

*Feasibility Analysis and evaluation of the viability of multimodal corridor of the approved Action "Sea2Sea" under the Trans-European Transport Network (TEN-T)*

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**1st Deliverable - D1**

**Current State Analysis and Long-Term Forecast**

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ADK | AKKT | EVIAM | Milionis-Iliopoulou



**ΕΒΙΑΜ ΕΠΕ**

**ΝΙΚΟΛΑΟΣ ΜΗΛΙΩΝΗΣ - ΚΩΣΤΟΥΛΑ ΗΛΙΟΠΟΥΛΟΥ**

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## **1 INTRODUCTION**

The report presents data on the current state of the region and the corridor, in terms of environmental, planning, transportation and competitiveness matters and provides the basis on which initial long-term forecasts on its performance and operation can be drawn. The Consultant has collected information from previous studies for the area which were elaborated by the individual partners of the team, official data provided by respective authorities in Greece and Bulgaria (ports, railway companies, ministries etc) and also surveys by independent firms that are commercially available.

According to each sub-activity of the deliverable, various aspects (perspectives) of the study are presented. In this project, the Consultant holds an integrated approach and regards these different aspects to be interrelated. As such, certain pieces of information may be relevant to various perspectives of the study.

## 2 REGIONAL CURRENT STATE ANALYSIS

### 2.1 REGIONAL STATUS ANALYSIS - PLANNING AND DEVELOPMENT PERSPECTIVE

The purpose of this spatial analysis report is to focus on the spatial characteristics and the interactions between transport infrastructure and spatial development within the study area. It is estimated that the realization of the Se2Sea concept which is examined in the project, will have direct and indirect impacts on the spatial organization of the zone of the Sea2Sea corridor, as well as of its wider area of influence. The impacts from the operation of the corridor relate to: access to markets, market size, structure of the urban network, levels of growth and prosperity, business location, changes of land uses, environmental conditions, etc. At a regional planning level, it is estimated that the corridor will bring important - although different in nature and intensity - spatial effects. Critical issues to be studied are the changes in the accessibility of the hinterland and the implications regarding the development trends and the structure of the urban network.

Within this deliverable, the spatial study methodology is focused on two levels of analysis:

A) At a regional level – or at the area of direct influence - the analysis includes the four NUTS II regions, which the Sea2Sea corridor passes through: three regions on the Bulgarian side and one on the Greek side. These are the North-Eastern (Severoiztochen), South-Eastern (Yugoiztochen) and South-Central (Yuzhen Tsentralen) Regions in Bulgaria and the Region of East Macedonia and Thrace in Greece. (The Region of East Macedonia and Thrace is one of the 13 Administrative Regions of Greece, while Bulgaria is divided into six regions corresponding to the same spatial level, NUTS II).

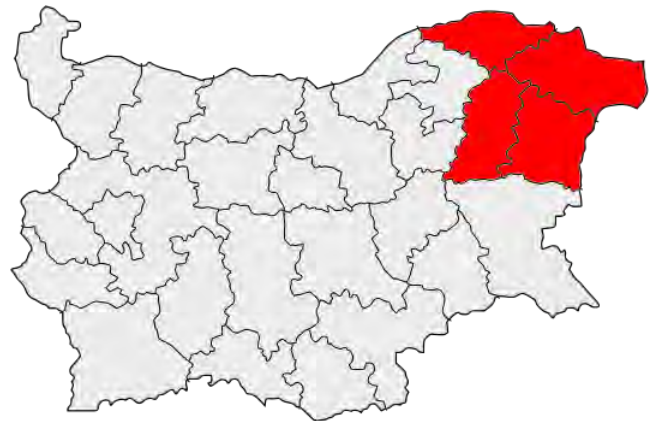
In this initial phase of the project, information, trends and relationships are explored at two levels, as regards the regional level (on the Greek and Bulgarian side):

- On a first level, an attempt is made to analyse the spatial and developmental profile of the Regions. The analysis highlights the basic geographical, spatial and developmental characteristics and indices, both per region and in a comparative perspective. This investigation involves both sides of the corridor (Greek and Bulgarian) and makes use of the available approved Plans / Frameworks / Programs, as well as statistical data, studies and outputs of other relevant projects financed by the EU.
- On a second level, the regional planning context and the programming of procedures of interventions within the Structural Funds Framework are summarized on a regional scale. The emphasis is given to transport infrastructure and to the major issues of spatial development (poles and development axes, urban network structure etc.). The purpose of this analysis is to indicate the developments related with the ongoing and the programmed interventions by national and regional public authorities. In this context, national and regional strategies, frameworks and programs, implemented over

the programming period 2007-13 and planned for the period 2014-20, are addressed.

Up to the present time, the study team has not succeeded to receive all the needed information on implemented programmes and plans on the regional and municipal levels, mainly by the Bulgarian side. However, recognizing the value of precise information on these critical aspects, the study team intends to include in the deliverables of the next phases of the study any important outcomes of studies or plans that will become available, (by that time, the design of the Sea2Sea corridor will be matured and the potential impact area will be more precisely defined).

B) On a wider level, a macroscopic approach to the potentially wider area of the Sea2Sea Corridor is used. The starting point for this analysis is that the bypass of the Bosphorus Straits - as defined by the initial perception of the Sea2Sea corridor – is of great interest for the whole Black Sea Basin transport market which is served through the Straits, especially for the combined transport market. It is



obvious that the hinterland, which potentially could be impacted by the corridor, can include a large part of the mainland around the Black Sea, and cover cumulatively the entire hinterland of each port. Such an approach could not be supported of this project. Therefore, the area which is macroscopically examined as far as its developmental characteristics is restricted to the regions that are eligible under the interregional cooperation Black Sea Basin ENI CBC programme, funded by the EU, while the macroscopic approach for the transport networks refers to the whole area of Black Sea, with the ports being the reference points.

### 2.1.1 Basic geographic, spatial and development characteristics per region

#### North-Eastern Region<sup>1</sup>

The North-Eastern Region (Severoiztochen) is located along the Danube River, facilitating the cooperation with 14 European countries. It benefits from the EU Strategy for the Danube Region. This region generates the second largest gross domestic product (GDP) of the country due to its critical mass of research, technological development and innovation (RTDI), business and financial organisations but features big intra-regional disparities<sup>2</sup>.

The region, in comparison with other regions of level 2 (NUTS II), occupies a relatively good position in economic terms. Nevertheless, the macro-economic situation is degrading since 2009, as a result of the ongoing global financial and economic crisis. North-Eastern Region shows a relatively well-developed 'maritime industry' with inter-linked activities. This unique

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<sup>1</sup>This chapter is based mainly on the Regional Plan for the Development of the Northeastern Region for the period of 2014 – 2020.

<sup>2</sup> <http://ec.europa.eu/enterprise/policies/innovation/policy/regional-innovation/monitor/base-profile/north-east-planning-region-bulgaria>

feature provides an important dynamic for future successful development. Despite the large contribution to the economy of the region, tourism has developed only along the coast.

The Regional Plan for the development of North-Eastern Region for the period 2014-2020, states that there is no progress in dealing with the inequalities within the region. In contrast, inequalities are increasing in terms of wealth and development, between the center (especially the area around Varna) and the rest of the region (distant rural areas). This leads to the 'center-periphery' problem. The city of Varna shows important development in economic, social and cultural terms. All the positive characteristics of the region remain stable, there are features of a center with national and international importance and the city plays an important role in maintaining a balance to the capital of Sofia (in eastern Bulgaria).

In terms of Spatial Structure the distribution of the land is the following: Agricultural areas are 68.8%, forest 23.3%, urban 5.9%. In this region there are 30 cities and 691 towns and villages. The urban population / degree of urbanization in the region is high and rates up to 77,4%, (higher than the average for the country which is 72,5%). In urban areas lives a percentage of 45% of the population of the region. The big city of Varna has a population of 334.870 inh., is part of the cities that belong to the second level of the hierarchy in the spatial network and is a city with national importance according to the European classification. Given its position as a port at the eastern border of the EU, Varna has the potential of joining the category of MEGA cities (in a European level).

In general the strategic geographical position of the region (the transport infrastructure, the international port, the international airport and the various resources for attracting foreign investment and business) is not fully explored.

**The national road network** in the region covers 84 kilometers of motorways, 483 km of roadway in category I, 467 km roads in category II and 1.633 km roads in category III. The development of the road network in the North-Eastern Region is largely connected with the importance and the functions of the city of Varna, that extend beyond the spatial level of the region itself. The road network has reached a high level of development. Also the presence of other transport infrastructure, such as the international port and the international airport of Varna, are of particular importance for further development of the road network. Future projects include the construction of observatories for the two national motorways 'Hemus' and 'Black Sea', which will create conditions for full and effective use of local capacity for development. The most dense road network of national importance has been observed in Shumen and Varna, while in the area of Dobrich this density (0.018 km/sq.km) is more than two times less than the average for the region (0.039 km/sq. km).

**The railway network** is the second most important provision of access and transport to the population in the North-Eastern Region. The total length of railway lines in 2010 was 478 km (11.8% of the railway network in the country). For the period 2007 to 2011 the length of railway lines in the region was reduced by 12 km, due to the closure of lines. The infrastructure of railway transport consists mainly of the following lines:

- Line II Mezdra Sofia - Gorna Oryahovitsa – Kaspichan - Varna that connects Varna with the rest of the country.

- Line IX Rousse - Kaspichan - Varna. This is a main line that connects the ports of Rousse and Varna. This line adds to the competitiveness of the land access to the 'Black Sea-Constantza" Canal. This railway line is one of the most important infrastructure in the region.
- Main railway line III. Line Karnobat - Sindel / Varna. This line is a part of PETC 8 and forms an axis connecting the region with the south of Bulgaria. The development of railway transport has been made a priority for the pan-European transport corridors.
- Poveyanovo-Varna-Dobrich-control station Kardam at the Bulgarian -Romanian border.

The region is one of the least developed regarding the spatial structure of the railway network in the country (but relatively more modernized). In particular, the density of the railway network in the North-Eastern Region in 2011 was 32.7 km /1.000 sq. km, less than the average in the country - 36.7 km / 1.000 sq. km. and the lowest of all Bulgarian regions. About half of the railway stations and stops serving the region cover the wider area of Varna, mainly because of the concentration of economic and transport activities.

The Shumen area is also relatively well-organised, gathering a quarter of the total number of stations in the region. In general the regional nature of railway transport is characterised by limited mass transport of passengers and small number of regular passengers leading to economic inefficiency and interruption of certain lines. This will be particularly worrying for areas such as the Dobrich area, where even the maintenance is limited.

**Maritime transport** is highly developed in the North-Eastern Region. The international port of Varna is an important center of the national transport system, through which is passing a large part of imports and exports. The port plays an important role in the general development of the country's and the region's economy as well as on an international stage. Varna, as a major commercial, financial and administrative center of the region, is situated at the crossroads of movement of Pan-european transport corridors No. 7, No 8 and No 9, creating excellent conditions for the transit of goods between Europe, the Middle and Far East - TRACECA. The functions of Varna as logistics center and stronghold of Eurasian transport corridors and particularly in the field of maritime transport, designate a specific feature in the economy of the area, **'maritime industry'**.

Varna is a multi-operations port with specialized terminals, serving all types of cargo. The main feature of the port is processed cereals, containers, chemical and general cargo. The main port has 9 specialized terminals - 3 in the port Varna - East and 6 in the port Varna - West. Each one of them has the necessary equipment and warehouses for the storage of different types of cargo. One of the features of the port of Varna is that all the piers, except for those which are strictly for certain types of liquid and bulk cargo or containers, have multiple roles and are used for the handling of general cargo (kaolin, quartz sand, soil, sugar, etc.). All terminals of the port are connected to the railway network.

As the major Bulgarian port for containers, the port of Varna has 2 container terminals, 1 in the port of Varna - East and one in the Varna – West port. The stations mainly serve feeder

lines from the Mediterranean and the Black Sea, starting from the major ports of the Mediterranean, including Piraeus.

Part of the port complex of Varna is the port of Balchik, which operates since 1969 and is the third largest freight port on the Black Sea coast. It has also the potential to serve the tourist needs of the region with marinas, the development of which is linked to the development of the coastal zone of the town of Balchik.

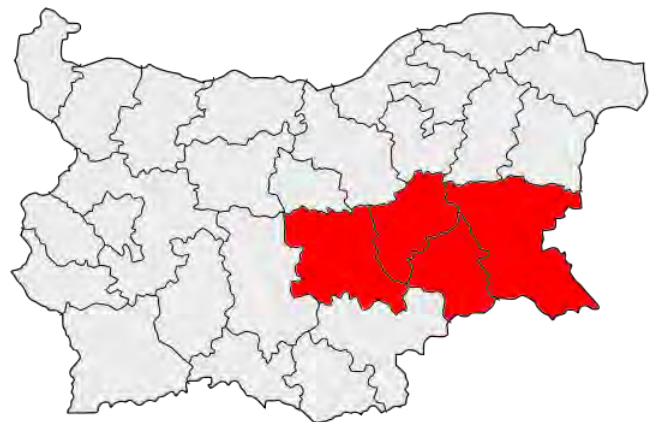
**The international airport of Varna (PLC)** is one of the five international airports in the country. Its strategic location ensures high volumes of chartered flights during the summer season. Almost 99% of passengers are tourists (more than 1 million passengers per year).

### South-Eastern Region<sup>3</sup>

The South-Eastern Region is a medium-sized region, bordering westbound with the South-Central Region, southbound with Turkey, eastbound with the Black Sea and northbound with the North-Eastern Region. The region ranks third in gross domestic product (GDP) and GDP per capita terms and generates 3.2% of all research and development (R&D) expenditures (2011 National Statistical Institute data)<sup>4</sup>. Its main industrial sectors are food and drinks production, textiles, petrochemical products, and wood processing.

The Region is part of level 1 (NUTS1) 'Northern and southeastern Bulgaria', that includes, in addition, the North-Western, North-Central and North-Eastern Regions, while spatially it includes the provinces of Burgas, Sliven, Stara Zagora and Yambol (NUTS 3) with a total of 33 municipalities.

The area of the Region is 19.799 km<sup>2</sup> (17.8% of the territory of the country). Its spatial structure is the following: agricultural soils 41,87%, forests 52,07%, urban environment 4,89%, while the percentage of protected areas is 7.6%. The population in 2011 was 1.078.002 inh., representing 14,64% of the total population of the country. The population density is 54.45 inh./km<sup>2</sup>, significantly lower than the national average - 66.34 inh./km<sup>2</sup> (the North-Western Region has the lower density). The demographic characteristics and the characteristics of the population structure of the region are relatively favorable in relation to other regions.



As far as the urban population is concerned, the urbanization rate is 71,33%, (indication that the region is closer to the level of the North-Eastern Region than the south-eastern region). Large cities (more than 100.000 inh.) are Burgas – 200.271 inh. and Stara Zagora -138.272

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<sup>3</sup> This chapter is based mainly on the Regional Plan for the Development of the Southeastern Region for the period of 2014 – 2020

<sup>4</sup> <http://ec.europa.eu/enterprise/policies/innovation/policy/regional-innovation/monitor/base-profile/severna-i-iztochna-bulgaria/south-east-planning-region>

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inh., medium-sized cities (30.000 – 100.000 inh.) are Sliven – 91.620 inh., Yambol – 74.132 inh. and Kazanluk – 47.325 inh., and there are two cities of 20.000 inh.. The main axis of urbanisation seem to be identical with the transport axis Burgas - Stara Zagora (secondary axes are the Nessebar - Pomorie - Burgas, Sozopol and Sliven, Yambol, and also Kazanlak, Stara Zagora - Radnevo - Galabovo).

In the field of economy the contribution of the services sector is wide, with a percentage of 51% of GDP for the year 2010 (average for the country 63,8%). The second economic sector is the one of industry, with 43% (average for the country 31%). Agriculture holds the 5.8% of GDP for the region (with the same average in the country). Tourism, as part of the services, also has a leading position in the economy.

**Transport infrastructure** in the Region covers all networks, while its potential for intermodal transport constitutes one of its comparative advantages.

- The total length of **the road network** is 3.174km, equivalent to 16.3% of the country. The region has the lowest density of road network in all regions (however, the density of the high class road network (0.035 km/ km<sup>2</sup>) is higher than the national average (0.030 km/km<sup>2</sup>), while the regional road network's of category II and III density is 0.126 km/km<sup>2</sup>, that is the lowest value for all regions. Sections of PETCs IV, VIII and X pass through the Sout-Eastern Region. It has high motorway density, which is higher than the country's average, but below the average in the EU27.
- The project with the greater importance for the inclusion of the South- Eastern Region in the national and the European road network is the completion of 'Trakia' highway, as well as road I -7 (Silistra - Shumen - Yambol - Elhovo) and 87 (Durankulak - Varna - Burgas, Sozopol - Malko Tarnovo). The area between Burgas and Varna is part of the European Transport Corridor No8. The regional road network to the south borders with Greece is less developed and is characterized by low accessibility to the residential centers, especially in the remote areas. The improvement of accessibility to development centers at various spatial levels is crucial (roads of regional and local importance), however the Region is described as the region of the country with the less developed regional road network.
- The most accessible area is the area of Yambol, where the density of road network is above the average of the country and the region. This network in the region of Burgas is one of those with the longest - 1169 km or 36.8% of that region.
- The connection of the South-Eastern with the neighbouring South-Central Region is realized by the new integrated section of the 'Trakia' highway, and with the North-Eastern Region and the border areas of neighbouring Turkey, with I and II category roads. The connection of the road network in the South-Eastern Region with the neighbouring frontier region of Turkey is carried out via two Border control points, one on the I-87 -crossing the Malko Turnovo and a second on I-7 - post "Lesovo"..

The density of **the railway network** in the South-Eastern Region is 33.5 km/ approximately 1.000 km<sup>2</sup> and is less than the average in the country - 36.7 per cent km/ approximately 1.000 km<sup>2</sup> (the average density for the regions of the EU is 25 - 50 km/ 1.000 km<sup>2</sup>). This

density is high in comparison with the average density in some remote countries of E.E. such as Estonia, Greece, Spain, Ireland, Latvia, Lithuania, Portugal, etc.

In Burgas - Pomorie the total length of the railway lines in operation is 664 km, which constitutes 16.3% of the railway network in the country. Better connection with rail transport is found in the area of Stara Zagora with a network density equal to 50,9 km / 1,000 km<sup>2</sup>. The lowest density is detected in the area of Burgas (22.8 km/1,000 km<sup>2</sup>).

Main railway lines serving the South-Eastern Region are 'Sofia - Plovdiv - Burgas', 'Sofia - Karlovo - Burgas and 'Karnobat Sindel - Varna'. The latter has an important role to play, not only for the development of the region, but also for the operation of the national transport system as a link between the international port of Burgas and Varna in the West and the Varna - east of the Black Sea and the port of Rousse on the Danube also between the European transport Corridor 7 and 8 and included in European Agreement on the most important routes for international combined Transport (AGTC). The terminals in Stara Zagora and the port of Burgas are also part of this destination for combined services.

The Regional Plan specifically states that low speed of trains and poor condition of the rolling stock are responsible for the present unsatisfactory status of railway stations. Another problem is the lack of adequate public access to stations, in cases where it is away from residential areas.

Finally, the same Plan states that, in the future, it is advisable to increase the attractiveness of railway transport in the South-Eastern Region, as well as the migrant passengers and goods, because of smaller impact on the environment in comparison with road transport. The improvement of railway infrastructure in the region is considered to be a prerequisite for the increase of the competitiveness of the regional economy.

**Maritime transport** in the South-Eastern Region is also highly developed. The international port of Burgas is an important center of the national transport system, and plays a leading role in the overall development of the national and regional economy. Thanks to the port's development the city of Burgas is perceived as an important commercial, financial and administrative center of the region.

The total freight movement of the port amounts to 15 million tonnes per year, quantity which corresponds to about 60 % of the total traffic load of the country's seaports. With modern equipment and excellent public transport connections, this port is a "gateway" between Europe, Russia, Ukraine and the countries of the Caucasus region, Central Asia, The Middle and Far East. As part of the infrastructure of Corridor VIII, the port of Burgas enables favorable conditions for becoming a node of pan-European Networks and the TRACECA.

**Air transport** is carried out by the international airport of Burgas, which is of strategic importance due to its geographical position. It has infrastructure for freight transit and has the infrastructure to serve combined freight transport by air. Overall, it records steadily increasing carriage trends.

## South-Central Region<sup>5</sup>

The South-Central Region of Bulgaria is second after the South-West Region in terms of gross domestic product (GDP), number of students, research and development (R&D) spending and the number of applications submitted to the National Innovation Fund (NIF), the National Science Fund (NSF), and the Sixth and Seventh Framework programs.<sup>6</sup>



South-Central Region covers the territories of provinces of Plovdiv, Pazardzhik, Smolyan, Kardzhali and Haskovo and comprises of 57 municipalities. The area covers the low western half of Upper Thrace, the southern part of central Stara Planina mountain range, part of the Sredna Gora, and the Rhodope Mountains. The region's area is 22.365,1 km<sup>2</sup> or 20.1% of the territory of the country.

The structure of basic categories of land cover is the following: agricultural areas 48.1%, forests 45.1%, urban areas just 3.9%. South-central region has one of the richest biodiversities in the country. There exists a large part of the national park 'Central Balkan', part of the national park 'Rila' and the whole of the Rhodope Mountains. There are also 155 protected sites and 98 regions of natural beauty. In this region one finds the most protected areas (Natura 2000 network), with 44.5% of the whole country.

The population (on 31.12.2012) is 1.462.252 inh., or 20,08% of the population of the country, and this number sets the South-Central Region second in population after the South-West Region. The most populated area is the one of Plovdiv – 678.818 people, and the less populated one is the area of Smolyan – 118.778 people.

Population density is 65.3 inh./km<sup>2</sup>, slightly less than the national average, (65,6 inh./km<sup>2</sup>). The highest density of population is in the Plovdiv area, 113,6 inh./km<sup>2</sup>. Rates of population growth show that the Region is ranked at about the country average, with modest negative trends.

The degree of urbanization is 66,9%, with an average for the country of 72,9% (the region is part of the the group of regions with low density). Within the region there are 54 urban areas, with only 9 of them having more than 20.000 inh.. The largest city is Plovdiv (the second largest in the country) with a population of 339.077 inh., while there are four medium-sized cities with a population greater than 30.000 residents. These are the centers of areas Haskovo – 75.336 inh., Pazardzhik – 71.174 inh., Kardjali – 43.670 inh., and Smolyan – 30.068 inh. .There are four other cities with populations of more than 20.000 inh.. Complementary to other regional centers are Asenovgrad (50.317 inh.), Dimitrovgrad

<sup>5</sup> This chapter is based mainly on the Regional Plan for the Development of the South-central Region for the period of 2014 – 2020

<sup>6</sup><http://ec.europa.eu/enterprise/policies/innovation/policy/regional-innovation/monitor/base-profile/yugozapadna-i-yuzhna-tsentralna-bulgaria/south-central-planning-region>

(37.816 inh.), Karlovo (22.853 inh.) and Velingrad (22.316 inh.). The population of all the cities (with the exception of Djebel) decreased during the period 2000 - 2010.

In this region there are clear axes of development with national importance in the direction of Pan-European Corridor IV (Sofia - Plovdiv - Haskovo - Svilengrad) and European Corridor IX (Rousse - Veliko Tarnovo - Stara Zagora - Haskovo – Kurdjali).

Economic development in the South-Central Region is relatively stable. The contribution of the services sector predominates with a percentage of 54,1% which is considerably lower than the average percentage of the country (65,6%). The industrial sector has also a significant impact and contribution to the regional (and national) economy with a rate of 38.1%, with an average rate for the country equal to 29,4%. The corresponding figure in the agricultural sector amounted to 7.8% that is significantly higher than the national average (4.9%). Tourism development in the region receives more and more importance for the economy and employment.

Environmentally the areas with accumulated problems are those in Plovdiv, Kurdjali, Dimitrovgrad and Asenovgrad.

The total length of road network in 2009 was 9,144 km. This is the region with the longest road network running. The region is crossed by Pan-European Transport Corridors IV, VIII, IX, and TRACECA. The road network of European and national range consists of highways 'Maritza' and 'Trakia', highway no 80 (as part of the European transport Corridor No. 4), highway no 773 (as part of the Corridor 8) and I-5 (part of the road infrastructure Corridor 9). South-Central Region is served primarily by the regional road network (II and III category), which is in a good condition.

The road network mainly serves the northern half of the region, with the southern part (in the borders with Greece) is served by the secondary and the tertiary road network. The areas of Plovdiv and Haskovo have bigger length - 1.022 and 1.079 Km and percentages of 25,6% and 26,9% of the network in the region, while the area of Smolyan is the area with the smallest length and rate of 13,5% of the entire region. Therefore, the construction of the 'South-horizontal' road, as well as the improvement of cross-border connectivity toward the hinterland, which is included in the priorities of the road transport infrastructures in the country, are considered to be of strategic importance.

The railway network in 2010 was 784 km and corresponds to 18,9% of the railway network in the country. The density of the network is 37.3 km/thousands of km<sup>2</sup> and it is lower than the country's average.

Plovdiv, Pazardzhik and Haskovo are the areas that are better serviced by railway network which makes them suitable for production facilities that have increased requirements as regards to volumes/cargo movement. In contrast, the region of Kurdjali is lagging behind in relation to the development of the railway network. This area is serviced exclusively by road network. Also, in the area of Smolyan railway network is not developed excluding the installation of economic activities.

Main railway lines are 'Sofia – Plovdiv- Burgas', 'Plovdiv - Svilengrad', 'Podbalkanska Sofia - Karlovo - Burgas' and 'Rousse - D. Gorna Oryahovitsa - Stara Zagora – Kurdjali- Podkova'.

Railway lines 'Sofia - Plovdiv- Burgas', ' Plovdiv - Svilengrad' and 'Rousse - D. Gorna Oryahovitsa - Stara Zagora – Kardjali - Podkova' are part of the European transport corridors, passing through the region. The railway lines contribute to the integration of the region with the country's railway network and the Southeast Europe. Railway lines 'Dragoman - Sofia - Plovdiv - Dimitrovgrad - Svilengrad', 'Rousse - Gorna Oryahovitsa -Dabovo - Dimitrovgrad' and 'Plovdiv - Zimnitsa - Karnobat - Burgas' are included in the European Agreement on the railway lines, for combined transport. In this context, an important role is played by the terminals of Plovdiv - Fillipovo and Dimitrovgrad - North.

**Air transport** is carried out by the Plovdiv international airport (PLC). The connection with the capital is good, while very close to the airport there is a station on the railway line Sofia - Plovdiv - Burgas/Svilengrad.

The region is part of the mainland, and thus there are no water transport infrastructures. The nearest port of the Black Sea, is in Burgas. Once the border station of Makazza is completed and starts its operation, there will also be the alternative option of the Alexandroupolis port.

### North-Central Region<sup>7</sup>

The North Central Region is located along the Danube River and facilitates cooperation with 14 European countries. It participates in the EU Strategy for the Danube Region. It has average socio-economic performance and a regional innovation system featuring weak links between research and industry despite a high concentration of research and development (R&D) and universities on its territory.

The Region is part of level 1 (NUTS1) 'Northern and southeastern Bulgaria', that includes, in addition, the North-Western, South-Eastern and North-Eastern Regions. This region encompasses five Bulgarian provinces: Ruse, Veliko Tarnovo, Gabrovo, Targovishte and Razgrad.

North Central Region is one of the least developed regions of Europe. Its main economic centre is Ruse, Bulgaria's largest fluvial port.

As far as the population is concerned this region's largest cities are Ruse (population 175.000), Gabrovo (67.000) and Veliko Tarnovo (100.000, including hinterland) while the total population of the Region is 928.000 (2008—source [http://en.wikipedia.org/wiki/Severen\\_Tsentralen\\_Planning\\_Region](http://en.wikipedia.org/wiki/Severen_Tsentralen_Planning_Region)).

The total area of the North Central Region is 14,974 sq. Km, which represents 13.49 % of the territory of the country. Agricultural land prevails with a percentage of 68.1%, while forest territories represent a percentage of 23.82 % of the territory of the region.

### **Transport infrastructure and accessibility**

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<sup>7</sup> This chapter is based mainly on the Regional Plan for the Development of the Southeastern Region for the period of 2014 – 2020

Northern central region plays an important role in national and international transport. The region is crossed by two Pan-European transport corridors - transport corridors No. 7 and No. 9 and supplemented from the corridor TRACECA: Europe - Caucasus - Asia. Through the territory of the region also pass the following international routes: IS-70/ I- 2) Ruse - Razgrad - Varna, Is-83/ I-3 Sofia - Pleven - White and IS-772 Yablanitsa - Veliko Tarnovo - Shumen - Varna. As far as water transport is concerned, in the territory of the region operate several ports with national importance: Ruse, Svishtov, Tutrakan and Silistra. Finally on the territory of North Central Region are located two airports: Airport Gorna Oryahovitsa - 4 km from the town of Gorna Oryahovitsa and 12 km from the town of Veliko Tarnovo and airport Ruse (also known as Shtraklevo), 17 km from the town of Ruse. Airport Gorna Oryahovitsa has a leading role in the development of the region in social and economic terms.

In general the port of ro-ro terminal, the railway station of Ruse and the combined bridge for road and railway transport Ruse-Giurgiu provide functions of multimodal facility on the intersection of international transport Corridor.

The condition of Infrastructure of the Bulgarian railway network does not meet the modern Requirements for combined transport and the coordination of the connections between rail transport and shipping is unsatisfactory.

### Eastern Macedonia and Thrace Region<sup>8</sup>

The Region of Eastern Macedonia and Thrace [REM-T] (Anatoliki Makedonia - Thraki) is situated along the crossroads of Europe and Asia and is predominantly an agricultural area<sup>9</sup>. It is a border region which gradually transforms into a gateway of the country and the European Union.

With regard to its development profile at a national level, REM-T along with the Regions of Central Macedonia, Thessaly and Epirus are the regions that are classified as "descending" because by 2009, they show lower growth rate of employment and GVA (gross value added) than the average of the country. In recent years, the international environment, in particular Europe and Greece, after the appeal of the country to the Support Mechanism, resulted in negative socio-economic impacts. This on a regional level is proved by the negative trends of all the indicators of the economy (employment, consumption, investments etc.) and of the population growth.

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<sup>8</sup>This chapter is based on: YPEKA-EPERAA (contr. Th. Papagiannis and Associates AEM, Diktuo A.E., Eurotec, K. Hatzigiannis) (2014), "Study for the evaluation, revision and specialization of the Regional Framework for Spatial Planning and Sustainable Development of the Region of East Macedonia and Thrace", A' and B' phase.

<sup>9</sup><http://ec.europa.eu/enterprise/policies/innovation/policy/regional-innovation/monitor/base-profile/region-anatoliki-makedonia-thraki>

The structure off the Regional GDP displays the service sector as the dominant for the regional economy with 72,1% of GDP in the region, while the industrial and the agricultural sectors contribute with 22.3% and 5.6% respectively. As far as the employment, however, the agriculture and livestock farming are the dominant activities with 24,2% of the total, followed by the sectors of public administration (11,2%), processing (11.1%), retail trade (8.6%). These figures show that the high concentration of employment is combined with relatively low productivity.



The evolution of the regional economy towards the service sector over the last 20 years relied mainly on public service employment and consumption. The evolved shocking devaluation of this model during the last five years of economic crisis in the country gives reasons for additional consideration as far as its future sustainability. The above findings indicate that the REM-T is based to a significant extent on activities which either are in the process of restructuring, or show a diminishing trend and are hardly sustainable in the current period of economic crisis in the country.

The structure of the production model of the region displays concentration trends in lowland areas, large agricultural holdings and monocultures where the production is done vertically, and urban centers as centers of trade and services.

The current situation has produced a diversified development axis, as a result of the dynamics of the Egnatia Odos. This list includes the urban centers/capitals of Regional Units (Kavala, Xanthi, Komotini, Alexandroupolis -and to a lesser extent, situated outside the direct influence of the axis, city of Drama), that have undertaken the role of development poles.

The body of the urban network of the region consists of the capitals of former prefectures, today Regional Units:

- Komotini urban center of 1th level,
- Drama, Kavala, Xanthi, Alexandroupolis urban centers of 2th level and Orestiada second center within the Unit of Evros.

In terms of road network, the region includes the eastern part of the Egnatia Odos, four of its vertical axes (completed and not), the national road network (with classification in primary, secondary, tertiary) and the main Provincial roads.

In general, East Macedonia and Thrace has invested strategically to a large extent on inclusion in the International transport networks. Main factor in this process is the completion of the Egnatia Odos. However delay in the development of vertical axes and combined transport reduces the expected positive results, mainly because the ports of Kavala ('Philippos B') and Alexandroupolis are not sufficiently developed and lack appropriate infrastructure. Egnatia Odos was to be connected with three corridors of the Pan-European Transport Network (IV, IX, and X).

The connection of Egnatia Odos with the pan-European corridors is currently realized through the national and provincial network that leads to border posts. None of the nine (9) vertical axes (with characteristics of a motorway) is fully completed.

At present – and in the medium term – the integration of the Region in the wider international transport networks depends mainly on the upgrading of the Alexandroupolis - Ormenio axis (road and railway) and its connection with the Corridor IX of Pan-European Transport Networks.

In the Regional Framework for Spatial Planning the ports of the Regions are divided to 3 categories:

- Large freight ports of national importance: Alexandroupolis, Kavala.
- Smaller ports
- Tourism and recreation ports.

The port of Alexandroupolis has a sufficient land infrastructure, with high expansion availability, and a specifically designed container wharf. However it suffers from crucial deficiencies, with regard to the land and sea access. The construction of railway connection of the container wharf pier is expected to be completed by the end of the year 2014, while dredging works of the port basin and the approach channel are ongoing. Its direct connection with Egnatia Odos is still pending. The port can potentially attract diversified freight traffic, by taking advantage of the connectivity with the port of Burgas, a fact that creates potential for alternative passage between Black Sea and Mediterranean.

The construction of the freight port " Philippos B" in Nea Karvali of Kavala was launched at the end of 2006, scoping to gradual development of a node for transit operations, complementary / competitive to the port of Thessaloniki. The port is included in the Comprehensive TEN-T network, a fact which supports a future potential for attracting flows to/from the Balkans, to be processed through the planned connections of the port to the Trans-European Corridor Orient/East Med, through the road E61 (connection Kavala - Serres - Promahonas) and the road axis Komotini - Haskovo via Nymfaia.

There are two international airports in the region, State Airport "M. Alexander" in Kavala and State Airport "Dimokritos" of Alexandroupolis.

In the case of railway transport, there has been a delay in the connection of Kavala's port with the existing railway network, while necessary improvements of the existing line in the section Xanthi – Alexandroupolis have not yet been implemented. The existing railway line



connects the city of Thessaloniki with Ormenio (Ebros) and continues to the Greek-Bulgarian border passing through all the towns and cities of the Region, apart from Kavala.

### North-Central Region<sup>10</sup>

The North Central Region is located along the Danube River and facilitates cooperation with 14 European countries. It participates in the EU Strategy for the Danube Region. It has average socio-economic performance and a regional innovation system featuring weak links between research and industry despite a high concentration of research and development (R&D) and universities on its territory.

The Region is part of level 1 (NUTS1) 'Northern and southeastern Bulgaria', that includes, in addition, the North-Western, South-Eastern and North-Eastern Regions. This region encompasses five Bulgarian provinces: Ruse, Veliko Tarnovo, Gabrovo, Targovishte and Razgrad.

North Central Region is one of the least developed regions of Europe. Its main economic centre is Ruse, Bulgaria's largest fluvial port<sup>11</sup>.

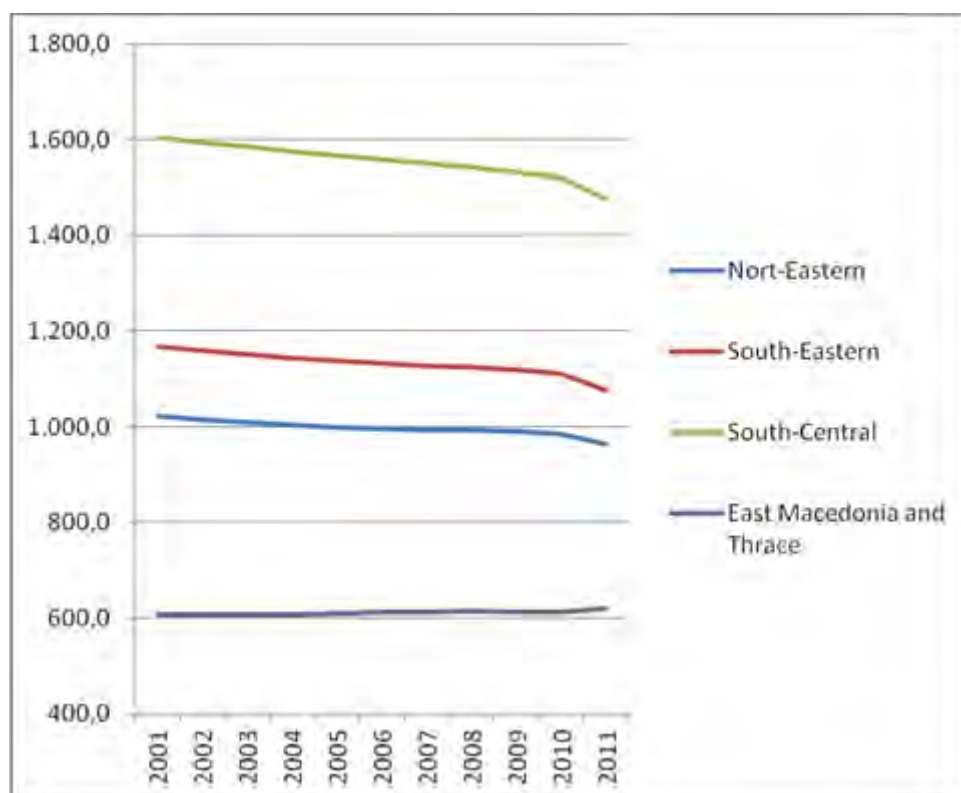
#### 2.1.2 Basic population and development rates – Comparative perspective

According to Eurostat data (09/2014), in 2011 the population of the study area (4 regions) amounts to 4,135,500 inh., corresponding to 22.36% of the total population of the two countries. During 2001-2011, Greece's population reduced by 0.4% and Bulgaria's population by more than 7%, at a time when the EU28 has seen an increase which reaches 3%. The population trends during the decade 2001-2011 in the study regions are shown in the following Graph. The figure shows that the three Bulgarian regions recorded significant population decrease, ranging from -5.65% for the North-Eastern region and -8,06% for the South-Central region, when East Macedonia and Thrace recorded increase slightly more than 2%. It is worth mentioning that at the same time the South-Western region (*Yugozapaden*), in which the capital of Bulgaria, Sofia, belongs, increased its population by 1.69%.

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<sup>10</sup> This chapter is based mainly on the Regional Plan for the Development of the North Central Region for the period of 2014 – 2020

<sup>11</sup> [http://en.wikipedia.org/wiki/Severen\\_Tsentralen\\_Planning\\_Region](http://en.wikipedia.org/wiki/Severen_Tsentralen_Planning_Region)



**Graph 2-1: Regional population growth of the Study area, 2001-2011**

Source: Eurostat (09/2014) and own elaboration

The Table lists the **population size and population change** of the examined areas for the period 2004 – 2011, for which full statistics are available from Eurostat. The picture in the Bulgarian regions, and the country as a whole, is negative, while East Macedonia and Thrace’s performance is above the country’s average. Nevertheless, all of the examined territorial units remain below the EU28’s change (2.49%).

**TABLE 2.1: POPULATION SIZE AND POPULATION CHANGE, 2004-2011**

	<b>2004</b>	<b>2011</b>	<b>Change 2004-2011 (%)</b>
<b>EU28</b>	492,709,300	504,961,522	2.49%
<b>Bulgaria</b>	7,801,273	7,369,431	-5.54%
<b>Greece</b>	11,037,745	11,123,392	0.78%
<b>North-Eastern</b>	1,003,800	964,100	-3.95%
<b>South-Eastern</b>	1,143,300	1,075,700	-5.91%

<b>South-Central</b>	1,575,800	1,475,800	-6.35%
<b>East Macedonia and Thrace</b>	607,000	619,900	2.13%

Source: Eurostat (09/2014)

To a significant extent the negative picture of the Bulgarian regions regarding population change should be attributed to the migratory flows of previous years. According to a press release from the Hellenic Statistical Authority (ELSTAT) issued in August 2013<sup>12</sup>, 8.3% of the aliens that reside in Greece (2011 census) have Bulgaria citizenship. During the last five years before the 2011 census, 3,146 Bulgarian citizens migrated to East Macedonia and Thrace, which represents 15% of the total number of people residing in the Region from abroad (ELSTAT, 2011 census data).

Following the presentation of the national spatial planning of the two countries that is analyzed in a following section, the main urban centers of the study area can be identified. These **urban centers, their level in the urban network hierarchy, the population size and population change** (2001-2011) are shown in TABLE 2.2.

The largest city on the Bulgarian side of the study area is Plovdiv, with a population of approximately 340,000 inh. (2011), showing trends of population stabilization. Plovdiv is the second largest city in Bulgaria after Sofia (1<sup>st</sup> level Urban center, population of the metropolitan area: approximately 1,300,000 inh.). Varna follows with little difference (approximately 335,000 inh.), while the third largest city is Burgas (approximately 200,000 inh.). Both Varna and Burgas recorded positive population change during the last decade, equal to 7% and 4.1% respectively, while all the other Bulgarian main urban centers have reduced the population, at rates ranging from 3.6% to 10.3%. These figures show both the significance of the cities of Varna and Burgas in the urban network of the study area (and the country's as a whole), as well as their population dynamic.

Within the Region of East Macedonia and Thrace (EMT), there are 7 urban centers placed up to the 5<sup>th</sup> level of the urban network's hierarchy (on the basis of the under review regional plan), of which Komotini, Alexandroupolis, Kavala, Drama and Xanthi (which are all seats of the Regional Units of EMT) have a population between 44,000 and 58,000 inh. Orestiada and Didimoticho have a population of approximately 18,000 and 9,000 inh. respectively. During the decade 2001-2011, all these urban centers have increased their population, with the exception of Kavala which showed negative population change, equal to 8.8%. Xanthi experienced the largest percentage increase in population (20.8%), followed by Orestiada (19.4%), Alexandroupolis (16.3%) and Komotini (14.8% - seat of the Region). Overall, with the exception of Kavala, EMT's urban centers show significant population trends.

<sup>12</sup>ELSTAT (2013), "Bulletin on demographic and social characteristics of the resident population of the country according to the population - housing census 2011", Pressrelease, August 23<sup>rd</sup> 2013, Piraeus. Available at:

[http://www.statistics.gr/portal/page/portal/ESYE/BUCKET/General/nws\\_SAM01\\_GR.PDF](http://www.statistics.gr/portal/page/portal/ESYE/BUCKET/General/nws_SAM01_GR.PDF)

**TABLE 2.2: POPULATION SIZE AND POPULATION CHANGE OF THE MAIN URBAN CENTERS OF THE STUDY AREA, 2001-2011**

Urban centre	Level in hierarchy	Population 2001	Population 2011	Population change 2001-2011 (%)
<i>Greece (Region of East Macedonia and Thrace)</i>				
Komotini	2 <sup>nd</sup>	44,421	50,990	14.8%
Alexandroupolis	2 <sup>nd</sup>	49,724	57,812	16.3%
Kavala	3 <sup>rd</sup>	59,222	54,027	-8.8%
Drama	4 <sup>th</sup>	43,934	44,823	2.0%
Xanthi	4 <sup>th</sup>	46,457	56,122	20.8%
Orestiada	5 <sup>th</sup>	15,438	18,426	19.4%
Didimoticho	5 <sup>th</sup>	8,853	9,263	4.6%
<i>Bulgaria (North-Eastern, South-Eastern and South-Central Regions)</i>				
Plovdiv	2 <sup>nd</sup>	338,224	338,153	0.0
Varna	2 <sup>nd</sup>	312,889	334,870	7.0
Burgas	2 <sup>nd</sup>	192,390	200,271	4.1
Stara Zagora	2 <sup>nd</sup>	143,420	138,272	-3.6
Targovishte	3 <sup>rd</sup>	40,659	37,611	-7.5
Shumen	3 <sup>rd</sup>	89,214	80,885	-9.3
Dobrich	3 <sup>rd</sup>	100,000	91,030	-9.0
Sliven	3 <sup>rd</sup>	100,366	91,620	-8.7
Yambol	3 <sup>rd</sup>	82,649	74,132	-10.3
Haskovo	3 <sup>rd</sup>	80,303	76,397	-4.9
Kardjali	3 <sup>rd</sup>	45,659	43,880	-3.9
Smolyan	3 <sup>rd</sup>	33,091	30,642	-7.4

Urban centre	Level in hierarchy	Population 2001	Population 2011	Population change 2001-2011 (%)
Pazardjik	3 <sup>rd</sup>	78,855	71,979	-8.7

Source: Statistical Authority of Bulgaria (2011 population census) as referred in: Egnatia Odos S.A. – Observatory (forthcoming), “Study of the Impacts of Egnatia Odos in South-East Europe: transport intermodality, polycentric spatial development and cross-border territorial cooperation,” Report WP 1 and 2, September 2014, pp. 105-107, and Hellenic Statistical Authority (ELSTAT) (population census 2011).

All four regions under consideration are characterized by relatively low **population densities** (TABLE 2.3). The lower density corresponds to the Region of East Macedonia and Thrace (44.3 inh./km<sup>2</sup>), which is significantly less than Greece’s density. North-Eastern and South-Central regions are characterized by densities near the density of their country (around 66-67 inh./km<sup>2</sup>), while the South-Eastern Region is of lower density compared with the other two Bulgarian regions (55.2 inh./km<sup>2</sup>). It should be noted that the South-Western region (*Yugozapaden*), which Sofia is located in, is a region of significantly higher density (equal to 106.3 inh./km<sup>2</sup>), as similar is the size of the Region of Central Macedonia, where Thessaloniki, the largest population center of Northern Greece and the second metropolitan center in the country, belongs.

**TABLE 2.3: POPULATION DENSITY, 2012 (INH./KM2)**

Population density (inh./km <sup>2</sup> )	2012
EU28	116.3
Bulgaria	67.1
Greece	84.8
North-Eastern	66.3
South-Eastern	55.2
South-Central	67.1
East Macedonia and Thrace	44.3

Source: Eurostat (09/2014)

TABLE 2.4 below shows the changes in the **Gross Domestic Product** (GDP at current prices) for the years 2004 and 2011. The GDP in the Bulgarian regions in 2011 ranged from 4,089 to 5,357 million euros, while in Eastern Macedonia and Thrace amounted to 8,228 million euros. The three Bulgarian regions generate 37% of the country's GDP, while East Macedonia and Thrace contributes 4% of Greece's total GDP. The important conclusion to be drawn from the figures in the table is the impressive increase in the GDP of the Bulgarian regions and the country as a whole during the last seven years. In particular, Bulgaria increased its GDP by 89%, with the corresponding figures for the three regions varying between 68% and 77%. The higher change in the GDP concerns the North-Eastern Region (76.6%). Definitely, these increases are much higher than the EU28. In contrast, the Region of East Macedonia and Thrace increased its GDP by 11%, which is a little lower than the country's average (12.6%) and well below the EU28 average (19.3%).

**TABLE 2.4: GDP AT CURRENT PRICES AND GDP CHANGE, 2004, 2011 (MILLION EUROS)**

	<b>2004</b>	<b>2011</b>	<b>Change 2004-2011 (%)</b>
<b>EU28</b>	10,658,019	12,711,207	19.3%
<b>Bulgaria</b>	20,388	38,505	88.9%
<b>Greece</b>	185,266	208,532	12.6%
<b>North-Eastern</b>	2,317	4,089	76.5%
<b>South-Eastern</b>	2,757	4,606	67.1%
<b>South-Central</b>	3,186	5,357	68.1%
<b>East Macedonia and Thrace</b>	7,413	8,228	11.0%

Source: Eurostat (09/2014)

**GDP per capita in Purchasing Power Standards (PPS)** was recorded in 2011 higher in East Macedonia and Thrace than in the Bulgarian regions (TABLE 2.5). The examined regions and the two countries fall far short of the European medium, however, impressive is the positive change between the years 2004 and 2011 for the regions of Bulgaria, which increased the per capita nominal purchasing power with rates of the order of 40%. The corresponding figure for the whole of Bulgaria amounts to 56%, while in Greece the GDP per capita has not changed. However, the GDP per capita in East Macedonia and Thrace decreased by 4.1%.

**TABLE 2.5: GDP PER CAPITA IN PURCHASING POWER STANDARDS (PPS) AND CHANGE (PPS), 2004, 2011 (IN CURRENT PRICES EURO)**

	2004	2011	Change 2004-2011 (%)
<b>EU28</b>	21,600	25,100	16.2%
<b>Bulgaria</b>	7,500	11,700	56.0%
<b>Greece</b>	20,300	20,300	0.0%
<b>North-Eastern</b>	6,600	9,400	42.4%
<b>South-Eastern</b>	6,900	9,500	37.7%
<b>South-Central</b>	5,800	8,100	39.7%
<b>East Macedonia and Thrace</b>	14,800	14,200	-4.1%

Source: Eurostat (09/2014)

**Employment by sector** is shown in TABLE 2.6. The employment in sectors of production on the one hand expresses the productive orientation and expertise of an economy and on the other constitutes an indication of its dynamism. The productive sectors discussed are grouped into three categories (NACE REV2): primary sector (agriculture, forestry, fishing), secondary sector (industry, manufacture, construction) and tertiary sector (trade, transportation, communication, finance, insurance, real estate, education, research, art, culture, public administration, defense, human health etc.)<sup>13</sup>. The tertiary sector concentrates the largest share of employment in all examined territorial units, being above 50% in all cases. The Bulgarian regions (as well as the country as a whole) present significantly higher employment share in the secondary sector in comparison with Greece and the Region of East Macedonia and Thrace, while the majority of the Bulgarian regions present very low share of employment in the primary sector<sup>14</sup>.

**TABLE 2.6: EMPLOYMENT BY SECTOR (%), 2011**

	Primary	Secondary	Tertiary

<sup>13</sup>Egnatia Odos S.A. – Observatory (forthcoming), "Study of the Impacts of Egnatia Odos in South-East Europe: transport intermodality, polycentric spatial development and cross-border territorial cooperation," Report WP 1 and 2, September 2014, p. 64.

<sup>14</sup> For comparative reasons, Eurostat data for the territorial units are used here. Recently published data by ELSTAT population - housing census (2011) generally verify the presented trends (Interactive map: <http://www.statistics.gr/portal/page/portal/ESYE/PAGE-interactive-census-map>). In particular, the distribution of employment by sector is as follows: For the whole of Greece, 10% in the primary, 17.5% in the secondary and 72.5% in the tertiary sector. For the Region of East Macedonia and Thrace, 20.7% in the primary, 16.5% in the secondary and 62.8% in the tertiary sector.

<b>Bulgaria</b>	6.8%	31.5%	61.8%
<b>North-Eastern</b>	7.5%	28.4%	64.1%
<b>South-Eastern</b>	7.4%	36.1%	56.6%
<b>South-Central</b>	10.7%	36.0%	53.2%
<b>Greece</b>	12.4%	17.8%	69.8%
<b>East Macedonia and Thrace</b>	26.8%	14.1%	59.2%

Source: Database created by using Eurostat statistics in the context of: Egnatia Odos S.A. – Observatory (forthcoming), “Study of the Impacts of Egnatia Odos in South-East Europe: transport intermodality, polycentric spatial development and cross-border territorial cooperation,” Report WP 1 and 2, September 2014.

Finally, the analysis of trade flows contributes to the understanding of the capacity and economic dynamism and orientation of the two countries. In TABLE 2.7 below, the trade balance of Bulgaria and Greece in 2013 is presented, which is negative in both cases.

**TABLE 2.7: TRADE BALANCE OF BULGARIA AND GREECE, 2013 (MILLION EUROS AND % EU28)**

	<b>Imports</b>	<b>Exports</b>	<b>Balance</b>
<b>Bulgaria</b>	22,229	25,839	-3,610
% EU28	0.5	0.6	
<b>Greece</b>	27,553	46,788	-19,235
% EU28	0.8	1.5	

Source: Eurostat (09/2014)

According to findings in an ongoing project of Egnatia Odos S.A.<sup>15</sup>, the recent years (at least since 2007) expansion of Bulgarian trade (imports and exports) with foreign countries was recorded, with exports increasing in higher rates than imports. The trade balance is in deficit, showing, however, shrinking trends. During the same period examined by this specific project (2007 - 2012), there has been a contraction in Greece’s trade deficit, which amounted to 21 billion euros in 2012 from the record levels of 41 billion euros in 2007. This period there was a significant increase in exports and equally significant reduction of

<sup>15</sup>Egnatia Odos S.A. – Observatory (forthcoming), “Study of the Impacts of Egnatia Odos in South-East Europe: transport intermodality, polycentric spatial development and cross-border territorial cooperation,” Report WP 1 and 2, September 2014, pp. 91-92.



imports. For Bulgaria, raw materials, fuels and consumer products are the basic commercial goods with the countries of Southeast Europe. In the case of Greece, about 75% of exports in 2012 related to industrial products and fuels, while significant also was the export of foodstuffs and agricultural products. The same groups of goods participate in the structure of the main imports.

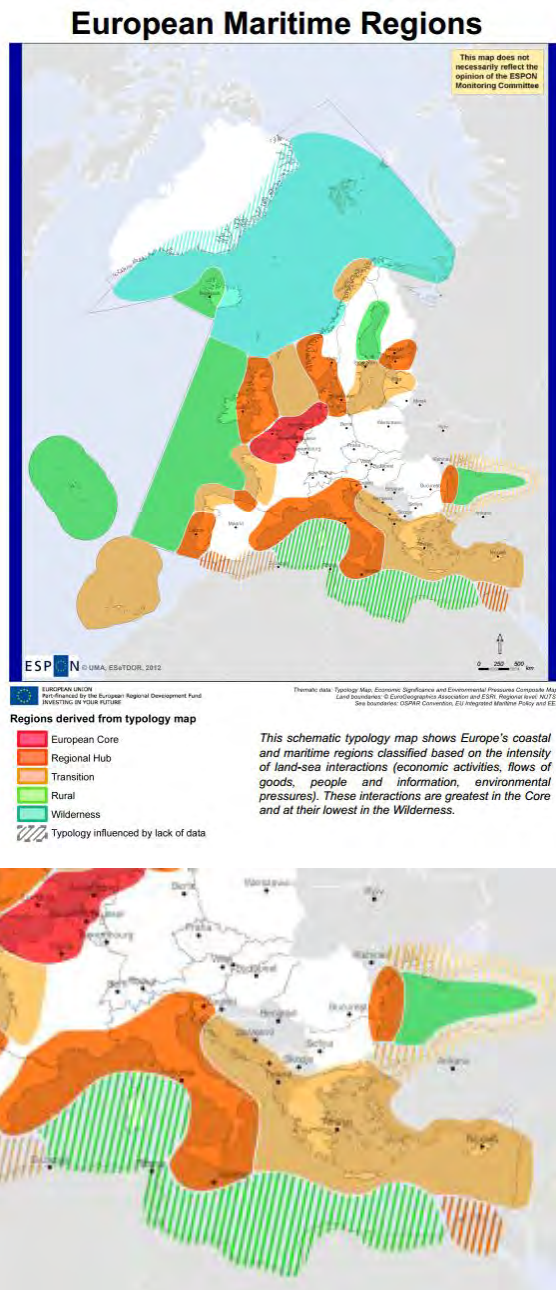
### 2.1.3 The regions of the study area in selected European typologies

**ESaTDOR: European Seas** Project of the ESPON 2013 Programme developed a maritime region typology by combining a limited number of land and sea-based data sets based around economic activity, environment and flows. This typology, which is shown in TABLE 2.8 and Figure 1, indicate the intensity of land-sea interactions expressed by types of maritime regions.

**TABLE 2.8: CHARACTERISTICS OF THE TYPES OF MARITIME REGIONS IDENTIFIED BY ESATDOR**

	<b>EUROPEAN CORE</b>	<b>REGIONAL HUB</b>	<b>TRANSITION</b>	<b>RURAL</b>	<b>WILDERNESS</b>
<b>Economic Significance</b>	Greatest concentration of maritime employment/ high strategic economic importance.	High maritime employment, significant economic importance.	More localised concentrations of maritime employment/ more dependent upon a limited number of strategic industries.	Low levels of maritime related employment, economy dominated by primary production and tourist sectors.	Very low and intermittent levels of maritime employment, limited direct economic importance.
<b>Flows</b>	Great international connectivity, global hinterland.	Nationally significant and some international connections, European scale hinterland.	Nationally and regionally significant connections and hinterland.	Limited connectivity, local/ regional hinterland with some more significant sectors/ seasonal extensions.	Remote areas, limited connectivity. Very small local hinterland, some extensions.
<b>Environmental Pressures</b>	High environmental pressure associated with human uses.	Significant environmental pressures.	Medium environmental pressures.	Low environmental pressure.	Limited environmental pressure.
<b>Land-Sea Interactions</b>	<b>Very high</b>	<b>High</b>	<b>Medium</b>	<b>Low</b>	<b>Very low</b>

Source: ESPON (2013), ESaTDOR. European Seas and Territorial Development, Opportunities and Risks, Executive Summary, Final Report | Version 15/4/2013, p. 4, [http://www.espon.eu/export/sites/default/Documents/Projects/AppliedResearch/ESaTDOR/FR\\_160413/ESaTDOR\\_Executive\\_Summary.pdf](http://www.espon.eu/export/sites/default/Documents/Projects/AppliedResearch/ESaTDOR/FR_160413/ESaTDOR_Executive_Summary.pdf)



Focus on the study area

**Figure 1: European Maritime Region Typology (schematic map) according to the ESaTDOR Project**

Source: ESPON (2013), ESaTDOR. EuropeanSeas and Territorial Development, Opportunities and Risks, Executive Summary, Final Report | Version 15/4/2013, p. 6, [http://www.espon.eu/export/sites/default/Documents/Projects/AppliedResearch/ESaTDOR/FR\\_160413/ESaTDOR\\_Executive\\_Summary.pdf](http://www.espon.eu/export/sites/default/Documents/Projects/AppliedResearch/ESaTDOR/FR_160413/ESaTDOR_Executive_Summary.pdf)

All regions of Greece are characterized as *Transition* Maritime Regions, while the areas around Burgas and Varna *Regional Hubs*. In the European Core, land-sea interactions are at their most intense, whereas in Regional Hubs, Transition, Rural and Wilderness regions land-

sea interactions are at their least intense. The land-sea interactions on the Bulgarian side of the Study Area are considered "high", while on the Greek side are considered "medium". Based on this specific typology, the special characteristics of the study area are summarized as follows:

On the Bulgarian side of the S2S area:

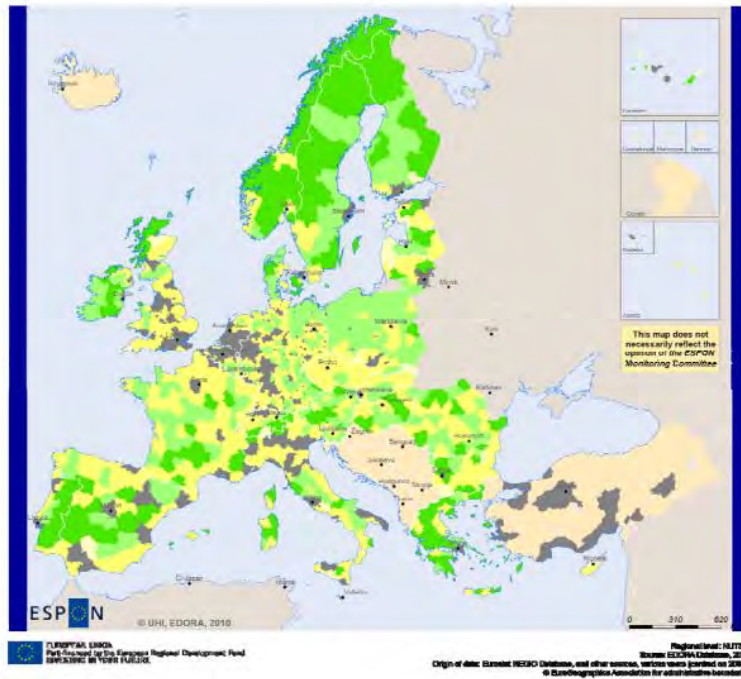
- a) High maritime employment, significant economic importance,
- b) Nationally significant and some international connections, European scale hinterland,
- c) Significant environmental pressures.

On the Greek side of the S2S area:

- a) More localised concentrations of maritime employment / more dependent upon a limited number of strategic industries,
- b) Nationally and regionally significant connections and hinterland,
- c) Medium environmental pressures.

In the framework of **EDORA. European Development Opportunities for Rural Areas** Project of the ESPON 2013 Programme three typologies were developed (at the level of NUTS III):

- The first typology is described as Dijkstra-Poelman (*D-P*) *Urban-Rural Typology* and uses criteria of population density and access time to a city. The Regional Unit of Kavala is characterized as "Predominantly Rural Close to a City", the Regional Unit of Evros as "Predominantly Remote", and the Provinces of Varna and Burgas as "Intermediate Close to a City" - Figure 2.
- The second typology, referred to as *Structural Typology (Structural typology)*, derives its rationale from the transformations affecting the agrarian economy and society, and the increasing impact of global economic forces. The Regional Units of Kavala and Evros are characterized as "Agrarian Regions". They are defined as those which exceeded the EU27 average for three indicators; share of GVA derived from the primary sector, share of employment in the primary sector, and agricultural Annual Work Units (AWU) as a percentage of total private sector employment. The Provinces of Varna and Burgas are characterized as "Consumption Countryside", which concern regions in which at least one indicator in two out of three thematic groups exceeded the EU27 average. The three groups of indicators relate to capacity for and intensity of tourism activity, access to natural areas, and the importance of peri-productivist farming styles - Figure 4.
- The third typology, called *Performance Typology*, places regions on a continuum between "depletion" and "accumulation" of various kinds of capital (human, financial, fixed, and so on), through the creation of a synthetic performance indicator, combining five indicators. These are net migration rate, GDP per capita, annual percentage changes in GDP and employment, and unemployment rate. The Regional Units of Kavala and Evros are classified in the category "Below average", as it is the case with the Province of Burgas, while the Province of Varna is classified as «Above average» (Figure 4).



