
CONSIDERATION OF THE PORT OF BRČKO CONTAINER TERMINAL IN THE CONTEXT LOGISTICS SERVICE IMPROVEMENT

Nedžad Branković^a, Smajo Salketić^{a,*}, Azra Ferizović^a

^a Faculty of Traffic and Communications- University of Sarajevo, Bosnia and Herzegovina

Abstract: Port of Brčko for years occupies an important place in the overall transport-logistic system of Bosnia and Herzegovina and the wider region. The economy of Brčko District generates significant demand for all forms of transport, are evident and significant cargo flows that transit the region. Railway line Tuzla-Brčko-Vinkovci connects Tuzla region and Brčko District with railway Corridor X linking the a railway line Tuzla - Doboj is connection to Corridor Vc. The road network of the Brčko District and the region is well developed and connects Bosnia and Herzegovina with neighbouring countries Serbia and Croatia. The Sava River connects Bosnia and Herzegovina with the world inland waterways. The aim of this paper is to underline importance sport construction of a container terminal in the Port of Brčko as a part of well-designed policy of development of transport logistics system in Bosnia and Herzegovina.

Keywords: port, logistics, container, terminal

1. INTRODUCTION

All attempts at defining the transport policy in Bosnia and Herzegovina at the end of the twentieth and early twenty-first century are its key principles based the on line logistic freight-transport centres (FTC). For each region in Bosnia and Herzegovina is planned one FTC with designed container terminal. In order to offer a correct score of such an approach to solving transport policy in BiH, arguments it can be argued that in relation to other centres of Brčko has the advantage over the others. The needs for the use of container forms of transport are the most demanded. There should be an integrative factor for railway, road and river transport, which is the face in such a way that each of these forms of transportation offers its share in providing complete transport services. Container transport integrates all types of transport and allows full transport service in the logistics transport chain from sender to receiver on the principle "door to door". The further development and elaboration of the issue construction of container terminals in the Port of Brčko in general does not need to be questioned. It is necessary to locate and dimensioned its capacity but in terms of solving traffic problems in the region and the town of Brčko. The existing traffic solutions, particularly land transport in the town of Brčko, have become a bottleneck braking the further development of the economy. In order to provide a comprehensive solution that will be a service to the economy and citizens, hereinafter will next define the basic parameters of the container terminal in Port of Brčko, to be

* ssalketic@yahoo.com

offered and commented on other issues in the field of transport in the region. The construction of container terminal will be a key step on the road towards completion of the intermodal centre in Brčko District.

2. KEY CONTAINER TERMINAL PROJECT ASPECTS ASSESSMENT

It is undeniable that the current handling capabilities of the Brčko District have not been sufficiently exploited and to offer a chance to get through quality planning and investment comes to durable solutions. Complete this matter can be observed and elaborate from several aspects.

2.1. Development aspect

Brčko Port is located on the right bank of the Sava River at 220 km from the confluence of the Sava and Danube rivers, and it is the only international port in Bosnia and Herzegovina. The current port was built in 1913 and rebuilt in the period of 1952-1962, and in 1953 an official has established the company for river traffic and dock. Commercial waterway stretching on almost 600 km and linking Belgrade and Sisak in Croatia, about 50 km from Zagreb. Navigability of the Sava River is the AGN in the class IV and the Brčko up to Sisak, class III. Generally speaking, waterways class IV and above are considered of international importance. The key technological aspects of the distance from the Danube, 220 km, provided that the availability of the Port of Brčko 266 days a year for barges depth gauge of 180 cm and a load of about 1,000 tons. The main quality of this port is in its three modal resources, customs terminal and almost ideal position in the basin area of heavy industry in BiH. The port is provided with road and rail links, allowing it to connect on the highway Zagreb-Belgrade, and good connections with Corridors X and Vc, which are connected by rail link with the European railway network. The port is owned by the Brčko District of Bosnia and Herzegovina and since year 2004, as a public company. According to the disposition in relation to the inland waterway, it is classified as a port of the open coast. These geographical, technological and administrative parameters create a real basis for long-term and quality development of the Port of Brčko.

