



Faculty of Economics, University of Niš, 13 October 2016

International Scientific Conference

**THE PRIORITY DIRECTIONS
OF NATIONAL ECONOMY DEVELOPMENT**

**LOGISTIC CENTER PIROT – EURO ASIAN INTERMODAL
TRANSPORT NODE**

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***Abstract:** Mainly because of the competition between modes of transport, the transport system has been for a good period of time highly segmented and un-integrated. More specifically, the search for the particular advantages in terms of cost, reliability and safety of each mode of transport lead to a lack of integration between the modes, phenomena which were also accentuated at times by the public policy. The introduction of the container and its diffusion within transport systems (particularly within maritime transport system) lead to the integration of different transport modes through intermodalism. This process was carried out in three major stages: containerization of maritime transport systems, containerization of inland transport systems, intermodal and transmodal operations.*

In order to integrate within the Euro – Asian intermodal freight transport network it is necessary to develop adequate intermodal transport infrastructure. In order to become a part of the up to date system it is planned development of Logistic Centre Pirot, as an intermodal node of a worldwide freight transport network located in Balkans.

***Keywords:** Logistic Centre Pirot, Free Zone Pirot, Distributive centre, Supply Chain, Intermodal node.*

1. Introduction

The Balkans area presents a not homogeneous level of development of transport infrastructures and a preponderance of road freight traffic flows, with great impact of current traffic on the environment of the area. It presents the need of better connecting ports with landlocked countries too.

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UDC 658.286(497.11 Pirot)

Improving accessibility of Balkans involves better freight mobility, upgrading transport standards, developing unified models of sustainable mobility management and integrated logistics chains and attracting innovative investments looking at the integration into the Euro Asian common market economy. The integration strictly involves better cooperation among the different Countries and Regions combining physical and professional training investments through interregional transport networking and pre-feasibility studies.

Main envisaged activities are the assessment of existing transport standards and terminal supply, gap analysis, the development of "Corridor quality networks" and "Multimodal Development Centres", harmonization of existing ICT tools for tracing rail transport and interface with customs, the establishment of "Green Transport Agreements" and common training modules.

Efforts should be focused in contributing to prove the feasibility of a better usage of the existing transport infrastructure and a wider usage of multimodal transport and upgrade transport infrastructure to support and facilitate certain interregional connections. Development of an intermodal node in the middle of Balkans will facilitate further development of intermodality in the region.

2. Logistic Centre Pirot - Setup of the analyses

The analyses carried out in the document intend to provide for a preliminary answer to the following key question: which target market(s) may be potentially defined as attractive for the development of an intermodal centre in Pirot. In that respect, three main lines of potential development have been identified:

- intercepting import/export and transit flows to/from ports
- offering regional distribution transport and logistics facilities within the Balkans
- supporting transit trade from Turkey along TEN-T corridor X branches