### Urban-Rural Types (NUTS 3 Regions)

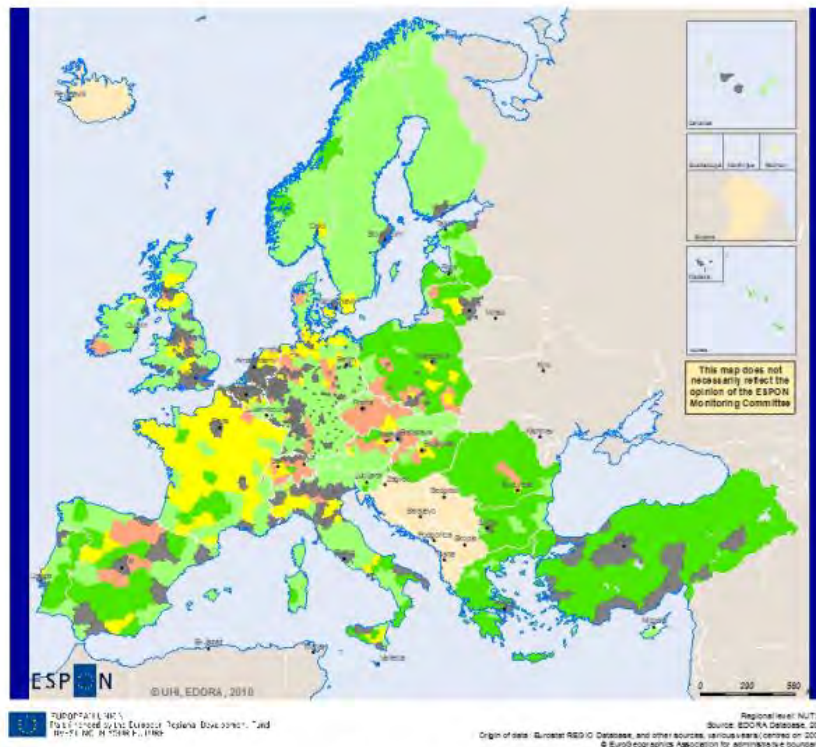
- No Data
- Predominantly Urban
- Intermediate Close to a City
- Intermediate Remote
- Predominantly Rural Close to a City
- Predominantly Remote



Figure 2: The Dijkstra-Poelman Urban-Rural Typology according to the EDORA Project

Source: ESPON (2011), EDORA. European Development Opportunities for Rural Areas. Final Report | August 2011, p. 17,

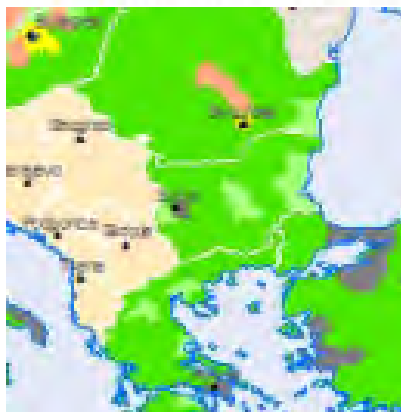
[http://www.espon.eu/export/sites/default/Documents/Projects/AppliedResearch/EDORA/EDORA\\_Final\\_Report\\_Parts\\_A\\_and\\_B-maps\\_corrected\\_06-02-2012.pdf](http://www.espon.eu/export/sites/default/Documents/Projects/AppliedResearch/EDORA/EDORA_Final_Report_Parts_A_and_B-maps_corrected_06-02-2012.pdf)



### Structural Types (Intermediate and Predominantly Rural NUTS 3 Regions)

- No Data
- PU Regions
- Agrarian
- Consumption Countryside
- Diversified (Strong Secondary Sector)
- Diversified (Strong Private Services Sector)

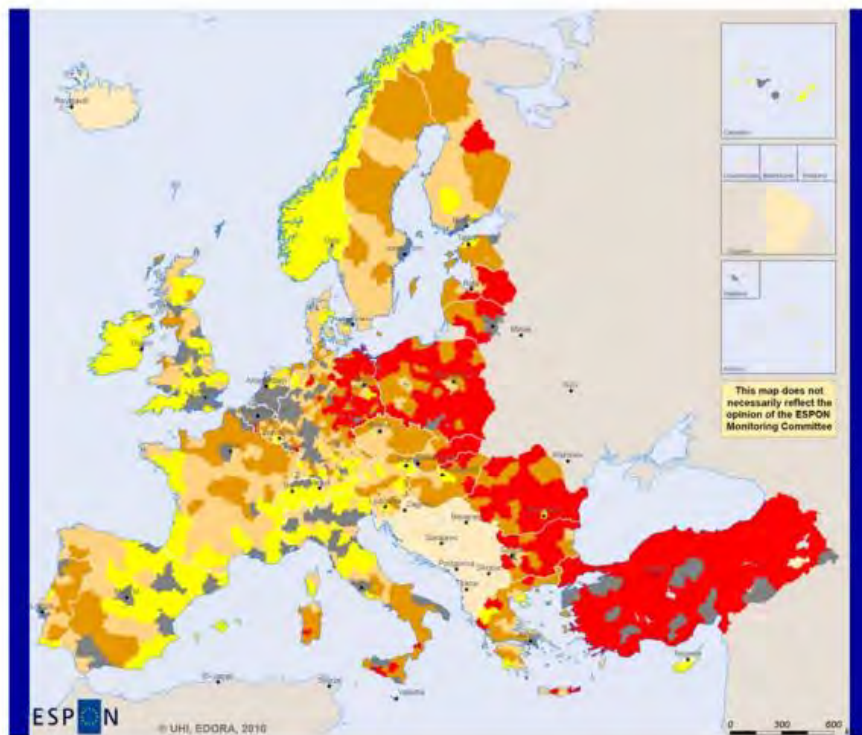
Note: A simplified classification procedure was necessary in CH and TR, due to missing data. However it is anticipated that acquisition of a wider range of indicators would not materially change the outcome.



**Figure 3: The Structural Typology according to the EDORA Project**

Source: ESPON (2011), EDORA. European Development Opportunities for Rural Areas. Final Report | August 2011, p. 19,

[http://www.espon.eu/export/sites/default/Documents/Projects/AppliedResearch/EDORA/EDORA\\_Final\\_Report\\_Parts\\_A\\_and\\_B-maps\\_corrected\\_06-02-2012.pdf](http://www.espon.eu/export/sites/default/Documents/Projects/AppliedResearch/EDORA/EDORA_Final_Report_Parts_A_and_B-maps_corrected_06-02-2012.pdf)

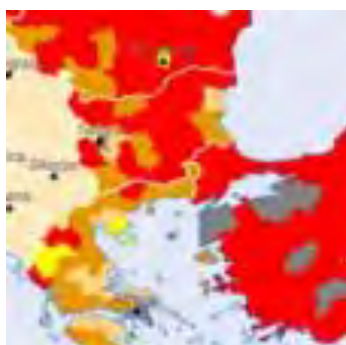


Regional level NUTS 3  
 Source: EDORA Database, 2010  
 Origin of data: Eurostat REGIO Database; and other sources, various years (colored in 2006).  
 © EuroGeographics Association for administrative boundaries

**Performance (A-D) Types (Intermediate and Predominantly Rural NUTS 3 Regions)**

- No Data
- PU Regions
- Depleting
- Below Average
- Above Average
- Accumulating

Note: The type allocation to TR and CH is based upon a reduced set of indicators, and should not be considered fully comparable with the typology for the EU27.



**Figure 4: The Performance Typology according to the EDORA Project**

Source: ESPON (2011), EDORA. European Development Opportunities for Rural Areas. Final Report | August 2011, p. 20,

[http://www.espon.eu/export/sites/default/Documents/Projects/AppliedResearch/EDORA/EDORA\\_Final\\_Report\\_Parts\\_A\\_and\\_B-maps\\_corrected\\_06-02-2012.pdf](http://www.espon.eu/export/sites/default/Documents/Projects/AppliedResearch/EDORA/EDORA_Final_Report_Parts_A_and_B-maps_corrected_06-02-2012.pdf)

## 2.2 ENVIRONMENTAL PERSPECTIVE

### 2.2.1 Current Environmental status of greater area – Greece

#### Valuable and sensitive ecosystems- Areas of environmental protection

##### *General*

Since 1937, Greece has started to identify areas with special ecological interest (forests, wetlands, etc..) and put them under protection.

As far as national law, the declaration of protected areas indifferent protection categories was based up to 1986, particular in provisions of the Forest Code. The National Parks, the Aesthetic Forests and Natural Monuments are provided by Law. 996/1971 which is part of the Law. 86/1969" the forestry code." The Wildlife refuges, Controlled Hunting Areas and Breeding Areas are provided by Law. 177/75, as amended by Law. 2637/1998

Under N.3937/ 11 (FEK60A /31.03.11) "Conservation of biodiversity and other provisions" is defined the national system of protected areas "consisting of all the areas covered by one or more of the categories listed in Article 19 of N.1650/1986 (FEK160 A). According to Article 5 (Replacement of Article 19 of N.1650/1986) of N.3937/ 2011, protected areas are divided into:

- Strict nature reserves
- Nature reserves
- Natural parks
- National parks
- Regional parks
- Habitat/species management areas. Distinguished in SAC, SPA and Wildlife refuges (WLR).
  - Special Areas of Conservation
  - Special Protection Areas
  - Wildlife Refuges
- Landscapes
  - Protected landscapes / seascapes
  - Protected natural formations categories such as "Areas of absolute protection of nature" and "nature protection areas" are areas of statutory national parks for which there are specific limitations..

In terms of habitat protection areas and species they are divided into:

- Special Areas of Conservation
- Special Protection Areas

#### □ Wildlife refuges

These areas are either within national parks, so they follow the designation of protected areas and the limitations of national parks, or outside national parks, so they follow the minimal constraints posed by N.3937 / 11.

*In order to reflect the environmental information along the studied terrestrial and marine corridor, they are presented at a level of Regional Unity which is run by the main runway of protection areas. Specifically are presented areas NATURA, Ramsar and wetlands, wildlife sanctuaries and national parks, the Regional Units (IP) Kavala, Xanthi Rodopi and Evros.*

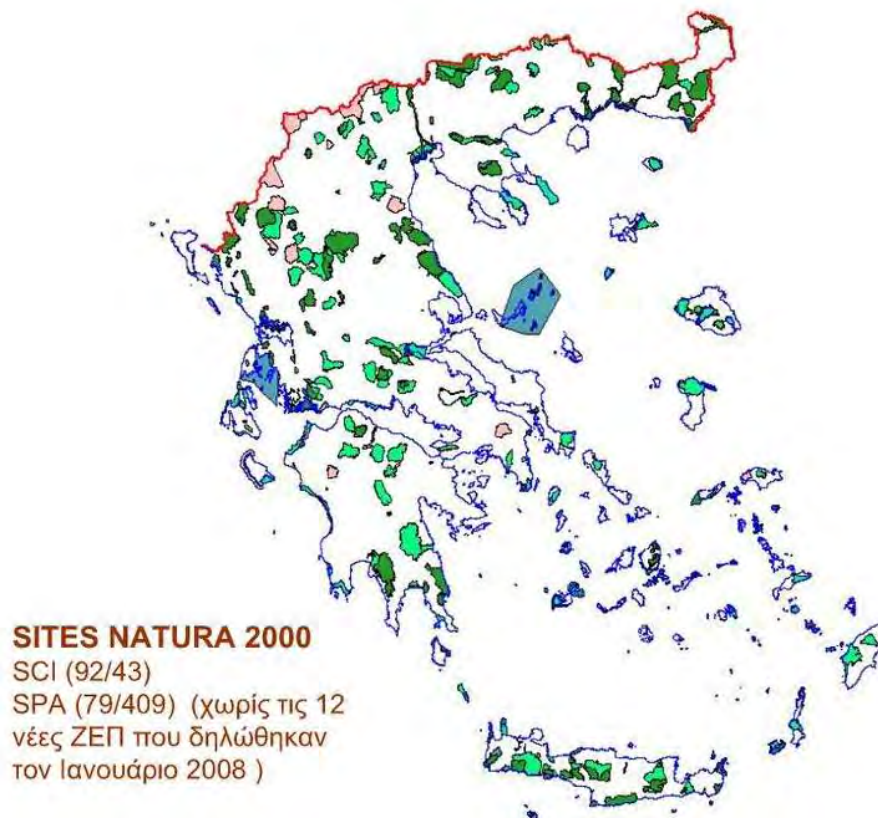
#### *NATURA Areas*

Natura network 2000 is a European ecological network of areas that host natural habitat types and habitats of species that are important at European level. It consists of two types of areas: the "Special Protection Areas (SPAs)» for Birds, as defined in Directive 79/409 / EK, and "Sites of Community Importance (SCIs)» as defined in Directive 92/43 / EC. SPAs, after qualification by the Member States, they are automatically integrated in the Natura Network 2000, and their management follows the provisions of Article 6 of Directive 92/43 / EC. In contrast, for the integration of the SCI a scientific evaluation and negotiation between the Members States and the European Commission are been held, according to the results of the biogeographical seminars ecological unit.<sup>16</sup>

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<sup>16</sup> Ministry of Environment, Energy and Climate Change <http://www.ypeka.gr/http://www.minenv.gr/>





**Figure 5: Natura Network Map in Greece (without 12 SPAs declared in January 2008)**

Article 3 of the EU Directive 92/43 / EEC provides for the creation of a 'coherent European ecological network of special areas of conservation', the familiar NATURA Network 2000. In the same article there is a reference to controlling the impact of economic development of the areas of the network. Article 6 refers to the maintenance and restoration of areas of the network. The Directive 92/43 / EEC sets strict procedures for checking the possible impact of economic development in the NATURA Network 2000 (Article 6) and requires Member States to ensure the restoration and / or preservation in 'favorable conservation status '(Article 3).

In Article 10 is institutionalized the protection of the main characteristics of sites that act as corridors or stepping stones between network sites and obliges Member States to improve the "ecological coherence" of the network, ensuring that land use planning policy, protects some key features inside and outside protected areas, especially in corridors places. From the above it is evident that the ecological network NATURA 2000 is a tool of paramount importance for halting the loss of biodiversity in Europe.<sup>17</sup>

Member States are required to draw up, for all SAC, conservation measures. The measures taken in accordance with the Directive, designed to maintain or restore, at favorable conservation status, natural habitats and of wild fauna and flora of Community interest.

<sup>17</sup> Kireas.org

These measures are positive and apply to all natural habitat types in Annex I and Annex II of species occurring in the regions, with the exception of those whose presence is not significant according to the Standard Data Form for the Natura 2000.<sup>18</sup>

In Greece the activities in the areas of the Natura 2000 network are regulated by National Legislation. The Directive 79/409 / EC harmonized in Greek law with the Joint Ministerial Decision 414985 / 11.29.85 (Official Gazette 757 / B / 18.12.85) 366 599 / 12/16/96 (GG 1188 / B / 31 -12 to 96), 294 283 / 12.23.97 (Official Gazette 68 / B / 02.04.98). The Directive 92/43 / EC harmonized in Greek law in the Joint Ministerial Decision 33318/3028 / 11/12/98 (GG 1289 / B / 28.12.98). In the study area there are 18 SPAs and SACs regions with corresponding total area 302793.01 and 150280.26 ha

The largest SPA area is the area "Mountain Evros - Valley Dereios» (GR1110010), with 48907.49Ha, while the largest SAC area is the area of "Mountains of Evros» (GR1110005), with 42,372.5Ha.<sup>19</sup> In many of these areas are overlapping surfaces.

*The following table shows the Natura areas located in the zone of the runway and in the region, namely the IP concern.*

Note that the coastal protection areas and estuaries while not within the immediate area are strongly influenced by the marine portion of the runway and the operation of ports of interest and require reporting.

**TABLE 2.9: SPAs AND SACs OF NATURA NETWORK**

No	Code	Category	Name	Surface (ha)
<b>EVROS</b>				
1	GR1110002	SPA	DADIA-SOUFLI FOREST	41111.58
2	GR1110003	SAC	TREIS VRYSES	9912.62
3	GR1110004	SAC	FEGGARI SAMOTHRAKIS, EAST COAST OF ISLET ZOURAFA AND WATER ZONE	16437.74
4	GR1110005	SAC	SAC EVROS MOUNTAINS	42372.50
5	GR1110006	SPA	EVROS DELTA	12557.92
6	GR1110007	SAC	EVROS DELTA AND WEST BRANCH	9857.56
7	GR1110008	SPA	NEAR-RIVER FOREST OF NORTH EVROS AND ARDA	2593.73

<sup>18</sup> Management of areas of Natura 2000- The provisions of Article 6 of DIRECTIVE 92/43 / EEC Habitats EUROPEAN COMMISSION

<sup>19</sup> <http://natura2000.eea.europa.eu>

No	Code	Category	Name	Surface (ha)
8	GR1110009	SPA	SOUTH FOREST OF EVROS	29275.36
9	GR1110010	SPA	MOUNTAINOUS EVROS - DEREIO VALLEY	48907.49
10	GR1110011	SPA	ERYTHROPOTAMOS VALLEY (ASVESTADES - KOYFOVOYNO - VRYSIKA) (*)	9587.12
11	GR1110012	SPA	SAMOTHRAKI: FEGGARI MT. AND COASTAL ZONE (*)	21021.87
<b>KAVALA</b>				
12	GR1150001	SPA	NESTOS DELTA AND LAGOONS OF KERAMOTI AND THASOPOULA ISLAND	14624.76
13	GR1150005	SAC	PANGAIO MT. PEAKS	10345.47
14	GR1150008	SAC	HAVEN OF POTAMIA - CAPE PYRGOS TO GRAMVOUSSA	357.89
15	GR1150009	SAC	BAY OF PALAIO - HAVEN OF ELEFThERA	1168.27
16	GR1150010	SAC	NESTOS DELTA AND LAGOONS OF KERAMOTI - WIDER AREA AND COASTAL ZONE	22484.63
17	GR1150011	SAC	PANGAIO MT. AND SOUTH FOOT (*)	24384
18	GR1150012	SPA	THASOS (YPSARIO MT. AND COASTAL ZONE) AND ISLETS KOINYRA, KSIRONISI) (*)	17592.29
<b>XANTHI</b>				
19	GR1120003	SAC	CHAIKTOU-KOULA MT. AND SURROUNDING PEAKS	3491.99
20	GR1120004	SPA	NESTOS STRAITS	8752.99
21	GR1120005	SAC	AESTHETIC FOREST OF NESTOS	2335.86
<b>RODOPI</b>				
22	GR1130006	SAC	FILIOURIS RIVER	2058.44
23	GR1130007	SAC	KOMPSATOS RIVER (NEW BED)	
24	GR1130008	SAC	MARONEIA - SPILAIO	1.31
25	GR1130009	SAC	LAKES AND LAGOONS OF WIDER AREA AND THRAKI COASTAL ZONE	29455.98

No	Code	Category	Name	Surface (ha)
26	GR1130010	SPA	VISTONIDA, ISMARIS LAKES, LAGOONS OF PORTO LAGOS, ALYKI PTELEA, KSIROLIMNI, KARATZA	18217.14
27	GR1130011	SPA	FILIOURI VALLEY	37565.9
28	GR1130012	SPA	KOMPSATO VALLEY	16600.86
(*) addition of SPAs after update of NATURA 2000 database in 2010				
(**) deleted old code SPA GR1140007, included ino newSPA GR1140008.				

Apart from the foregoing, there are some areas recorded in IP Serres in the Region of Central Macedonia. Specifically:

- estuaries Struma (SPA-SAC, GR1260002) - part owned in IP Kavala,
- Peaks Sera Paggai (SACs, GR1150005) and Mount Paggai and southern foot (SPA, GR1150011) while belong to N. Kavala are also included in a part of IP Serres.

The management actions (eg environmental monitoring, habitat inventory) carried out by the competent bodies for areas SPAs and SACs are usually separated according to their inclusion in the statutory National Park area controlled by the Management Body or if they are outside. In the case of SPAs and SACs outside the National Parks usually actions are coordinated by the competent authorities of the ministry.

The situation in these areas vary depending on the size of pressures from human activities and their integration in a protective regime. **In areas belonging to National Parks it is considered that there is a rudimentary guard and control by their management bodies, while for areas outside there is no effective treatment by other entities. Also seafront lying areas generally get greater pressure from human activities, both in terms of pollution and nuisance or limiting of habitats.**



Figure 6: Natura Areas (Source: Egnatia)

### Ramsar Areas and Wetlands

The Greece currently has more than 400 small and large wetland areas totaling over 2 million acres. Many of them are complex and form a mosaic of wetlands or wetland complexes. Before two generations Greece had three times more the area of wetlands.<sup>20</sup>

In the region of interest the following were identified<sup>21</sup>.

**TABLE 2.10: TYPE, NUMBER OF EACH TYPE AND SIZE OF WETLANDS IN THE REGION OF EASTERN MACEDONIA AND THRACE (SOURCE: EKBY)**

Delta		Lakes		Lagoons		Springs		Outfalls		Artif. Lakes		Rivers	TOTAL		
No/Area (acre/10)		No/Area (acre/10)		No/Area (acre/10)		No/Area (acre/10)		No/Area (acre/10)		No/Area (acre/10)		No	Length (m)	No	area (acre/10)
2	230	2	45	2	40.2	3	530	-	-	-	-	13	720	22	316.13

Ten of the most important wetlands in the country designated as Wetlands of International Importance under the Convention Ramsar (1971). The Convention has been ratified by Greece with N.D.191 / 20/11/1974 1950/1991 and the Law "On ratification of the amendments to the Convention Ramsar». The Greek wetlands designated by August 21, 1975 as Wetlands of International Importance (Wetlands Ramsar) is ten (10) and cover an area of 163,501 hectares (1,635,010 acres). Note that Greece by signing and ratifying the Ramsar Convention is committed to the conservation and proper use of all wetlands in the country through local, regional and international action and cooperation. In the study area the following wetlands Ramsar are identified:

**TABLE 2.11: RAMSAR AREAS**

No	Name	Code	Surface (acr.)
	Nestos Delta and neighboring lagoons	3GR004	219300
2	Evros Delta	3GR001	92670
3	Lakes Vistonida, Porto Lagos, Ismarida and neighboring lagoons	3GR002	243960

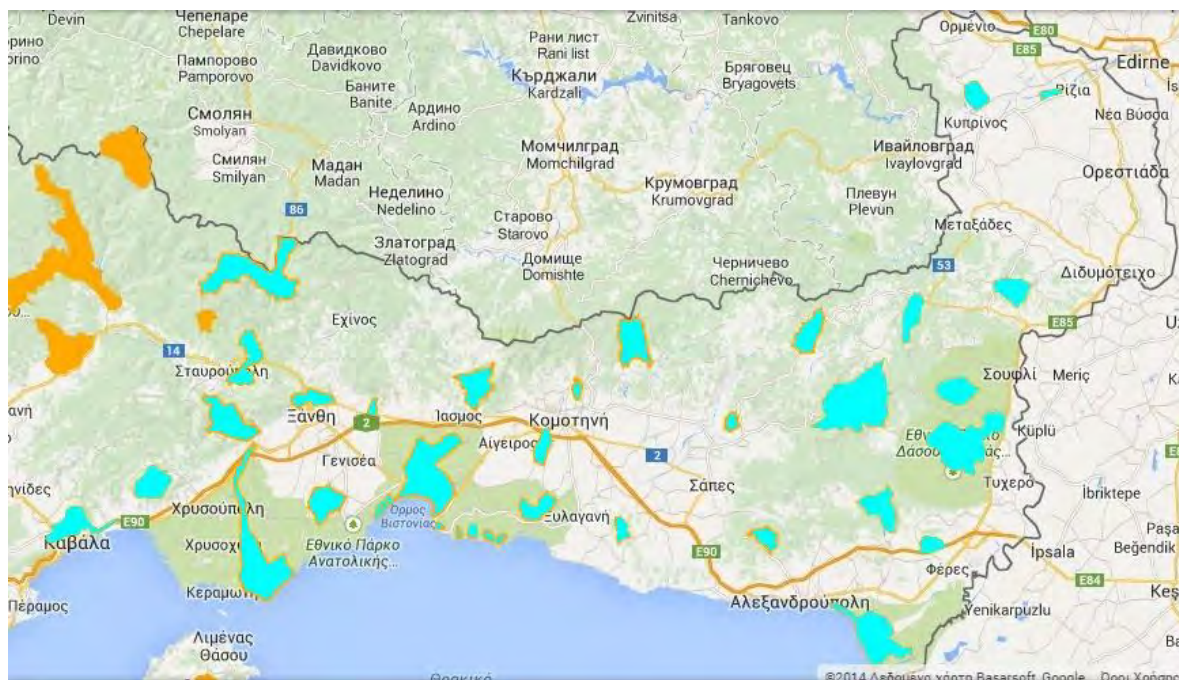
<sup>20</sup> Greek Centre of Biotope Wetland <http://www.ekby.gr/>

<sup>21</sup> <http://www.ramsar.org/> - Ramsar Organisation



Figure 7: Wetlands Ramsar (Source: Observatory Egnatia Odos)

## Wildlife Refuges



**Figure 8: Wildlife Refuges in the area of REMT - shown in blue are shelters in IP interest (except for the area of Thassos) Source: Oikoskopio**

In addition to the SPAs and SACs at regions of habitat protection and species are presented and the Wildlife Refuges.

The following table presents the wildlife sanctuaries in the regional sections of interest.<sup>22</sup>

**TABLE 2.12: WILDLIFE REFUGES**

#	Shelter Name	Legislative framework (GG)
<b>Evros</b>		
1	Aggelos (Komara)	779B/76
2	Poulia (Mikro Dereio - Soufli)	343/29-6-87
3	Tsanaktere (Karyofyta)	392/B/89
4	Kalos Yalos (Platis - Arzou - Ryzia)	354/B/90
5	Zioga - Kalyvia (Dadia - Soufli)	305/B/86

<sup>22</sup> WWF Greece -www.oikoskopio.gr



#	Shelter Name	Legislative framework (GG)
6	Dadia - Lykofos - Leukimi	305/B/87
7	Kallithea - Treis Vryses, Alexandroupolis, Orfeas and Soufli Munic.	841/B/03-07-01 Modif. 15 Kirki, Alexandroupolis Munic. 841/B/03-07-01 Est.
8	Votsi, Didymoteicho and Orfea Munic.	841/B/03-07-01 Modif.
9	Evros Delta, Traianoupolis - Ferres Munic.	1069/B/30-08-00 Deferral of Modif. 841/B/03-07-01 Modif.
10	Katsampas, Samothraki Munic.	841/B/03-07-01 Modif.
11	Alonouda, Samothraki Munic.	841/B/03-07-01 Modif.
12	Pylais - Kavissos - Ferres, Ferres Munic.	841/B/03-07-01 Modif.
13	Nipsas, Traianoupolis Munic. Forest	841/B/03-07-01 Modif.. 1213/B/31-08-05 Modif.
<b>Kavala</b>		
14	Nestos Straits - Left bank	632/22-9-94
15	Ayios Timotheos - Koupia	733/B/76
16	Pangaio Mountain, Pangaio-Eleftheroupoli-Pieria-Orfano Munic.	625/B/25-05-01 Modif.
17	Strimonas Outfalls, Orfanos Munic.	672/B/01-06-01 Establ.
18	Limaneria, Theologou, Potamia, Prinou, Marion, Thasos Island	672/B/01-06-01 Modif.
19	Kastene Ntag, Oreino Munic.	625/B/25-05-01 Modif.
20	Kallirachi - Maries	744/B/76
<b>Xanthi</b>		
21	Filia - Simantra (Selerou)	561/B/85
22	Ntomouz Orman (Avdira)	458/B/85
23	Nestos Straits	733/B/76
24	Kotza Orman Nestos, Topeiros Munic.	908/B/16-07-01 Modif.

#	Shelter Name	Legislative framework (GG)
25	Vistonida Lagous Lake, Avdira Munic.	908/B/16-07-01 Modif.
26	Drymos, Stavroupoli Munic.	909/B/16-07-01 Modif.1011/B/02-08-01 Modif.
27	Panayias Kalamous Taksiarchon, Xanthi Munic.	931/B/19-07-01 Modif.
28	Geraka - Oraio, Stavroupoli Munic.	909/B/16-07-01 Modif.. 1011/B/02-08-01 Abolition(Partial). 1012/B/02/08/01 Modif.
<b>Rodopi</b>		
29	Mavromatio, Mitriko Lake	354/B/97
30	Fanari, Porto Lagos	666/B/78
31	Anadasoseis (Reforestations), Ismaros	607/B/78
32	Elos, Aigeiros Munic.	842/B/03-07-01 Est.
33	Ptelea, Aigeiros Munic.	842/B/03-07-01 Est.
34	Karatza, Aigeiros Munic.	842/B/03-07-01 Est.
35	Alik, Aigeiros Munic.	842/B/03-07-01 Est.
36	Arrianon - Neas Santas, Arriana Munic.	842/B/03-07-01 Modif.
37	Nymfaia, Komotini Munic.	842/B/03-07-01 Modif.
38	Ksirilimni, Aigeiros Munic.	842/B/03-07-01 Establ.
39	Kompsatou, Iasmos Munic.	842/B/03-07-01 Modif.
40	Patermon - Adas, Komotini Munic.	842/B/03-07-01 Establ.
41	Kechrou-Kerasias, Kechros Munic.	842/B/03-07-01 Establ.
42	Poas - Dichalas, Sostis Munic.	842/B/03-07-01 Establ.
43	Chatisio (Kosmiou)	601/B/76

### *Aesthetic Forests*

As Aesthetic Forests have been identified 19 areas in Greece, with a total area of 32506 ha. According to the digitized boundaries, the total land area of Aesthetic Forests corresponds to 0.24% of the area of the country. Their marine part occupies an area equal to 9.8 hectares. In the study area the following are identified:

**TABLE 2.13: AESTHETIC FORESTS**

<b>Aesthetic Forests</b>	<b>SurfaceGG(Hect)</b>	<b>GG</b>
Nestos Straits Kavala-Xanthi	2.380	283/Δ/1977
Forests of Amygdalees-Kavala	2.216	606/Δ/1979

*National Parks*<sup>23</sup>

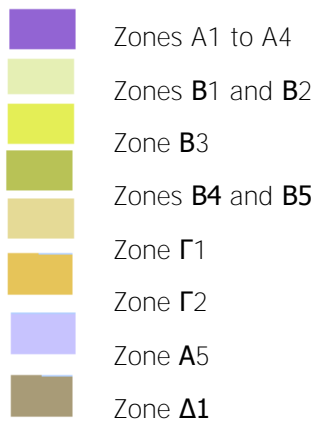
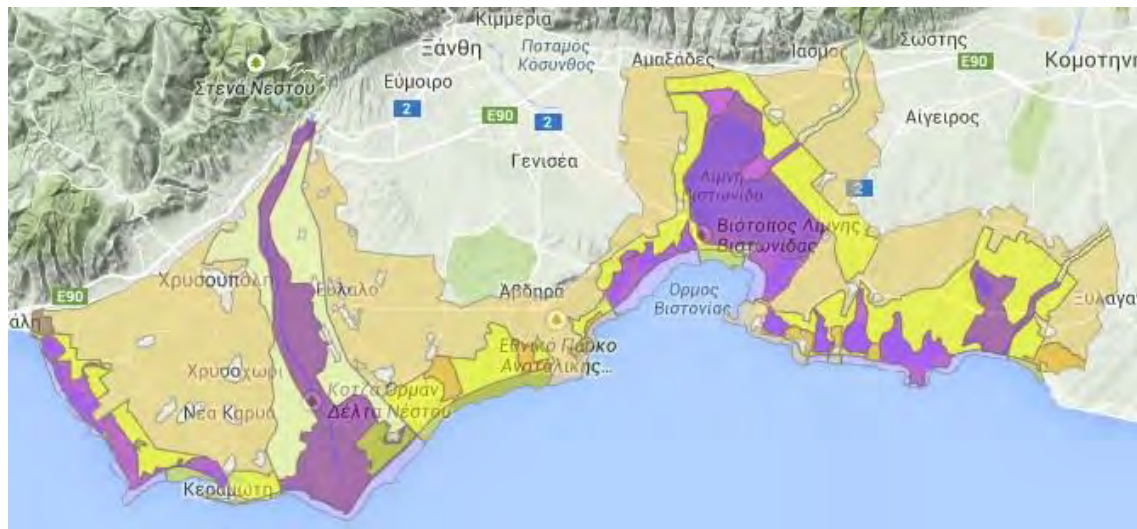
*National Park of East Macedonia and Thrace (EPAMTH)*<sup>24</sup>

The National Park of East Macedonia and Thrace (EPAMTH) includes land and water area of 726.775,03str total area (with the regional area), extending in the coastal zone of IP Kavala, Xanthi and Rhodope in total of 6 Municipalities. The CMD of 2008 essentially replaces the earlier KYA57 / 96 (Government Gazette 854 / B / 09.16.1996).

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<sup>23</sup>"EVALUATION, AND SPECIFICATION REVIEW REGIONAL FRAMEWORK SPATIAL PLANNING AND SUSTAINABLE DEVELOPMENT REGION EASTERN MACEDONIA AND Thrace" – Phase A Step A1 - 2012 \

<sup>24</sup>Characterization of Nestos Delta wetlands, lakes and lagoons Vistonidas limniaia features Ismarida Lake and the surrounding area as a National Park with Peripheral Zone (Official Gazette 497 / D / 17.10.2008).



**Figure 9: EPAMTH Zones** (Source: Organization Management <http://www.fdnestostvistonis.gr/>)

Within the area of the National Park established protection zones A (A1, A2, A3, A4, A5), B (B1, B2, B3, B4, B5) and C (C1, C2), with the following designations:

- ❑ Zone A1 (Nestos River - riparian formations, Lake Vistonida littoral zone, Lake Ismarida - littoral zone). Nature conservation area.
- ❑ Zone A2 (Region lagoons, Marsh area of permanent or seasonal). Nature conservation area. conformation). Nature conservation area.
- ❑ Zone A4 (Grove nesting birds Porto Lagos). Nature conservation area.
- ❑ Zone A5 (marine zone). Nature conservation area.
- ❑ Zone B1 (H surrounding the river Nestos - Zone A1- area). Area protected natural formations, protected landscapes and landscape elements.
- ❑ Zone B2 (Departments of rivers and riparian conformation). Area protected natural formations formations, protected landscapes and landscape elements.

- ❑ Zone B3 (Rest of land area). Area protected natural formations, protected landscapes and landscape elements.
- ❑ Zone B4 (marine area). Area protected natural formations, protected landscapes and landscape elements.
- ❑ Zone B5 (land area former "Voice of America"). Area protected natural formations, protected landscapes and landscape elements.
- ❑ Zone C1 (land and sea area). area eco-development.
- ❑ Zone C2 (land area). area eco-development.

Outside the area of the National Park Regional defined Zone - Zone D1 (land area).

Within the area of the park are included four (4) areas of the Natura 2000 network: Nestos Delta and lagoons Keramotis - Region and coastal zone (GR1150010, SAC), Nestos Delta and lagoons and Keramotis Island Thasopoula (GR1150001, SPA), Lakes Vistonida Ismarida - Porto Lagos lagoons, Aliki Ptelea, Xirolimni, Karatzas (GR1130010, SPA) Lakes and lagoons of Thrace - region and coastal zone (GR1130009, SAC), with an area of 29455,98str. Also included are two (2) Ramsar sites: Lake Vistonida Porto Lagos, Lake and neighbouring lagoons Ismarida and Nestos Delta and neighbouring lagoons.



Figure 10: National Parks Study Area (source: Oikoskopio)

## Wetland National Park of Evros Delta<sup>25</sup>

Evros is the longest river in the Balkan peninsula. It flows from the mountains of Rilou in Bulgaria, enters Greece and a small part is a natural border of Greece and Bulgaria. From New Vyssa and up the estuary, Evros is the Greek-Turkish border line. In Evros flow many small watercourses and the two main tributaries: the Ardas, which stems from the Bulgarian side of the mountains of Koula and seeps across the county and the Erythropotamos, who comes from the same direction and passes Didymoteichon. The wetlands of Evros, is one of the most prolific and renewable natural resources with multiple benefits for humans. Physical features of the wetland system are the recharge of groundwater, sediment trapping, absorption of carbon dioxide, store and release of heat, capture of solar radiation and support of food chains. The Evros Delta provides water for drinking and irrigation, works as a natural purification filter of water from pollution, prevents the salty sea water to invade the land, favorably affects the climate of the region and offers ideal conditions for the development of livestock and ichthyology. In the Evros Delta are answered all formal formations and units of a Mediterranean vegetation Delta. The main formations ammophilous vegetation of halophytic communities, hydrophytes and riparian forests are maintained in many sectors, in very good condition. More than 350 plant species have been recorded in both the delta and the area along the river. On Evros river and its Delta have been found 46 species of fish, 7 species of amphibians, 21 species of reptiles and more than 40 mammals. But the great value of the Delta consists mainly of the rich avifauna. In the Evros Delta have been seen 304 species of birds from 407 species in Greece. The diversity of this species is rare in European terms and demonstrates the great importance of the Evros Delta.

Characterized as a National Park under the name "National Park Evros Delta wetland" land and sea area of wetlands of the delta at the mouth of the Ebro and the wider region. Includes two regions (2) of the Natura 2000 network: Evros Delta (GR1110006, SPA), Evros Delta and West arm (GR1110007, SAC and Ramsar site).

The region is divided into eight (8) zones, while a Regional Zone is bounded. Specifically, the zones are:

Zone A: Characterized as a Nature Reserve. (No. 19 N.1650 / 1986). Includes wetland areas in Almyres area, shores and islands of deltaic formation, Nymphs lake and shallow water area southwest of such.

Zone B: It occupies the western part of the Park. Includes wetland and wasteland in the areas of Mafrotopos, Nisi, Valtos and a shallow sea area south of these areas.

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<sup>25</sup>Characterization of the land and sea area of wetlands of the delta at the mouth of the Ebro and the region as a National Park, named wetland National Park Ebro Delta. (Official Gazette 102 / D / 16.03.2007).

Zone C: It covers a large part of the northern and eastern part of the Park. Includes lagoons Drana, Avganon, Voulgaroudas, Monolimnis, wetland areas, grasslands and agricultural crops.

Zone D: In this subject the area enclosed between the river and Bath EO-Alexandroupolis border.

Zones E, G, H and I: These parts are enclosed between brackets or embankments of the Evros River and the boundary line.

The peripheral zone of the park **includes the areas south of the railway line Alexandroupolis-Orestiadas**, surrounding zones of the Park.

- ❑ Zones A, B and C contain the bulk of the sensitive areas of the Delta ecosystem, habitats and birds. There dwelling bird species that are considered endangered, according to the directives 79/409 and 92/43 EEC.
- ❑ Zones D, E, G, H and I are areas, which also have significant ecological value, but also have greater durability. Therefore protection is deemed compatible with the exercise of certain traditional activities and compatible financial holdings.

Also :

- ❑ Is allowed throughout the National Wetland Park the scientific research of the characteristics of the ecosystem.
- ❑ Imposed rules governing the stay and the passage of the public to monitor the nature and recreation, parking of service vehicles and visitors, and the construction of parking of such vehicles in completely defined points.
- ❑ Allowed even the projects of water resources management, where a prior EIS, vocational and recreational fishing, recreational boat traffic (governed by the rules of crossing vessels recreational fishing), the use and restoration of ecosystems as natural lagoon farms and the operation of existing wells, if not raise salinity.

In each zone there are special regulations described in the relevant decision function of the park.



Figure 11: Natura areas and Evros Ramsar wetland area park



### *National Forest Park of Dadia-lefkimis-Soufliou*

The National Forest Park of Dadia-lefkimis-Soufliou is located in the middle of the IP Evros. Holds a unique geographical position at an international level as it is at the crossroads between Asia, Europe and Africa and near the eastern flyway of many bird species. Extensive land use by humans in the mists of time has led to the formation of a rich mosaic landscape with many variations. The gaps created by disturbances, such as grazing, logging and small-scale and intensive fires in the past, determining the existence and survival of most raptors, providing easier access to food. In the region are recorded a total of 360-400 species, of which 25 species of orchids, 104 species of butterflies, 12 to 13 species of amphibians, 29 species of reptiles and 60-65 species of mammals, of which 24 are bats. Furthermore, the particular aesthetic landscapes with rock formations, streams and rivers, endemic plants and geological points of interest are of high ecological value. The ecological value of Dadia forest was noted in 1970 by European scientists, in 1980 was declared a protected area and since 2006 has been designated as a National Park. Plus is one of the few shelters of rare birds of prey in Europe and here occurs the only breeding population of black vultures in the Balkans<sup>26</sup>.

The Forest Park area includes a total area 428.000str., which is the forest complex Dadias-Lefkimi Soufliou in the IP Evros. Within the National Park are designated areas A and B as follows:

- Within the area A, of approximately total area 78.000str., which is designated as a nature conservation area are designated Zones A1, A2.
- Area B, of approximately total area 350.000str. are defined Zones B1, B2, B2a, B2b and B3.

Across the National Park of Dadia - Lefkimmis - Soufliou as delimited in accordance with Article 2 (OG 911 / 13-10-2006). decision determined by zone and region terms and conditions and restrictions and protective measures imposed as follows:

a. Forests and woodland preserve their forest nature and are governed by the applicable forest law.

You may not change the use and destination of forests and woodlands.

The sustainable management of the region A and the Zones B1, B2, and B3 B2b National Park is done in accordance with the prescribed rules of forest management studies (Special Management Area cores D and other regions Regional Management Study Zone Cluster).<sup>27</sup>

The Management Authority shall cooperate in the drafting and adoption of specific standards and forest management studies and their application and therefore has

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<sup>26</sup> Management Agency of National Park of Dadia <http://dadianp.maps.arcgis.com/>

<sup>27</sup>"EVALUATION, AND SPECIFICATION REVIEW REGIONAL FRAMEWORK SPATIAL PLANNING AND SUSTAINABLE DEVELOPMENT REGION EASTERN MACEDONIA AND Thrace" – Phase A Step A1 - 2012 \

information, identifies directions or management measures and undertakes, in compliance with the needs, specific application tasks.

b. Is maintained and protected the native vegetation on the banks of streams and 20 meters across these. Is allowed the extraction of aggregate materials from the beds of streams. Also is allowed the recreational fishing in streams in accordance with the relevant provisions, except for the area A, which may be authorized by the Rules of Administration and Operations Management Body.

c. Is prohibited the creation of organized landfills.

d. Is prohibited the definition of rigid zones and the establishment of extractive and mining activities.

e. Are allowed, except for the area A, the necessary extensions of settlements, in accordance with the relevant applicable provisions.

f. Hunting is allowed, except for Zones A1 and A2, in accordance with the special provisions applicable to the area. Modification of the existing arrangements for hunting is allowed with the Regulation Administration and Operation Management Agency, upon scientific study and monitoring.

g. To carry out scientific research, photography and filming according to the ecological characteristics and the applied management of the National Park, the approval of the Management is required.

To carry out the above activities in the area A is required an additional special entrance permit issued by the Management Body.

h. Is allowed the research and monitoring of the physical characteristics and components of biodiversity and the works for management of protected flora and fauna species.

i. The tour and operation of ecotourism facilities, and vehicular traffic in the area A, is carried out under license, issued by the Management Body.

j. For all authorized projects and activities fall into the no. 15393/232/2002 (B. 1022) Joint Ministerial Decision and regardless of the category they fall into, is required the preparation and approval of an Environmental Impact Study (MP EV.), and their installation is possible, since no significant effect on the conservation of protected areas and case.<sup>28</sup>

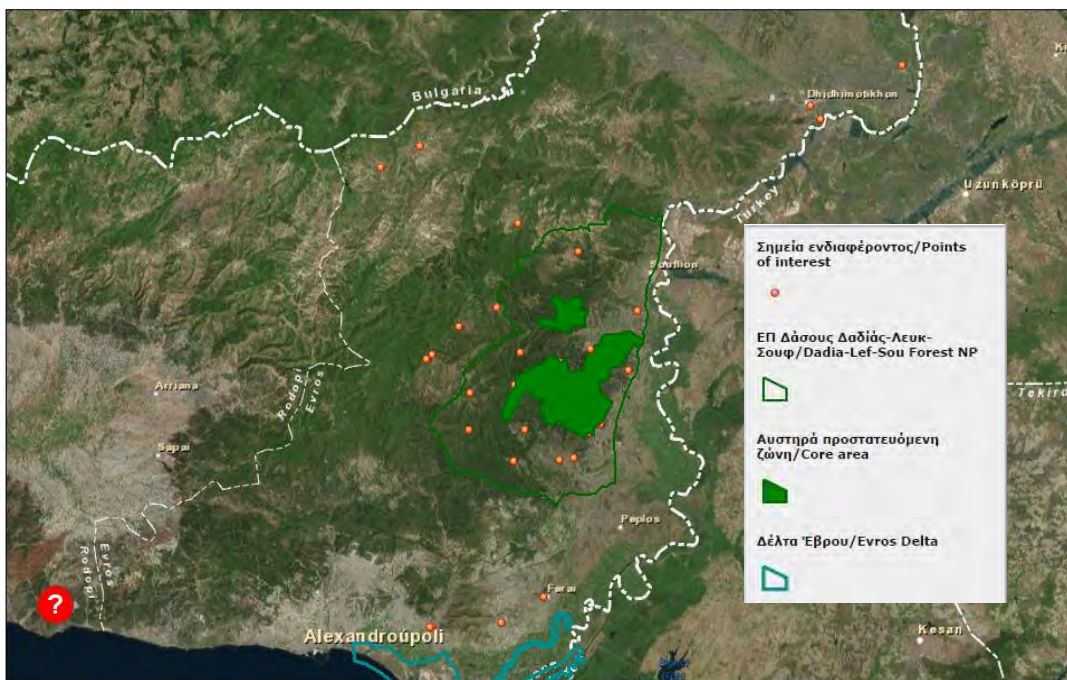
k. Any other activity which is not permitted by the provisions of this article is prohibited without prejudice referred to in Article 6 of JMD 35633 (Official Gazette 911 / 13-10-2006).

In each zone there are special regulations described in the relevant decision function of the park.

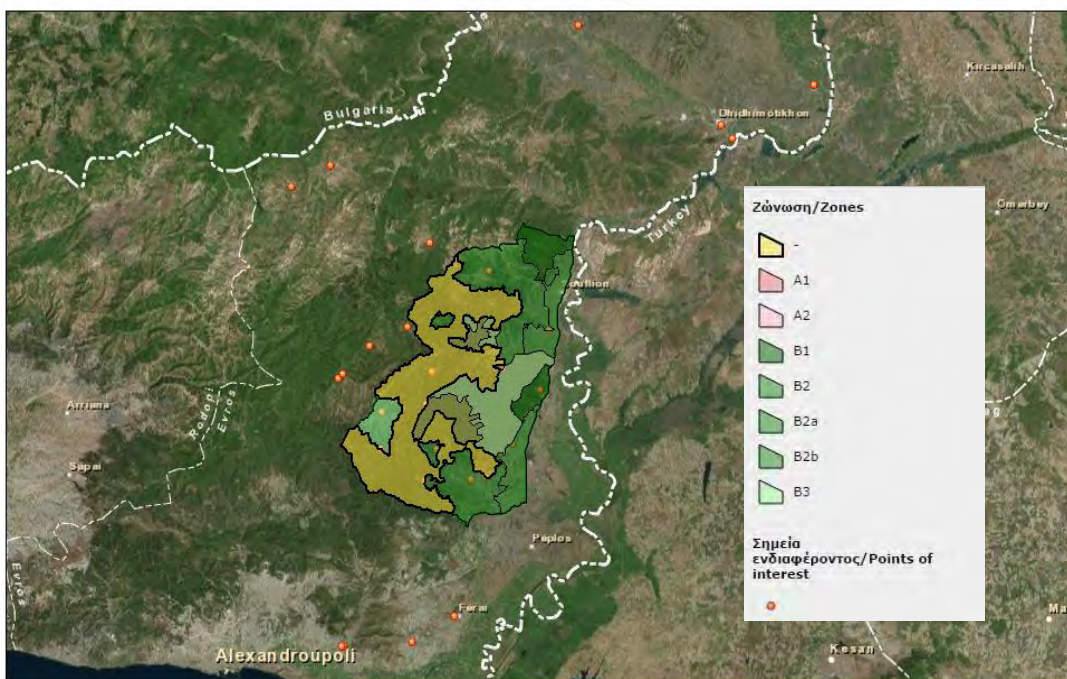
Within the park there are two areas of the Natura 2000 network: Forest of Dadia-Soufli (GR1110002, SPA) and Evros Mountains (GR1110005 SAC).

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<sup>28</sup>"EVALUATION, AND SPECIFICATION REVIEW REGIONAL FRAMEWORK SPATIAL PLANNING AND SUSTAINABLE DEVELOPMENT REGION EASTERN MACEDONIA AND Thrace" – Phase A Step A1 - 2012 \



0 5 10 20 mi  
0 5 10 20 km  
1:577,791  
Source: Esri, DigitalGlobe, GeoEye, i-cubed, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP,



October 6, 2014

0 5 10 20 mi  
0 5 10 20 km  
1:577,791  
Source: Esri, DigitalGlobe, GeoEye, i-cubed, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP,

Figure 12: Dadia National Park Map - Privacy Protection Zones (Source: National Park Management Body Dadia <http://dadianp.maps.arcgis.com/>)

### *National Parks Management Bodies*

Under N.3044 / 02 were established four (4) Protected Areas Management Bodies, who are responsible for as many National Parks in the Region of Eastern Macedonia and Thrace. For the region of interest are the following:

- ❑ Management Agency of the National Park of Nestos Delta Vistonidas-Ismarida,
- ❑ Management Agency of the National Park of Evros Delta,
- ❑ Management Agency of the National Park of Dadia-Leukimi-Soufli

### **Environmental pressures - pollution sources**

#### *General*

The sources of pollution of the Region of Eastern Macedonia and Thrace, especially in regions of interest, Kavala and Evros mainly include anthropogenic activities which may result in a charge to water bodies and soil. The issue of the impact on water bodies of the various sources of pollution is addressed today from the application of Directive 2000/60 and the harmonization of the Greek legislation. The implementation of the Directive requires the preparation of management plans of water apartments, which addresses the issue of pollution or the risks to aquatic recipients.

For the study area are developed Water Districts of Eastern Macedonia (YD11) and Thrace (YD12) management plans, which are currently in consultation and reflect the state of pollution of water discharges from human activities.

Following is the summary of the conclusions arising on the major sources of pollution as outlined in the Regional Plan of EMT<sup>29</sup>.

*The information given is by pollution source and specializes in Regional Areas of Interest, by which the corridor passes on its the terrestrial part.*

#### *Urban Wastewater - Wastewater Treatment Plant*

Urban waste water is a major source of pollution for which treatment is deemed necessary especially when related to sensitive recipient. For the area of REMT until today under 19661/1982/1999 MD, are set the following sensitive areas (it also concerns and sewage disposal in these areas):

- ❑ Evros Delta
- ❑ Lake Vistonida
- ❑ Lake Mitrikou
- ❑ West tributaries (tributaries of river Vozvozi)
- ❑ Evros River

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<sup>29</sup>"EVALUATION, AND SPECIFICATION REVIEW REGIONAL FRAMEWORK SPATIAL PLANNING AND SUSTAINABLE DEVELOPMENT REGION EASTERN MACEDONIA AND Thrace" - Phase A Step A1 - 2012

- ❑ Evrythropotamos River (Evros tributaries)
- ❑ River Kompsatos
- ❑ River Kosynthos
- ❑ Aggitis River (including the Region of Central Macedonia)

Based on the requirements of Directive 91/271 / EEC "for the treatment and disposal of urban waste water" and the relevant National Planning on the classification of settlements in the country in three priorities 35 (A, B and C) reveals the following to address pollution from urban wastewater in REMT:

- ❑ Priority A' Settlements (ICS> 15,000). They have completed projects of WWTP in Komotini, Orestiada Didymoticho (sensitive recipient - freshwater).
- ❑ Priority B' Settlements. They have completed the WWTP Kavala (with addressee coastal waters - normal range), and Xanthi, Alexandroupolis, Chrisoupolis (with standard recipient - coastal or freshwater).
- ❑ Priority C' Settlements. Reported (30) priority C' settlements with WWTP

The remaining settlements have no WWTP (others nor sewer) and are considered point sources of pollution. The pollution load of these pollution sources is detailed presented in management plans in both Comp. Generally, in order of size with respect to the incoming load is for the WWTP of major cities / IP headquarters of the Region, Kavala, Alexandroupolis, followed by other WWTP (Orestiadass, Didimoticho Chrisoupolis,, Soufliou etc.).

#### *Solid Waste*

As a source of pollution to soil and water bodies are considered and the municipal solid waste, which are point pollution. The issue of waste management is addressed through the Regional Planning and is referred to the next paragraph. Important in terms of pollution are considered the existing landfills and uncontrolled landfills. In REMT are operating landfills of Xanthi, Komotini, Kavala:

- ❑ The Xanthi landfill is located in Prasinada farm of the Topeirou municipality, with Petrohori and Vaniano as the nearest settlements to it. The place is open from January 1995 and serves the IP Xanthi. The terrace of the landfill has a total area of 200str. and receives approximately 45,000 tonnes of waste in a year.
- ❑ The Komotini landfill is located in "Siderades" Komotini, approximately 15km. from the city of Komotini and is open since August 2002. It belongs to the municipality of Komotini. The terrace of the landfill has a total area 116str.
- ❑ The Kavala landfill is located in Eski Kapou within 10 miles from the city of Kavala and serves all IP Kavala and Thassos.

Regarding the uncontrolled landfills continue to operate the following six (6) in REMT. More specifically in the region of interest:

- ❑ Uncontrolled landfill at "AMPELIA" of the Orestiadas municipality, which serves the Kallikratic municipality of Orestiados,
- ❑ Uncontrolled landfill at "MEGA REMA" of the Soufli municipality, which serves the Kallikratic municipality of Soufli,
- ❑ Uncontrolled landfill at "DIDIMOTICHO" of the Didimoticho municipality, which serves the Kallikratic municipality of Didimoticho,
- ❑ Uncontrolled landfill at "MAVROTOPOS (2)" in the Municipality district of Alexandroupolis, serving the municipalities of Alexandroupoli and Samothrace
- ❑ Uncontrolled landfill at "KOUROU TSAI" of the Prosotsani municipality, which serves the Kallikratic municipalities of Prosotsani and Lower Nevrokopiu,

### *Industry*

The sources of pollution related on industrial activities mainly include:

- ❑ sewage treatment plants of Industrial Parks (INDUSTRIAL AREA),
- ❑ industries and facilities within the requirements of the Directive IPPC, 36
- ❑ industries and facilities within the provisions of Directive SEVESO, industries sectors of Article 13 of Directive 91/271 / EOK37,
- ❑ other polluting facilities that due to capacity does not fall within the provisions of the Directives.

Industrial activities in the area of interest may be considered polluting, sited in industrial areas (Industrial Area) and industrial park (industrial zone), which are as follows: Industrial Area of Kavala, Xanthi, Komotini, Alexandroupoli, Drama, and VIOPA Orestiadas, soaps, Prosotsani.

Across the region stand some plants which either because of their capacity or because the recipient of the treated wastewater pollutant causing greater burden than the others, as identified in the Regional Plan of EMT <sup>30</sup>

For the Water District Thrace, the most important of these is the storage industry and oil (OIL Kavala AU), which has treated industrial effluents in the immediate area of the sea. The facility is located in the seaside area of N.Karvalis (Kavala) and polluting contribution covers almost 35% of the entire Water District Thrace. There is also a three establishments that are both house and farm of the third - a slaughterhouse provide secondary or tertiary treatment plant. These facilities under the IPPC Directive.

Three more plants under the IPPC Directive and have their wastewater treated to a natural recipient is: one paper producing industry with natural acceptor stream Asiri and a sugar industry with the natural acceptor stream Laspia. There is also a significant dairy industry which throws their waste to a natural acceptor (Genisea stream), with little polluting contribution. In the CE and Thrace are also two landfill facilities, which fall within the IPPC.

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<sup>30</sup>"EVALUATION, AND SPECIFICATION REVIEW REGIONAL FRAMEWORK SPATIAL PLANNING AND SUSTAINABLE DEVELOPMENT REGION EASTERN MACEDONIA AND Thrace" - Phase A Step A1 - 2012

According to the conclusions of the Regional Plan of EMT <sup>31</sup> the pollutant burden of these facilities is significantly less than the cost of the industrial units above.

In the water district in eastern Macedonia (part REMT and specifically in the area of interest) stands an industry of chemicals and fertilizers, which has treated its industrial effluents in the immediate area of the sea. The facility is located in the seaside area of N.Karvalis (Kavala) and the main pollutant contribution is due to nitrogen and phosphorus.

#### *Quarries - Sand Extractions*

Compared with existing quarries generally are not observed layouts that generate hydromorphological alterations in surface water systems.

Local scale hydromorphological alterations detected in river WR (Xirorema) in the town of Dysvato Kavalas.

Of all the quarries (in terms of area), is located only one (1) licensed quarry, with area larger than 250str. (chert quarry in the municipality of Orestiados). The highest concentration of marble quarries is observed in the Municipality district Oreinou of Nestos municipality within the Xirorema basin.

Regarding the removal of sand, they are carried out in a large number of watercourses FOD either legally or illegally. Extensive sand extraction that was made in Chionorrema (or West Vosvozi tributary), in conjunction with the uncontrolled disposal of debris and other waste led to hydromorphologically alteration of the river and complete alteration of the landscape.

### **2.2.2 Current Environmental status of greater area – Bulgaria**

#### **Valuable and sensitive ecosystems - Areas of environmental protection**

##### *General*

Bulgaria is among the European countries with the greatest biodiversity. The protection areas - 5.2% of the national territory and areas Natura - 35% of the territory composing the National Ecological Network (National Ecological Network / DE) is indicative that the percentage of Natura in Bulgaria is two times larger upon average - 18%. <sup>32</sup>

The NEN is optimal in southern Bulgaria, the largest percentage of protected areas is located in SW (Southwest) Region - 8.98%, while the SE (southeast) with 1.11% and NK (South-Central) with 2.02% are less frequently protected areas<sup>33</sup>.

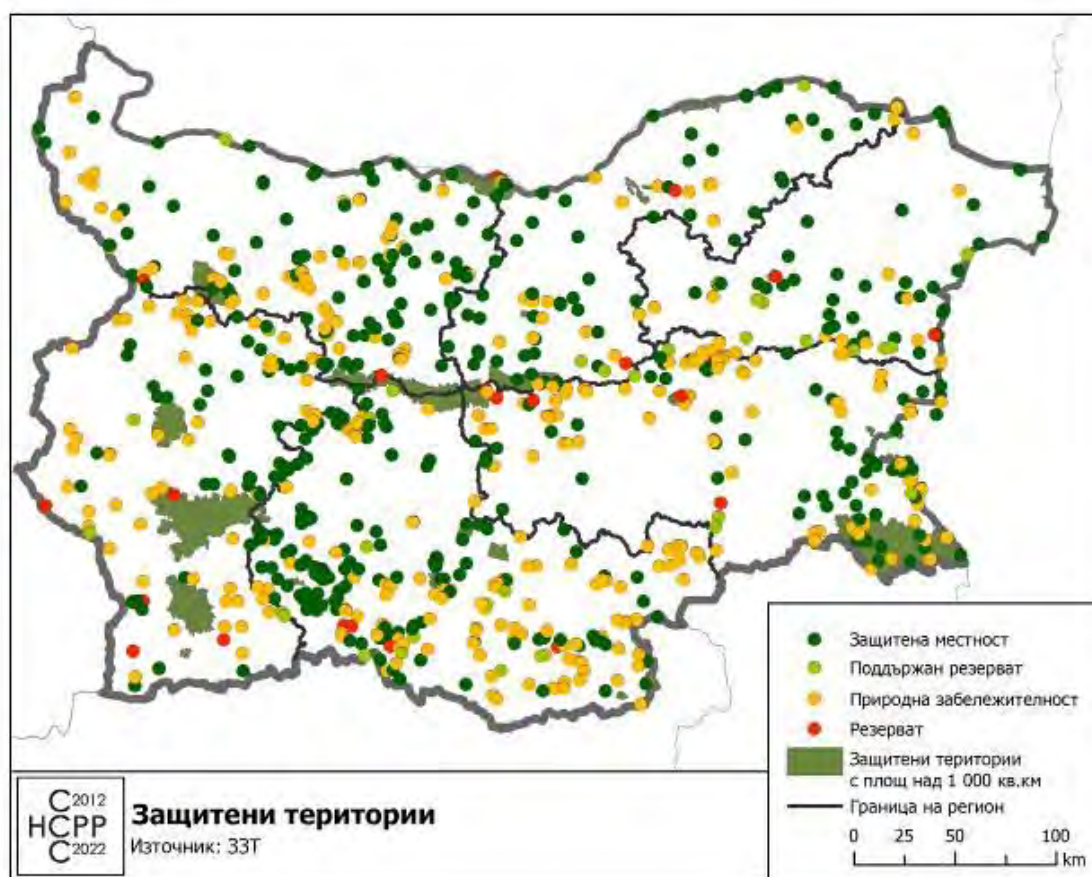
The legislative framework in Bulgaria which relates to the protection of nature includes national laws and international conventions.

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<sup>31</sup>"EVALUATION, AND SPECIFICATION REVIEW REGIONAL FRAMEWORK SPATIAL PLANNING AND SUSTAINABLE DEVELOPMENT REGION EASTERN MACEDONIA AND Thrace" - Phase A Step A1 - 2012

<sup>32</sup> National Regional Development Strategy (NRDS) 2012

<sup>33</sup>GENERAL TRANSPORT MASTER PLAN OF BULGARIA Environmental Assessment of General Transport Master Plan 2010



**Figure 13: Protected areas per region of Bulgaria (Source: National Regional Development Strategy (NRDS))**

According to the Constitution of the Republic of Bulgaria, the international conventions ratified by the National Assembly are binding on Bulgaria and supersede national law. Bulgaria has signed and ratified the following conventions at world and European level:

- Global Biodiversity Convention (Convention on Biological Diversity). Entered into force in Bulgaria on February 29, 1996 (Government Gazette Issue 19/1999)
- Convention on International Trade in Endangered Species of Fauna and Flora (Convention on International Trade with Endangered Species of Wild Fauna and Flora -Washington, CITES) entered into force in Bulgaria on April 16, 1991 (Government Gazette, Issue 6/1991). The requirements set out in the Convention Biological Diversity Act (BDA). Annexes I, II and III
- Convention on the Conservation of Migratory Species of Wild Animals (CMS Convention on the Preservation of Migratory Wild Animal Species), signed in June 1979 and entered into force in November 1983



- Treaty Ramsar, entered into force on 01.24.1976, as amended by the Protocol of 03/12/1982,. For Bulgaria entered into force on 02.27.1986, / Official Gazette, No. 56/1992.
- Convention on the Conservation of European Wildlife and Natural Habitats in Europe (Bern Convention) (Convention on European Wildlife and Natural Habitats Preservation Bern convention), in force for Bulgaria on 01/05/1991 (Official Gazette, Issue 23 / 1995).
- Convention for the Protection of the World Cultural and Natural Heritage (Convention on World Cultural and Natural Heritage Preservation)
- International Convention to Combat Desertification (United Nations Convention to Combat Desertification)
- European Landscape Convention into force for Bulgaria on 01/03/2005.
- Directive 92/43 / EEC on the conservation of natural habitats and of wild fauna and flora.

