

The Impact of Rail Infrastructure on the Military Security of the Republic of Poland

Dominik Piękoś

Military University of Technology in Warsaw, Poland

Abstract

In the nineteenth century, there was a significant development of rail transport in Poland. The use of rail transport by the Polish Armed Forces depends on the current situation in the country and in the world as well as on the tasks performed by military institutions. In peacetime, the railway is used mainly for the transport of troops to the area of training grounds and maneuvers. A key role during the transport of troops is also a properly planned route, taking into account the available railway infrastructure. The technical condition of the infrastructure largely affects the activities of a military nature. Adequate infrastructure affects the logistical security of own and allied troops in times of peace, crisis and war. Properly logistically secured, the Armed Forces of the Republic of Poland have a fundamental impact on the country's military security.

Keywords: rail transport, security of military transports

1. INTRODUCTION

The development of railways on the territory of today's Poland began in the 19th century, when the first railway line between Wrocław and Oława was built. At that

time, Poland was under partitions and the development of the railways depended on the political and economic situation. Soon, the prospering development of the railway system became the reason for the settlement and the direction of development of industrial zones. Railway in Poland is an important means of transport and plays a significant role in the transport of goods and translocation of passengers.

Nowadays, it can be seen that rail transport is one of the main sectors of the economy, but also one of the key modes of military transport. The use of railways by military institutions enables efficient and safe implementation of planned needs for operational transport and supplies. It is worth noting that the railway has the highest transport potential among other types of land transport. The aim of the article is **to present the possibility of using rail shipments to transport troops, and its impact on the military security of the Republic of Poland.**

The objective of the article defined in this way allows to outline the research problem, which is: **To what extent is it possible to use the Polish railway infrastructure to move troops? Is the technical condition of the infrastructure adequate?**

The analysis of specialist literature allowed to define the research hypothesis, which is: **rail infrastructure determines the state of military security of the Republic of Poland.** For the preparation of this article, the method of analysis of literature, domestic legal acts and allied doctrines as well as synthesis and inference were used.

2. THEORETICAL ASPECTS OF MILITARY TRANSPORTS

Many elements of the military transport and traffic subsystem are responsible for the planning and safe implementation of military transport by rail. The transport subsystem includes mainly three organizational units responsible for the transport of troops by rail. Of course, these units also deal with other modes of transport and are located at various levels of the organizational structure of the Armed Forces of the Republic of Poland. They have various organizational units that correspond thematically to the tasks they carry out. These organizational units include¹:

¹ Pawlisiak M., *System logistyczny determinantem bezpieczeństwa Sił Zbrojnych Rzeczypospolitej Polskiej*, published by Wojskowa Akademia Techniczna, Warszawa 2016, pp. 364–370.

- Command of Transport and Military Movement - Military Movement Coordination Centre,
- Military Movement Coordination Centre at the Theatre,
- Military Transport Headquarters.

The implementation of military rail transport should be seen in two aspects - planning and executive. However, it should be remembered that planning military transport with the use of rail transport is part of the logistic planning regarding the transport needs of the Polish Armed Forces. However, the main goal of planning rail transport is to estimate the type and number of wagons necessary for the transport of troops, indicate the place of loading, determine the date of transport and the destination. When organizing the transport of troops by rail, it must be remembered that the most important role is played by the transported military unit. It defines the needs that result from the plans of the current activity. Considering the need for vast knowledge related to the organization of military transport, a representative of the Military Transport Command may be an adviser. Such a person has extensive experience in securing the appropriate number and type of railway carriages, as well as has more complete knowledge of the current restrictions in rail traffic². It is worth adding that the Military Headquarters makes arrangements and supervises the conditions of transport and use of railway infrastructure by the military. The headquarters covers 2-3 voivodships and cooperates with the railway administration. There are 8 Military Transport HQs in Poland. Their location is not accidental, because they are located in provincial cities and at military training grounds. This location significantly affects the implementation of tasks related to the transport of troops by rail.

Rail transport can be divided into domestic and international. This division also applies to military transport. It should be added, however, that in the Armed Forces of the Republic of Poland, transports performed within the territory of the country are classified as central and regional services. Central transport concerns transports performed throughout the country. On the other hand, regional transport is carried out in the area of responsibility of only one Regional Logistics Base. The division of military transport by rail, taking into account the scope and type of requirements, is shown in Fig. 1.

The use of rail transport by the Polish Armed Forces depends on the current situation in the country and in the world as well as on the tasks carried out by military

² Ibidem, p. 376.

institutions. In peacetime, the railway is used mainly during the transport of troops to the area of training and manoeuvres. Optionally, the railroad can also be used to transport supplies and materials necessary to perform the tasks.

In the conditions of destabilization of the country, i.e. crisis and war, the railway becomes a strategic tool during the activities performed as part of the mobilization and operational development of troops. With the help of rail transport, troops can be transported relatively quickly and the assigned tasks can be performed efficiently and safely.