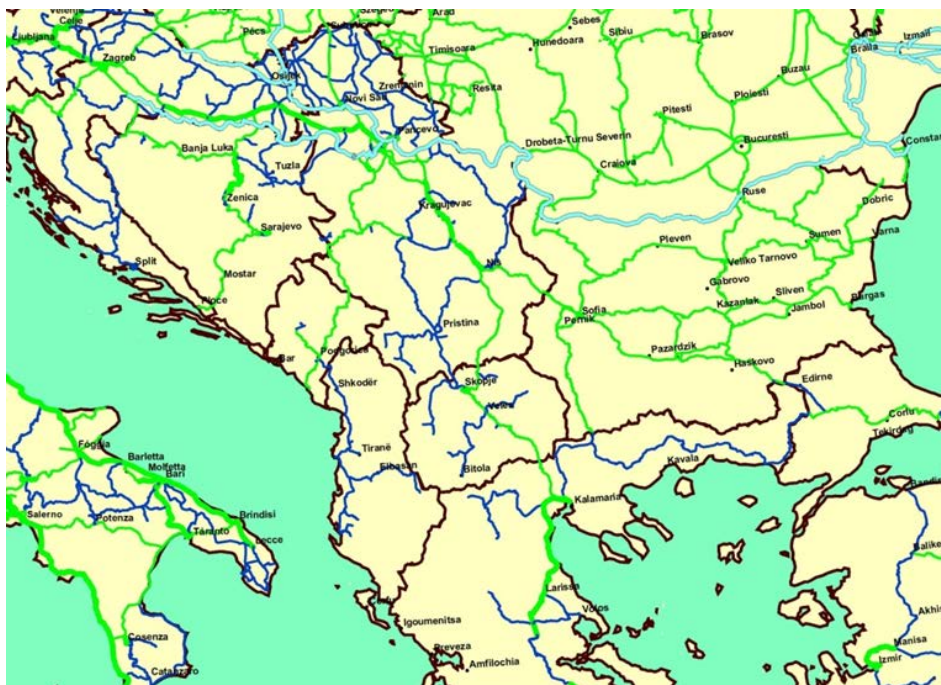
In general, from the supply side, important infrastructural projects and plans are in progress and/or have been already financed both by the Serbian Government and the European Union, which will lead to a significant increase of the national and international connections of the Pirot Free Zone. Notably, an accessibility analysis has been explicitly carried out, showing that Pirot will benefit of a remarkable increase of the rail and road connections with ports both in the Adriatic and in the Black Sea, with a reduction of the transit time by road and railway. Furthermore, its centrality within the Balkans region will be significantly enhanced thanks to the general upgrade of the local and regional road networks. This context will provide for an overall increase of the accessibility of Pirot Free Zone, meaning more effective and efficient possibilities of both international/inter-continental supplying and of regional distribution in the Balkans area. In addition, the national and international transport and logistics operators active in the area exhibited a remarkable interest in consolidating their position and, if effectively supported, to support the growth of future traffic.

3. Brief review of policies and projects for the enrichment of freight transport networks in Balkans

The current structure of the road network in the Balkans area, defined considering the actual configuration of infrastructures at the end of 2009, a main motorway axis run along the path of the future Pan-European Corridor X between Beograd and Nis, with two southbound branches going respectively towards Former Yugoslavian Republic of Macedonia and Bulgaria, with a good connection up to the Turkish border. The remaining road axes, also along the paths of future Corridors IV and VIII, exhibit not exceptional performances, with a single carriageway and not effective functional characteristics. Intra-national road connections are also substantially poor, with significant bottlenecks and capacity drawbacks in a remarkable part of the network.

Similarly, the rail and inland waterways network structures taken into account for the definition of the current scenario. Notably, Serbian and Bulgarian networks are substantially electrified, with some remarkable 2-tracks branches, while the remaining of the network is mostly characterized by only single non electrified links, leading to inadequate performances for effective freight traffic.

Figure 1. Main rail (green) and inland waterways (blue) networks in Balkans region (situation at 31/12/2009)



