Financial Analysis of the Intermodal Terminal in Belgrade

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The development of logistics infrastructure in Serbia is the key to achieving regional competitiveness and economic prosperity of the state. Intermodal terminals have great significance in logistics networks and their development enables the implementation of intermodal transport technologies as well as participation in international goods flows. Belgrade, the national and regional economic centre and an important traffic node, attracts significant intermodal, container flows. For this reason, it represents a location for the development of an intermodal terminal that would play an important role in the logistics network of Serbia and the region as well. This paper analyses the financial justification of the development of an intermodal terminal in Belgrade, based upon four parameters – net present value (NPV), internal rate of return (IRR), benefit-cost ratio (B/C) and investment return period (RP). Furthermore, a sensitivity analysis of the observed parameters regarding the change of input parameter values (the volume of intermodal, container flows and the service price levels) is conducted. Two project funding scenarios are defined according to the involvement of the private sector in overall investments. The result analysis indicates that in both of the scenarios, the development of an intermodal terminal in Belgrade would be financially justified. The sensitivity analysis has shown that the financial justification of the development of the observed intermodal terminal is more sensitive to the change in container flow volumes in comparison with the change in terminal service price levels.

Key words: financial analysis, sensitivity analysis, logistics network, intermodal transport, intermodal terminal

1. INTRODUCTION

The economic activity greatly depends on the logistics systems and processes that occur along supply chains. Logistics has been identified as a key activity that supports the economic development of a country. In the countries of the European Union (EU), the growth rate of logistics is greater than the average economic growth rate [1].

Globalization, growth in world trade volumes, demographic changes, the growth of living standards and the individualization of customer demands have caused the need for designing and managing efficient logistics systems and networks [2]. Furthermore, the lg-

lobal trend is to reduce the participation of road transport in the overall transport, and to redistribute the transport labour through greater involvement of eco-friendly transport modes – such as rail and inland waterway transport.

Therefore, it can be stated that intermodal transport is the development direction of global, European and regional logistics networks.

The development of intermodal systems must encompass the analysis of all of its elements, where a special accent is set on intermodal terminals. It is necessary to determine their number, location, functions and subsystems structure, place and role in a logistics network. All aforementioned analyses must be accompanied by a financial analysis of the systems' development.

This paper financially analyses the justification of the development of an intermodal terminal in Belgrade. Two funding models are defined regarding the

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private sector involvement in the overall investment costs. In the first scenario, the greatest part of the investment is covered with EU grants, while in the second scenario, all investment costs are covered by the private investor.

The financial analysis is conducted according to four parameters – net present value (*NPV*), internal rate of return (*IRR*), benefit-cost ratio (*B/C*) and investment return period (*RP*). A sensitivity analysis for the observed parameters is conducted according to the change of input parameter values – the volume of container flows and terminal service price levels.

The remainder of the paper is organised in 5 sections. In the following section, the intermodal transport system is described, with the accent set on intermodal terminals and intermodal networks. In section 3, a short preview of intermodal transport treatment in Serbia is presented. The section that follows describes the intermodal terminal in Belgrade that the financial analysis is focused on. In this section, the development and funding plans, as well as the structure of terminal exploitation income and expenses are presented. Section 5 describes the observed financial parameters, and the results obtained by a deterministic approach in their evaluation are presented. The same section contains the sensitivity analysis of those financial parameters regarding the change in the values of input parameters. The last section contains concluding remarks and future research directions.

2. INTERMODAL TRANSPORT

The integration of countries in European logistics and transport system, as well as in international goods flows, is impossible without the application of intermodal transport technologies. Intermodal transport represents the movement of goods in one and the same loading unit or road vehicle, which uses successively two or more modes of transport without handling the goods themselves in changing modes [3].

Positive effects that follow the application of intermodal transport are reflected by the reduction of energy use, time, costs and negative environmental effects of transport. It is obvious that intermodal transport stands out as one of the key factors for achieving sustainable development. The countries of the EU have realized its importance long ago. Some of them, such as Germany, Austria and Romania have clearly defined intermodal transport development plans. Furthermore, in the developed EU countries, intermodal transport is institutionalized and clearly defined funding models exist [4]. As most of the developed intermodal networks are concentrated in its western parts, east and southeastern Europe fall behind greatly.