#### *National legislation*

- Biological Diversity Act, published in the Government Gazette issue 77/2002, Official Gazette 59/2012 last update,
- Protected Areas Act, published in the Government Gazette issue 133/1998, last modified Gazette 38/2012

For Bulgaria the National System of Protected areas include the following categories:

- National Park. The National Parks found a great variety of natural ecosystems, a large variety of flora, fauna and natural ecosystems, especially combining natural features and landscapes.
- Managed Nature Reserve. In these areas there are rare or threatened species and ecosystems may be protected in such a place so as to ensure the reproduction of these species.
- Strict Nature Reserve. It is strictly protected areas occur representative natural ecosystems and habitats. The activities in these areas that may damage the precious ecosystems and habitats are severely punished
- Naturalparks. Very large, mainly mountainous and forested areas with a variety oikosytimata, particularly landscapes and natural features.
- Protectedareas. Include smaller areas with specific natural features and areas or populations of threatened, rare or sensitive species.
- Naturallandmarks. It is mainly rock formations, caves, waterfalls, dunes, fields and fossils and other great aesthetic, scientific and cultural importance.

Many protected areas in Bulgaria are of great international importance and are included in the list of Unesco and the Ramsar Convention.

In order to reflect the environmental information along the studied terrestrial rail and road corridor and ports of interest, then presents a district level (district) of Bulgaria, the most important protected areas. Specifically included from south to north provinces Haskovo, Stara Zagora, Sliven, Yambol, Burgas and Varna.

According to Ministry of Environment of Bulgaria protection areas by district interest, ie by passing the corridor (road and rail), are the following:

- ❑ Haskovo (South Central Region): 56 protected areas 25 protection zones
- ❑ Yambol (Southeast Region): 17 protected areas 21 protection zones
- ❑ Burgas (Southeast Region): 100 protected areas 37 protection zones
- ❑ Varna (Northeast Region): 42 protected areas 22 protection zones
- ❑ Sliven (South-Central Region): 45 protected areas 24 protection zones
- ❑ Stara Zagora (South-Central Region): 42 protected areas 22 protection zones

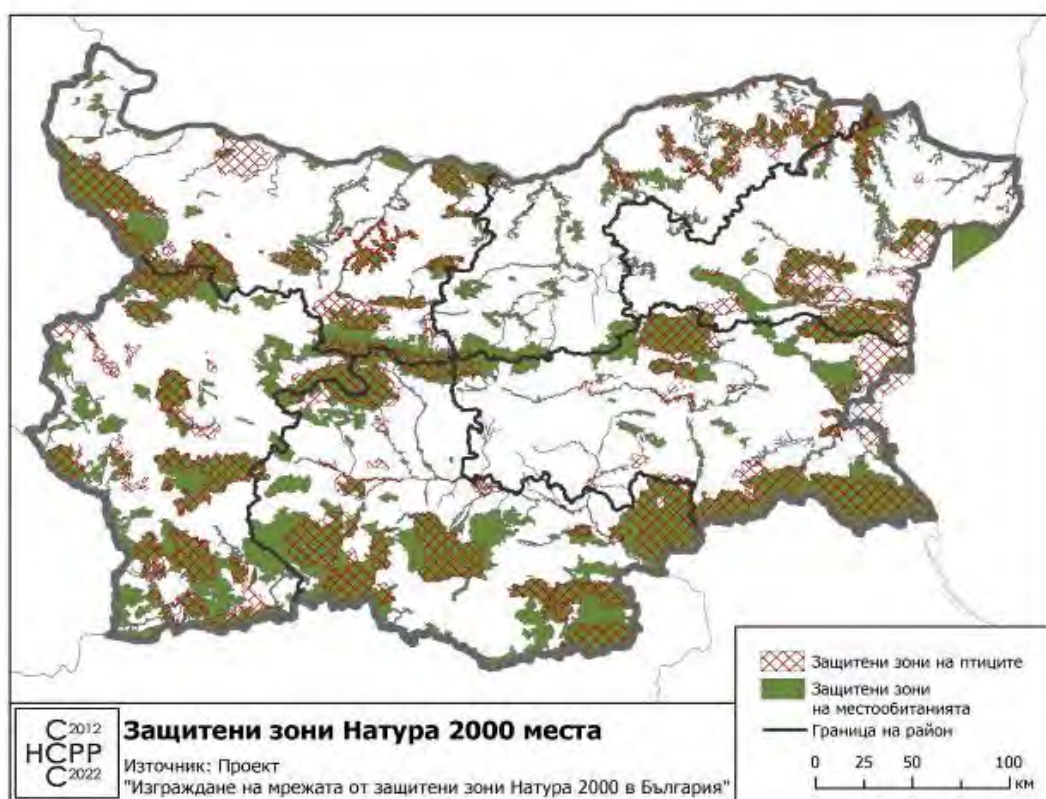
*Due to the large number of protected areas in Bulgaria, the size scale of the provinces and the fact that the area of the corridor passes through a small portion of some provinces (eg. Haskovo, Sliven, Stara Zagora) decided to protect the areas captured along zones of rail and road route corridor. In this report, it is predominant to identify areas to protect around the rail corridor.*



Figure 14: Road and rail network in Bulgaria in Area of Interest

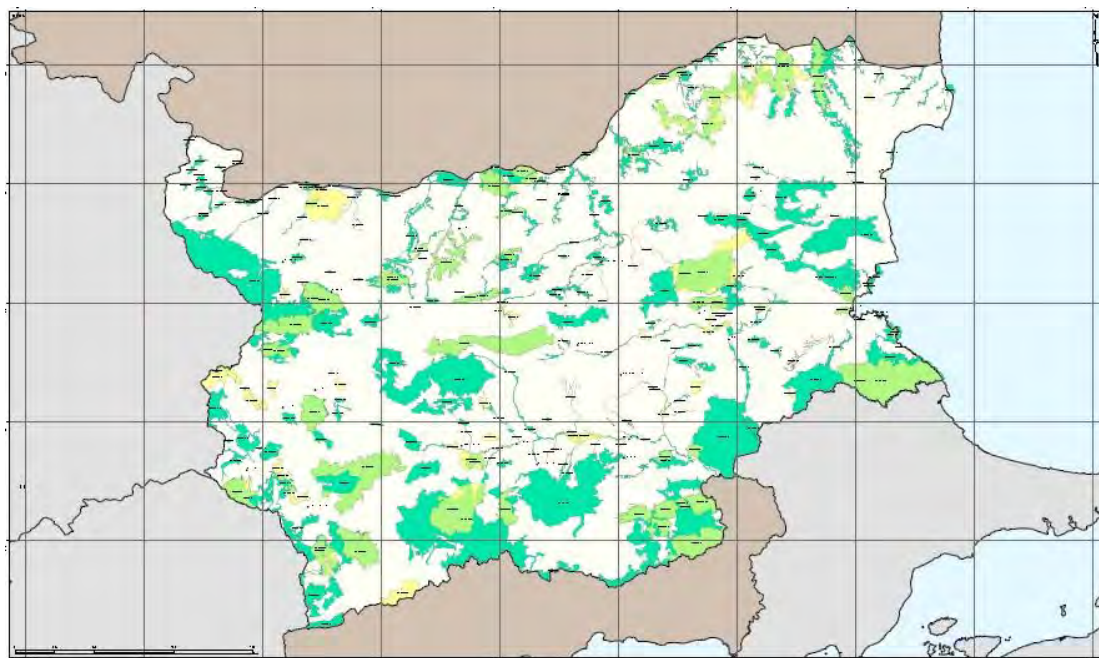
### NATURA Areas - Bulgaria

Network Natura 2000 is a European ecological network of areas that host natural habitat types and habitats of species are important at European level. It consists of two types of areas: the "Special Protection Areas (SPAs)» for the Birds, as defined in Directive 79/409 / EK, and "Sites of Community Importance (SCIs)» as defined in Directive 92/43 / EC. SPAs, after qualification by the Member States, they are automatically integrated in the Network Natura 2000, and their management is the provisions of Article 6 of Directive 92/43 / EC. In contrast, the integration of the SCI is scientific evaluation and negotiation between the Members States and the European Commission, according to the results of the ecological unit Biogeographic Seminars.



**Figure 15: Protected areas network Natura by Region of Bulgaria (Source: National Regional Development Strategy (NRDS))**

The essential requirements of EU Directive 92/43 / EEU and 79/409 / EEC reflected in the Bulgarian legislation with the Biodiversity Act (Biological Diversity Act - BDA) in August 2002.



**Figure 16: Protected areas network Natura (Src: Natura Net)**

In the area of interest are identified 50 areas of network protection which are reflected in the table below

**TABLE 2.14: PROTECTED AREAS NETWORK NATURA**

No	Code	Category	Name	Surface (ha)
<b>Haskovo district</b>				
1	BG0000212	SCI SPA	Sakar	132117.76
2	BG0000578	SCI	REKA MARITSA	14696.075
3	BG0002021	SCI	SAKAR	125713.83
4	BG0002066	SPA	Zapadna Strandzha	53821.147
5	BG0001032	SCI SPA	Rodopi - Iztochni	217446.89
6	BG0001034	SCI SPA	Ostar kamak	15994.31
<b>Stara Zagora - Sliven District</b>				
7	BG0000441*	SCI	Reka Blatnitsa	1079.864
8	BG0000425**	SCI	Reka Sazliyka	992.0966

No	Code	Category	Name	Surface (ha)
9	BG0002022**	SPA	Yazovir Rozov Kladenets	1265.0956
<b>Yambol District</b>				
10	BG0000217	SCI SPA	Zhdreloto na reka Tundzha	7856.99
11	BG0000218	SCISPA	Derventski vazvishenia 1	38696.501
12	BG0000219	SCI	Derventski vazvishenia 2	55036.13
13	BG0000192	SCI	RekaTundzha 1	9502.9987
14	BG0002094	SCI	Adata Tundzha	5636.2998
15	BG0000195	SCI	RekaTundzha 2	5953.32
16	BG0000196	SCI	RekaMochuritsa	8702.8302
17	BG0000205	SCI SPA	Straldzha	882.02
18	BG0002028	SPA	Kompleks Straldzha	2872.9714
19	BG0000401	SCI	Sveti Iliyski vazvishenia	8464.27
20	BG0000402	SCI	Bakadzhitsite	4504.87
21	BG0000151***	SCI	Aytoskaplanina	29379.4
22	BG0000513	SCI	Voynishki Bakadzhik	1198.94
<b>Burgas District</b>				
23	BG0001001	SCI	Ropotamo	12815.82
24	BG0001004	SCI	Emine - Irakli	11282.795
25	BG0001007	SCI	Strandzha	118225.03
26	BG0000230	SCI	Fakiyska Reka	4103.8565
27	BG0000146	SCI	Plazh Gradina - Zlatna ribka	1153.12
28	BG0000270	SCI SPA	Atanasovsko ezero	7209.9962
29	BG0000271	SCI SPA	Mandra Poda	6139.177
30	BG0000273	SCISPA	Burgasko ezero	3066.9026

No	Code	Category	Name	Surface (ha)
31	BG0000242	SCI SPA	Zaliv Chengene skele	190.157
32	BG0002043	SPA	Emine	66748.84
33	BG0000149	SCI	Rishki prohod	11860.774
34	BG0000393	SCI	Ekokoridor Kamchia -Emine	28077.079
35	BG0000574	SPA	Aheloy - Ravda - Nesebar	3928.38
35	BG0000574	SPA	Aheloy - Ravda - Nesebar	3928.38
36	BG0002077	SCI	Bakarlaka	33507.9025
<b>Varna District</b>				
37	BG0002044	SPA	Kamchiyska planina	88891.587
38	BG0000100	SCI	Plazh Shkorpilovtsi	5125.6526
39	BG0000104	SCI	Provadiysko-Royaksko plato	50158.588
40	BG0002038	SPA	Provadiysko-Royaksko plato	84031.504
41	BG0000116	SCI SPA	Kamchia	12929.061
42	BG0000133	SCI SPA	Kamchiyska i Emenska planina	63726.484
43	BG0000132	SCI	Pobitite Kamani	231.33
44	BG0000103	SCISPA	Galata	1624.7271
45	BG0000102	SCI SPA	Polinata na reka Batona	18471.439
46	BG0000191	SPA	Varnesko-Belaslavsko ezero	4686.7767
47	BG0000118	SCI SPA	Zlatni pyasatsi	1374.2989
48	BG0000573		Kompleks Kaliakra	44144.453
49	BG0002082	SPA	Batova	38149.516
50	BG0000132	SPA	Pobitite Kamani	231.3368
51	BG0002060	SPA	Galata	8043.0683

No	Code	Category	Name	Surface (ha)
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\* They belong only in the province Stara Zagora

\*\* Belonging to both provinces

\*\*\* Area extends to Burgas and Varna



Figure 17: Main areas Natura region of interest (Source background: Google earth-<http://natura2000.eea.europa.eu/>)

#### Ramsar Areas

Eleven of the most important wetlands in Bulgaria has been designated as Wetlands of International Importance under the Convention Ramsar (1971) covering an area of 19876 hectares (1,635,010 acres). The Convention has been ratified by Romania on 24 January 1976 With respect to wetlands designated as Wetlands of International Importance (Wetlands Ramsar), the following areas are lakes Atanasovsko, Poda Vaya and Pomorie are within the Gulf of Burgas, while Ropotamo Complex in the coastal zone between Burgas and Varna.

The following are identified in the study area:

**TABLE 2.15: RAMSAR AREAS**

No	Name	Surface (ha)
1	Atanasovsko Lake (Partially Maintained Reserve)	1404
2	Poda	307
3	Pomorie Wetland Complex (Pomorie Lake, Pomoriysko Ezero)	922
4	Ropotamo Complex	5,500
5	Vaya Lake	2,900

#### *National and Natural Parks*

The largest share of protected areas in Bulgaria possess nature parks with rate 44.1% and the national parks with 25.8%<sup>34</sup>.

The management of nature reserves made by the National Forestry Department of the Ministry of Agriculture and Forestry.

Overall in Bulgaria there are three major National Parks that are located away from the study area.

*In the wider study area, are identified two natural parks of Bulgaria, Natural Park of Strandhza and Zlatni pjasatsi, which of course are located along the route of the corridor but are mentioned to this because of the proximity and importance as elements of its wider region.*

#### *Natural Park Strandhza*<sup>35</sup>

With an area of 1161km<sup>2</sup> is the largest protected area in the country. It covers a large part of the mountain of Strandhza in southeastern Bulgaria. 50% of the fauna of Bulgaria has been observed in the park, and the area has 121 habitat types. We have found 600 species of invertebrates, 400 species of vertebrates, 41 species of freshwater fish, 10 species of amphibians, over 20 different species over 20 different species of reptiles, more than 130 breeding birds, over 60 different species of mammals. Note that the region has recorded the greatest diversity of amphibians in Europe and the most impressive deciduous in the continent.

<sup>34</sup> They include areas and from other protected areas.

<sup>35</sup> <http://www.bg-parks.net/>





Figure 18: Nature Park Strandzha

Existing prohibitions and restrictions <sup>36</sup>:

- Is prohibited the harvesting, storage or landfill of hazardous waste, which is listed in the Government Decree № 153/1993 (addition of N 2).
- Is prohibited to transport within the park any waste
- Is prohibited the transfer of non-indigenous species, subspecies, and forms and flora and fauna
- Is prohibited the use of non-native plants or animals resources, in an amount and manner as to endanger the existence of species that negatively affect biodiversity or harass the normal functioning of ecosystems.

#### *Nature Park Zlatni pjasatsi*

The park was designated as a protected area 60 years ago. The forests of the park are developed in parallel with the coastline surrounding the resort of Zlatni Pjasatsi and connected with forests and protected areas around Varna. The park is located 17 km north of the city and covers an area of 1320,7 ha, with an average length of 9,2 km and an average width of 1,2 km.

Existing prohibitions and restrictions <sup>37</sup>:

<sup>36</sup> Ministry of Environment and Water Bulgaria - <http://eea.government.bg/>

<sup>37</sup> Protected Areas Act, 1998, 2012

- ❑ Is prohibited the logging, excluding health reasons and cultures until the completion of a development plan.
- ❑ Is prohibited hunting and organized hunting events.
- ❑ Is prohibited the harassment of wildlife, building nests and shelters for animals and birds, as well as getting someone young and eggs.
- ❑ Is prohibited the collection of flowers, breaking branches and whatever activity destroys vegetation.
- ❑ Is prohibited the operation of quarries and quarry preparation, geological mining and other operations that modify the natural landscape and the water passages.
- ❑ Is prohibited the destruction or deterioration of signs.



Particularly in areas of absolute physical protection (strict nature reserves) are prohibited all activities except for the following<sup>39</sup>:

1. The natural guard of the areas
2. Visit for scientific purposes
3. Pedestrian movement in marked hiking trails, including educational visits
4. Collecting fruits of wild plants and animals for scientific research or for repopulating quantities for other areas, in time and manner that does not disturb ecosystems.
5. Extinguish fires and the collection of waste / environmental cleaning in forests damaged by natural disasters and calamities (New, SG No. 28/2000, amended, No. 77/2002)
6. Hiking trails identified in the relevant 3 of this should be recognized by a directive of the Ministry of Environment and Water.
7. All visits mentioned above in 2 and 4 must be approved by the Ministry of Environment and Water or by authorized officials of the Minister. (Amended, SG No. 103/2009)
8. The activities of above 5 (except fighting) must be approved by the Minister of Environment and Water or by officials authorized by the Minister, following a positive opinion of the Bulgarian Academy of Sciences and the National Council of Biological Diversity.

The existence of other types of protected areas does not change in the ownership of the land in farms and are managed by the owner in accordance with the instructions of official schemes or management plans.

On physical protection management areas (managed nature reserves) prohibits all activities except for the following<sup>40</sup>:

1. The natural guard of the areas
2. Visit for scientific purposes
3. Pedestrian movement in marked hiking trails, including educational visits
4. Collecting fruits of wild plants and animals for scientific research or for repopulating quantities for other areas, in time and manner that does not disturb ecosystems.
5. Preparation of conservation measures, guidance, control and rehabilitation. Described in the Management Plan of the area of protection.

The main area of interest and the surrounding area of the corridor (road and railway line) are presented in the following tables<sup>41</sup>: For the following areas based on the so far survey

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<sup>39</sup> Ministry of Environment and Water Bulgaria - <http://eea.government.bg/>

<sup>40</sup> Ministry of Environment and Water Bulgaria - <http://eea.government.bg/>

<sup>41</sup> Ministry of Environment and Water Bulgaria - <http://eea.government.bg/>

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data of the study group haven't been found maps to depict them. Therefore there may be omissions.

**TABLE 2.16: STRICT NATURE RESERVES<sup>42</sup>**

No	Name	Code / Municipality	Surface (ha)
<b>Yambol</b>	<b>District</b>		
1	Gorna Topchiya	12/ Konevets	164.38
<b>Varna</b>	<b>District</b>		
2	Kamchia	11/Dolni chiflik	849.75
<b>Burgas</b>	<b>District</b>		
3	Ropotamo	53 / Primorsko	1000.70
4	Silkosia	1 / Tsarevo	389.60
5	Sredoka	50 / Malko Tarnovo	607.80
6	Tisovitsa	51 / Tsarevo	749.30
7	Uzunbodzhak	15 / Malko Tarnovo	259.60
8	Vitanovo	36 / Malko Tarnovo	112.4

**TABLE 2.17: MANAGED NATURE RESERVES<sup>43</sup>**

No	Name	Code / Municipality	Surface (ha)
<b>District</b>	<b>Burgas</b>		
1	Atanasovsko Ezero	33/ Burgas	1074.50
2	Pyasachnata Lilia	20/Sozopol	0.60
3	Velyov Vir (Vodnite Lilii)	22/Primorsko	13.6

<sup>42</sup>Protected Areas Act, 1998, 2012

<sup>43</sup>Protected Areas Act, 1998, 2012

No	Name	Code / Municipality	Surface (ha)
<b>District</b>	<b>Varna</b>		
4	Kirov Dol	27/Dolni chiflik	53.5
5	Varbov Dol	23/Asparuhovo	70.6
<b>District</b>	<b>Yambol</b>		
6	Valchi Prohod	12/ Dolni chiflik	43.1
7	Balabana	17/Elhovo	76.98

## Environmental pressures - pollution sources

### Water

With regard to water, the period from 2006 to 2009 used less water so the quality was improved. The provinces with the lowest interest water quality in relation to the rest of Bulgaria.

Water quality along the Black Sea coast is improved from north to south. According to data from the 2010 Bay of Varna and Burgas had poor water quality.<sup>44</sup>

### Air pollution

Bulgaria is among the areas with the biggest problem of air pollution among the European Union countries<sup>45</sup>.

The last 20 years, there are constant improvements in the quality of the environment in Bulgaria. The total concentrations of pollutant loads in air are reduced but the problem has not been eliminated, as observed across the country concentrations of pollutants in excess of normal levels. The last decade has seen a decrease of 60% at concentrations of air pollutants, but levels remain above the European average in several areas. *The southern regions, meaning the regions that the corridor is passing are included in the studied areas with the greatest risk to human health from air pollution.*

According to the reference of the European Environmental Bureau EAD Bulgaria has the largest concentration of two basic types of suspended particles which are usually derived from airborne droplets or vehicle exhaust. As suspended particles (Suspended Particulate Matter, SPM) characterize each body, solid or liquid, other than water, which is dispersed

<sup>44</sup>General Transport Master Plan Of Bulgaria Environmental Assessment of General Transport Master Plan 2010

<sup>45</sup> "Air quality in Europe — 2013 report" EEA European Environment Agency

and has a diameter greater than 0.0002 microns and smaller than 500 microns. Dust, smoke, fly ash are examples of suspended particles. Some particles are large or dark, that become visible as smoke, while others are so small that they can only be detected by electron microscopy. The concentration of airborne particles in clean air is of the order of 10 mg / m.<sup>46</sup>

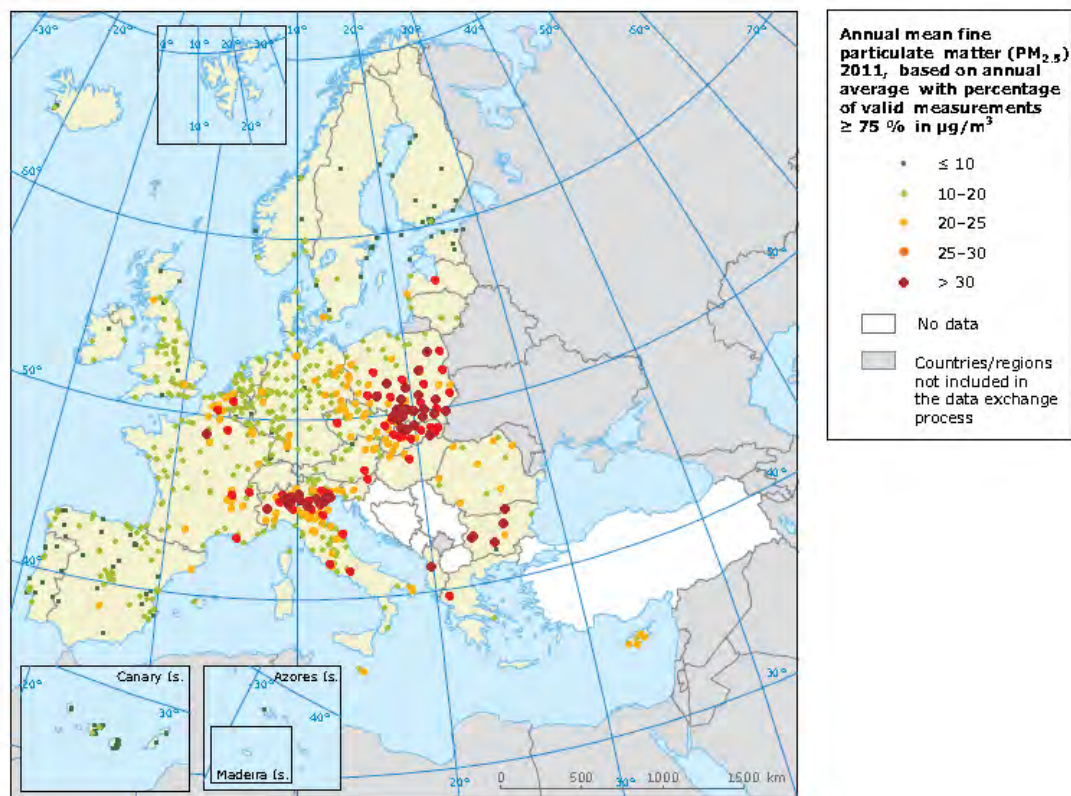
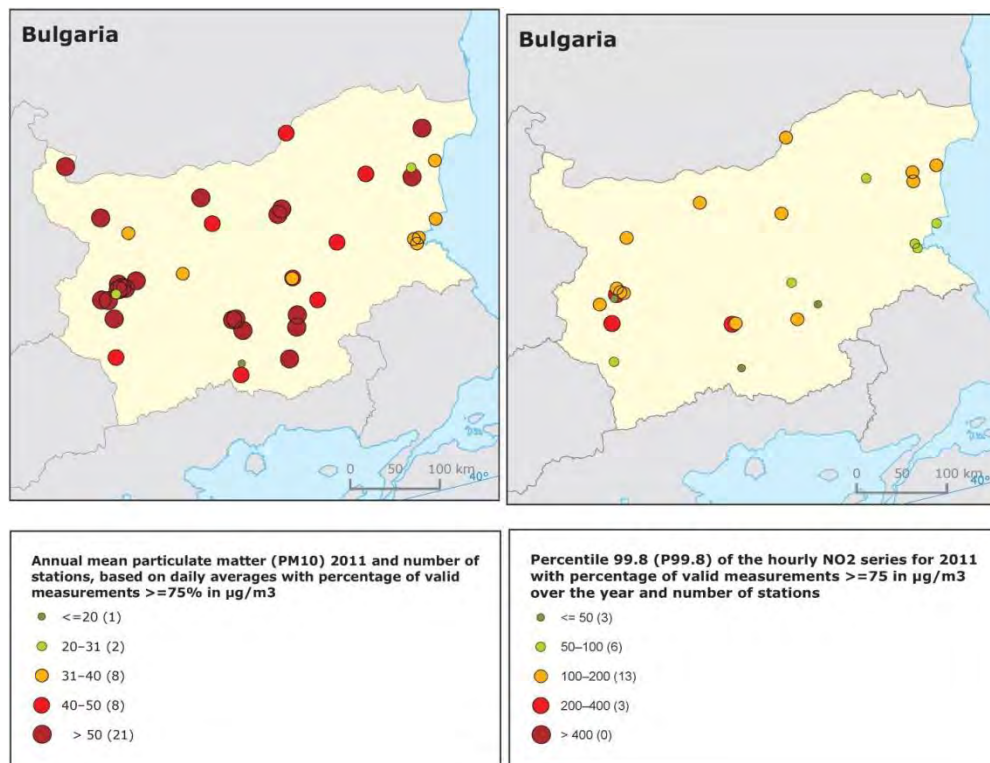


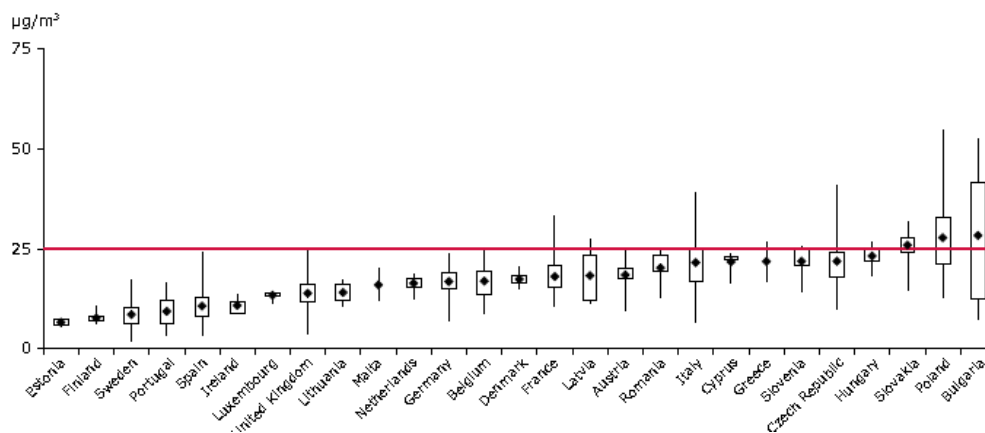
Figure 20: Annual average concentration of PM2.5 in 2011 (Air quality in Europe – 2013 report” EEA European Environment Agency)

<sup>46</sup> <http://www.air-quality.gr/>



**Figure 21: Concentrations of PM10 and NO2 in Bulgaria (Source: Air pollution fact sheet 2013 EEA European Environment Agency)**

**Figure 2.4 Attainment situation for PM<sub>2.5</sub> in 2011**



**Graph 2-2: Concentrations of PM2.5 to 2011 (Air quality in Europe — 2013 report” EEA European Environment Agency)**

Four of the five cities with continued high levels of particulate matters are found in Bulgaria. Pernik a mixed city in the southwestern part is at the top of the list. (see Figure 20 and



Figure 21). The regions of Varna and Burgas located in the study area appear to have high concentrations<sup>47</sup>.

It also presents the greatest concentrations of carbon monoxide and sulfur dioxide. In the following charts and maps is illustrated the current situation in the concentrations of these contaminants.

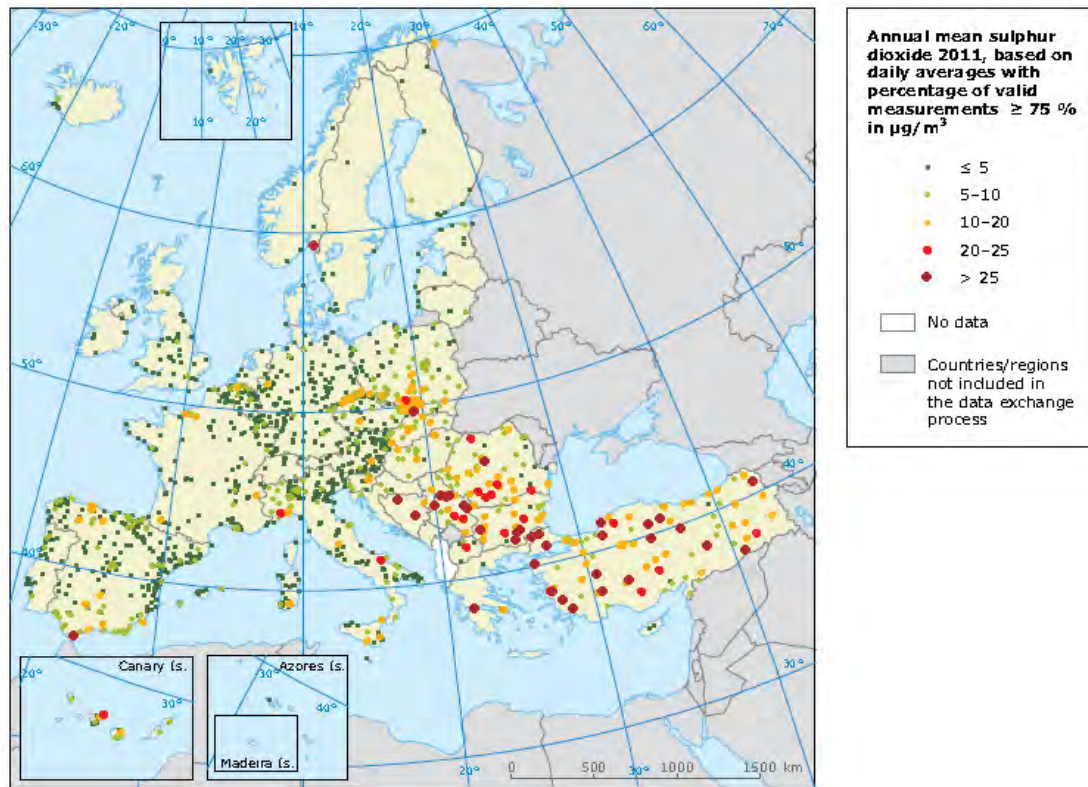
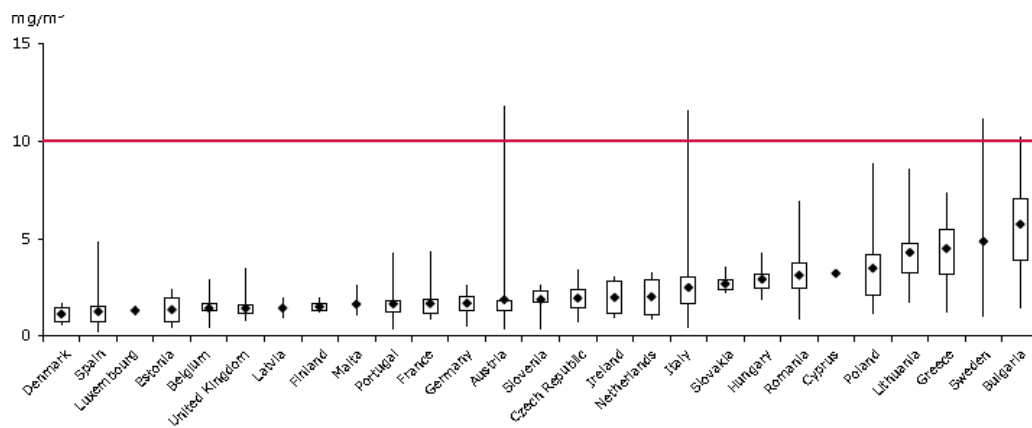


Figure 22: Annual average SO2 concentrations for 2011 (Air quality in Europe — 2013 report” EEA European Environment Agency)



Graph 2-3: Maximum 8-hour average concentrations CO 2011 (Air quality in Europe — 2013 report” EEA European Environment Agency)

<sup>47</sup> “Air quality in Europe — 2013 report” EEA European Environment Agency

In the next stage or the next update will be a supplementation of this with information <sup>48</sup> regarding the regions of interest (NE, SE SC), and / or large urban centers runned by the coridor, namely Varna and Burgas.

#### Soil pollution

The soil in the areas of Bulgaria is in good condition as regards content of biogenic elements and the level of pollution by heavy metals and metalloids. *There are problems with the quality of soils in two regions of southern Bulgaria to the south west and South-Central.*

#### Waste management

The latter, the total amount of waste produced in Bulgaria has decreased. Since 1999 the average amount of household waste generated per capita was less than the average in the European Union. The department organized the collection and transportation of municipal waste is available to more and more citizens.

**TABLE 2.18: TABLE OF AREAS SERVED BY SYSTEMS ORGANIZED COLLECTION AND WASTE MANAGEMENT 1999-2012**

Region / Province	Served areas - number													
	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
<b>Country Total</b>	<b>1139</b>	<b>1190</b>	<b>1295</b>	<b>1361</b>	<b>1465</b>	<b>1801</b>	<b>2388</b>	<b>2780</b>	<b>3128</b>	<b>3445</b>	<b>3988</b>	<b>4238</b>	<b>4364</b>	<b>4431</b>
<b>NE Region.</b>	<b>63</b>	<b>72</b>	<b>75</b>	<b>76</b>	<b>78</b>	<b>101</b>	<b>144</b>	<b>249</b>	<b>341</b>	<b>391</b>	<b>494</b>	<b>601</b>	<b>671</b>	<b>671</b>
Varna	37	42	45	45	46	44	70	117	150	150	157	157	157	157
<b>SE Region.</b>	<b>130</b>	<b>144</b>	<b>171</b>	<b>171</b>	<b>185</b>	<b>186</b>	<b>286</b>	<b>336</b>	<b>375</b>	<b>446</b>	<b>515</b>	<b>559</b>	<b>566</b>	<b>589</b>
Burgas	67	69	68	68	74	79	106	141	157	188	194	196	203	214
Sliven	32	35	35	35	35	44	67	67	67	84	110	110	109	110
Stara Zagora	21	30	58	58	66	54	102	115	138	157	157	155	154	156
Yambol	10	10	10	10	10	9	11	13	13	17	54	98	100	109
<b>SC Rwgion.</b>	<b>320</b>	<b>340</b>	<b>352</b>	<b>380</b>	<b>401</b>	<b>578</b>	<b>807</b>	<b>852</b>	<b>910</b>	<b>989</b>	<b>1065</b>	<b>1076</b>	<b>1081</b>	<b>1063</b>
Haskovo	24	30	34	32	30	75	149	150	124	167	197	212	206	211

(SOURCE: STATISTICAL OFFICE OF BULGARIA, [HTTP://WWW.NSI.BG/](http://www.nsi.bg/))

Data on waste and their management by district is given in the table below<sup>49</sup>

<sup>48</sup> requested and if provided

<sup>49</sup> <http://www.nsi.bg>

**TABLE 2.19: MANAGEMENT OF URBAN AND OTHER WASTE, DATA 2012 (SOURCE: STATISTICAL OFFICE OF BULGARIA, HTTP://WWW.NSI.BG/)**

Region / Province	Total municipal waste generated (thousand tonnes) <sup>1</sup>	Served areas - <sup>2</sup>	Population of served areas	Percentage of population served by waste collection systems - %	Collected waste in served areas (thousand tonnes) <sup>3</sup>	Waste collected per capita kg/yr/person	Landfill - number	Total waste in Landfill - (thousand tonnes) <sup>4</sup>	Of these: Municipal waste (thousand tonnes)	Of these: Construction Waste thousand tonnes <sup>5</sup>	Excess capacity of Landfill - m <sup>3</sup>
<b>Country total</b>	<b>3249</b>	<b>4431</b>	<b>7228808</b>	<b>99.2</b>	<b>2508</b>	<b>347</b>	<b>157</b>	<b>3257</b>	<b>2323</b>	<b>554</b>	<b>11391118</b>
<b>NE Region</b>	<b>296</b>	<b>671</b>	<b>946807</b>	<b>98.9</b>	<b>296</b>	<b>313</b>	<b>22</b>	<b>369</b>	<b>251</b>	<b>21</b>	<b>1150095</b>
Varna	146	157	473213	100.0	146	309	10	207	102	10	319846
<b>SE Region</b>	<b>404</b>	<b>589</b>	<b>1046400</b>	<b>98.0</b>	<b>394</b>	<b>377</b>	<b>26</b>	<b>420</b>	<b>394</b>	<b>15</b>	<b>985916</b>
Burgas	199	214	404478	97.7	196	484	13	205	196	2	674397
Sliven	59	110	195345	100.0	59	303	2	68	61	4	230000
Stara Zagora	112	156	317927	96.4	108	341	8	115	108	6	81519
Yambol	34	109	128650	100.0	34	263	3	32	29	3	0
<b>SC Region</b>	<b>520</b>	<b>1063</b>	<b>1450930</b>	<b>99.2</b>	<b>540</b>	<b>372</b>	<b>27</b>	<b>570</b>	<b>484</b>	<b>14</b>	<b>1937049</b>
Haskovo	77	211	239374	99.0	77	320	4	101	95	6	316090

<sup>1</sup> The data are results of statistical estimation of the amounts of municipal waste from client and unserved settlements. Not including cached waste.

<sup>2</sup> Areas served by organized collection systems.

<sup>3</sup> Has been an assessment of collected municipal waste

<sup>4</sup> Since 2004 included civil, materials and waste. Analyzed in the following columns

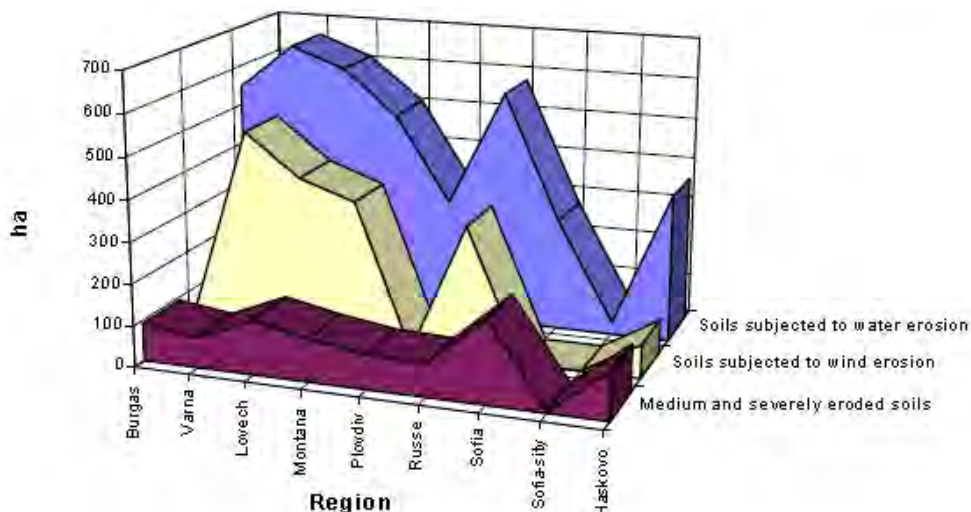
<sup>5</sup> Since 2008, included demolition waste.

### Soil erosion

Bulgaria dealt a corrosion problem of the soil surface, mainly due to water and air. Studies have shown that over 80% of arable land and 15% of forest areas subject to erosion due to water, while 37% due to air blowing. Erosion due to irrigation may potentially affect 0.5x 106ha, which represents 50% of the irrigated land in the country. It has been found that erosion occurs in regions with slopes greater 2% for gravitational corrosion and 8% for irrigational corrosion.

According to surveys<sup>50</sup> in areas with moderate to high corrosion problems was found that:

- The sites with the most erodible areas are located in northern Bulgaria: Varna, Lovech, Ruse and Burgas, ie in two provinces through which the corridor. The catchment area ranging from 0.55 to 0.65 x 106 ha.
- The most heavily corroded areas are in the provinces of Sofia, Lovech and Haskovo. For the Province of Haskovo (by passing the corridor) the area is estimated at 0.1 x 106 ha.



**Graph 2-4: Condition rural areas compared to erosion by wind and water**

(Source: Soil Erosion Control under Conditions of Private Agriculture in Bulgaria KROUMOV Victor, DOCHEV Grozyu)

### Black Sea coastal erosion

Then a problem occurs directly affected mainly the coastal areas of Bulgaria and is considered important because the study corridor includes two major ports in the Black Sea, to the Varna and Burgas.

Generally, coastal erosion is a process due to anthropogenic or not (geological, tectonic, etc.) and factors regarding the retreat of the coastline profile coastal areas. To 70% around

<sup>50</sup>Soil Erosion Control under Conditions of Private Agriculture in Bulgaria KROUMOV Victor, DOCHEV Grozyu

the coast of Bulgaria eroded, while over 48% of sandy beaches suffered erosion in recent decades. The rates of eroding coasts have increased since the 60s, mainly because of uncontrolled urbanization and the various human activities in the coastal zone, such as building reservoirs, sand extraction, coastal engineering projects, etc..

At times they have implemented various projects to protect the coastline, as cantilevers (groins), dikes (dykes), breakwaters (breakwaters) and Sanitation projects coast (beach nourishment) to a very small scale, serving more tourism purposes rather than for protection<sup>51</sup>

The most vulnerable - low-lying areas along the Bulgarian coast are shown on the map below in red.

The most dangerous are: the area around the city of Varna, the area of the river Kamchia, the resort Sunny beach, and the towns of Pomorie and Burgas<sup>52</sup>. *Almost all areas are above the zone of influence of the road section of the corridor, near the port of Interest.*

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<sup>51</sup> <http://www.climateadaptation.eu/>

<sup>52</sup> HUMAN POPULATION PRESSURE, NATURAL AND ECOLOGICAL HAZARDS ALONG THE BULGARIAN BLACK SEA COAST Atanas Palazov, Hristo Stanchev 2006

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Figure 23: Vulnerable areas of the coastal zone area of interest

(Source: HUMAN POPULATION PRESSURE, NATURAL AND ECOLOGICAL HAZARDS ALONG THE BULGARIAN BLACK SEA COAST Atanas Palazov, Hristo Stanchev 2006)

## 2.3 ECONOMICS PERSPECTIVE

### 2.3.1 Analysis of the current status of the region.

#### General

The transit corridor area which is the focus of this study includes the Greek Regional Units (former prefectures) of Evros and Kavala/Thasos and the Bulgarian Provinces of Burgas and Varna. The Sea2Sea transport development hubs include the Greek ports of Kavala and Alexandroupolis and the Bulgarian ports of Burgas, Varna and Ruse. Lastly, the network that connects, or will connect the hubs falls under the control of the Greek and Bulgarian Railway companies in their current legal form and structure.

#### Region

##### *Regional Unit of Evros*

The former Evros Prefecture is located in the north-eastern part of Greece, on the country's natural border with Bulgaria to the north and Turkey to the east; it is one of the three tricountry points in Greece. Its boundaries remained unchanged when it became a regional unit under the Kallikratis local government reorganisation plan (2011). Distance-wise, it is the most remote regional unit, farthest away from Athens. The capital of the unit, Alexandroupolis, is 840 km from Athens, 340 km from Thessaloniki, 295 km from Istanbul, and 60 km from Komotini which is the administrative centre of the region of Eastern Macedonia and Thrace.

The basic geographic data for the Evros regional unit are the following:

- ✚ Area: 4,242 km<sup>2</sup>
- ✚ Population: 149,354
- ✚ Population Density: 35.2 inhabitants/km<sup>2</sup>

Evros has a generally flat landscape. Only 10.3% of the area consists of mountain ranges, whilst extensive plains cover 62.4% of the region, much of which is cultivated. The presence of the many Evros river tributaries and numerous irrigation channels make an important contribution to agricultural cultivation.

The main occupation of the inhabitants is cultivation of the land and the production of agricultural products, both individually, and collectively through local cooperatives. The region's farmers mainly grow cotton, wheat and beets. Livestock is the second most important source of employment for residents in the outlying districts of the region, although this sector is undergoing a substantial decline. Evros was once responsible for the major share of meat production in Greece.

Today the tertiary sector is constantly increasing in importance against primary production. A greater and greater proportion of the population, predominantly young people, are turning to service sector occupations. Recent years have seen significant tourism development in the region. More and more new luxury hotel complexes are being built along the coast, increasing the accommodation capacities of Alexandroupolis both in

number of beds and quality of service. There are two protected areas in the region, the Forest of Dadia and the River Evros wetlands, where agritourism accommodation and ecotourism centres have been established. A youth festival is held near the River Ardas every year.

The administrative capital and largest city of the regional unit is Alexandroupolis. Alexandroupolis has a population of 58,125 inhabitants (2011 Census) and covers an area of 642,245 km<sup>2</sup>. The city is a major port and commercial centre in north-eastern Greece.

**TABLE 2.20: POPULATION GROWTH IN ALEXANDROUPOLIS OVER TIME**

YEAR	RESIDENTS
1951	18,916
1961	21,209
1971	25,529
1981	35,799
1991	39,261
2001	50,017
2011	58,125

Alexandroupolis is a rapidly expanding modern city with well-designed town planning arrangement. It is one of the most important transport hubs, and there is easy access via all means of transport - air, rail, road and coastal ferry. Noteworthy infrastructure works include the modern international port facility, the Egnatia Motorway, and the railway network link to major cities, which combine to make the city a commercial hub and create the appropriate conditions for its further development in the future.

#### *Regional Unit of Kavala*

The regional unit of Kavala is part of the region of East Macedonia and Thrace and borders on the regional units of Serres to the west, Drama to the south west, and Xanthi to the north. To the south lies the Aegean Sea.

The basic geographic data for the Kavala regional unit are the following:

- ✚ Area: 2,111 km<sup>2</sup>
- ✚ Population: 124,917 residents
- ✚ Population Density: 59.17 residents/km<sup>2</sup>

The terrain of the prefecture is mountainous over 55%, gentler hills cover 24%, and 21% are lowlands. The terrain of the region is dominated by three major mountain ranges: Pangaio in the west, on the borders of the Serres regional unit, the mountains of the basin in the north east, on the borders of Xanthi and Drama, and the Symbolos range in the south west, opposite and parallel to the Pangaio Mountains. Lying between these mountains, and at their lowest extremities, are the lowland areas of the region. The most important watercourse of the prefecture is the Nestos River, which flows along the boundary line of the Prefecture of Xanthi, providing irrigation for the fertile plain of Chrysoupolis.



The region's coastline, spanning the distance between the mouths of the rivers Strymona and Nestos, has, on the western side, a generally uniform gently sloping appearance. As it turns towards the north at the foot of the Symbolos Mountain Range, it becomes steeper and more sharply defined, continuing without easy access to landfall from the sea as far as the Vrasidas Peninsular at Nea Peramos, the western boundary of the Gulf of Kavala. After this, it is followed by the bays of Eleftheres, Palio, Toskas, Bati, and Kalamitsa as far as the distinctive coastal indentation where the key port facility of Kavala is located.

The administrative capital and largest city of the prefecture is the city of Kavala. The Municipality of Kavala has a population of 70,501 (2011 Census) and the city of Kavala itself has 54,027 residents.

**TABLE 2.21: POPULATION GROWTH IN KAVALA OVER TIME**


YEAR	RESIDENTS
1951	42,261
1961	44,978
1971	46,887
1981	57,248
1991	57,461
2001	59,222
2011	54,027

The city of Kavala began its transformation into a modern urban centre after the 1920s, when the population increased rapidly due to the large number of refugees who came to settle in the city after the 1922 Asia Minor Catastrophe. Today it has the second largest population of Macedonia and Thrace, after Thessaloniki. The increase in population also drove the early development of the industrial sector. The greater proportion of the city's residents is now employed in the tertiary sector. Kavala Oil operates here, the only unit in the country extracting and desulphurising hydrocarbons from the Prinos oil field. The only phosphoric fertilizer production facility in the country also operates here in Kavala. There are dozens of other units providing thousands of jobs in the city's industrial zone; the most significant being marble processing and glass manufacture. The expansion of commercial trade has necessitated construction of a new port in the industrial area of the city. Construction work on the new 'Philip II' Port in Kavala began in 1990, and the West Quay has already been completed. Since October 2002 all port facility mechanical equipment has been relocated to it, and commercial freight traffic is now serviced there.

#### *Province of Burgas, Bulgaria*

The Bulgarian province of Burgas is the largest province in the country, located at its south east perimeter on the south eastern shores of the Black Sea. To the south it borders on Turkey.

The basic geographic data for the Province of Burgas are as follows:

 Area: 7,748 km<sup>2</sup>

- ✚ Population: 409,018 residents
- ✚ Population Density: 52.79 residents/km<sup>2</sup>

**TABLE 2.22: POPULATION GROWTH IN THE PROVINCE OF BURGAS OVER TIME**

YEAR	RESIDENTS
1956	352,812
1965	387,252
1975	420,268
1985	449,237
1992	440,372
2001	423,608
2011	415,887

The province of Burgas is one of the most developed regions of Bulgaria. The main activities in the province are wine production and tourism, which is especially developed along the Black Sea coast.

The capital and largest city of the province is the city of Burgas, which is also the fourth largest city in Bulgaria after Sofia, Plovdiv and Varna. Burgas has a residential population of 200,271 (2011) and is located at the western-most point of the Black Sea, in the large bay of the same name. Burgas is a large industrial centre, transport hub and tourist destination. The largest refinery in south east Europe (LUKOIL Neftochim Burgas) is also located in the vicinity.

**TABLE 2.23: POPULATION GROWTH IN THE CITY OF BURGAS OVER TIME**

YEAR	RESIDENTS
1956	72,526
1965	106,185
1975	144,755
1985	182,856
1992	195,986
2001	192,390
2011	200,271

#### *Province of Varna, Bulgaria*

The province of Varna covers an area of 3,819.5 km<sup>2</sup>. To the east lies the Black Sea. It covers part of the Danube plain, the plain of Provadiya, the plain of Varna – Denya and the Varna and Beloslav lakes, and the River Kamchiva valley.

The province's natural resources include large deposits of mineral salts, silica and clay. All these raw materials are used for chemical processing in the local glass and cement industries. Silicon is also exported. There are natural gas reserves (the Galata offshore field)

with the potential capacity to produce 2 billion m<sup>3</sup>, which could cover 15% of Bulgaria's demand for natural gas. There are also deposits of manganese.

**TABLE 2.24: POPULATION GROWTH IN THE PROVINCE OF VARNA OVER TIME**

YEAR	RESIDENTS
1956	314,214
1965	366,855
1975	431,024
1985	464,807
1992	462,970
2001	462,013
2011	475,074

The city of Varna is the capital and largest city of the province, and the second largest city of Bulgaria.

**TABLE 2.25: POPULATION GROWTH IN THE CITY OF VARNA OVER TIME**

YEAR	RESIDENTS
1956	120,345
1965	180,633
1975	253,039
1985	302,816
1992	308,601
2001	312,889
2011	334,870

The city's economy is based on services with 61% of its revenue derived from commercial trade and tourism, 16% from industry, 14% from transport and 6% from construction. Financial services, and particularly banking, insurance and real estate, are growing rapidly, while the global financial crisis of 2008 has not seriously affected the local economy. The city lies on the easternmost edge of Pan-European Corridor 8, while it connects to corridors 7 and 9 via Ruse. The main economic activities of the city have traditionally included transport and shipbuilding.

#### *Province of Ruse*

The province of Ruse or Ruse is located in northern Bulgaria on the borders of Romania, from which is separated by the Danube River. As of 2010, the only bridge across the Danube on Bulgarian territory is to be found in the province. The province covers an area of 2,803.4 km<sup>2</sup>.

**TABLE 2.26: POPULATION GROWTH IN THE PROVINCE OF RUSE OVER TIME**

YEAR	RESIDENTS
1956	236,117
1965	273,226
1975	305,722
1985	315,762
1992	290,800
2001	266,213
2011	235,252

The capital and largest city of the province is Ruse, the fifth largest city in Bulgaria. Ruse is located in north eastern part of the country, on the right bank of the Danube, opposite the Romanian town of Giurgiu, at a distance of 75 km from Bucharest and 200 miles from the coast of the Black Sea.

**TABLE 2.27: POPULATION GROWTH IN THE CITY OF RUSE OVER TIME**

YEAR	RESIDENTS
1956	83,453
1965	128,888
1975	159,578
1985	183,746
1992	170,038
2001	161,453
2011	149,642

Ruse is a large industrial centre and has two (east and west) free trade zones. There are also a logistics park and a business park.

The city's economy is dominated by light industry (garments, yarn, food). There are also manufacturers of petroleum-based products (oils) and industrial chemicals (dyes), and the shipbuilding and construction industries are well-established.

Ruse is an important road and rail hub. The city's rail connection to Varna dates back to 1867. Today the railway network connects Ruse to Sofia and to Bucharest, via the bridge over the Danube, which until 2013 was the only road and rail link between Bulgaria and Romania. (A new bridge was opened at Vidin on 14 June 2013).

Ruse is the largest Bulgarian city-port on the Danube.

#### *Conclusions*

- ✚ The corridor region presents considerable development potential for both industry and services on the Greek and the Bulgarian sides.
- ✚ Corridor terminals are all, to a greater or lesser extent, important international transportation hubs.

- ✚ The areas where terminals are located, with the exception of Ruse, have exhibited sizeable tourist development in recent years, which could be put at risk by indiscriminate unregulated development of transport facilities.

## Ports

### *Alexandroupolis*

The port of Alexandroupolis, which is managed by the Alexandroupolis Port Authority (OLA S.A.), is one of the gateways of Northern Greece, together with the ports of Thessaloniki and Kavala, for the movement of goods to and from the countries of Eastern Europe and the Balkans.

The port infrastructure consists of the following:

#### West quay (ferry service)

The quay is 295 m long with a usable depth of -10.00 m (MSL), and is used by the passenger/vehicle ferries on the connecting route to Samothraki and the islands of the north and south east Aegean. The quay has four (4) ramps to accommodate docking of ferryboats.

#### North west pier and tourist yacht moorings

The quay is 150 m long and has a width of 40 to 50 m. The south quay of the pier has a usable depth of -7.40 m (MSL). The north quay of the pier, in conjunction with a section of the north coastal quay provides small pleasure craft with an overall mooring length of approximately 340 metres and a usable depth of -3.00 m (MSL).

#### North commercial cargo pier

This pier extends to the east of the small pleasure yacht mooring facility and has a length of approximately 260 metres. The quay has a usable depth of -8.00 m (MSL) and is used for berthing, loading and unloading of ships carrying (mainly) bulk and general cargo.

#### Commercial quays on the North Pier

The main (north) commercial quay in the west part of the port is 'L' shaped. The west and the south quay of the pier (150 and 260 metres in length respectively) have a usable depth of -8.00 m (MSL) and are used for berthing, loading and unloading of ships carrying (mainly) bulk and general cargo.

#### Fishing boat shelter

The fishing shelter is located on the north eastern boundary of the west section of the port. The total length of the perimeter quayside reaches about 480 metres. The usable depth of these quays is approximately -4.00 m (MSL).

#### Container Terminal

The total length of container terminal quays is about 730 metres, of which 500 m can be used for the vertical movement of containers (Lo-Lo) and the handling of bulk cargoes (quay wall retaining height -14.13 m (MSL)). The remaining 230 metres is used for mixed (vertical and/or horizontal) movement of containers and other unitised loads (Ro-Ro/Lo-Lo) (quay wall retaining height -11.63 (MSL)).

### Inland road and rail infrastructure of the port

The western area of the port has three road entrances (gates), one west of the Customs Office, one near the OSE passenger train station, and there is a third access road entrance at the central (north) pier on Sounion Road.

Four (4) branch lines of the current OSE railway network also terminate at the landside zone in the west section of the port of Alexandroupolis.

### Internal road network, west section of the port

The landside areas in the west section of the port are predominantly tarmacked, without any organised system of internal road demarcation (road lines, roundabouts).

### Vehicle waiting and passenger traffic areas

The ferry service quay in the west section of the port features a tarmacked area for waiting vehicles, with an approximate operating area of 12,600 m<sup>2</sup>.

### Open and covered spaces for cargo handling and storage in the west (old) port area

The north coastal commercial quay in the west section of the port features:

- Open plot of land with a total area 7,000 m<sup>2</sup>, which covers a narrow strip with an average width of 30 metres, behind the quay walls (from the sill to the port traffic zone).

- There is a modern indoor warehouse facility for standard and/or bulk loads with a total floor area of about 2,200 m<sup>2</sup>. This warehouse is located at the east end of the quay, north of the internal vehicle traffic zone in the west section of the port.

The main commercial pier in the west port area has open land with a surface area totalling about 30,000 m<sup>2</sup>.

The west port section also has three general warehouses (TOL type) with a total area of 3,325.65 m<sup>2</sup>.

### Landside space on the container handling pier

The new Port Container Terminal covers a total surface area of 130,000 m<sup>2</sup>, of which 113,000 m<sup>2</sup> is covered with a heavy-duty fibre reinforced concrete (FRC) surface.

Works on the projects to connect the railway to the container terminal and dredge the harbour basin to a depth of -12 m are still in progress.

The historical growth of traffic through the port of Alexandroupolis is presented in the following TABLE 2.28 and TABLE 2.29.

**TABLE 2.28: PASSENGER TRAFFIC**

Year	Passengers			Vehicles		
	Disembarking	Embarking	Total	Disembarking	Embarking	Total
2004	83,684	84,920	168,604	16,395	17,582	33,977
2005	92,169	93,674	185,843	18,112	18,947	37,059
2006	75,456	80,300	155,756	16,611	16,855	33,466

2007	77,687	80,958	158,645	17,963	15,765	33,728
2008	97,613	98,011	195,624	18,935	19,096	38,031
2009	31,926	34,170	66,096	5,913	6,087	12,000
2010	73,395	72,163	145,558	14,443	14,359	28,802
2011	75,298	74,375	149,673	13,831	13,578	27,409
2012	65,963	67,074	133,037	11,969	12,265	24,234
2013 A	20,677	22,214	42,891	2,990	3,479	6,469

Source: OLA

**TABLE 2.29: FREIGHT TRAFFIC (TN)**

Year	Cereals			Other cargo		
	Loaded	Unloaded	Total	Loaded	Unloaded	Total
2004	96,574	32,291	128,865	282,991	369,340	652,331
2005	204,373	68,471	272,844	46,307	335,893	382,200
2006	129,192	56,382	185,574	50,089	305,560	355,649
2007			451,016			
2008			167,541			
2009			376,912			
2010			251,895			
2011	56,123	12,137	68,260	173,430	28,714	202,144
2012	118,860	20,246	139,106	73,840	1,300	75,140

Source: OLA

There is no container traffic passing through the Alexandroupolis port facility at present.

The financial results of the Port Authority of Alexandroupolis operating company OLA S.A. are presented in the following TABLE 2.30 and TABLE 2.31.