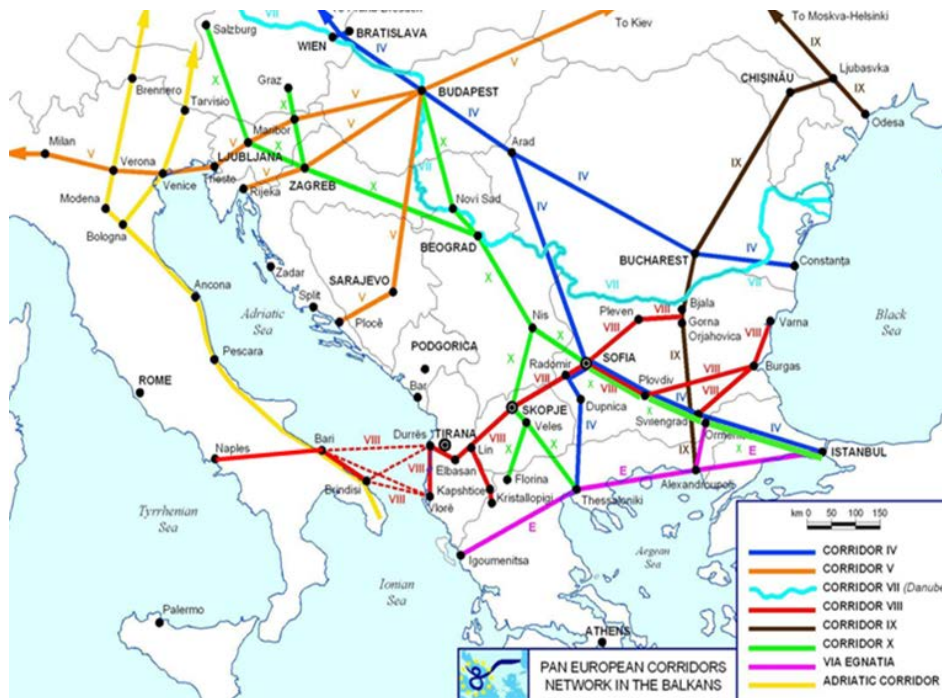
Source: Intermodal Logistic Centre Pirot, Prefeasibility study, November 2010

As a consequence, the area needs in general for a substantial improvement of the road and rail networks, in terms of both upgrading of the existing links and of construction

of new possibly intermodal axes, devoted to intra-regional and international passenger and freight traffic.

This is actually the main aim underlying the Pan-European corridors network in the Balkans, reported in the following Figure 2, whose structure is intended to provide for reliable north-south (namely Corridors X and IV) and east-west (namely Corridors V, VIII and the Egnatia route) connections.

Figure 2. Network of Pan-European corridors



Source: based on INFORMEST (internet)

Starting from these premises, a number of both EU and national funded projects have been carried out and/or are under implementation, with expected significant impacts on the freight accessibility in the Balkans. A thorough review of such implementations is covered by the SEETO¹.

4. Desk review of trade flows across Europe and Balkans

In order to draw preliminary indications about the scenarios, a demand analysis has been firstly carried out. In more detail, the current situation has been firstly depicted by estimating the o-d matrix through a combined desk analysis/model application. That is, as described in detail in the Annex, a thorough review of the EUROSTAT COMEXT and UNCTAD COMTRADE datasets has been performed in order to derive the current base

¹ SEETO – South East Europe Transport Observatory.

Logistic center Pirot – Euro Asian intermodal transport node

matrix for the year 2007². A remarkable effort has been spent in deriving matrices in quantities (tons/year) rather than in value, for obvious reasons in the light of the analyses to be carried out. As a result for yearly flows respectively to and from selected Balkan countries and the Euro-Mediterranean area. Notably, crude petroleum, electricity and natural gas trade were not taken into account because their transport modes usually involve the use of pipelines and other specific transport chains of no interest for the current feasibility study. The Republic of Serbia plays a major role in the area, with a remarkable amount of import/exports towards the Euro-Mediterranean basin.

The results of the assignment can be then compared with existing counts on some links, and specific correction procedures adopted for enhancing the goodness of fit of the analysis. Results of the assignment of the current demand matrix to the current supply network are reported in the following Figure 3, which has been derived under the assumption of competitiveness of the Corridor X, i.e. hypothesizing the removal of all barriers to transit trade through Serbia. Clearly, the route of Corridor X is one of the main axes for northbound-southbound Balkan crossing, with a strategic relevance in capturing and supporting trade to/from Eastern Greece and Turkey.

In more detail, the total Turkish trade with the 57 considered Euro-Mediterranean countries sums up to about 42 million tons/year in export and 75 million tons/year in import. With respect to this total amount, the transit trade potentially attractable from Serbia is represented by the flows approximately related to/from Central European Countries (e.g. France, Germany), which sums up to 14.66 million tons/year, subdivided into 8.37 million tons/year northbound and 6.29 southbound. These overall flows should be firstly disaggregated into the sea and road mode alternatives respectively; in turn, road flows should be further divided into flows crossing Serbia and flows crossing other Countries (e.g. Bulgaria): a summary of the situation is reported in the following Table 1.

