# REPORTS

## Quantitative assessment of the Danubian state border between Bulgaria and Romania

*Abstract*
Transport-geographical position of Bulgaria is determined by the importance of positioning the country as a natural and closest geographical bridge between Europe and Asia. It is reinforced by the proximity to the Caucasian-Caspian region. Bulgaria, being a Danubian country, is associated through this European navigable river to some of the most developed EU countries such as Austria and Germany, the Rhine and Main rivers and the Netherlands and the North Sea.

*Key words:* Bulgaria, Danube River, transport, geographical space

*The geographical location of Bulgaria*

The territory of the Republic of Bulgaria is situated in the Balkan Peninsula and occupies its central and eastern parts, to the south of the second large European navigable river – Danube, and the Black Sea as its eastern border. Only 30 km in the straight line separate the country from the Aegean Sea – the other closest to Bulgaria aquatic basin. Besides the territory, the National Geographical Space (NGS) includes also territorial waters along Danube Riverside and 12-mile sovereign territorial sea in the Black Sea.

*Quantitative assessment of the Danbubian border between Bulgaria and Romania*

In the geographical spaces, which can be regarded as systems, there is no strict distinction between inputs and outputs. These are the points where the main subsystems (territory, territorial waters and airspace) of the Bulgarian NGS interact with the spaces of neighboring countries. For the national territory those are the endpoints of the railway or the road network located at the border checkpoints, Bulgarian international airports, and as for the sea/river transport, those are the ports (see Fig. 1).

The length of the Bulgarian section of the Danube riverside is 470 km starting from the Timok River mouth at the Bulgarian-Serbian border to the west, to the town of Silistra to the east, where the Danube River enters Romanian territory.

If the total length of the land and river borders of a country is **S**, and that of the neighboring country is **S1**, while the length of the shared border is **D**, then the following ratios exist: **D/S** and **D/S1.** These ratios can only be three types – equality, or two kinds of inequality:

$$\mathbf{D/S = D/S1}, \quad \mathbf{D/S < D/S1} \quad \text{or} \quad \mathbf{D/S > D/S1}$$

These can be interpreted as follows – when there is equality (full or approximate), it can be assumed that the shared border is equally important for both countries. In the opposite case, the shared border is more important for only one of the country. The computing algorithm of the Danube border with Romania indicates the following:

- Bulgaria-Romania (D/S = 470 km/1,808 km = = 0.260) and Romania-Bulgaria (D/S1 = 470 km/ /2,508 km = 0.187)
- or **0.260 > 0.187**, which leads to the assumption that this particular border is more important for Bulgaria than it is for Romania. It is out of question that the Danube River, which connects Bulgaria with a number of European countries to the west and to the east, is very important for our country. With the completion of the second bridge near the town of Vidin and with the launch of the two ferry lines between Silistra-Calarasi and Nikopol-Turnu Magurele and with other similar connections in progress, the importance of the Danube will increase.

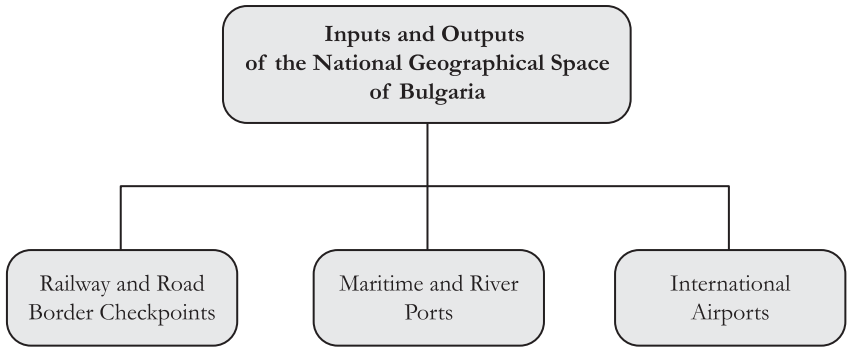


**Figure 1** Main types of connections of the National Geographical Space of Bulgaria.

*Transport activity in the Bulgarian sector of the Danube River*

*River navigation*. The Bulgarian section of the Danube allows both – transportation of cargo between Bulgarian ports and between Bulgarian and foreign Danubian ports in a number of countries (trans-European corridor No. 7). Unlike some other EU member states, Bulgaria has no other internal river navigation. The ports are main transport infrastructure of course with the existing port facilities. The national river port infrastructure includes two regional directions – in **Ruse** and **Lom**, which include the following three port complexes.

**Ruse port complex** consists of the following river ports: Port of Ruse – procession of crops, fertilizers, metals and general cargo; Port of Somovit – crude oil, oil products, bulk cargo, general cargo; Port of Svishtov – construction materials and general cargo; Tutrakan Port and Port of Silistra – general cargo.

The second one is the **Lom port complex** which includes: Port of Lom – procession of coal, chemicals, metals and general cargo, and the Port of Oryahovo (Oryahovo port and Oryahovo ferry complex) – construction materials and general cargo.

**Vidin port complex** (ports of Vidin-Central, Vidin-South and Vidin ferry line) processes combined cargo. This complex is a part of Lom Regional Direction.