**TABLE 2.30: OLA S.A. OPERATING RESULTS (€)**

	2009	2010	2011	2012	2013
Sales	548,739	567,192	931,643	810,271	637,077
Less: Cost Of Sales	-126,947	-141,697	-193,732	-211,667	-230,936
<b>Gross Profit</b>	<b>421,792</b>	<b>425,495</b>	<b>737,911</b>	<b>598,604</b>	<b>406,141</b>
Other Operating Income	33,533	69,891	257,009		
<b>Operating Profit</b>	<b>455,325</b>	<b>495,386</b>	<b>994,920</b>	<b>598,604</b>	<b>406,141</b>
Administrative expenses	-523,898	-408,304	-482,392		
Distribution costs	-49,545	-55,920	-125,833		
Other operating expenses	-4,415	-51,815	-40,958		
<b>Operating results</b>	<b>-122,533</b>	<b>-20,653</b>	<b>345,737</b>	<b>-211,803</b>	<b>44,670</b>
Cost of finance	3,608	-124	-220	0	0
<b>Profit/loss on ordinary activities</b>	<b>-118,925</b>	<b>-20,777</b>	<b>345,517</b>	<b>-211,803</b>	<b>44,670</b>
Investment income/expenses	0	0	0	0	0
<b>Pre-tax profits/losses</b>	<b>-118,925</b>	<b>-20,777</b>	<b>345,517</b>	<b>-211,803</b>	<b>44,670</b>
Income tax	0	0	0	46,000	-23,064
<b>Profit after tax</b>	<b>-118,925</b>	<b>-20,777</b>	<b>345,517</b>	<b>-165,803</b>	<b>21,606</b>

Source: OLA

**TABLE 2.31: OLA S.A. BALANCE SHEETS (€)**

	31.12.2009	31.12.2010	31.12.2011	31.12.2012	31.12.2013
<b>ASSETS</b>					
<b>Fixed Assets</b>					
Tangible fixed assets	758,347	729,915	925,802	899,559	928,827
Intangible Fixed Assets	0	0	960	0	0
Long-term receivables	1,500	1,500	1,500	47,550	40,382
Deferred tax receivables	0	0	0	0	0
<b>Total Fixed Assets</b>	<b>759,847</b>	<b>731,415</b>	<b>928,262</b>	<b>947,109</b>	<b>969,209</b>
<b>Current assets</b>					
Trade and other receivables	289.979	209.696	366.589	488.622	507.152
Cash and cash equivalents	73.709	238.707	304.530	215.961	295.727
<b>Total current assets</b>	<b>363.688</b>	<b>448.403</b>	<b>671.119</b>	<b>704.583</b>	<b>802.879</b>
<b>TOTAL ASSETS</b>	<b>1.123.535</b>	<b>1.179.818</b>	<b>1.599.381</b>	<b>1.651.692</b>	<b>1.772.088</b>
<b><u>EQUITY &amp; LIABILITIES</u></b>					
<b>EQUITY</b>					
Share capital	1.354.741	1.354.741	1.354.741	1.354.741	1.354.741
Capital reserves	0	0	34.241	0	0
Balance carried forward	-888.838	-932.094	-586.577	-718.139	-696.533
<b>Total equity</b>	<b>465.903</b>	<b>422.647</b>	<b>802.405</b>	<b>636.602</b>	<b>658.208</b>
<b>LIABILITIES</b>					
<b>Long-term liabilities</b>					
Provisions for employee benefits	78,532	39,731	42,495		
Deferred tax liabilities	0	0	0		
Future income from state grants	464,855	451,726	435,058		
<b>Total long-term liabilities</b>	<b>543,387</b>	<b>491,457</b>	<b>477,553</b>	<b>547,675</b>	<b>676,215</b>
<b>Short-term liabilities</b>					
Suppliers and other liabilities	82,251	224,666	295,170		
Short-term tax liabilities	31,993	41,048	24,252		
<b>Total short-term liabilities</b>	<b>114,244</b>	<b>265,714</b>	<b>319,422</b>	<b>467,414</b>	<b>437,664</b>
<b>Total liabilities</b>	<b>657,631</b>	<b>757,171</b>	<b>796,975</b>	<b>1,015,089</b>	<b>1,113,879</b>
<b>TOTAL EQUITY AND LIABILITIES</b>	<b>1,123,534</b>	<b>1.179.818</b>	<b>1,599,380</b>	<b>1,651,691</b>	<b>1,772,87</b>



### Kavala

The growth of Kavala necessitated the construction of a new port, managed by the Kavala Port Authority (OLK S.A.), outside the city. A number of studies carried out since 1966 culminated in a proposal for the construction of a new port at Nea Karvali, 8 km east of the city, with direct connection to the Egnatia Motorway (part of the Trans-European road network).

Construction work on the 'Philip II' commercial port began in 1990. Today, the commercial port has a quay length of 400 m, a quay depth of 10.5 m, and cargo handling and warehouse facilities covering 50,000 m<sup>2</sup>. The existing infrastructure can service two 190 m vessels and one Ro-Ro ship simultaneously.

With the completion of expansion projects by autumn 2016, the commercial port will have a quay length of 910 m, with depths up to 12 m and cargo handling and warehousing facilities covering 130,000 m<sup>2</sup>.

Infrastructure at the port of Kavala remains incomplete at present and there is no container traffic.

### Burgas

The port of Burgas is located on the West coast of the Black Sea, at the head of the Gulf of Burgas. It lies at the end of Pan-European Corridor VIII (Para-Egnatia), which runs from Italy via Albania and FYROM. The management of the port belongs to a public authority.

It is one of the two major ports of Bulgaria, and serves all the major industrial centres of the southern Balkans. Rail and road services at the port are very good.

The limited capacity container terminal are located in the west port and include container ship quay facilities with a total length of 200 metres, depths of up to 11 m and available container storage area of 60,000m<sup>2</sup> with 1,330 ground slots. The Master Plan for the port scheduled as far as 2015 provides for construction of a new container terminal with 2 berths and total length of 450 m, and an estimated annual capacity of 150,000 TEU.

Details of recent container traffic through the port of Burgas are given in **Table 2.32** below.

**Table 2.32: CONTAINER TRAFFIC THROUGH THE PORT OF BURGAS CONTAINER TERMINAL**

YEAR	2011	2012	2013(*)
CONTAINERS (TEU)	29.449	46.009	15.330

(\*): 1<sup>st</sup> quarter.

## Varna

The port of Varna is the biggest Bulgarian container port and the main gateway for the export of industrial and agricultural production of northern Bulgaria. It is located on the West coast of the Black Sea, near the Bosphorus Strait and the Danube River. It is characterized by the combination of a favourable geographical position, mild climate, strong industrial hinterland and excellent rail and road access. It is also the meeting point of several European transport routes. Its location and extensive port infrastructure make it an important hub between Europe, Russia, Ukraine, the Caucasus, and the near and far East. It connects to the national road network, i.e. the E-87 linking Varna with Burgas and then with the Turkish border, the 'Hemus' Motorway (Sofia) and E-70 (Varna-Ruse).

The port consists of four separate facilities (Varna East, Varna West, Balchik and Varna Power Station), with 9 specialised stations.

Container traffic is managed at the Varna East terminal. The Varna East container terminal is a functional link in the supply chain for goods in transit to/from central Europe, which are routed through the port of Ruse on the Danube, and then use the Ruse-Varna section of the railway system.

The Varna East container terminal has a landside stacking area of 45,000 m<sup>2</sup>, a quay length of 340 m with a depth of 7.5 m, conventional mobile cranes, 1 bridge crane (30.5 T) and storage capacity of 1,600 TEU.

The Varna-West container terminal is situated near an industrial area, 30 km west of Varna. It is equipped with modern technological equipment for handling transfer of fertilizers, phosphates, soda ash, mineral ores, cement and containers. It has landside stacking areas of 70,000 m<sup>2</sup>, quay lengths of 500 m with a depth of 9 m, and storage capacity for 2,600 TEU.

The port of Varna has restored permanent cooperation with the river port of Ruse, in collaboration with the BDZ and Bulgarian River Shipping Company. They offer a special package of services for transportation to and from central Europe and Yugoslavia as far the Black Sea. The combined intermodal service includes transport along the Danube River, loading onto container cars at Ruse, rail transport to Varna, loading onto seagoing vessels, and vice versa. The Master Plan for development of the port of Varna includes the creation of 3 new container terminals by the year 2020.

**Table 2.33: CONTAINER TRAFFIC THROUGH THE PORT VARNA CONTAINER TERMINAL**

Year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
CONTAINERS (TEU)	78,599	84,000	94,046	99,713	155,326	112,611	118,702	122,844	127,948	131,569

## Ruse

There was traditionally no container traffic through the port of Ruse during the previous years, but the plans of an intermodal station aim to change this course (Just in 2012, Ruse received its first container block (unit) train, for transportation of goods from Austria to Turkey).

## Conclusions

Existing data for terminal ports on the corridor indicates the following:

- ✚ Container handling in the ports lies between zero (for the Greek ports) to negligible (for the Bulgarian), with the greatest volume passing through the port of Varna.
- ✚ All ports lack adequate infrastructure and superstructure to cope with the handling of high volumes of container traffic.
- ✚ All the ports have planned major investments in development of container terminal facilities, though funding remains less than adequate.
- ✚ The financial situation of the port authorities is weak, and they do not appear to have the capacity to pursue independent funding of important projects from their own capital reserves.

## Railways

### Greek Railways

The Greek Railways Organisation is composed of two separate public limited companies. TRAINOSE S.A. is the system administrator, and OSE S.A. is the owner of the infrastructure. Given this duality, the body responsible for implementing investments in rail infrastructure on the corridor is – on the Greek side – ERGOSE.

Financial data pertaining to ERGOSE's activities are given in tables 1.14 & 1.15 below.

**Table 2.34: ERGOSE BALANCE SHEET (€)**

Amounts in EUR	Note	31/12/13	31/12/2012
<b>ASSETS</b>			
<b>Noncurrent assets</b>			
Self-used fixed assets	9.1	33,353.58	34,949.65
Intangible assets	9.2	8,148.04	8,042.98
Other long term receivables	9.3	32,280,724.25	4,580,401.15
Deferred tax receivables	9.8	335,838.23	224,724.09
<b>Total</b>		<b>32,658,064.10</b>	<b>4,848,117.87</b>

<b>Current Assets</b>			
Trade receivables	9.4	6,360,333.92	21,966,706.86
Sundry receivables	9.5	18,978,582.61	4,572,790.75
Cash & cash equivalents	9.6	<u>102,644,224.99</u>	<u>85,335,386.18</u>
<b>Total</b>		<b><u>127,983,141.52</u></b>	<b><u>111,874,883.79</u></b>
<b>Total assets</b>		<b><u>160,641,205.62</u></b>	<b><u>116,723,001.66</u></b>
<b>EQUITY &amp; LIABILITIES</b>			
<b>Equity</b>			
Share Capital		300,000.00	300,000.00
Other reserves	9.7	4,444,236.74	4,444,236.74
Balance brought forward		35,085,713.17	32,856,393.92
<b>Total equity</b>		<b>39,829,949.91</b>	<b>37,600,630.66</b>
<b>Long term liabilities</b>			
Employee leaving benefit provisions	9.9	1,250,171.70	1,080,617.70
Other provisions	9.10	<u>0.00</u>	<u>892,013.48</u>
<b>Total</b>		<b><u>1,250,171.70</u></b>	<b><u>1,972,631.70</u></b>
<b>Short term liabilities</b>			
Suppliers and associated liabilities	9.11	12,164,861.78	23,986,570.10
Current income tax		1,216,950.46	529,025.50
Other short term liabilities	9.12	<u>106,179,271.77</u>	<u>52,634,144.22</u>
<b>Total</b>		<b><u>119,561,084.01</u></b>	<b><u>77,149,739.82</u></b>
<b>Total liabilities</b>		<b><u>120,811,255.71</u></b>	<b><u>79,122,371.00</u></b>
<b>Total equity &amp; liabilities</b>		<b><u>160,641,205.62</u></b>	<b><u>116,723,001.66</u></b>

Table 2.35: ERGOSE OPERATING RESULTS (€)

Amounts in EUR	Note.	<u>31/12/2013</u>	<u>31/12/2012</u>
Sales turnover	9.13	104,534,352.71	211,651,831.12
Cost of sales	9.15	<u>(100,988,259.33)</u>	<u>(207,835,841.30)</u>
<b>Gross profit</b>		<b><u>3,546,093.38</u></b>	<b><u>3,815,989.82</u></b>
Administrative expenses	9.15	(2,836,251.11)	(3,019,147.89)
Other operating expenses		(231,407.70)	(147,946.34)
Other operating income	9.14	<u>907,090.50</u>	<u>239,627.02</u>
<b>Operating results</b>		<b><u>1,385,525.07</u></b>	<b><u>888,522.61</u></b>
Financial expenses	9.17	(81,287.21)	(85,364.31)
Financial income	9.16	<u>2,742,203.97</u>	<u>1,478,452.04</u>
<b>Pre-tax profits</b>		<b><u>4,046,441.83</u></b>	<b><u>2,281,610.34</u></b>
Income tax	9.18	<u>(1,207,669.39)</u>	<u>(535,984.45)</u>
<b>Operating profits after tax</b>		<b><u>2,838,772.44</u></b>	<b><u>1,745,625.89</u></b>

**Other comprehensive income:**

**Items not included in operating results statements at a later date**

Actuarial profit/(loss) offset	16,238.00	93,559.00
Income tax on other comprehensive income not included in statements at a later date	(4,221.00)	(18,711.80)
		<hr/>
<b>Other total comprehensive income</b>	<b><u>12,016.12</u></b>	<b><u>74,847.20</u></b>
<b>Total comprehensive income after tax</b>	<b><u>2,850,788.56</u></b>	<b><u>1,820,473.09</u></b>

*Conclusion*

- ✚ The economic situation of ERGOSE is tenuous. Its revenue is derived from Greek state and EU grants. ERGOSE can only undertake substantial investment projects if external funding is secured.
- ✚ From existing articles in the press and based on discussions the Consultant had with officials in Bulgaria, it is deduced that the economic situation of Bulgarian State Railways PLC is inadequate and it is accordingly assumed that the execution of ambitious investment projects must be accompanied by external funding.

### 3 CORRIDOR CURRENT STATE ANALYSIS

#### 3.1 PLANNING AND DEVELOPMENT PERSPECTIVE

As mentioned in the introductory chapter of this spatial analysis report, the present chapter is a macroscopic overview of the wider geographic area, which can be considered as a potential "area of influence" of the Sea2Sea corridor, since, a "by-pass" of the Bosphorus Straits –the initial Sea2Sea suggestion – can affect the combined transport market of the Black Sea.

It is obvious that the greater Black Sea basin to which the Sea2SEA corridor could possibly have some impacts, is a very extended area, which includes a large continental portion of the surrounding countries. In more transport – oriented terms, the greater area of influence could include the hinterland of each container port in the basin. However, an in depth analysis of the spatial characteristics of such an extended area, is considered to be beyond the scope of the Sea2Sea project contact.

Instead, this macroscopic overview is more "focused" on the areas (BUT II Regions) which constitute the eligible area of the Black Sea Basin ENI CBC Programme (among which are 2 Greek regions, namely Eastern Macedonia – Thrace and North Aegean). The overview of the transport functions in the Black SeaBasin is based on the sea ports as nodes. Therefore, the following information is based on the "Black seaBasin ENI CBC 2014-2020 Report" (October 2013).

A statistical overview of the Black SeaBasin programme eligible area is provided in the table below.

**TABLE 3.1: OVERVIEW OF THE BLACK SEA BASIN ELIGIBLE AREAS**

COUNTRY	ELIGIBLE REGIONS	TERRITORY(km2)	POPULATION(thousands)	URBAN (%)	RURAL (%)	NB OF CITIES (> 20 000 inhabitants)	DENSITY (people/ km2)
ARMENIA	(whole country)	29 743	2 964	64%	36%	n.a.	104
AZERBAIJAN	(whole country)	86 600	9 356	53%	47%	54	108
BULGARIA	Severoiztochen	13 700	957	73%	27%	4	65
	Yugoiztochen	19 979	1 067	72%	28%	6	53

Feasibility Analysis and evaluation of the viability of multimodal corridor of the approved Action "Sea2Sea" under the Trans-European Transport Network (TEN-T)

COUNTRY	ELIGIBLE REGIONS	TERRITORY(km2)	POPULATION(thousands)	URBAN (%)	RURAL (%)	NB OF CITIES (> 20 000 inhabitants)	DENSITY (people/km2)
<b>GEORGIA</b>	(whole country)	69 700	4 484	53%	47%	13	64
<b>GREECE</b>	Kentriki Makedonia	19 146	1 876	78%	32%	10	100
	Anatoliki Makedonia – Thraki	14 157	608	61%	39%	7	43
	Vorio Agean	<i>n.a.</i>	199	56%	44%	3	52
<b>MOLDOVA</b>	(whole country)	33 846	3 559	42%	58%	9	117
<b>ROMANIA</b>	South-East	35 762	2 546	54%	47%	11	71
<b>RUSSIA</b>	Rostov Oblast	100 800	4 404	68%	32%	<i>n.a.</i>	42
	Krasnodar Krai	76 000	5 125	53%	47%	<i>n.a.</i>	67
	Adygea Republic	7 800	450	53%	47%	<i>n.a.</i>	57
<b>TURKEY</b>	Istanbul (TR10)	5 196	13 855	99%	1%	1	2666
	Tekirdağ (TR21)	18 665	1 593	66%	34%	3	85
	Kocaeli (TR42)	20 184	3 376	76%	24%	5	167
	Zonguldak (TR81)	9 493	1 020	52%	48%	3	107
	Kastamonu (TR82)	26 435	746	35%	65%	3	28
	Samsun (TR83)	37 524	2 718	60%	40%	4	72
	Trabzon (TR90)	35 174	2 545	38%	62%	6	72
<b>UKRAINE</b>	Odeska	33 300	2 395	67%	33%	7	72
	Mykolaiv	24 585	1 174	68%	32%	4	48
	Kherson	28 500	1 078	61%	39%	5	38

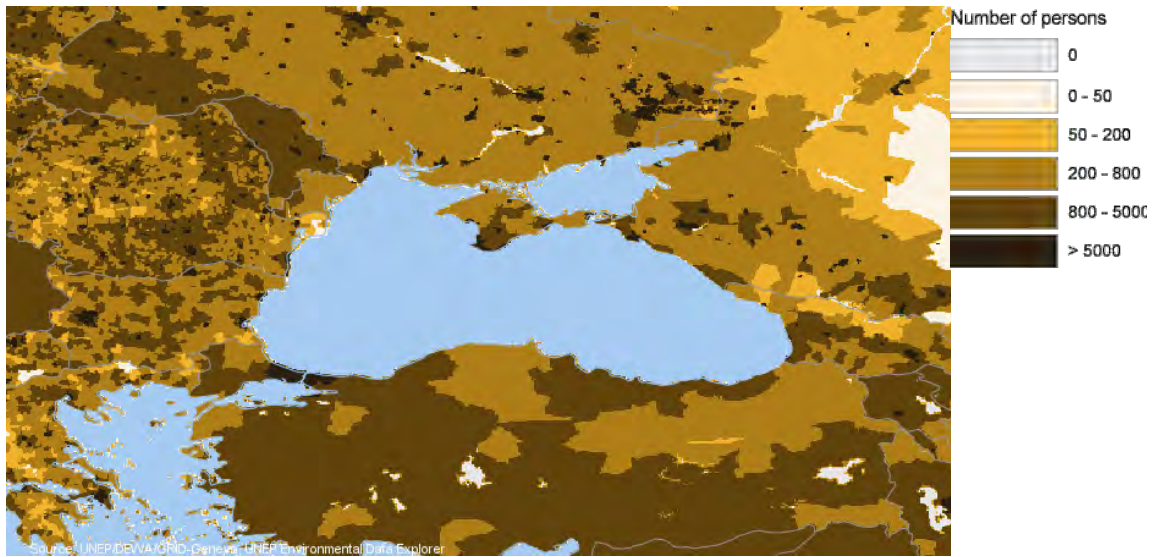
COUNTRY	ELIGIBLE REGIONS	TERRITORY(km2)	POPULATION(thousands)	URBAN (%)	RURAL (%)	NB OF CITIES (> 20 000 inhabitants)	DENSITY (people/km2)
	Zaporosh'ye Oblast	27 200	1 785	77%	23%	6	66
	Donetsk Oblast	26 517	4 375	91%	9%	27	165
	CrimeaRepublic	26 081	1 965	63%	37%	11	75
	Sevastopol	8 635	383	94%	6%	1	444
<b>TOTAL</b>		<b>834 722</b>	<b>76 404</b>	<b>64%</b>	<b>36%</b>	<b>200</b>	<b>91</b>

### 3.1.1 Urban and rural development

In 2012, population density in the Black Sea Basin ENI CBC programme area was 91 people/km<sup>2</sup>, a slight increase since 2005 though below EU average of 120 people/km<sup>2</sup>. The density in Black SeaBasin eligible areas ranges from 2,666 people/km<sup>2</sup> in Istanbul to 28 people/km<sup>2</sup> in Kastamonu, revealing huge discrepancies in territorial development as well as an ongoing urbanisation process (see figure)

The ENI CBC programme is characterised by the inclusion of both large rural areas and of major cities, including three capital cities (Baku, Tbilisi, Yerevan) and the megacity of Istanbul. Since 2005 the urban population in the programme area has increased by 5 points to 64%, a trend that is common to all the regions across the eligible area, though particularly strong in Turkey, as Istanbul itself grew by 2.2 millions (nearly 20%) over the period. Though this urbanisation process does not yet match the EU average (where 74% of the population is urbanised), it gives rise to common environmental and socio-economic challenges to ensure sustainable urban development.



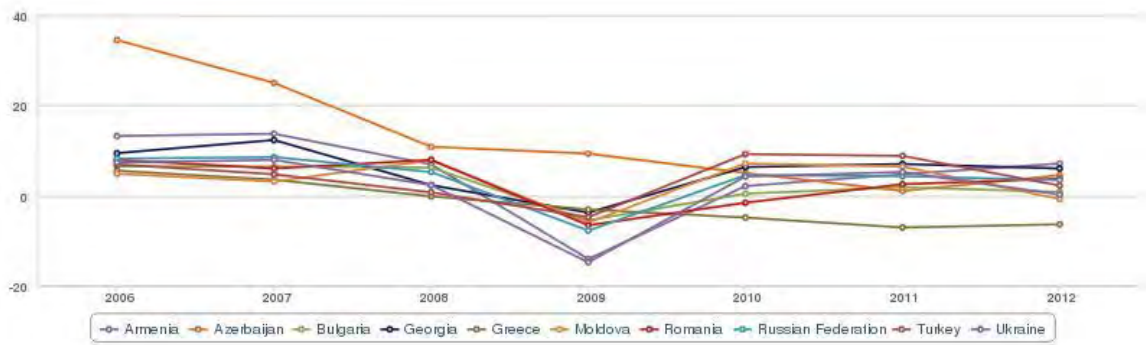


**Figure 24: Black Sea Basin population, 2000**

Another feature of the programme area is the dense population of most coastal zones, which increases considerably during the summer season due to tourism, creating economic opportunities but also putting additional strain on local infrastructure and the environment.

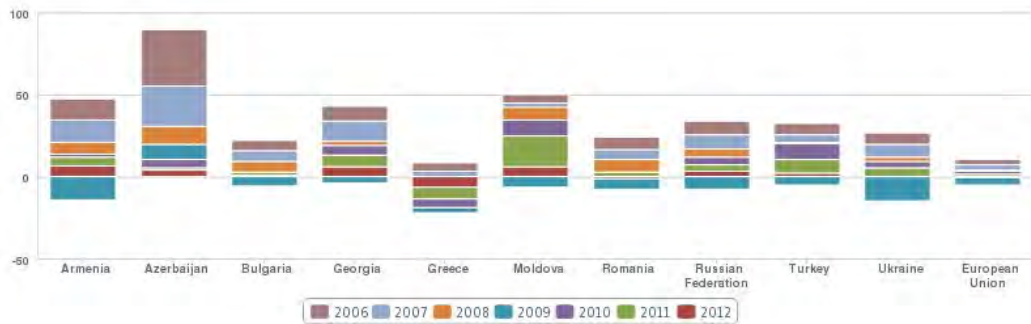
### 3.1.2 Economy

From 2000 to 2008, the Black Sea Basin countries enjoyed a steady growth based on foreign direct investment inflows, credit growth, increases in domestic demand, investment, and in particular export growth to Western European markets. After the short but severe recession that hit the Black Sea region economies following the global financial crisis in September 2008 most of them, except notably Greece, seem to be recovering (see Graph 3-1 below).



**Graph 3-1: Overview of GDP growth trends per year over the period 2006-2012 (annual %)**

Most Black Sea countries economic performance by far exceeded the EU's average over the 2006-2012 period (see Graph 3-2 below). Azerbaijan, Moldova, Georgia and Armenia registered particularly strong growth while on the other hand Greece's economy contracted over the period.



**Graph 3-2: Stacked GDP growth per country over the period 2006-2012 (annual %)**

Growth rates in 2012 still showed considerable variation among countries, with both Georgia and Armenia achieving high rates of growth (above 6%), while sub-national data reflects even greater disparities and persistent difficulties, in particular in eligible regions in Ukraine.

Though economic growth for the Black Sea Basin countries on average remained limited in 2012, it still outperformed the EU, which suffered a contraction of 0.3% overall. The EU recession and continuing problems emanating from the debt crisis limit further economic recovery in the Black Sea region. The EU, and more specifically the Eurozone area, is by far the most significant economic partner of the Black Sea region countries, EU Member States are key trade partners and the principal source of financing and foreign direct investment (FDI) for most Black Sea countries.

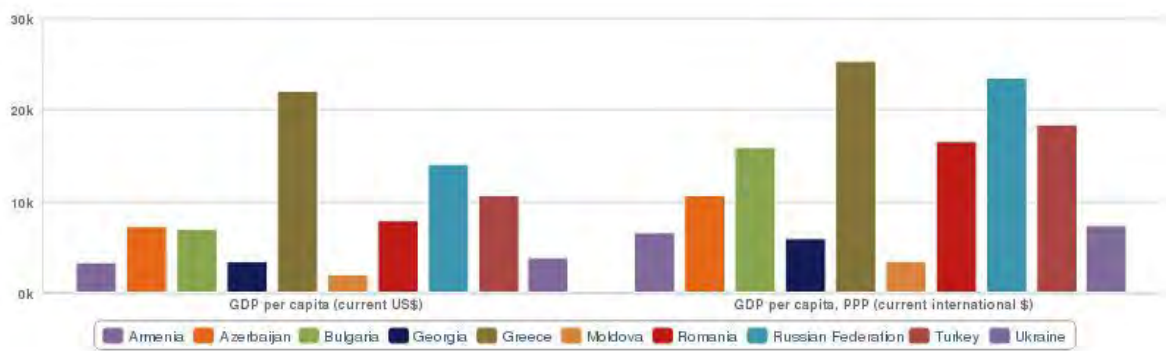
Other key indicators showed stable and sustainable trends in the Black Sea region, in particular the consumer price index that shows a continued trend of declining price pressures over the years. For the first time in 2012, all Black Sea region countries posted single digit rates of inflation, and inflation was below 5% in eight countries.

There has been overall a positive evolution of Black Sea Basin countries global competitiveness, as measured by the Global Competitiveness Index (CGI) of the World Economic Forum. Over the last five years, CGI scores for most countries have increased, meaning the countries improved the set of institutions, policies and factors determining the level of productivity and thus their potential for economic growth and their ability to sustain a high level of income. Between 2008 and 2012, Azerbaijan jumped from 69 to 39 (out of 148 countries) in CGI rankings, replacing Russia (downgraded from 64 to 51) as the most competitive economy of the Black Sea Basin. Armenia, Turkey, Georgia and Bulgaria are the other countries that have most improved their ranking and scoring over the period.

Put in a worldwide context, Black Sea Basin countries main competitive assets are the availability of a healthy and educated workforce and a conducive macro-economic environment (save Greece), while the innovation factor is their weakest point.

The Gross Domestic Product (GDP) per capita figures still reflect large wealth disparities among Black Sea countries (see Graph 3-3 below). GDP per capita in 2012 ranges from \$2,038 in Moldova to \$22,083 in Greece. The average for the region is \$8,139, which corresponds to an upper middle income level.

This average is still four times lower than the EU overall figure in 2012 (\$3,2677), although, considering it was six times lower in 2006, there has been a convergence over the period, driven by stronger economic growth on average in the Black Sea region. When comparing Purchasing Power Parity (PPP), the GDP per capita gap is even smaller, as Black Sea region average figure is only 2.5 times lower than that for the EU.



**Graph 3-3: GDP per capita of Black Sea countries, 2012**

Disparities among Black Sea countries have also reduced over the last few years, mostly due to the different countries growth rates but also to a lesser extent to their disparate demographic trends, notably affected by emigration. As a result the ratio in 2006 of 1 to 22 between the lowest (Moldova) and highest (Greece) GDP per capita figures, dropped to 1 to 11 in 2012 for nominal GDP, and 1 to 7 for PPP (see Graph 3-3 above).

The economic structure in the Black Sea Basin eligible area still shows overall a larger share of agricultural and industrial sectors than the EU average. In terms of economic structure, the countries have in common a long-term decline of the agricultural sector, the rapid growth of the services sector, and the fact that on the expenditure side the private sector accounts for most of the incremental economic growth, led notably by consumer demand.

However the economies of the Black Sea region are very diverse in their structure, e.g. Armenia and Moldova rely on their agricultural sectors, while e.g. Ukraine is still dependent on low value added 'heavy' industry. Most countries are energy importers, but there are also two energy exporters (Russia and Azerbaijan), who rely on these exports to fuel their growth

and face the challenge of diversifying their economies. Even service sector growth tends to take different forms. In some cases retail is more significant, though to varying degrees financial services, tourism, and transport and shipping also play important roles. This may generate complementarities within which regional cooperation may develop.

## 3.2 ENVIRONMENTAL PERSPECTIVE

### 3.2.1 Current state of Corridor's Environment – Greece Section

#### General

For the optimal design of the corridor is considered necessary to identify the most important and most vulnerable and sensitive environmental areas that permeates. This plan will identify any weaknesses or problems related to environmental constraints and commitments, so that in the design phase, to make the definition of the corridor, avoiding as much as possible the most sensitive areas. If it is necessary to cross the corridor through such areas, the next step will investigate the conditions and restrictions set out in the relevant protected zone and explore the possibilities or non-interventions within this.

*The following analysis relates to the existing road and railway axis in a belt area across these. Within the Greek area the two zones are identical and therefore not distinguished.*

#### Major areas of protection

Traversing the land corridor in a zone on either side of the existing road and rail network, from Kavala to Ormenio are found significant protection areas

**TABLE 3.2: PROTECTED AREAS IN THE ZONE OF INFLUENCE OF THE CORRIDOR – GREECE SECTION**

No	Code	Name
	<b>Natura Network</b>	
1	GR1110002	DADIA-SOUFLI FOREST
2	GR1110005	SAC OF EVROS MOUNTAINS
3	GR1110006	EVROS DELTA
4	GR1110007	EVROS DELTA AND WEST BRANCH
5	GR1110008	NEAR-RIVER FOREST OF NORTH EVROS AND ARDA
6	GR1110009	SOUTH FOREST COMPLEX OF EVROS

No	Code	Name
7	GR1130009	LAKES AND LAGOONS OF WIDER AREA AND COASTAL ZONE OF THRAKI
8		LAKES OF VISTONIS, ISMARIS AND LAGOONS OF PORTO LAGOS, ALYKI PTELEA, KSIROLIMNI, KARATZA
	<b>Wildlife refuges</b>	
9		DADIA - LYKOFOS - LEUKIMMI
10		PYLAIA - KAVYSOS - FERES OF FERRES MUNIC.
11		NESTOS STRAITS - LEFT BANK
12		AYIOS TIMOTHEOS - KOUPIA
13		FILIA - SIMANTRA (SELEROU)
14		CHATISIO (KOSMIO)
	<b>Parks</b>	
15		<i>NATIONAL PARK OF EASTERN MACEDONIA AND THRACE</i>
16		EVROS DELTA
17		<i>NATIONAL PARK OF DADIA-LEUKIMMI-SOUFLI FOREST</i>
	<b>Ramsar Areas</b>	
18	3GR004	NESTOS DELTA AND NEIGHBOURING LAGOONS
19	3GR001	EVROS DELTA
20	3GR002	VISTONIS LAKE, PORTO LAGOS, ISMARIS LAKE AND NEIGHBOURING LAGOONS

These areas are located along the route of influence of the corridor. Any modification or improvement of the alignment of the corridor should be made according to the constraints and limitations that are determined by the above areas. The characteristics and commitments in these areas are discussed in the relevant sections of the Deliverable 1.1.

### Environmentally sensitive areas

The most important and sensitive ecosystems in the corridors area as strongly reflected and in the protected areas are: **the Nestos Delta and lagoons, Evros Delta and the Forest of Dadia**. These areas are under protection and have an operator, but faced several problems due to anthropogenic activities, sources of pollution and other causes. Analytical the characteristics and commitments in the above areas are discussed in the relevant paragraphs of the Deliverable 1.1.

Follows a quote of the major problems and concerns in these environmentally sensitive areas, which are located along the corridors area and are directly affected by the its operations.

#### *Evros Delta*

Until the first half of the twentieth century, the form of the Evros Delta remained unchanged. Until then, prior to the construction of the embankment and the basic operation of the pumping stations, large areas of the delta flooded with water. The cycle of erosion and deposition between the sea, the river and the land and the effect of ocean currents along the coast played a major role in shaping the delta, which remains a dynamic system evolution. The normal cycle that has now changed as a result of human intervention in the surrounding basin. Dams, canals, ditches and flood control irrigation projects undertaken in Evros Delta between 1950 and 1980, in order to give land for crops, reduced freshwater supplies and limited free entry throughout the delta while boosted entry of seawater.

From 1956 began the implementation of projects in the delta (dikes, alignment, drainage channels, pumping stations) within the program "Evros - MERIC Project", aimed at draining large areas for farming. With the completion of these works the majority of members and liquid drained soils, while large quantities of fresh water channeled directly into the sea, resulting in reduction of aquifer recharge. Extensive drainage occurring in the coming years and the effort to "control" the river Ebro with mounds and alignments riverbed led to shrinkage and disappearance of important habitats and species. The lowering of groundwater has resulted penetrates the sea, both through the channel and through the sandy surface and fills a large area of the southern delta. Efforts to drying of the delta were not completely successful in creating new agricultural land mainly because of salinization of soils in south-western delta.

Degradation of wetland contributed largely drying Drana from community residents Bath in 1987 and some fish species colonies of nesting birds on the lagoon islands disappeared. The drainage of lagoon Drana had virtually no benefit to the residents and robbed by a major delta habitat and an equally important source of income (farm). It took more than 10 years (particularly in 2000), until the thought matured in the local community and the Prefecture of Evros for the restoration of lagoon Drana and place (2004) through the EU Life-Nature program.

Today, about half the area of the wetland is a protected area, with over 100,000 acres have been drained. Very important regions have been attributed to the culture so that the value of the wetland has been reduced, especially for the breeding of wild animals. Despite the deterioration in the value of the Ebro Delta wildlife is great, especially for birds, which attract many visitors, students, scientists, observers. Evros, according to data collected by the Greek Society of Water Resources, appears to have significant concentrations of nitrogen, phosphorus compared to other rivers of Northern Greece. The greatest burden is imported pollution, as it is a Tri-River, which passing through Bulgaria, Turkey and Greece receives sewage, industrial waste and runoff from crops.

In summary the major problems / threats / pressures shown in the wetland Evros is the following<sup>53</sup>:

- ❑ Reduction of flooded areas and periods of flooding.
- ❑ Worrying sediment reduction and increased coastal erosion.
- ❑ Reduction of populations of rare birds that live in the area.
- ❑ Continued land degradation due to the increase in salinity (salinization of groundwater).
- ❑ Uncontrolled pumping operation to drain land and make farmlands.
- ❑ Significant reduction of populations of rare mammals.
- ❑ Increase the already large number of illegal buildings used by poachers, with a consequent significant degradation of habitat, disturbance to water birds, degradation of flora and pollution by waste accumulated in the area.
- ❑ Gradual degradation of ecosystems and landscape.
- ❑ Overfishing.

#### *National Park of Dadia lefkimis Soufliou*

The name Dadia (refers to codes of Metropolis Didymoteichou from the mid-19th century.), derived from the word «dadi» and relates to the existence of extensive pine forests and logging, which was long ago the main occupation of the inhabitants. At past decades, intensification and systematization of human activities, especially logging, reforestation, deforestation, much of the old forest, affecting wildlife and flora, leading to reduced populations of rare species and change the character of some habitats. At the same time, stronger and different local land exploitation and abandonment of traditional farming form brought changes in vegetation, and today the forest transitions gradually from very dilute in the Lefkimmis and Liras (east and south) in closed and dense to Dadia forest and Soufli

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<sup>53</sup> "Greek Habitats Treaty Ramsar - Evaluation and Protection Management» - WWF- Greek Ornithological Society - Greek Culture and Society Environment - 2009

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(north and west). Other factors that have contributed to the character of the forest is forest policy for the exploitation of pine, grazing, and to some extent the fires, particularly after the extensive fires after the Civil war.<sup>54</sup>

Briefly problems / threats / pressures shown in the park are presented:

- ❑ The biggest threat to the habitat is the risk of fire. The last event was in 2011, thus burning more than 25,000 acres of oaks, pines and farmland.
- ❑ The Dadia Forest has a network of firebreaks and forest roads for access and management of the fire, but the Forestry of Soufli does not have the necessary money from the ministry to maintain the project, while the carrier has not received any public funding.
- ❑ Have been identified major problems in the management of the park, according to letters operators (WWF Greece etc.)<sup>55</sup>

#### *Nestos Delta and Lagoons*

Although the area still retained significant elements of biodiversity, the situation is more a result of negligence and short-range development or other interventions despite proper management. Unfortunately, the design does not take any account of the protection status of the area and does not include adequate measures for conservation. Instead planned projects such as irrigation of Xanthi prefecture abduction huge quantities of water from the Nesto, urban residential development in the coastal zone, and install oil tanks in Lagoon Vassovas outline an alarming picture of the future<sup>56</sup>. In summary the major problems / threats / pressures shown:

- ❑ Changes in the hydrological regime of the river Nestos upstream dams due to the result of fluctuations in the quantity of water in the Nestos Delta and sediment supplied to the delta.
- ❑ Coastal erosion problems in the Nestos Delta.
- ❑ Lagoons degradation of water quality from activities related to aquaculture.
- ❑ Deterioration of water quality due to changes in the salinity of the lagoons.
- ❑ Illegal irrigation.
- ❑ Alteration of riparian vegetation and reproductive effects in fish and amphibians due to changes in the hydrological regime and reduce the temperature of the water.

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<sup>54</sup> Management Agency National Park of Dadia [www.dadia-np.gr http://dadianp.maps.arcgis.com/](http://dadianp.maps.arcgis.com/)

<sup>55</sup>"Letter to National Park Management Body of Dadia-Soufliou-lefkimis», WWF 2009

<sup>56</sup> "Greek Habitats Treaty Ramsar - Evaluation and Protection Management» - WWF- Greek Ornithological Society - Greek Culture and Society Environment - 2009

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- ❑ Drainage of wetland areas for crop establishment.
- ❑ Illegal tourist constructions.
- ❑ Illegal logging.
- ❑ Illegal fishing in the Strait of Nestos, mainly trout
- ❑ Illegal sand extraction.
- ❑ Disposal of solid waste in the river Nestos.
- ❑ Output wastewater into the river Nestos.

### 3.2.2 Current state of Corridors Environment – Bulgaria Section

#### General

For the optimal design of the corridor is considered necessary to identify the most important and most sensitive - environmentally vulnerable areas penetrates. During the planning phase of the corridor will identify any weaknesses and problems associated with environmental constraints and commitments, so that the alignment of the runway to be avoiding as much as possible the most sensitive areas or limiting the maximum extent possible the procedures therein. If it is necessary to pass through the corridor protected areas governed by a regime of environmental commitments, will explore the conditions and limitations specified in each protected area and the potential non-interference in this.

The initial analysis of the areas of environmental protection and general environmental pressures that the area of the road corridor passes through more sensitive and protected areas, even traversing the area between Varna Burgas ua very fragile and vulnerable coastal zone. In contrast, the railway network runs lesser extent terrestrial protected areas in relation to the road. The above conclusion without compromising in any way the environmental value of sites that permeates the railroad corridor gives an overview of the situation and identify a major drawback of the road route options.

*Then the following analysis relates to the existing railway line and a zone of influence on either side.*

#### Major areas of protection

Traversing the terrestrial R / L corridor from Ormenio and the entrance to the Varna Bulgaria to meet significant protection areas listed in the table below. Italics shows the protected areas within the Bay Varna and Burgas affecting port operations.

**TABLE 3.3: PROTECTED AREAS IN THE ZONE OF THE RUNWAY (R/L)**

No	Code	Name

No	Code	Name
<b>NATURA Areas</b>		
1	BG0000212	Sakar
2	BG0000578	Reka Maritsa
3	BG0002021	Sakar
4	BG0001034	Ostar kamak
5	BG0000441*	Reka Blatnitsa
6	BG0000425**	Reka Sazliyka
7	BG0002022**	Yazovir Rozov Kladenets
8	BG0000192	Reka Tundzha 1
9	BG0000196	Reka Mochuritsa
10	BG0000205	Straldzha
11	BG0002028	Kompleks Straldzha
12	BG0000151	Aytoska planina
13	BG0000270	<i>Atanasovsko ezero</i>
14	BG0000271	<i>Mandra Poda</i>
15	BG0000273	<i>Burgasko ezero</i>
16	BG0000242	<i>Zaliv Chengene skele</i>
17	BG0000393	Ekokoridor Kamchia -Emine
18	BG0002044	Kamchiyska planina
19	BG0000104	Provadiysko-Royaksko plato
20	BG0002038	Provadiysko-Royaksko plato
21	BG0000116	Kamchia
22	BG0000133	Kamchiyska i Emenska planina

No	Code	Name
23	BG0000103	Galata
24	BG0000191	Varnesko-Belaslavsko ezero
25	BG0002077	Bakarlaka
26	BG0002060	Galata
27	BG0000132	Pobitite Kamani
<b>Ramsar Areas</b>		
28		Atanasovsko Lake (Partially Maintained Reserve)
29		Poda
30		VayaLake
<b>Managed Nature Reserves</b>		
31	33	Atanasovsko Ezero
32	23	Varbov Dol
33	17	Balabana

These areas are located along the route of the corridor of influence.

Any modification or improvement of the alignment of the studied corridor should be made according to the constraints and limitations that define the above spaces.

### ***Environmental sensitivities of areas of interest***

The most important and sensitive ecosystems in the rail corridor as reflected in protection areas are shown below.

These areas are under protection and do not appear to have independent management, at least according to the currently available data and research.

Note that due to the large number of protected areas along the zone of influence of the rail corridor were selected in the first major step, without underestimating the environmental value of sites omitted. The next step in the planning phase of the corridor will be examined in greater detail the areas of intervention sites.

Following are given data of important areas in the zone of influence of the corridor.

Are identified several wetlands as they are considered more volatile and vulnerable ecosystems.

### **Complex wetlands - lakes of Burgas**

This is an important wetland complex surrounding Burgas. Specifically included:

- LakePomorie,
- Lake Atanasovsko, protected area (Natura and Ramsar)
- Lake Burgas or Vaya, the largest lake in the country in surface
- Protected area Poda, sometimes considered part of Lake Mandrensko
- Lake Mandrensko, Today a lake with fresh water, the largest in group Lake Atanasovsko<sup>57</sup>

The lake Atanasovsko is a coastal saltwater lake north of Burgas. It has a length of approximately 5km and is divided in two by a sand strip in the middle. It is known for its biodiversity of flora and fauna and is surrounded by canals that drain the entire basin upstream.

Due to the high salinity of the lake water are salt marshes in the region since 1906, producing salt 40000tons time. The road connecting Varna to Burgas is situated on a lane in the middle of the lake.

It is part of the system of lakes Bourgas, and is one of the three most important wetland complexes on meetings of waterfowl along the Bulgarian Black Sea coast.

The area of the lake Atanasovsko now hosts 288 bird species, 127 of which are listed in Red Data Book of Bulgaria and are referred to as BirdLife species of European interest (Species of European Conservation Concern SPEC). Of these, 19 are included in SPEC1 (globally threatened), 28 in category SPEC 2 and 80 in category SPEC 3, as species threatened in Europe. The area provides suitable habitats for 105 species listed in Annex 2 VVA (Bulgarian Biodiversity Act) (requiring specific conservation measures), of which 103 are also listed in Annex I of the EU Directive on Birds.

The lake is located on the Via Pontica migration corridor and is a typical assembly point bird use updrafts of air (soaring birds) during migration from North, Central and Eastern Europe (up to 240000 storks and 60000 raptors). It is the region with the largest concentrations of migratory white pelicans (*Pelecanus onocrotalus*), silver pelicans (*Pelecanus crispus*), Marsh Harrier (*Circus aeruginosus*) and red-footed falcon (*Falco vespertinus*) in Europe and the second for the smallest labeled eagle (*Aquila pomarina*) after Bosphorus. Along with the other lakes of the Burgas is one of the favorite places for overnights of pelicans and storks between the delta of the Danube and the Bosphorus. There are three designated areas of

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<sup>57</sup>Program Life LIFE11 NAT/BG/000362, [www.wikipedia.com](http://www.wikipedia.com) , [www.ramsar.org](http://www.ramsar.org)

protection (Annex I of the Habitats Directive) located in Atanasovsko, but unfortunately the eco-environment of the lagoon is threatened by changes in the hydrological regime, drainage, degraded connection with the sea, pollution and of eutrophication.

#### Lake Burgas or Lake Vaya<sup>58</sup>

The largest lake in the country with an area of 27.60 km<sup>2</sup>, a length of 9.6 km and a width of 2.5 to 5 km. It has a depth of over 103 feet and was a major source of fish production in the past. A large part of its economic importance and environmental balance was lost following the construction of petrochemical plant near the city, because of which there was a decrease of species of the lake and an increase in the levels of contamination.

Wetland of great importance for biodiversity (especially regarding the birds), is a shallow freshwater / brackish water area (the lake water containing a small amount of salt - about 4-11 ‰) associated with marshy areas, extensive reedbeds (largest in the country), aquaculture basins, next to the lake, and is largely overgrown by aquatic vegetation.

In the area are recorded several species of IUCN red list - - 5 invertebrates, 4 fish, 4 amphibians, reptiles 3, 5, birds and mammals 3 The lake is located on the flyway Via Pontica, and is an important intermediate station and stop for a large number of waterfowl, raptors and passerine birds. Every year during the migration and wintering over 20,000 (100,000) waterfowl congregate there, some species more than the limit of 1% of the biogeographical population, including cormorants (*Phalacrocorax carbo*), Pygmy Cormorant (*Phalacrocorax pygmeus*), pelicans (*Pelecanus crispus*), and White-fronted geese (*Oxyura leucocephala*).

Problems: overfishing, sand extraction and petrochemical plant operation.

#### Lake Mandrensko and Pomorie<sup>59</sup>

The lake has a length Mandrensko 8km and 1.5km wide at the maximum point, spanning 38.84 km<sup>2</sup>. It was a natural lake brackish until 1963, when it was converted into a reservoir with a dam structure to ensure clean water for large oil refinery Neftochim Burgas. Rivers Izvorska, Fakiyska, Sredetska Rusokastrenska and flow into the lake.

Lake Pomorie is 6.7km in length and width 1.8-2.0km maximum point, spanning 8.5 km<sup>2</sup>. It is separated from the sea by a thin strip of sand and an artificial mound. It is a brackish water lagoon.

#### Podia Area<sup>60</sup>

It is a marshy wetland and bay located on the outskirts of Burgas, on the Black Sea coast.

Although created as a natural part of the Burgas-Mandra Gulf coastal wetland restricted due to human intervention in the 1960s and later evolved into a mosaic of different habitats - freshwater, brackish, saline and hyper-saline reservoirs, and flooded areas overgrown with

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<sup>58</sup>, [www.wikipedia.com](http://www.wikipedia.com) , [www.ramsar.org](http://www.ramsar.org)

<sup>59</sup>[www.wikipedia.com](http://www.wikipedia.com)

<sup>60</sup>[www.ramsar.org](http://www.ramsar.org)

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aquatic vegetation. The area includes a shallow sea bay Phoros. The area has great importance for the conservation of biodiversity, and hosts more than 260 rare, vulnerable and endangered species of plants and animals, including eight globally threatened bird species and a globally threatened animal species (Otter *Lutra lutra*). The Poda is an important breeding ground for some waterfowl (a mixed colony of Glossy Ibis, Spoonbill - the only place on the Bulgarian coast, where they grow - and five species of herons) and a valuable stopover for migratory birds, as it hosts many winter concentrations of waterfowl, many species are often beyond the limit of 1% of the biogeographical population - (Pelicans *Pelecanus crispus*, Great White Egret *Egretta alba*, piskountoura *Aythya fuligula*, and White-fronted geese *Oxyura leucocephala*).

#### **Lakes Beloslavsko and Varnesko - Varna<sup>61</sup>**

The lake has Beloslavsko 8km length and width from 0.5 to 3.5km. low marshy coast. By 1975 the lake was connected to a navigable channel Varnesko .. Past the lake was fresh water, while today the salinity reaches the 5% o, due to the influx of sea water and chemical waste. The use of water from karstic source Devnya result to reducing the flow of water into the lake and reducing of the lakes volume.

The lake Varnesko is greater in volume (170 million. M3), has a length of 15km and a width of 1.3km and is the deepest lake in coastal Bulgaria, with limited depth of 19m .. on the east by the coast, and the northern coast is swampy and mild and southern steep and tall. Powered by river water via Lake Beloslavsko, groundwater and seawater. Salinity reaches 6.7-7.0‰ in surface layer of water and 8.0‰ o in the lower layers.

#### **Sakar - Haskovo<sup>62</sup>**

The Sakar mountain is near the border with Greece, in the entrance area of the runway in Bulgaria in the river Tundzha, Sokolitsa and Sazliyka, who are in some parts within the influence zone of the rail corridor.

Typical habitats include dry resistant grasses, shrubs (Christ's thorn bush) and mixed oak forests. In many riverbanks still encounter species of white (old white and hybrid poplar trees) that provide good nesting sites for raptors. The area has a rich biodiversity. while many globally threatened species. The diversity of bird species is even richer: 221 types, 59 of them included in the Red List of Bulgaria, and 96 are important at European level. The area is of great importance for the protection of birds of prey in Bulgaria, especially species such as the imperial eagle, the lesser spotted eagle, the eagle, the long-legged buzzard, and the black kite. In the past, the region had favorable conditions for the existence of a population of Egyptian vulture (*Neophron percnopterus*).

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<sup>61</sup> Biogeography and Ecology of Bulgaria - Victor Fet, Alexi Popov

<sup>62</sup> lifeneophron.eu

Locals take advantage of the area extensively with traditional, friendly nature way - with minimal use of chemicals, heavy machinery and land overuse, mainly for farming and agriculture and forestry on a smaller scale.

Activities leading to the loss of biodiversity include:

- ❑ plowing pastures for receiving government subsidies, and then their abandonment,
- ❑ fires in dry pastures and meadows and in coniferous trees plantations,
- ❑ poaching
- ❑ the construction of wind and solar farms in environmentally sensitive areas.

### **3.3 TRANSPORTATION PERSPECTIVE**

#### **3.3.1 Initial corridor definition**

The corridor under study is considered to link the ports of Kavala, Alexandroupolis, Burgas and Varna. Also, for the purposes of a potential further market reach, an extension to the port of Ruse is considered.

In Bulgaria there is a network of railways, featuring diverse characteristics in terms of geometry, capacity and power (electricity) supply, as previously described. According to the information provided, the freight distribution hub located at Plovdiv should be treated as one of grave importance to the operation of the corridor; hence the deviation adrift of any otherwise thought physical fastest route.

The route through Greek territory is quite straightforward, since there is a single option along the only available line that runs through Drama, Xanthi (both north of the port of Kavala), Alexandroupolis and Ormenio.

Even by simple observations one can now define the rail corridors pertaining to the Project as the combination of sub-corridors Varna-Plovdiv, Burgas-Plovdiv, Ruse-Plovdiv and their extensions to Svilengrad-Alexandroupolis, Makaza-Komotini-Kavala and Sofia-Kulata-Thessaloniki.

Of those, the branch Haskovo-Makaza-Kavala is the only one which lacks a considerable length of rail track. Only the missing link connecting the port of Kavala to Toxotes on the rail axis Thessaloniki-Alexandroupolis has an estimated investment cost of 250m euros. This link will be further discussed in the 2<sup>nd</sup> phase. Of the remaining potential corridors, the main contender is Alexandroupolis-Ormenion-Svilengrad-Plovdiv and a possible competitor that of Thessaloniki-Kulata-Sofia-Plovdiv.

Plovdiv is key to market reach, because of the local distribution center hub. Also, the connection Varna - Gorna Oryahovitsa as part of the path to Stara Zagora is preferred because of the higher standards of the network at place. This option also expands Varna's connection with the rest of the inland market (and potentially the waterways and Ruse

northwest) and avoids the degraded north-south link of about 120 km just west of Burgas and Varna.

The port of Kavala, even with a railway connection, is hard to be included in the corridor concept along with the one of Alexandroupolis, since both would work in a competitive way to one another and Alexandroupolis is closer to the border anyway. However, there could be a minor assisting role for the port of Kavala, as could be demonstrated by the predictions in the 2nd phase of this project.

### 3.3.2 The Ports

#### BlackSea

Container ports in the Black Sea are largely feeder ports, serving their local markets, except Constantza which is also a transshipment hub for the Black Sea. Direct deep-sea services were introduced at Constantza from around 2005, following the commissioning of a deep-sea terminal. Subsequently, some direct services also began calling at Ukraine's ports and at Novorossiysk. However, in 2009, the onset of recession led to the suspension of a number of shipping links to the region, including MSC's Far East line, and services by the New World and Grand Alliances. Meanwhile, Maersk and CMA CGM combined to launch a single Far East service using 6500 TEU vessels.

Container throughput at Black Sea ports expanded fivefold over 2001-10 to 2.09mTEU, but this included a huge, 52 percent drop in the recessionary year of 2009 and, in 2010, volumes were still 41 per cent below the 2008.

Apart from Constantza, which serves as a hub for the region, the ports largely serve as gateways for their respective national markets. However, there are also some transit volumes for neighbouring countries.

**TABLE 3.4: BLACK SEA: CONTAINER PORT DEMAND BY COUNTRY, 1995-2010**

	1995	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
<u>'000TEUs</u>												
Romania	68.6	106.0	118.6	136.3	206.4	386.3	776.6	1037.1	1411.4	1380.9	594.3	556.5
Bulgaria	45.6	48.7	57.3	73.0	85.1	105.6	109.0	120.4	130.3	201.3	136.4	142.2
Ukraine	51.6	129.5	163.3	214.4	311.9	397.9	579.5	707.6	1056.2	1242.7	512.3	656.0
Black-Sea Russia	0.0	25.0	38.0	58.6	88.5	134.4	161.8	236.8	380.0	429.9	245.0	485.4
Georgia	10.2	35.2	40.1	49.0	62.6	79.9	105.9	126.9	184.8	253.8	181.6	226.1
Black-Sea Turkey	0.0	0.0	0.0	0.4	3.7	1.5	0.3	5.4	22.3	22.1	21.3	23.1*



*Feasibility Analysis and evaluation of the viability of multimodal corridor of the approved Action "Sea2Sea" under the Trans-European Transport Network (TEN-T)*

<b>Total</b>	176.0	344.4	417.4	531.6	758.2	1105.7	1733.1	2234.3	3185.1	3530.7	1691.0	2089.4
<b><u>Percent share</u></b>												
Romania	38.9	30.8	28.4	25.6	27.2	34.9	44.8	46.4	44.3	39.1	35.1	26.6
Bulgaria	25.9	14.1	13.7	13.7	11.2	9.6	6.3	5.4	4.1	5.7	8.1	6.8
Ukraine	29.3	37.6	39.1	40.3	41.1	36.0	33.4	31.7	33.2	35.2	30.3	31.4
Black-Sea Russia	0.0	7.3	9.1	11.0	11.7	12.2	9.3	10.6	11.9	12.2	14.5	23.2
Georgia	5.8	10.2	9.6	9.2	8.3	7.2	6.1	5.7	5.8	7.2	10.7	10.8
Black-Sea Turkey	0.0	0.0	0.0	0.1	0.5	0.1	0.0	0.2	0.7	0.6	1.3	1.1
<b>Total</b>	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

\*estimated

Figures may not sum exactly due to rounding. Source: Ocean Shipping Consultants

**TABLE 3.5: BLACK SEA: CONTAINER THROUGHPUT BY PORT, 1995-2010**

'000 TEUs	1995	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
<b><u>Romania</u></b>												
Constantza	68.6	106.0	118.6	136.3	206.4	386.3	776.6	1037.1	1411.4	1380.9	594.3	556.5
<i>Total</i>	68.6	106.0	118.6	136.3	206.4	386.3	776.6	1037.1	1411.4	1380.9	594.3	556.5
<b><u>Bulgaria</u></b>												
Varna	26.5	37.3	45.5	59.1	65.1	78.6	84.0	94.0	99.7	155.3	112.6	118.7
Burgas	19.1	11.4	11.8	13.9	20.0	27.1	25.0	26.4	30.6	45.9	23.8	23.5
<i>Total</i>	45.6	48.7	57.3	73.0	85.1	105.6	109.0	120.4	130.3	201.3	136.4	142.2
<b><u>Ukraine</u></b>												
Odessa/Ilyichevsk	51.6											
Odessa		69.5	75.6	111.2	158.9	201.4	288.4	395.6	523.5	572.1	255.5	354.5
Ilyichevsk		60.0*	87.7	103.2	153.0	196.4	291.1	312.1	532.8	670.6	256.8	301.5
<i>Total</i>	51.6	129.5	163.3	214.4	311.9	397.9	579.5	707.6	1056.2	1242.7	512.3	656.0
<b><u>Black-Sea Russia</u></b>												
Novorossiysk	-	25.0	38.0	58.6	88.5	134.4	161.8	226.6	342.2	381.3	234.8	471.4
Taganrog	-	-	-	-	-	-	-	10.3	37.8	48.6	10.2	14.0
<i>Total</i>	0.0	25.0	38.0	58.6	88.5	134.4	161.8	236.8	380.0	429.9	245.0	485.4
<b><u>Georgia</u></b>												
Poti	10.2	35.2	40.1	49.0	62.6	79.9	105.9	126.9	184.8	209.6	172.8	209.8
Batumi	-	-	-	-	-	-	-	-	-	44.2	8.8	16.3
<i>Total</i>	10.2	35.2	40.1	49.0	62.6	79.9	105.9	126.9	184.8	253.8	181.6	226.1
<b><u>Black-Sea Turkey</u></b>												
Trabzon					3.7	1.5	0.3	5.4	22.3	22.1	21.1	23.0
Samsun	-	-	-	0.4	-	-	-	-	-	-	0.3	0.1
<i>Total</i>	0.0	0.0	0.0	0.4	3.7	1.5	0.3	5.4	22.3	22.1	21.3	23.1
<b>Total</b>	352.1	688.7	834.8	1062.8	1512.7	2209.8	3465.9	4463.1	6347.9	7039.3	3201.9	4275.5

\* estimated

Figures may not sum exactly due to rounding.

Sources: Ports & Port authorities (Ocean Shipping Consultants)

## Bulgaria

Container port throughput at Bulgaria's two container ports, Varna and Burgas, increased by 148 per cent over 2001-10, to 0.14m TEU. The ports achieved a record throughput of 0.20m TEU in 2008, caused in part by the transfer of cargoes from Greek ports which experienced severe labour problems during the year, following which volumes dropped by 32 per cent in 2009.

Both ports are served by feeders. At Varna, the principal container port, volumes expanded by 161 per cent over 2001-10, to 0.12m TEU, which was nevertheless 24 per cent below the 2008 level. Imports of consumer goods, as well as inbound and outbound cargo for factories in the local Devnya industrial complex, where much of the country's chemicals factories are based, both fell in 2009. MSC, Bulcon, K Line, Zim and Hapag Lloyd are the main customers at the Burgas Container Terminal.

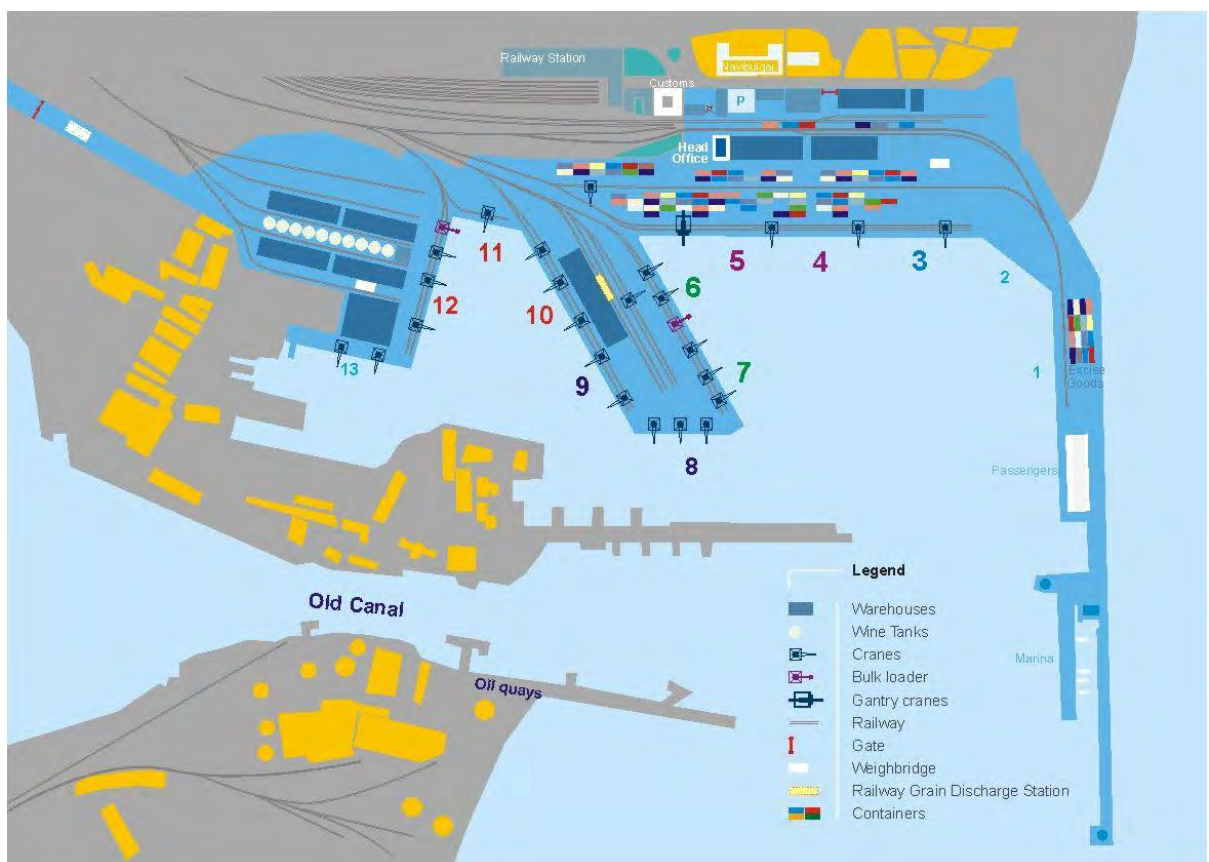


Figure 25: Port of Varna- East Terminal

Commercial port of Burgas hinterland rail connection

The port of Burgas situated in a strategic geographic position in the Black Sea, is forming a bridge between Europe and Asia. It is the largest port in the country of Bulgaria. It is a crucial transport node of the Trans European corridor VIII and the TRACECA corridor.

The area of the commercial port of Burgas is very well connected to the to the national railway network. With a total length of railway tracks of 200 km in Burgas municipality, the railway handles over 5million tons of cargoes per year.