Table 1. Potential transit Turkish trade for Pirot area in the current scenario (model estimates)³

trade to/from Turkey of interest for Serbia [tons/year]	direction	
	northbound	southbound
overall	8,374,246	6,289,727
sea mode	4,938,204	2,986,133
<i>Ro-Ro Adriatic sea (Trieste port)</i>	<i>2,706,430</i>	<i>1,656,998</i>
<i>Ro-Ro France (Marseille Fos Tolone)</i>	<i>2,231,774</i>	<i>1,329,135</i>
road mode	3,436,042	3,303,594
<i>through Serbia (Dimitrovgrad)</i>	<i>1,659,928</i>	<i>1,396,312</i>
<i>through other Countries (mainly Bulgaria)</i>	<i>1,776,114</i>	<i>1,907,282</i>
<i>Actual Serbian market share</i>	<i>48%</i>	<i>42%</i>

Source: Intermodal Logistic Centre Pirot, Prefeasibility study, November 2010

² Matrices for years 2008 and 2009 (the latter based on provisional values) have been also calculated, but they were not used in the applications because of the effect of the global economic recession.

³ Note: data related to Dimitrovgrad border have been validated on the basis of National Statistics for Serbia. Northbound and southbound directions refer to trade respectively from Turkey towards EU and from EU towards Turkey.

Interestingly, approximately half of Turkish road transit trade crosses Serbian boundaries northbound. Model estimates suggest the total trade along the M1 branch between Pirot and Nis to be approximately 6.85 million tons/year (4.11 northbound and 2.74 southbound), therefore the weight of Turkish transit trade on the Pirot road axis is approximately the 40% northbound and 50% southbound.

Notably, in the interpretation of the results the perspective increase in effectiveness of the Corridor IV should be taken into account, in the sense that a proper “attractiveness policy” towards Corridor X should be supported by the Government of Serbia in order to make the route more attractive (e.g. reduction or abolition of transit fees). Indeed, the completion of Corridor X is a real priority of the Government of the Republic of Serbia and the Government of the Republic of Bulgaria, witnessed by the agreement signed on 27/04/2010 between the Prime Minister of the Republic of Bulgaria and prime minister of the republic of Serbia. This way Corridor X will be crucial in the northbound-southbound directions, allowing for achieving higher rates of traffic flows.

This aspect can also be easily stressed when looking simply at distances. For instance, a consignment between Istanbul and Munich would require⁴:

- 2154 km on Corridor IV
- 2016 km on Corridor X along the Serbia-Hungary direction
- 1928 km on Corridor X along the Serbia-Croatia direction

Figure 3. Yearly flows (tons) in the current demand scenario under the hypothesis of effective corridor X



Source: Intermodal Logistic Centre Pirot, Prefeasibility study, November 2010

⁴References: Internet – Google maps

Logistic center Pirot – Euro Asian intermodal transport node

Notably, the last option means reaching in practice a 10.5% saving in the distance for each trip and, taking into account that the daily traffic at the Gradina border crossing is about 900 trucks, this leads to a 41 million tons/km per day saving.

5. Logistic Centre Pirot project

Logistics CentrePirot (acronym: LCP) will enable current users and future investors infrastructure equipped land and more efficient transport and transshipment of goods from truck to rail and vice versa, by reducing transport costs, reduction of environmental pollution.

Technical specification of the construction of LCP⁵:

- Railway terminal with three railway tracks: 304m, 304m and 548m in the first phase, projected track length of 650-680m in the second stage.
- Development and infrastructure equipment around 36 hectares of land (3.2 km of roads, 500m long dike for flood length, 10 new transformer stations 10 / 0.4kV 630 KVA and 8, 5 km long 10kV underground cable network, setting the street lightning in the designated land, setting 3.2 km channel for a telecommunication system, the construction of 3.5km of water supply network, 3.7 km drainage system, a 2.7 km sewer system.