An intermodal transport system is comprised of a set of mutually connected subsystems whose goal is to provide an efficient cargo transportation service [5]. Regarding physical and organizational components, it comprises of the following subsystems: intermodal transport unit, transportation vehicles, transport infrastructure, terminals/logistics centres, terminal network, transportation organization, operators, telematics, logistics strategies and regulation [6].

Intermodal terminals, as one of the key intermodal transport subsystems, represent the location of storing and transshipment of intermodal units between different transportation modes. They are vital components of every intermodal network and serve as important catalysts of regional economic development. Intermodal terminals are complex systems that can differ significantly according to their function, role, subsystems, customers, applied technologies, etc. [5].

Logistics networks are systems that are comprised of nodes and connections between those nodes. Generally speaking, network nodes represent the origins or final destinations of goods flows, and they can be production plants, warehouses, logistics centres, intermodal terminals, ports, etc. [7]. The connections between network nodes are established through road and/or rail infrastructure or through inland waterways.

One of the global imperative trends is to develop logistics, intermodal networks. Besides the development of individual transportation modes, it is important to plan and develop regional multimodal corridors that would connect the nodes of logistics, intermodal networks. Of course, logistics, intermodal networks are not an unchangeable category, so a constant investment in their maintenance and expansion is required.

The expansion of a logistics network requires the selection of adequate terminal type [8], the definition of terminal elements and structure [9], and terminal location selection [10, 11]. The performances and sustainability of intermodal networks depend on the efficiency of their elements. If intermodal transport is the catalyst of regional development, then the planning and designing of logistics, intermodal networks is the foundation of achieving sustainable development.

The involvement of the public sector during the planning and funding of intermodal systems greatly reflects on their future success. The construction of intermodal terminals, as one of the key elements of an intermodal system, is characterized by high investment costs, long construction time, and a low return rate of investments. The fact the return of investments takes a long time, independent and individual engagements of the private sector in this field are rare. Furthermore, due to high operational costs in the initial years of terminal exploitation, the terminals often operate

without any profit, so a financial intervention of the public sector [12] through different forms of public-private partnerships (PPP) [13] is needed. Through PPP, the public and private sectors mutually share expenses, risks, responsibilities, benefits and profits [13, 14].

3. TREATMENT OF INTERMODAL TRANSPORT IN SERBIA

Countries from the Balkans region differ greatly in economic characteristics, problems, development stadium and the applied intermodal transport technologies. Therefore the topic of intermodal transport has been treated differently [4, 15, 16]. Although a department under the Ministry of construction, transport and infrastructure that tackles some topics of intermodal transport in Serbia exists, there is no detailed plan for its planning and development [4].

In order to develop intermodal transport in Serbia, responsible institutions and organs must be defined, cooperation among actors has to be established, and the terminal network has to be planned and designed. Furthermore, the competitiveness of prices and services of intermodal transport has to be achieved, the goods flows realization trends must be observed and researched, necessary technology solutions must be developed, etc. [17].

In the physical context, the initial phase of logistics' network development refers to the development of key intermodal terminals with regional character. The goal of this approach is to integrate the developed intermodal network with the existing regional networks. In the second phase, the national network would be completed through the development of smaller logistics centres and intermodal terminals in other vital logistics micro-regions of the country. The development of intermodal systems can be executed in different directions, while in the case of Serbia, two scenarios are possible: corridor scenario and network scenario. In both scenarios, the intermodal terminal in Belgrade plays a key role [17].

Having in mind that the area of Belgrade is the main concentration point of goods flows in Serbia, the development of an adequate intermodal terminal would serve as an embryo for further development and expansion of national (and later regional) logistics, intermodal network.

In the project „Facilitating of intermodal transport in Serbia“ from 2011, it is clarified that the development of a road-rail intermodal terminal in Belgrade would be of great significance [18]. On the distance of 15 km from the city centre, Batajnica is selected as the potential location of the intermodal terminal.

4. INTERMODAL TERMINAL IN BELGRADE

The Corridor X represents an important European corridor that connects the countries of central Europe with Greece, Turkey and the Middle East. Since a section of the corridor lies on the territory of Serbia, it represents an important axis for the development of the national intermodal system.