2.2. The economic aspect

Brčko District contains a variety of existing production and processing capacities, especially in the field of agriculture and food industry, which represent a significant potential for economic and social development. At the same time, these facilities provide opportunities for the development of the wider region, which gravitates to the District so the entire BiH. In recent years there has been significant growth and expansion of capacities in the area of food production and processing in these companies which requires primarily high-quality logistic support. In addition to the need for supply of existing resources generated by the economy of Brčko District many goods transit the region various modes of transport and the space make a great crossroad of roads. This refers to the logical conclusion that the prospects of economic development of the Brčko District and the wider region should be based on investing in two key activities, such as production and processing of food and transportation. The result of this approach will be primarily an increase in employment in the region, then modernization of transport infrastructure and the improvement of standards and living conditions of the local population. The final scores will be economic development of the region and other economic benefits that investments bring.

2.3. The spatial and location aspect

The method and conditions of use of the area belonging Port of Brčko defined by legislation. Area Port of Brčko is divided into two main territories: (1) Land space (territories) and (2)

Water area (waters) on the right bank of the Sava River. From the point of use of the total territory with the aim of defining of functional, area of the Port of Brčko is divided into sub-areas. Land area is divided into four dedicated areas affected and each is reserved for certain types of goods and manipulation. The water space is divided into three anchors each of which has its uses.

2.4. Traffic connections

Port of Brčko is located in the north-eastern part of Bosnia and Herzegovina, on the right bank of the Sava River waterway (44 52'N, 18 48'E). (221/224 RKM). Over Port of Brčko it is possible to achieve direct commodity flows on the Sava River with the Danube ports of Western and Eastern Europe, as well as to ports on the North and the Black Sea. With the European railway network is connected to the traffic road Tuzla-Vinkovci and Tuzla - Doboj. In the immediate vicinity of Port is the dual carriageway M14.1. Good connections by land roads opens up the possibility for the establishment of transit cargo flows and flows whose destination is in a narrow gravitational field of the Port of Brčko. Distance industrial centres by the different modes of transport are shown in Table 1.

Table 4. Regional connections-distance Brčko of the destinations in the region (Salketić & Ajanović, 2013)

Brčko -	Sisak	Sl. Brod	Beograd	Smederevo	Novi Sad	Vukovar	Osjek	Zenica	Sarajevo
by IWW	358	140	226	281	310	388	457	-	-
by Rail	265	105	213	292	189	86	104	253	337
by Road	240	90	168	239	158	75	99	164	194

In the center of all the possible combinations for plotting potential routes for the development of of intermodal transport in the Western Balkan region and beyond, Brčko is an essential location. Corridors not only the direction and scope of transport flows, but are each other's competition and, more importantly, compete with alternative routes in the country and the region. Transport network of Brčko District has connections on the Pan-European corridors, a connection to Corridor Vc in Bosnia and Herzegovina, and with Corridor X in Croatia Corridor VII across the Sava River. Across the river Sava and the Danube Brčko District connecting the inland waterways around of the world. When it comes to transport flows, the economy of Brčko District generates significant transport and they are by train, road and river traffic is distributed to the desired destination.

3. MARKET ANALYSIS

Due to natural and strategic position of the city of Brčko are prerequisites for its quality development into a regional economic and transport centre.

3.1. The main economic resources

The main industrial potentials are based n food production. The largest users of transport services are the SCO Studen Agrana with 180,000 - 200,000 tons/year of raw sugar to bring the rail from the Port of Ploče and processing factory in Brčko. Processed sugar consumption is shipped in different directions mainly by truck. Then, Bimal oil producer with annual processing of 100,000 to 120,000 tons of oil and produces 50 to 60,000 tons of oil. Certain amounts of crude oil that is used in the production, approximately 10,000 tons of containers coming through the port of Rijeka and rail to Brčko. There are also other food products, among which an important place occupied by about 1,500 tons of coffee that are transported by trucks, as well as the bread-making industry whose production is on the rise. The complete range of these food products is very suitable for container transport. Besides the industrial potential of the region of Brčko as

potential users of transport services a very important role is played by transit transport flows. Railroad Tuzla-Brčko in recent years, in addition to raw materials and products of food industry in significant quantities transported following types of goods: coke, anthracite, coal, soda, salt, wire rod and other steel products, liquor, alumina, coal tar, hydrate, fuel oil, ammonium, sodium, etc. products of the chemical industry. Certain amounts listed goods are always transported on the Sava River and primarily coke, coal, anthracite, and wire and steel products. Using containers and becoming larger transport units most goods from food industry of Brčko economy also can be dispatched by river transport.