Regarding project documentation, it is completed the conceptual design of LCP, pre-feasibility study, feasibility study for construction of LCP, detailed regulation plan. After construction of the terminal to investors will be offered 36ha of land equipped with infrastructure and intermodal terminal with a maximum capacity of 25,000 TEU / year for operation.

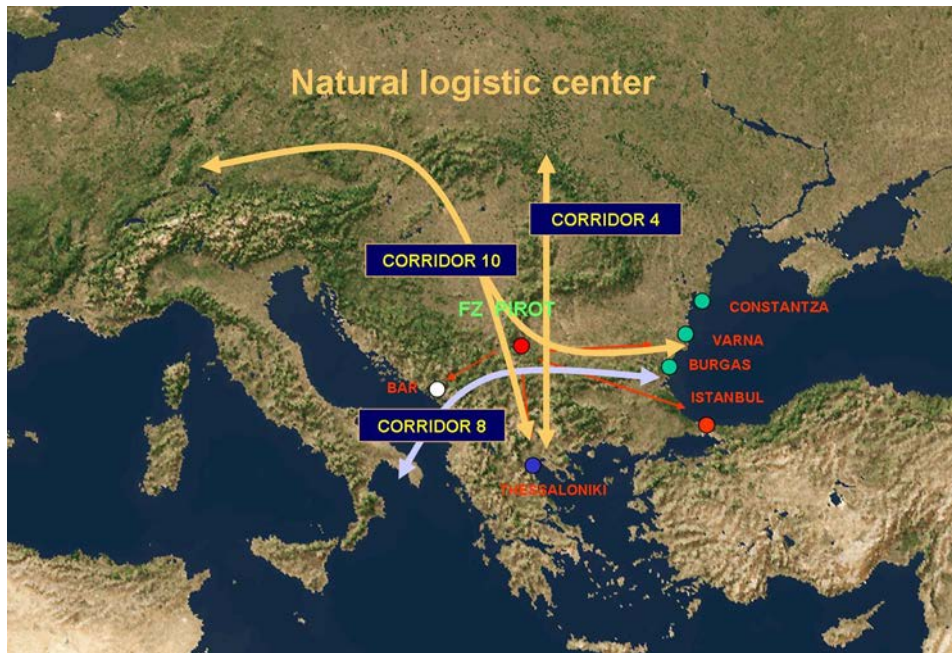
The aim of the project is to attract investment and reduce unemployment in the wider Pirot district and South-eastern Serbia.

Distance from LCP to the future highway (Corridor 10c) is 500m and the direct connection of the intermodal terminal with the railway leg Nis - Bulgarian border. It is located close to the airport in Sofia and Nis. The possibility of operating of users in the regime of Free Zone Pirot using all the benefits offered to investors by the Republic of Serbia, the law on free zones, local government, efficient export / import procedure.

Regarding the time frame, the completion of construction works will be at the end 2020, and the location of the project is Free Zone Pirot. Total value of the project is EUR 12,8 Million.

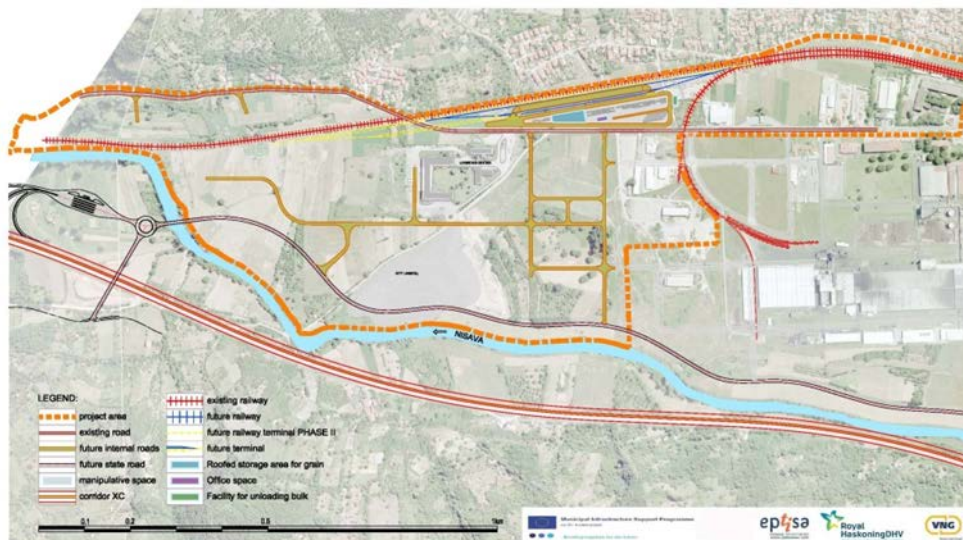
⁵ Reference: Logistic Centre Pirot, Feasibility study, February 2014, Municipal Infrastructure Support Program.

