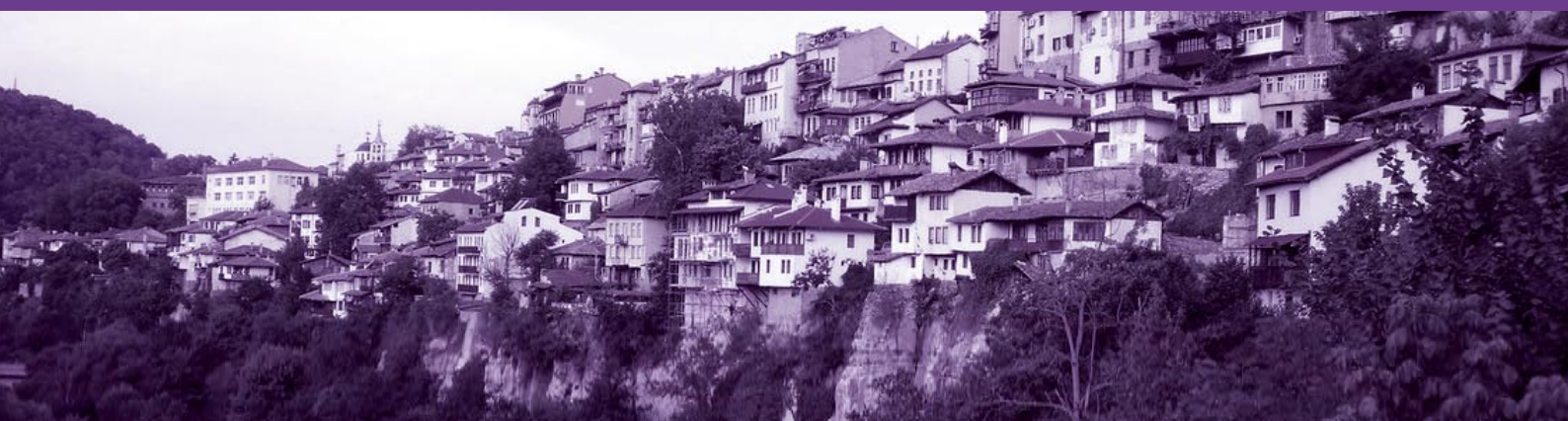




DIOMIS

Evolution of intermodal rail/road traffic in Central and Eastern European Countries by 2020

BULGARIA



Developing Infrastructure & Operating Models for Intermodal Shift

December 2009

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FOREWORD

In January 2008, the Combined Transport Group of the UIC presented the **AGENDA 2015 FOR COMBINED TRANSPORT IN EUROPE**, which constituted the epitome of the work carried out over two years in the **UIC DIOMIS project**: developing infrastructure and operating models for intermodal shift.

Previously, with KombiConsult and K+P Transport Consultants, we investigated whether enough capacity would be available for Combined Transport (CT) on the European railway infrastructure by 2015 considering the expectations placed on Rail Freight and particularly on Combined Transport. In other words, given the most realistic growth projections, taking into account the foreseeable evolutions of the other Railway activities and visualising, on the basis of the current and planned infrastructure realisations and projects, the railway infrastructure available in 2015, would there be sufficient and appropriate infrastructure? If not, what should be done, in terms of investments and organisations, including those related to terminals?

It was shown that severe bottlenecks would constrain many parts of the European railway network and that, in all fields (infrastructure network, operations, terminals, ...), there was a need for innovative solutions leading to a deep re-evaluation of our current infrastructure and operating models.

A recent update of our growth projections for CT, in the light of the present recession, indicates that, despite the current traffic downturn caused by the recession, CT will have grown considerably by 2015, compared to 2005, and that, with unchanged methods of production and without considerable improvements in productivity, we will still be faced, on the central part of the European network covered by the initial phase of **DIOMIS**, with severe capacity constraints in the field of railway infrastructure, CT terminals and even wagons.



DIOMIS established that CT has become the growth business segment of freight railways and provides the opportunity to increase the market share of rail freight in Europe. However, considering the prospective capacity constraints that were identified by 2015, **DIOMIS** considered how the stakeholders, i.e. railways undertakings, operators and terminal managers, besides inevitable infrastructure expansions, can, within the projected infrastructure constraints, increase capacity and optimize capacity use in order to face the expected strong growth of combined transport of 7,3 % domestic and 8,7 % internationally ?

The results published in this **AGENDA 2015 FOR COMBINED TRANSPORT IN EUROPE** constituted a call for action for all the decision makers of the stakeholders (Railway Undertakings, Combined Transport Operators, Terminal Managers, Infrastructure Managers etc.), including national and supranational authorities and port authorities. The ambition of **AGENDA 2015** is to become an integral part of their respective strategies.

The second phase of DIOMIS, covering 2008-9, has ensured the full dissemination of AGENDA 2015 and updated the overall detailed report on Combined Transport (CT).

Most importantly, it expanded to a number of Central and Eastern European Countries (CEEC) the geographical scope and the investigation methods of **DIOMIS**. The countries investigated in the course of this second phase were Bulgaria, Croatia, the Czech Republic, Hungary, Poland, Romania, Slovakia, and Slovenia.

For each of these countries, the team identified the current situation of CT, its challenges and prospects, the prospective capacities of the railway infrastructure and of the CT terminals, and the related investment plans and needs. The impact of the current recession, that is hitting hard some of the countries involved, was also taken into account.



The result is a set of comprehensive reports, constituting for the deciders in these countries, and for the stakeholders of CT interested in developing CT business within and in relation with the CEEC countries, and in conjunction with **AGENDA 2015**, a precious information source but, even more importantly, also a useful analytical and decision tool.

As was the case for the other **DIOMIS 1** and **2** modules, KombiConsult and K+P Transport Consultants carried out the work and prepared these reports. We are very thankful to Hans-Paul Kienzler, from K+P Transport Consultants, and to Rainer Mertel, from KombiConsult, and their respective teams.

DIOMIS was also coached by a very active Steering Committee, composed of Martin Burkhardt (Director General UIRR), Javier Casanas (Trenitalia, partim), Gerard Dalton (Infrastructure Director of UIC), Gilberto Galloni (Chairman Europlatforms), Sandra Géhénot (Senior Freight Advisor UIC), Eric Peetermans (SNCB Holding, Chairman CTG UIC), Eric Pfaffmann (DB Intermodal), Erich Rohrhofer (Head of Combined Transport, RailCargo Austria), Daniel Molcan (Head of Combined Transport, CD Cargo) and Oliver Sellnick (Freight Director UIC).

Our dearest wish is now that these papers be integrated into the strategies of the stakeholders and we are confident that all parties concerned will share our excitement at this perspective and will co-operate to this achievement. We certainly remain available to discuss with the interested parties the results and prospects detailed in these reports.

Eric Peetermans
Chairman
UIC Combined Transport Group (CTG)

Oliver Sellnick
Director Freight
UIC

December 2009

1. SOCIO-ECONOMIC INFORMATION ON BULGARIA

The Republic of Bulgaria is a country on the eastern Balkan Peninsula of south-eastern Europe, covering an area of 111,002 km² and bordering five countries: Romania to the north, Serbia and Republic of Macedonia to the west and Greece and Turkey to the south. The Black Sea forms Bulgaria's eastern border.

Geographically diverse, the two thirds of the country is lowland with the being very mountainous including some famous ranges (such as: Rila, Pirin, Balkan Mountains).

Administratively the Republic of Bulgaria is divided into 28 districts (see **Figure 1-1**), comprising 264 municipalities.

Figure 1-1: Bulgaria: administrative division into districts

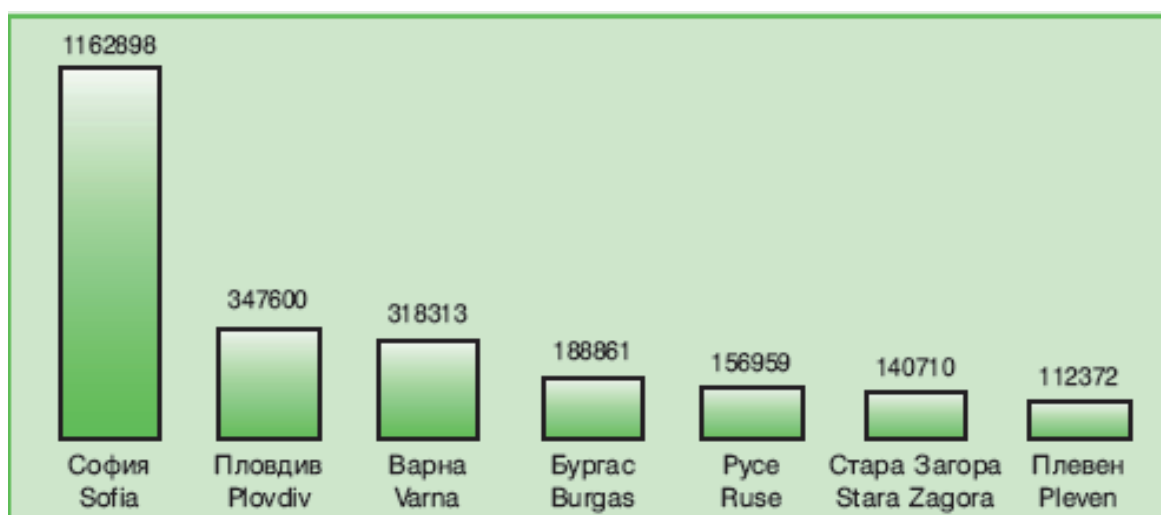


Source: National Statistical Institute Bulgaria, Bulgaria 2009

1.1 - Population

Bulgaria's population is decreasing and stood at about 7.61 million at the end of 2008. Approximately 28 per cent live in the South West region which includes Sofia, by far the largest city with a population of about 1.16 million. The next largest settlements are Plovdiv and Varna, comprising a population of about 347,600 and 318,313 respectively. All other towns such as Burgas, Ruse, Stara Zagora or Pleven have less than 200,000 inhabitants (see **Figure 1-2**).

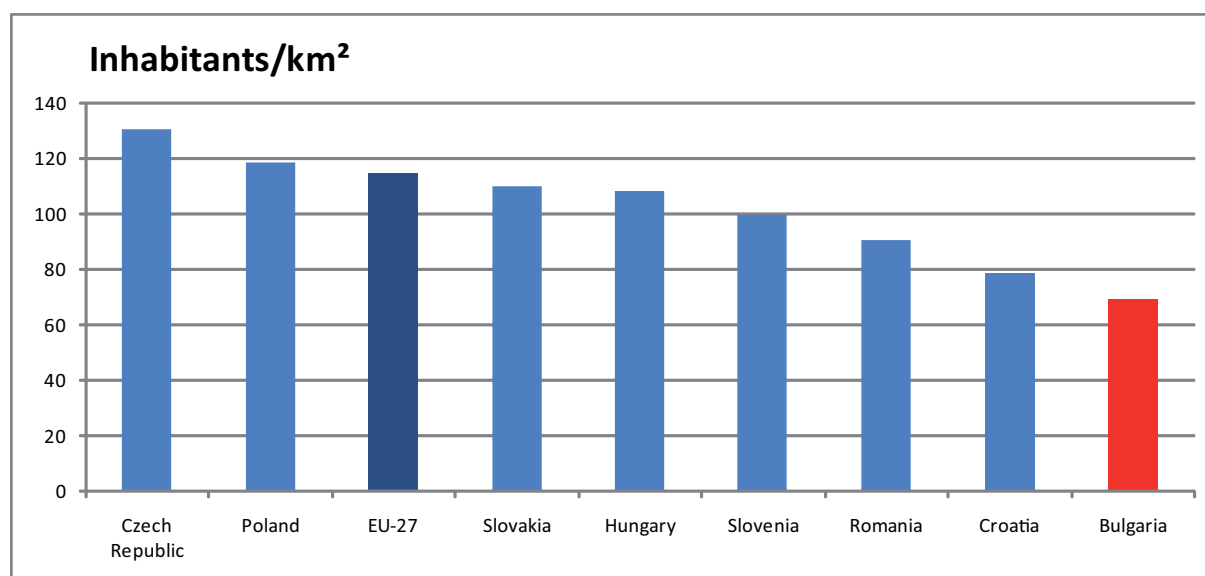
Figure 1-2: Bulgaria: population in biggest cities, 2008



Source: National Statistical Institute Bulgaria, Bulgaria 2009

Among the CEE states covered by this DIOMIS study; Bulgaria is the fifth largest country in terms of population and the third largest in terms of size of territory. In 2008, this equated to an average population density of about 69 inhabitants per km² - the lowest of the CEE states covered - with particularly low density in rural areas. It goes without saying that these facts have an impact on freight traffic volumes and on the market potential for intermodal services. This relationship will be analysed in-depth in chapter 3.

Figure 1-3: Population density of selected European countries, 2007



Source: Eurostat, KombiConsult analysis

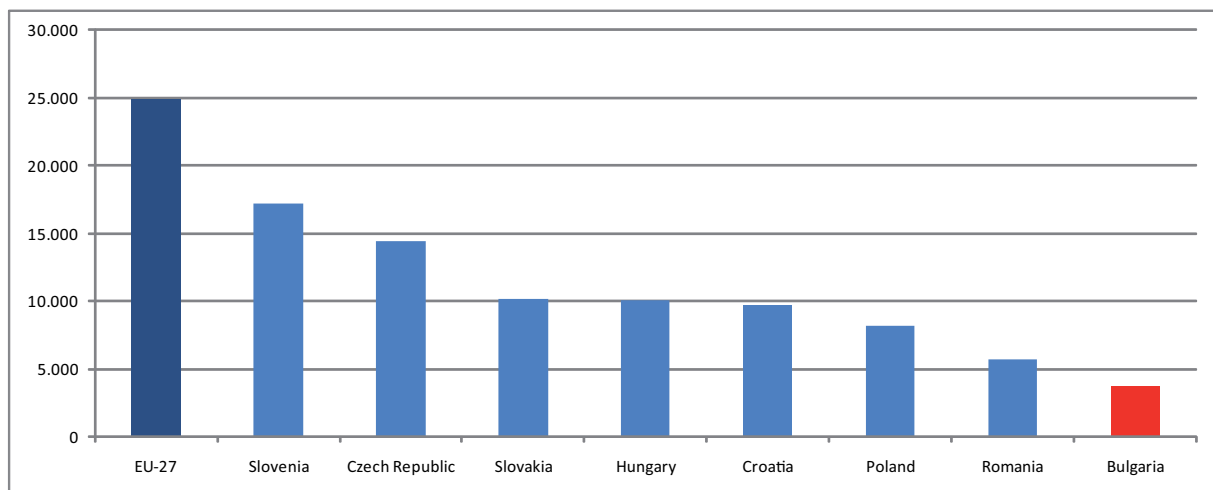
1.2 - Economy

Over the past 20 years, Bulgaria has tried to transform itself from a centrally planned state to a performing market economy. But strong growth has only been achieved in recent years and the country still appears low down on the list of member states in terms of economic indicators. Bulgaria's difficulties have been compounded by the global economic crisis and domestic structural problems. This is reflected in the following key economic indicators:

- In 2007, Gross Domestic Product (GDP) in Bulgaria amounted to about € 28.9bn at current prices. Even though it experienced the fourth highest growth rate from 1999 to 2007 among the covered CEE states, an average of 17 % per year, it still ranks as the lowest income state. This situation would not change even with further growth from 2007 to 2008 of over 18 per cent.
- In Bulgaria GDP per capita was € 3,700 in 2007 corresponding to only about 15 per cent of the EU average of approximately € 25,000 and is the lowest of the eight CEE countries involved this study (see also **Figure 1-3**).

