Railways in the light of the sharp traffic decline experienced in recent years and the need for a least-cost transport system
Consultants: CIE Consult, Ireland
Schedule: Study completed in 1995
Availability: Bechtel has a copy

D.3 Port of Duress Master Plan

Funded by:
Scope: Development of a short, intermediate, and long-term master plan for the Port of Duress
Consultants: British
Schedule:
Availability: The Ministry should have documentation

D.4 Port of Vlore Master Plan

Funded by: PHARE
Scope: Development of a master plan for the Port of Vlore
Consultants:
Schedule:
Availability: The Ministry should have documentation

Appendix B

Transport officials and other concerned individuals interviewed and/or contacted during the course of the study:

Albanian Ministry of Public Works & Transport

Sadedin Çeliku, Vice Minister

Ing. Danja Vasili, Chief Secretary

Arben Babameto, State Secretary for Transport

Shkelqim Xhaxhiu, General Director of Transport

Gezim Bimbli, General Director, General Roads Directorate

Perparim Zuna, Director, Directory of Civil Aviation

Kujtim Hashovra, Head of Transport Department

Sotir Bebi, Advisor of Minister for Transport

Thimjo Plaku, Vice Director, Institute of Transport Studies

Ilia Çili, Director, Department of International Relations

Shkelqim Kozoj, Director, Foreign Aid Department

Abanian Railways

Arben Keçi, General Director

Mak Albania

Zakaria Rashed, Area Manager

Port of Durres

Eng. Zamir Ramadani, General Director

Macedonian Ministry of Transport and Communications

Branko Petkovski, Deputy Minister

Risto Andreev, Undersecretary

Ljupco Dimitrov, Chief of Road and Infrastructure

Jasmina Karovska, Chief of Cabinet of the Minister

Dragica Nikiforovic, Advisor

Macedonian Ministry of Urban Planning, Construction & Environment

Borce Ralevski, Undersecretary

Jegehi Ulber, Advisor, Department of Foreign Investment

Michel Apostolski, Department for Foreign Investment

Svetlana Gjorgjeva, Advisor, Department of Foreign Investment

Fund for National and Regional Roads, Macedonia

Stevica Bozinoski, Director

Tatjana Minovska, Economist, International Affairs

Pop-Iliev Djordji, Highway Engineer

Vladimir Pavlovski, General Director, A.M.E.R.I.T.

Macedonian Railways

Naumov Stojan, General Director

Blagja Petreski, Assistant Director General, Traffic and Exploitation

Stanisa Gregorov Pozinoznki, Railroad Engineering Manager

Bulgarian Ministry of Transport

Petro Tabakov, Deputy Minister

Anton Antov, Advisor of Minister

Velislav Dobrev, Head of Foreign Transport Policy Department

Kalcho Hinov, Deputy Minister and Secretary General

Apik Garabedian, Deputy Minister

Lachezar Lalov, Deputy Minister

Velitchko Raykov, Head International Agreements and Organizations

Vessela Gospodinova, Head Infrastructure and Foreign Investment

Kostadin Grouev, Head Information Technologies

Vassil Kostov, Economic & Commercial Counselor

Tatyna Savova, Expert, International Relations Department

Virzhinia Meshineva, Secretary of Coordinating Group

Raja Velkova, Assistant

General Road Administration, Bulgaria

Dimitar Dimov, General Director

Stefan Popov, Head International Relations

Bulgarian State Railways

Simeon Evtimov, Strategic Development, Head of department

Maria Batchvarova, Expert Signaling and Telecommunications

Valentin Doytchev, Chief of Sector Telecommunications

Port of Varna, Bulgaria

Semo Semov, Head Commercial Department

Alexander Stankov, Manager

Ivan Lalev, Deputy Director Operations

Port of Burgas, Bulgaria

Dimitar Alexiev, Executive Director

Rossen Nenov, Director of Exploitation

Stefan Valtchev, Director of Technical Division and Port Development

U.S. State Deparment

Daniel Neher, Regional Economic Officer, Office of South Central European Affairs

Eric Lundberg, Albania Desk Officer

U.S. Department of Commerce

Jay A. Burgess, Director, East European Division

U.S. Embassy in Bulgaria

Susan Weidner, Senior Commercial Officer

Uliana Kanelli, Senior Commercial Specialist

U.S. Embassy in Macedonia

Rozita Cesnovska, Representative

Arben Geza, Representative

U.S. Emabassy in Albania

Lynn Gurian, Second Secretary

U.S. Customs Service

John Holbrooke, Chief Foreign Advisory Development Branch

The World Bank

Carlos Elbirt, Resident Representative, World Bank Resident Mission in Albania

Adriana Damianova, Infrastructure Program Team Leader, World Bank Resident Mission in Bulgaria

Peter Parker, Senior Transport Economist, Europe and Central Asia Region

Mirtha Pokorny, Senior Environmental Economist, Europe and Central Asia Region

Lou Thompson, Railways Adviser, Transportation, Water and Urban Development

Jacques Yenny, Principal Economist, Europe and Central Asia Region

Consultants

Nigel Ash, Gibb Limited, Technical Development, Head of Transport Planning

Cornelia Alter, GTZ