Figure 4. Illustration of the location of Free Zone Pirot



Source: Intermodal Logistic Centre Pirot, Prefeasibility study, November 2010

Figure 5. Illustration of the location of Logistic Center Pirot



Source: Logistic Centre Pirot, Feasibility study, February 2014

6. SWOT analyses

The SWOT analysis within this document discusses the potential future location intended for the construction of Logistic Centre Pirot. The aim of the analysis is to detect all potential advantages and disadvantages of the existing site as well as to perceive the opportunities and threats in the work of the terminal.

The SWOT analysis resulted from the previously presented part of the document which was done on the basis of the European strategic documents, Serbian strategic documents, the analysis of transport flows and availability of the distribution centres, the strategic documents the Free Zone Pirot, the Law on Free Zones, the local economic development strategy and, last but not least, on the basis of the interviews of the Pirot Free Zone users, who gave their opinion on the current advantages and disadvantages of the location and on the perspective of the future dual-mode terminal.

This analysis summarizes the results of previous chapters from highlighting the most important characteristics below.

Strengths: Located on Corridor 10, between Corridors 4 and 8; Nuts 3 area, where the Free Zone Pirot is located, represents the most accessible place (time, costs) with respect to the amount of influence of its road and rail transports in the Balkans, Greece, and northern Turkey; The flow of goods through the Free Zone Pirot: around 8000 trucks and 800 containers per year; The Istanbul - Munich route is shorter via Corridor X than via Corridor IV; Intermodal centre Pirot will receive a package that combines all business amenities in one place (a package of the Serbian Government subsidies, a package of incentives and tax exemptions for the town of Pirot, business potentials allowed by the Law on Free Zones, benefits of the Free-Trade Agreement); The synergy of the Free Zone and Industrial Park allows very flexible operation mode suitable for the users of the Free Zone Pirot; The Free Zone Pirot is the leading zone in Serbia when it comes to its size, capital turnover, the value of exported goods, and the value of completed business activities; The development plans of the Free Zone Pirot users show a significant capacity increase of the future intermodal centre; Efficient administration (one stop shop); The existence of the container stacking lanes in the FZP; Firmly established connections of the future intermodal centre with maritime transports of Cyprus, Burgas, Bar, Durres.

Weakness: The lack of development programs; Incomplete infrastructure and logistics equipment; The lack of feasibility study and other documentation that would demonstrate cost-effectiveness of the intermodal terminal; Underdeveloped marketing services; Insufficiently equipped container stack lane; Uncertainty about the duration of the benefits provided by the state.

Opportunities: Clear and strong support from the local authorities and state institutions; Available manpower of different profiles which can be included in the revival of the existing facilities and development of new activities; Presence of big companies 'Tigar Tyres' and 'Tigar AD'; Provision of subsidies for business development by the state; Regionalization and decentralization of Serbia and a new position of Pirot in the process offers additional advantages for the users of intermodal logistics centre; The completion of the road section of Corridor 10 should take place by 2018.