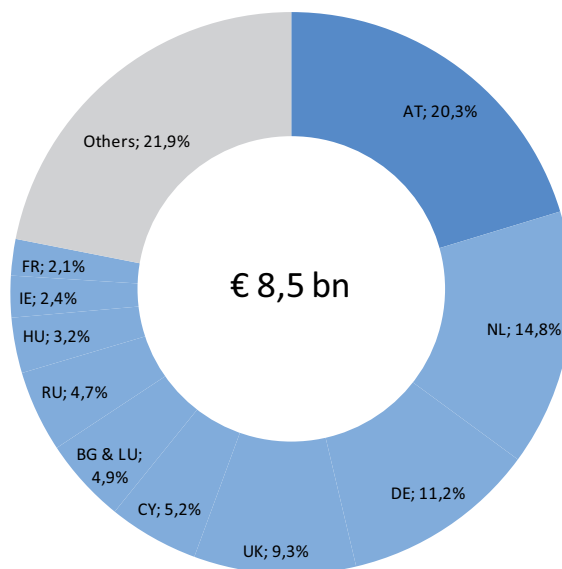
- After a period of economic crisis spanning the 90s the economy recovered after the turn of the century and the country has reinforced its industrial base over recent years, although it remains at a low level. In 2007 Bulgaria's external trade in goods and services amounted to € 35,000bn with a considerable trade deficit, representing about 122 per cent of GDP.
- Bulgaria has tamed its inflation since the economic crisis in the 90s, but latest figures indicate it is creeping back up.
- Bulgaria has also become one of the most attractive places in Central and Eastern Europe for Foreign Direct Investment (FDI). Since 2000 Bulgaria's FDI as a percentage of GDP has remained unsurpassed by any other country.

Figure 1-4: Gross Domestic Product per capita at current prices, 2007



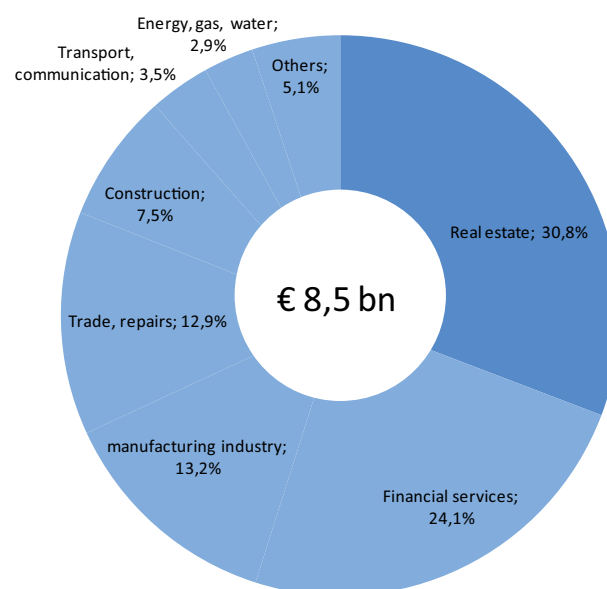
Source: Eurostat, website

Figure 1-5: Foreign Direct Investment in Bulgaria by investing country end 2007



Source: Eurostat, website

Figure 1-6: Foreign Direct Investment in Bulgaria by industry end 2007



Source: Eurostat, website

1.3 - Freight traffic

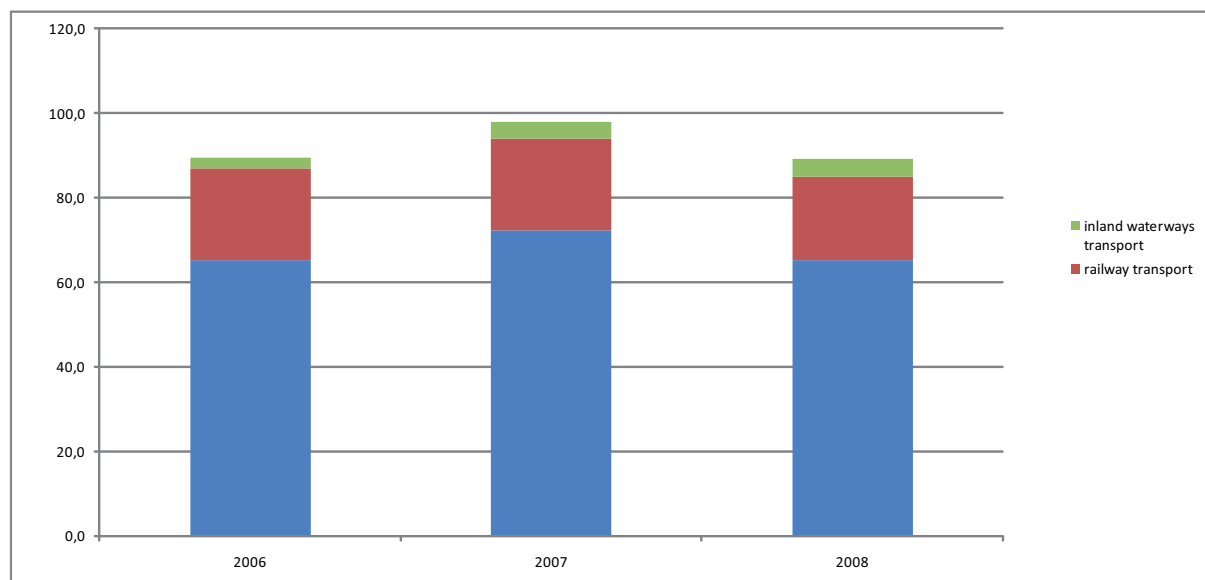
In 2007, about 89.5 million tonnes were carried by road, rail and inland waterways, whereof road transport accounted for over two thirds of the volume (about 73.6 per cent - see **Figure 1-7**).

From 2006 to 2007 road transport increased its volumes by 10 per cent, while rail volume stagnated for the same period. Tkm performance for this period is a further reflection of this phenomenon.

Since 1990 total rail freight volume has fallen by two thirds, with domestic freight traffic maintaining a leading position, although in recent years international and transit rail freight traffic increased from 11.6 per cent in 1999 to 26.5 per cent in 2005.

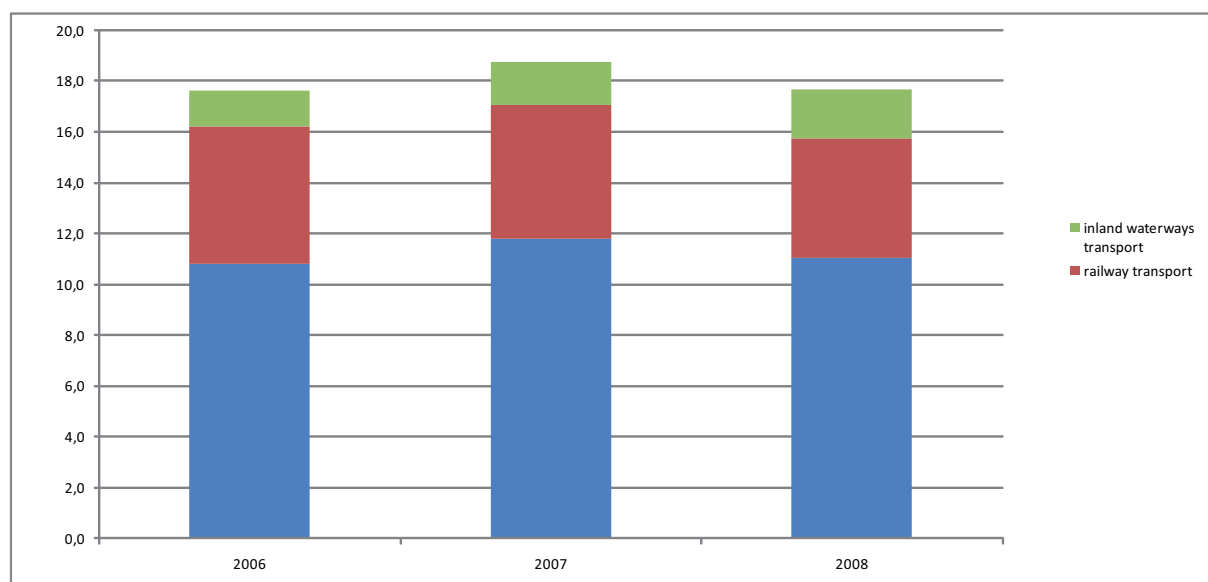
Rail freight traffic has slowly risen from its lowest volume ever in 2002. In 2008 both rail and road already seemed to be suffering from the economic crisis, experiencing a loss of about 10 per cent each. As such road volumes fell to 2006 levels, while rail volumes almost fell to their lowest level of 2002.

Figure 1-7: Freight traffic in Bulgaria: transported goods (million tonnes) by mode, 2006-2008



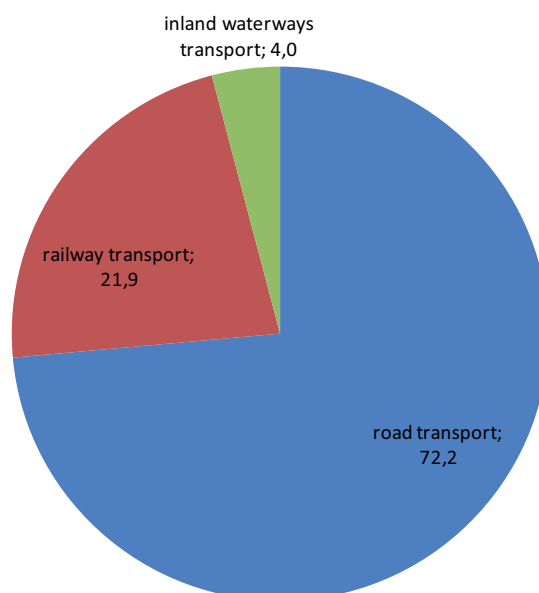
Source: National Statistical Institute Bulgaria, Bulgaria 2009

**Figure 1-8: Freight traffic in Bulgaria: performance
(billion tonne-kilometres) by mode, 2006-2008**



Source: National Statistical Institute Bulgaria, Bulgaria 2009

**Figure 1-9: Modal split of freight traffic in Bulgaria
(related to transported goods), 2007**



Source: National Statistical Institute Bulgaria, Bulgaria 2009

2. CURRENT STATE OF INTERMODAL RAIL/ROAD TRAFFIC IN BULGARIA

2.1 - Intermodal actors

The main actors who are co-operating in the organisation, implementation and operation of intermodal rail/road services are railway undertakings, intermodal operators and infrastructure managers.

Infrastructure Manager

As in virtually every EU Member State, in Bulgaria the public nationwide rail network - disregarding local or regional lines - is managed by a single company, the Bulgarian national *infrastructure manager*.

- National Railway Infrastructure Company (NRIC)

NRIC, providing the public network in the country, is a legally independent but state owned company. It was established on 1 January 2002, when the national company Bulgarian State Railways was divided into two companies according to their business activities.

NRIC is regulated by the Railway Transport Act, secondary legislation governing its administration. International agreements on railway transport, to which the Republic of Bulgaria is party, comply with EU regulations, specifically:

- European Commission Regulation 2001/12 on the development of the railways in the European Community;
- European Commission Regulation 2001/13 on the licensing of the railway enterprises;
- European Commission Regulation 2001/14 on the alignment of the railway infrastructure capacity and rates and the certification of safety.

Railway Undertakings

In 2007 only one railway undertaking supplied rail traction services in intermodal traffic:

- Bulgarian State Railways EAD (BDZ)

BDZ was, and still is, the only player for domestic and international intermodal services in Bulgaria. It was established in 2002, when the national company Bulgarian State Railways was divided into NRIC and BDZ. Although the government's aim is to liberalise the market, in 2007 there were only two other private railway undertakings besides BDZ licensed to operate on the Bulgarian railway network; namely Bulgarian Railway Company AD, and Bulmarket DM Ltd. However, neither operated intermodal services.

Although other railway undertakings have recently been licensed for the Bulgarian railway network, for the time being they have concentrated on conventional railway services rather than on intermodal services. At the moment there are a total of six railways with licenses for cargo transport:

- Bulgarian Railway Company Ltd, (BZK AD) (license issued: 04 / 2005)
- Bulmarket – DM Ltd (license issued: 10 / 2005)
- BDZ – Freight transport PLC (license issued: 01 / 2008)
- BDZ – Traction rolling composition (Locomotives) Ltd (license issued: 01 / 2008)
- GASTRADE S.A. (license issued: 10 / 2008)
- UNITRANSCOM (license issued: 10 / 2008)

“Foreign”, that is to say railway undertakings not resident in Bulgaria, are not allowed to receive a license for the Bulgarian railway network before 2010. Nevertheless they are preparing themselves, e.g. Rail Cargo Austria recently gained the safety certification for the Bulgarian network to operate transit traffic through Bulgaria to and from Turkey.

Intermodal service suppliers

In terms of intermodal service suppliers, there is only BDZ, the railway company, which acts as an intermodal operator for domestic and international shuttle services to and from Bulgaria itself, mainly for shipping line customers. This business model of a railway undertaking also acting as an intermodal operator is the model most commonly found in South-Eastern Europe.

For transit services, BDZ acts solely as a railway undertaking, with the following intermodal service suppliers as customers of BDZ:

- Adria Kombi (Ljubljana, Slovenia) in cooperation with
- Kombiverkehr (Frankfurt am Main, Germany),
- ICA (Vienna, Austria) mainly as agent for RCA with respect to the customer Gartner (Lambach, Austria),
- ICF (Basel, Switzerland),
- Transfesa (Madrid, Spain)

2.2 - Legal framework

The Bulgarian transport policy framework and planned actions envisaged are laid out in the following documents:

- National Strategic Reference Framework (NSRF),
- Sectoral Operational Programme on Transport 2007-2013 (SOPT)

The key objective of Bulgaria's transport policy is to ensure a "balanced and sustainable national transport system through the development and modernisation of key transport infrastructure links of nationwide, cross-border and EU importance", and is embodied in the National Strategic Reference Framework. The development of environmentally friendly transport infrastructure and construction of by-passes is also stated as being a key goal.