3.2. The transport facilities and transport volumes

On the railway network of Bosnia and Herzegovina, the average annual transports about 15 mil.t of goods. These are mostly raw materials and products for the needs of mines, power plants and metal industry.

Table 5. Freight rail transport on the Tuzla- Brčko (www.zfbh.ba)

Year	Plan(t)	Realised(t)	Import(t)	Export (t)	Transit (t)
2012	175.000	296.198	88.052	38.526	169.620
2013	225.000	264.784	59.904	46.482	158.398
2014	265.000	318.881	104849	124.209	89.823
2015	255.000	256.542	67.458	75.584	113.500
2016	270.000	261.000	64.135	78.550	127.315

The share of food and textile industry is around 5% or approximately 750,000 t. On rail line Tuzla-Brčko and generally in the Brčko region mostly dominated by goods from the food industry, which largely cover the 5% of the total railway transport in BiH rail network. Table 2 and Table 3 shows the volume of transport on the railway line Tuzla-Brčko and Brčko railway station in the period 2012-2016. So the structure that is there for over 50% of goods in the field of food industry.

Table 6. Railway station Brčko transport manipulations (www.zfbh.ba)

Year	Loading/railcar	Loading/t	Unloading/railcar	Unloading/t	Handover/t
2012	1148	56.578	37806	185.486	242.064
2013	1115	50.267	4301	206.254	256.512
2014	1266	50.239	3130	150.071	200.310
2015	1376	64.801	3541	167.158	231.959
2016	1411	68.305	3617	169.132	237.437

Given the nature and structure of economic resources in Brčko and dominated by food industry a number of raw materials suppliers are from the region and the neighbouring states of Serbia and Croatian. A certain quantity of goods for processing in factories in the Brčko is mainly delivered by road and truck transport from the Croatian and Serbia because the raw materials from these areas. A significant part in the shipment of finished products of food industry performs regional truck companies from Bosnia and Herzegovina.

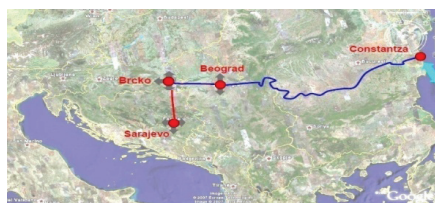


Figure 1. Inland water way: Constanța – Beograd - Brčko (DB International, 2008)

For serving the economy of Brčko District and further inland in Bosnia and Herzegovina can be used overland forms of transport by rail and road. One of likely solution is to use navigational capabilities River Basin (Figure 1). Barges on the Danube, in Constantza to the river Sava and Danube in Belgrade (here mainly offered a series of separation pushed), after which the loads and vice versa Brčko to be carried by Sava River. Belgrade is the main container centre in the Western Balkans region, which is well integrated into the trans-European container flows and could become a place of consolidation for container flows from the East in BiH. Belgrade, as the main centre in South East Europe, could be a great source of goods in railway transport to BiH, because the second container flows could add to the quantity of Constantza.

Table 4. Handling of the goods in te Port of Brčko and railway station (www.lukabrcko.ba)

Godina	Handling in the Port (t)	Handling in rail station(t)	Handling Total(t)
2012	71.272	242.064	313.936
2013	62.242	256.512	318.754
2014	115.994	200.310	316.304
2015	80.104	231.959	312.063
2016	149.187	237.437	386.624

Further transport from the Port of Brčko at the place of destination in BiH and wider in the region can be made by road or rail traffic. Table 4 presents handling goods in the Port of Brčko in the period 2012th-2016th years. In year 2016 has recorder maximum operation of 150,000 tons reloading. According to data from the previous period, reloading in year 1989 reached approximately 300 000 tonnes.