The intermodal terminal in Batajnica (Belgrade) [18] would be bimodal by connecting road and rail transportation modes. The project scheduled two development phases. The first phase refers to the first two years of construction and it includes all preliminary, ground, rail, and drayage works, as well as the construction of all necessary buildings and the provision of the necessary equipment. The second construction phase begins when the annual container flows traffic reaches 70 000 TEU (the year 2031). This development phase refers to the expansion of terminal capacities by providing and installing a portal container crane. On the area of nearly 14.4 ha, the first construction phase refers to the development of container transshipment subsystem, container storage subsystem, administrative and governance subsystem, as well as auxiliary subsystems (parking, vehicle and equipment maintenance, customs sector, fuel provision, etc.).

With the development of an intermodal terminal in Belgrade, it would be justified to establish shuttle rail connections with Milano, Moscow and Warsaw [18]. Along the shuttle routes, the goods are transported with fixed rail compositions, according to the established schedule, without additional stopping along the route between the origin and the destination. Such transportation concepts in intermodal transport are very efficient due to great transportation speed without unnecessary stops and manipulations with containers and wagons. The best scenario for the observed intermodal terminal is 8 shuttle trains along the determined routes on a weekly level [18].

4.1 Evaluation of container flow volumes

The profit of an intermodal terminal is closely bound to the intermodal, container flow volumes that pass through the terminal. Container flows directly impact the levels of labour and terminal services that generate profits. The anticipated container flow volumes in a 30-year time horizon reach approximately 110 000 TEU (table 1).

The levels of goods trade between regions depend on a large number of factors. On the first place are the factors of economic, social and political nature. It is very difficult to precisely anticipate trade levels between two entities in the future due to the unpredictability of the factors that are affecting it. Furthermore, structural changes in logistics systems cause situations where some systems attract greater volumes

of flows, while some others are losing on their attractiveness. During the development of a logistics centre, the evaluation of goods and transportation flows that would be redirected on the centre services is of vital importance [19]. Caused by a large number of factors that affect container flows and the dynamic/stochastic changes in the surrounding, the realization of any logistics project must be accompanied with appropriate sensitivity analyses to the changes in the system/surrounding.

Table 1. Annual estimation of container flow volumes through the intermodal terminal in Belgrade [18]

Year	TEU	Growth (%)	Year	TEU	Growth (%)
2013	0	0	2028	54880	2.3
2014	3200	0	2029	61040	11.2
2015	15960	398.8	2030	65520	7.3
2016	21000	31.6	2031	70611	7.8
2017	27300	30	2032	74055	4.9
2018	30660	12.3	2033	77499	4.7
2019	33460	9.1	2034	80943	4.4
2020	34580	3.3	2035	84387	4.3
2021	38080	10.1	2036	87831	4.1
2022	44240	16.2	2037	91275	3.9
2023	46480	5.1	2038	94719	3.8
2024	47320	1.8	2039	98163	3.6
2025	51100	8	2040	101607	3.5
2026	53620	4.9	2041	105051	3.4
2027	53620	0	2042	108495	3.3

4.2. Required investments for the development of the intermodal terminal in Belgrade

The development of the intermodal terminal in Batajnica is planned to be executed through two operational phases [18]. The first phase refers to the first two years of construction and it includes all preliminary, ground, rail, and drayage works, as well as the construction of all necessary buildings and the provision of the necessary equipment. Construction costs for the first phase are estimated to be 8 million euros for the first (2013) and 12 million euros for the second (2014) year. The procurement of additional manipulation equipment (reach stacker) is required when the terminal reaches 30 000 TEU of annual traffic (2018). The costs of reach stacker are 0.5 million euros [18].

The second phase of the construction starts when the terminal reaches 70 000 TEU of annual container throughput (2031). This phase of the construction refers to the expansion of terminal capacities by providing a portal container crane. Its installation requires

additional railway infrastructure and terminal building works so the construction costs of this phase are estimated to be 10 million euros [18].

This paper will analyse two funding scenarios for the project of intermodal terminal development. In the first scenario, the first construction phase is completely funded by EU grants. Initial operational costs and the costs of additional equipment and expansion in later years are funded through loans of a private investor. In the second scenario, all of the funding is at the expense of the private investor.