The first priority therefore is to fully integrate the national transport system into the EU transport network, by virtue of the fact that five out of ten Pan-European transport corridors affect the country (see **Figure 2-1**), Corridor N° IV likely being the most important land axis for South-Eastern Europe in the direction of Istanbul. Four of the corridors are over land:

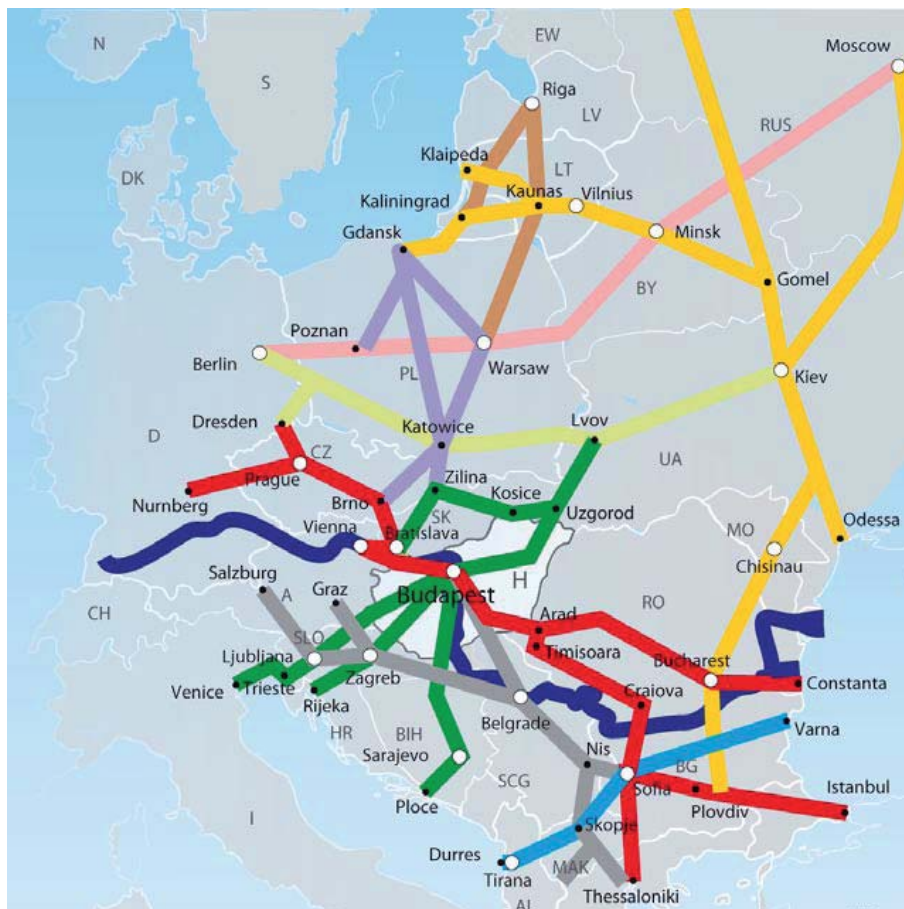
- Corridor N° IV (Dresden/Nuremberg - Prague - Vienna - Bratislava - Győr - Budapest - Arad - Bucharest - Constanța / Craiova - Sofia - Thessaloniki / Plovdiv – Istanbul)
- Corridor N° VIII (Durrës - Tirana - - Skopje - Bitola - Sofia - Plovdiv - Burgas - Varna- Constanța)
- Corridor N° IX (Helsinki - Vyborg - St. Petersburg - Pskov - Moscow - Kaliningrad - Kiev - Ljubashevka/Rozdilna (Ukraine) - Chișinău - Bucharest - Dimitrovgrad - Alexandroupolis)

- Corridor N° Xc (Salzburg - Ljubljana - Zagreb - Beograd - Niš - Sofia - Plovdiv - Dimitrovgrad - Istanbul via Corridor IV).

And one corridor is an inland waterway:

- Corridor N° VII (The Danube River and its tributaries - Northwest-Southeast).

Figure 2-1: Bulgaria within the Pan-European transport corridor network



Source: Ministry of Economy and Transport: Transport infrastructure development in Hungary

The development strategy of the transport sector is defined in more detail in the Sectoral Operational Programme on Transport 2007-2013 (SOPT), as part of the National Strategic Reference Framework. 80 per cent of the strategy concentrates on the development of road and railway infrastructure along the major national and Trans-European transport axes.

The third priority is the improvement of intermodality for passengers and freight and the fourth priority is the improvement of maritime and inland-waterway navigation.

Other national documents concerning the transport sector forming the basis for this programme are:

- Strategy for Development of Transport Infrastructure of the Republic of Bulgaria for the Period 2006-2015
- National Strategy for Integrated Development of Infrastructure of the Republic of Bulgaria for the Period 2006-2015
- Ten Year Development Plan for NRIC developed under the Project “Railway Organizational Restructuring – Management Development of the Railway Infrastructure Company” by SYSTRA, CIE Consult, Railplan and Deloitte & Touche financed by the PHARE programme 2002
- Development of a Strategy for Integration of the Bulgarian Railway Infrastructure into the European Intermodal Transport Network

Concerning direct action to promote intermodal traffic the following instruments have been implemented in Bulgaria:

- Preferential infrastructure fees for intermodal traffic given by the National Railway Infrastructure Company for traffic of containers and/or cargo trucks with block-trains
 - Currently accounts for up to 30 per cent
 - But always uncertain whether conditions may change


No knowledge of other funding schemes.

2.2.1 - Overview of combined transport market

For this DIOMIS study, the intermodal traffic in 2007 has been selected as a reference, on which the assessment of the evolution of the industry up to 2020 should be based.

Statistics supplied by NSI (the National Statistical Institute of Bulgaria) formed the first source of information to set up the 2007 data base for all intermodal rail/road traffic in Bulgaria ,. However, these were not completely sufficient in the following areas in particular:

- The NSI statistical data does not reveal the market structure to the required extent. In fact, it only displays total volumes carried by rail

- 
- NSI statistical data only shows the volume of containers carried by rail. As we completed the data base by including other intermodal units that were carried by rail on Bulgarian territory, the total number of TEU of intermodal traffic in Bulgaria published in it exceeded the figure reported by NSI
 - We identified some considerable discrepancies in container volumes measured in tonnes between the NSI data base and other available data. Although NSI statistical data only gives containers carried by rail, the volume measured in tonnes is much higher than the volume we have gathered from other sources, where, in contrast, the total volume measured in TEU is higher.
 - We also identified some considerable discrepancies by performing simple checks of the average weights per TEU in the NSI data base which, in some years, were extremely high, not to say impossible.

In addition to the NSI data base we had access to the 2007 statistics of almost every railway undertaking and intermodal operator performing intermodal services in, with or through Bulgaria. A thorough analysis and comparison proved that, even if two co-operating companies were concerned, the majority of the data sets were not consistent, neither on an aggregate level such as the volume of a country-country link, nor in sub-categories. The cases where an intermodal operator reported figures for a clearly defined intermodal service which differed considerably from those from its rail traction service provider were particularly striking.

Owing to these inconsistencies we were cautious in our approach to statistics. First of all we determined transport volumes on routes or market segments where we had two reliable, independent and fairly congruent data sources. In a second step, we analysed statistics on intermodal services, for which we provided in-depth market knowledge and/or reliable auxiliary information such as frequency of departure, maximum train length or weight. By carrying out plausibility analyses and cross-checks with NSI data for example we were able to pinpoint traffic volumes and assign them with relative precision to market segments and traffic types.

A key outcome of this extensive exercise is the overview of total intermodal traffic in Bulgaria in 2007 and the allocation of volumes of unaccompanied traffic to traffic types (domestic, international, transit) and intermodal market segments (maritime, continental), presented in **Figure 2-2**.

According to our analysis, 95,500 TEU of intermodal units were transported on intermodal rail/road services in Bulgaria in 2007. The cargo shipped by intermodal trains totalled over 0.93 million gross tonnes, including both the weight of the goods and the tare weight of the intermodal loading units. This did not include the transportation of heavy road vehicles on accompanied services.

Figure 2-2: Intermodal rail/road traffic in Bulgaria, 2007

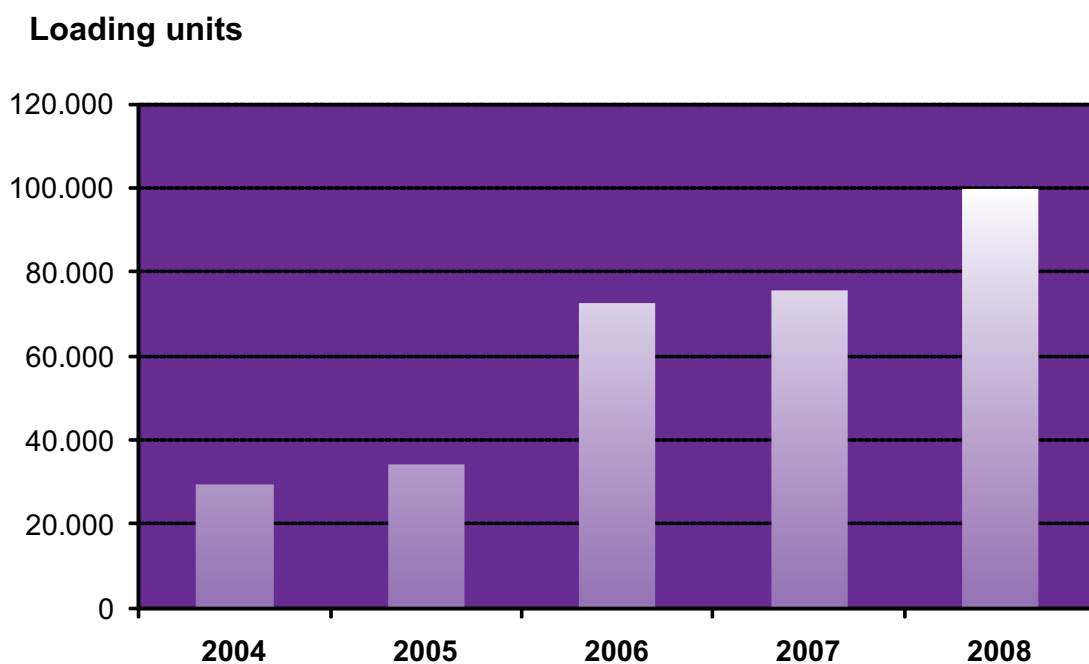
Intermodal market segment		TEU	%	Gross tonnes	%
Unaccompanied traffic		95,500	100.0%	934,100	100.0%
Domestic	maritime	2,300	2.4%	34,300	3.7%
	continental	-	0.0%	-	0.0%
	Subtotal	2,300	2.4%	34,300	3.7%
International	maritime	14,500	15.2%	191,300	20.5%
	continental	2,900	3.0%	37,100	4.0%
	Subtotal	17,400	18.2%	228,400	24.5%
Transit	maritime	-	0.0%	-	0.0%
	continental	75,800	79.4%	671,400	71.9%
	Subtotal	75,800	79.4%	671,400	71.9%
Accompanied traffic		-	0.0%	-	0.0%
Total intermodal traffic		95,500	100.0%	934,100	100.0%

Source: KombiConsult analysis based on NSI, railways and operators statistics

Although we cannot provide a long-term development chart for unaccompanied traffic expressed in TEU and gross tonnes, the development trend for the intermodal market can be identified through other measures (see **Figure 2-3**). The graph shows that the total number of unaccompanied containers carried by rail increased by approximately 240 per cent from about 29,000 in 2004 to 100,000 in 2008.

In contrast to total rail freight traffic, where domestic traffic is dominant, the main share of Bulgaria's intermodal traffic is international and transit, accounting for 97.6 per cent together. As transit transport accounts for over 79 per cent of the market, Bulgaria benefited considerably from the boom in the European economy and global trade, e.g. huge growth in traffic to and from Turkey, where great efforts have been made in recent years to shift volumes from road to rail.

Figure 2-3: Unaccompanied container traffic in Bulgaria: TEU carried, 2006-2008



Source: NSI, KombiConsult analysis

As the domestic volumes are low, cross-border services represent the backbone of intermodal transportation in Bulgaria (see **Figure 2-2**). Most intermodal units (79.4 %) are clearly conveyed on transit services. Notwithstanding, bilateral international services accounted for 18.2 per cent of total unaccompanied intermodal traffic in 2007 and thus reaching levels unparalleled in any other country. Transit services through Bulgaria almost solely shipped goods between Europe and Turkey, and as such this service is entirely continental. In contrast more than 83 per cent of bilateral traffic is maritime containers moved on hinterland services to or from Bulgaria.

2.3 - Unaccompanied intermodal traffic


2.3.1 - Domestic traffic

In 2007, only about 2,300 TEU of intermodal units were carried via inland links in Bulgaria; total freight accounting for 34,300 gross tonnes, (about the same as in 2006), the reason for these figures is that they are based on one service for marine containers for a dedicated customer, a shipping line. Other flows of intermodal traffic were not known in 2007, excluding some single containers that may have been transhipped in rail sidings.

This demonstrates Bulgaria's current limited and greatly underdeveloped domestic intermodal traffic. It is influenced strongly by external factors; the volumes are rather small, volatile, and subject to the decisions of a few major customers.

As for total intermodal traffic in Bulgaria, for the time being BDZ is the only provider of domestic intermodal services. Owing to the low, volatile and customer-sensitive demand, services are tailor-made and there is no real inland single wagon system for intermodal traffic, except for a few single containers that may be transhipped in some terminals. The service level concerning transit time, not necessarily prices, is basically not competitive when compared to trucks, which also keeps demand low.

However, it should be acknowledged that the geo-economic conditions are not favourable to domestic intermodal traffic in Bulgaria either. Population and economic activities are concentrated in the Sofia area to a large extent. Although located in the Centre-West of the country, distances to other major cities or important production sites are comparatively short at about 150 to 250 km and a few up to 300 km. It is next to impossible to establish road-competitive intermodal services over such distances in almost all European countries,



except where road traffic is restricted such as in Switzerland. Only the distances between Sofia and the two ports of Varna and Burgas seem to be competitive enough to establish regular intermodal services. It is more “challenging” in a country like Bulgaria, where truck operators offer their services at significantly lower rates than in Western Europe.

2.3.2 - International traffic

The total unaccompanied cross-border traffic in Bulgaria including transit accounted for about 93,200 TEU and 0.9 million gross tonnes respectively in the reference year 2007. Of the total international volume, 17,400 TEU (18.7 %) were allocated to bilateral and 75,800 TEU (81.3 %) to transit services.

For many years ***bilateral international traffic*** has relied almost entirely on dedicated intermodal trains, between Sofia and the port of Thessaloniki, a joint operation between BDZ and OSE, the Greek state railway company. This service has been offered since 2003, also serving a shipping line for the only domestic service in 2007, belonging to:

- Maersk Line, Maersk Bulgaria Ltd.

The only other notable volume in 2007 was a weekly block train service to and from Romania. On the other few bilateral routes or links such as those with Germany or Austria, which were very meagre, intermodal shipments were carried in single-wagon traffic together with conventional wagonloads under the responsibility of the railway undertakings involved. The economic basis for the dedicated intermodal service above is a block train contract between the railway undertakings involved and a shipping company, but it leaves the capacity risk to the railway undertakings.

According to our investigations the following companies – some of them co-operating in commercial partnerships – supplied bilateral intermodal block train services to and from Bulgaria in 2007:

- BDZ
- CFR Marfa, Bucharest (Romania)
- Intercontainer Austria – ICA. Vienna (Austria)
- Kombiverkehr, Frankfurt am Main (Germany)
- OSE, Athens (Greece)

Figure 2-4 gives a breakdown of the *international bilateral traffic* per transport corridor, which demonstrates the discrepancies between the trade and intermodal statistics. With the exception of Greece and Romania, there has been no intermodal traffic between Bulgaria and its top ten external trade partners up to now.. This shows, as is the case for domestic intermodal traffic, that the key volumes are based on single and dedicated block train services and the decisions of a few customers.

The table shows that Greece is Bulgaria's most important partner for unaccompanied traffic, relying on the Sofia – Thessaloniki link, with about 83 per cent of total bilateral volume and the same share of container hinterland traffic.