4. ANALYSING THE SPATIAL AND TECHNICAL TRANSPORT VOLUME POSSIBILITIES OF CONTAINER TERMINAL IN THE PORT OF BRČKO

The territory of 14 hectares of Brčko Port is a resource that leaves room for long-term planning, design and creation of new related content. Most of the area consists of the coast with auxiliary and supporting facilities, open and closed warehouse and workshop space. When it comes to local waters, near the operative coast there are three anchorages, formed in accordance with the technological operations and the type of goods can accommodate 12 vessels. Length built operative coast with hair quay is 104 m and 76 m with vertical quay. Along the wharf there are four shunting tracks total length of 2,586 m. With the main train station of Brcko, the port is connected to single-route of the railway. When it comes to reloading mechanization current capacity of two cranes are about 1 million. tons of goods per year and two storage capacity of approximately 60,000 open and around 15.000m² closed area. In addition, there is a quality network of access roads, parking and reloading manipulative space. What is the key fact is that all these capacities may expand and new upgraded.

In the previous period few documents were done dealing with the forecast of the volume of goods flow in Brčko District: Brčko Port, Industrial Zone and Railway station Brčko. Of the listed documents exist three that dealt with deeper analysis and projection is properly prospective need for transport for the period from 2016 to 2030. That are: (1) The study of intermodal transport in Bosnia and Herzegovina, DB International GmbH, 2009, (2) PPIAF Reform of management Brčko Port - Advisory program for public-private infrastructure, Public - Private Infrastructure Advisory Facility, 2009, (3) The project of rail siding Railway station Brčko New - Port of Brčko, Saraj ENGINEERING, 2012. The estimations were made by types of goods and users of services and the calculation has been made by the containerization factor. The obtained parameters were used as relevant for locating and sizing of container terminal in the Port of Brčko. At this point it can be concluded that the planned processes in the field of development of transport in Brčko District place on the line presented forecast but much slower.

Notwithstanding the slower realisation of forecasts, issue of the construction of intermodal transport center in Brčko with container terminal in the port remains only a matter of time.

5. CONCLUSION

The geographic, strategic and geographical location of the city of Brčko, which is located on the Sava River and right next to the border of the three neighboring countries (Bosnia and Herzegovina, Croatia and Serbia) make it predestined for connecting and linking regions, economy and population. Transport possibilities offered by existing resources, the Sava River, railways and roads that pass through the Brčko can be developed to unexpected proportions. The economic resources of the Brčko District and the region generates considerable amounts of goods that need to be transported and that with transit flows of goods represent a very serious challenge for the profession and are looking for modern solutions.

This paper listed the current capabilities and capacities of all modes of transport in the Brčko District. An overview of quantity, volume of transport that are realized in the last five years. Given the state of capacity and transported it is obvious that offer much greater opportunities to be well thought out policy of transport. In this sense, it is necessary to use chance offered to improve logistics services. Development of transport capacities in Brčko District should be planned in such a way that the existing forms of transport are each other's help and not competition. The construction of container terminals in the Port of Brčko, for which there are all preconditions, should be an integrative factor for river and land transport and that leads to the realization of the project "Regional intermodal center on the Sava".

REFERENCES

- [1] Božičević, D., Kovačević, D., (2002). Modern transport technologies (in Croatian: *Suvremene transportne tehnologije*), Faculty of Transport and Traffic Sciences, Zagreb.
- [2] Dalla Chiara, B., Ercoloni, F., Gačanin, E., Kiso, F., (2004). Intermodal transport (in Bosnian: *Intermodalni transport*), Bosanska riječ, Sarajevo.
- [3] DB International, (2008). The studies of intermodal transport in Bosnia and Herzegovina (in Bosnian: *Studije intermodalnog transporta u Bosni i Hercegovini*), DB International GmbH, Berlin.
- [4] Saraj INŽENJERING, (2012). The main project of industrial track, Railway station Brčko Novo-Luka Brčko (in Bosnian: *Glavni projekat industrijskog kolosijeka, Željeznička stanica Brčko Novo-Luka Brčko*), Sarajevo.
- [5] MTBS, (2009). Reforming the Management of the Port of Brčko: Towards Improving Port Efficiency and Operational Performance (in Bosnian: *Reforma rukovođenja Lukom Brčkon - Savjetnički program za javno-privatnu infrastrukturu*), final report, PPIAF Public Private Infrastructure Advisory Facility.
- [6] Salketić, S., I Ajanović, I., (2013). Feasibility study on the construction of container terminal in the Port of Brčko (in Bosnian: *Elaborat o opravdanosti izgradnje kontenerskog terminala u Luci Brčko*), Saraj INŽENJERING, Sarajevo.
- [7] www.hdzi.hr
- [8] www.zfbh.ba
- [9] www.lukabrcko.ba