Since the construction and development expenses of an intermodal terminal are extremely high, it is assumed that the private investor would take loans. For the purpose of this paper, it is assumed that the credit for funding the first construction phase is repaid over the course of 10 years, with a yearly interest rate of 4.5%, where the loan return begins in 2018. The private investor has to take another loan in order to cover the initial operating costs of the terminal. The amount of assets in this loan is 1.4 million euros [18]. This loan is repaid through 7 annual rates, beginning in 2017, with a yearly interest rate of 4.5 %. The procurement of a reach stacker, costing 500 thousand euros, is funded through a loan whose annuity plan is 7 years, with a yearly interest rate of 4.5 %, without a grace period. The loan of 10 million euros, for the funding of the second construction phase, is repaid through the period of 8 years, with a yearly interest rate of 4.5 %, without a grace period. The return of this loan begins in 2034. The interests of all loans are calculated according to the principle of complex interest calculation [20], and the loan principals are repaid through even yearly rates.

4.3. Estimation of terminal profits and expenses

Appropriately structured services are of vital importance for the sustainability of the designed logistics system. The services that an intermodal terminal provides have a direct impact on its gravitational zone, container flow volumes, and the profits that the terminal generates. The services are realized through the subsystems of the terminal, that beside the investment cost generate also operating costs during their exploitation, and can be treated as elements that affect the profits that justify the development of a logistics system [19].

The intermodal terminal in Batajnica services can be divided into services for goods, services for vehicles and other services [18]. Goods services refer to container transshipment and storage. Vehicle services refer to parking services, and the price of these services is high, not for making a profit, but rather to stimulate carriers to spend less time on terminal grounds. Other services refer to all the services that must accompany

specialised container types (refrigerated containers and containers for hazardous goods), as additional manipulations, monitoring and specific storage conditions. Besides the aforementioned services, the terminal offers the services of organizing road transportation for the clients that are unable to organise their transportation themselves. The price of these services is high so that the terminal would remain focused on its primary activity. Service prices are shown in table 2.

Table 2. Intermodal terminal services prices [18]

SERVICE	PRICE		
Manipulation with ITUs	39 €/manipulation		
ITU storage	First three days for importing containers and one day for exporting containers is this service free of charge	For containers	For EITU
	Storage for the next 5 days	16 €/day	29 €/day
	Storage for the next 2 days	34 €/day	68 €/day
	Storage for the next 2 days	57 €/day	99 €/day
Specialised ITU storage	additional 30% on the prices for standard ITUs		
Road transportation planning	In the boundaries of the logistics zone	Territory of Belgrade	Outside of Belgrade
	80 €	144 €	190 €
Parking	First two hours	After the first two hours	
	Free of charge	7.5 €/h	
Cancelling fees	85 €/cancellation		
Container inspection fees	17 €/container		

Annual intermodal terminal expenses can be divided into fixed and variable expenses. Fixed expenses are the same for every year and they refer to the costs of electricity, internet, office equipment expenses and maintenance, service insurance and fees for freight village developer. Variable expenses refer to the costs that are the consequence of terminal labour and that depend on the container flow volumes. Variable expenses are comprised of personnel salaries, training and inspection costs, electricity costs of container manipulations, and the costs of road transportation planning. The described expenses are presented in table 3. All terminal exploitation profits and expenses are evaluated according to real-life and the project [18] data.

Table 3. Intermodal terminal expenses [18]

FIXED EXPENSES	EXPENSES
Energy, telecommunications, Internet	30000 €/year
Office equipment	22500 €/year
Service insurance and taxes	57500 €/year
Fixed maintenance costs	333000 €/year
Freight village developer fees	160000 €/year
VARIABLE EXPENSES	EXPENSES
Personnel salaries and expenses	17155 €/employee
Manager salaries and expenses	32740 €/employee
Annual training, control and inspection costs	10 % of employee costs
ITU manipulation electricity expenses	1.45 €/ITU
Road transportation planning expenses	100 €/truck

5. FINANCIAL ANALYSIS OF THE INTERMODAL TERMINAL DEVELOPMENT

In this chapter, financial parameters for the analysis of the intermodal terminal in Batajnica are presented. The included parameters are net present value, internal rate of return, benefit/cost ratio, and the return period of investments.

Net present value (*NPV*) is one of the standardised project evaluation and selection parameters. During a financial analysis of a project, *NPV* takes into consideration the time value of assets. The calculation of *NPV* includes the discount of all future asset inflows and outflows. *NPV* is calculated according to [20]:

$$NPV = \sum_{t=0}^n \frac{AF_t}{(1+i)^t} \quad (1)$$

In the formula (1), AF_t stands for the asset flow of the project at the end of the period t . The value of i refers to the interest/discount rate, while n represents the time horizon of the analysis.