Figure 2-4: International unaccompanied traffic in Bulgaria by corridor, 2007

Corridor		TEU
Bulgaria -	Greece	14,500
Bulgaria -	Romania	2,800
Bulgaria -	other countries	100
Total		17,400

Source: KombiConsult analysis based on railways and operators statistics

As is primarily the case for bilateral and domestic traffic, in 2007 the entire volume of *intermodal transit traffic* through Bulgaria was shipped on dedicated intermodal block trains. One intermodal operator or a partnership of companies held the economic responsibility for each service, and then contracted a leading railway undertaking to carry out the rail transport. According to our survey the following operators provided transit services in 2007:

- Intercontainer Austria (ICA)
- Intercontainer-Interfrigo (ICF)
- Transfesa

The majority of intermodal transit services are clearly geared towards the requirements of continental. As a result, all of the total volume of 75,800 TEU in 2007 was continental shipments, passing through Bulgaria to and from Turkey.

The increase in total intermodal traffic in Bulgaria in recent years has mainly been due to the rapid development of transit flows through the country. This demonstrates the increasing integration of South-Eastern Europe and Turkey into the “mature” Western European intermodal network. These are the corridors through Bulgaria which accounted for the largest numbers of shipments in 2007::

- Austria – Turkey
- Germany – Turkey
- Hungary – Turkey
- Romania – Turkey

2.4 - Accompanied intermodal traffic

In Bulgaria there are no recorded accompanied intermodal services.

2.5 - Rail and intermodal terminal infrastructure

2.5.1 - Rail network

As already mentioned in chapter 2.1, the national rail infrastructure in Bulgaria is owned and managed by the National Railway Infrastructure Company NRIC, which is responsible for a total of 6,938 km of line (see **Figure 2-5** and **Figure 2-6**).

Figure 2-5: Key indicators of Bulgaria’s railway network

Indicator	Kilometres	% of network
Total length of line	6,938	100%
Total length of track	4,997	72%
Single-track lines, length of line	3,048	44%
Double-track lines, length of track	1,941	28%
Double-track lines, length of line	3,882	56%
Limitations of infrastructure		
max length of train	520 m	
max use weight of train	1,200 t	
Electrified lines, length of track	3,348	67%

Source: NRIC, KombiConsult analysis

Figure 2-6: Railway network in Bulgaria

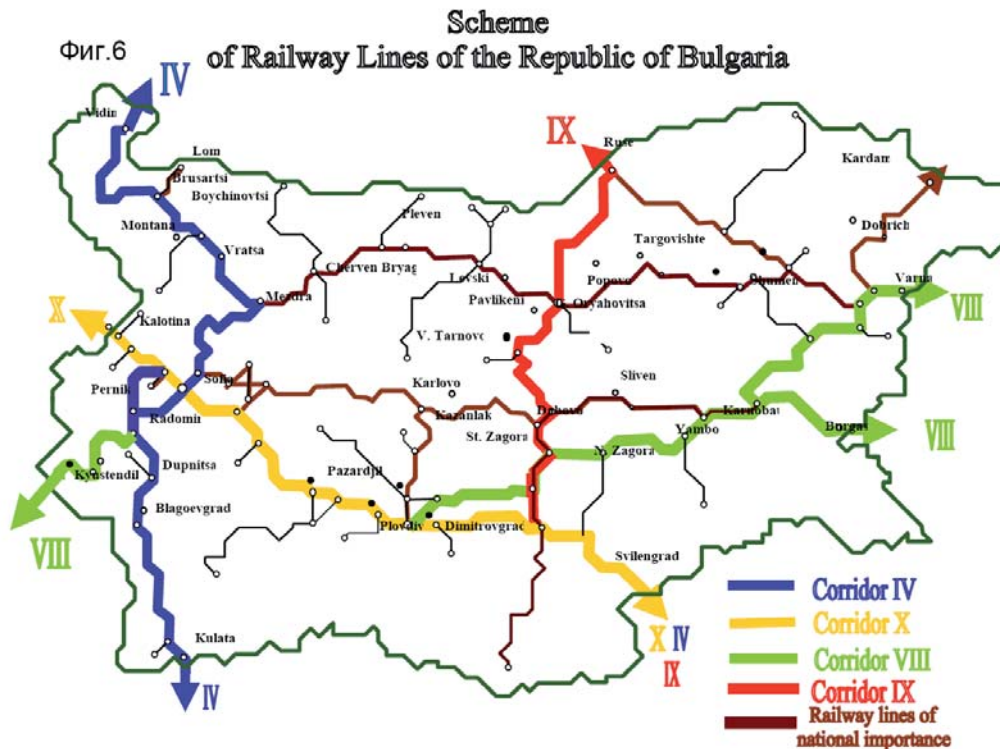


Source: NRIC, National Railway Infrastructure Company

Bulgaria's rail infrastructure is in a key position with respect to the network of Pan-European Corridors. The country is crossed by five important corridors, of which four land corridors (see **Figure 2-7**). Corridor N° IV is probably the most important land axis towards Istanbul for South-Eastern Europe:

- Corridor N° IV (Dresden/Nuremberg - Prague - Vienna - Bratislava - Győr - Budapest - Arad - Bucharest - Constanța / Craiova - Sofia - Thessaloniki / Plovdiv – Istanbul)
- Corridor N° VIII (Durrës - Tirana - - Skopje - Bitola - Sofia - Plovdiv - Burgas - Varna - Constanța)
- Corridor N° IX (Helsinki - Vyborg - St. Petersburg - Pskov - Moscow - Kaliningrad - Kiev - Ljubashevka/Rozdilna (Ukraine) - Chișinău - Bucharest - Dimitrovgrad - Alexandroupolis)
- Corridor N° Xc (Salzburg - Ljubljana - Zagreb - Beograd - Niš - Sofia - Plovdiv - Dimitrovgrad - Istanbul via Corridor IV).

Figure 2-7: Pan-European corridors and lines of national importance in Bulgaria



Source: NRIC, National Railway Infrastructure Company

As Turkey is the primary origin and destination of transit international intermodal services, it is obvious that the overwhelming percentage of the current volume is carried on corridor IV and X, the links with Western Europe. With Sofia as the primary origin and destination of bilateral international intermodal services, further considerable volumes are carried on corridor IV, the connection with Thessaloniki. Domestic intermodal services are mainly operated on Corridors VIII and a few key national railway lines.

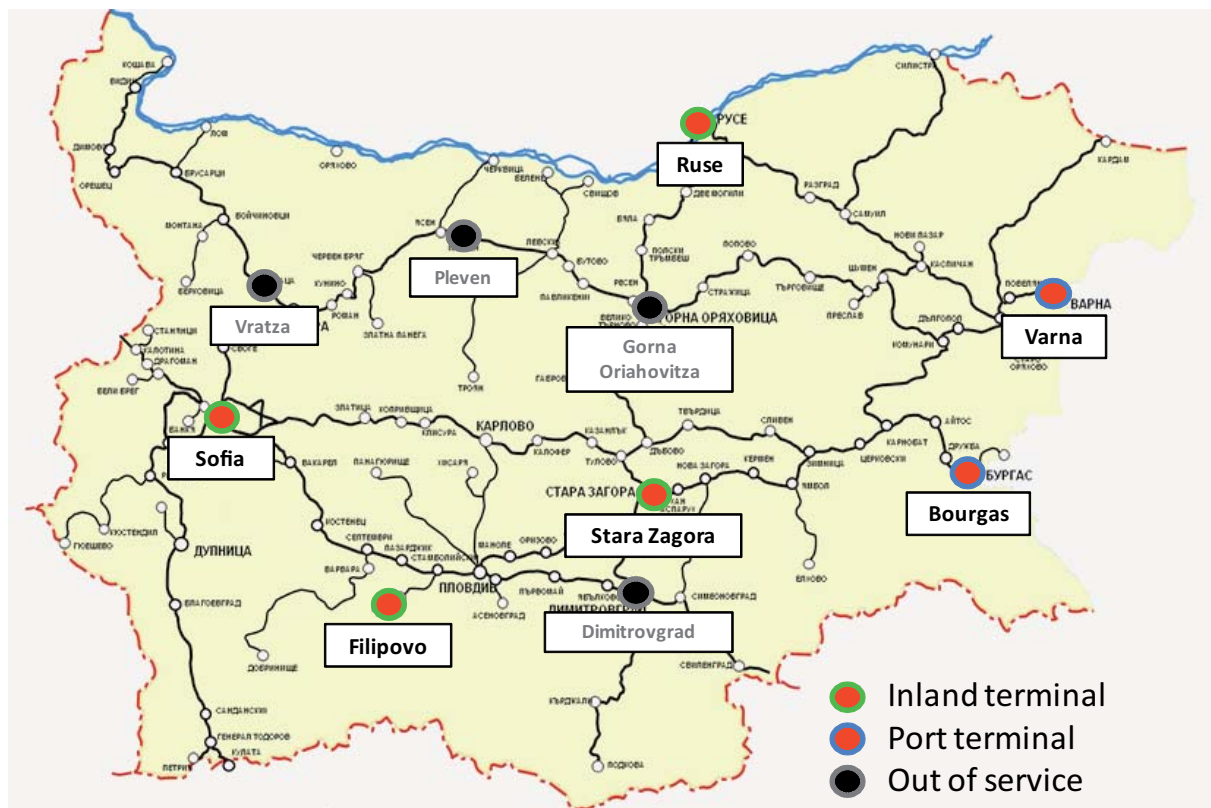
The Bulgarian rail infrastructure of **Corridor IV** is electrified. It only provides simultaneous double-track lines on the section between Sofia and Plovdiv. In contrast, the section between Plovdiv and the Turkish border station Svilengrad is neither electrified nor equipped with double track. This already affects existing services, but it is not the only issue as in recent years Bulgaria's railway infrastructure has generally suffered from a lack of maintenance and investment as little has been done.

This has led to a considerable decrease in quality due to the many capacity and speed restrictions in place along significant sections such as on corridor IV. In future these constraints could become severe bottlenecks if transit services through Bulgaria and the bilateral traffic with south-east European countries increase and infrastructure investments is not undertaken.

2.5.2 - Terminal infrastructure

There are at least ten intermodal terminals in Bulgaria, built to serve unaccompanied intermodal traffic. The vast majority are owned by NRIC and operated by BDZ, except for the two port terminals and the terminal in Filipovo, the latter being operated by the shipping line RCL for their own services. According to our market investigation, four terminals have already closed owing to poor terminal infrastructure and a lack of demand for services (see **Figure 2-8** and **Figure 2-9**).

Figure 2-8: Terminals for unaccompanied intermodal traffic in Bulgaria



Source: KombiConsult analysis

The “largest” and most important terminal in Bulgaria in terms of handling, although on a low level, is the Sofia freight station. It handled almost 15,000 TEU in 2007. The start-up facility for this terminal, with two 220 m long tracks and one gantry crane, came into operation in 1973. Since then the terminal closed when the gantry crane broke down in 1998. Although reopened in 2001, with a reach stacker purchased with the support of the US government, the terminal has remained greatly underdeveloped since then. As a reach stacker is now used instead of a crane, only one of the handling tracks can be used for transhipments and the handling area cannot be fully used either.

The next largest facilities in terms of rail/road transhipment volume are Burgas, which is located in the port of Burgas, and Filipovo (Plovdiv). One service is operated between these two terminals. There are no block trains operated between the other terminals, only a few single containers.

No intermodal facility in Bulgaria has handling tracks which can accommodate the full length of 600 or 700 metre international direct or shuttle trains. Stara Zagora terminal has 300 m tracks, but all other sites have much shorter tracks at about 100 to 220 m. The terminals were primarily established during the 70s and 80s, but not well maintained and used properly. Thus technical and infrastructure conditions of all facilities are not state-of-the-art. Since, however, demand for handling services has generally been low due to the concentration of traffic on the economic “centre of gravity” Sofia, where a new terminal is planned anyway – modernisation of these facilities does not currently appear to be a wise investment.

Figure 2-9: Terminals for unaccompanied intermodal traffic in Bulgaria

Terminal	Handling tracks		Handling equipment		Annual handling capacity (LU)		Handling volume 2007		Remark
	N°	Length (m)	Gantry	Mobile	Reported	Calculated	TEU	LU	
Burgas Zaprad	2		2			53,300	2,300	1,400	
Dimitrovgrad-North									out of service
Filipovo (Plovdiv)	3	180	1		-	21,600	2,300	1,400	
Gorna Oriahovitza									out of service
Pleven-West									out of service
Ruse Tovarna	2	116	1		-	9,300		-	
Sofia freight	1	220		1	-	10,600	14,500	9,100	
Stara Zagora	2	300	1		-	24,000		-	
Varna	4	200	2	1	-	32,000		-	
Vratza									out of service

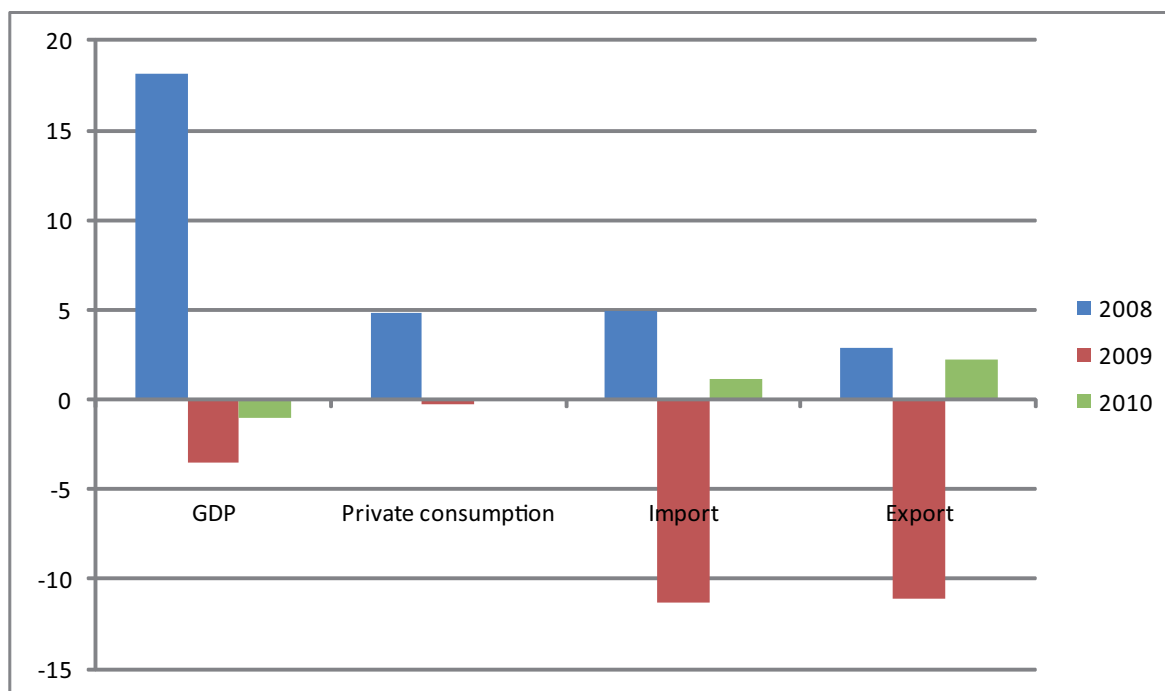
Source: BDZ; KombiConsult analysis

3. EVOLUTION OF UNACCOMPANIED INTERMODAL RAIL/ROAD TRAFFIC IN BULGARIA BY 2020


3.1 - Recent developments up to 2009

The Bulgarian economy, after experiencing strong growth in recent years, had already lost momentum due to the global financial and economic collapse. E.g. the real Gross Domestic Product, which had previously grown rapidly, is estimated to fall over three per cent in 2009, primarily as a result of a collapse of the industrial production, and falling demand from private households. Likewise Bulgarian external trade, which previously showed outstanding double-digit growth rates, also came to a halt in 2009, and exports and imports are estimated to drop by 11 per cent (see also **Figure 3-1**).