Figure 26: Transport map of existing rail connection in the greater area of the port of Burgas

#### Commercial port of Burgas hinterland road connection

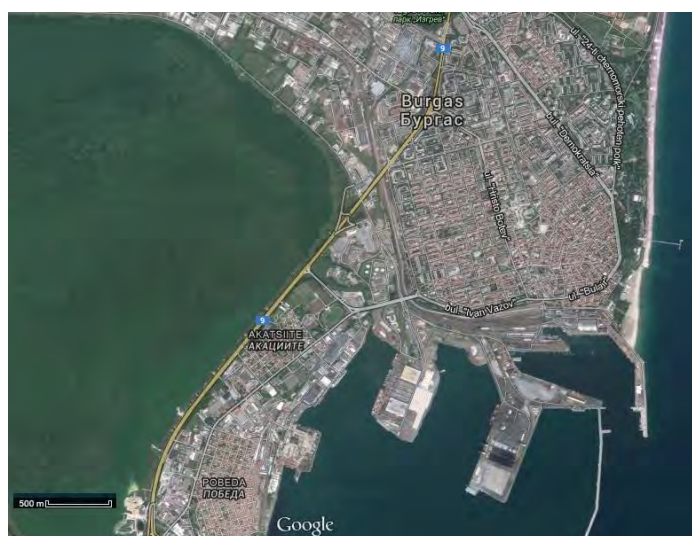


Figure 27: Satellite map of existing road connections to the port of Burgas

The port area of Burgas is good connected via road to the primary national roads of E773 east-west direction and E87 north-south direction which are passing through the city. These primary roads are giving direct access on the east-west direction to the Trakia motorway designated A1 which connects Burgas with Plovdiv and Sofia with a modern highway connection of 140km/h maximum speed for cars. On the north-south direction the existing primary roads are giving direct access to the Chernomorec motorway or the Black Sea motorway designated A5 providing highway connection to the city of Varna. This motorway has not been completed and is not currently under construction, although there are plans for the future.

### **Commercial port of Varna hinterland rail connection**

The port of Varna on the Black Sea is a crossing point of the European Corridor VIII, the international corridor TRACECA and the inland waterway European Corridor VII (Rhine-Main-Danube) as it is close to Ruse, the largest river port of Bulgaria.

The rail connection of the commercial port of Varna with the national railway network is already established and efficient. In the port area, there is a well-forked railway network and a large scale of port facilities that allow the handling of practically all kinds of cargoes also including containerised loads.



**Figure 28: Transport map of existing rail connection in the greater area of the port of Varna**

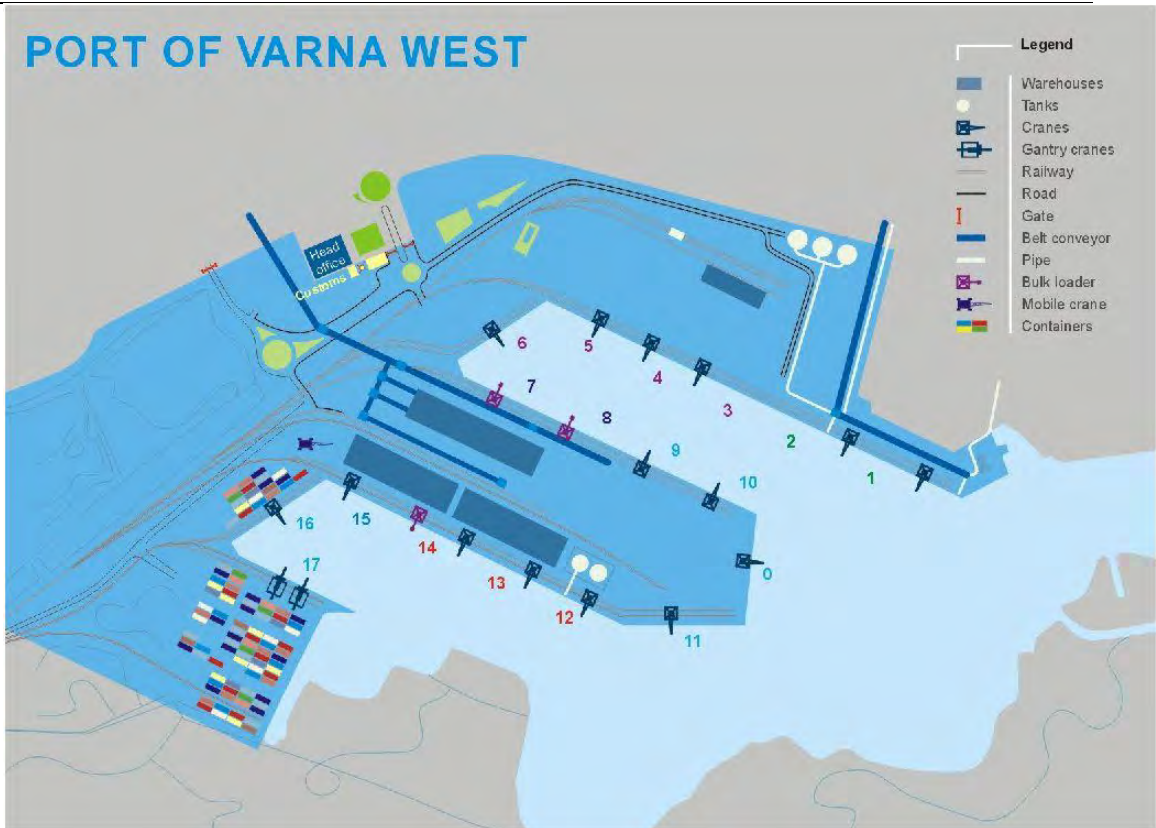
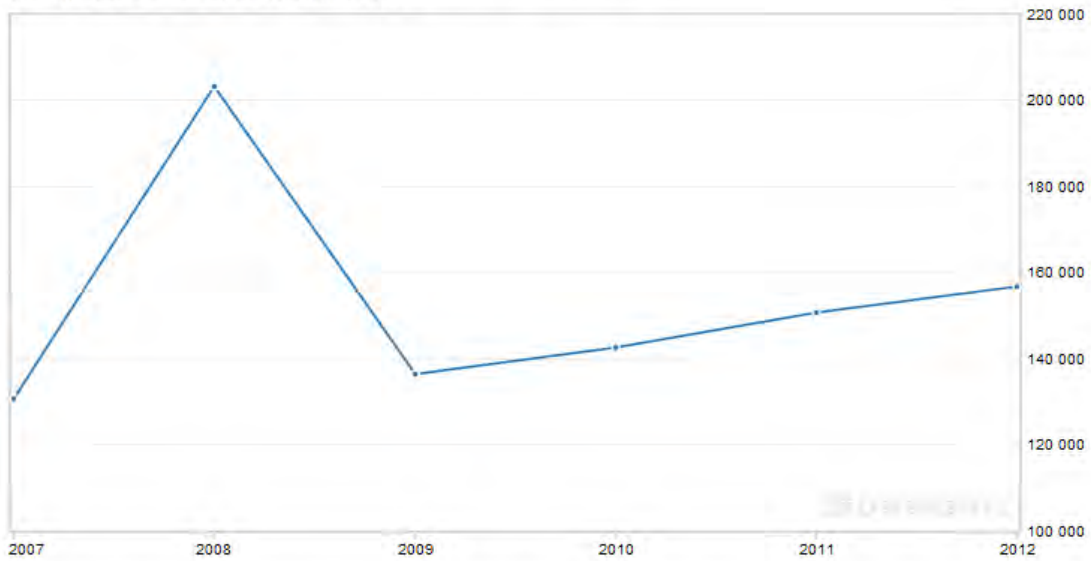


Figure 29: Port of Varna - West

**Container port traffic (TEU: 20 foot equivalent units)**

Country: Bulgaria Units: TEU: 20 foot equivalent units

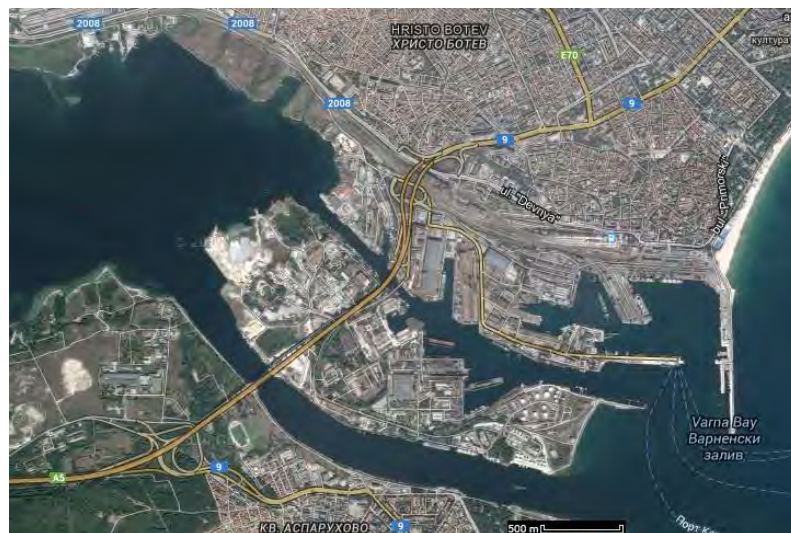


Source: World Bank (citing: Containerisation International, Containerisation International Yearbook.)

Graph 3-4: Container traffic - Bulgaria

### Commercial port of Varna hinterland road connection

The port of Varna is well connected to the east-west direction with Hemus motorway, designated A2 via the primary road of E70. Hemus is a motorway currently under construction in Bulgaria and it will be completed it will connect Varna with Sofia with a highway of 140km/h maximum speed for cars. Its first section Varna–Shumen is completed while the rest two sections Shumen–Yablanitsa–Sofia are still under construction. In the same way the port of Varna is connected to Ruse, the biggest river port of the country, via Hemus motorway until Shumen with 140km/h for cars and from Shumen until Ruse via E70, which is a primary national road, with an average speed of 70km/h for cars.



**Figure 30: Satellite map of existing road connections to the port of Varna**

In the north-south direction the port of Varna is connected by road to Burgas via Chernomorec Motorway or the Black Sea motorway designated A5. This connection uses the Asparuhovo Bridge with a total length of 2km over the canals between the Black Sea and Lake Varna and it is a potential bottleneck for the southern access to the port of Varna. The Bridge of Asparuhovo has two traffic lanes per direction and serves a daily traffic of 10,000 crossing vehicles. Therefore there are discussions for a new bridge, parallel to Asparuhovo over the lake of Varna.

## Mediterranean Turkey

Container port throughput at Turkey's Mediterranean ports multiplied 3.9-fold over 2001-10, to 5.85mTEU. This was largely generated by booming domestic traffic, but transit traffic has also grown. Ports in Ambarli have moved increasing land-transit and transshipment traffic for Black-Sea and Balkan countries, whilst those in the Eastern Mediterranean have begun to handle transit traffic for landlocked and other countries in the Near East.

### Marmara Ports

In 2010, terminals in the Istanbul region handled 2.72m TEU, equivalent to 47 per cent of the throughput of Turkey's Mediterranean ports.

Istanbul's and Turkey's largest port is at Ambarli, which has replaced Haydarpaşa as the main gateway for Istanbul, and is also a transshipment hub for the Black Sea. Its container throughput grew 7.5-fold over 2001-10, to 2.54mTEU. 57 percent of 2010 container throughput was hinterland traffic for Turkey, Greece, Romania and Albania. The balance was transshipment.

Throughput at the state-owned Haydarpaşa facility fell by 21 per cent over 2001-10, but by 56 per cent from the 2006 peak of 0.40m TEU, to 0.18mTEU in 2010, as container handling is gradually phased out.

### Greek Ports

## Port of Alexandroupolis

The port of Alexandroupolis has got two basins: the western basin (at the western area of the port) with a total surface of approximately 280 acres and the eastern basin of the new eastern sector of the port with a total surface of about 1100 acres. After completion of works at the eastern basin, the basin will have a depth of -12.00m (MSL) in a 667 acre surface and a maneuver circle with a diameter of about 730 meters. The approach of ships is ensured with simultaneous excavation of a navigation channel with a total length of 3.5 km, minimum width of 160.0 meters and depth of -12.50 m (MSL).

The port is currently building a rail link connection to the container berth and also undertakes dredging works (see table below).

**TABLE 3.6: PROJECTS AT THE PORT OF ALEXANDROUPOLIS**

Project Title	Quick Project Description	Auctioning Budget(€)	Implementation Organization



<p>"Railway Connection of New Cargo Pier of Port of Alexandroupolis</p>	<p>Construction of infrastructure-superstructure of the container Terminal railway and connection to the lines complex of the Railway Station of Alexandroupolis</p>	<p>4.920.000,00 (with VAT)</p>	<p>ERGOSE.SA</p>
<p>"Completion of Basin Dredging and Channel Port Excavation"</p>	<p>a. Completion of eastern basin dredging procedures(-12m MSL)  b. Completion of dredging procedures for opening the approach channel (-12.50m MSL)  c. Completion of backfill formulation of reef-freeboards and of freeboards deposition with suitable dredging materials  d. Protection of channel banks</p>	<p>21.900.000,00 (with VAT)</p>	<p>Ministry of Infrastructure, Transport and Networks/G.S.P.W/Department of Harbor works and airfields (Td4)</p>

The total length of the platforms of container terminal is about 730.0 meters , of which 500.0 meters can be used for the vertical movement of containers (Lo-Lo) and the movement of bulk cargo ( quay wall mounting level -14.13 m, MSL ) . The remaining 230 meters o mixed (vertical and / or horizontal) handling of containers and other unitized cargo (Ro-Ro/Lo-Lo) (quay wall mounting level -11.63 m, MSL) .

According to the approved program plan of the port, a further deepening of the basin up to -15,00m (MSL) is to be performed at a later stage.

#### **Commercial port of Alexandroupolis hinterland rail connection**

The adjacent railway axis crosses the city of Alexandroupoli and the missing link of ca. 1km from the Cargo Terminal (SEMPO) of the Alexandroupolis port is already under

construction. The connection is estimated to be completed within 2015 and it is an investment of up to 5 million €.

The new connection will remove the bottleneck that exists today, providing a direct rail connection of the New Pier of the Alexandroupolis Port with the main railway line of Alexandroupoli-Ormenio.

Similar to the connection of the Cargo Terminal (SEMPO) with the railway network, any future piers and terminals such as the Multipurpose Terminal development scenario will require an expansion of rail facilities.

### **Commercial port of Alexandroupolis hinterland road connection**

The existing road connection to the port of Alexandroupolis is poor. Currently both passenger and cargo traffic to and from the port, airport and industrial area is channelled through the main arteries of the city such as the Republic Avenue - Leoforos Dimokratias. Congestion on the road connection between the port and Egnatia Motorway is considered a bottleneck for the seamless freight flow on the Sea2Sea corridor. Any future increase of the traffic flow from the operation of the Sea2Sea2 freight corridor will reduce the traffic safety in the urban area in the absence of no additional infrastructure.



**Figure 31: Satellite map of existing road connections to the commercial port of Alexandroupolis**

Currently there are plans for a Ring Road that will bypass the city centre and also provide access to the freight flow from the commercial port. Another project is also implemented for the improvement of the port internal road network design so that in combination with the new Ring Road of Alexandroupolis, is expected to remove the bottleneck that exists today.



Figure 32: Port of Alexandroupolis - current state

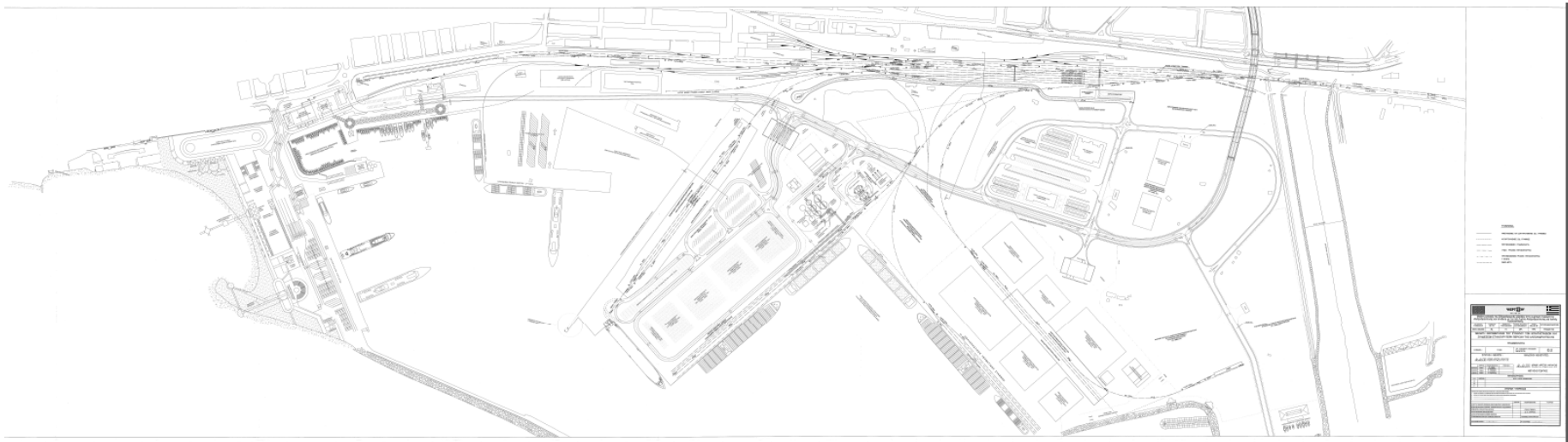


Figure 33: Port of Alexandroupolis - masterplan, under construction

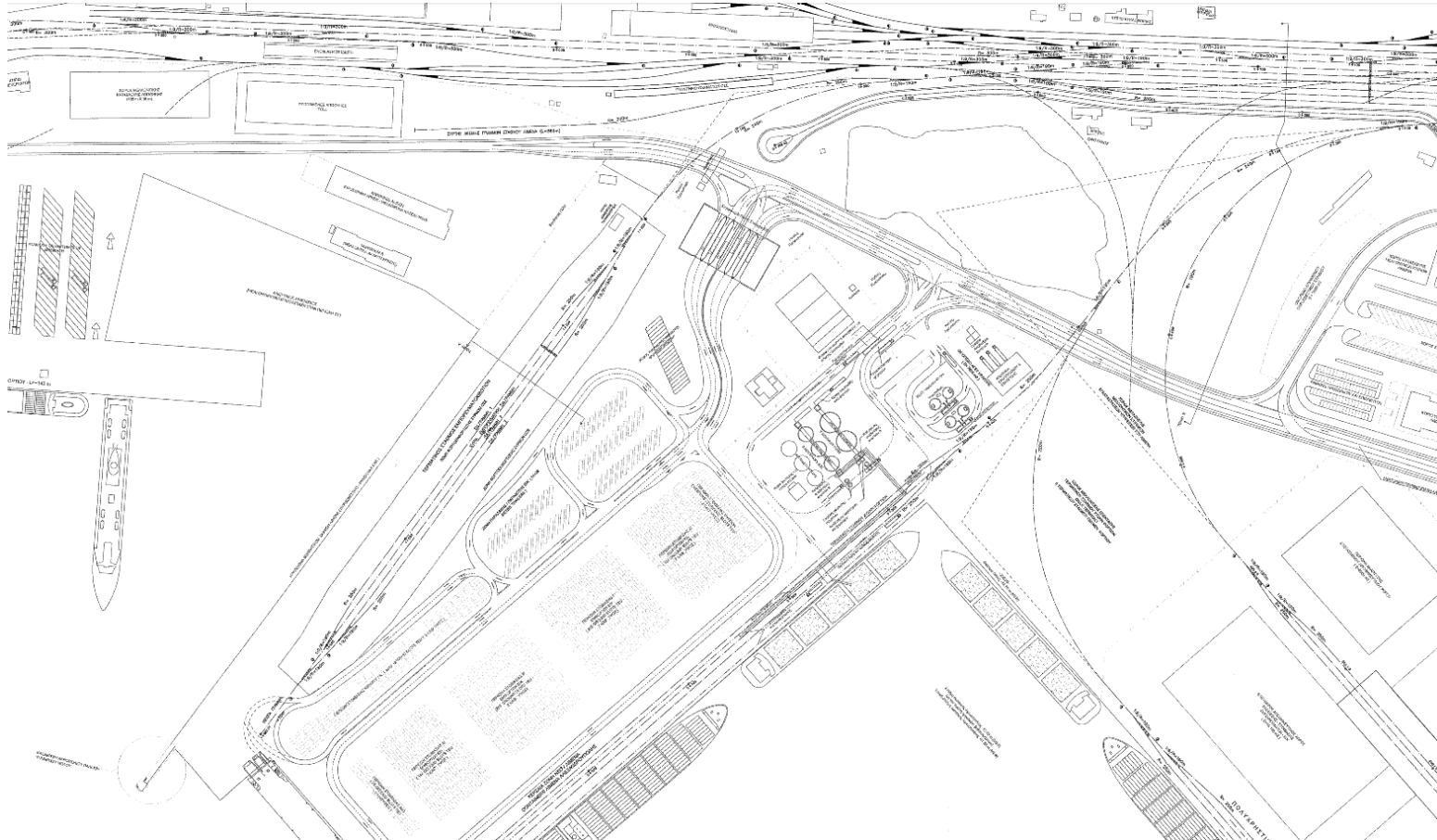


Figure 34: Port of Alexandroupolis - detail of quay and rail connection

## The Port of Kavala

### “PHILIPPOS II” Commercial Port

Work is under way on the project to extend the windward (south) quay by 200m., with a budget of 13.9 million Euros. This extension will further improve the existing wave conditions in the basin of the commercial port. The contract which concerns the repair of the commercial breakwaters on the north side of the port totalling a length of 510 metres, the port’s internal road network, flood protection works and works to deepen the port basin, was signed on 02-11-2006 and was a bridge project for the subsequent programming period 2007-2013.

Currently the port has no rail connection to the national network and the closest point of contact is the Toxotes station 32km away.

### Commercial port of Kavala hinterland rail connection

The area of the commercial port of Kavala is not connected to the national railway network. The adjacent railway axis of Thessaloniki - Turkish border / Bulgarian border is located more than 30km away from the coast. The missing connection has already been identified and included in the list of priority projects within the National Strategic Reference Framework (NSRF) of Greece 2014-2020. In the same context, the Hellenic Railways Organization (OSE) with its subsidiary ERGOSE S.A. has tendered a study for the construction of a new single-track line ca. 35km long, which will connect the new commercial port of Kavala in New Karvali with the existing railway line Thessaloniki – Alexandroupolis.

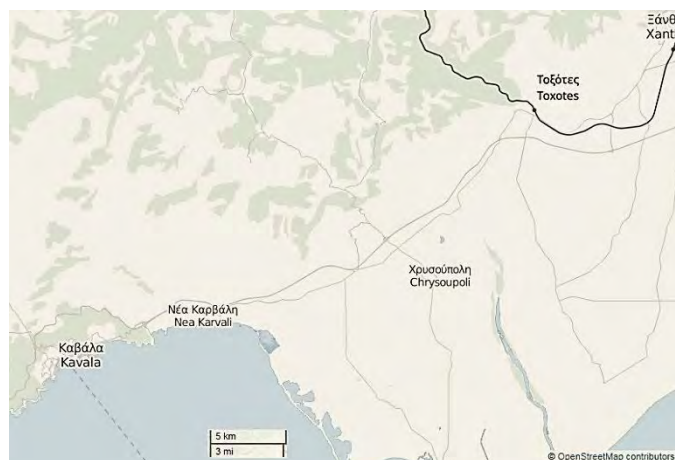


Figure 35: Transport map of existing rail axis in the greater area of the commercial port of Kavala

This new line will be joining the main railway axis close to the existing station of Toxotes in the Xanthi regional unit. The study is at completion phase, soon to be finalised. The new line is included in the Trans-European Transport Networks. Its implementation requires an estimated investment of 250million €.

### **Commercial port of Kavala hinterland road connection**

With respect to the road side access to the port of Kavala, relevant bottlenecks have not been identified.



**Figure 36: Satellite map of existing road connections to the commercial port of Kavala**

The connection of the major road network infrastructure of the direct hinterland to the commercial port of Kavala is established with two lanes per direction connecting the port area to the “Egnatia Motorway” (E90/A2 only 1km away from the motorway axis) via a separate grade intersection. The port is also connected to the old national road network of Kavala-Xanthi giving access to the urban Kavala area. The accessibility of the Kavala freight port via the road network is considered, in terms of proximity, safety and capacity, as highly efficient.





## **Port of Thessaloniki**

At Thessaloniki, containers are handled on 530m of a 596m quay on Pier VI, which has 12m depth alongside. Notwithstanding a shortage of space, the port has achieved throughput of 0.45m TEU/year, using two panamax and two post-panamax container gantry cranes, but only by storing containers outside the port. There is a double-track rail link to the national rail network.

There are ambitions to expand the container terminal, to meet increasing demand from landlocked F.Y.R.O.M., and to establish the port as a gateway for southeast Europe and trade with the Black Sea.

Plans are to extend the west face of Pier 6 from 596-1,120m, expand the terminal area to 42 ha and dredge the extension to 16m alongside. A possible second phase would boost the terminal area to 71 ha and add 650m to the east face. Development was to have taken place in the context of a concession awarded to Hutchison Ports, but their withdrawal at the end of 2008 threw the plans into abeyance. The port now hopes to fund the €265m extension of Pier 6 itself, with assistance from a €120m loan by the European Investment Bank.

The proposed project includes a new road to the national highway grid to relieve growing traffic congestion in the city.

**TABLE 3.7: REGULAR MARITIME SERVICES FROM/TO BULGARIA'S MAIN PORTS – UP-DATE APRIL 2013**

Port	Service from/to	Shipping Line	Mode	Frequency	Capacity	Notes
<b>Burgas</b> <b>Varna</b>	Ambarli <sup>0</sup>	MSC (Bulgaria Service)	Lo-Lo	Weekly	1x1388TEUS	In-house feeder service
<b>Burgas</b> <b>Varna</b> <sup>1</sup>	Ambarli <sup>2</sup>	MAERSK	Lo-Lo	Weekly	1x1092TEUs	In-house feeder service

<sup>0</sup>Mar port Terminal.

<sup>1</sup>West Terminal.

<sup>2</sup>Kum port Terminal.

Source: Logistics Processes and Motorways of the Sea II, *Progress Report IV – Annex 6, Shipping Line Information, 2013*

### 3.3.3 Port Accessibility via land networks - Summary

The following table summarises the bottlenecks identified for the land side port accessibility for the two commercial ports of the southern end of the Sea2Sea corridor, namely Kavala and Alexandroupolis. The table also includes the investments planned to remove these bottlenecks that will improve the port hinterland connections. A significant parameter is the maturity of each planned investment which reflects the consultation level and the priority level of each project.

**TABLE 3.8: SUMMARY OF BOTTLENECKS AND PLANNED INVESTMENTS ON PORT TO HINTERLAND CONNECTIONS**

Port	Bottleneck	Planned investment
Alexandroupolis	Congestion on the road connection between the port and the Egnatia Motorway	Improvement of the connection to the motorway via a Ring Road that will bypass the city centre and a new separate grade intersection with Egnatia Odos Motorway.
	Need to expand the Railway connection within SEMPO and connect to the main railway system	Rail connection of container terminal SEMPO of ca. 1km long and track formation at the Alexandroupolis railway station.
	Need for expansion of rail facilities into the future Multipurpose Terminal	Expansion of rail facilities to the future Multipurpose Terminal
Kavala	Lack of a railway connection between the Port area and the national railway network	Construction of new single-track line of ca. 35km, which will connect the new commercial port of Kavala with the existing railway line Thessaloniki – Alexandroupolis at the existing station of Toxotes - Xanthi

### 3.3.4 Rail Networks

The Bulgarian State Railways EAD (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.

Though 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 intermodals 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)

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 38**), 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:

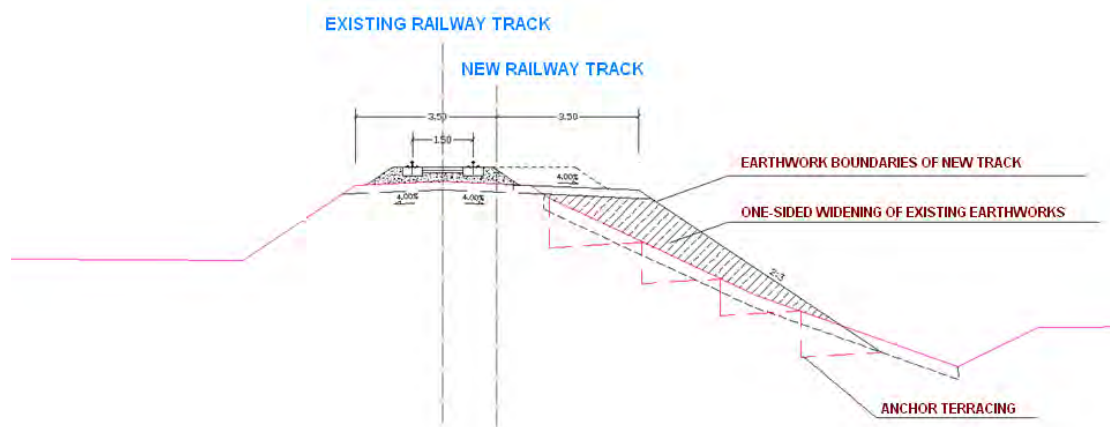
- Corridor N° VII (The Danube River and its tributaries - Northwest-Southeast).



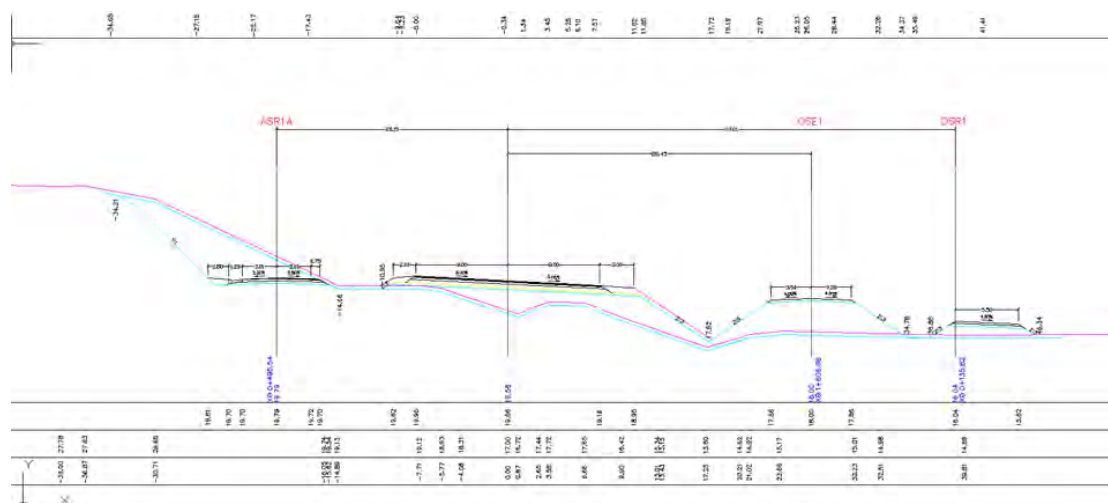
Figure 38: Bulgaria within the Pan-European transport corridor network

Source: UIC

For the Greek side, there is essentially a line rather than a railway network up North. There is a single track line north of Alexandroupolis to the border (Ormenio), experiencing tight alignment patterns around the area of Soufli. There is spatial provision for a possible expansion into a double-track line for the most part.



**Figure 39: Cross section containing railway track along the section Alexandroupolis-Ormenio**



**Figure 40: Cross section containing rail and roadway along the section Alexandroupolis-Ormenio**

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 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.

**TABLE 3.9: INTERNATIONAL UNACCOMPANIED TRAFFIC IN BULGARIA BY CORRIDOR, 2007**

Corridor	TEU
Bulgaria - Greece	14,500
Bulgaria - Romania	2,800
Bulgaria – other countries	100
Total	17400

Source: Kombi Consult analysis based on railways and operators statistics

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.

**TABLE 3.10: KEY INDICATORS OF BULGARIA'S RAILWAY NETWORK**

Indicator	Value	% of TTL
Total track length (TTL)	6 517 km	100%
Single railway lines with normal gauge (1435 mm.)	2 907 km	44,61%
from TTL		
Double railway lines	1978 km	30.3%
Station's tracks with normal gauge (1435mm)	1480 km	22.7%
Narrow railway lines (gauge 760 mm)	125 km	1.92%
Narrow station's tracks (gauge 760 mm)	13 km	0.2%
Station's tracks with wide gauge (gauge 1520 mm)	15 km	0.23%
Switches	7300	
Railway Tunnels	186, 47.5 km	
Railway Bridges	976, 41.9 km	
Level crossings	777	
Average density of the railway network	59.2km/1000	
Curves with radius up to 500m	1077 km	
Disturbed maintenance cycle	1700 km	25.6%

Source: NRIC network statement 2014-2015

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.

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. A reach stacker is now used instead of a crane, only one of the handling tracks can be used for transshipments and the handling area cannot be fully used either.

The next largest facilities in terms of rail/road transshipment 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. UIC notes that since 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'.

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, although expected to start again in 2010, it has not yet materialize. 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.

### 3.3.5 Focus on Bottlenecks of the Railway network

This section emphasizes on the bottlenecks observed through the railway network and associates them with related investments plans for upgrades. It has to be noted that **this section is essentially a common part both for Deliverable 1 (D1) and Deliverable 2 (D2) and much of it is taken from the analysis destined for D2.** For this reason, bottlenecks and associated upgrade investments are not completely separated in their form of reporting.

The following figure is taken from the latest EU regulation on Trans-European transport Network. It presents the railway network status and projects, together with the connected ports in our study area.





Figure 41: Trans-European Railway Network, ports and planned infrastructures Greek part of Sea2Sea Corridor

The development of the Greek railway network is a major project carried out by the Hellenic Railways Organization (OSE) and its subsidiary company ERGOSE which is responsible for the Investment Programme projects and in particular those co-funded by EU Programmes. It is estimated that the country needs a total of 6 billion € to rehabilitate and upgrade its railway infrastructure within a business plan horizon of 2000-2017. One of the top priorities of the railway development plan is the seamless connection to all the Freight Terminals, to Sea Ports and to the Trans-European Networks. The projects that have been selected and presented here are core parts of the Sea2Sea corridor and they are parts of the greater Greek railway development plan.

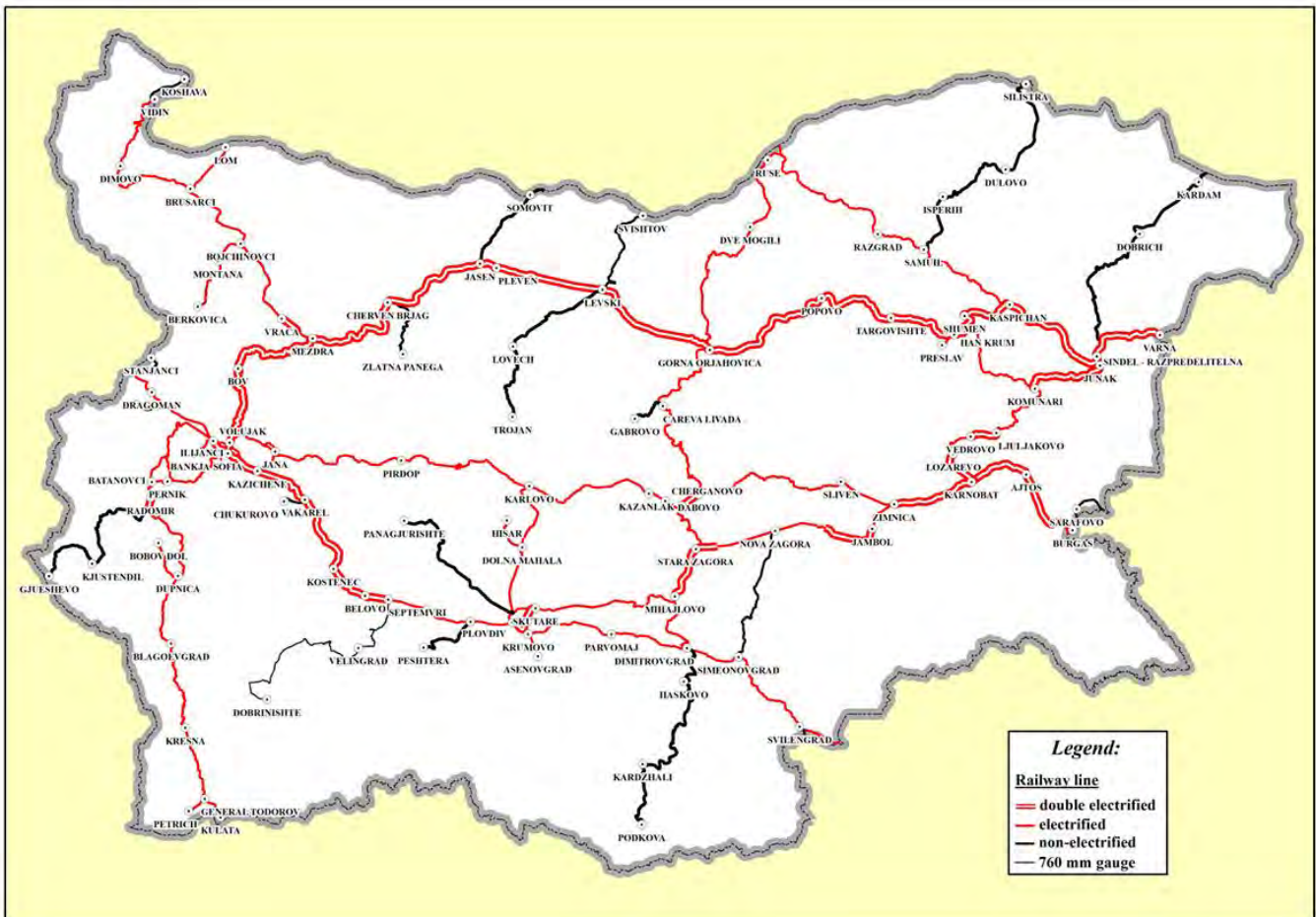
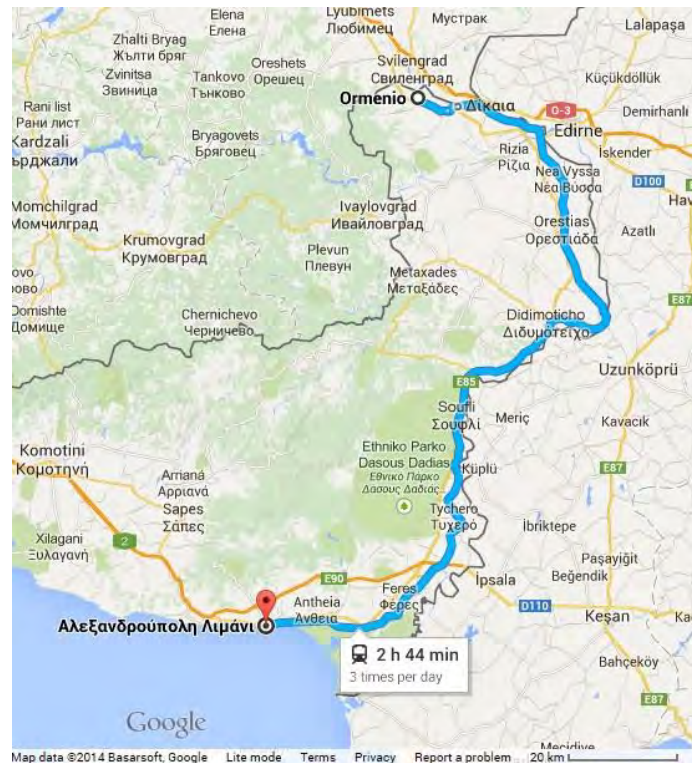


Figure 42: Schematic map of Bulgarian railway network infrastructure

### Alexandroupoli - Ormenio /Bulgarian Border railway electrification and upgrading

The 180km single track rail line between Alexandroupoli and Ormenio/Bulgarian border has been recently renovated. Nevertheless, there is lack of electrification infrastructure and advanced signalling equipment which can be considered as a bottleneck for the efficiency of the Sea2Sea corridor and its interoperability. The electrification of this part of the railway network and the upgrading of the signalling systems can improve the interoperability of the corridor, its capacity and safety.



**Figure 43: Alexandroupoli-Ormenio Railway Electrification and Upgrading project location**

The project is under discussion and there are plans by the railway authority ERGOSE to start the relevant preliminary studies. The required investment is estimated at appr.80 million €.

The single track after its upgrading can be considered efficient in capacity to facilitate the Sea2Sea corridor. The upgrading is expected to increase the commercial speed of the freight trains by 20-30% and also to increase capacity of each freight train due to increase of the traction power following the electrification of the line. Additionally, the electrification, the advanced signalling and the implementation of a central management system, are expected to increase safety of rail transport, improve operating conditions and train traffic, line capacity and service reliability. The operation and maintenance costs will also be reduced significantly.

#### **Thessaloniki - Kavala (via Amfipoli) high-speed railway connection**

In the existing situation the railway connection between Kavala and Thessaloniki- the city with the largest freight port in northern Greece- is rated as poor.

This specific line deviates significantly from the shortest path between the two cities and has many curves and steep slopes at sites. Furthermore, in the network there are a large number of level crossings with roads, many of which are unattended especially in rural areas. The network is not electrified. Its signalling, telecommunications and traffic management, are limited.

The construction of a new highspeed railway connection between Thessaloniki and Kavala via Amfipoli has been proposed and studied at a preliminary level. The main feature of the solution is that it includes 147 km of new infrastructure and reduces significantly the travel

time of Thessaloniki-Kavala-Toxotes line up to 50%, that is from 4 hours 40 minutes to 2 hours 20 minutes.

The project is included in the EU Regulation of the Trans-European transport networks but it is not included in the national priority list of projects because it is a major investment that has been estimated to approx. 1 billion €. The proposed section is a part of the "Egnatia Railway" concept.

The proposed new high-speed railway between Thessaloniki and Kavala will serve not only the freight transportation demand but also the passenger demand from Thessaloniki to Kavala-Xanthi-Komotini-Alexandroupolis. Currently, these trips are dominated by car/truck traffic via the Egnatia Odos Motorway. Moreover, the proposed new connection will enhance the cooperation between the northern Greek ports of Thessaloniki-Kavala-Alexandroupolis and will contribute to the development of a gateway for Corridors X and IX.

### **Bulgarian part of Sea2Sea Corridor**

The development of Bulgaria's railway network is a major project carried out by the National Railway Infrastructure Company. It is estimated that the country needs a total of 4 billion € to completely rehabilitate and upgrade its railway infrastructure, with the Operational Programme on Transport OPTI 2014-2020 for Bulgaria providing the 673.345.447,65 €. The projects that have been selected and presented here are core parts of the Sea2Sea corridor and they are parts of the greater Bulgarian railway development plan.

### **Plovdiv-Svilengrad/ Greek Border railway Upgrading and Electrification**

This particular railway section is contributing to the formulation of both corridors IV and IX of the Trans-European networks.

The project encompasses the reconstruction of ca. 150 km of railway track, parts of which are double track, signalling systems, telecommunications and radio control, as well as structures which will enable the complete doubling of the line in the future. The wider objectives of the project are the improvement of the quality of the overall transport system in Bulgaria, the realisation of a railway connection between Europe and Asia, the integration of the Bulgarian railway system in the Trans-European networks.

The introduction of an up-to-date technology and upgraded standards in the railway transport in Bulgaria, in line with the requirements and practices of EU, will improve transport safety, reduce travel times, increase capacity, reduce maintenance costs of the railway infrastructure and protect the environment by the electrification of the diesel-powered traction.



**Figure 44: Plovdiv-Svilengrad Railway Electrification and Upgrading project location**

The whole project length is approx. 150 Km with a 20km of double track and a maximum speed of 160 km/h for passenger trains which means that block trains could reach the maximum speed of 120km/h. The project includes also sections implemented for future doubling. There are extensive technical structures such as bridges, underpasses, culverts etc. The upgrading will be completed with a Signalling and Telecommunications System (ETCS Level 1) in a 252 km long network.

The project of modernisation of the Svilengrad - Plovdiv railway complements the electrification and signalling of the Alexandroupolis - Ormenio railway project and together they form a significant portion of the Sea2Sea corridor. The combination of the two rail upgrading projects will fulfil high level of efficiency and interoperability standards, rendering the corridor an attractive, safe and green option for the multimodal freight transport in the East European region and the area of the Black Sea.

#### **Rehabilitation and upgrade of the Plovdiv – Burgas railway**

This particular railway section is contributing to the formulation of the corridor VIII of the Trans-European network. The project scope is the completion of the Plovdiv-Burgas railway modernisation, including the Burgas railway junction. The existing line is electrified with a total length of 292 km, of which 139 km is single line and 153 km is double line. The project aims to restore original design parameters of the sections Mihaylovo-Kaloyanovetz, Stara Zagora-Zimnitza and Tzerkovsky-Burgas with a total refurbishment route of 177 km. The work focuses on three stretches of the electrified line between the village of Mihaylovo and

Burgas on the Black Sea. Five stations will be delivered with new signalling together with the 177 km of improved rail track. Other important work includes reconstruction of the railway stations at Stara Zagora, Kermen and Yambol, reconstruction of the bridge over the River Tundza, and re-signalling of the Burgas node. A new signalling control centre will be installed and signalling systems replaced at five stations between Drujba and Burgas.



**Figure 45: Burgas-Plovdiv Railway Rehabilitation project location**

The project is currently under construction. When completed, the upgraded line will enable passenger trains to travel at up to 160 km/h and freight trains with 120km/h. This will increase the line's capacity and result in significantly shorter journey times for both freight and passenger traffic. Co-funded by the EU, this major project will be managed and operated by the National Railway Infrastructure Company (NRIC).

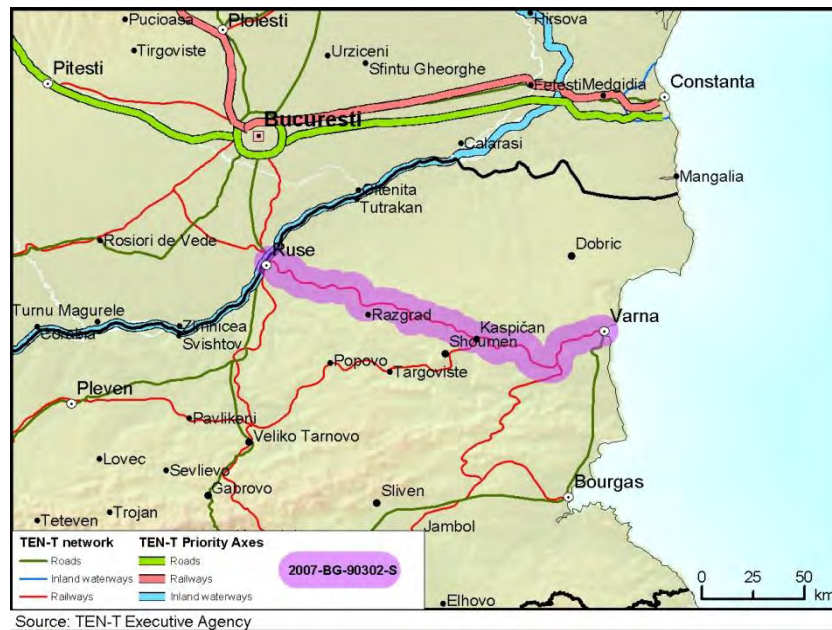
The project forms part of an overall strategy to refurbish and upgrade the railway routes from Sofia to Burgas (Black Sea) and the borders with Greece and Turkey. It will eventually also benefit the Sea2Sea corridor with the added value of connecting to the southern Caucasus and Central Asia also known as the TRACECA corridor, the historic Silk-Road between Europe and Asia.

#### **Rehabilitation of Ruse (on the Danube) – Varna railway**

The railway link Varna – Ruse is the main land link of the Ruse port on the Danube River to the port of Varna on the Black Sea. It is also the shortest link that connects the Black Sea region and the TRACECA corridor with Central and Western Europe. The railway link of Varna – Ruse also connects the eastern region of Bulgaria with the only existing railway border crossing to Romania. It provides transport communication between the Pan-European transport Corridors VII, VIII and IX.

The project also includes repair of energy facilities (partial replacement of poles, carrying ropes, and the contact network). Furthermore it includes a traction substation for integration with the SCADA system, repair and / or replacement of facilities and SCB

networks to level 1 GSM-R and ETCS with the possibility of upgrading to a higher level when necessary.

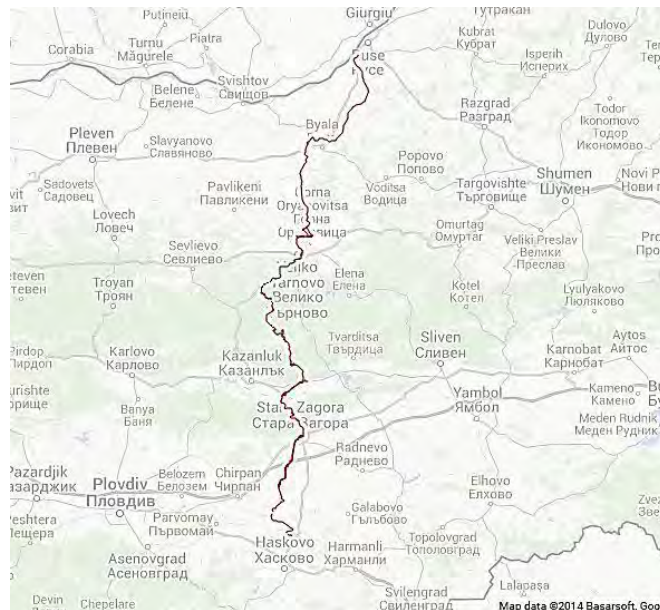


**Figure 46: Ruse-Varna Railway Rehabilitation project location**

The project will reduce travel times and increase reliability and safety of transportation, which contributes to attract traffic from road transport to rail transport. The improved railway line will contribute to eliminating bottlenecks in the interconnections in the south-eastern region of the EU, as well as those in neighbouring EU countries. The project contributes to an optimal combination and integration of the various modes of transport and improvement in the capacity and efficiency of the existing railway line. The project is not included in the OPTTI and will be realized when funding available.

#### **Ruse– Stara Zagora–Dimitrovgrad railway electrification and upgrade**

This specific connection forms the major Bulgarian part of corridor IX. The Rail corridor IX in Bulgaria has a length of 390 km and runs from the Bulgarian/Romanian border (Ruse) to Stara Zagora – Dimitrovgrad and further to the Bulgarian/Turkish border (Svilengrad) and Bulgarian/Greek border (Ormenio). Located on the strategic north – south axis, utilising the existing crossing of the Danube to Romania and giving access to the growing markets in Turkey, the route is currently in poor condition with significant capacity restrictions. The rail infrastructure on this section varies considerably, between double and single track and electrified and non-electrified. The proposed scheme includes renewal of the existing infrastructure systems, track upgrade and re-signalling, that will enhance operational performance, will restore route functionality and will improve travel time and provide reliability benefits.



**Figure 47: Ruse-Stara Zagora-Dimitrovgrad railway electrification and upgrade project location**

The proposed scheme Ruse– Stara Zagora has been subject to a CBA in the General Transport Master Plan (GTMP) 2010 for Bulgaria with a Benefit to Cost Ratio  $BCR < 1$ . Nevertheless the GTMP recommends its inclusion in the Master Plan together with a number of combined highway and railway schemes. The investment required for this project is calculated up to a level of approximately 170million €.

**Doubling and electrification of Karnobat – Sindel (close to Varna) railway.**

The section is a part of European Transport Corridor VIII with Varna at its easternmost edge (from the border with F.Y.R.O.M. through Sofia – Plovdiv – Burgas/Varna). The railway line Karnobat – Sindel is the shortest land connection between the two biggest Black sea ports – Varna and Burgas, with a length of 123 km. In the current situation 71 km of the total railway line alignment are doubled and electrified. The rest 52 km are one-way electrified railway line along the existing alignment. The design speed of the railway section is 130 km/h, for passenger trains with the exception of sections Lazarevo – Vedrovo (18 km) and Ljuliakovo – Asparuhovo (36 km) with the reduced speed of 85 km/h. The project is not included in the Bulgarian Operational Programme on Transport OPTTI 2014-2020.



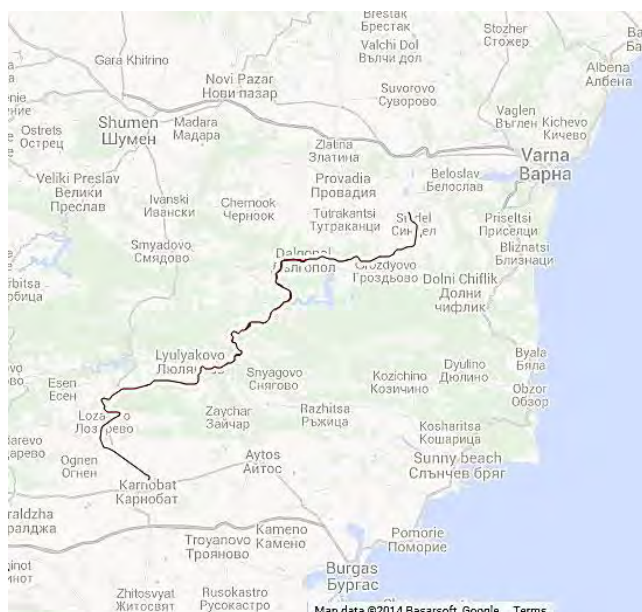


Figure 48: Varna/Sindel-Karnobat railway doubling and electrification project location

Summary table Bottlenecks at Railway network of the Sea2Sea corridor

TABLE 3.11: SUMMARY OF PLANNED INVESTMENTS AT RAILWAY NETWORK OF THE SEA2SEA CORRIDOR

Country	Bottleneck/missing links	Planned investment
Greece	Lack of electrification and modern signalling of the Alexandroupolis – Ormenio railway line	Improvement of the 180km single track line with electrification and advanced equipment of signalization
	Thessaloniki-Amfipolis-Kavala section	Construction of new railway line Thessaloniki-Amfipolis-Kavala
Bulgaria	Poor features of the Plovdiv-Burgas railway line	Modernisation of the Plovdiv-Burgas railway underway, including the Burgas railway junction. section Mihaylovo – Kaloyanovets (21, 3 km) is completed and in operation; Stara Zagora - Zimnitsa (109 km) – physical progress above 92%; Tserkovski – Burgas (115,2 km) – physical progress above 75%.
	Poor features of the Varna-Ruse Railway	Restoration of design parameters of the

Country	Bottleneck/missing links	Planned investment
	line	Ruse – Varna railway line
	Poor features of the Karnobat - Sindel (close to Varna) railway line	Doubling and electrification of Karnobat-Sindel (close to Varna) railway
	Need for reconstruction and signalling and modern signalling of the RR section Ruse–Stara Zagora–Dimitrovgrad	Improvement of the line and advanced signalling equipment

#### *Additional infrastructures on the Sea2Sea corridor*

##### **Ruse Region Intermodal Terminal**

The project is concerning the completion of an intermodal transport terminal at the Bulgarian Danube city of Ruse. The planned intermodal terminal comes in two Trans-European corridors – corridor VII - River Rhine - Main - Danube and corridor IX - Giurgiu - Rousse - Dimitrovgrad – Alexandroupolis / Istanbul. The port of Ruse on the northernmost part of the Sea2Sea corridor is the major river port of Bulgaria. The project is associated with the railway connection of Ruse -Varna, which is a very important link for the intermodal transport connecting central Europe to the Black Sea.

The project aims to facilitate and improve intermodality in the south-eastern region of the EU. It will facilitate international transport to/from the countries of the region, the TRACECA countries and the countries of Central and Western Europe, providing better quality service for freight transport. It enhances the interoperability and interconnection of the Sea2Sea corridor with the greater Pan European freight corridors. The project is currently under discussion and preliminary studies are forthcoming, with an expected year of completion being 2015. The level of investment required for the implementation of the intermodal transport terminal at the Bulgarian Danube city of Ruse is estimated at ca. 25 million €;

**TABLE 3.12: SUMMARY OF PLANNED INVESTMENTS COMPLEMENTARY TO THE SEA2SEA CORRIDOR-RUSE REGION**

Country	Bottleneck	Planned investment

Country	Bottleneck	Planned investment
Bulgaria	Limited capacity and other restrictions in the accommodation of the transshipment to inland waterways at Ruse as the Intermodal node for (Danube river)	Ruse Region Intermodal Terminal

### *Bottlenecks at railway border crossings*

The crossing of borders is another bottleneck for the seamless freight traffic between Greece and Bulgaria and especially when we examine railway connections. Not only between these two countries but also in the rest of the Europe, until recently, train operators did not provide services beyond the border stations of their own country. In most cases, locomotives had to be changed at the border, with only few exceptions for specific operators between Germany and Austria or France and Switzerland. In the past few years, there have been substantial changes in cross-border train operation as a result of European Union 'open access' requirements for international traffic. These changes were initially applied to freight and as a result freight trains work across borders, in some cases without the locomotive or crew change. Nowadays there are many examples of cross-border operations without changes as explained in the above, by private-sector freight operators in Central Europe.

To remove the bottleneck at border crossing for the Sea2Sea corridor, the ERTMS system needs to be implemented in the frame of the upgrading or/and rehabilitation of the planned railway infrastructure in both countries. ERTMS is the abbreviation for European Rail Traffic Management System, which concerns an initiative of the European Union to enhance cross-border interoperability and the procurement of signalling equipment, by creating a single Europe-wide standard for train control and command systems. The two main components of ERTMS are: the European Train Control System (ETCS), a standard for in-cab train control, and GSM-R, the GSM mobile communications standard for railway operations. Specifically, the components of the ERTMS are described as follows:

ETCS, the European Train Control System, is an automatic train protection system (ATP) to replace the existing national ATP-systems.

GSM-R is a radio system for providing voice and data communication between the track and the train, based on standard GSM using frequencies specifically reserved for rail application with certain specific and advanced functions.

The equipment needed for the installation/ implementation of the ERTMS system is subdivided in infrastructure and on-board. Regarding the infrastructure equipment, the fitting of ETCS often involves the complete renovation of the line. For this reason the range

of the relevant costs is rather wide and estimates vary between €30,000 and €300,000 per kilometre. The necessary investment costs on the ERTMS infrastructure side for the Sea2Sea Corridor have been included in the budget of the upgrading/rehabilitation projects of the railway lines that form the Sea2Sea corridor. These have been described in the chapter "Bottlenecks of the Railway network along the Sea2Sea corridor".

Regarding the on-board equipment, the cost of the investment depends on the type of locomotives or train sets. According to the EU report "ERTMS in 10 questions", this cost would be around €100,000 for new equipment, while prices vary between €200,000 and €300,000 when existing equipment has to be adapted. It is therefore important to fund the operators or provide them with incentives to upgrade their on-board equipment used for the rail line of the Sea2Sea corridor. It is estimated that the initial level of such an investment for the supply of radio coverage system GSM-R and relevant services for the railway axis under study is approximately 2million €.

**TABLE 3.13: SUMMARY OF SCHEMES ON THE COMPLEMENTARY TRANSPORT CORRIDOR THROUGH THE PORT OF THESSALONIKI ON THE SOUTH-NORTH DIRECTION**

Planned investment	Investment maturity	Estimated cost of investment
Electrification of railway line between Thessaloniki and Promachonas/(Bulgarian border) and small scale upgrade at parts	Under construction	100M €
Railway connection of 6 <sup>th</sup> pier of Thessaloniki port to the main railway network	Under study	30M €
Completion of integrated signalling system and tele management on the Railway axis Athens-Thessaloniki and the sections Thessaloniki-Polikastro and Thessaloniki-Promachonas (Bulgarian Border)	Under construction	55M €
Provision of GSM-R Terminal Station and relative services on the railway axis Patras-Athens-Thessaloniki-Eidomeni (FYROM Border /Promachonas (Bulgarian border)	Under construction	10M €
Road connection of 6 <sup>th</sup> pier of Thessaloniki port to the Egnatia Odos Motorway	Under construction	30M €

### **3.3.6 The Network Model Representation**

The project approach is definitely of a macroscopic nature and the model network over which the team is conducting the study is expected to offer this kind of information. The Consultant has concluded into a model that depicts the rail links among major nodes of interest, along with an estimation of lengths between intersections. For this level of analysis the model network is considered to be adequately detailed if not more than so.

The model network has been divided into a Bulgarian and Greek section, going along with the differences in conditions, tariffs and policies between the two countries. **Figure 49** and **Figure 50** below show the respective network representations for the Bulgarian and Greek networks respectively. The corridor of particular focus in this study is highlighted.