A project will be accepted if the *NPV* is positive, or refused if *NPV* is negative. In the case when *NPV* equals zero, the profit rate of the project equals the interest rate, so the decision-makers are indifferent whether the project should be accepted or refused.

The internal rate of return (*IRR*), along with the previously described *NPV*, represents a mandatory tool for the evaluation and selection of investment projects. *IRR* represents the discount rate for which the *NPV* of the project equals zero. The mathematical formula used for calculating *IRR* is [20]:

$$\sum_{t=0}^n \frac{AF_t}{(1+IRR)^t} - I_0 = 0 \quad (2)$$

In the formula (2), AF_t stands for the asset flow of the project at the end of the period t . The value n stands for the time horizon of the analysis, while I_0 represents

the initial investments of the project. When the value of *IRR* is greater than the actual interest rate, the observed project is financially acceptable. This means that the investment is profitable because it generates more profits than the interest rate gained from a bank deposit [20]. In the case where the value of *IRR* is lesser than the interest rate, the project should be refused.

By comparing the discounted values of benefits and costs the benefit/cost ratio (*B/C*) is calculated. In other words, *B/C* represents the relation of present values of benefits and costs, and it is calculated according to [20]:

$$B/C = \frac{DV_{benefits}}{DV_{costs}} \quad (3)$$

where $DV_{benefits}$ represents the discounted value of benefits, and DV_{costs} represents the discounted value of costs. An investment project is accepted if the value of *B/C* equals/is greater than 1. The relation between *NPV* and *B/C* is such, that a positive *NPV* is accompanied by a value of *B/C* greater than 1.

Investment return period (*RP*) represents the period required for making the benefits of an investment equal to its expenses [20]. Aside from the aforementioned parameters *NPV*, *IRR*, and *B/C*, *RP* does not take into consideration asset time value. Instead, *RP* only measures the period required for the return of the investment of a project.

This parameter is not from the group of scientific methods, and it serves only as a quick financial insight of projects. In intermodal terminal projects, several years are often required for the return of initial investments. In order to accept a project, *RP* has to occur within the time horizon of the financial analysis.

5.1 Intermodal terminal financial parameters analysis

In order to determine the values of all financial parameters, for every year of the analysis, the asset inflows and outflows are determined, so that the profits (expenses/costs) can be calculated. The results of the analysis are presented in table 4. The values of *NPV*, *IRR*, *B/C*, and *RP* are such that the project in both funding scenarios is acceptable in the time horizon of 30 years.

The values of all parameters are more favourable in the scenario where the initial investments are covered with EU grants. In the first scenario, *NPV* is almost 23 million euros, *IRR* is 31.84 %, *B/C* is 1.494, and the *RP* is 8 years. In the second scenario, *NPV* is almost 4.9 million euros, *IRR* is 7.6 %, *B/C* is 1.094, and the *RP* is 22 years. These results indicate that the financial intervention of the public sector increases the project profitability for the private investor.

5.2 Financial parameters sensitivity analysis

Since the values of the input parameters (container flow volumes and terminal service price levels) can vary over time, it is important to conduct a sensitivity analysis of the financial parameters regarding the change in the input parameter values. The examined input parameter values change is in the range between -50% and 50% from their expected value, with the step of 1%. The minimal and maximal values of financial parameters regarding the change in the values of input parameters are shown in table 4. It is also highlighted what reduction of the input parameter values lead to negative (unacceptable) financial parameter values.

Based on the sensitivity analysis, it can be stated that the financial parameters are way more sensitive to the change in container flows volumes than to the change of intermodal terminal service price levels. Furthermore, the values of the financial parameters are more favourable in the first funding scenario of the intermodal terminal construction. In this scenario, regarding the change of terminal service price levels, all the financial parameters have positive values. Regarding the change in container flows volumes, the financial parameters become negative only with their drastic reduction. In the second scenario, *NPV* and *IRR* become negative with a relatively small reduction of the input parameter values, while *B/C* and *RP* become negative with a moderate reduction of the input parameter values.