Figure 3-1: Expected development of Bulgaria's key indicators, 2008-2010, in percent change year on year



Source: Germany Trade & Invest, www.gtai.de, KombiConsult analysis



The impact of these economic developments on unaccompanied intermodal traffic was noticeable in every market segment except for transit services.

Due to the fact that intermodal traffic in Bulgaria is also mainly based on single services for dedicated customers, the intermodal market is very fragile, demonstrated simply by the evolution from 2007 to 2008. During 2008 two intermodal services were suspended; at the same time there were requests for several others to start, but some of these never actually commenced. The domestic service between Burgas and Plovdiv and the international bilateral service between Sofia and Thessaloniki were suspended for several reasons. The latter shall start again in 2010. Thus, as these services were the backbone of their traffic types, the volume of domestic and international traffic may have dropped to nearly zero in 2008 and also 2009. In contrast, in 2008 there were requests for other new domestic services for maritime containers between Sofia and the ports of Varna and Burgas, initiated by container shipping lines Maersk, RCL and WTO as dedicated customers of BDZ. However, owing to the economic crisis, the start of these services encountered some difficulties and was delayed.

In contrast the weekly transit service between Ljubljana and Halkali was successfully started in 2008. This service was initiated via cooperation of the intermodal suppliers Adria Kombi and Kombiverkehr. Via the Ljubljana – Munich service it is linked with several regions in Germany as well as other regions and the frequency is to be increased according to the intermodal service suppliers.

Another recent development is the service of a new market segment of non-craneable semitrailers between Wels in Austria and Halkali, provided by Ökombi, an Austrian intermodal service supplier, which shall start in October 2009, further contributing to the status of Bulgaria as a transit country.

Regardless of the number of services running or not, according to the market survey we have carried out the decline of the traffic volume started at the end of 2008 and has generally continued in 2009. According to most intermodal service providers, in the first-half of 2009 the number of intermodal shipments decreased between 10 and 30 per cent compared with the first six months in 2008. Yet various sources such as operators, railways and terminals reported at least a preliminary stop in the downturn trend at the end of the second quarter of 2009.

Virtually all intermodal companies responded to the decline in demand by reducing the frequency of departures. Some operators have tried to improve train capacity load factors by merging services or transforming previous direct trains into liner train or Y-type shuttle train operations. In a very small number of cases, services have even been completely suspended. Roughly estimated, capacities have been cut by 20 per cent compared to 2008.

In spite of these current challenges, up to mid-2009, the scope of transit services affecting Bulgaria (but not necessarily the total number of departures) has increased compared to 2007.

3.2 - Analysis of impact factors

The implementation of efficient and sustainable intermodal services generally requires a “critical mass” of regular shipments to and from a catchment area surrounding an intermodal terminal. Sufficient volumes can occur either due to agglomerations of people resulting in strong demand for consumer goods or when major large-scale distribution centres are present in the area or it is heavily industrialised, which generates a high level of inbound and outbound shipments of industrial products such as prefabricates, semi-finished goods or consumer goods, or through a combination of all these elements.

In this context our investigation into the future of intermodal traffic in Bulgaria has particularly focused on the analysis and evaluation of multiple socio-economic factors such as those mentioned above, which essentially impact on opportunities for intermodal transport.

Moreover we have examined existing prognoses on road and rail traffic, political, infrastructural, intermodal and rail freight industry-internal factors and evaluated whether they may foster, jeopardise or impede intermodal services in, with or through Bulgaria and – if so - to what extent. Based on these result a quantified forecast of intermodal traffic to 2020 has been carried out (see chapter 3.3 to 3.5).

3.2.1 - Development of road and rail freight traffic

How can intermodal traffic volumes be increased? It could grow as part of the growth of the entire freight market or by transporting goods currently shipped by road. Statistical data clearly show that, in Bulgaria, road traffic has been the most dynamic mode over the past decade and could increase its market share.

Consequently, there is vast **theoretical** market potential on international trade lanes. However, whether service suppliers are capable of designing a product which matches customer requirements and is competitive with road, is a different question. In this context it is worth examining expected evolution of the relevant long-distance freight market since it helps to identify growth potential for demand for intermodal services.

According to the results of our inquiries with Bulgarian authorities there are no official long-term prognoses on goods transport and its modal split for the 2015 or 2020 horizon. We analysed other sources, but the results were not accurate: early reference years, so that reality has already overtaken the forecasts; non-harmonised data; lack of transparency regarding the assumptions for forecasts.

The only source that appeared to be methodologically clear and suitable for establishing a frame of future freight traffic is *Progrants'* "European Transport Report 2007/2008". It provides several freight-related performance indicators for 2015 and 2020 generated through a trend forecast. This means that recently observed developments of several socio-economic factors were more or less extrapolated and used as inputs into a quantitative transport model. The results for Bulgaria are presented in **Figure 3-2**. It shows the growth rates for several freight market segments 2005-2015 and 2005-2020. We used 2005 as a reference as this was the last year for which *Progrants* provided actual figures.

Figure 3-2: Performance-related prognosis of Bulgarian freight traffic (tkm)

Indicator		Growth rate	
		2005-2015	2005-2020
Total domestic traffic		19.8%	26.37%
Total International traffic		82.8%	110.3%
	Export	n.a.	n.a.
	Import	n.a.	n.a.
	Transit	n.a.	n.a.
Total freight traffic		35.0%	46.7%
Total road freight traffic		70.5%	88.5%
Total rail freight traffic		-17.3%	-15.4%

Source: *Progrants: European Transport Report 2007/2008; KombiConsult analysis*

Progtrans forecasts that the total international freight market will grow by over 110 per cent in the period 2005 to 2020. A *Progtrans* forecast which seems improbable is that rail traffic will decrease by over 15 per cent up to 2020. Since, unfortunately, the report does not provide separate data on international rail freight traffic we are not in a position to assess if *Progtrans* predicts similar changes for international as for total rail freight traffic. As the latter includes the stronghold of international and transit traffic, which is expected to grow considerably, total rail freight traffic is likely to increase somewhat.

Based on our own investigations we consider the forecasts on total domestic, international and transit freight traffic to be plausible.

3.2.2 - Population

The size and regional distribution of population have a major influence on total freight traffic as well as on the logistic patterns and modal choice in particular with regard to opportunities for consolidating volumes.

In 2008, Bulgaria had a population of 7.61 million. In its “European Transport Report 2007” the Swiss-based consultancy *Progtrans* forecasted that Bulgaria’s population would fall by around 800,000 inhabitants (-10.8 %) by the year 2020. If, however, the current trend, which sees an average annual decrease of the Bulgarian population of about 40 persons per 10,000 inhabitants, were to continue, the total population would ‘only’ decline by 470,000 (-6.2 %) to 7.17 million.

Such a fall would not have a notable effect on freight in general nor specifically on intermodal transport. What is much more important for potential demand for transport services is population distribution. There is a clear concentration of population in Bulgaria in and around Sofia. About 18 per cent of all inhabitants live in this area, in the whole South-Western region it is about 28 per cent of the population. All other districts have far less inhabitants and some are rural areas. This is also reflected in the fact that the next biggest cities, except for Plovdiv and Burgas, have populations of 150,000 to 200,000.

This demonstrates that Bulgaria has a strong Western region surrounding its capital but generally features a rather low level of urbanisation.

3.2.3 - Evolution of Gross Domestic Product

Bulgaria's real gross domestic product at current prices rose by over 137 per cent between 1999 and 2007. From 2007 to 2008 it grew by a further 18 per cent. Due to the current economic crisis it is expected to decline in 2009 and 2010 but rise again in 2011. Concerning long-term GDP forecasts, once again we established our own estimate based on the *Prograns* report. *Prograns* expects Bulgaria's real GDP (at 2000 prices) to rise by 45.3 per cent in the period 2005-2015 and by 60.3 per cent in the period 2005-2020. This corresponds to following average growth rates:

- 2005 – 2015: 3.8 %
- 2015 – 2020: 3.2 %

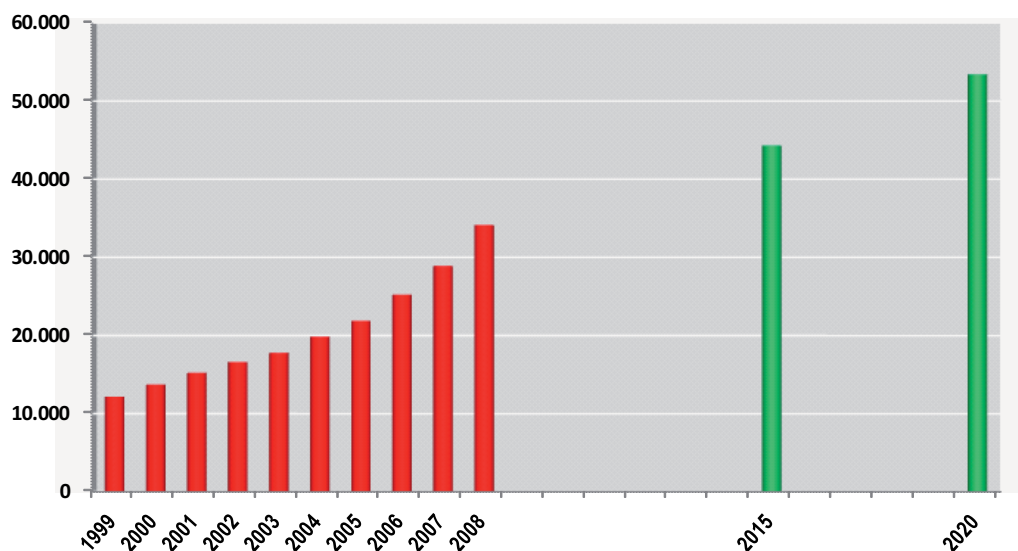
Taking the economic crisis into consideration, which impacts considerably on average GDP growth rates, the *Prograns* forecast on development to 2015 appears realistic. We, however, do not agree that the growth rate will fall after 2015. According to our economic analysis of Bulgaria, large potential in unsatisfied consumer demand and opportunities to extend the industrial production base, due to increased integration into the European and world economies, will be sustained after 2015 (see sections below). Based on this prediction we forecast the following average growth rates:

- 2005 – 2015: 3.8 %
- 2015 – 2020: 3.8 %

As we – unlike *Prograns* - had access to data on actual Bulgarian GDP growth up to 2008, which showed a higher growth rate than expected, we applied the above growth rates as of 2008 and calculated development up to 2020 (see **Figure 3-3**).

Figure 3-3: Evolution and forecast of Bulgarian GDP (at current prices)

Euro bn

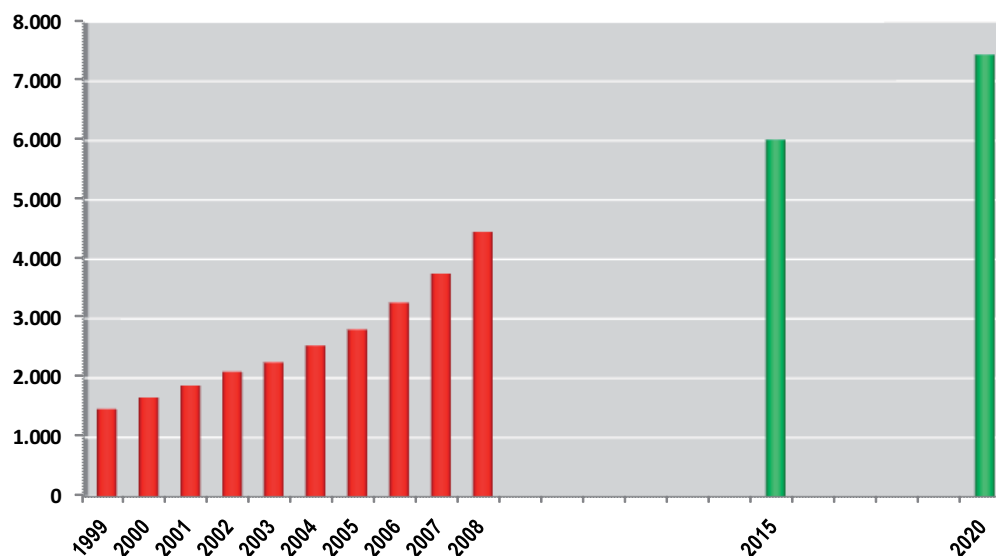


Source: Protrans; KombiConsult calculations


GDP per capita in Bulgaria was € 3,800 in the reference year 2007 and grew by a further 18 per cent to € 4,500 in 2008. By applying the population forecast and GDP growth calculated previously, the predicted development of GDP per capita to 2020 can be calculated (see **Figure 3-4**):

Figure 3-4: Evolution and forecast of real GDP per capita in Bulgaria

Euro



Source: Protrans; KombiConsult calculations



Based on the evaluation of the Bulgarian economy and the evolution of population (see chapter 3.2.2) we determined the following average growth rates:

- 2005 – 2015: 7.9 %
- 2015 – 2020: 4.4 %

To identify potential markets for intermodal services regional distribution is much more important than general development of GDP. Here we assume that the Sofia area in the South-Western region will remain the centre in terms of Bulgaria's population as well as the economic centre relating to added value.

3.2.4 - Evolution of manufacturing industry and foreign investments

It is obvious that the growth potential for intermodal traffic is determined by the future development of those industries generating cargo transport through the procurement of supplies and distribution of commodities. Apart from wholesale and retail sectors, the evolution of which will be analysed in conjunction with private consumption, it is primarily the manufacturing industry which will influence potential demand for intermodal services.

The main industrial sectors in Bulgaria for value added are:

- Chemicals
- Foodstuffs
- Tobacco industry
- Mechanical engineering
- Metal products
- Textile industry

Other industries such as glass and porcelain also contribute considerably to the output of the manufacturing industry. The overwhelming majority both of supplies and products of these industries can essentially be regarded as potential markets for intermodal services – this does, however, depend on the transport distances involved.