The length of navigational routes of Bulgarian cargo ships in 2006 was 1,000 km, the same as in 2001. The length of navigational routes of the cruise ships is much higher – in 2005 cruise ships have navigated 8,000 km as opposed to 2001 when it was only 1,000 km.

The average total length of transport was increased from 281 km in 2001 to 500 km in 2006. However this sole navigable river of Bulgaria is not used optimally, which can be seen if we make a comparison with the river transport indicators of other Danubian countries.

The analysis shows that the river navigation is most intensive at both ends of the navigable river section – the western most part (German ports, those in Austria, Slovakia, northern and central Hungary) and the eastern most part (Romania and Ukraine), while the central part, where the Bulgarian section is, it is the least intensive. As of 2005 the transported cargo in the above mentioned western most part was around 12 mil. t, in the easternmost part over 25 mil. t, while in the central part (Serbia and Bulgaria) the transported cargo was around 6 mil. t, out of which only 2.5 mil. t were in the Bulgarian section (as opposed to 2.7 mil. t in 1995, or the transported cargo decreased).

*Ferry lines*. Besides the earlier mentioned transport infrastructure (ports) complexes, in the Bulgarian-Romanian section of the Danube, the following

ferry lines operate: Vidin–Calafat, Oryahovo–Beket, Silistra–Calarasi and Nikopol–Turnu Magurele, which give yet another development opportunity for cross-Danube transport connections.

*Bridges*. Because of the insufficient capacity of the bridge near Ruse, the building of a second bridge (near Vidin) was launched. This bridge is already under construction by a Spanish consortium. The bridge facilities will offer additional opportunities for a better integration of Bulgaria into the common transport network of EU – through No. 4 and No. 9 trans-European corridors.

*International legal regulations of the transport activity along the Danube River*

The 1948 Navigation Convention establishes a special International Danube Commission seated in Budapest which is responsible for all activities along Danube River.

Some other documents as The Protocol signed in connection with the signing of the Additional Protocol for the Convention, as well as the Additional Protocol itself, also include important rules about strict implementation of this Convention.

Since 2001 a new initiative has been operational, which emerged as an Austrian-Romanian suggestion. This is the so called "Danube Cooperation Process", which was later joined by the European Commission and The South-Eastern Europe Stability Pact.

All Danubian countries, together with two non-Danubian ones, which territories gravitate towards that important trans-European navigational corridor (Bosnia and Herzegovina and Slovenia), participate in "The Danube Cooperation Process". Ministry conferences are called once per two years, which conferences are the chief managing body of the Process. Bulgaria supports all activities towards intensifying the transport along the internal water routes, which activities are embedded in the integrated European action program for internal water transport.

*Environmental protection in the scope of the Bulgarian sector of the Danube River*

The environmental protection of the Danube coastline is an important national task with regards to the existing natural hazards such as the landslides near Oryahovo, Tutrakan and other locations, etc.

The most precious natural treasure along the Bulgarian section of the Danube River is Sreburna lake, located near the town of Silistra, which lake is internationally recognized wetland by the Ramsar Convention and therefore included in the UNESCO World Natural and Cultural Heritage List.

Because of the shutting down of some polluting industries in Vidin, Lom, Nikopol and Ruse, the waters of the Bulgarian coast at Danube River are in comparatively good sanitary-hygiene condition.

Internationally coordinated water protection activities have been undertaken – in 2000 the ministers of the environment of several Danubian countries (Bulgaria, Romania, Moldova and Ukraine), signed a common declaration for creating the Lower-Danube Green Corridor, which stretches across the river delta covering some 1 mil. ha of wetlands along the shores of these countries.

*Asessment of the Danube River for the Bulgarian transport system*

The Bulgarian section of the Danube offers a sole opportunity for river transport development. Through this river section Bulgaria is able to make important transport contacts with a number of no sea access Central European countries. The Danube river transport is an important part of the national transport system of Bulgaria which has to be exploiting much more intensively in the future.

**References**

*Additional Protocol to the Convention on the Regime of Navigation on the Danube* (signed in Budapest on March 26, 1998), issued in the State Gazette of Republic of Bulgaria on February 26, 1999 (in Bulgarian).

*Convention on the Regime of Navigation on the Danube* (signed in Belgrade on August 18, 1948).

*Directive 2007/60/EC of the European Parliament and the Council of 23 October 2007 on the assessment and management of flood risk*. Issued in the Official Gazette of the European Community, effective November 26, 2007.

**Gurevich, B. L.** 1968: Geographical differentiation and its measures in the discrete scheme. *Matters of Geography* 77 (in Russian).

**Kolev, B.** 2002: Geographical location of Bulgaria. In *Geography of Bulgaria - Physical and Socio-Economic Geography*, Sofia (in Bulgarian).

**Kolev, B.** 2008: *National Geographic Space of Republic of Bulgaria*. Heron Press, Sofia (in Bulgarian).

**Popov, P.** 1972: *Mathematical methods in Economic Geography*. Sofia (in Bulgarian).

**Simonov, Y. G.** 1970: Geographical neighborhood and methods of measurement. *Bulletin of Moscow University*, No. 4. (in Russian).

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