Treats: Inefficient rail (low transport speed and unreliability of delivery); Possible postponement of the EU aid to transport infrastructure; Failure to comply with deadlines for

the construction of infrastructural facilities; Investors' distrust of the institutions; Either accelerated migration or aging of the work-capable population; Inadequately skilled manpower; Problems with the capital infrastructure facilities; Political instability and slow reform processes; The status of Kosovo, cooperation with the Hague Tribunal, relations with the EU; The gap between the education system, industry demands; The danger of environmental pollution due to the presence of Corridor X (railway and highway).

7. Conclusion

From a general standpoint, as a logistics base, due to its position, Serbian Logistic Centre Pirot is a good place for a company to locate its operations if wanting to closely and most efficiently serve its EU, SEE or Middle Eastern customers. It borders the EU, at the Hungarian state line, offering a possibility of production outside the European Union. At the same time, businesses can enjoy all the benefits of working outside the EU, while being able to provide services and transport goods in projected and flexible time frames. Externally, Serbia can serve as a manufacturing hub for duty-free exports to a market of 1 billion people. It includes the European Union, the United States of America, Russia, South East Europe, and Belarus.

Therefore, the following key aspects have been identified with reference to the preceding target markets:

- connection with ports: Pirot FZ can be effectively served by rail from the Black Sea ports, especially Burgas, which is exhibiting significant trade increase in recent years. Furthermore, Thessaloniki can be also reached by rail, with a slightly less effective connection, and in perspective the resolution of the current issues in the Nis and Beograd railway stations will lead to effective rail connections also with the Adriatic ports (e.g. Rijeka, Koper). This might have importance in increasing the supply of future regional distribution centres (see next point);

- regional distribution centre: the preceding point clarifies that the possibilities of intercontinental and international supplying of the Pirot intermodal centre will increase in the future, together with a substantial increase of its accessibility in the Balkans. Therefore, Pirot can be an ideal candidate for regional distribution in the area. This possibility will be subsequently explored in a detailed feasibility study which will identify potential customers, starting from the supply chains of the customers already established in the Free zone;

- transit trade: the possibility of scale economies in the transit trade will benefit of the substantial increase of the overall traffic along Corridor X. In that respect, the detailed feasibility study will investigate the possibility of integration between Pirot Free Zone and relevant international transport hauliers (e.g. Turkish road carriers).

According to position on the corridors on the leg of the Corridor X, experience of employees with container transport, already existing two-mode terminal, because of more than 200 users of Free Zone Pirot-industrial giants "Tigar Tyres" and "Tigar AD" company, due to already full infrastructure equipped location, Free Zone Pirot will have a significant role in the network of intermodal terminals in Balkans related to connection to Asian transportation and trade links.

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LOGISTIČKI CENTAR PIROT – EVRO AZIJSKI INTERMODALNI TRANSPORTNI ČVOR

Apstrakt: Uglavnom zbog konkurencije između različitih vidova transporta, transportni sistem je dugo bio visoko segmentiran i nije bio integrisan. Preciznije, potraga za određenim prednostima u pogledu troškova, pouzdanosti i sigurnosti svakog oblika transporta dovode do nedostatka integracije između modova transporta, fenomena koji je takođe naglašenim u javnoj politici. Uvođenjem kontejnera i širenjem primene u transportnim sistema (posebno u pomorskom saobraćaju) dovelo je do integracije različitih vidova saobraćaja kroz intermodalnost. Ovaj proces je sprovedena

Dragan Kostić, Aleksandar Simonović, Vladan Stojanović

u tri glavne faze: Kontejnerizacija pomorskih transportnih sistema, Kontejnerizacija unutrašnjih transportnih sistema, intermodalnih i transmodalnih operacija.

U cilju integracije u Evro - azijsku intermodalnu teretnu transportnu mrežu potrebno je razviti odgovarajuću intermodalnu saobraćajnu infrastrukturu. Kako bi postali deo savremenog transportnog sistema, u planu je razvoj logističkog centra Pirot, kao intermodalni čvor svetske teretne transportne mreže lociran na Balkanu.

Ključne reči: Logistički Centar Pirot, distributivni centar, lanac snabdevanja, Intermodalni čvor.