3.2.5 - Evolution of private consumption

In recent years private consumption in Bulgaria has been very strong. The boom of the national economy enabled a growing proportion of the population to satisfy “accumulated needs”. Consequently Bulgaria’s private consumption rose considerably by over 47 per cent between 2000 and 2007; and grew a further 4.8 per cent from 2007 to 2008. Due to the current economic crisis it is expected to decline in 2009 (-0.3 per cent) and to stagnate in 2010, but to rise again in 2011. Concerning long-term forecasts once again we drew our own conclusions based on the *Progtrans* report. *Progtrans* expects Bulgaria’s private consumption (at 2000 prices) to rise in the period 2005-2015 by 50.4 per cent and in the period 2005-2020 by 64.6 per cent. This corresponds to the following average growth rates:

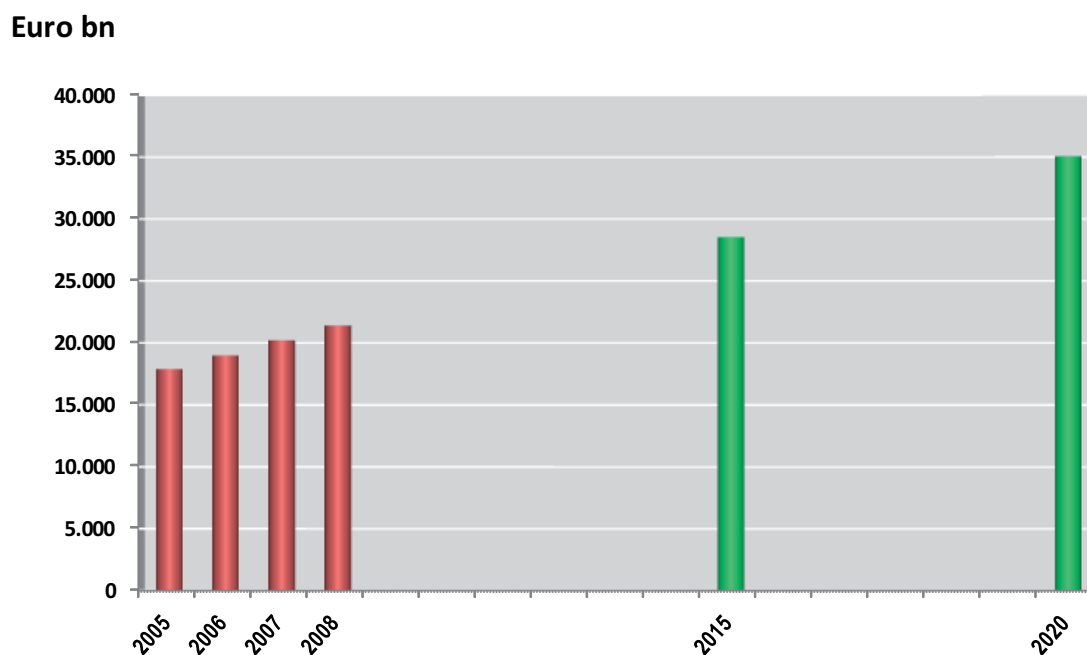
- 2005 – 2015: 4.2 %
- 2015 – 2020: 3.4 %

We, however, again do not agree with the estimation of growth after 2015. Based on our analysis of Bulgaria’s significant potential of unsatisfied consumer demand, the high growth will be sustained after 2015. On this basis we determined the following average growth rates:

- 2005 – 2015: 4.2 %
- 2015 – 2020: 4.2 %

As we – unlike *Progtrans* - had access to data on the actual evolution of Bulgarian private consumption up to 2008, which showed a lower growth rate than expected, we applied the above growth rates as of the year 2008 and calculated development up to 2020 (see **Figure 3-5**).

Figure 3-5: Evolution and forecast of Bulgarian private consumption (at current prices)



Source: *Prograns*; *KombiConsult* calculations

The previous boom catapulted private consumption as a portion of real GDP to about 63 per cent up to 2008. However, the international society of economic advisors apparently considers that Bulgarian consumers still have not reached their limits. At least that is what our investigations suggest. Most professionals expect private consumption to increase as it did before the economic crisis. *Prograns*, for example, anticipates that this, the largest component of GDP, will gain a further almost 10 percent share of real GDP by 2020 compared with 2005.

Considering the economic crisis, which impacts considerably on average private consumption rates, the *Prograns* forecast on development by 2015 appears to be realistic. It is certain that Bulgarian private consumption will suffer from the impact of the current economic crisis at present and in the near future. But in the medium-term prospects for consumer demand could improve greatly.

Bulgarian private households overall – like in virtually all CEE countries, though to a different extent - still have tremendous “accumulated needs”. Owing to their current disposable income they cannot buy many items which are now available in local supermarkets or multinational retailers. Most of them would, however, like to purchase them if they had the financial resources available. Thus we may assume that as household purchasing power increases (meaning increased disposable income), and as social security improves, many households will strive to improve their standard of living and acquire state-of-the-art items for their homes.

Taking these important factors into account, in the medium-term we expect demand in private households to substantially contribute to GDP growth. This is also due to market stimulation stemming from the entrance of international wholesaling and retail companies into Bulgaria. Most of them such as Rewe (Penny, Billa), Schwarz (Lidl, Kaufland), Metro, Carrefour, Deichmann, etc. have already established supermarkets and distribution centres in Bulgaria. It is said that, owing to the economic crisis and a lack of purchasing power among a great deal of Bulgarian households, most of these companies currently regard their investment more as “strategic” than purely profit-oriented. But this is due to change as soon as disposable incomes rise.

A further increase in private expenditure will also increase volumes for freight transport systems. At present consumer goods - if they were not containerised overseas - are usually transported by trucks supplying distribution centres and shops of wholesalers and retailers in Bulgaria. We expect that, at first, road transport will acquire a large part of the additional freight volumes as the road logistics industry is well experienced in delivering appropriate services.

There is, however, no reason why consumer goods should not also be shipped on intermodal services. Basically these goods do not have particularly demanding logistic requirements. In most cases they are full-truckload or part-load shipments. They must not be moved fast but rather cost-efficiently and must reliably be delivered on-time. The intermodal industry must design and ensure a service profile which matches these requirements.

3.2.6 - Evolution of external trade

In the period from 2006 to 2008 Bulgaria's external trade grew at outstanding rates. The total volume of goods and services increased by 33.2 per cent from € 30.5bn to € 40.6bn at current prices. This corresponds to an annual average growth of 15.4 per cent. The Bulgarian import economy grew even faster and raised revenues by 37.1 per cent to € 25.3bn while exports achieved a plus of 27.2 per cent to € 15.3bn. Thus, owing to the boost in imports, Bulgaria has a trade deficit.

Bulgaria's three main export trading partners, as has mainly been the case in past years, are Greece, Germany and Turkey, but closely followed by other countries such as Italy, Romania and Belgium (see **Figure 3-6**). None of them have a clear lead. Russia and Germany are Bulgaria's key import trading partners at 14.5 and 11.8 per cent respectively.

Figure 3-6: Bulgaria's external trade: top 11 countries, 2008

Exports			Imports		
Rank	Country	share	Rank	Country	share
1	Greece	9.9%	1	Russia	14.5%
2	Germany	9.2%	2	Germany	11.8%
3	Turkey	8.8%	3	Italy	7.9%
4	Italy	8.5%	4	Ukraine	7.2%
5	Romania	7.3%	5	Romania	5.6%
6	Belgium	5.8%	6	Turkey	5.5%
7	Serbia	4.2%	7	Greece	5.4%
8	France	4.1%	8	Austria	4.1%
9	Russia	3.0%	9	France	3.3%
10	Macedonia	2.3%	10	China	3.0%
11	others	37.0%	11	Others	31.6%

Source: Germany Trade & Invest, *gtai.de*

Bulgaria's main trading partners are a mix of European Union and non-European Union nations. In 2008, EU Member States accounted for 60 per cent of Bulgarian exports and 56 per cent of imports. The portion of imports is smaller than for exports as Bulgaria traditionally receives considerable import volumes from countries such as Russia and Ukraine.

According to *Prograns*' forecasts Bulgaria's external trade will essentially lose strength after 2015. Exports are expected to increase by an average annual growth rate of 7.1 per cent between 2005 and 2015, growth will then slow to 5.9 per cent up to 2020. For Bulgarian imports the corresponding rates are 7.1 % and 5.8 % respectively. So *Prograns* anticipates that exports will grow slightly more than imports. The report, however, does not indicate on what assumptions this forecast is based and why external trade is going to slow after 2015.

Owing to the current downturn of economic activities in Bulgaria and virtually all other European countries, which *Prograns* could not anticipate to this extent, economic development in Bulgaria is likely to differ substantially from their forecasts. While average growth in Bulgaria's external trade will be lower in coming years than *Prograns* forecasted, especially in terms of exports, it will be much higher in the second half of the next decade. Moreover we predict significantly higher long-term growth than *Prograns*. Based on this we have established the following assessment:

Exports:

- 2005 – 2015: + 6.1 %
- 2015 – 2020: + 6.9 %

Imports:

- 2005 – 2015: + 6.1 %
- 2015 – 2020: + 6.8 %

Based on our findings concerning the evolution of the Bulgarian fiscal situation, industrial production, private consumption and foreign investments (see previous sections), we expect the following detailed developments of Bulgaria's external trade:

(1) The main driver for Bulgaria's exports and imports will be the EU Single Market. This applies to both the current and also prospective new Members such as Turkey, already an important trading partner. According to our evaluation of trends, integration into intra-European trade will be reinforced in the last years of the next decade. We consider the following factors to be crucial in this development:

- A more stable legal and economic framework will facilitate and foster foreign investment in Bulgaria and contribute an increase in exports and imports.

- The Bulgarian population will seek to achieve Western standards of living and consequently demand for consumer goods produced to a certain extent in the EU will increase. We would like to emphasise, however, that in the medium term it is likely that Bulgarians will increasingly meet their consumption needs with products imported from the Far East and other non-European countries.
- All manufacturers and retailers are subject to increasing competition for market shares. In order to take full advantage of potential productivity gains, the international division of production processes will continue to be extended and thereby reinforce the establishment of integrated trans-European and global production chains. Bulgaria can do well in attracting new production sites or distribution centres with several comparative advantages explained previously.
- Given the international integration of production, increased production in Bulgaria will drive up volumes of international long-distance freight transport and increase inbound and outbound transport of supplies, components, semi-finished and finished products between Bulgaria and Western markets. There is no reason why the traditionally strong relationships between Bulgaria and its main trade partners should cease.
- The existing trend in Bulgaria that trade with CEE countries is growing faster than with Western European countries, will be further strengthened. The intra-CEE exchange of manufactured products will increasingly be integrated into European supply chains. We particularly expect trade lanes with Hungary, Poland and Romania to expand rapidly.
- Infrastructure enhancement in CEE countries improves the global position of European production. Bulgaria is in a particularly favourable position for international transport as it is located at the crossroads between Europe and Asia
- Bulgaria could also benefit from the partial relocation of production chains, particularly from Asia to Europe as mentioned above.

(2) Although we expect the EU single market to be a strong player we also expect globalisation to play a key role in shaping trade and logistics structures over the next decade due to the economic benefits of a global division of work and the relocation of production to low-cost countries (often outside Europe) increasing transcontinental trade. The containerisation of commodities, although at an incredibly high level compared to prognoses from 20 years ago, will also increase.

What is the effect on maritime container traffic to and from Bulgaria when the expected economic development as explained in previous sections is taken into account?

Once the global economy recovers, container traffic will grow once more. But even if volumes were to rise by double-digit rates it would take a number of years to compensate for the current setback. Based on the findings of our market survey we expect the following average annual growth rates of container traffic, regardless of mode of transport:

- 2007 – 2014: + 3 %
- 2015 – 2020: + 9 %

3.2.7 - Intermodal competition


While previous sections have examined the potential development of total all-mode traffic including size and composition of Bulgaria's trade and transport volumes, this and the following sections will investigate the opportunities and competitiveness of intermodal traffic in Bulgaria when compared to road transport.

The Bulgarian road operators are among the lowest priced carriers in Europe. Although their equipment (trucks and spare parts) are generally not cheaper than those of their Western European counterparts, they can offer considerably lower rates. This is almost entirely due to lower labour costs.

On this basis this section is intended to analyse how cost competition between truck operators and intermodal traffic is likely to develop and whether intermodal services have a chance of catching up with road transport. It highlights the following issues:

- Energy costs
- Staff costs
- Cost of access to infrastructure
- Allocation of social cost.

(1) In recent years we saw a tremendous increase in energy prices. Particularly the price of oil and its derivatives such as diesel fuel soared. The global economic downturn seems to have stopped a further upward movement and stabilised prices. No expert doubts, however, that fuel prices will rise again. The question is only when the next jump will hit the economy and to what extent prices will skyrocket.



Even if intermodal transport will not be able to avoid a rise in energy prices completely they will not be hit as hard as the diesel-based road transport business. This could be observed during the last oil price rise when market prices for road traffic virtually exploded. It is not only the case that the electricity supply for electric locomotives is less dependent on fossil-fuel energy than trucks, it is also true that the share of energy cost as a portion of total transport cost is also considerably smaller – about 10 versus 30 per cent. Thus in future, when fossil-fuel prices rise again, the comparative cost ratio is likely to change to the benefit of intermodal rail traffic. Although electric locomotives are not overwhelmingly employed in Bulgaria on current intermodal services to/from and through Bulgaria, the electrification of ever more lines could be a key step forward for Bulgaria.

(2) For some years the costs of driving staff in road transport have been increasing considerably reducing the difference in costs to intermodal traffic where personnel costs remained relatively stable. There are three reasons for this:

- In Western Europe a shortage of truck drivers has arisen. This is initially the result of the fact that the armed forces, previously a “natural” trainer for truck drivers, have less draftees. Secondly, more and more truck drivers do not want to spend their life on motorways. They prefer jobs in regional or local transport.
- The accession of the CEE countries to the EU has “saved” Western European road-based logistics companies because many CEE residents were willing to work as low-cost truck drivers instead of being unemployed at home. However, the more the economy in CEE countries has prospered the more truck drivers changed to more attractive industrial jobs in their countries. It seems this development has yet to affect Hungary. But if the economy recovers further we believe that many Bulgarian drivers may also turn their back on trucks within the next five years.
- The greatest and most sustained impact on road costs can be expected from the new EC regulations on drivers’ working and resting times and the obligatory application of the digital tachograph (“blackbox”). Both measures reduce the effective working time per driver and require road transport operators to employ more drivers for the same scope of services. Forwarders estimate that personnel cost in road transport have increased by 10 to 25 per cent depending on the level of compliance with current rules. Considering that the cost of drivers account for about 30 per cent of total road transport costs, the price of services is expected to rise by 3 to 8 per cent.

(3) The reduction in drivers' working time will prove to be positive for intermodal services in the long run. Drivers who comply with the regulations will not generally be able to perform a round trip on a route of about 300 to 350 km in one shift, including loading/unloading. Even if road operators develop smart operational solutions such as relay systems of interchanging trucks or drivers, the working time regime is likely to lead to a significant increase in transport costs and result in reducing the point of equal costs between intermodal and road services.

(4) Regarding infrastructure charging, road operators are still in a better position than rail freight services. Even if some countries have introduced road tolls for the use of motorways, charges, in general, are comparatively low. This means that, in Bulgaria, road operations can be carried out at very low cost as the cost of wear and tear on the road is not taken into account.

On the other hand railway undertakings – and consequently intermodal operators and their customers – have to pay track access fees for the usage of virtually any European network, although in Bulgaria there is a reduced track access charge for carrying containers and/or cargo trucks with block-trains. However, it is uncertain if this reduction will continue and for how long.

(5) Although intermodal service are currently penalised via infrastructure access charging when compared to road operations they could considerably benefit from a regime ensuring that the social costs of each mode of transport are charged for. Any calculation shows that rail incurs much lower social costs per tonne-kilometre than road especially with regard to air emissions and accident costs which are not currently covered.

Our analysis provides evidence that two of the major cost drivers of road freight transport, fuel and personnel cost, are due to rise noticeably over the next few years. If plans for polluters to pay for social cost were implemented in due time intermodal services could gain additional benefit and thus could compensate – at least partly – for the cost disadvantage in in-frastructure access charging systems. In total we expect that in contrast to the past 20 years which have seen a continuous decline in market prices, road freight rates will increase by an average annual rate of 1.5 to 2.0 per cent by 2015. If authorities, however, felt that the transport industry is not doing enough to reduce its carbon dioxide and ecological footprint they might even strengthen measures and increase the “price” on road traffic.