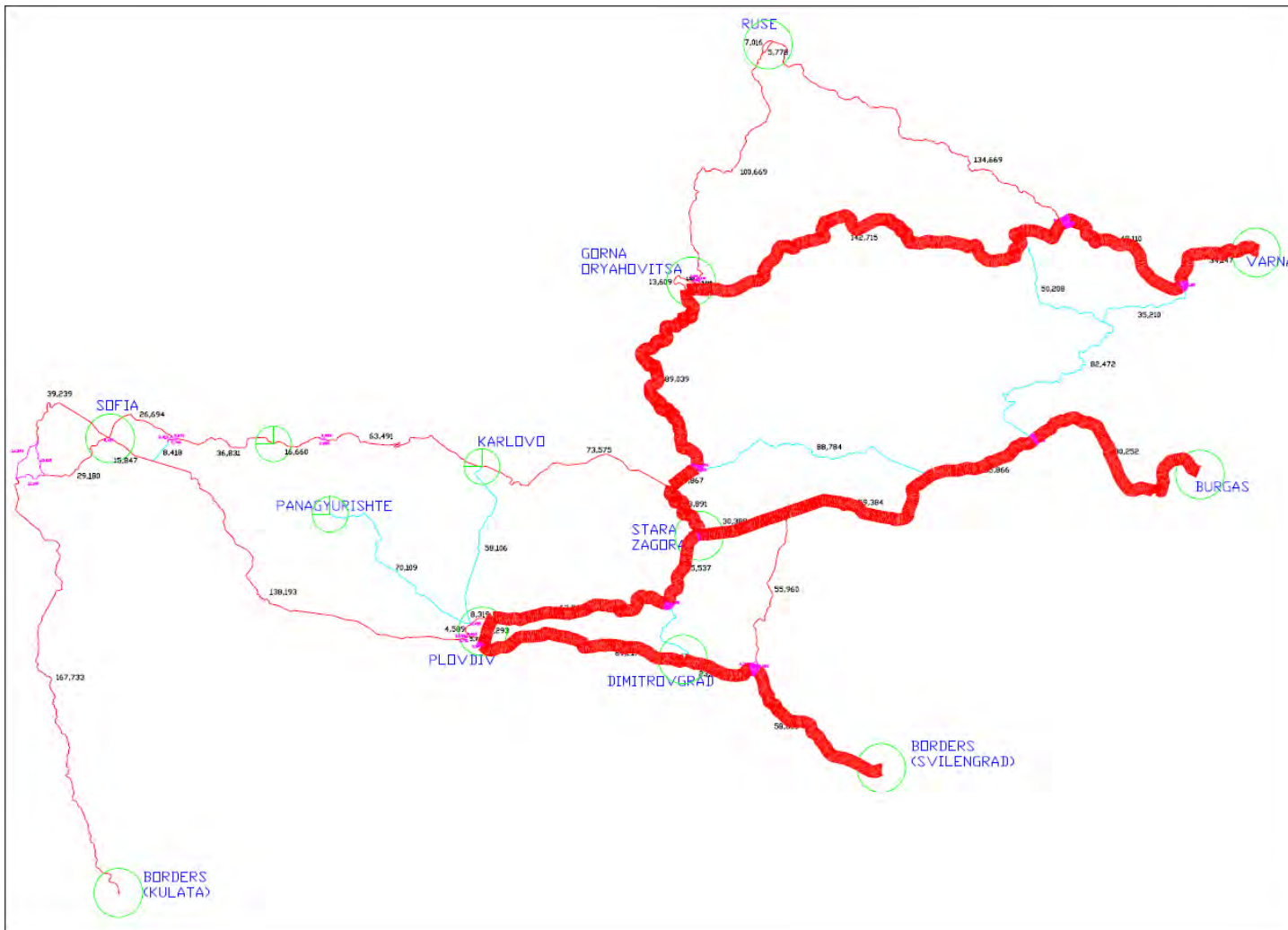


Figure 49: Bulgarian model rail network

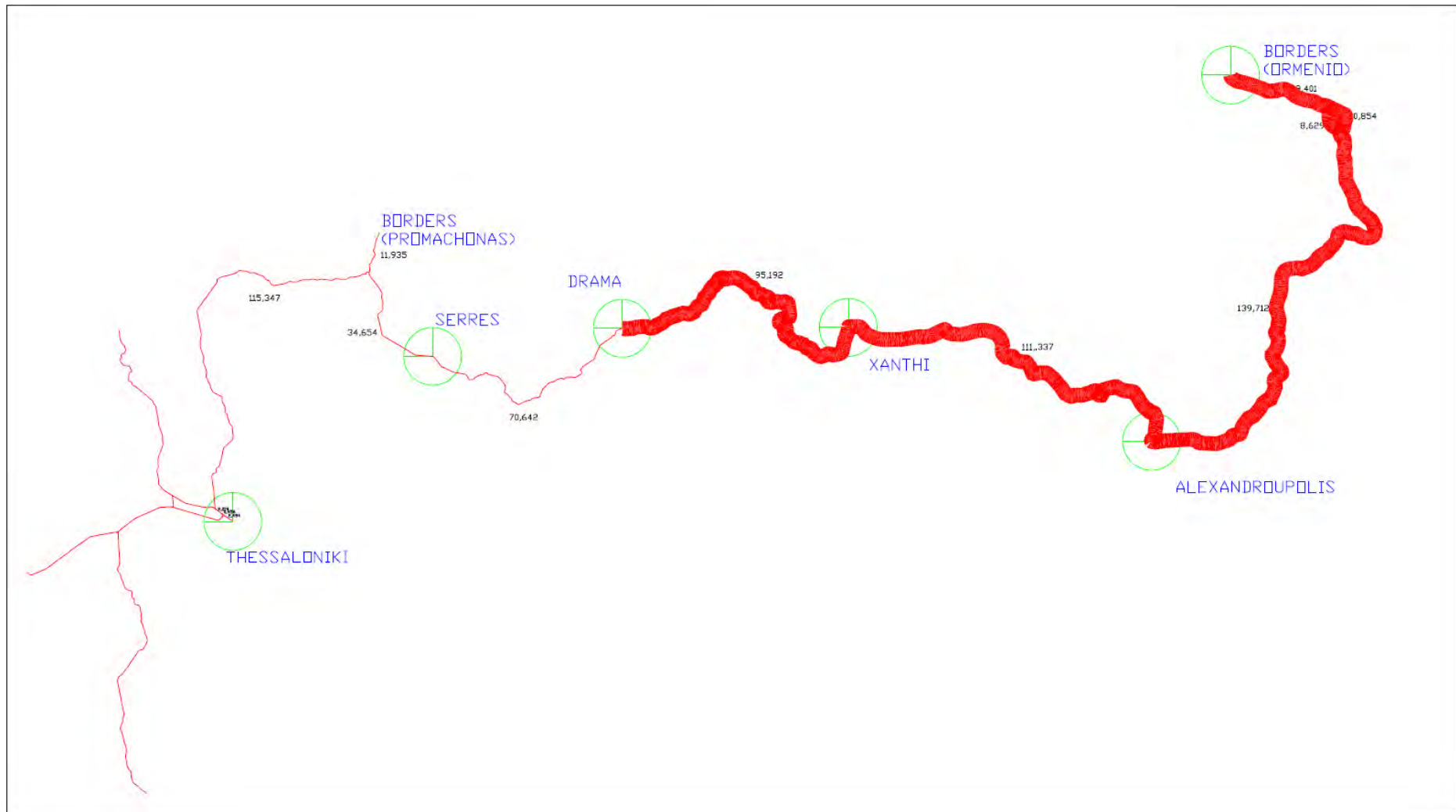


Figure 50: Greek model rail network

## 3.4 ECONOMICS PERSPECTIVE

### 3.4.1 Analysis of the current status of the corridor

#### General

The cost of transport via the corridor, as well as of alternative routing through the Bosphorus Strait depends on the cost of loading and unloading at the respective ports, rail transport costs, the cost of crossing the Bosphorus, including the cost of shipping. The following subsections present the available cost data pertaining to container transport costs.

#### Tariffs

##### *OLA S.A. (Alexandroupolis)*

Current OLA SA tariffs for container loading/unloading are as follows (€/TEU):

- Work on board vessel: 16 for empty, 28 for laden.
- Quayside work: 16 for empty, 28 for laden.
- Container relocation: 16 for empty, 28 for laden.

As far as storage (demurrage) charges for containers remaining in outdoor storage areas are concerned (i.e. time expected to elapse between arrival of container in port and loading/departure by train): the first day is free of charge.

In addition, cargo ships approaching the port incur following charges:

- Anchorage fees: 0.004836 EUR/GT.
- Berthing fees: 0.0871026 EUR per day & per metre length.

##### *OLK S.A. (Kavala)*

The current OLK SA tariff list for container loading/unloading is as follows (€/TEU):

- Work on board vessel: 7.59 for empty, 9.79 for laden.
- Quayside work: 7.59 for empty, 9.79 for laden.
- Container relocation: 7.59 for empty, 9.79 for laden.

As far as storage (demurrage) charges for containers remaining in outdoor storage areas are concerned (i.e. time expected to elapse between arrival of container in port and loading/departure by train): the first day is free of charge.

##### *Burgas*

Current tariffs at the port of Varna for loading/unloading containers are as follows (€/TEU):

- Work on board vessel: 40.30 empty & 50.35 laden.
- Quayside work: 40.30 empty & 50.35 laden.



The first day for which containers are held in outdoor storage areas on the train) is free of charge (i.e. of the time the containers are expected to remain at the port before loading).

In addition, cargo vessels above 10,000 GT approaching the port are subject to charges of €40.00 per 1,000 GT.

Costs of pilotage and berthing will be provided in due course.

With regard to container storage - the first 10 days of storage in an outdoor area is free of charge.

#### *Varna*

The current tariffs at the port of Varna for loading/unloading containers are as follows (€/TEU):

- Work on board vessel: 48.50 empty, 56.30 laden.
- Quayside work: 19.70 empty, 24.95 laden.
- Container relocation: 7.59 empty, 9.79 laden.

As far as storage (demurrage) charges for containers remaining in outdoor storage areas are concerned (i.e. time expected to elapse between arrival of container in port and loading/departure by train): the first day is free of charge.

#### *Ruse*

The current tariffs charged by the port of Ruse for handling container loading and unloading is as follows (€/TEU):

- Work on board vessel (ship – wagon): 50.00 empty & 55.00 laden.
- Work on board vessel (ship – storage): 37.00 empty & 45.00 laden.
- Quayside work (wagon – storage): 20.00 empty & 25.00 laden.

Storage costs amount to 1.10 €/day & TEU.

#### *TRAINOSE Freight Rates*

The following **TABLE 3.14** and **TABLE 3.15** present TRAINOSE's rates for transport of containers (€/TEU)

**TABLE 3.14: TRAINOSE CONTAINER FREIGHT TRANSPORT RATES**

Απόσταση χλμ Distance km	Εισαγωγές Εξαγωγές και Transit Importation Exportation et Transit	Απόσταση χλμ Distance km	Εισαγωγές Εξαγωγές και Transit Importation Exportation et Transit
0000-0100	201	0751-0800	659
0101-0150	251	0801-0850	695
0151-0200	266	0851-0900	719
0201-0250	280	0901-0950	772
0251-0300	318	0951-1000	781
0301-0350	356	1001-1050	802
0351-0400	392	1051-1100	831
0401-0450	432	1101-1150	861
0451-0500	461	1151-1200	888
0501-0550	501	1201-1250	917
0551-0600	528	1251-1300	946
0601-0650	568	1301-1350	974
0651-0700	594	1351-1400	1.001
0701-0750	633	1401-1450	1.029
		1451-1500	1.055

**TABLE 3.15: TRAINOSE WEIGHTED CONTAINER FREIGHT RATES**

Κωδικός μήκους Code longueur LC / CL	Πόδια Pieds	Μικτό βάρος / Masse brut (t) Μήκος / Longueur <sup>1)</sup> (m)	≤ 8 t <sup>2)</sup>	> 8 t <sup>2)</sup> ≤ 16,5 t	> 16,5 t <sup>2)</sup> ≤ 22 t	> 22 t <sup>2)</sup> ≤ 34 t	> 34 t <sup>2)</sup>
			20	20'	≤ 6,15	0,37	0,45
25	-	6,16 - 7,82	0,37	0,50	0,55	0,75	0,85
30	30'	7,83 - 9,15	0,50	0,55	0,75	0,75	0,85
40	40'	9,16 - 13,75	0,70	0,75	1,00	1,00	1,00
45 <sup>4)</sup>	45'	9,16 - 13,75	0,70	0,75	1,00	1,00	1,00
70	-	Ημιρυμουλκούμενο Semi-remorque	0,70	0,75	1,00	1,00	1,00 <sup>2)</sup>

Bulgarian Railways Tariffs

**Table 3.16: TARIFF TABLE FOR THE BULGARIAN RAILWAYS NETWORK (BDZ) in €/TEU**

Distance (km)	Amount	Distance (km)	Amount
---------------	--------	---------------	--------

1-20	116	501-550	609
21-40	144	551-600	656
41-60	176	601-650	707
61-80	193	651-700	756
81-100	207	701-750	784
101-120	228	751-800	831
121-140	244	801-850	877
141-160	263	851-900	922
161-180	277	901-950	969
181-200	300	951-1000	1016
201-220	315		
221-240	333		
241-260	355		
261-280	364		
281-300	389		
301-320	405		
321-340	423		
341-360	441		
361-380	461		
381-400	480		
401-420	498		
421-440	513		
441-460	529		
461-480	543		
481-500	560		

Weighted tariff coefficients are similar to those of TRAINOSE.

#### *Bosphorus Tariffs*

The tariffs for crossing the Bosphorus are as follows:

Sanitary Dues (up and down):  $0.0604 \times N.T$  (in USD)

Light Dues (up and down):  $0.169323 \times N.T$  (in USD)

Salvage Dues (up and down):  $0.08063 \times N.T$  (in USD)

#### **Basic Fees:**

Vessels'N.T.	Basic Fees for each passage through one Strait, in Euro
0 - 1000	100
1001 - 2000	145
2001 - 3000	170
3001 - 4000	200
4001 - 5000	230
5001 - 7500	280
7501 - 10000	320
10001 - 20000 per 1000 NT or fraction thereof	15
20001 - 30000 per 1000 NT or fraction thereof	10
30001 - 40000 per 1000 NT or fraction thereof	5
40001 - 50000 per 1000 NT or fraction thereof	5
Over 50001 additional, per 1000 NT or fraction thereof	5

### Ship Costs

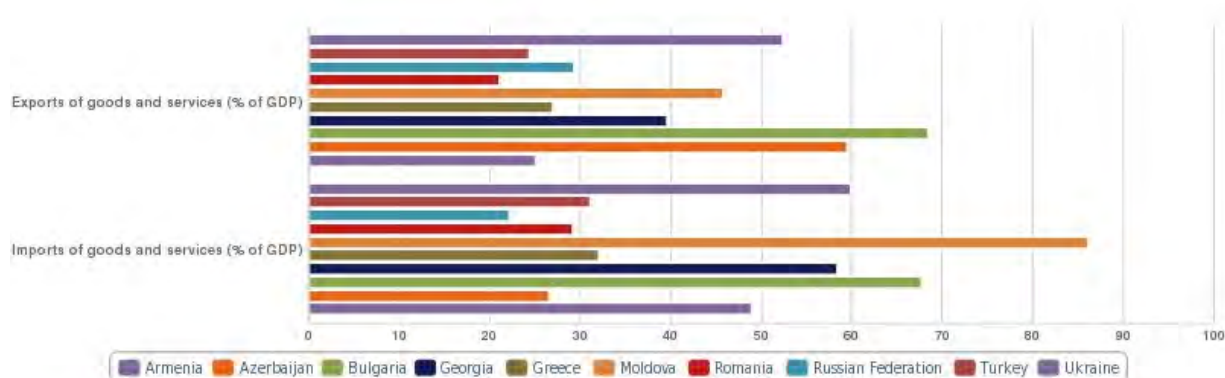
Given a reference size ship of 27,000 GT or 11,000 NT carrying 2,000 TEU, transport costs are estimated (according to Ocean Shipping Consultants) at:

- Daily capital charge: 20.242 USD
- Operating costs: 5.751 USD
- Fuel at sea: 22.395 USD
- Fuel in port: 1.380 USD
  
- Daily costs at sea/TEU: 24.19 USD
- Daily costs in port/TEU: 13,69 USD

## 4 CORRIDOR CURRENT COMPETITIVENESS ASSESSMENT

### 4.1.1 International trade

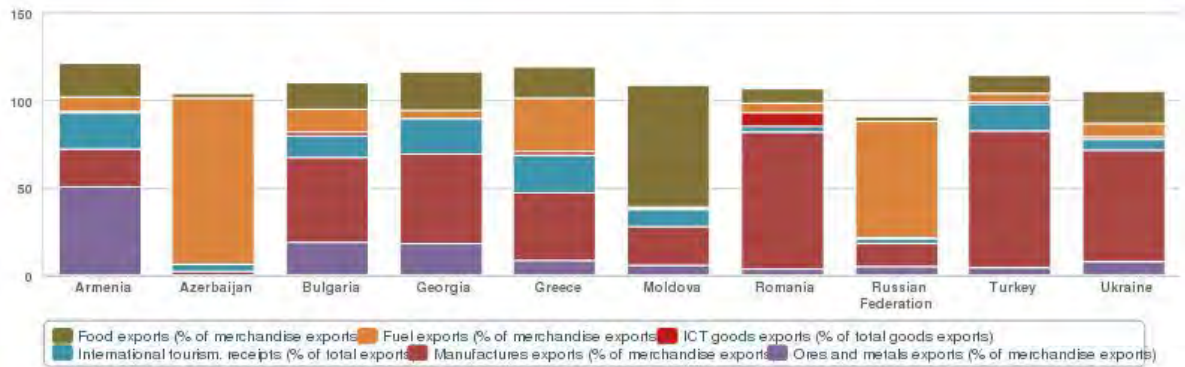
With average exports representing 39% of GDP and imports 46% of GDP, the Black Sea countries show overall in 2012 a trade openness similar to that of the EU (with respectively 43% for exports and 41% for imports). These averages nonetheless mask great national discrepancies both in terms of the integration of these countries into international trade – with Bulgaria, Moldova and Ukraine being the most integrated and Romania and Russia the least - and in terms of trade balance, with the two oil-exporting countries achieving considerable trade surplus, while several others struggle with large trade deficits (see Graph 4-1 below).



**Graph 4-1: Exports and Imports of goods and services, as a % of GDP, 2012**

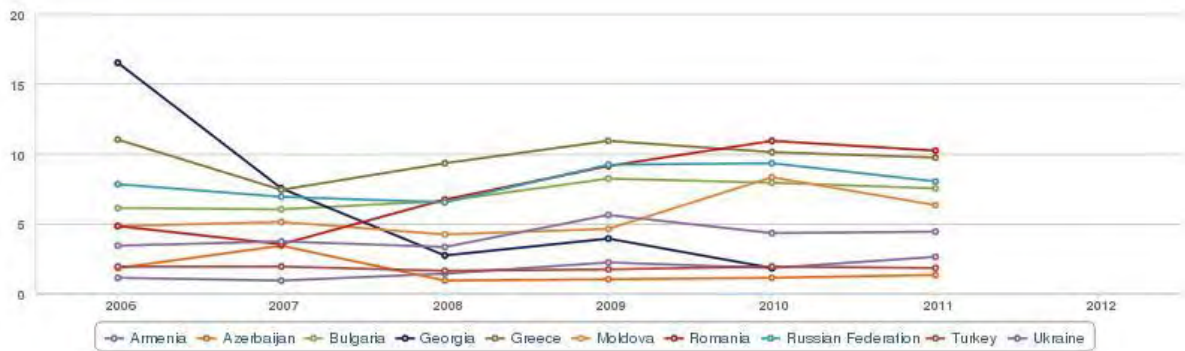
Since 2004, the EU has become the main trading partner for each country in the Black Sea region. In 2009, trade with the EU amounted to 30% of overall trade for Armenia, 43 % for Azerbaijan and 29% for Georgia. Trade figures also reveal that intra-regional trade within the Black Sea region expanded more quickly than overall external trade, both in the growth years, from 2000–2008, and in the recovery year of 2010.

The breakdown of key exports for each country is presented in the figure below and shows the great disparities among Black Sea export profiles, with notably Moldova relying mostly on food products, Romania and Turkey on manufactured goods and Azerbaijan and Russia on fuel (see Graph 4-2 below).



Graph 4-2: Main type of exports per country, 2011

High technology exports remain limited overall, ranging from 1.3% (Azerbaijan) to 10.2% (Romania) of manufactured goods exported in 2011 against 16% on average for the EU, with an uneven tendency over the last few years (see Graph 4-3 below). These figures show that the stimulation of innovation and research in the Black Sea Basin area remains a challenge.



Graph 4-3: High technology exports (% of manufactured exports), 2006-2011

#### 4.1.2 Overview of Black Sea Basin transport infrastructure

Economic development in the Black Sea countries and the subsequent rise of foreign trade, gave a great push to the organization and development of a regional Black Sea transport system. The total cargo turnover for the ports of Bulgaria, Georgia, Russia, Romania and Ukraine between 2000 and 2007 increased more than twice and around 50,000 ships sail through the Bosphorus every year including at least 10,000 oil tankers.

There is a steady increase of the rate of containerisation of freight in the transport market of the Black Sea and an increase of the volume/capacity ratio of the ports and networks. The market reached an absolute peak in 2008. The container market in the area mostly interesting the Sea2Sea concept, is estimated today to approximately 2 – 2,5 mi TEUs per year (not including the Turkish ports). In 2012, the container ports of the Black Sea (not including the Turkish ports) served a total of 2,43 mi. TEUs, a net increase of appr. 3 % over

the previous year, but still under the 2008 throughput. Direct calls to the major container ports overseas were linked to Costantza after the completion of the new container wharf (pushing the port's container throughput to a record high in 2006). However, today the area is served basically by feeder lines from the major Mediterranean hub-ports, (among which Piraeus, Goia Tauro, etc.).

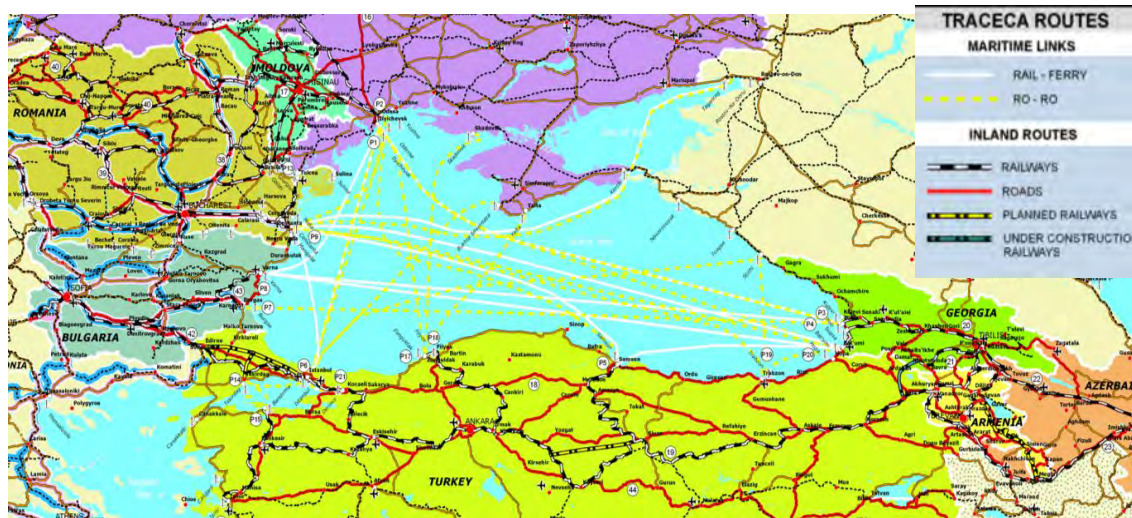
The ports which present the highest interest for the Sea2Sea project, Costantza serves 450.000 – 500.000 TEUs per year (it reached over 1 mi. TEUs in 2007) while both the Bulgarian ports, Varna and Burgas serve 150.000 – 200.000 TEUs per year.

The overall quality of port infrastructure around the Black Sea is still assessed as rather poor in Moldova and Romania and as good in Greece, Turkey (Trabzon is the major Turkish container port in the Black Sea) and Georgia (Poti, Batumi). It is noticeable, however, that even in the Black sea countries with poor port infrastructure, there are individual specialized terminals with modern equipment and high service level (including container, grain and oil terminals).

The Trans-BlackSea inter-modal transport network is also gaining more importance in the region with sea ports playing an essential role in connecting land transport lines with maritime lines. The ports of the Black Sea region serve not only as transport gateways for the routes connecting the countries of the region but they also serve commodity turnover between the Asian-Pacific region and Europe. Even for Black SeaBasin land-locked countries, maritime transport provides access to the Mediterranean Sea and to ocean transport shipping routes i.e. for intercontinental trade links. The Danube river also plays a strategic role in the Black Sea region connecting the region with the North Sea and the rest of Europe and serving as a central artery for Bulgaria, Moldova, Romania, and Ukraine.

Ferry lines cross the Black Sea in both north-south and east-west routes. Other routes also run parallel with the coast. The promotion of passenger, cruise and high speed ferry links could play an important role in the development of domestic and international tourism in the Black Sea region.

An overview of the Black Sea rail, road and maritime transport framework, as well as planned TRACECA routes, is provided in the map below.



**Figure 51: Overview of Black Sea Basin transport network (existing and planned), including main railways and roads**

Motorways of the Sea (MoS) have been identified for transnational multimodal axis including the Black Sea region, as an extension of the Trans-European Transport Networks (TEN-T) to EU Neighbouring countries (see Figure 53 below). The aim is to improve transport connections between the EU and its Eastern neighbours, as well as to improve intermodal freight operations, through the integration of short sea shipping into transport logistics, therefore improving port operations and making hinterland connections more efficient. The reference transport networks include different corridors in the Black Sea and Caspian Sea region, with EU countries being part of the EU TENs connecting with the Black Sea and the Transport Corridor Europe-Caucasus-Asia (TRACECA) linking Black Sea and Caspian Sea countries. (see Figure 51 and Figure 52).



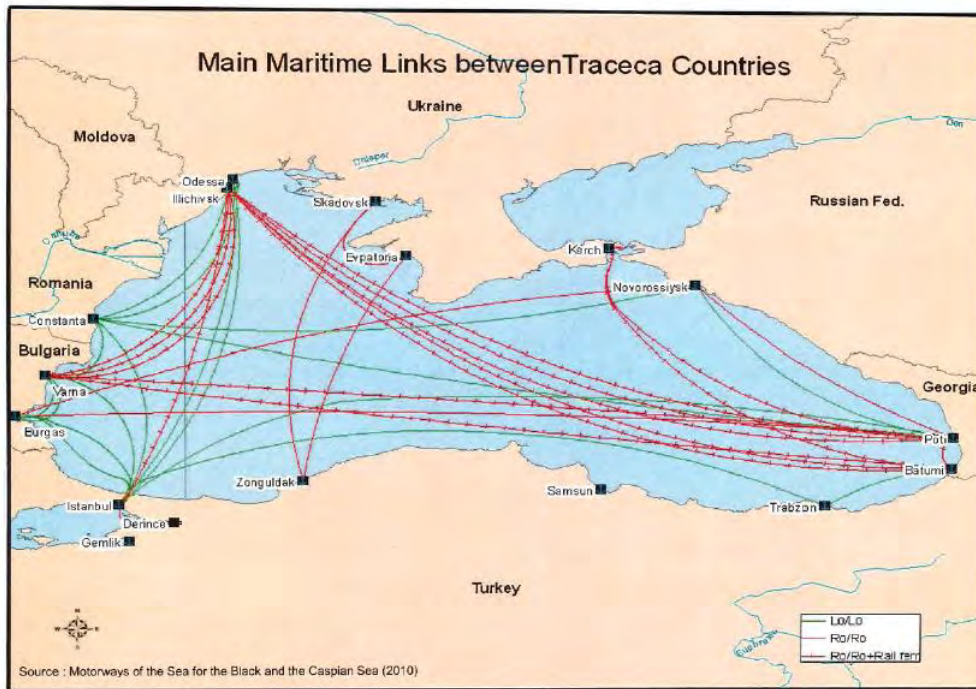


Figure 52: Main maritime routes in the Black Sea, 2010.



Figure 53: Multimodal axis within the Black Sea Basin and beyond, Ten-T network and priority axes, 2005

Cargoes movement and delivery against a background of increasing volumes of trade flows has become a priority for all countries of the region. However a complex of issues and requirements concerning maritime infrastructure, fleet renewal, quality of the services in the seaport, market access to the port services, adjustment to the international environmental standards and improvement of regulations and legislation related to the sea ports remain challenging.

#### 4.1.3 Economic assessment of the current competitiveness of the corridor

##### General

The corridor, in the sense of an alternative route to bypass the Bosphorus, does not currently exist per se. After completion of the container terminal at Alexandroupolis and its connection to the OSE network (in 2015) it will exist in theory, with the capacity to offer an alternate route between Alexandroupolis and the Bulgarian ports. This does not necessarily mean that, practically speaking, it will be in full active operation then, since all the terminal ports lack the infrastructure and superstructure required to support the project, and the railway infrastructure capacity is an unknown.

The following chapters present the calculation of the cost of using possible routes through the Bulgarian Ports to the Mediterranean, either via the Bosphorus or via potential rail connections.

##### Bosphorus Straits Pass

To calculate the cost of connecting the Bulgarian Black Sea ports to the Mediterranean through the Bosphorus, the following assumptions were made:

- ✚ The reference ship has a capacity of 27,000 GT (11,000 NT) and a length of 180 m.
- ✚ The container transport ship is a 'liner', spending 12hrs waiting time per Bosphorus crossing, plus 12hrs per crossing in transit over the Bosphorus and the Dardanelles.
- ✚ The voyage to the Black Sea takes 24hrs per crossing, and there is a 24hrs waiting time for loading/unloading (estimated use of 2 cranes per ship averaging a performance rate of 20 movements per hour).

In light of the above, the cost of taking the route from Mediterranean to the Black Sea ports (or the reverse) is calculated on the basis of data indicated in section 3.4.1 as follows:

##### Cost of crossing the Bosphorus (up & down)

$$(0.0604 + 0.169323 + 0.08063) \times 11.000 / 1.26 + 2 \times 1.460 = 4,380 \text{ EUR}$$

##### Ship Cost

$$[5 \times (20,242 + 5,751) + 3 \times 22,395 + 2 \times 1,380] / 1.26 = 158,659 \text{ EUR}$$

Total Cost: 163,039 EUR or 81.52 €/TEU (with provision for transshipment of 2,000 TEU per trip).

### Railway Connections

#### *Scenarios*

For the purposes of the analysis, consideration is given to the following alternative rail transport scenarios from the Mediterranean to the Bulgarian Ports and vice versa, via the existing rail network.

**Scenario A:** Port of Thessaloniki – Promachonas – Kulata – Sofia – Plovdiv – Stara Zagora – Gorna Oryahovitsa – Port of Ruse.

Total Distance by Rail: 76.6 km in Greece and 683.7 km inside Bulgarian territory.

**ScenarioB1:** Port of Alexandroupolis - Ormenio - Svilengrad – Dimitrovgrad - Plovdiv – Stara Zagora – Gorna Oryahovitsa – Port of Ruse.

Total Distance by Rail: 178.5 km in Greece and 542 km inside Bulgarian territory.

**ScenarioB2:** Port of Alexandroupolis - Ormenio – Svilengrad - Dimitrovgrad – Plovdiv – Stara Zagora – Port of Burgas.

Total Distance by Rail: 178.5 km in Greece and 524.4 km inside Bulgarian territory.

**Scenario B3:** Port of Alexandroupolis - Ormenio – Svilengrad - Dimitrovgrad – Plovdiv – Stara Zagora – Gorna Oryahovitsa - Port of Varna.

Total Distance by Rail: 178.5 km within in Greece and 667.3 km inside Bulgarian territory.

#### *Transport Cost Parameters*

The calculation of transport costs takes into account the following factors:

Port of departure costs include the movements: ship to quay, quay to warehouse area, warehouse area to train. A minimum warehouse storage period of 24 hrs is also included. Differential charges are attributed in line with applicable Port Authority tariffs for loaded and empty containers.

Rail cost calculation is based on the corresponding tariffs charged per kilometre by TRAINOSE and BDZ within their respective territories. Weighted tariff coefficients of 0.37 for empty containers and 0.45 for laden are taken into account.

The destination port costs include the following movements: train to storage area, storage area to quay, quay to ship. A minimum storage period of 24 hrs is also included. Differential charges are attributed in line with applicable Port Authority tariffs for loaded and empty containers.

The cost of pilotage and berthing is considered negligible.

### Calculation

Taking into account the preceding section 1.2, transportation costs are calculated for each scenario in the following tables, **Table 4.1**, **Table 4.2**, **Table 4.3**, **Table 4.4**.

**Table 4.1: SCENARIO A TRANSPORTATION COST (€/TEU)**

	LOADED	UNLADEN
Transfer: Ship - Quay (THPA)	70.60	57.30
Transfer: Quay - Storage Area (THPA)	28.40	21.50
Transfer: Storage Area - Wagon (THPA)	28.40	21.50
Storage fees (THPA)	3.50	1.75
TRAILOSE Rail Transport	90.45	74.37
BDZ Rail Transport	340.20	279.72
Transfer: Wagon - Storage Area (RUSE)	25.00	20.00
Transfer: Storage Area - Ship (RUSE)	45.00	37.00
Storage fees (RUSE)	1.10	1.10
<b>TOTAL</b>	<b>632.65</b>	<b>514.24</b>

**Table 4.2: SCENARIO B1 TRANSPORTATION COSTS (€/TEU)**

	LOADED	UNLADEN
Transfer: Ship - Quay (AL.PA)	28.00	16.00
Transfer: Quay - Storage Area (AL.PA)	28.00	16.00
Transfer: Storage - Wagon (AL.PA)	28.00	16.00
Storage fees (AL.PA)	0.00	0.00
TRAILOSE Rail Transport	119.70	98.42
BDZ Rail Transport	244.35	200.91
Transfer: Wagon - Storage Area (RUSE)	25.00	20.00
Transfer: Storage Area - Ship (RUSE)	45.00	37.00
Storage fees (RUSE)	1.10	1.10
<b>TOTAL</b>	<b>519.15</b>	<b>405.43</b>

**Table 4.3: SCENARIO B2 TRANSPORTATION COSTS (€/TEU)**

	LOADED	UNLADEN
Transfer: Ship - Quay (AL.PA)	28.00	16.00
Transfer: Quay - Storage Area (AL.PA)	28.00	16.00
Transfer: Storage - Wagon (AL.PA)	28.00	16.00
Storage fees (AL.PA)	0.00	0.00
TRAILOSE Rail Transport	119.70	98.42

BDZ Rail Transport	238.05	195.73
Transfer: Wagon - Storage (BURGAS)	50.35	40.30
Transfer: Storage Area - Ship (BURGAS)	50.35	40.30
Storage fees (BURGAS)	0.00	0.00
<b>TOTAL</b>	<b>542.45</b>	<b>422.75</b>

**Table 4.4: SCENARIO B3 TRANSPORTATION COSTS (€/TEU)**

	LOADED	UNLADEN
Transfer: Ship - Quay (AL.PA)	28.00	16.00
Transfer: Quay - Storage Area (AL.PA)	28.00	16.00
Transfer: Storage - Wagon (AL.PA)	28.00	16.00
Storage fees (AL.PA)	0.00	0.00
TRAI NOSE Rail Transport	119.70	98.42
BDZ Rail Transport	295.20	242.72
Transfer: Wagon - Storage Area (VARNA)	24.95	19.70
Transfer: Storage Area - Ship (VARNA)	56.30	48.50
Storage fees (VARNA)	0.00	0.00
<b>TOTAL</b>	<b>580.15</b>	<b>457.34</b>

Cost of transportation between Alexandroupolis and Plovdiv is calculated in the following **Table 4.5**.

**Table 4.5: TRANSPORTATION COST ALEXANDROUPOLIS – PLOVDIV (€/TEU)**

	LOADED	UNLADEN
Transfer: Ship - Quay (AL.PA)	28.00	16.00
Transfer: Quay - Storage Area (AL.PA)	28.00	16.00
Transfer: Storage - Wagon (AL.PA)	28.00	16.00
Storage fees (AL.PA)	0.00	0.00
TRAI NOSE Rail Transport	119.70	98.42
BDZ Rail Transport	118.35	97.31
<b>TOTAL</b>	<b>322.05</b>	<b>243.73</b>

#### 4.1.4 Conclusions

It has to be noted that -at the moment- the corridor does not actually exist, in terms of significant freight transportation. The road network that has been upgraded on both sides of the border has indeed improved mobility between Bulgaria and Greece, also assisted by the interoperability and flexibility advantage resulting as benefit from the EU membership.

However, there is practically no current freight traffic on the railway and -with a substantial part of the network being operated on a single line and twisty alignments- the transformation of the physical corridor into a freight transportation one is purely theoretical and of no significant value.

Nevertheless, this report examines the existing conditions in the alternative routes and identifies major hindrances within these routes and along the corridor of the study. The delays and passing costs through the Bosphorus straits and the actual distance of the Thessaloniki-Sofia corridor from the Black Sea field of operation are indeed the major setbacks for these alternatives. The project corridor maybe could gain against the Bosphorus straits in terms of passing time and against the Thessaloniki-Sofia line in terms of market reach (since it's in direct contact with the Black Sea, the Mediterranean and inland Bulgaria).

In that sense, the Sea2Sea corridor will have to be examined regarding its potential to draw market interest coming from the inland as well.

From the data in this section it is clear that the costs of transport by sea (through the Bosphorus) are in any event far lower than that of rail transport and in this sense the corridor may not be considered a viable alternative route for bypassing the Straits. However, a distinction must be made between these costs and shipping freight charges, since the second is strongly influenced by market conditions.

The other alternative rail routes show similar costs, which, in the case of Scenario B, are likely to rise due to increasing port costs when the port of Alexandroupolis, Burgas and Varna are asked to handle loads of a much greater magnitude than they do at present. In that strict sense, Scenario A appears to be the most attractive under the present circumstances.

Summing up: scenario A appears to be the most attractive under the present circumstances, since:

- The railway connection is already established and in use for several years.
- The port of Thessaloniki and especially the container terminal has the necessary capacity to accept the relevant container carriers, without additional investments. The existing investment program is not connected to the operation of the "corridor".
- On the other hand for the operation of Scenario B significant investments are needed, as is described in details in the following chapters.

## 5 REGIONAL AND CORRIDOR LONG-TERM FORECAST

### 5.1 FRAMEWORKS AND PLANS OF SPATIAL PLANNING, DEVELOPMENT AND OPERATIONAL PROGRAMMING

#### 5.1.1 Introduction

Spatial Planning in the context of market economy is a relatively new element in national development in Bulgaria. The Parliament adopted a Regional Development Law in March 1999. The Government of Bulgaria, in compliance with the provisions of paragraph 13 of this law, approved the principal parameters for drawing up a specific national plan for regional development. It also adopted the criteria for defining 2 networks of Regions<sup>63</sup>. The first is a network of 6 planning Regions, corresponding to NUTS II level, while the second includes 28 Regions, corresponding to NUTS III level.

In this report the following frameworks/projects are analyzed at national level:

- The National Regional Development Strategy for the period 2012 – 2022;
- The National Framework for Spatial Development for the period 2013 – 2025;
- The National Development Program 2020;

There is also a summary report of the "Common Strategy for Spatial Development for the V4 + 2 Countries", as a basic text for programming in Bulgaria.

At a regional level (NUTS II) Regional Plans for Development for the period 2014 – 2020 are approved for all three (3) Regions under study. These plans are examined in detail.

Finally, in regards to the analysis of the Operational Programming on the Bulgarian side of the S2S Corridor for the period 2007-2013 the elements of programming of the Operational Program for Transport are studied. Regarding the period 2014-2020 the details have been drawn from published statements of departmental executives and managers from the competent ministries which are available on the internet.

Spatial planning in the Greek territory is governed by the provisions of Act 2742/99. On a national level, the "General Framework for Spatial Planning and Sustainable Development" (FEK 128A/3-7-2008) is a body of texts and diagrams with which, "factors that affect long-term spatial development and structure of the national space are recorded and evaluated, spatial impact of international, European and national policies is valued and basic priorities and strategic directions for integrated spatial development and the sustainable organization of national space are identified for the next fifteen (15) years"<sup>64</sup>. Directions of the General Framework for Land-use Planning and Sustainable Development are specified in sectoral

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<sup>63</sup> Kolev B. (undated), "The Institutional functioning of regional development in Bulgaria", Institute of Geography, Available at:

[http://www.seedcenter.gr/projects/mne/1stconfer/1stconf\\_papers/kolev.pdf](http://www.seedcenter.gr/projects/mne/1stconfer/1stconf_papers/kolev.pdf)

<sup>64</sup> <http://www.ypeka.gr>

“Specific Frameworks for Spatial Planning and Sustainable Development”. So far there have been adopted Special Frameworks for aquaculture, tourism, industry and renewable energy sources.

On a regional level, Regional Frameworks for Regional Planning and Sustainable Development have been approved for every region of the country (with the exception of Attica) in 2003. In them "the position of the Region on an international and European level is recorded and evaluated, its role on a national level and in comparison with other regions and its inter-regional functions which has been or may be developed are recorded and the factors that affect the long-term development and structure of space on a regional level are evaluated. Also the spatial impact of European, national and regional policies and programs at the level of the region are valued. Finally on a fifteen years perspective key priorities and strategic options for the comprehensive and sustainable development on a regional level, which will promote the full-fledged integration in the wider world, European and national space are determined". The approved Framework (ΠΠΧΣΑΑ) for the REM-T was adopted in 2003 (FEK1471B/ 9-10-2003). An updating of that framework is currently under way, near completion (Oct. 2014).

The report examines the followings:

- The General Framework for Spatial Planning and Sustainable Development;
- The Regional Framework for Spatial Planning and Sustainable Development for the Region of Eastern Macedonia and Thrace;
- The published part of the study "Evaluation, review and refinement of the approved Regional spatial planning framework and sustainable development of the Region of Eastern Macedonia - Thrace"

The analysis of the Operational Programming on the Greek side of Sea2Sea Corridor, is based on the general and regional planning documents:

- The Regional Operational Program of Eastern Macedonia - Thrace 2007 - 13
- The Strategic Investment Program for Transport 2014 – 2025

### **5.1.2 Framework / plans of spatial planning and development**

#### **Bulgaria**

##### **I. National Regional Development Strategy (NRDS) of the Republic of Bulgaria for the period 2012-2022**

The “National Regional Development Strategy (NRDS) for the period 2012-2022” (Ministry of Regional Development and Public Works) is a fundamental document defining the strategic framework of the government’s policy for attaining balanced and sustainable development of the country’s regions and for overcoming the intra- and interregional differences/disparities in the context of the all-European policy of cohesion and achieving smart, sustainable and inclusive growth.



The vision and goals of the NRDS for the period 2012-2022 were formulated in the context of the following fundamental and goal-setting provisions of the papers and documents referred to above:

- Making the regions more attractive places to live and work in, by improving their transport connectivity, raising employment, the level and quality of education and the administrative services, and preserving their natural balance and cultural identity;
- Combining economic development goals with preserving the quality of the environment;
- Connecting the environmental, landscape and cultural assets of the regions and regarding them as the added value of development;
- Clarifying the degree of vulnerability of the regions to the challenges of globalization, changing demographics, climate change, energy dependence;
- Encouragement and support for the development of a knowledge- and innovation-based economy;
- Strengthening the territorial dimension of development strategies;
- Maintaining a balanced polycentric network of urban centers and improving their interaction with the surrounding rural areas, as well as with the peripheral and border areas;
- Achieving better connectivity of the regions by improving the transport and other infrastructures that ensure access to health care, education, high-speed internet and the energy grids;
- Taking advantage of cross-border, trans-national, inter-regional cooperation as a powerful tool for dealing with a wide range of problems at regional and local level: from commuting issues to the environment, by applying specific pilot practices;
- Implementing policies for integrated development of urban areas.

In 2008, global economic crisis interrupted the positive trends in almost all spheres of human activity, prompting the need to revisit and reconsider the big and very real challenges that, to countries like Bulgaria economically underdeveloped and peripheral to the EU, become threats: globalization, demographic decline, climate change, energy dependency; possible loss of biodiversity and natural and cultural heritage.

Irrespective of the new realities, challenges and threats on a national, European and global scale in the past years of crisis, the common idea of a desirable future development and state of the Bulgarian regions remains characterized by positive expectations for: 'dynamic development', 'sustainable development', 'high rates of economic growth and employment', 'improved quality of life', 'well-preserved natural and cultural heritage'. It is in that context that the **vision** for the country's regional development during the 2012-2022 period has been formulated:

### **Vision for Regional Development during the 2012-2022 period**

*The regions of Bulgaria: attractive to live in, making the most of their potential for sustainable growth, job creation, business and tourism, with well-preserved natural and cultural heritage.*

The network of city-centers consists of five levels: the 1<sup>st</sup> level includes capital Sofia – center of European importance, the 2<sup>nd</sup> includes 9 large cities – centers of national importance, including Burgas and Varna, the 3<sup>rd</sup> level consists of 25 medium-sized cities - centers of regional importance, the 4<sup>th</sup> 495 small cities and the 5<sup>th</sup> 133 small settlements - seats of municipalities. Since in the present study small differences in the hierarchy of residential centers between the National regional development strategy 2012 - 2022 and the national framework for the spatial Growth for the period 2013 – 2025 were found, these issues are analyzed in more detail in chapter 4.2.1.II.

Within the national territory of Bulgaria, two E-W (“parallel”) and three N-S (“vertical”) axes are considered to be the most significant: One parallel axis is in Southern Bulgaria: Dragoman-Sofia-Plovdiv-Svilengrad; this is a traditional European axis, whereas its branch linking Plovdiv, via Stara Zagora, with Burgas is a major national one. The other parallel axis is in Northern Bulgaria: Sofia-Pleven-Rousse, with a branch linking Pleven via Veliko Tarnovo and Shoumen with Varna. The western vertical axis is Vidin-Vratza-Sofia-Blagoevgrad-Kulata. The central vertical axis is Rousse-Veliko Tarnovo-Gabrovo-Stara Zagora-Haskovo-Kurdjaj-Makaza (greek borders). The eastern vertical axis runs along the Black Sea coast.

As a part of the basic priorities, it is necessary to carefully select urban areas for concentration of socioeconomic activities in accordance with objectively defined mechanisms of the market economy. In this context, it is necessary to support the development of Sofia’s European functions as an urban nucleus (MEGA) of European significance with a view to its promotion to a higher category than the current 4<sup>th</sup>. Support is also necessary for the development of the major cities as urban centers of national and regional significance generating growth and a high level of social and cultural functions. Activities will be focused on modernization of the basic infrastructure and putting in place of the infrastructure of the information society, development and transfer of technologies and innovations, applied science and R&D, higher education, development of high-growth generating sectors, protection of the environment and the cultural heritage, development of cultural institutions, improvement of public works in the cities and the quality of the urban environment, so that these centers would become attractive to investors and would participate actively in the competitive environment and the cultural and economic exchange among cities within the European Union. One of the important developmental objectives in these cities is to take advantage of their capacity to provide an impetus for development across the entire area of the respective regions through integration of the surrounding territory and attainment of economic, social, and spatial cohesion. Those are the cities and their functional urban areas (FUAs) included in the European network of cities of

national/trans-national functions - Plovdiv, Varna and Burgas. The Strategy aims to expand that network by the inclusion of major cities of Rousse, Stara Zagora and Pleven.

There is a clear need to stimulate the emergence of a major urban center in the periphery of the underdeveloped Northwestern Region. Such a city is Vidin, which has an important stabilizing role to play in view of its specific geographic location at the crossing point of two major transport corridors of the Trans-European Transport Network. It is also worthwhile considering, at a later stage, the inclusion of Blagoevgrad and Veliko Tarnovo in this category. Blagoevgrad is a traditionally strong urban center in the southwestern part of Bulgaria, whose important stabilizing and organizing role should be supported and developed further. With its history, tradition and present-day development Veliko Tarnovo gives every indication that it, too, deserves to be treated as an urban center belonging to the first category that, with its location in the North Central Region, it can serve as double for the urban center of Rousse.

Thus, within the level 2 regions, one can identify pairs of urban centers and their dipoles:

- In the North-Western Region: Pleven - Vidin,
- In the North-Central Region: Rousse - Veliko Tarnovo,
- In the North-Eastern Region: **Varna** - Shumen,
- In the South-Eastern Region: **Burgas** - Stara Zagora
- In the South-Central Region: Plovdiv – Haskovo
- In the South-Western Region: Sofia – Plovdiv.

In terms of transport infrastructure one of the priorities of the Strategy (priority 4.2) is the connectivity improvement of the regions in a national and international context, including major urban centers in neighbouring countries. This priority is part of the 4<sup>th</sup> Goal described in the Strategy as:

*“Balanced territorial development through strengthening the network of urban centers, improving connectivity in the regions and the quality of the urban environment in populated areas.”*

Improving the connectivity between regions and, above all, their links with the major European urban centers, is considered to be a crucial matter for the development and improvement of communication and transport and an issue of European importance.

Some of the objectives of this priority that are important for this study are:

Objective No. 1: Improving the connectivity of regions in an international context, with major urban centers in neighbouring countries.

Improving the connectivity of regions in a national and European context depends directly on the improvement of the network of corridors of the Trans-European Transport Network (TEN-T) and the other transport infrastructure of European and national significance. This is of particular importance for major urban centers of levels 1 and 2 and their connectivity with

the European network of cities. Of paramount importance is their connectivity with the capitals and other major urban centers in neighbouring countries in South-eastern Europe and the V4 Group. Instrumental for achieving better connectivity with major urban areas in neighbouring countries are:

- "Strouma" MW (to Thessaloniki and Athens) (this motorway is planned to be connected with one of the vertical connections of Egnatia Odos);
- Sofia-Kalotina MW and Maritza ME (to Belgrade and Istanbul respectively);
- Sofia-Vidin speedway (to Budapest);
- "Hemus" MW and the Veliko Tarnovo-Rousse speedway (to Bucharest);
- Pernik-Kyustendil-Gyueshevo speedway (to Skopje).

**Objective No. 2:** Improving transport connectivity in a national context, through developing the road infrastructure of regional importance.

Special attention is to be given to class 2 roads running parallel to the banks of the Danube and connecting municipalities along the river, as well as to class 2 and 3 roads running parallel to Bulgaria's southern border and connecting municipalities of the border area. The road connections referred to herein play an important role in broadening cooperation between municipalities in the two informal territorial communities, on the basis of dealing with similar issues and utilizing the potential of the border area for development and cooperation.

Listed below are the Priorities with regard to land use issues and the transport networks for the Regions covered by this report.

**North-Eastern Region:** The Region has a good potential for social and economic development. What is characteristic is that it accounts for the largest relative share in the attainment of the goals of the Europe 2020 Strategy with regard to the RES share in final energy consumption (18%) and decreasing the energy intensity of GDP by 54% compared with a national average of 50%. The priorities for attaining the regional development goals will be linked with the integrated maritime policy and the consolidated priorities of the Black Sea region program. They are orientated towards utilizing the development potential in the following areas (relevant to Sea2Sea concept):

1. **Transport infrastructure** – Development of the road and railway infrastructure of the European transport corridors and creating appropriate conditions for the successful inclusion of the Port of Varna in the increasing freight turnover in the Black Sea and making it as a main logistics and distribution center connecting Pan-European Transport Corridors VII, VIII, IX and TRACECA. Construction of the Black Sea Motorway and diverting transit vehicle traffic away from the sensitive coastal area, the resorts and hotel complexes along the coast. Construction and reconstruction of regional roads, guaranteeing future development, as well as curbing depopulation and the decline in employment by creating of new sources of income and employment.

2. Renewable Energy Sources [RES] – Utilizing the potential of the region for construction of installations for production of energy from renewable energy sources, especially of wind generators in coastal territories.
3. Territorial development and cohesion – Expanding cross-border, interregional and transnational cooperation. Creating better conditions for communication with the Central and Western European and Asian countries and integrating the regional economy into the European market. The region has potential to develop as an eastern gateway to the EU, connected via the Black Sea Motorway. Varna is a city of national / transnational importance according to the European Classification of functional Urban Areas (FUA) and will play the role of a European gateway. Varna has the potential of joining in the future the category of cities of European importance (MEGA);

Also:

4. Environmental protection - Overhauling the mass transit system, ensuring higher safety, reducing the noise pollution and improving the air quality in the urban areas.
5. Natural and cultural heritage, tourism;
6. Quality of life;
7. Development of information and communication technologies;
8. Innovations and development of science and technology;

**South-Eastern Region:** The Region has development potential as evidenced by 2020 projections. The priorities for attaining the regional development goals are similar to these for the NER and will be linked with the integrated maritime policy and the consolidated priorities of the Black Sea Region Program, taking into account the development potential in the following areas:

1. Transport infrastructure – Development of the European Transport Corridors, road and railway infrastructure, the Burgas international port with all modern facilities: specialised terminals, logistics centers, etc. Construction of the Black Sea Motorway and enabling intermodal transport by air, water and land, which will stimulate business and maritime tourism. Construction of sections of the two motorways, 'Trakia' and 'Black Sea', which will enable better and more efficient utilisation of the local development potential. Reconstruction of the roads in the southern part of the region.
2. Territorial development and cohesion. Expanding the cross-border, interregional and transnational cooperation by enabling communication with the Central and Western European and Asian countries. The region has a potential to develop as an eastern gateway to the EU – the development of Pan-European Transport Corridor No. 8 and its eastward extension, where it continues as TRACECA (Transport Corridor Europe-Caucasus-Asia), is an opportunity for entering the emerging markets on the eastern Black Sea coast.

Also:

3. Economic environment - Developing a diversified economy, capable of improving the flexibility and adaptiveness of the local economies to the processes in the global economy.

4. Social environment - Increasing the quality, scope and accessibility of social, cultural and educational services..
5. Potential for development of RES.
6. Development of information and communication technologies.

**South-Central Region:** The South Central Region is unique in its location as a crossroads of important transport corridors connecting Europe and Asia. The region is characterized by a balanced distribution of resources: fertile agricultural land, areas rich in immovable cultural monuments, important bio-corridors connecting the NATURA 2000 areas of special conservation, abundant woodlands and mountain areas with potential for development of winter sports and recreation, foothill areas with traditional land use – orchards and vineyards, a variety of settlements in terms of size, character, production profile, cultural traditions and values, including such of global importance.

Taking into account the development potential and the potential for reducing the negative processes, priority public interventions are envisaged in the following areas:

7. Transport infrastructure– Development of Pan-European Transport Corridors No. 4, No. 8 and No. 9 as part of the European transport network. Further development of Maritsa MW and “Trakia” MW. Construction of the so called “Southern parallel” along the route Petrich – Burgas via the Rhodope Mountains. Development of the railway infrastructure and use of Plovdiv international airport. These measures will make the region accessible and attractive for locating businesses, for growth in foreign investments and for development of tourism.
8. Territorial development and cohesion – Expanding cross-border cooperation with Greece and Turkey, as well as transnational cooperation by creating better conditions for communication with the Central and Western European and Asian countries. The area has a potential to develop as a gateway to the Southern Balkans and Asia. Construction of industrial and business zones.

Also:

9. Economy - Development of clusters and development and introduction of innovations and technical renewal of industrial facilities. Enhancing access to, and development of, regional and local infrastructure: construction of new or expanding the existing business, industrial and technological parks in the large industrial centers: Plovdiv, Dimitrovgrad, Kardjali, Pazardzhik, Panagyurishte, Haskovo, Rakovski, etc.
10. Natural and cultural heritage, including biodiversity and tourism.
11. Social infrastructure.
12. Environmental protection.

**North – Central Region:** The priorities for the Region will be related to the Danube Strategy, taking into account the development potentials. The priority public interventions related to transport infrastructure and Territorial development and cohesion are:

- Development of the potential for making transport a key sector in the region's economy. Development of Pan-European Transport Corridors No. 7 and No. 9 and the TRACECA corridor as part of the European transport network. Construction of an intermodal terminal in Ruse. Improving the port infrastructure in Svishtov, Tutrakan and Silistra, developing the two freight ports in Ruse so that they can handle international freights. Reconstruction and modernisation of the existing bridge Ruse – Giurgiu, construction of a fourth bridge over the Danube at Silistra – Calarasi. Construction of the Ruse – Veliko Turnovo – Makaza speedway and a tunnel under the Shipka pass the Ruse – Razgrad – Shoumen speedway and Hemus Motorway; reconstruction and modernization of class 1 road Silistra – Shoumen. Development of the Gorna Oryahovitsa international airport and strengthening its leading role for the social and economic development of the region. Development of Shtraklevo Airport as a national civil aviation airport. Development of railway transport. Adequate realization of the opportunities for intermodal transport by air, water and land.

Expanding cross-border, interregional and transnational cooperation: enabling communication with Central and Western European countries and integrating the regional economy into the European market. Utilising the potential of Ruse for cross-border cooperation in European region Ruse – Giurgiu.<sup>65</sup>

## II. National Concept for Spatial Development for the period 2013-2025

The National Concept for Spatial Development for the period 2013-2025 (NCSD) ("National Concept for Regional Development for the period 2013-2025. The national space – our common heritage for the future", National Centre for Regional Development, OP Regional Development 2007-2013), is a mid-term strategic document, which outlines the directions for land-use planning, governance and protection of the national territory and aquatory and creates

### **Main objective of the National Concept for Spatial Development for the period 2013-2025**

*Spatial coordination of the processes in the national territory through establishing a spatial and land-use planning base and a regulator for implementation of both regional planning and individual socio-economic sectoral planning at the national level in the context of the common European spatial development for the purposes of achieving complex integrated planning*

preconditions for spatial orientation and coordination of the sectoral policies. Together with the National Regional Development Strategy 2012-2022 it is a principal document in the most recent legislation of the country and a long-aspired instrument for integrated planning and sustainable spatial, economic and social development. The general trend laid down in the Concept is overcoming the threat of orientation towards monocentrism, promotion of

<sup>65</sup> National Regional Development Strategy (NRDS) of the Republic of Bulgaria for the period 2012-2022

the movement from monocentrism towards moderate polycentrism, which expands and comes closer to developed polycentrism over time.

The selected vision of the NCS D is formulated in three brief messages:

- The national space of Bulgaria – open to the world and integrated in the European space and in the European network of core-cities and axes of development, culture, science and innovations.
- The well-preserved national resources – the people, land, waters and forests, ores and minerals, natural and cultural heritage – a guarantee for the national identity.
- Balanced and sustainable integrated development, achieved through rational organization of the economic, social, transport, engineering, cultural and tourist infrastructure and ensuring smart economic growth, adaptability to change and equal treatment.

From this vision the strategic objectives of the NCS D have been derived:

- Strategic objective 1: "Integration in the European space"
- Strategic objective 2: "Polycentric territorial development"
- Strategic objective 3: "Spatial cohesion and access to services"
- Strategic objective 4: "Well-preserved natural and cultural heritage"
- Strategic objective 5: "Promoted development of specific areas"
- Strategic objective 6: "Competitiveness through growth and innovation areas"

Strategic objectives 1 and 5 are of importance for the present project. In particular, Strategic objective 1 concerns, among others, the development of national and cross-border/trans-border transport, with a view to achieving territorial cohesion, cooperation and integration within the region and in the European space. Strategic objective 5 refers to integrated planning and promoted development of areas with specific characteristics (such as Black Sea coast, Danube river basin etc.), with a view to preserving and effective use of their natural, economic, social and cultural development potential.

More specifically, within *Strategic objective 1: "Integration in the European space"*, certain priorities have been identified that relate to the objective of the S2S project, which are the following:

- Linkage of Bulgarian cities in axes for urban development, incorporated in the pan-European network of cities of transnational significance and in the pan-European development axes
- Development of the national transport infrastructure as part of the Trans-European Transport Network (TEN-T), which ensures integration in the European space and connections with the major urban centers of neighbouring countries.

The following priority that is included in *Strategic objective 5: "Promoted development of specific areas"* is also relevant to the present project:



- Integrated management and sustainable development of the Black Sea coastal municipalities, including through cross-border cooperation with neighbouring countries from the Black Sea Region, for introduction of an Integrated Maritime Policy.

The National Concept builds upon and develops further the polycentric model of hierarchically ranked centers and development axes, proposed in the NRDS 2012-2022 (see Chapter 4.2.1.I).

Focusing on the **sector of transport**, the proposals for the development of transport networks are related mainly to the most important axes of the Trans-European Transport Network (TEN-T) and the connections with the neighbouring countries and regions, as well as with the directions of the pan-European corridors, which are not covered by the major axes and some of the additional connections. In the course of implementation of these priorities the national transport network will gain a more rational spatial organization, ensuring links between different European countries via the territory of the country, connections of Bulgaria with neighbouring countries and connections between the main urban centers. Specifically the road infrastructure of regional and local significance is of particular importance for the functioning of the polycentric model, since it complements the functions of the road network of national significance.

The urban development axes of the country are related on the one hand to the transport corridors and their integration with the development poles and on the other the cultural corridors in Southeast Europe (see also Chapter 4.2.1.I). The urban axes laid down in the NCS D follow the scheme proposed in the Joint Paper of the Vishegrad Four Countries plus Bulgaria and Romania (V4+2) (see Chapter 4.2.1.IV) and elaborate further the ideas of the National Regional Development Strategy 2012-2022. Within this rational, it is necessary to (among others): a) Complete the construction of the important geostrategic axes for the connections of the country with Europe and Asia and with the countries in the Danube and the Black Sea regions; b) Ensure a sustainable transport communication system in the national space for equitable access from the secondary axes to the major axes and to the centers of administrative, social, cultural and touristic services.

Regarding the urban network structure, a "baseline state" model is initially formulated, containing a hierarchic system of core-cities. In this model, four levels are identified:

- The 1<sup>st</sup> level includes the capital city of Sofia, center of European significance for the national territory. According to the European classification of ESPON, Sofia is a city of 4<sup>th</sup> degree of the Metropolitan European Growth areas (MEGA) level.
- The 2<sup>nd</sup> level includes six big cities, centers of national significance for the territory of the regions: Plovdiv, Varna, Burgas, Ruse, Pleven, Stara Zagora<sup>66</sup>. According to the European classification of ESPON, only the cities of Plovdiv, Varna and Burgas belong to the 2<sup>nd</sup> level (Transnational–national).

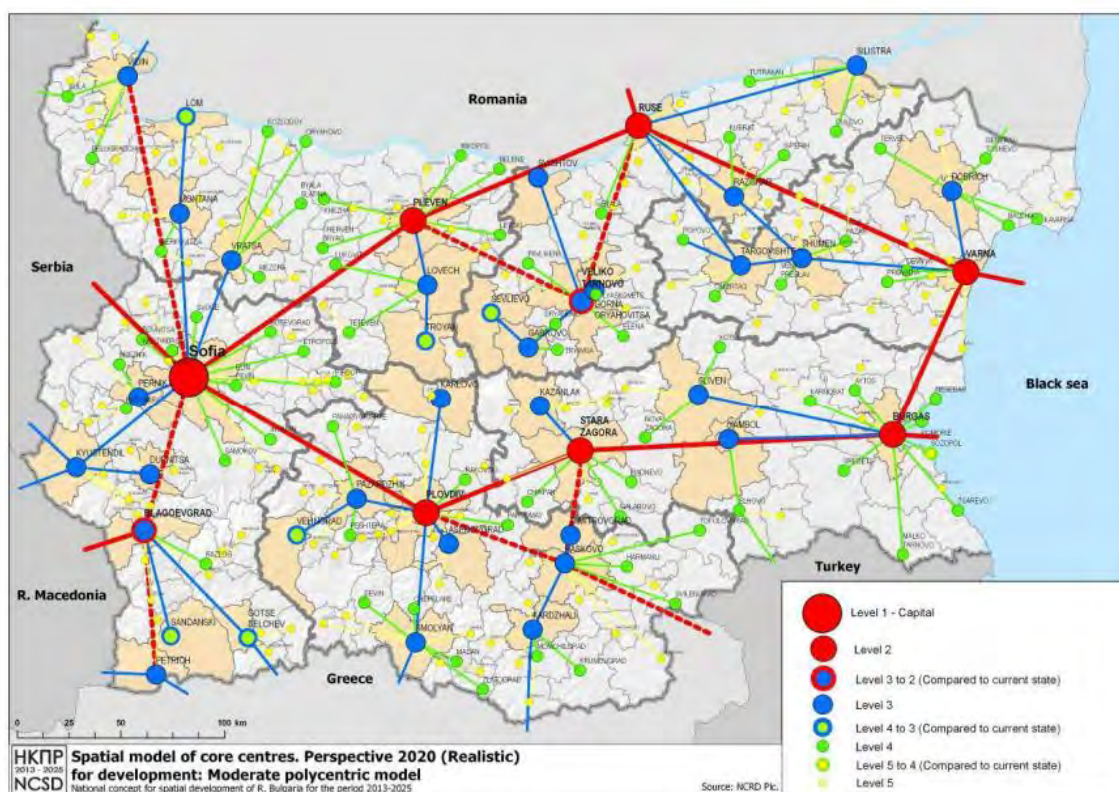
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<sup>66</sup>The centers that are relocated within the North-eastern, South-eastern and South-central regions are underlined.