Table 4. The values of *NPV*, *IRR*, *B/C* u *RP* for the observed project

Parameters		<i>NPV</i>	<i>IRR</i>	<i>B/C</i>	<i>RP</i>
Scenario 1		22.9 mil. €	31.84%	1.498	8 years
Depending on the container flows	min	-1.7 mil. €	3.20%	0.97	3 years
	max	48.6 mil. €	88.60%	1.87	24 years
	Becomes negative	-47%	-47%	-48%	/
Depending on service prices	min	6.7 mil. €	16.20%	1.24	6 years
	max	39 mil. €	40%	1.6	12 years
	Becomes negative	/	/	/	/
Scenario 2		4.9 mil. €	7.58	1.094	22 years
Depending on the container flows	min	-20.5 mil. €	7.70%	0.66	12 years
	max	31.3 mil. €	30.90%	1.27	> 30 years
	Becomes negative	-10%	-10%	-13%	-28%
Depending on service prices	min	-11.9 mil. €	2.90%	0.77	17 years
	max	21.4 mil. €	14.40%	1.27	> 30 years
	Becomes negative	-15%	-15%	-19%	-39%

6. CONCLUSION

The purpose of this paper was to financially analyse the development of an intermodal terminal in Belgrade. The analysis was based on four financial parameters – *NPV*, *IRR*, *B/C*, and *RP*. A sensitivity analysis of these financial parameters regarding the change in the input parameter values (container flows volumes and terminal service price levels) is examined as well.

Two construction funding scenarios of the intermodal terminal are analysed. In the first scenario, terminal construction is funded by EU grants. In this scenario, the private investor funds only the initial operating costs and the procurement of additional manipulation equipment when the terminal reaches an annual throughput of 30 000 TEU. In the second scenario, the private investor is funding the project entirely and covers the expenses with loans.

The result analysis indicates that the investment in the observed intermodal terminal is financially justified. The values of all financial parameters are significantly favourable in the first construction funding scenario of the intermodal terminal. The sensitivity analysis has shown that the cost-effectiveness of the project is more sensitive to the change in container flows volumes than to the change in terminal service price levels.

From everything abovementioned, it can be stated that the construction of an intermodal terminal in Belgrade would be financially justified. Future research could focus on the economic analysis of the construction of an intermodal terminal as well as to examine the influence on different funding models on the financial and economic analysis. Furthermore, future research could examine the development justification of an intermodal terminal considering a dynamic and stochastic environment. Another research direction could focus on the impact that the development of intermodal transport system in Serbia would have on its economic growth. Of course, such research should be preceded by an appropriate analysis of the required number, locations, structure and role of intermodal terminals in the national logistics network. Finally, future research could focus on the intermodal technologies that justify the development and implementation of intermodal transport systems in Serbia, and the region as well.

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REZIME

FINANSIJSKA ANALIZA INTERMODALNOG TERMINALA U BEOGRADU

Razvoj logističke mreže u Srbiji je ključ postizanja regionalne konkurentnosti i ekonomskog prosperiteta države. Intermodalni terminali imaju poseban značaj u logističkim mrežama, a njihov razvoj omogućava implementaciju tehnologija intermodalnog transporta i uključivanje u međunarodne tokove. Beograd, kao nacionalni i regionalni privredni centar i saobraćajni čvor, privlači značajne intermodalne, kontejnerske tokove. Iz ovog razloga, predstavlja lokaciju za razvoj intermodalnog terminala koji bi imao važnu ulogu u logističkoj mreži Srbije, ali i regiona. U ovom radu je sprovedena finansijska analiza opravdanosti izgradnje intermodalnog terminala u Beogradu na osnovu četiri parametra – neto sadašnje vrednosti (NSV), interne stope prinosa (ISP), racija koristi i troškova (K/T) i perioda povraćaja uložених sredstava (PP). Osim toga, urađena je i analiza osetljivosti posmatranih finansijskih parametara na promenu ulaznih vrednosti – obima intermodalnih, kontejnerskih tokova i cene usluga terminala. Definisana su dva scenarija finansiranja projekta, a prema učešću investitora u ukupnim ulaganjima. Rezultati analize pokazuju da bi u oba scenarija razvoj intermodalnog terminala bio finansijski opravdan. Analiza osetljivosti je pokazala da je finansijska opravdanost izgradnje terminala osetljivija na promenu obima tokova nego na promenu cene usluga terminala.

Ključne reči: finansijska analiza, analiza osetljivosti, logistička mreža, intermodalni transport, intermodalni terminal