3.2.8 - Sustainable logistics

Climate policy, responding to the threat of a change in world climate, may become key leverage for shifting shipments from road to more environmentally-friendly supply chains, of which intermodal traffic could particularly benefit.

During our market survey we have identified several companies which are about to examine how they could reduce the ecological footprint of their logistics systems. What is remarkable or even spectacular is that it is not only the chemical industry, which already has quite an affinity to rail, but other industries, which, to date, have been comparatively “road-minded” and largely wanted to avoid rail.

Recently several major European wholesalers and retailers have been driving sustainable “green” logistics. They have started to examine where, in their own logistical system, they could reduce the environmental impact of their supply chains for foodstuffs and non-food consumer goods. To a greater extent they are also requesting that their suppliers contribute to this objective. We have learnt that the big producers of food and non-food consumer goods have particularly taken this concept to heart. It has become clear that the majority of them are generally looking for solutions as to how they could shift current road-based tonnage to intermodal services. They are analysing which of their trade lanes match existing intermodal services, and if there are no existing services they are requesting that intermodal operators introduce an appropriate service.

What is suddenly driving these industries to care about the climate impact of their logistics and transport? According to our analysis the following influences are a key:

- The major driver of green logistics is economics. The companies anticipate that in the near future social costs will be allocated to polluters fully or partly. This will definitely make their road-based operations much more expensive. They are therefore looking for more cost-efficient alternatives which can deliver a comparable level of service and intermodal traffic provides this solution.
- Wholesalers and retailer have noticed that consumer values have changed and recognised that the revenues from organically produced products are increasing more than the market average, even if their share is still modest (less than 10 per cent). Customers that buy those products are a minority but they are “opinion formers”. For supermarket owners it is clear that these customers will at some stage also demand

“politically correct” transportation of organic products. The companies involved are trying to anticipate this development by restructuring parts of their logistics.

- Finally more and more shareholders are asking corporate managers what they intend to do to respond to the challenges of climate change.

If the intermodal industry responds appropriately to the requirements of companies concerned about their ecological footprint and ensures reliable and cost-efficient services we can expect climate policy to induce a tremendous surge in demand for intermodal traffic and raise volumes. According to our findings both shippers and intermodal operators are interested in taking part in the first steps on Western European corridors. Assuming these initial steps are successful we anticipate shipments to and from Bulgaria being integrated in the second stage. The corridors through Bulgaria provide favourable conditions involving long transport distances which make large environmental savings possible.

3.2.9 - Rail and terminal infrastructure

In the course of Bulgaria's integration into the EU, the government has developed a comprehensive improvement programme for the modernisation of rail infrastructure. It entails priorities in the goal of transforming the country into a transit link between the countries of Western and Central Europe to the Middle East, Western and Central Asia as well as the North-South-axis, of which in particular infrastructure measures are:

- Plovdiv-Svilengrad railway line; electrification and reconstruction; total cost: €340 million, to be completed by 2017
- Carnobat-Sindel railway line on Corridor VIII; doubling and electrification; total cost: €21.12 million
- Sofia-Plovdiv railway line; modernisation; total cost: €353 million; to be completed by 2014
- Sofia-Pernik-Radomir railway line modernisation; total cost: €103 million; to be completed by 2013
- Plovdiv-Burgas railway line; renewal; total cost: €66.5 million; to be completed by 2011
- Sofia-Dragoman (Serbian border); modernisation; total cost: €85 million; to be completed by 2012
- Mezdra-Gorna Oriahovitsa railway line; modernisation; total cost: €167 million; to be completed by 2011.

As part of this programme the upgrading of the Pan-European Corridors IV, VIII and IX, and a number of lines of national importance is foreseen (see **Figure 3-7**). The Pan-European Corridors are mainly those railway lines of paramount importance for bilateral and transit intermodal services, while the rest are relevant nationally for domestic transport. Whether intermodal capacity really increases, however, depends on the mix of passenger and freight traffic on the line and, particularly with respect to transit services, whether neighbouring countries enhance their networks.

Figure 3-7: Priority public sector projects railway in Bulgaria: water and air transport



Source: Strategy for development of the transport infrastructure of the Republic of Bulgaria by 2015

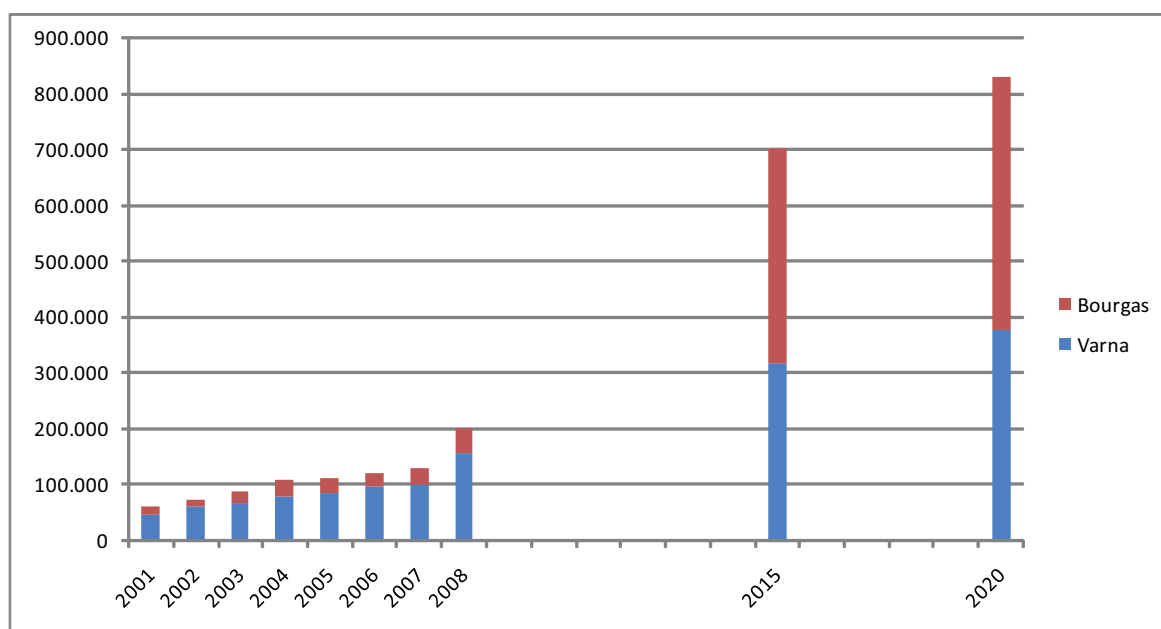
As the development of the intermodal transport system is one of the priorities of Bulgaria's Transport Programme, a project has been also developed, financed by the PHARE Programme, which includes an integrated Intermodal Logistics Strategy. It recommends the construction of terminals starting from Sofia as a hub. Many feasibility studies have been undertaken for the construction of a terminal in the Sofia region, concluding that the construction of such a terminal in Sofia is an economically and socially sound investment for Bulgaria, but, due to several reasons, none of these projects have actually been realised so far and it remains unclear when construction work may begin.

According to the project the second important region to develop intermodal traffic in Bulgaria is the Plovdiv region. We are aware that an application for financing from the TEN-T yearly working programme for 2007 for the project 'Technical Assistance for construction of Intermodal Terminal at the planning Southern Central Region in Bulgaria – Plovdiv' has been approved by EC, but we are unaware as to what extent the project has been realised.

3.2.10 - Port development

Bulgaria has two major international seaports, one in Burgas and one in Varna. In recent years there has been a large increase in volumes handled by these ports, in particular handling of containers. Continued strong growth is expected in this field. Varna already has a specified container terminal, whereas containers in Burgas are handled in the same facilities as bulk cargo. However, both ports' equipment is aging and there are plans to build two new container terminals to cope with the expected growth in container volume, because, compared to an estimated combined container handling volume of 127.000 TEU in 2007, demand is expected to rise to about 700.000 TEU for both ports in 2015. This correlates to growth of 451 per cent in just eight years. Regarding the New Container Terminals Development Project at the ports of Varna and Burgas, the targets for 2017, 2 years after completion, are 375.000 TEU and 454.000 TEU respectively, a total of 829.000 TEU (see **Figure 3-8**). This means a total increase of 552 per cent between 2007 and 2020.

Figure 3-8: Development plan for the ports of Varna and Burgas in TEU, up to 2020



Source: port of Burgas and Varna, KombiConsult analysis

3.2.11 - Evolution of intermodal industry

The previous sections have presented evidence that external influences will add potential to the intermodal services market in the medium to long term. However, the volumes of external trade and long-distance freight traffic already offer ample opportunities services development and a recovery of the Bulgarian economy will only serve to enhance this. Cost-efficient and reliable services are required for intermodal to compete with Bulgaria's low-cost road carriers both now and in the future.

The question is whether the intermodal industry can and will develop capabilities, strategies and instruments to improve its competitiveness as well as what conditions are beneficial for this improvement. We have analysed the industry and drawn our conclusions on its likely evolution as follows:

- (1) Freight volumes are concentrated to a very large extent on the Sofia area. Traffic flows are increasingly east-west. Such conditions facilitate the implementation of - multi-frequency - point-to-point intermodal block train services.

(2) There is currently no competition in the intermodal industry on the operator and railway side in Bulgaria. The presence of competition could generally enhance the competitiveness of international intermodal services to and from the country. Recently it seems that intermodal stakeholders located in different fields of business have become keen to change the situation in some South-Eastern countries. Changes could contribute to improving service quality and productivity and developing new markets and trade lanes in the future.

(3) In order to foster intermodal services on routes involving Bulgaria, which do not initially provide full-trainload volumes, it may be necessary to first establish hub-based rail production systems (gateway services) between several interconnected bundling points of international importance in South-Eastern Europe. Sofia could be integrated into such a network from the start to achieve economies of scale on train services later on.

The requirements for such a hub terminal are, amongst others, a sufficient interim storage area, competitive handling and interim storage rates, flexibility, and the ability to deal with delays or other issues shipments may encounter.

3.3 - Evolution of domestic intermodal rail/road traffic by 2020

It is virtually impossible to forecast a complete scenario of Bulgaria's domestic traffic either for next year or up to 2020. Given the geo-economic conditions, there are not currently many opportunities to establish road-competitive domestic services. Demand for intermodal shipments on domestic lines will therefore remain extremely volatile and dependent on the decisions of individual companies. Such decisions cannot be forecasted within the framework of a global evaluation, only on relevant trade lanes between two catchment areas, as it was performed in international rail/road traffic evolutions and will be explained more in detail below (see chapter 3.4).

We expect that – as in 2007 or planned in 2008 – the main portion of domestic volumes will be sourced from containers carried to and from the international Black Sea ports of Varna and Burgas. We assume that domestic hinterland traffic between the seaports and inland terminals in Bulgaria, specifically Sofia as the final hinterland destination of both ports, will benefit from these circumstances and increase its traffic share. According to our calculations, volumes of domestic intermodal rail/road traffic will thus rise to 70,200 TEU in 2020. As volumes were at a very low level in 2007, this corresponds to an increase of 2,952 per cent between 2007 and 2020.

3.4 - Evolution of international intermodal rail/road traffic by 2020

In order to assess the development of international volumes of intermodal traffic of the countries involved in this study, we investigated whether there may be potential demand on each trade lane between two catchment areas may, by 2020 there may be potential demand which:

- Is initially sufficiently high to warrant a regular full-trainload (FTL) intermodal service, e.g. a direct or shuttle train;
- Secondly, we consider suitable for an intermodal service featuring an appropriate service profile.

For those trade lanes which matched both requirements, we “designed” a distinctive profile for an intermodal service particularly including the following items:

- Total train capacity;
- Average capacity load factor;
- Weekly and annual frequency of the service.

Inputs are mainly based on our knowledge of current services on the trade lane in question – if there is a service – and the general economic conditions of intermodal trains, the forecasted goods and logistics patterns and the infrastructure parameters on the freight corridor up to 2020. Through this comprehensive exercise we were able to determine the 2020 levels of intermodal shipments (in TEU) for each trade lane. These results were assigned to the corresponding country-to-country pair. The consolidated volumes of all trade lanes between two countries provide the total bilateral intermodal traffic.

Based on this methodology we have assessed bilateral traffic to and from Bulgaria and transit traffic through the country. The transit traffic segment includes corridors between two other CEE countries involved in this DIOMIS study, but primarily traffic between “third countries”.

3.4.1 - Evolution of bilateral international traffic to/from Bulgaria

Intermodal traffic on bilateral intermodal services with Bulgaria is expected to increase by 1,192 per cent in the period between 2007 and 2020. Total shipped quantities are expected to rise from 17,400 TEU to 224,800 TEU (see **Figure 3-11**).


The two main intermodal market segments will develop distinctively. While container hinterland traffic will “only” increase by 231 per cent, the volume of freight shipped on continental services is forecasted to increase by 5,997 per cent from 2,900 TEU in 2007 to 176,800 TEU in 2020. Based on our findings on the evolution of Bulgaria’s external trade and the situation in terms of competition between intermodal and road continental intermodal traffic is expected to grow particularly strongly on trade lanes with the following countries:

- Austria
- Belgium
- Germany
- Hungary
- Italy
- Romania
- Slovenia

Figure 3-9: Bilateral international unaccompanied intermodal traffic by corridor, 2007/2020

Bulgaria from/to	2020			2007			% change on total
	Maritime	Continental	Total	Maritime	Continental	Total	
Austria	-	27.000	27.000	-	-	-	n.a.
Belgium	-	20.200	20.200	-	-	-	n.a.
Germany	-	48.600	48.600	-	-	-	n.a.
Greece	48.000	-	48.000	14.500	-	14.500	231%
Hungary	-	16.200	16.200	-	-	-	n.a.
Italy	-	21.600	21.600	-	-	-	n.a.
Poland	-	10.800	10.800	-	-	-	n.a.
Romania	-	16.200	16.200	-	2.800	2.800	479%
Slovenia	-	16.200	16.200	-	-	-	n.a.
Total	48.000	176.800	224.800	14.500	2.800	17.300	1199%

Source: KombiConsult analysis



According to the information presented above continental intermodal traffic will increase its market share of bilateral international traffic to more than 78 per cent up from 16 per cent in 2007.

International maritime traffic to and from Bulgaria is not expected to grow as much as continental traffic, as Bulgaria's own ports will also contribute greatly to maritime intermodal traffic in Bulgaria. Thus, this market is expected to see an increase of "only" 231 per cent from 14,500 TEU in 2007 to 48,000 TEU in 2020. We expect the Greek seaport of Thessaloniki, already a strong intermodal partner for Sofia, to continue to be the key port in Bulgarian international maritime traffic.

At first glance the total and relative increase in bilateral traffic may appear unrealistic. The following aspects should, however, be taken into account:

- Bilateral traffic is starting at a very low level.
- Bilateral international traffic primarily serving continental trade was much less affected by the current economic crises than international maritime traffic.
- We are not expecting a considerable increase in external trade between the old and new EU Member States
- Most of the corridors along which we assume intermodal traffic will grow strongly exhibit very long transport distances more suited to rail transport and are expected to potentially provide more than a daily full-trainload of point-point freight.