- The 3<sup>rd</sup> level includes 28 medium-sized cities, centers of regional significance for the area of the Districts: Vidin, Montana, Vratsa, Lovech, Gabrovo, Veliko Tarnovo, Targovishte, Razgrad, Shumen, Silistra, Dobrich, Sliven, Yambol, Haskovo, Kardjali, Smolyan, Pazardjik, Pernik, Kyustendil, Blagoevgrad, Svishtov, Gorna Oryahovitsa, Kazanlak, Dimitrovgrad, Assenovgrad, Karlovo, Dupnitsa, Petrich. According to the European classification of ESPON, this level is called "Regional–Local". It is considered that the cities of Veliko Tarnovo, Gabrovo, Shumen, Dobrich, Haskovo, Pazardjik and Blagoevgrad have potential possibilities to shift to level 2 in the event of appropriate future development and possible promotion. The cities of Gorna Oryahovitsa, Dimitrovgrad, Assenovgrad, Karlovo, Dupnitsa and Petrich, although they have been listed as belonging to Level 3, in fact they are on the borderline between Level 3 and Level 4. Depending on the influence of a variety of factors in their future development, they might categorically remain within Level 3 or lose their significance and drop to Level 4.
- The 4<sup>th</sup> level includes 90 small cities of micro-regional significance for the territory of a group of municipalities (former "counties"). The following 4<sup>th</sup> level cities are located in the regions of the study area:
  - North-eastern Region, 10 cities: Balchik, General Toshevo, Tervel, Kavarna, Devnya, Provadiya, Veliki Preslav, Novi Pazar, Omurtag, Popovo.
  - South-eastern Region, 15 cities: Aytos, Karnobat, Nessebar, Pomorie, Sozopol, Sredets, Tsarevo, Malko Tarnovo, Elhovo, Kotel, Nova Zagora, Tvarditsa, Galabovo, Radnevo, Chirpan.
  - South Central Region, 20 cities: Parvomay, Rakovski, Sopot, Stamboliyski, Hissarya, Svilengrad, Harmanly, Topolovgrad, Krumovgrad, Momchilgrad, Ivaylovgrad, Zlatograd, Madan, Devin, Chepelare, Velingrad, Panagyurishte, Peshtera, Rakitovo, Septemvfi.

Depending on their future development, some of the above cities might shift to level 3 or drop to level 5.

- The 5<sup>th</sup> level includes 139 very small towns and villages, centers of municipal significance for the territory of the respective municipalities (20 in the North-eastern region, 13 in the South-eastern region and 29 in the South-central region).



In addition to the very small towns there are also 38 villages, which are centers of municipalities, and 40 very small towns, which are not municipal centers.

**Figure 54: The “Baseline state” model of spatial development of Bulgaria**

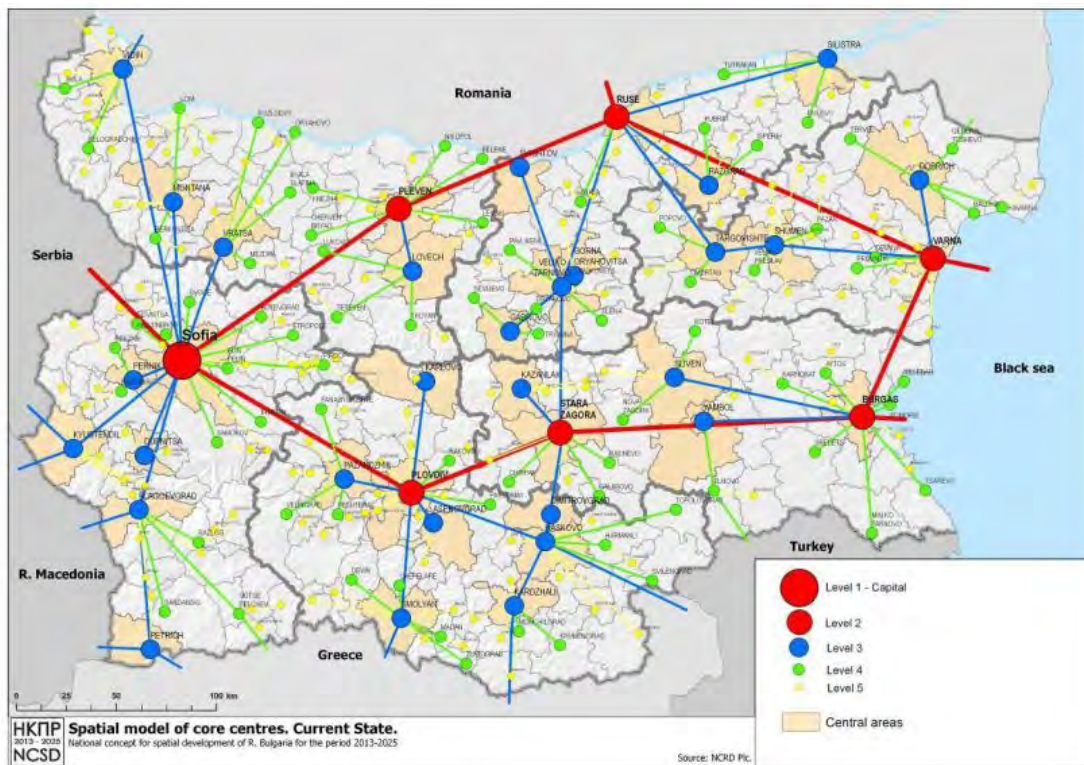
Source: National Centre for Regional Development (2012) “National Concept for Regional Development for the period 2013-2025. The national space – our common heritage for the future”, p. 35

As it was mentioned before, the model chosen for spatial development for 2025 is that of “*moderate polycentrism*”, as a model in between “*extreme monocentrism*” and “*extreme polycentrism*”. This model develops under the conditions of moderately reduced rates of demographic shrinkage and successful implementation of the regional policy, accompanied by overcoming of the economic difficulties and slight economic growth.

According to this model, the development of the capital, Sofia, as a city of MEGA European level is combined with successful development of a limited number of Level 2 centers of national significance. These are Varna, Plovdiv, Burgas, Ruse, Stara Zagora and Pleven. A group of medium-sized cities demonstrate potential to shift to hierarchic Level 2: Vidin, Vratsa, Gabrovo, Veliko Tarnovo, Shumen, Dobrich, Sliven, Yambol, Haskovo, Pazardjik, Blagoevgrad, Pernik and Kjustendil.

The targeted regional policy contributes for the advance of the cities of Veliko Tarnovo and Blagoevgrad, and at a later stage of Vidin (none of which belongs to the study area). Varna and Burgas in Eastern Bulgaria in particular, will develop as major poles of growth and counterweights of the capital. These cities are the “eastern gateways” for the European

Union and will develop as important transport and commercial centers in the European network of cities.



**Figure 55: The “Moderate polycentrism” model of spatial development of Bulgaria for 2025**

Source: National Centre for Regional Development (2012) “National Concept for Regional Development for the period 2013-2025. The national space – our common heritage for the future”, p. 39

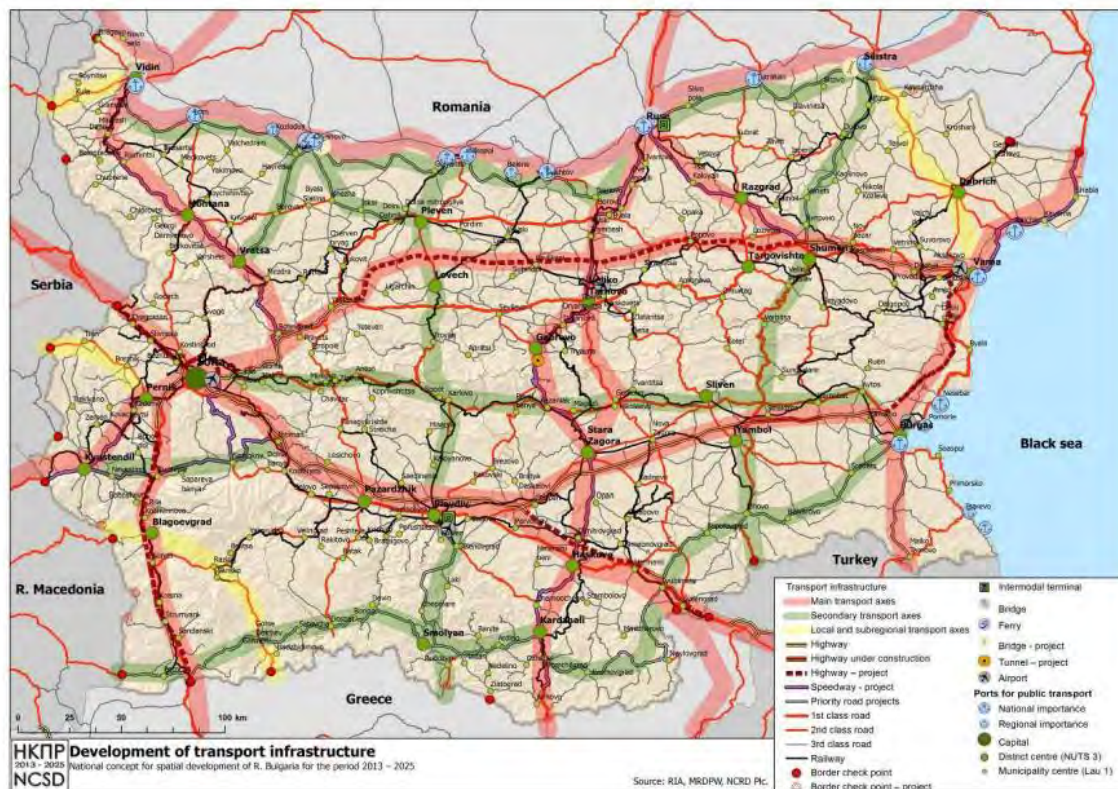
In the National Concept, four types of agglomerations with their respective scopes have been identified: agglomerations of big cities in the territory of a group of neighbouring municipalities; Agglomerations of big cities in the territory of their own municipality; Agglomerations of medium-sized cities, shrunk to the scope of the nucleus in the territory of their own municipality; Agglomeration formations of tourism-oriented type, developing under the influence of the contemporary processes of urbanization and the predominating tourism-related functions. Varna and Burgas are included in the first of these types of agglomerations, being affected simultaneously by tourism-related functions (Black sea area) which impact on their spatial and economic structure, the appearance and characteristics of their coastal zones within the boundaries of the urbanized territory and the adjacent rural areas and small human settlements.

Focusing on the analysis of transport infrastructure, as it is referred in the National Concept, the fact that the territory of Bulgaria is crossed by five of the ten PETC gives great advantage

to many of the main urban centers to join the Trans-European Transport Network (TEN-T), but the quality of the component infrastructure undermines this opportunity.

**A major problem, identified in connection with the characteristics and properties of the infrastructure, is the absence of unbroken, continuous and permanent transport networks, ensuring rapid and safe travel at longer**

The spatial model of the transport infrastructure proposed by the National concept is shown in the figure below. The model will be based on the currently developed configuration with center Sofia in Western Bulgaria and the balancing centers Varna and Burgas to the east. It will develop in a 'grid'-type modality with prominent and evenly spread parallel and meridian axes across the territory.



**Figure 56: Spatial model of the transport infrastructure**

Source: National Centre for Regional Development (2012) "National Concept for Regional Development for the period 2013-2025. The national space – our common heritage for the future", p. 65.

The main transport destinations/axes, characterizing this model, are as follows:

- **Major western "north-south" axis (Romania/Vidin-Sofia-Kulata/Greece)** via Bulgaria between Western Romania and Greece/Turkey along the route of PETC No. 4. It ensures

the connection between Western Europe and Greece, traversing entirely only EU Member-States. This axis is formed by Priority Axis No. 7 of TEN-T for the road infrastructure and Priority Axis No. 22 for the railway infrastructure, connecting the important urban centers Dresden/Nurnberg-Prague-Vienna/Bratislava-Budapest-Arad-Bucharest-Constanta/Craiova-Sofia-Thessaloniki/Plovdiv-Istanbul.

- **Major central "north-south" axis (Romania/Ruse-Stara Zagora-"Makaza" border-crossing point/Greece)** as part of the destination of PETC No. 9, connecting Finland and Russia with Greece via Romania and Bulgaria. Without being part of TEN-T, PETC No. 9 ensures connections of the country with the important urban centers Bucharest, Kiev, Moscow, St. Petersburg and Helsinki to the north and Alexandroupolis to the south. The National Concept points out that this axis will ensure its comprehensive operation, among others, with the construction of an intermodal terminal in Ruse and the modernization of the railway line along this destination.
- **Major eastern "north-south" axis (Romania) "Durankulak" border crossing point-Varna-Burgas-"Malko Tarnovo" border crossing point/Turkey**, connecting the Bulgarian Black Sea tourist centers with those in South Romania (in the area of Mangalia, Constanta and Mamaya) and Turkey to the south. This axis runs as part of the route of PETC No. 8 only in the section between Burgas and Varna, where the construction of the "Black Sea" Highway is envisaged. The "Black Sea" Highway is considered to be part of a future main ring road around the Black Sea.
- **Major axis "west-southeast" ensuring the transport communications of Central and Western Europe with Asia and the Middle East.** This axis is a combination of the routes of PETC No. 10, PETC No. 8, PETC No. 4 and PETC No. 9 and will develop as a priority for connection of TEN-T with the neighbouring countries and regions. The development of this axis comprises, among others, the modernization of the Sofia-Plovdiv railway line, as well as the construction of an intermodal terminal in Plovdiv.
- **Southern "west-east" major axis (FYROM/"Gyueshevo" border crossing point-Kyustendil-Sofia-Plovdiv-Burgas/Varna)**, ensuring connection between the countries from the southwestern part of the Balkan Peninsula with the Black Sea ports along the destination of PETC No. 8 - Durrës-Tirana-Skopje-Sofia-Plovdiv-Burgas/Varna, conveying traffic from and to the Adriatic region. After completion of the construction of "Trakia" Highway and upgrading of the railway infrastructure, as well as the construction of "Black Sea" Highway, the southern major axis in the country will ensure the functioning of PETC No. 8. The missing connection "Gyueshevo-Kriva Palanka" between the railway networks of Bulgaria and FYROM continues to present a problem. The project for construction of a railway line Sofia-Skopje is of strategic significance both with a view to the connection of the railway networks of the two neighbouring countries and to the comprehensive construction of the railway route along PETC No. 8. The development of Varna and Burgas ports as 'point' elements of PETC No. 8 and important gateways of the country along the EU external border will support the functioning of the southeastern major axis for Europe, connecting the European Union via the Balkans and Turkey with Caucasus and the Caspian Sea, as well as with Egypt and the Red Sea.

- **Northern "west-east" major axis (Sofia-Veliko Tarnovo-Shumen-Varna)**, establishing itself after completion of the construction of "Hemus" Highway, which was incorporated through a decision of the European Commission in TEN-T.
- **Far northern "west-east" major axis** which is formed along Priority Axis No. 18 of TEN-T (the River Danube), connecting all prominent European centers of the Danube countries. As a water-borne way this axis is mainly of international significance and has lesser influence on the spatial organization on a national scale. Among others, a very important project connected with this axis is the construction of a high-speed road Ruse-Shumen and upgrading of the railway line. The land connection Ruse-Varna represents an alternative segment of PETC No. 7 and provides faster connection between the transport main route "Rain-Main-Danube"/the port of Ruse - the port of Varna - the Caucasus countries - the countries of Central Asia, Iran and the Far East.

The major axis of the transport infrastructure model described above, ensure the international connections of the country with the neighbouring and other EU Member States. Development of the secondary (in international aspect) axes, which are however of national significance for the balanced development of the system of human settlements, will also be necessary for the implementation of the desired model of moderate polycentrism:

- Secondary Danube axis "Vidin-Silistra" (northern horizontal)
- Secondary southern border axis "Petrich-Burgas" (southern horizontal)
- Secondary Fore-Balkan axis "Sofia-Karlovo-Burgas" (central horizontal)
- Secondary eastern axis "Romania/Silistra-Shumen-Yambol-"Lessovo" border crossing point/Turkey"
- Secondary western axis "Nikopol-Pleven-Lovech-Plovdiv-Smolyan-Rudozem"

Concluding, it is worth mentioning the following reference included in the National Concept:

***Till now Bulgaria had not undertaken steps for construction of high-speed railway lines, which might improve the domestic and international connections***

*The globalization process and the striving for enhanced competitiveness and territorial cohesion call for launching the construction of high-speed railway connections which will help new conditions for spatial development set in.*

In this respect, the Concept places special attention to the connection of Sofia with the capitals of the neighbouring countries and the big MEGA centers in the region, such as Istanbul and Athens, as well as along the destination Danube Bridge 2 – Budapest.

### **III. National Development Programme 2020**

The "National Development Programme: Bulgaria2020" (NDP BG2020) is the leading strategic and programming document detailing the objectives of the development policies of

the country to 2020. The formulated objectives of the proposed policies aim to ensure the achievement of accelerated economic growth and raising the standard of living of the Bulgarian citizens in the medium and long term.

*The main purpose of the NDP BG2020 is to achieve quality and balanced long-term economic growth.*

The economic growth of Bulgaria is determined by the following factors: human capital, employment, physical capital (production facilities, equipment, etc.), infrastructure (road, water, energy, communications, etc.), technological expertise (research and innovation, information and communication technologies). The main challenge facing the formulation of economic policies consists in finding the optimal balance in respect of the promotion of all the above factors related to production.

The accepted hierarchy of the concepts in NDP BG2020 is: vision, goals, priorities, sub-priorities, areas of impact, measures and activities.

### **Vision**

*As of 2020, Bulgaria is a country with a competitive economy, providing conditions for the complete social, creative and professional realization of the individual through intelligent, sustainable, inclusive and territorially balanced economic growth.*

### **Goals**

- 1. Raising the standard of living through competitive education and training, creating conditions for quality employment and social inclusion and ensuring accessible and quality health care.*
- 2. Building of infrastructure networks, providing optimal conditions for the development of the economy and quality and healthy environment for the population.*
- 3. Enhancing the competitiveness of the economy by ensuring a favourable business environment, promotion of investments, application of innovative solutions and improving resource efficiency.*

With regard to the present project, **Priority 8 “Improving transport connectivity and access to markets”** is of great importance. This specific priority is related to the construction and reconstruction of transport infrastructure and establishing optimal conditions for economic development, improved market access, reduced environmental pollution. Indeed, the rapid development of the transport infrastructure is considered a major condition for generating and sustaining high economic growth and balanced development and a prerequisite for attracting and utilizing local, national and foreign private investments.

The measures included in the priority (six sub-priorities) aim at *improving the railway, road and port infrastructure, connection with the European transport system, developing the*



logistics infrastructure by means of establishing and reconstructing intermodal and container terminals. The policies promoted focus on:

- constructing sustainable railway transport system through sector reforms
- effective maintenance, modernization and development of the transport infrastructure
- achieving high transport safety and security
- limitation of the negative impact of transport over the environment and human health
- sustainable development of public transport
- Improving the connectivity and integration of Bulgarian regions on a national and international scale.

The **construction of a sustainable railway transportsystem** through sector reforms envisages combining strategic investments with restructuring activities with view of establishing a viable and financially stable railway sector (*Sub-priority 8.1*). The integration of the Bulgarian transport system in the European transport system is focused on the construction, modernization, maintenance and development of rail, road and logistics infrastructure. The **development of different modes of transport** and their integration will help to provide better access to and improving the efficiency of the markets for goods, services and labor (*Sub-priority 8.2*). **Improving the connectivity and integration of Bulgarian regions** on a national and international scale and of big cities within the country will be realized through the **improvement of road infrastructure** and the national and municipal roads network (*Sub-priority 8.6*).

As specifically referred to within the NDP BG2020, in regard with maintaining, modernizing and developing the railway infrastructure, the state will support, among others, **the construction of modern railway lines** along the basic directions of the trans-European transport network, as well as the **construction of railway connections with ports and airports in the country**. Investments will be assigned to the following priority projects:

- Modernization of railway line Sofia – Plovdiv
- Renovation of sections of railway line Plovdiv – Burgas
- Modernization of railway line Vidin – Sofia
- Modernization of railway line Sofia – Pernik – Radomir

The expected results of the measures implementation are the following: improved quality of the railway infrastructure and of railway services; increased productivity of railway transportation; achieving operative compatibility, increase of the cargo railway traffic; increase of the passenger traffic; increased speed, decreased travel time; improved conditions for intermodal transport development; increased freight capacity; increased safety.

#### **IV. Common Spatial Development Strategy of the V4+2 Countries**

The 'Common Spatial Development Strategy of the V4+2 Countries' was composed in March 2014 under the coordination of the Institute of Spatial Development (the Check Republic), in

the context of a mutual agreement that spatial development, in order to be successful and sustainable, cannot be isolated and without connections with neighbouring countries and regions. The Common Strategy is a milestone of the cooperation of Czech Republic, Hungary, Poland, Slovakia (the Visegrád group – V4), Bulgaria and Romania (+2). It resulted in the Ministerial conclusions of the ministers responsible for regional development of the Visegrád four, Bulgaria and Romania, adopted on 29<sup>th</sup> March 2010 in Budapest.

The elaboration of the Common Strategy required to: find an agreement in the understanding of spatial development; name common spatial development problems, which it is necessary to solve in a coordinated manner and in mutual cooperation and agreement; determine the content and orientation of this strategy. Its main purpose was to facilitate the coordination of various sectoral policies, which influence spatial development,

The analysis and strategy that is included in the Common strategy is strictly confined within the boundaries of the abovementioned countries, and thus no issues arise regarding the programming and connections of Bulgaria with the Greek territory and the Study Area in particular.

## **V. Regional Plan for the Development of the North-Eastern Region for the period 2014 – 2020**

The vision, strategic objectives, priorities and specific objectives of the Regional Program for the Development of the North-Eastern Region for the period 2014 - 2020 have been made as a result of understanding the socio - economic analysis ("SWOT") as well as the analysis of synthetic core problems, dynamics and opportunities for the upcoming development of the region. Simultaneously the National Strategy for Regional Development in Bulgaria for the period 2012 – 2022 was taken under consideration together with the guidelines of the European frameworks (such as the Strategies Guidelines for the development of the Community and the strategy ' Europe until 2020 ', etc.), in order to ensure that the Plan for the Regional Development can converge to the policy of the EU and to the national targets for regional development.

The determining factor for the development of the North-Eastern Region will be the development of a competitive economy, characteristics of the area and local potential, but also technological innovation. Such an economy is able to provide economic development, employment and conditions for improving the quality of life. One of the main objectives is to achieve spatial balance and normalize differences and inequalities. The other important factor for integrated development of the region is to achieve improvement of the quality of the human capital by improving education, health and social services and by increasing the general level of culture.

Particular attention will be given in the spatial aspect of the development and the actions for improving characteristics of both economic and social environment, as well as the natural environment and cultural heritage.

### **Vision for North-Eastern Region**

*The area, which by having access to the Black Sea is global in nature, has maintained its rich history and culture, fertile land, human capital, developed infrastructure and tourism image and is moving toward the general economic progress and improvement of quality of life.*

The vision is to enhance and develop the potential of the region, in particular in relation to its strategic position in the Black Sea region. The solving of current problems will rely on local labor force which will be evaluated and used with a view to effective implementation of strategy for 'Europe until 2020'.

Strategic objectives and priorities for the region's development are:

- Strategic Objective 1: increase the competitiveness of the region through the activation of specific potential in conjunction with the protection of the environment.

Within the framework of this objective proposed, among other improvements in infrastructure, is the development of new business models and innovation with great emphasis on the development of an economy, which is connected to the sea - marine industry.

- Strategic objective 2: Increase in the social capital of the region by improving the standards of living and the quality of the natural environment.
- Strategic Objective 3: Promotion of balanced spatial development and cooperation through the Improvement of connectivity , as well as functional integration of the poles – centers system.
- Main priorities of the objective related to the present study concern improvement of internal regional connectivity and support for the development of the hierarchical system of cities. Centers and small towns in rural areas, the creation of conditions for the classification of Varna as a second center in MEGA level, by increasing the role of the cities Dobrich, Shoumen and Targovishte as regional centers and the stimulation of inter-regional and cross-border cooperation.

### **VI. Regional Plan for the Development of the South-Eastern Region for the period 2014 – 2020**

The last few years as a result of the economic crisis challenges and threats in a European, national and regional scale have increased. Regardless of the new realities, future development is desirable and it is recognized that the South-Eastern Region must continue to bear specific positive characteristics: 'Dynamic', 'sustainable development', 'economic growth and employment', 'improved quality of life', 'protection of natural and cultural heritage'. This sort of direction has drafted the vision for the development of the region for the Period 2014 - 2020.

The vision for the region describes that, as a result of the implementation of the spatial plan, the level of economic development will significantly increase, and the living conditions in densely populated areas of the region will improve. The goal is to move closer to the average level of socio-economic growth in the EU, which would be smart, sustainable, inclusive and friendly to the natural environment and resources development. In particular, the region will take advantage of its special features for the development of tourism and the energy resulting from the strategic position of the Black Sea. For the implementation of the vision the region is based on local resources and capabilities, with the assistance of the financial instruments of the EU.

The strategic objectives for the period 2014 - 2020 set out in this Plan are as follows:

- Strategic Objective 1: Economic convergence of the region with the other regions of the country.
- Strategic objective 2: Promoting Social cohesion and the reduction of internal disparities in the region through investment in human resources and the improvement of social infrastructure.
- Strategic Objective 3: Development and improvement of spatial cohesion of the Region through cross-border , transnational and inter-regional spatial cooperation.

Among others priority 1 refers to the development of cross-border cooperation and mobilization of potential border territories in South-Eastern Region. Cross-border cooperation can be a vehicle for promoting investment, for the development of business and tourism, for the protection of natural resources as well as for the strengthening of interest for strategic investors in these areas. Between the actions that must take place is and the **improvement of basic infrastructure - roads and railways.**

- Strategic objective 4: balanced territorial development of the region through the strengthening of cities - centers and enhanced connectivity in the rest of the region.

This objective has the following priorities (which are related to the content of the Sea2Sea concept):

- Priority 1: integrated urban development of South-Eastern Region and improvement of the urban environment's quality.
- Priority 2: improved connectivity in the region (national and international). Transport connectivity contributes to mobility, economic development and access to basic services in the region. The consistency of the region on a national and an international level improves the access to markets and services. Among specific objectives is to improve the connectivity through improving regional routes. The improvement of the connectivity is directly dependent to the network of corridors of Trans-European transport network TEN - T - 4 , 8 and 10 and of other transport infrastructure with European and national importance. Also important is the improvement of the network of roads II and III Class - Integration and rehabilitation. Finally it is necessary to improve the transport on sparsely populated areas in conjunction with improving public transport.

- Priority 3: improving the quality of life in rural areas.

## VII. Regional Plan for the Development of the South-Central Region for the period 2014 – 2020

In accordance with the Regional Plan of the south-Central region, provision must be made for targeted interventions, specifically geared to reduction of large disparities in the development of the sectors of enterprises in a manner friendly to the environment and energy efficient solutions. Also, attention will be paid to high quality networks which are necessary for the southern part of the region. In such a direction the vision for the development of the South-Central Region for the period 2014-2020 is drafted, described as:

### Vision for South-Central Region

*'South - Central Region - an attractive place of business and tourism, with better conditions for communication and protection of the natural environment and cultural heritage '.*

The policy for the future development of South-Central Region is aimed at improvement of the economic and social situation on the basis of the sustainable and balanced development, through investment in infrastructure and human resources. For the implementation of this vision the policy is based on the competitiveness of the local economy and the local resources, translated into competitive advantage. Balanced territorial development will be achieved through the strengthening of urban centers, improvement of connectivity and quality of the environment. The strategic objectives for the development of the region in the period 2014 - 2020, are the following:

- Strategic objective 1: economic convergence on a national and a regional level.

To achieve sustainable economic development important role will be played by the creation of new or the development of existing business activities, or industrial and technological parks in large industrial centers: Plovdiv, Maritza, Rakovski, Pazardzhik, Panagyurishte, Dimitrovgrad, Kardjali, Haskovo, Svilengrad , etc. In these areas the infrastructure is being built through public investment. The objective is to attract new and modern companies, while great emphasis is placed on innovation and new technologies, in order for companies to be competitive and modern. Then there are the specific objectives for the development of tourism and infrastructure for the protection of the environment and adaptation to climate change with many more specific objectives and priorities.

- Strategic objective 2: Social cohesion and reduction of intra-regional disparities through investment in human capital and social infrastructure.
- Strategic objective 3: Development of cross-border and transnational cooperation.

The application of common cross-border initiatives and projects to improve quality of life and working environment, access to basic services and the creation of new opportunities for

increased regional competitiveness and sustainable development are proposed. The priorities among other things relate to:

- Maintenance, management and enhancement of natural resources.
  - Connectivity and accessibility, improvement of the road and the railway network, opening of new border stations, improvement of telecommunications infrastructure.
  - Promotion of Entrepreneurship - strategies and plans for the creation of joint industrial parks etc.
- Strategic objective 4: Promotion of balanced spatial development through the strengthening of cities – centers, enhanced connectivity (transport and communications) and the quality of the environment in urban areas.

The specific objectives of the integrated and sustainable urban development, refer to the poles of development, which are Plovdiv and Haskovo, Kardjali, Smolyan, Pazardzhik, Asenovgrad, Dimitrograd and Karlovo. Also important are the improvements and connections to smaller cities, such as Svilengrad, Ivailovgrad, Devin, Velingrad, Panagyurishte and Krumovgrad (mainly urban transport and improvement of air travel).

The reason for low quality in the field of transport is the low level of road infrastructure (high-class roads and class I) in the region. To compensate for the problems it is necessary to complete road II 86 'Plovdiv –Asenovgrad- Smolyan- Rudozem'. As part of the improvement of intra-regional transport and travel there are also plans to improve roads: II- 84 'September-Velingrad', II-37 ' Etropole-Zlatitsa-Panagyurishte-cave-Dospat', II-64 ' Karlovo-Plovdiv ', II-56 ' Plovdiv-Brezovo, and II-58 'Assenovgrad -connection with I-5 '.

Finally, the improvement of the connectivity of the region on a national and international level is promoted. As it has been judged that a precondition for the development of the region will be the improvement of transport and connectivity the road tunnel Troyan - Hristo Danovo is proposed.

### **VIII. Regional Plan for the Development of the North-Central Region for the period 2014 – 2020**

According to the Regional Plan the vision for this Region is translated as follows:

North central area - fast and sustainable developing European region, an integral part of Danube space, where young people see their future and personal realization.

The specific strategic goal that relates to the Sea2Sea project refers to territorial cohesion - connectivity and balanced, integrated and sustainable development of the territory and its urban areas. One of the priorities of this goal is the construction of priority infrastructure corridors and their adjacent facilities.

Improvements in the accessibility of the area and the construction of important infrastructure corridors are also in line with the strategic objective of NSRF for Territorial cohesion. The priority considers competitive advantages of the area the intersection of several very important transport corridors and is trying to further develop their potentials

for transforming the area into a transport unit with European importance. The construction of Corridor 9 and its servicing facilities is a priority not only with national, but also pan-European importance. The most important transport direction in the axis north-south in Bulgaria provides connectivity between Turkey and the Middle East on the one hand and North Europe and Russia on the other. The development of the Bulgarian-Romanian section of the most important European inland waterway is expected to have a serious effect on economic activity in the region, and to strengthen its links with the countries of the middle and upper course of the Republic of Bulgaria.

## Greece

### I. General Framework of Spatial Planning and Sustainable Development

The General Framework of Spatial Planning and Sustainable Development (GFSPSD), which was adopted in 2008 (FEK 128A/3-7-2008), has as main purpose to determine strategic guidelines for the integrated spatial development and sustainable organization of the national space for 15 years time.

#### **General objective of the General Framework of Spatial Planning and Sustainable Development**

*Formulate a spatial development model, within the context of sustainability principles, that will be the result of a synthetic, balanced, perception of parameters which promote the protection and enhancement of the natural and cultural environment of the country and strengthen social and economic cohesion and competitiveness. Special emphasis is placed on conservation of biodiversity.*

The goals of GFSPSD that relate to the purpose of the present project are:

- The emergence of the country as major transport, energy and communications hub, and also as pole of cross-border and other types of cooperation, especially those that promote research, technology, innovation and tourism.
- The strengthening of balanced - polycentric development of the country, in particular with the reduction of development inequalities between different regions and the exploitation of comparative advantages with respect to the environment and the cultural heritage.
- The improvement of access to basic transport, energy and communications networks and the development of relevant infrastructure.

The dynamic integration of Greece in the international and especially in the European environment is considered as a precondition for the development of the national territory. There are three orientation axes of the country:

- Northwest, towards the European central development cluster.
- North-Northwest, towards the Balkans, the new Central and Eastern Europe and
- South, towards the Southeast and wider Mediterranean, as well as the Red Sea.

As shown in the following map, regarding the axis towards the Balkans, special reference is made to the corridor studies in the present project, since the Framework promotes the creation of two new pan-European corridors along the coasts of the Black Sea (Alexandroupolis – Ormenio – Burgas – Varna – Costanza – Bucharest) as well as of the Adriatic (Ioannina / Siatista – Tirana – Split – Resia - Ljubljana – Trieste – Salzburg).





Χάρτης 3.2: Η Ελλάδα στο Βαλκανικό χώρο.



Figure 57: Greece in the Balkan territory

Source: General Framework of Spatial Planning and Sustainable Development, FEK 128A/3-7-2008

*Basic strategic choice of the General Framework is the adoption of a sustainable spatial development pattern, based on setting up **a grid of poles and development axes**, which will strengthen the competitive status of the country in the international environment and will promote social and economic cohesion, by spreading development over the national territory, as well as the protection of the environment. This grid, adapted to the constraints of the geographical relief, includes the main urban centers, articulates with the areas of productive activities and is supported by **an integrated transport, communications and energy network**.*

With regard to the spatial organization of the main national poles and development axes, a polycentric structure is promoted, with transformation of the existing bi-polar model (with Athens and Thessaloniki as poles) into a polycentric one, and the creation of an integrated grid of urban poles and development axes.

For the mainland, the proposed network of urban centers will be part of a grid of development axes, which articulates with other smaller centers and areas where productive, economic and administrative activities and services develop. This network will be supported by the strategic transport networks and infrastructure, linking to the gateways of the country.

The development poles are categorized in the following groups:

13. Metropolitan centers (Athens, Thessaloniki)
14. Primary national poles, which concern the significant urban centers that are regional capitals or are functionally linked with them, enhancing its development process. This group includes Patras, the Larissa-Volos dipole, Ioannina, the Heraklion-Chania dipole and Komotini-Alexandroupolis dipole. In these poles, the development of activities and services of international and national magnitude are promoted, as well as their participation in developing international cooperation networks. In particular for the strengthening of the Komotini - Alexandroupolis dipole, that falls within the study area, it is proposed that Alexandroupolis will emerge as an international energy hub and gateway to the marine corridor Mediterranean - Black Sea, and that the dipole will strengthen its position to the international land transport networks (connection with the sea gates of Bulgaria, the diagonal axis "Central Europe - Belgrade - Sofia - Istanbul" etc.).
15. Secondary national poles, which include the following especially dynamic urban centers: Corfu, Kozani, Lamia, Kavala, Tripoli-Kalamata dipole, Serres and Chalkida. For these urban centers, the Framework promotes the upgrading of their technical and social infrastructure and services as well as innovation, with a view to developing and improving the competitiveness of their productive workforce.
16. Rest of the national poles, for which no extensive reference needs to be made to this study.



Χάρτης 5: Πύλες - Πόλοι και Άξονες Ανάπτυξης



Figure 58: Gateways – Development poles and axes of development

Source: General Framework of Spatial Planning and Sustainable Development, FEK 128A/3-7-2008

In addition, the Framework promotes the development of cooperation networks between neighbouring urban centers and, through them, the creation of dipoles or multi-poles, such as those of Kozani - Ptolemaida - Florina, Kavala - Xanthi - Drama, Trikala - Karditsa, Arta - Preveza - Lefkada, Agrinion - Messologgi and Pyrgos - Amaliada.

Also, the completion of development axes for the mainland of Greece and Crete is promoted. The North axis, is developed along the Egnatia Odos, passes through part of the study area, includes the metropolitan area of Thessaloniki, primary national poles (Ioannina and Komotini - Alexandroupolis dipole) and other important -on a national scale- development poles (Kozani, Kavala, Serres, Xanthi and Drama), as well as the international gates toward the Balkans (Kakavije, Krystalopigi / Ieropigi, Niki, Evzoni, Promahonas, Ormenio), towards the Adriatic/Italy (Igoumenitsa) and European Turkey (Kipi) and, consequently, Asia Minor. It also includes the adjacent islands of North Aegean (Samothrace, Thasos, Corfu).

In the *field of transport*, the General Framework gives emphasis on supporting the international role of the country and the diffusion of development throughout the Greek territory. Thus, it aims at the improvement of the quality of the existing transport infrastructure and the relevant services throughout the country, in order to increase the level of accessibility, reduce the time and cost of transport services, increase the safety of transport / transport services (passenger, goods and pedestrians) and reduce fuel consumption. In this context, infrastructure and services of rail and rapid transit are strengthened, as well as short sea shipping, especially on routes that can become competitive, as regards transport by air and road transport, respectively. The development of integrated intermodal transport systems is promoted. *"These systems require the creation of nodes at points where optimum performance of the modes can be achieved, under the following conditions: (a) that ensures the functional connection of transport infrastructure (e.g. roads, rail axes connecting ports with airports) and (b) that are being developed and used, in combination and in an integrated way, electronic systems for the collection, transmission and management of information regarding the transport sector, in real time"*.

In particular for the freight transport sector, among others and in relation to the purpose of this project, it is considered necessary to:

- *Further strengthen the rail and maritime infrastructure, for environmental reasons and make their services be competitive with road and air transport. (...)*
- *Create new (or upgrade existing) specialized ports and airports for freight transport, either in nodal –for international trade– areas (in combination with free trade areas) or in areas where there is large freight transport load.*
- *Connect transport nodes (ports, airports, freight transport centers) through autonomously –as far as possible- transport networks (road and/or rail), in order to avoid congestion (conflict with urban land-uses).*

In the field of rail transport and services, the following guidelines are provided aiming at the most efficient use on a national and international level:

- *Completion of the rail axis PATHE-P which connects the major urban centers of the country (Patras - Athens – Thessaloniki – Promahonas) and is linked to the Pan European rail Corridor IV: Berlin.Nyremberg – Prague – Bratislava – Budapest – Costantza/Thessaloniki/Turkey (high speed electrified line, double track, rail-road separation, signaling and automated traffic control, etc.).*
- *Development of high speed rail service for passenger transport and introduction of “freight freeways”*
- *Development of integrated multimodal systems for combined passenger and freight transport, based on the rail network.*
- *Construction of new rail line on the Thessaloniki – Amfipolis – Kavala – Xanthi segment.*
- *Development of suburban rail services in certain urban areas, including the Alexandroupolis – Komotini dipole.*

In the field of maritime transport and port infrastructure and services, the following directions, among other, are provided:

- *Strengthening of the international role of specific ports, including that of Alexandroupolis, in order to enhance and establish them as major sea gateways of the country. In addition, strengthening of the ports of international interest and national importance, such as that of Kavala.*
- *Continuous upgrading of all existing ports with significant freight or/and passenger flows, aiming mainly at providing transport safety. The ports of Thessaloniki, Kavala and Alexandroupolis can undertake a special role in upgrading their connections with the Northern Aegean, the SporadesIslands and the Aegean Sea in general.*

(For the port of Alexandroupolis specifically, it is referred that it can expand and upgrade into a specialized oil terminal, preserving at the same time its initial planning regarding container and bulk cargo handling. (This reference corresponds to facts existing at the time of writing the GFSPSD, which is no longer valid - at least for the time being).

Finally, the General Framework promotes *the integrated railway connection and provision of high quality combined transport in almost all ports in the vicinity of the national rail network, with priority being given to freight transport parts of the ports of Piraeus, Thessaloniki and Patras and secondarily the ports of Alexandroupolis, Volos, Chalkida, Corinth and Kalamata (...).*

Overall, according to the GFSPSD, and as regards the wider area to which Greece belongs, the integration of Bulgaria in the EU and the foreseen extension of the actions of the EU to other countries will further improve the cooperation between Greece and the countries of its immediate geographical context. Also from the initial estimates of the Framework it is deemed that *“the position of Greece in relation to the axes of international maritime transport combination with its significant specialization in the international shipping industry, provide the opportunity to play an important role as a Freight Center, especially in*

view of the fact that traffic will increase due to globalization and the rapid growth of exports of Asian countries in Europe and elsewhere". By the beginning of its text, the Framework refers to the need of creating the necessary infrastructure in ports, airports and major road axes. Also, one of its main objectives is the promotion of the country as major transportation, energy and communications hub, as well as pole of cross-border and other types of cooperation.

As far as the international and interregional gateways and connections of the country are concerned, the Framework states:

*Greece may play an important role in international transport and communications, due of its position at the borderline of the Balkan Peninsula and the Eastern Mediterranean, provided that it will adequately exploit:*

17. The prospects offered by the international axes and the development poles of the wider area.
18. The contemporary possibilities offered by maritime transport and overland communication corridors for the strengthening of its relationships with its neighbours to the north and the east, in the Balkans, the Black Sea and the Eastern Mediterranean.
19. The nodal position of the country in maritime transport,.
20. The geographical advantage of proximity to the international air corridors that connect Western Europe with Eastern and Southern Africa, the Middle East, South and South-east Asia, as well as the Oceania.
21. The opportunities that are emerging for the development of the country through the completion of major infrastructure projects that are planned or being constructed.

## **II. Regional Framework of Spatial Planning and Sustainable Development of the Region of East Macedonia and Thrace**

The Regional Framework of Spatial Planning and Sustainable Development (RFSPSD) of the Region of East Macedonia and Thrace determines, with a view of at least fifteen (15) years, the basic priorities and the strategic options for the integrated and sustainable development of the region's territory, which promote its equal inclusion in the wider international, European and national space.

The approved Regional Framework deemed that the region is transformed from a border region cut off from its neighbours, a Region in which the development axis of the country leads (Kavala), to a gate Region of the country and the European Union. Being a "border deadlock" is a characteristic that could no longer exist after the economic restructuring of the countries to the north, in particular after the accession of Bulgaria to the European Union (and in the future of Turkey, to the east of the country). These structural changes in the neighbouring countries, in conjunction with the development of infrastructure and communications, constituted "*mechanisms for creating prospects for the development process in East Macedonia and Thrace which would gradually provide a new pattern in both the country (gate) and the wider geographical environment*".

In the field of transport, the ports of the Region were expected to play an important role in this process, but mostly the Egnatia Odos and its Vertical Axes. Nevertheless, the work of Egnatia Odos was supplemented by:

- the upgrading of the ports of Alexandroupolis and Kavala, which would allow their complementary operation to the main ports of the country (Thessaloniki, Piraeus, Patras and Heraklion) and to ports in countries of Eastern Europe (Burgas, Constanta etc.),
- the creation of a Freight Centre in the new port of Alexandroupolis and of a Free Zone in the new port of kavala,
- the upgrading of the airports of Kavala and Alexandroupolis, the first of which is described as of "wider regional significance" and the second as of "Community interest" (gate of the country),
- the programmed rail link to the new port of Kavala.

The development of integrated transport systems and access to knowledge, and the improvement of the region's accessibility and internal cohesion, were two of the general objectives defining the spatial organization pattern of the Region.

Concerning the organization of the urban network, the main aim was the promotion of a balanced and polycentric network of urban centers, whose role should be strengthened and improved. This network articulated around the functional networking of the main urban centers Drama - Kavala - Xanthi, Xanthi, Komotini, Komotini - Alexandroupolis, Alexandroupolis - Soufli, Didimoticho, Orestiada. Despite its linear layout, this primary network in the Region was showing increasing functional integration, which speeded up by the developing transport and communications infrastructure. According to the Regional Framework, the cities are being developed either as urban centers of trade and services, approximately along the line that separates the plain from the mountain mass, or as ports on the coast. The smaller settlements also develop following the same logic, with the population being mainly concentrated not so much in the plains but rather in hilly areas.



**Figure 59: Spatial Development Pattern of East Macedonia and Thrace according to the approved RFSPSD**

Source: Regional Framework of Spatial Development and Sustainable Development of the Region of East Macedonia and Thrace (FEK 1471B/9-10-2003)

Regarding the role of Alexandroupolis, in particular, it became apparent that it is strengthened due to its nodal position in the trans-European networks. Its development had already been put in place with the two major projects which were carried out (the new freight port and the university hospital). Because of the complementary roles of and the short distance between Alexandroupolis and Komotini, a pole was being created that could operate competitively and complementary to that of Thessaloniki (distance >250 km.), being at the same time the gateway at the east end of the region and the north-east end of the country. The cities of Kavala, Drama and Xanthi form a triangle in space that can operate complementary, i.e. formulating a wider urban concentration in between these three regional units. Kavala, in particular, has been described as western gateway in the region, complementary to Thessaloniki and Alexandroupolis. It had since then major port and airport, giving the city a role as intermediate station in transport networks.

The emphasis in the field of transport was put, of course, on the eastern part of the Egnatia Odos and its Vertical Axes, highlighting also the integration of the transport system with the five ports, eight airports and the railway network (in particular the sections that serve ports). The projects that were carried out and planned regarding the railway network dealt with small improvements. Ever since the drawing up and approval of the RFSPSD, the new railway line Thessaloniki – Amfipoli – N. Karvali of Kavala was an important issue under



consideration for the long-term planning. The incorporation of Kavala in the railway network would be achieved with the proposed section Toxotes – New port of Kavala.

Finally, with regard to the two ports of Alexandroupolis and Kavala, for the first it is seen as necessary to create a Freight Center and its connection with the Egnatia Odos, while for the second it is expected to grow into a transit port, complementary / competitive to that of Thessaloniki". In addition, the establishment of the Organization of the Port of Kavala, the establishment of a free trade zone and the railway connection through Toxotes (Regional Unit of Xanthi) were proposed as requirements.

*The **infrastructure** which will be promoted in the region, through the development programs, will be those which turn this development dynamic into an essential comparative advantage, **supporting the extroversion of productive activities and contributing to the increase of trade flows in a targeted way.** In order for the Region to be able to seek an active role on the chess board of international flows and in the competition of various poles for attracting investment capital, it must create first and foremost a stand-alone development potential to make it attractive.*

Recently, a project titled "Evaluation, Revision and Specification of the approved Regional Framework of Spatial Planning and Sustainable Development of the Region of East Macedonia - Thrace" has been completed and the respective Ministerial Decision for its approval has been drafted.

The objectives of RFSPSD include, inter alia, the pursuit and promotion of strengthening the Region's position and role in the international, European and national space in the context of territorial cohesion policies for integrated, balanced and sustainable development, with controlled competitiveness of territorial systems, of the inter-regional area.



Figure 60: The Region of East Macedonia and Thrace in the wider European territory according to the RFSPSD under revision

Source: YPEKA-EPERAA (contr. Th. Papagiannis and Associates AEM, Diktuo A.E., Eurotec, K. Hatzigiannis) (2014), "Study for the evaluation, revision and specialization of the Regional Framework for Spatial Planning and Sustainable Development of the Region of East Macedonia and Thrace", B' Phase – Stage B1, B.1.2.a. Explanatory Report of the Ministerial Decision & B.1.2.b. Ministerial Decision draft.

According to the Ministerial Decision draft:

*The advantages deriving from the accession of **Bulgaria** and Romania in EU are not yet sufficiently developed. The **inadequate access in the major centers and development axes of Bulgaria**, in combined with the **delay in the completion of projects that will complement combined transport**, constitutes a main reason for not absorbing this dynamic. (...)*

The spatial development pattern of the Region of East Macedonia and Thrace displays a strong structure of urban centers around the Egnatia Odos axis. The concentration of the largest share of employment and GDP in the main urban centers, mainly through the development of the tertiary sector, has boosted dependences on them, without however creating sustainable functional units outside the development axis. More specifically, in accordance with the Ministerial Decision draft, the structure of the spatial development pattern is organized around the traditional development axis, East - West, and completed by the two vertical axes Alexandroupolis - Ormenio and Kavala - Drama - Exohi, and the proposed new axis Kavala - Serres (Promahonas - trans-European networks), in order to strengthen the regional cohesion and to enhance the cross-border and interregional dynamic of the region.

The international port gateways of Kavala and Alexandroupolis are located on the nodes of these vertical axes with the main axis, and support the role of the axes as the ending of the cross-border regions, while the connection of Komotini with Haskovo increases the flows towards these two gateways. The connection with the Northern Aegean mainly occurs through these gateways.

With regard to the main development poles / Gates of the transport network, Komotini and Alexandroupolis are characterized as primary national poles of interregional coverage, urban centers of 2<sup>nd</sup> level, and they are defined as "development dipole". The first of these centers is the seat of the region and of the Regional Unit of Rodopi, while the second is the seat of the Regional Unit of Evros and "gateway" of international and inter-regional coverage of the region.

Kavala is considered to be a secondary national pole of inter-regional coverage and gateway of inter-regional range with

#### **Major development axes in the Region of East Macedonia and Thrace**

- *Main longitudinal development axis east-west*
- *Secondary development axis Alexandroupolis - Ormenio*
- *Secondary development axis Kavala - Drama -K. Neurokopi - Exohi*
- *Secondary development axis Kavala - Serres*

international role. It belongs to the 3<sup>rd</sup> level urban centers and forms a “functional - urban dipole” with Drama.

Xanthi and Drama, seats of the respective Regional Units, are categorized as rest of national poles / seats of regional Units and urban centers of 4<sup>th</sup> level. Orestiada is included in the group of 5<sup>th</sup> level centers characterized a important, and constitutes a “functional – development dipole” with Didimoticho. In addition to the national and regional poles, a network of settlements are defined as secondary regional centers with a specific role, for which no further explanation is needed to be made in this study.

**TABLE 5.1: STRUCTURE OF THE URBAN NETWORK IN THE REGION OF EAST MACEDONIA AND THRACE, LEVELS 1ST TO 5TH**

Urban structure levels	Descriptions	Urban centers
1 <sup>st</sup>	Metropolis – Seat of Regional Government	<ul style="list-style-type: none"> <li>▪ none</li> </ul>
2 <sup>nd</sup>	Primary National Pole Regional capital	<ul style="list-style-type: none"> <li>▪ Komotini</li> <li>▪ Alexandroupolis: Regional Metropolitan Centre, Development Dipole</li> </ul>
3 <sup>rd</sup>	Secondary National Pole Capital of Regional Unit	<ul style="list-style-type: none"> <li>▪ Kavala Functional/urban dipole Kavala-Drama</li> </ul>
4 <sup>th</sup>	Rest of National Poles Capital of Regional Unit	<ul style="list-style-type: none"> <li>▪ Drama</li> <li>▪ Xanthi</li> </ul>
5 <sup>th</sup>	Primary Regional Urban Centers	<ul style="list-style-type: none"> <li>▪ Orestiada – Didimoticho: Functional-Development dipole</li> </ul>

Source: YPEKA-EPERAA (contr. Th. Papagiannis and Associates AEM, Diktuo A.E., Eurotec, K. Hatzigiannis) (2014), “Study for the evaluation, revision and specialization of the Regional Framework for Spatial Planning and Sustainable Development of the Region of East Macedonia and Thrace”, B’ Phase – Stage B1, B.1.2.a. Explanatory Report of the Ministerial Decision & B.1.2.b. Ministerial Decision draft.

Alexandroupolis and Kavala are defined by RFSPSD under revision as "gates", i.e. there the cross-border flows are concentrated. These are the two cities in the region in which the existence of port facilities is combined with the proximity to the respective airports, the connection with the national road network and the potential for railway connection. In this way, the two cities support the international and inter-regional connection of the region.

International role is indirectly appointed also to Komotini, as the seat of the region, due to its central position, the possibility of easy connection with the ports and the airports of Alexandroupolis and Kavala, as well as due to its connection with Bulgaria.

Alexandroupolis, as development dipole with Komotini, is defined as primary national pole of inter-regional coverage and is expected to play a particular role as transit node for combined freight transport and also a role in the field of tourism (marina) and passenger transport. Its endorsement as a gateway is associated with the interconnection between the port, the airport, the railway and the road network, as well as the improvement of the port's infrastructure and facilities. Simultaneously it connects with policies which must be formulated at both national and regional level in relation to the international flows and trade and the country's role in the international economic and development environment.

Kavala is recognized as secondary national pole of inter-regional coverage and gateway of inter-regional coverage with international role. Its reinforcement as a gateway is associated with the connection between the "Philippos B" port and the rail network, the improvement of the port's infrastructure and facilities and the interconnection of the city with the proposed Kavala - Serres axis. It also relates to the improvement of the city port's infrastructure and facilities in order to operate as a cruise port and marina.

As far as the transport infrastructure is concerned, the region has invested strategically and to a large extent in its incorporation into the international transport networks. The completion of the Egnatia Odos constitutes one crucial factor in this process, but the delay in the development of the vertical axes and combined transport reduces the expected positive results - in particular since the ports of Kavala ("Philippos B") and Alexandroupolis are not sufficiently developed and lack appropriate infrastructure. However, the two ports have the opportunity to develop into major nodes of intermodal transport.

In the medium term, the integration of East Macedonia and Thrace in wider international transport networks, depends on the upgrading of the Alexandroupolis - Ormenio axis (road and rail) and its connection with PETC IX. As a result of this dynamic, the port of Alexandroupolis is possible to attract a multi-type freight traffic, taking advantage of the connectivity with the port of Burgas, a fact that creates prospects of alternative passage between Black Sea and Mediterranean. The incorporation of the port of Kavala into the extensive TEN-T, creates the conditions for flows to and from the Balkans, especially with the future connection of the port with the main trans-European corridor Orient / East Med, through the road E61 (connection Kavala - Serres - Promahonas) as well as with the incorporation of the corridor Komotini - Haskovo, via Nymfaia in the extended network.

The **strategic objective for the transport sector** for East Macedonia and Thrace is the optimum exploitation and the targeted development of transport infrastructure and cross-border links of the region through its integration in the wider international transport networks, as a gateway of the country's North-east axis orientation (development), as well as an exit of the Balkan countries, and especially Romania, to the Mediterranean through Axis IX.

The **strategic guidelines for the transport sector** are:

- Development of intermodal transport (...)
- Increase of accessibility and optimal utilization of existing infrastructures, instead of programming new ones
- **Gradual reconciliation of the balance between road and railway transport, both at the level of freight and passenger flow**
- Development of a system of combined passenger transport at urban, suburban and regional level

The implementation of these strategic guidelines requires a change of philosophy, from planning individual projects toward the adoption of an integrated approach. The achievement of these objectives requires priority interventions in the following sections:

- Completion of projects that concern the strengthening of the North-east development axis of the Region (via Pan-European Axis IV) and support the goal of Alexandroupolis becoming gateway of the Region and important transport hub within the south-East Balkans.
- Completion of projects that concern the strengthening of Kavala's role as a secondary national pole of trans-regional range and as gateway of trans-regional range with international role.

In order for the railway network to be able to play a new role, it is necessary to implement important projects for upgrading the existing network and create new connections with strategic targeting and prioritization. Certain projects in this direction are inter alia:

- The improvement of the rail axis Alexandroupolis – Ormenio, and its connection with the port of Alexandroupolis. The project is characterized as 'high priority', since it contributes to the development of the Rail-Road Terminal of Alexandroupolis, which is included in the trans-European network.
- The connection of Kavala and its port to the existing railway network (Kavala-Toxotes segment).

- Investigation of the feasibility – viability of the rail connection between Komotini and Bulgaria via Nymfaia.

In the context of upgrading the role of rail, much emphasis should be placed on the interoperability / interconnectivity of the Greek network with those in Bulgaria and Turkey.

### **5.1.3 Implementation of Operational Programmes**

The present chapter is a synopsis of the programming documents of the programming periods 2007-13 and 2014-20 of both sides of the Sea2Sea corridor as far as the interventions related to the transport sector. Emphasis is given to those interventions which support multimodal combined transport networks and operations.

Information for the 2007-13 period are extracted from official documents for the Bulgarian side (Progress Reports) and from the available published implementation data (on a project-by-project basis) for the Greek side.

## **Bulgaria**

### **I. Strategy for the Development of the Transport System of the Republic of Bulgaria until 2020**

The Bulgarian transport system supported by 2008, on a daily basis, an average of 2.54 million passenger trips and the transport of 274,000 tons of freight. Transport and communications generate 11.7% of the gross value added in the country and directly employ more than 138,000 persons (Source: National Statistical Institute – NSI, Employees under labour contract). The development of the transport sector is of a paramount importance for enhancing Bulgaria's foreign trade relations and of tourism.

The "Strategy for the Development of the Transport System of the Republic of Bulgaria until 2020", (March 2010) is the approved long-term government document for the development of the transport system in the next period to 2020, which is the basis of sector and business plans and development programs are being implemented or planning / consultation at the time of this Report.

The strategy set out in the Strategic Plan is compatible with the basic principles of the EU transport policy. It complies also with the Lisbon Strategy, and aims at the further development and modernization of the transport infrastructure, the liberalization of the market for transport services and the large-scale application of information and telecommunication technologies. A special attention is paid, within the framework of this Strategy, to the cohesion policies of the European Union.

The document takes into account the specific domestic conditions and needs, as well as with the following national strategic documents:

- National ISPA strategy for the Transport sector
- National Regional Development Strategy of the Republic of Bulgaria for the period 2005 – 2015

- Strategy for the Development of the Transport Infrastructure of the Republic of Bulgaria by 2015 (2007)
- National Strategic Reference Framework 2007 – 2013
- Operational Programme on Transport 2007 – 2013
- Operational Programme Regional development 2007 – 2013
- National Programme for the Development of Public Ports by 2015 (draft)
- National Strategy for Sustainable Development (draft)
- National Long-Term Programme for Energy Efficiency until 2015
- National Long-term Programme to Encourage the Use of Biofuels in the Transport Sector 2008 – 2020
- National Strategy for Sustainable Development of Tourism in the Republic of Bulgaria 2009 – 2013
- National Strategy for the Environment 2009 – 2018
- Programme of the Government of European Development of Bulgaria

In full compliance with the national vision and priorities, the mission of the transport sector has been formulated as follows:

**«2020, Bulgaria should have a modern, safe and reliable transport system in order to satisfy the demand for high-quality transport services and to provide better opportunities for its citizens and business»**

According to the basic guidelines of the Strategic Plan, the main road and railroad networks, as well as the ports and the civil airports will remain public state property. Certain components of the transport infrastructure, however, may and should be transferred for operation to the private sector, with guarantees for public services of general economic interest and non-discriminatory access to such services. The state will continue to have responsibility for the research, development, assessment and application of various financial instruments and schemes for assuring these resources. The resources required for the development of the transport system will come from EU structural funds, the national budget and the private sector under public-private partnership mechanisms for private sector.

#### **Strategic factors, influencing the transport sector**

The strategic factors that determine the priorities of the programme can be categorized into external and internal groups with respect to the transport system, and are described as follows:

##### **International external factors**

Among international factors considered to influence the strategy of the transport sector, the most relative with the Sea2Sea concept are the followings:

- In a long-term perspective, the Bulgarian economy and transport sector must be prepared to meet the challenge of globalization of world economy and make the best use of the expanding opportunities. Transit between EU and Asia will develop further, and Bulgaria should be able to attract a major share of this traffic.



- Bulgaria's favorable geographic location by itself does not provide guarantees for the development of international transit transport. Substantial investments are required first for improving and maintenance of the existing infrastructure, and – to a lesser extent – for the construction of missing infrastructure components.
- The political stabilization of the Balkan region, as well as the construction of important infrastructure facilities in Southeast Europe – like the railway tunnel under the Bosphorus and the combined bridge across the Danube between Vidin and Calafat – outlines a tendency towards an enhanced demand for transport services, increased intermodal and transit transport through the territory of Bulgaria, and a need to integrate the transport networks of the individual states.

### **External factors related to the national economy**

Among the factors related to the national economy and affect the strategy of the transport sector, the most relative with the Sea2Sea concept are the followings:

- After the initial period of transition in Bulgaria's integration process in EU and after overcoming the consequences of the global economic crisis, the expected sustainable economic development during the period, covered by the Strategy, will result in a growth of transport demand.
- The long-term perspectives for the development of the major sectors of industry are expected to result in a decline in the demand for transporting raw materials and products by railway and waterborne transport.
- The development of the energy sector by 2020 provides for preserving or even a slight rise in the demand for internal railway freight transport.
- The positive trends in the development of light industry by 2020 outline an expected rise in the demand for freight transport by road, mostly in domestic hauls, and to a limited extent within the EU.

### **Factors, which are internal to the transport sector**

#### **Demand for transport services**

- The demand for domestic freight transport is relatively stable, varying around 82 million tons per year, which accounts for 74% of the total demand for freight transport. This demand is met primarily by road transport and to a lesser extent by the railway, which is the preferred means for bulk cargoes over long distances. Waterborne transport is practically not used for domestic transport.
- The demand for international freight transport services for export and import, which is met predominantly by sea shipping, is relatively stable with a trend towards an increase. A tendency towards increasing the demand for international freight transport services by road and railway transport has emerged as a result of the restructuring of the economy and foreign trade orientation of this country, and this tendency is expected to persist.
- The demand for transit transport services, mainly by road transport, and to a lesser extent by rail, is relatively stable with a slight tendency towards an increase. The volume of transit through ports is minimal. Improving the parameters of the Danube waterway and the elimination of bottlenecks along the Bulgarian-Romanian section

of the river will create conditions for increase of the transit operations and will result in a more efficient utilization of the Bulgarian river ports along the Danube. It may be expected in the future that transit transport will increase mainly from Western and Central Europe to the Middle East.

### Supply of transport services

Among the internal factors related to the status of the infrastructure and the operating framework of the transport sector, the most relative with the Sea2Sea concept are the followings:

- The transport infrastructure of the country, as a whole, is well developed and provides relatively good conditions for all transport modes: railway, road, sea, inland waterway, air and intermodal.
- The railway network of the country is very well developed and highly electrified, and it can absorb a much higher demand for transport services. Due to delayed repairs, its current state as a whole is not satisfactory, which has a negative impact on permissible maximum speeds, duration of travel, comfort and maintenance costs of railway trains traffic. Most of the safety, telecommunication and energy supply systems are outdated and at a low technological level, which does not match contemporary requirements for operative compatibility and could create problems in terms of transport safety. The railway network product quality is not satisfactory at the relatively low infrastructure access charges, which should cover to a higher extend the deficit, accrued because of low traffic, in funding network maintenance.
- The existing road infrastructure is sufficiently well developed and is capable of absorbing demand, with the exception of the suburban areas of large agglomerations. The quality of the product provided by the road network is not satisfactory, mainly because of the poor state of repair of the road pavements and the insufficiently developed network of highways and roads with more than two lanes. The product price is competitive but does not include the full amount of social expenses. The weakness of the road network lies in the insufficient bypass roads, as a result of which motor vehicles traffic is passing through a large number of towns and cities.
- Bulgaria's seaports of national importance have sufficient capacities for processing general, bulk, liquid and refrigerated cargo, containers, heavy pallets and RO-RO units. Currently, some 75 to 80 % of the infrastructure capacity is being utilized with the available reloading equipment. The weaknesses of the ports can be summarized as follows:
  - Insufficient specialization of terminals
  - Unsatisfactory state of port installations and reloading equipment, which does not match modern tendencies observed in the freight flow structure
  - Insufficient depth of the ports' water areas
  - Outdated organisation, which does not match modern market requirements
  - Limited capabilities for development of some of the terminals, located in central sections of the respective urban agglomerations
  - Lack of modern logistic and information systems at the ports.

- The hydrological and climatic conditions along Bulgaria's only internal waterway – the Danube River – imply that measures must be taken for improving navigation and for assuring a minimum depth of 2.5 m during the whole or most of the year required for ships of up to 3,000 tons.
- Bulgaria's river ports of national importance have sufficient capacities for processing general, bulk, liquid and refrigerated cargo, containers, and RO-RO units. Currently, some 60% percent of the infrastructure capacity is being utilized with the available reloading equipment. The weaknesses of the river ports can be summarized as follows:
  - Unsatisfactory state of port installations (quays) and reloading equipment, which does not match modern tendencies observed in freight flow structure
  - Lack of adequate equipment for handling and storage of grain
  - Unsatisfactory state of the links to the national road and railway infrastructure
  - Lack of modern logistic and information systems at the ports
  - Poor state of development of pollution control equipment.
- The network of freight terminals in the country is poorly developed. The capacity is sufficient for the current volume of traffic but will be quickly exhausted with its increase. The current state of both the railway lines and terminals, and the reloading equipment is unsatisfactory. The quality of the provided services is low.
- The market for land transport services is characterized by a strong competition between railway and road carriers and between individual road transport companies. The private railway operators do not attract cargo from competitive transport modes but actually redistribute the existing demand. A qualitative change could be expected mainly in the segment of transit operations with the eventual emergence of foreign operators on the domestic market, as the deregulation of freight railway transport has already been completed.
- The railway cars and engines fleet has a very unfavorable age structure and does not match European requirements and standards.
- The cargo truck fleet, used for domestic transport, is also outdated, while the rates of renewal of the vehicles pool used for international haulage are better.

### **Traffic forecasts**

The Strategic Plan bases its guidelines for priority interventions on the conclusions of the Final Report of the EU project "Scenarios, traffic forecasts and analysis of traffic flows including countries neighbouring the European Union: (EUN STAT)", which had been drafted jointly with the Dutch government and NEA Transport research and Training Institute (2005).

In the conclusions of that Report, the evolution of traffic trends on the main corridors of the Bulgarian network is summarized as follows:

- *Branch C of the Pan-European Transport Corridor X passes through Bulgaria (Belgrade – Nis – Sofia. The corridor merges after Sofia with Corridor IV to Dimitrovgrad – Svilengrad – Turkish border)*

A major portion of the freight traffic to Bulgaria is expected to be transported by Corridor X. The reference scenario predicts more than 10 million tons of road freight flows annually,

which will be passing through Bulgaria along Corridor X. The volume of freight transported by rail is expected to rise to 5 million tons annually.

The reference scenario - as the alternative scenario for Corridor X - based on recognition of Turkey and Russia as main trading partners. The most intensive railway traffic is observed in flows from/to Russia along the Bulgaria – Romania – Ukraine – Russia axis, as well as from Turkey through Bulgaria to Germany. The most intensive road traffic is observed to/from Russia and Turkey along the main axes:

- Turkey – Bulgaria – Balkan states – Germany
- Turkey – Bulgaria – Balkan states – Northern Italy – Southern France – Eastern Spain
- Bulgaria – Romania – Ukraine.

Improving the shipping conditions along the DanubeRiver, in line with the tendency towards reassignment of road transport to the more environment-friendly inland waterway transport, follows the provisions of the European transport policy. This will create favorable conditions for accelerating the region’s economic growth. The expected freight traffic by 2020 in the section Vidin – Ruse will not exceed 10 million tons annually, while the forecasts for the section between Ruse and Silistra freight volumes are expected to raise above the 10 million tons a year level.

The forecasts for 2020 regarding the different transport modes indicate a predominant share of road freight flows compared to rail freight.

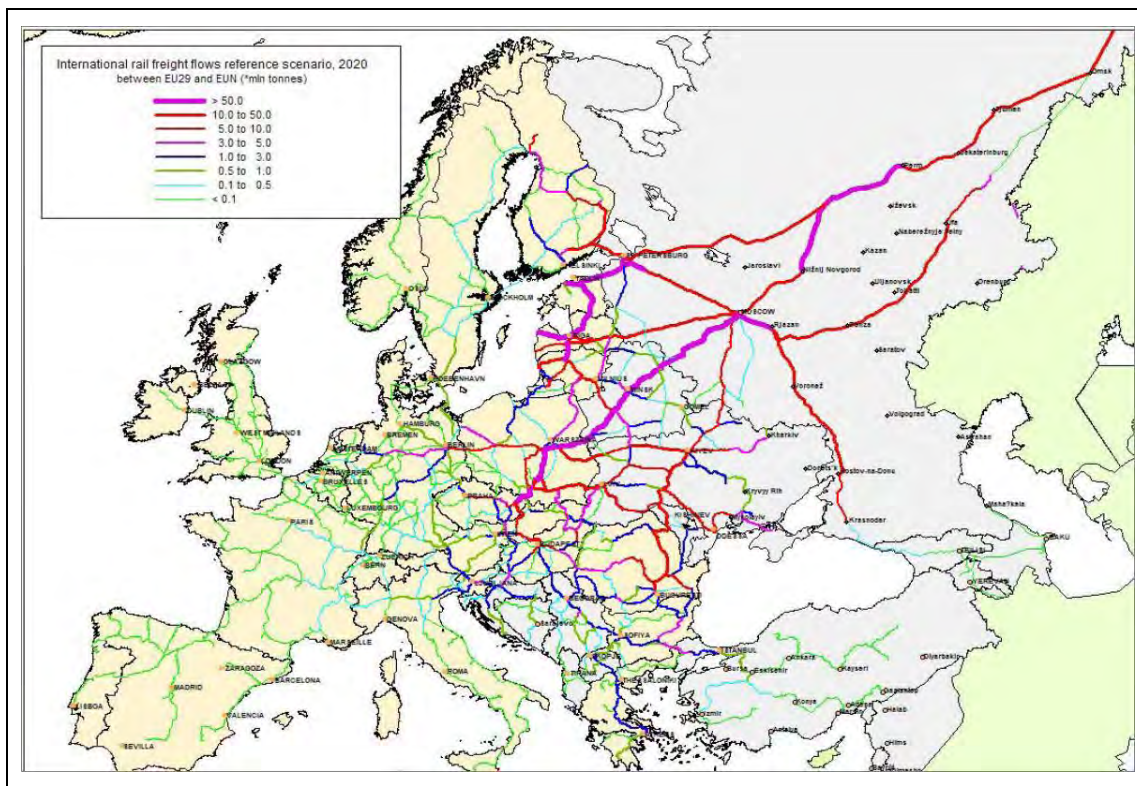


Figure 61: Rail freight volumes, 2020 (reference scenario 1)

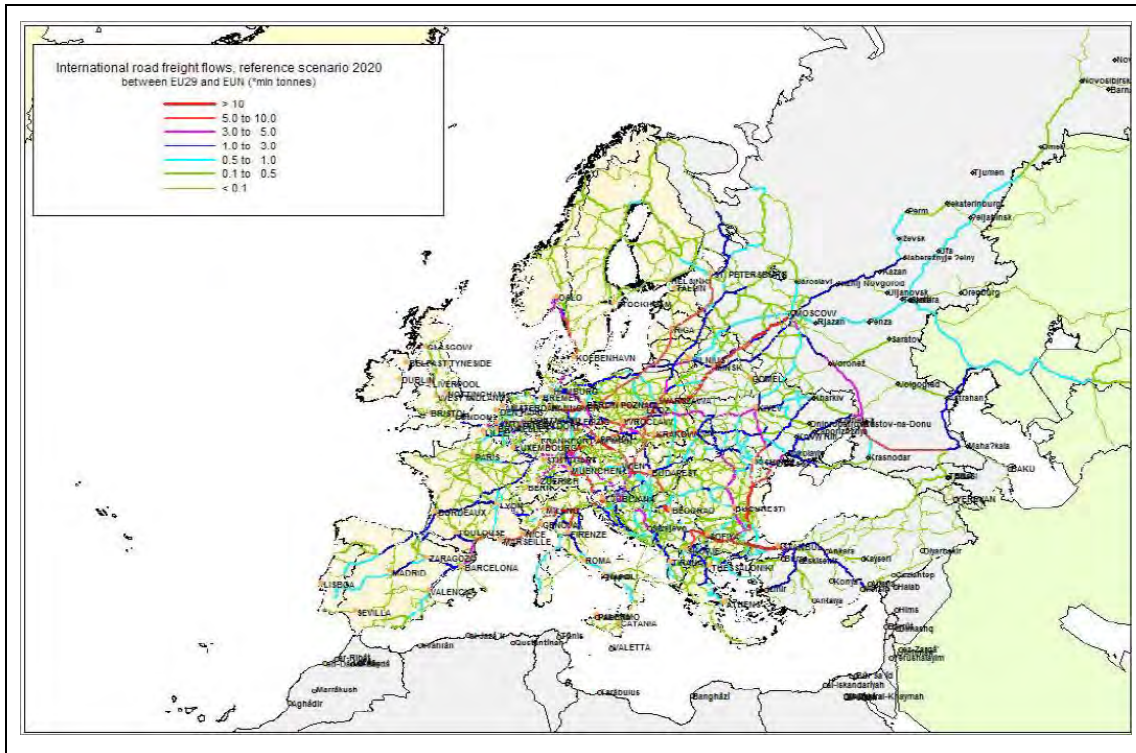


Figure 62: Roa freight volumes, 2020 (reference scenario 1)

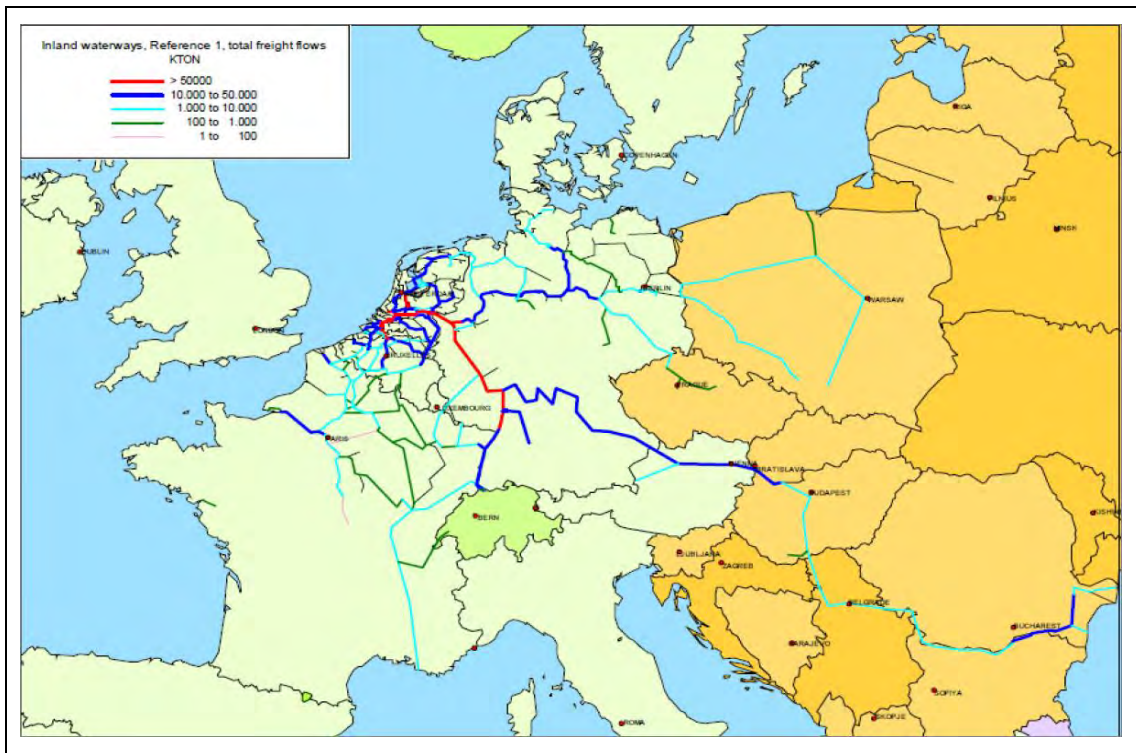


Figure 63: Inland –water freight volumes, 2020 (reference scenario 1)

***Priorities in infrastructure upgrading***

No substantial changes in the status of Bulgaria's neighbours are expected during the period until 2020. The chances of accession to the European Union of the states in the Western Balkan (with the exception of Croatia) and Turkey are slim, which means that there will be no major change in the TEN-T priority axes. The process of development of the Trans-European Transport Network and the links to neighbouring countries and regions, described above, may be used to draw the following conclusions about the priorities by 2020 of the main axes, corridors and links, passing through Bulgaria's territory:

**Priority 1: The most important axes for the development of the TEN-T:**

- The Vidin – Sofia – Kulata section of the Corridor IV
- Corridor VII: the Danube River.

**Priority 2: The most important axes connecting the TEN-T with neighbouring countries and regions:**

- Corridor X – Branch C, Belgrade – Nis – Sofia, and from there along Pan-European Transport Corridor IV – to Istanbul – TRACECA
- Corridor VIII: Durres /Vlore – Tirana – Skopje – Sofia – Burgas/Varna
- Motorways of the sea: the links between the ports in Varna and Burgas and the ports in Ukraine, Russia, Georgia, and Turkey.

**Priority 3: Corridors, which are not covered by the main axes (Priorities 1 and 2):**

- Corridor IX: Bucharest – Ruse – Dimitrovgrad – Alexandroupolis.

**Priority 4: Additional links, TINA network**

- The railway link Mezdra – Pleven – Gorna Oryahovitsa
- The road link Ruse – Kaspichan – Sindel
- The road link Botevgrad – Pleven – Byala
- The road link Svilengrad – Burgas.

## **II. Projects related to Sea2Sea financed through the OP "Transport 2007-13"**

Achieving these strategic priorities pursued a series of measures, including, of particular interest in relation to the project Sea2Sea, has measure 1 Priority 1 of the Strategic Plan: Priority 1 - Measure 1: Accelerate the implementation of infrastructure projects in rail, road, inland waterway, air and intermodal transport

The projects were included in the measure of this Strategic Plan are included to implement the OP "Transport" 2007 - 2013 and allocated to Priority Axis [AP] OP: AP 1: "Development of railway infrastructure along the major national and pan-European transport axes"

- Modernization of the railway line Sofia - Plovdiv,
- Electrification and reconstruction of the railway line Svilengrad - Turkish border
- Upgrading the railway line along the railway line Plovdiv - Burgas,
- Modernization of the railway line Sofia - Dragoman,
- Modernization of railway line Vidin - Sofia. AP 2: "Development of road infrastructure along the major national and Pan-European transport corridors"

- Improvement of sections E 79 Vratsa - Botevgrad, Vidin - Montana, Kardjali - Podkova,
- Connection of the Hemus Motorway to the Sofia ring road,
- Construction of motorway Struma - Sections 1 and 4,
- Construction of motorway Maritsa (-72 from km 5 km.) • Completion of the construction of the motorway Trakia - Sections 2, 3 and 4
- Axis 4 "Improvement of maritime and inland waterways"
- Improved navigation on the Danube to the public along the joint Bulgarian - Romanian Chamber: rkm 530 -rkm 520 (Bathin), rkm 576 - rkm 560 (Belene),
- Development of information system IWT System in the Bulgarian part of the Danube,
- Growth Management System Navigation (VTMS) - Phase 3.

The latest available data on the development of selected projects contained in suspended online Annual Progress Report 2010 Operational Programme, Annual Report OPTTI 2010 (as given by the official Bulgarian sources of information, all these projects were in progress at the time of conducting the Annual Report, having been delayed in starting work - different durations.

The contracted projects which are in progress at the time of preparation of the Annual progress Report 2010 - as indicated in the relevant contract award - were the followings:

#### Rail projects

- Design of Vidin - Sofia railway line
- Modernization of Sofia - Plovdiv railway line
- Electrification and reconstruction of the Svilengrad - Turkish border railway line
- Rehabilitation of the railway infrastructure along sections of Plovdiv - Burgas railway line
- Modernization of the railway Sofia - Dragoman
- Modernization of Vratza - Botevgrad section of the road I-1 (E-79)

#### "Road projects

- Road E-79 Vidin - Montana
- Kardzhali - Podkova
- Connection of "Hemus" MW with SRR"
- Construction of "Struma" MW"
- Construction of "Maritza" MW from km 5 to km 72
- Completion of "Trakia" motorway lots 2, 3, 4
- Lot 2 "Stara Zagora - Nova Zagora"
- Lot 3 "Nova Zagora - Yambol
- Lot 4 "Yambol - Karnobat

#### River transport projects

- Improvement of the navigation in joint Bulgarian - Romanian parts of the River Danube from rkm 530 to rkm 520 - Batin and from rkm 576 to rkm 560 - Belene

- Development of a River Information Services System in the Bulgarian Sector of the River Danube
- Development of a Vessel Traffic Management Information System (VTMIS) - phase 3

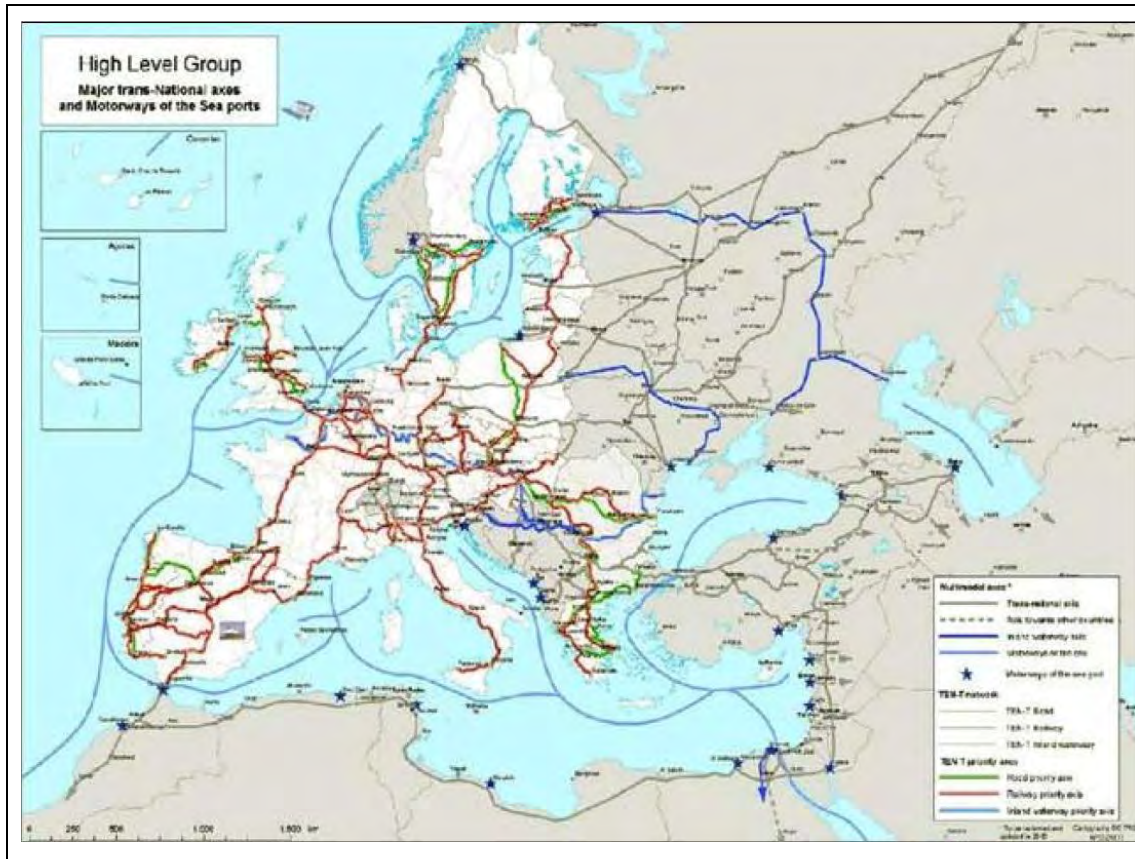


Figure 64: TEN-T Priority Axes

### Strategic priorities of the transport policy

Based on the analysis of the existing situation and the diagnosis of priorities for infrastructure development, the Strategic Plan concludes to the following strategic priorities:

- Priority 1: *Efficient maintenance, modernization and development of the transport infrastructure*
- Priority 2: *Integration of the Bulgarian transport system into the European transport system*
- Priority 3: *Provision of transparent and harmonized competitive business environment of the transport market*
- Priority 4: *Sufficient financing for transport sector development and performance. Efficient absorption of EU funds*



### III. Projects related to the Sea2Sea concept, planned to be implemented during 2014-20 the programming period

The author of this report has submitted an application to the Bulgarian side for official notification of the planning priorities for the programming period 2014-20 in terms of transport infrastructure, but the relevant information is not available by the time of submission. Therefore, the following information concerning the priorities of the Bulgarian side are derived from public statements of government officials, which were posted in the relevant Bulgarian site 67 with reference to Economic Forum event<sup>68</sup>, are not officially verified.

#### Road infrastructure

Among the major projects of road projects to be financed under the OPTTI "2014-2020" related to the Sea2Sea concept, are:

- The «Struma» motorway (Sofia - Kulata), which is part of Pan-European Corridor IV. The construction of the third hardest Department is expected to begin in 2015. The entire project is expected to be completed by 2021.
- The «Hemus» motorway (Sofia - Varna), with a total planned length of 433 km. Part of the project is completed. The remaining 250 km. Been divided into eight sections and the construction will be completed in three stages. Today the project is at an early stage and will be completed in 2020.
- The «Cherno More» motorway (Varna - Burgas), length 103 km along the coast of the Black Sea, which will be built with the participation of private resources.

#### Rail infrastructure

Regarding the future development of the railway network in Bulgaria is estimated that the country needs a funding of around € 4.0 billion for the full restoration and upgrading of rail infrastructure. However, only a small part of the amount of EUR 673.345.447,65 € will be available through the OPTTI 2014-20. Projects to be funded under the new Operational Programme "Transport and Transport Infrastructure" 2014 – 2020 include:

- Completion of the rehabilitation and upgrading of the line Plovdiv –Burgas (the correct project title is "Rehabilitation of the Plovdiv – Burgas railway line – Phase 2") - expected to start in 2015
- Upgrading of Septemvri (southern Bulgaria) – Sofia (the correct project title is "Modernization of Sofia – Septemvri railway section: sections Elin Pelin – Ihtiman and Ihtiman – Septemvri") – expected to start in 2016.
- Struma Motorway, Lot 3 "Blagoevgrad – Sandanski" – indicative amount: 750 millions of Euro;

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<sup>67</sup> <http://research.seenews.com>

<sup>68</sup> [www.biforum.bg](http://www.biforum.bg)

- Hemus Motorway: Yablanitsa – junction with E-85 "Ruse-Veliko Turnovo" (reserve project – amount of funding will depend on unused balance from the other road projects)
- Construction of the Sofia Metro: third metro diameter – indicative amount: 434 millions of Euro
- Extension of the Sofia Metro line 2 – indicative amount: 22 millions of Euro;

Connecting Europe Facility Projects on Bulgarian side:

- "Modernization of Vidin – Medkovets Railway Section (part of modernization of the Vidin-Sofia Railway Line – 376 millions of Euro
- "Development of Sofia Railway Junction and Rail Connection to Serbia" – 125 millions of Euro

Modernization of Sofia –Elin Pelin Railway Section (part of modernization of the Sofia-Plovdiv Railway Line) – 66 millions of Euro is not included in the OPTTI and proposal for funding under CEF will be submitted in 2015.

Also, projects Ruse – Varna and Karnobat – Sindel are out of the OPTTI 2014 – 2020 scope. Another funding possibilities shall be reached.

***It has to be noted that these are projects under the draft of the new programme, so their names and amounts are pending approval.***

## Greece

### **I. Projects in progress financed through the Ops of the 2007-13 programming period**

In the Greek side, the ongoing projects which are directly related to the Sea2Sea corridor, spatially located mostly in the Region of Eastern Macedonia – Thrace, financed through the Operational Programme " Improvement of Accessibility 2007-13" (ΕΠΕΠ) and Regional Operational Programme REM-T 2007 13 (ΠΕΠ ΠΑΜ-Θ) are given in TABLE 5.2 below.

The projects are parts of the TEN-T networks and necessary links between TEN-T axes. All projects included the table are critical for the objectives of the Sa2Sea project.

Of paramount importance is the construction of the railway connection of the container quay of the port of Alexandroupolis, which will support a completed infrastructure, designed for container operation, which allows immediate use and operation when equipment is installed and the issue of the operator is resolved.

**TABLE 5.2: PROJECTS IN PROGRESS RELATED TO THE SEA2SEA CONCEPT, SUPPORTED BY THE 2007-13 OPERATIONAL PROGRAMMES )**

FUNDING SOURCE	Project	Contract Date	Beneficiary	Budget	Project Status
ROP REM-Tr	Rail connection of the container warf of the port of Alexandroupolis	18/9/2013	ERGOSE	4.920.000	Under construction
ROP REM-Tr 2007-13(*)	Construction of the segment Didymoteicho – Marasia of the line Alexandroupolis - Ormenio rail line	7/5/2007	OSE	15.780.085	Completed
ROP REM-Tr 2007-13	Construction of the interchange of Egnatia Odos at the Industrial Area of Komotini	22/10/2010	EGNATIA ODOS S.A.	4.062.765	Under construction
ROP REM-Tr 2007-13	Construction of the section Mandra to Psathades, Evros, of the vertical axis Ardanio - Ormenio of Egnatia Odos.	1/1/2007	EGNATIA ODOS S.A.	43.960.449	Under construction
ROP REM-Tr 2007-13	Construction of the section Ardanio to Mandra,Evros, of the vertical axis Ardanio - Ormenio of Egnatia Odos	1/4/2011	EGNATIA ODOS S.A.	60.101.402	Under construction
OP IA(**)	New road from Komotini to the Greek-Bulgarian border, through Nymphaia		EGNATIA ODOS S.A.	83.106.862	The north part of the axis (14 km) is completed, the southern part in bidding process.

(\*): ROP REM-Tr 2007-13: Regional Operational Programme of the Region of Eastern Macedonia – Thrace 2007-13.

(\*\*) Operational Programme "Improvement of Accessibility 2007-13"

Source:www.anaptyxi.gov.gr/, Oct.2014

## II. Strategic Investment Programme for Transport 2014-2025 (SIPT 2014-25)

The SIPT 2014-25 is an ex-ante conditionality, requested from the country members by the EC, in accordance with the "Partnership Agreement for Development Framework 2014-2020". The requested conditionality for the transport sector is the existence of an integrated framework for transport infrastructure investments, which meets the legal requirements for strategic environmental assessment, and succeeds to contribute to the Single European Transport Area, in accordance with Article 10 of Regulation (EU) No. 1315/2013 of the European Parliament and of the Council.

SIPT 2014-25 defines the transport development strategy of the country for the period 2014 - 2025 and covers all modes of transport (road, rail, sea, air), both passenger and freight transport and all geographical regions of the country. It includes:

- As priorities for investment, projects which are parts of the TEN-T Core network and of the TEN-T Comprehensive network, which are eligible for financing through ERDF and the Cohesion Fund.
- Secondary connections, i.e. mature and sustainable projects which connect major axes of the TEN-T networks
- Measures to ensure the capacity of intermediary bodies and beneficiaries to implement the planned projects.

The SIPT 2014-25 includes primarily already approved projects of high level of maturity. Some included projects are in preliminary design status and others require additional operational studies. Among the projects included in the SIPT 2014-25 there are projects already in progress, started within the 2007-13 period ("bridge projects"). The available budget for the 2014-20 programming period for projects / actions in the transport sector is expected to be significantly reduced, compared to that of the 2007-13 programming period. Also included are connections between defined nodes of the TEN-T and the connections with the transport infrastructure networks of neighbouring countries.

The SIPT 2014-25 satisfies the regional dimension of the development of the transport infrastructure, taking into account the needs / priorities of the Regions of the country. Finally, it also includes measures promoting the use of alternative energy sources and the development of innovative technologies, and measures addressing technical and administrative problems, particularly in relation to network interoperability and enhancement of competition.

### **Policy Priorities**

The policy priorities of SIPT 2014-25 which ensure the attainment of the stated objectives, take into account a thorough assessment of the existing situation, as well as the relevant policies of EU, as they are expressed in the context of the financial instruments for infrastructure development (ERDF, CF, CEF). They also take into account the progress of programming procedures for the 2014 – 2020 period at national and regional levels and the relevant regulatory framework.

The policy priorities are summarized as follows:

- **Support for multimodal Single European Transport Area by investing in the TEN-T.**
- **Develop safe, consistent and interoperable railway system of high reliance and quality of service.**
- **Improve regional accessibility through connecting secondary and tertiary nodes to TEN-T axes.**
- **Improve functional characteristics of intraregional and interregional road networks.**
- **Improve the connections of the Regions to the international trade, production and urban centers.**
- **Reduce traffic bottlenecks.**
- **Develop environmentally friendly, low-carbon, transport systems and promote sustainable urban mobility.**
- **Ensure spatial coherence by ensuring equal opportunities for access and movement to all citizens.**

As part of the SIPT 2014-25 approval process an extensive consultation procedure with relevant public service departments and representatives of the regions has been undertaken. Each one of the involved actors was asked to report on its needs and priorities after the initiation of the SIPT 2014-25 preparation process. The proposals were drafted by the Program Planning Groups (PPG), under the guidance of No. 13650/6432 EFSSAAP / 03.29.2013 2nd Circular of EFSSAAP for Design and Development of Training Program for 2014-2020. The submitted modal and regional recommendations resulted from extensive consultation with modal and local stakeholders.

The Regions were asked to take into account the current economic and social conditions, the needs in national and inter-regional level, and to be compatible with the objectives of the 'Europe 2020' and the country's commitment to increase the quality and competitiveness.

The recommendations included in the SIPT 2014-25 for the Region of Eastern Macedonia – Thrace are based on an assessment of the potential of the Region as a node of combined transport for the wider area. The potential is attributed to its geopolitical position and aims to aiming to highlight the Region as a hub of the Balkans, Eastern European and Asian mainland.

As critical infrastructure improvement projects, the followings are considered:

- The completion of the vertical axes of Egnatia Odos,
- The upgrading of the infrastructure, equipment and operational status of the ports of Kavala and Alexandroupolis,
- The upgrading of the railway network of the Region and completion of connections with the other regions and neighbouring states.

The projects with geographical reference the REM-Tr, which were included in the public consultation for SIPT 2014-25 are given in the Table below.

**TABLE 5.3: SUGGESTED PROJECTS UNDER CONSIDERATION IN THE 2ND PHASE OF PUBLIC CONSULTATION OF THE STRATEGIC TRANSPORT INVESTMENT PLAN 2014-2025 (MAY 2014)**

<b>Road Projects</b>
Completion of the vertical axes of Egnatia Odos, Section Komotini - Nymphaea (southern section, link to Egnatia Odos)
Construction of the vertical axis Egnatia Xanthi - Echinus - Greek-Bulgarian border
<b>Rail Projects</b>
Construction of the rail connection of the new Container dock of the port of Alexandroupolis
Construction of the rail connection of the commercial port of Kavala (at New Karvali - "Filippos-B")
Upgrading of certain segments of the Alexandroupolis - Ormenio (Bulgarian border) rail line, renovation of the railway stations at Pythion and Ormenio, full electrification and deployment of automated control system.
Rail by-pass of Soufli, Evros, construction of new rail station
Rail connection from Komotini to Bulgarian border through Nymphaea
<b>Port Projects</b>
Dredging of the basin and the channel port of the port of Alexandroupolis
Construction of multipurpose freight quay and of a small ships' harbor in the port of Alexandroupolis
Completion of infrastructure in the new port of Kavala (New Karvali) with the construction of a container quay .

Source: Strategic Transport Investment Programme 2014 – 2025 (2nd phase of public consultation).

### III. The REM-T 2014 - 2020 regional strategy transport

The ROP EMT-T 2014-20 is consistency and complementarity with the key policy priorities of SIPT 2014-25 and allocates resources:

22. To the Investment Priority 7 to support a multimodal Single European Transport Area by actions to complete the analytical TEN-T and the creation node interconnected multimodal transport and

23. To the Priority Investment 7b to enhance regional accessibility, and particularly for the lifting of the isolation and enhance accessibility in mountainous, border and remote areas, to ensure safe operation and quality of networks and infrastructure and connecting residential centers and tourist, cultural and production areas to the main roads and trans-European routes.

Planned interventions by WFP to contribute two of the objectives of the EC transport policy:

- The construction intermodal hubs contribute to the movement portion of the volume of road freight transport (Objective 3) to other modes of transport (marine / rail), while
- other interventions contribute to increased safety (Objective 9) on the road network.

The ROP 2014-20 is currently in a process of negotiation with EC services. Finalization is expected by the end of year. The experience of the 2007-13 programming period indicates that at least certain segments of the projects of national importance are likely to be financed by financial resources of the ROPs, due to limited resource availability of the respective national sectoral programs.

#### **5.1.4 Synopsis**

The report presents a brief spatial and development analysis of the area of direct area of influence of the Sea2Sea concept, which includes the Region of East Macedonia - Thrace on the Greek side and the North-Eastern, South-Eastern and South-Central regions on the Bulgarian side.

The three out of four regions that constitute the direct influence area of the corridor have a common characteristic: the presence of major port facilities, which, on the Bulgarian side (Varna, Burgas) are already nodes of freight traffic handling high volumes, whilst the ports on the Greek side (Kavala and Alexandroupolis) have excess capacity and significant potential.

The development characteristics of the regions under study show significant divergences in basic macroeconomic data, and some similar characteristics, such as the intra-regional dominance of major urban centers - particularly on the Bulgarian side - the existence of large industrial concentrations, significant agricultural production, and especially significant improvement of their position in the respective national development maps, which is related to the development of the TEN-T and Pan-European Transport Networks.

The major population and development figures of the Regions under study, can be summarized as follows:

- The total population of 4 regions of the study area corresponds to 22.36% of the total population of the two countries. Between 2001 and 2011 all three Bulgarian Regions presented significant population decrease. In the contrary, East Macedonia - Thrace increased its population by approximately 2%. To a significant extent the negative population growth of the Bulgarian regions should be attributed to the migratory flows of previous years.

- Regarding the main urban centers of the study area (as they are identified by the national regional planning of the two countries), the largest city on the Bulgarian side is Plovdiv, followed by Varna and Burgas. These two, are the only main urban centers on the Bulgarian side of the study area that recorded positive population change during the last decade, a fact that indicates their dynamism in the urban network of the area (and of the country). On the Greek side, the majority of the main urban centers (with the exception of Kavala) have increased their population with significantly high rates.
- East Macedonia -Thrace's population density is lower compared to the Bulgarian regions.
- An important finding of the analysis is that the GDP of the Bulgarian regions increased significantly in the period 2004-2011, although below the country's level over the same period (but much higher than EU28). The change in GDP is positive also for East Macedonia - Thrace, but much less than the Bulgarian regions. The per capita GDP (in PPS) also presented high rise in the Bulgarian regions, in contrast with the negative percentage change in East Macedonia and Thrace.
- Regarding employment by sector, the service sector provides for the largest share of employment in all the examined regions, being above 50% in all cases. The Bulgarian regions (as well as the country as a whole) present significantly higher employment share in the industrial sector in comparison with Greece and the Region of East Macedonia - Thrace, while the majority of the Bulgarian regions present low share of employment in the agricultural sector.
- The trade balance in 2013 is negative in all regions under study.

Three (out of four) regions in the direct area of influence the Sea2Sea concept have high potential for achieving an important role as nodes in a future transport map of the wider territory, as well as throughout Europe:

- On the Bulgarian side, the two main ports of Varna and Burgas, already operate as nodes in the internal network of maritime transport in the Black Sea. They still have a surplus of capacity, while projects of expansion and upgrading of their equipment are planned for the near future. Their main strategic advantage is their position as the "end points" of the networks connected with TRACECA. Therefore, regarding the trade flows between Europe and Caucasus-Asia, these ports have a dynamic which is not dependent on external factors, and is supported by the operation of the river transport system of the Danube. Regarding the freight flows to/from the Far East and the rest of the world, shipping uses, the Bosphorus Strait, with all the restrictions that this implies - mainly burden of transport cost.
- On the Greek side, the ports of Alexandroupolis and Kavala clearly play a subordinate role (compared with the Bulgarian ports), they have inadequate equipment and are overshadowed by the port of Thessaloniki as regards freight flows. Particularly in the field of combined transport, the port of Thessaloniki



operates as a port of distribution to a wider hinterland, including large part of Bulgaria. Both ports however have substantial infrastructure and a great potential for expansion. Connections to the rail network are scheduled (almost completed in Alexandroupolis, under study in Kavala). The upgrading of both ports in order to seek a role as intermodal nodes is a consistent objective of development planning of the country and the Region in the last programming periods. Significant resources have already been allocated in order to construct new facilities, while construction and dredging projects are in progress.

The TEN-T and the Pan-European Corridors on the Bulgarian territory creates a grid of land axes which is dominated by those in the direction East-West , with an end to the ports and on the border with Turkey. This grid complements the Danube river waterway. Cross-border links with direction North-South are clearly degraded in terms of their contribution to transport and of their priority degree.

The national road network of Bulgaria still displays serious inadequacies as far as the implementation of the TEN-T, but the country is in the process of planning major interventions in the 2014 - 20 programming period. The Bulgarian railway network is fully developed. Important works of geometric and functional upgrade for parts that belong to TEN - T are in progress.

The overview of the frameworks/plans on both sides of the corridor reveals several issues relating to the inadequacies, dynamic and strategies in the field of spatial planning and transport.

- On the Bulgarian side:
  - The South-Eastern Region together with the North-Eastern Region are expected to play an important role in spatial development in the area of the Black Sea. Both of these regions should base their development on their dynamism, i.e. the existing cities, and should try to achieve polycentric urban network structure at various hierarchical levels.
  - Varna and Burgas are 2 out of 6 urban centers categorized as "Level 2" (according to the hierarchical model of cities-cores for Bulgaria). Varna has potential to be incorporated in the main European metropolitan agglomerations (MEGAs), while Burgas' influence is also expected to grow and strengthen.
  - In the transport sector the proposals for the development of transport networks are associated with the most important axes of the TEN-T and the connections with the neighbouring countries and regions, as well as the destinations of the Pan-European Transport Corridors and some additional connections.
  - The development of the ports of Varna and Burgas as nodal points of the Corridor VIII and as important gateways of the country to the external borders of the EU will support the operation of the southeast main axis, connecting the EU through the Balkans and Turkey with the Caucasus and the Caspian Sea, as well as Egypt and the Red Sea. In particular, Varna, as an important trade, economic and administrative center of the region is situated at the crossroads of Corridors

VII, VIII and IX, creating excellent conditions for the transit of goods between Europe, the middle and Far East - TRACECA. As part of the infrastructure of the Corridor VIII, the port of Burgas also creates favourable conditions for transit of goods between Europe, the Middle East and the TRACECA.

- With the construction of the "Trakia" Motorway and the upgrading of the railway infrastructure, as well as the "Black Sea" Motorway, the south axis of Bulgaria will ensure the operation of the Corridor VIII. In addition, the modernization of the railway line Sofia-Plovdiv and the construction of an intermodal terminal in Plovdiv are planned.
- On the Greek side:
  - The main development axis of the REM-T coincides into a large extent with the transport axes, which already have significant development dynamics.
  - For the Sea2Sea scope, the secondary axis Alexandroupoli – Ormenio is of paramount importance. Its special dynamic derives from the existing transport networks' potential (both road and rail) to be incorporated into the Trans-European transport networks and, in relation to the port of Alexandroupolis, create a corridor that bypasses the Bosphorus Straits.
  - The adopted strategic guidelines for the transport sector include the development of intermodal transport, the increase of accessibility and optimal utilization of existing infrastructures, (instead of programming new ones), and the gradual balancing of the road and railway transport, both for freight and passenger transport. The implementation of these guidelines requires a change of planning philosophy, from individual projects toward the adoption of an integrated approach.
  - The achievement of these objectives requires priority interventions in the following sections: i) Completion of the projects which contribute to the strengthening of the North-East development axis of REM-T and support of the port of Alexandroupolis to achieve a role of regional transport hub for the south-East Balkans; ii) Completion of projects which concern the strengthening of Kavala's role as a secondary national pole of trans-regional importance and as a gateway of trans-regional and cross-border role.
  - The ports of Alexandroupolis and Kavala have not yet managed to play this development role. For this to be achieved, they should be interconnected with the rest of the transport network (Egnatia Odos, rail network). Under certain conditions, it might be possible that the two ports are complementary.
  - Certain important projects must be implemented in order for the rail transport to be able to play a new role: i) The improvement of the rail axis Alexandroupoli – Ormenio, and its connection with the port of Alexandroupoli. The project is characterized as 'high priority', since it contributes to the development of the Rail-Road Terminal of Alexandroupoli, which is included in the Trans-European network; ii) The connection of Kavala and its port to the existing railway network

(Kavala-Toxotes segment); iii) Investigation of the feasibility – viability of the rail connection between Komotini and Bulgaria via Nymfaia.

The wider area of the Sea2Sea concept that is examined by this analysis is the coastal zone of the Black Sea. It is obvious that the surrounding hinterland, which potentially could be served by the corridor, may include a large part of the mainland around the Black Sea, and cover the entire hinterland of each port. This was not considered feasible in the context of this study. For this reason, the macroscopic approach of the developmental characteristics include the regions that are eligible under the interregional cooperation Black Sea Basin ENI CBC programme funded by the EU, while the macroscopic approach for the transport networks refers to the whole area of Black Sea, with the ports being the reference points. The study highlights the important role of the Bulgarian ports in the internal transport network of the Black Sea region.

The overview of the programmatic documents on both sides of the direct area of the S2S Corridor shows that the programming priorities of the two countries regarding land networks reach for the implementation of TEN-T. On the Bulgarian side, the largest share of available resources seems to be primarily directed to the completion of the East - West axis. There are, however, ongoing or planned interventions covering large part of the requirements for the creation of the Sea2Sea corridor.

On the Greek side, as far as the road network of the TEN-T is concerned, after the completion of the Egnatia Odos, the focus turns on the completion of the vertical axes, which by definition relate to the Sea2Sea corridor. As regards to the railway network, completing critical connections to ports is displayed as a priority, while high priority seems to be given to the vertical axis of Alexandroupolis - Ormenio, which will form the "backbone" of the Sea2Sea Corridor's infrastructure.

## 5.2 Transportation - Future Development

### 5.2.1 Future developments in infrastructure and traffic

#### Railway 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:

- Modernization of the Sofia - Plovdiv railway line (Modernization of Septemvri - Plovdiv section) - ongoing, total value 130 M EUR, expected completion 2015;
- Completion of Reconstruction and electrification of Plovdiv-Svilengrad railway line (Parvomai - Svilengrad section) - ongoing, total value 176 M EUR, expected completion 2015;

- Rehabilitation of railway infrastructure along sections of the Plovdiv - Burgas railway line – ongoing (partially completed), total value 180 M EUR, expected completion 2015;
- Reconstruction of key railway station complexes – Sofia central railway station, Pazardzhik (completed, in operation), Burgas – ongoing, total value 40 M EUR, expected completion 2015;
- Construction of IMT in South central planning region of Bulgaria – Plovdiv – ongoing, total value 5,3 M EUR, expected completion – end 2015;
- Completion of the Plovdiv – Burgas railway line (Rehabilitation of the Plovdiv – Burgas railway line – Phase 2) – forthcoming, indicative value 320 M EUR; construction 2016-2019;
- Modernization of the Sofia - Plovdiv railway line (Modernization of Sofia – Elin Pelin section – ongoing technical design, indicative value 66 M EUR, construction 2016-2019 (CEF);
- Modernization of Sofia – Septemvri railway section: sections Elin Pelin – Ihtiman and Ihtiman – Septemvri – ongoing technical design, indicative value 756 M EUR, construction 2016-2020;
- Modernization of the Sofia - Dragoman railway line – ongoing technical design, indicative value 130 M EUR, construction 2016-2020;
- Modernization of the Sofia - Pernik - Radomir railway line – ongoing technical design, indicative value 360 M EUR, construction after 2020;
- Development of railway junction Sofia – ongoing technical design, indicative value 125 M EUR (incl. partially sections of Sofia – Dragoman line); construction 2016 – 2020 (CEF);
- Development of railway junction Burgas – ongoing technical design, indicative value 20 M EUR, construction starts 2015 (within the scope of Plovdiv – Burgas Phase 2 project);
- Modernization of the Vidin – Sofia railway line: modernization of Vidin – Medkovets railway section – ongoing technical design, indicative value 376 M EUR, construction 2016-2020 (CEF);
- Modernization of the Vidin - Sofia railway line: modernization of the sections Medkovets – Ruska Byala and Ruska Byala – Mezdra – ongoing update of preliminary design; technical design 2016-2018; construction 2019 – 2025;
- Restoration of the design parameters of the Ruse - Varna railway line – design and EIA completed; investment costs 305 M EUR; construction – forthcoming (when funding available);
- Modernization of Radomir – Gyeshevo/FYROM border – completed preliminary design, indicative value 556 M EUR; further preparation included in OPTTI 2014-2020

- Modernization of the Karnobat – Sindel railway line - indicative value 180 M EUR; construction – forthcoming (when funding available);
- Modernization of the Radomir – Kulata/GR border railway line – ongoing studies and preliminary design (under PP22 project); indicative value – 767 M EUR; construction after 2020

**Privatization of national railways:**

Former Transport Minister, Danail Papazov, has suggested (2013) that there is a possibility of restarting the privatization procedures for part of the in-debt national railways (BDZ). This time, though, this referred to passenger traffic business and not the commercial part, the second privatization attempt of which had been cancelled June 2013. At this moment, the restart of the privatization efforts is not probable in the foreseeable future.

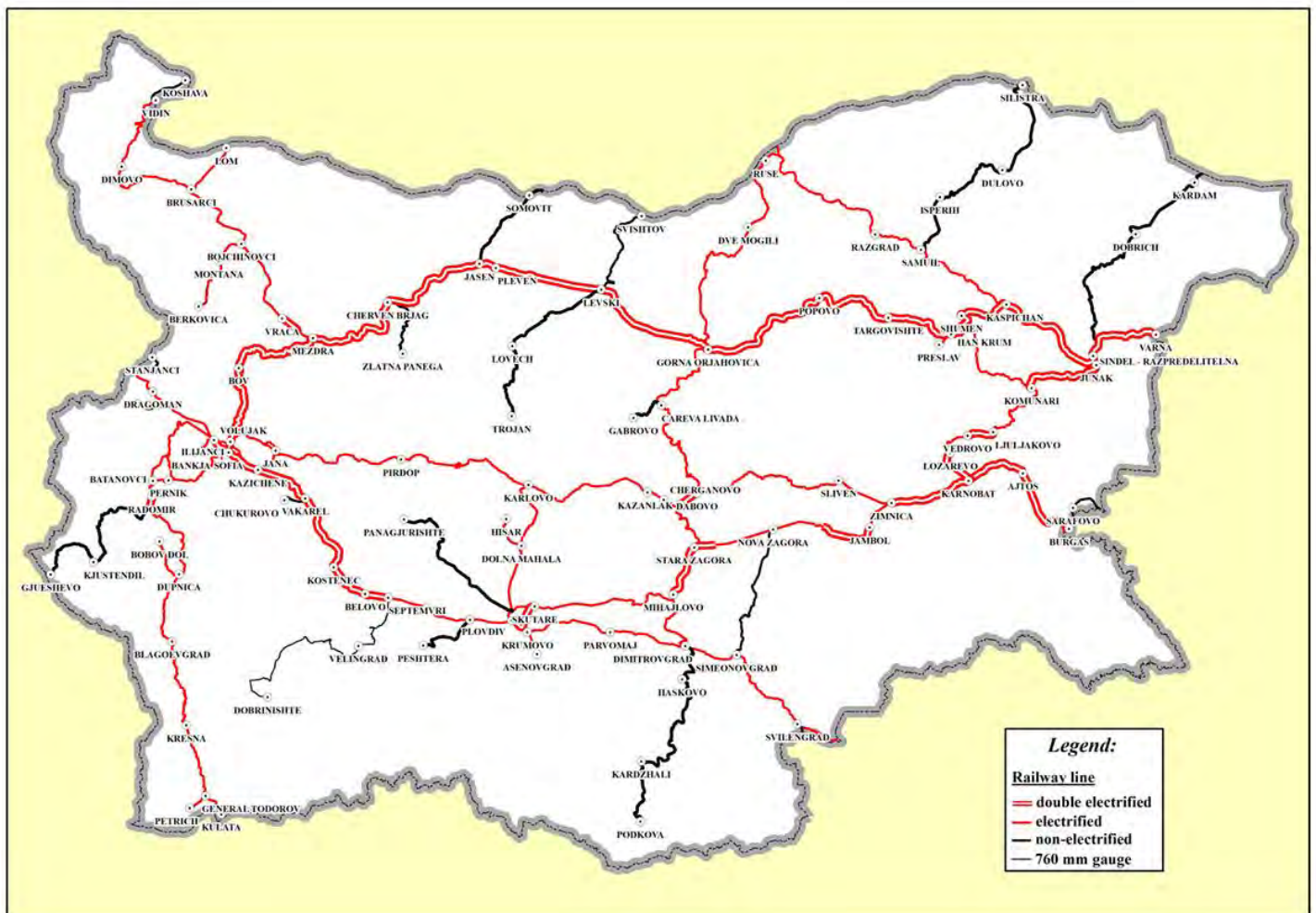


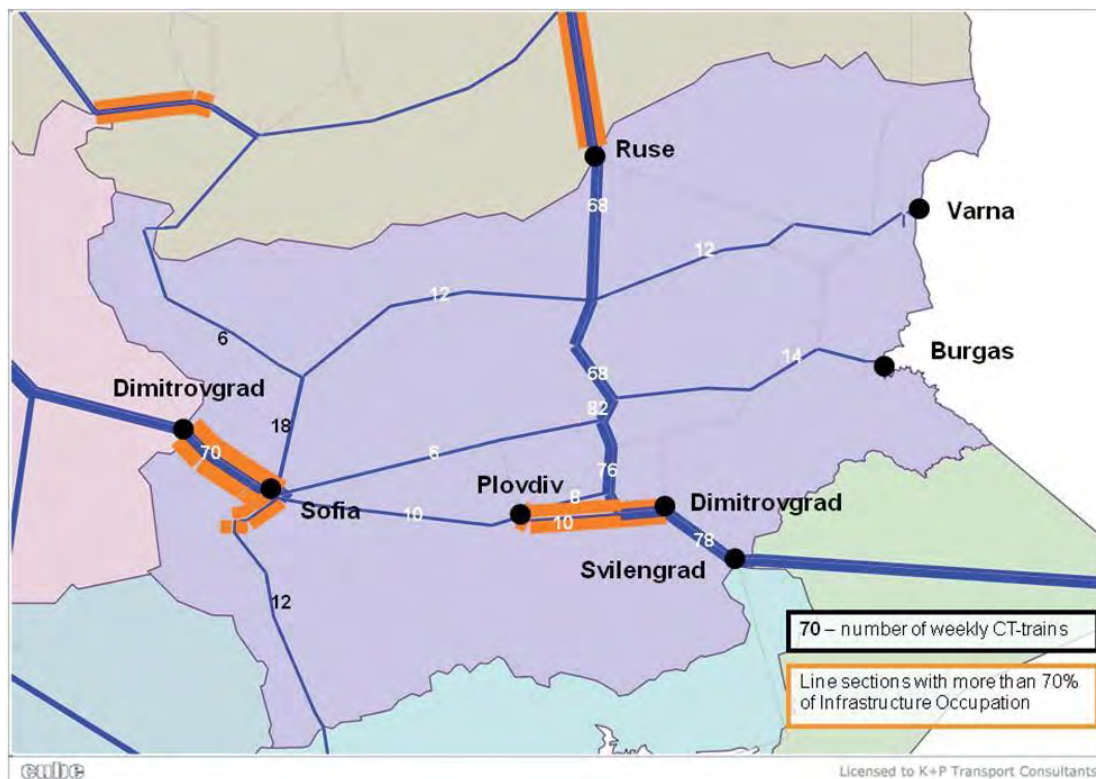
Figure 65: Schematic map of Bulgarian railway network infrastructure

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.

A relatively recent study by UIC (Evolution of intermodal rail/road traffic in Central and Eastern European Countries by 2020, Bulgaria) argues that 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. 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 dependent on the timely completion of Bulgarian rail infrastructure projects, border crossing procedures but also the behaviour of neighbouring countries’ intermodal stakeholders at large. This is confirmed by a study by K+P Transport Consultants, which sees very few sections of the Bulgarian rail network employed by an average of 70 per cent or more by 2020 (see **Figure 66** below).



**Figure 66: Assignment of intermodal trains on the Bulgarian rail network, 2020**

Source: K+P Transport Consultants

## Bulgaria Ports and Traffic

At Varna, containers are handled at terminals in Varna West on Lake Varna and Varna East on the Black Sea. There are plans for anew 0.12mTEU/year facility, which forms part of a masterplan for development to 2020, drafted with assistance by the European Bank for Reconstruction and UK civil engineering company, Posford Duvivier. The terminal is to occupy a 17.5h site and offer depth of 12.5m, which compares with a maximum of 9m at the present lake-side facility at Varna West. In 2008, plans were confirmed to replace the Varna East terminal with a new, larger facility on the northeastern shore of Lake Varna, with the estimated €500m costpart-financed by a loan from the Japan Bank for International Cooperation (JPIC). In 2010, a new centre-right government announced it would seek a private operator for the terminal, to finance the loan repayment. Varna East, which is in the city centre, is to be redeveloped into a tourist and residential area.

JPIC is also part-funding plans for a US\$47m container terminal for feeder vessels at the port of Burgas, comprising two berths totaling 450m and providing capacity to handle 0.15mTEU/year. This terminal is also to be operated under a private concession. The current West Pier terminal at Berths23/24 has 400m of quay. Use of two multipurpose gantry cranes was superseded by the purchase of a mobile harbour crane in 2008.

The Bulgarian ports of Varna and Burgas remain for the moment smaller players in the container market. The traffic decline in Black Sea ports is in sharp contrast to strong growth witnessed by Piraeus and Turkish deep-sea ports near the Sea of Marmara. This development demonstrates shipping lines for the time being prefer a hub-feeder model in the Med to service the Black Sea area instead of direct deep-sea calls in the Black Sea.

**TABLE 5.4: BULGARIA: RECENT, COMMITTED AND PLANNED CONTAINER PORT INVESTMENT**

Port	Project	Quay length (metres)	Annual Capacity (m TEUs/year)	Year
Bulgaria				
Varna	New container terminal	na	0.12	2014
	Closure of Varna East container terminal	-338	-0.05	2014
Burgas	Mobile harbour crane		net 0.02	2008
	Feeder terminal	450	0.15	2015
	Redesignation of existing terminal	-400	-0.05	2015

Source: Ocean Shipping Consultants

**TABLE 5.5: ROMANIA AND BULGARIA: ANTICIPATED CONTAINER HANDLING CAPACITY BY PORT TO 2020**

m TEUs/year	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
<b>Romania</b>													
Constantza	1.42	1.645	1.645	1.645	1.645	1.645	1.645	1.645	2.020	2.395	2.895	2.895	3.395

**Bulgaria**

Varna	0.15	0.15	0.15	0.15	0.15	0.15	0.22	0.22	0.22	0.22	0.22	0.22	0.22
Burgas	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.15	0.15	0.15	0.15	0.15	0.15

Figures may not sum exactly due to rounding.

Source: Ocean Shipping Consultants

**TABLE 5.6: THESSALONIKI: RECENT, COMMITTED AND PLANNED CONTAINER PORT INVESTMENT**

Port	Project	Quay length (metres)	Annual Capacity Year (m TEUs/year)	
Thessaloniki	Expansion of Pier I	600	net 0.90	2016/20
	Pier 6 extension	524	0.60	2016-17
	Deepen existing berths		0.20	2016-17

Source: Ocean Shipping Consultants

**TABLE 5.7: THESSALONIKI: ANTICIPATED CONTAINER HANDLING CAPACITY BY 2020**

m TEUs/year	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Thessaloniki	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.80	1.20	1.20	1.20	1.20

Figures may not sum exactly due to rounding. Source: Ocean Shipping Consultants



**TABLE 5.8: BLACK SEA: FORECAST TOTAL CONTAINER HANDLING DEMAND TO 2025 BY COUNTRY**

mTEUs	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2025
<b>Romania</b>														
<i>Non-transshipment</i>														
Base Case	0.45	0.32	0.39	0.41	0.46	0.52	0.57	0.63	0.69	0.75	0.81	0.87	0.93	1.21
Enhanced-Recovery Case	0.45	0.32	0.39	0.41	0.47	0.53	0.59	0.66	0.72	0.79	0.86	0.92	0.99	1.32
Continued-Instability Case	0.45	0.32	0.39	0.41	0.44	0.49	0.54	0.59	0.64	0.69	0.74	0.79	0.84	1.08
<i>Transshipment</i>														
Base Case	0.93	0.28	0.16	0.19	0.28	0.46	0.72	0.94	1.14	1.33	1.52	1.69	1.87	2.63
Enhanced-Recovery Case	0.93	0.28	0.16	0.20	0.29	0.48	0.74	0.98	1.19	1.40	1.61	1.80	1.99	2.88
Continued-Instability Case	0.93	0.28	0.16	0.19	0.27	0.43	0.66	0.86	1.04	1.21	1.36	1.51	1.65	2.26
<u>Total</u>														
Base Case	1.38	0.59	0.56	0.60	0.75	0.98	1.29	1.57	1.83	2.08	2.33	2.56	2.79	3.84
Enhanced-Recovery Case	1.38	0.59	0.56	0.61	0.76	1.01	1.33	1.64	1.91	2.19	2.47	2.73	2.98	4.20
Continued-Instability Case	1.38	0.59	0.56	0.60	0.71	0.92	1.20	1.45	1.68	1.90	2.11	2.30	2.49	3.34
<b>Bulgaria</b>														
<i>Non-transshipment &amp; total</i>														
Base Case	0.20	0.14	0.14	0.16	0.17	0.19	0.21	0.23	0.25	0.27	0.29	0.31	0.33	0.43
Enhanced-Recovery Case	0.20	0.14	0.14	0.16	0.17	0.19	0.22	0.24	0.26	0.29	0.31	0.33	0.35	0.47
Continued-Instability Case	0.20	0.14	0.14	0.15	0.16	0.18	0.20	0.21	0.23	0.25	0.27	0.29	0.30	0.38
<b>Ukraine</b>														
<i>Non-transshipment &amp; total</i>														
Base Case	1.24	0.51	0.66	0.77	0.91	1.04	1.17	1.29	1.41	1.54	1.67	1.79	1.91	2.52
Enhanced-Recovery Case	1.24	0.51	0.66	0.78	0.93	1.07	1.21	1.34	1.48	1.63	1.77	1.91	2.05	2.76
Continued-Instability Case	1.24	0.51	0.66	0.77	0.86	0.98	1.09	1.19	1.30	1.40	1.51	1.62	1.72	2.22
<b>Black-SeaRussia</b>														
<i>Non-transshipment &amp; total</i>														
Base Case	0.43	0.25	0.49	0.56	0.62	0.69	0.76	0.83	0.91	0.98	1.05	1.13	1.21	1.58
Enhanced-Recovery Case	0.43	0.25	0.49	0.56	0.63	0.71	0.78	0.86	0.94	1.02	1.11	1.19	1.28	1.71
Continued-Instability Case	0.43	0.25	0.49	0.55	0.60	0.66	0.72	0.78	0.84	0.91	0.97	1.04	1.10	1.42
<b>Georgia</b>														
<i>Non-transshipment &amp; total</i>														
Base Case														

	0.25	0.18	0.23	0.26	0.30	0.33	0.37	0.40	0.44	0.47	0.51	0.55	0.58	0.78
Enhanced-Recovery Case	0.25	0.18	0.23	0.27	0.30	0.34	0.38	0.42	0.46	0.49	0.54	0.58	0.62	0.84
Continued-Instability Case	0.25	0.18	0.23	0.26	0.28	0.32	0.35	0.38	0.41	0.44	0.47	0.50	0.53	0.70
<b>Black-SeaTurkey</b>														
<i>Non-transshipment &amp; total</i>														
BaseCase	0.02	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.04
Enhanced-Recovery Case	0.02	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.04	0.04
Continued-Instability Case	0.02	0.02	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.04
<b>Total</b>														
<i>Non-transshipment</i>														
BaseCase	2.60	1.41	1.93	2.18	2.49	2.80	3.11	3.42	3.73	4.05	4.37	4.68	4.99	6.56
Enhanced-Recovery Case	2.60	1.41	1.93	2.20	2.53	2.87	3.21	3.55	3.90	4.25	4.61	4.97	5.32	7.13
Continued-Instability Case	2.60	1.41	1.93	2.16	2.37	2.65	2.91	3.18	3.45	3.73	4.00	4.27	4.53	5.84
<i>Transshipment</i>														
BaseCase	0.93	0.28	0.16	0.19	0.28	0.46	0.72	0.94	1.14	1.33	1.52	1.69	1.87	2.63
Enhanced-Recovery Case	0.93	0.28	0.16	0.20	0.29	0.48	0.74	0.98	1.19	1.40	1.61	1.80	1.99	2.88
Continued-Instability Case	0.93	0.28	0.16	0.19	0.27	0.43	0.66	0.86	1.04	1.21	1.36	1.51	1.65	2.26
<i>Total</i>														
BaseCase	3.53	1.69	2.09	2.38	2.78	3.27	3.83	4.36	4.87	5.38	5.89	6.38	6.86	9.19
Enhanced-Recovery Case	3.53	1.69	2.09	2.40	2.82	3.35	3.95	4.53	5.09	5.66	6.22	6.77	7.32	10.01
Continued-Instability Case	3.53	1.69	2.09	2.36	2.64	3.08	3.58	4.04	4.49	4.93	5.36	5.78	6.18	8.10

Source: Ocean Shipping Consultants

### 5.2.2 General Conclusions

As already indicated in numerous occasions within this report, the physical absence of the corridor as a current freight transportation network prohibits from credibly evaluating its current competitiveness and its future performance.

The general trend of freight volumes increase in the wider area of the Black Sea, the northern Mediterranean ports of Greece and Turkey indicate that there is a market opportunity; alternative hubs and routes may be considered by the transportation and forwarding companies operating through the region. However, the corridor shows more potential at parts and not as an integrated system of transshipment between the Mediterranean and the Black Sea. Connections of Alexandroupolis, Varna and Burgas to Plovdiv may have potential in their own respect, with the one of Alexandroupolis-Plovdiv showing comparatively better.

A better understanding of the future attractiveness of the corridor is to be drawn during the next phases of the project, where the corridor will correspond to an operational theoretical route without today's bottlenecks and spatial constraints.