3.4.2 - Evolution of transit traffic through Bulgaria

Intermodal transit had the highest share of intercontinental traffic in Bulgaria in 2007 with over 79 per cent, which equates to 75,800 TEU. Due to strong growth in international traffic it almost lost its leading position, achieving a market share of 44.7 per cent. These volumes are expected to increase to 238,300 TEU by 2020. The main reason for the predicted growth is that we expect bilateral intermodal traffic between Western European countries (especially Austria and Germany) and Turkey to grow substantially. But also other bilateral intermodal traffic with Turkey is expected to grow substantially, such as with Romania and Slovenia.

Figure 3-10: Unaccompanied intermodal traffic in transit through Bulgaria by corridor, 2007/2020

Transit corridor		2020	2007	% change
Austria -	Turkey	50.400	12.500	303%
Germany -	Turkey	100.800	25.000	303%
Hungary -	Turkey	22.300	37.500	-41%
Romania -	Turkey	37.800	800	4625%
Slovenia -	Turkey	27.000	-	n.a.
Total transit through Bulgaria		238.300	75.800	214%

Source: KombiConsult analysis

At first glance the total and relative increase in transit traffic may also appear unrealistic. But the following aspects should be taken into account:

- Transit traffic is also starting at a low level, although not as low as bilateral international and domestic traffic
- Transit traffic through Bulgaria primarily serving continental trade was much less hit by the current economic crises than international maritime traffic.
- We are expecting a considerable increase in external trade between the old and new EU Member States and Turkey
- Each of the corridors where we assume intermodal traffic will grow strongly, exhibits very long rail-oriented transport distances and is expected to potentially provide more than a daily full trainload of point-point freight.

As is the case today, continental cargo will be the only transit traffic to 2020.

3.5 - Evolution of total intermodal rail/road traffic by 2020

We expect unaccompanied intermodal traffic in Bulgaria to increase from 95,500 TEU in 2007 to 533,300 TEU in 2020. This is more than a quintupling of the total volume. Since the international traffic to and from Bulgaria is predicted to be most dynamic during these years, this market segment will increase its share from 18.2 per cent to 42.2 per cent and thus will almost equal transit which is expected to fall from 79.4 per cent to 44.7 per cent.

**Figure 3-11: Total unaccompanied intermodal traffic in Bulgaria
by traffic type, 2007/2020**

Intermodal market segment		2020	2007	Total growth	Annual growth
Unaccompanied traffic		533.300	95.500	458%	14,1%
Domestic	maritime	70.200	2.300	2952%	30,1%
	continental	-	-	n.a.	n.a.
	Subtotal	70.200	2.300	2952%	30,1%
International	maritime	48.000	14.500	231%	9,6%
	continental	176.800	2.900	5997%	37,2%
	Subtotal	224.800	17.400	1192%	21,8%
Transit	maritime	-	-	n.a.	n.a.
	continental	238.300	75.800	214%	9,2%
	Subtotal	238.300	75.800	214%	9,2%
Total intermodal traffic		533.300	95.500	458%	14,1%

Source: KombiConsult analysis

4. IMPACT OF EVOLUTION OF INTERMODAL TRAFFIC ON INFRASTRUCTURE

4.1 - Impact on rail network capacity

The **Figure 4-1** shows the approximate assignment of the 2020 transport programme of block train services from/to and through Bulgaria determined by our assessment of the evolution of unaccompanied intermodal traffic, on the Bulgarian rail network. Since we expect that the majority of intermodal shipments will be carried on international trains between Bulgaria and the western European countries of Austria and Germany as well as Hungary and Slovenia on the one hand and Turkey and Greece on the other hand the rail lines via Bulgaria which are part of the Corridor IV and X will have to bear the highest load of bilateral intermodal trains.

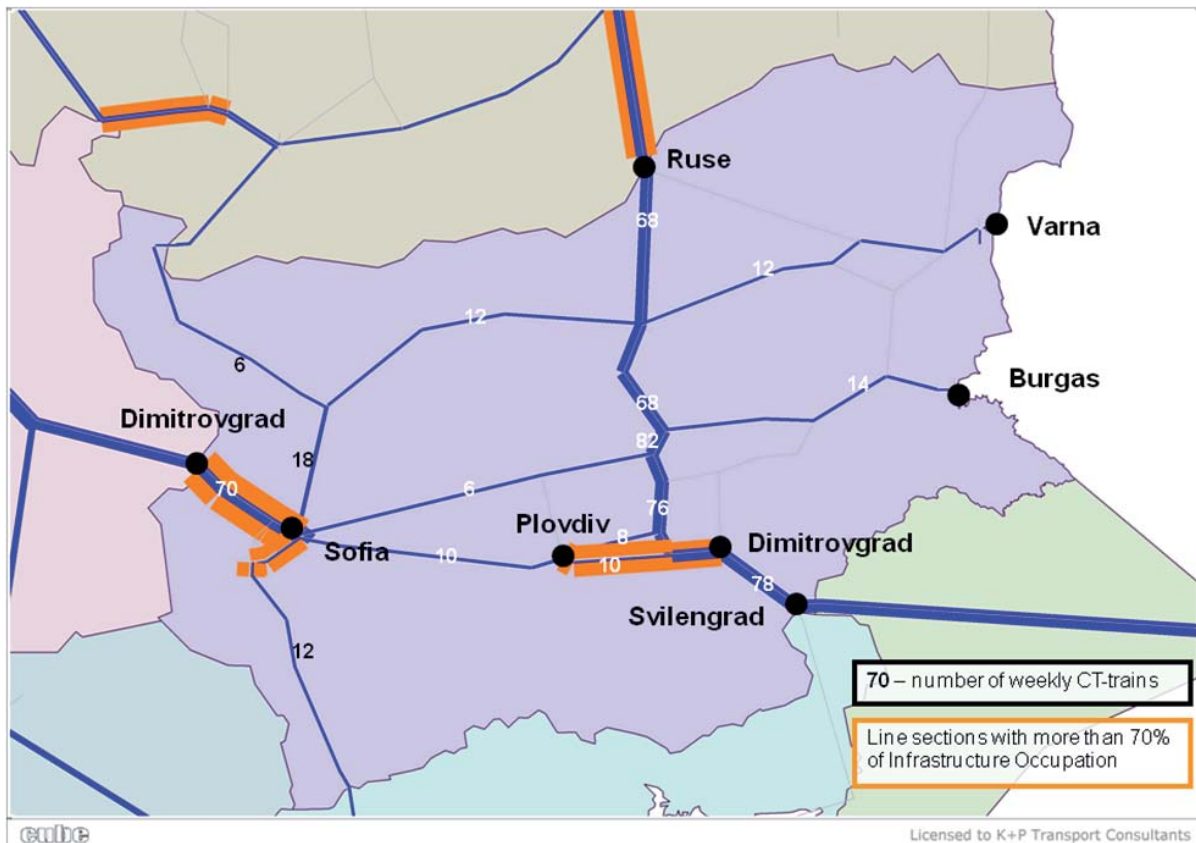
In spite of this substantial growth of intermodal trains until 2020 we basically don't anticipate major capacity constraints on the Bulgarian network also taking account of other freight and passenger trains. Considering several ongoing construction works, to be completed by the year 2020 the latest, the situation will significantly change compared to the existing state (see section 2.5.1). Nevertheless, even if the large scale measures will be implemented parts of the network will still suffer from bad operating conditions due to not sufficiently financed railway infrastructure development: maintenance, access border crossing Giurgiu / Ruse, Dimitrovgrad - Sofia, Plovdiv – Dimitrovgrad / Svilengrad which will remain bottlenecks.

However, as explained in previous section the routing of in particular transit trains to/from Western European sources/destination to Greece and in particular Turkey is not only de-pendent on the timely completion of Bulgarian rail infrastructure projects, border crossing procedures but also the behaviour of neighbouring countries' intermodal stakeholders at large.

This statement is basically confirmed by the ERIM 2020 study, which sees very few sections of the Bulgarian rail network employed by an average of 70 per cent or more by 2020.

Yet it should be qualified that this does mean that there will be sufficient capacities on general but not necessarily at the time-window required from the intermodal service supplier and its customers.

Figure 4-1: Assignment of intermodal trains on the Bulgarian rail network, 2020



Source: K+P Transport Consultants

4.2 - Impact on terminal capacity

By the year 2020 intermodal terminals in Bulgaria will require transshipment capacity for an annual volume of 295,000 TEU in unaccompanied traffic. This is the consolidated volume of expected intermodal shipments on domestic and bilateral international services. Only these two market segments affect terminals located in Bulgaria, since we assume that transit shipments will be carried between terminals in other countries and not be handled at Bulgarian sites in the framework of gateway or hub systems.

In order to determine the handling capacity required to process the transport volume of 533,300 TEU it is necessary to translate the amount of TEU in number of loading units (LU). Loading units are the objects which terminals physically lift and therefore the appropriate unit for calculation.

In this respect we need to distinguish maritime from continental traffic since the mix of loading units is expected to be quite different. Based on apparent trends we expect one loading unit to correspond to 1.6–1.65 TEU on container hinterland services with Bulgaria by 2020. For all further calculation we have used the ratio 1 LU:1.6 TEU.

Current continental intermodal services are strongly focused on the chemical industry and therefore move a large number of 20' (1 TEU) and 30' (1.5 TEU) tank and bulk containers. For this reason the TEU-loading unit ratio is comparatively low, lower than on maritime services. We, however, expect that intermodal operators will gain market share in general cargo freight over the next decade. We will then see a significant change in the pattern of loading units employed. To carry general cargo, such as foods, dry cargo domestic containers, semi-trailers and swap bodies are required. An equivalent of a full truckload of such a continental intermodal shipment corresponds to on average of 2.3 TEU. We determined a 1.8 TEU-LU-ratio as the weighted average of dry cargo and bulk units (see **Figure 4-2**).

Figure 4-2: Conversion of TEU-related intermodal volume into handling loading units, 2020

Market segment	Volume 2020 (TEU)	TEU/LU ratio	Volume 2020 (LU)	Handling ratio	Handling 2020 (LU)
Domestic	70,200	1.60	43,900	2.00	87,800
International Maritime	48,000	1.60	30,000	1.00	30,000
International Continental	176,800	1.80	98,200	1.00	98,200
Transit	238,300	1.80	132,400	-	-
Total	533,300		304,500		216,000

Source: KombiConsult analysis

The table shows that by 2020 Bulgarian intermodal terminals will require handling capacity of 216,000 loading units to be able to process the expected domestic and international transport volumes of 295,000 TEU (see **Figure 4-3**). Currently total transshipment sites only provide for a consolidated annual handling capacity of about 150,800 loading units, which is 70 per cent of the required capacity. According to the findings of our investigations into the Bulgarian logistics market, we estimate that intermodal traffic will continue to be concentrated in the Sofia area. This means that additional transshipment capacity of at least 148,000 loading units would be required in or around Sofia. The urgency of this matter may not be overlooked as there have already been many studies and projects aiming to build a new container terminal in Sofia, but, for various reasons, none of them have come to fruition.

The next inland location which we anticipate playing a role in intermodal traffic in Bulgaria, is Plovdiv. In this we agree with the PHARE-project. Although the terminal seems to have sufficient capacity to accommodate the requested handling capacity, both based on our calculations and from a current standpoint, this situation must be viewed critically, taking the condition of the existing terminals into account. This is also true of the ports of Varna and Burgas, where new container terminals will be built but it is unclear as to whether the rail terminals and connections in the ports will be involved. If the current terminal conditions are taken into account, modernisation of the terminals in Plovdiv and rail related terminal infrastructure in the ports of Burgas and Varna would be essential to cope with the forecasted rail handling volumes.

Figure 4-3: Capacity need for terminals in Bulgaria in 2020

Terminal	Annual handling capacity (LU) 2007		Capacity need 2020	? Capacity need 2020
	Reported	Calculated	(LU)	(LU)
Burgas Zaprad		53,300	23,600	-
Filipovo (Plovdiv)		21,600	13,500	-
Ruse Tovarna		9,300	-	-
Sofia freight		10,600	158,600	148,000
Stara Zagora		24,000	-	-
Varna		32,000	20,300	-
Total	-	150,800	216,000	148,000

Source: KombiConsult analysis

5. RECOMMENDATIONS ON INTERMODAL STRATEGY

(1) The key success factors for continental intermodal services to/from Bulgaria and in transit with Southern European countries are as follows:

- Time-schedules geared to the movement of consumer goods: buffer time in departure but early morning arrivals
- 95 % arrival punctuality rate
- Consistency
- Cost-efficient service
- Fast dispatching at terminals ("fast lane") to ensure efficient round trip schedules for trucking companies.

(2) The key success factors for container hinterland services to/from Bulgaria are as follows:

- Shuttle services with seaports, if possible several departures daily
- Control and management of port-to-door chain
- Flexibility: provision for additional trains; trucking containers by road
- Cost-efficient service
- Empty container depot at competitive rates.

(3) The market potential on trade lanes to/from and through Bulgaria is sufficiently high that intermodal operators, in co-operation with railway undertakings, should be able to industrialise intermodal operations and thus realise major productivity gains, which in turn contributes to improving competitiveness with road:

- Standardisation of processes and technology
- Employment of efficient rail production systems: multi-frequency shuttle systems
- Advanced interface management
- Commitment to reliable and consistent services.



(4) Seize the opportunities climate policy creates.

(5) Seamless international intermodal services:

- Interoperability
- Synchronisation of processes between railways and operators
- Data interchange; tracking of shipments.

(6) The State shall ensure level playing field between road and rail concerning infrastructure access charging.

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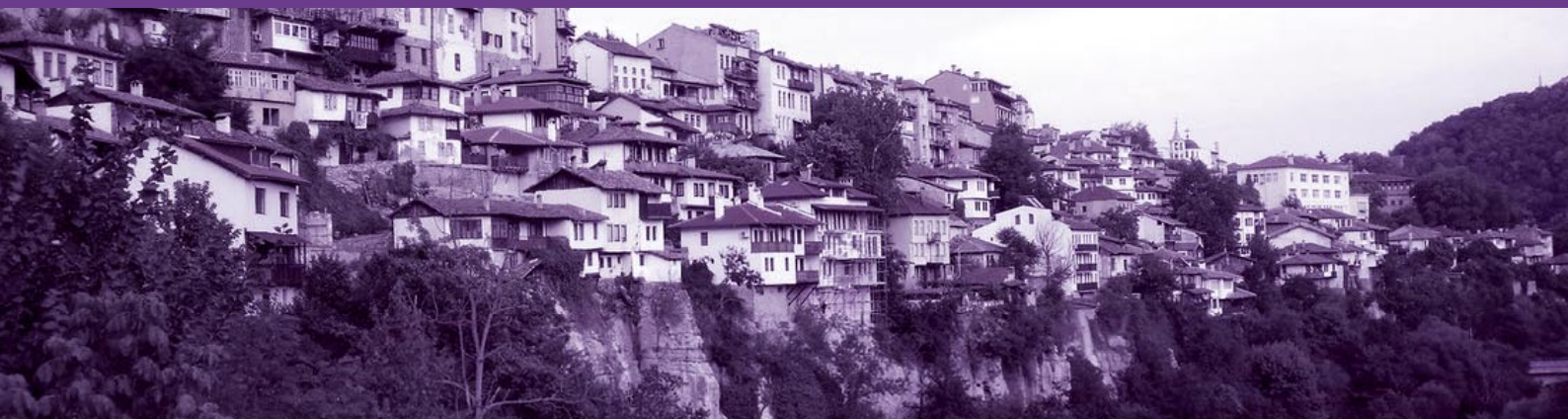
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