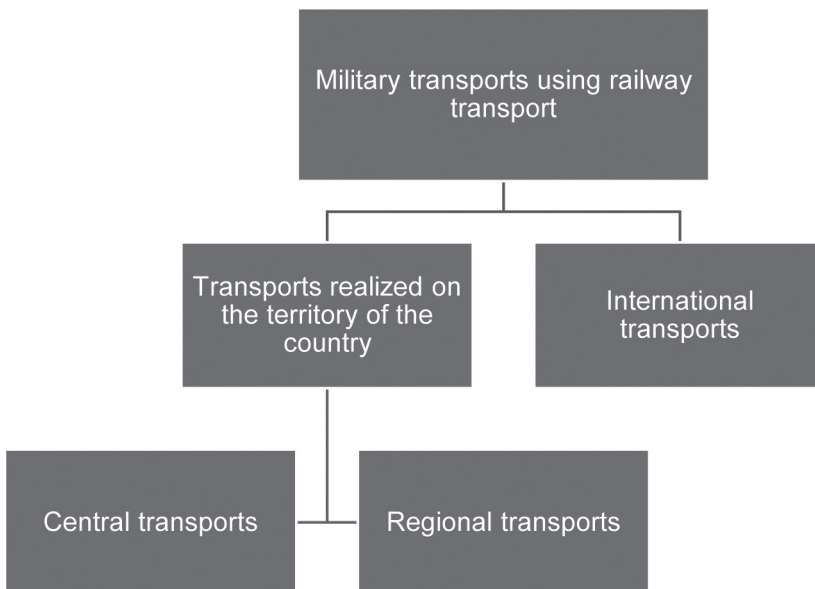


Fig. 1. Military transport using rail transport

Source: Own study based on: DU-4.4.1 (B) *Zasady przewozu wojsk transportem kolejowym*, Ministry of National Defense, General Command of the Armed Forces, Warsaw 2014.

The efficiency and planning of military transport by rail is possible thanks to the mutual collaboration of the Polish Armed Forces and the private sector dealing with railways. Nowadays, one can notice a number of changes being made towards the development of railway infrastructure and rolling stock. These types of activities improve the ability to maintain the necessary high mobility of the Polish Armed Forces.

3. TRANSPORT NEEDS OF THE LAND FORCES

Rail transport is mainly used for the translocation of heavy tracked and wheeled equipment. Currently, the Armed Forces are an active participant in the railway market. Rail transport plays an important role during the transport of troops and is one of the most effective forms of transport for our Armed Forces. The transport of troops by rail requires the implementation of a number of different activities, which are specified in the appropriate sequence and schedule. These projects are a component of the entire transport process and are closely related. A key role during the transport of troops is also an appropriately planned route, taking into account the available railway infrastructure.

The resources of rail transport are used by the Polish Armed Forces to transport soldiers and heavy equipment from the place of permanent dislocation to the area where the activities are carried out. Some vehicles can move independently - on tracked lines or on wheels, but such transport is unprofitable over a short distance. Then road transport should be used. When routes are longer or when the equipment units are not equipped with wheels, rail transport options should be used. This procedure requires attention and, above all, proper preparation so that the hardware units can safely reach their destination. When assessing the transport needs of the Polish Armed Forces, it is worth focusing on the Land Forces, due to their potential and the rapidly growing number of new equipment units.

In order to report on the security aspect of the transport of troops by rail, it is necessary to examine the structure of the Land Forces - mainly using railway resources, and to present the basic military equipment that is available in individual subunits, divisions and tactical associations.

The pillar of the Land Forces are four divisions. The division consists of 11 general military brigades and 10 regiments. In addition to the above-mentioned division structures, the Land Forces include the Multinational Brigade Command, 4 independent brigades and 10 combat support and security regiments. Thus, the structure of the Land Forces in terms of numbers and organizational span is quite extensive. To illustrate the transport needs, one division consists of about 21,000 soldiers and 8,000 hardware units. However, one brigade is about 11,000 soldiers and 5,000 hardware units. The land forces are an essential component of the Polish Armed Forces when responding to incidents that destabilize the

country's security. It is worth paying attention to the number and variety of equipment that will have to be transported. To illustrate the needs of the Polish Armed Forces, it should be added that in 2018, due to the need to transport soldiers and equipment for field training, 64 operational full-train transports were carried out using railways³. In 2019, for the purposes of the Defender 20 military exercises, about 100 heavy platforms for transporting equipment weighing up to 90 tons were purchased⁴. The presented data illustrate the importance of the transport needs of military subunits.

Taking into account the organizational structure of the Land Forces and the military equipment unit, it can be concluded that it is justified to use rail transport. Thanks to mutual cooperation, it is possible to achieve high manoeuvrability of troops while conducting the full spectrum of tactical operations, while maintaining an appropriate level of security. However, in order to meet the transport needs, it is necessary to maintain the railway infrastructure in the required condition, the more so as the transport needs will be increasing.

When discussing the structure and quantity of military equipment, it is advisable to pay attention to the current activities of the Ministry of National Defense, related to the amendment of the state's universal defense system. The Act on Defense of the Fatherland provides for a significant strengthening of the Polish army by increasing the number of soldiers, financial outlays for defense and modernization of military equipment. These activities will significantly influence the development of the structure of the Land Forces. In order to ensure proper conditions for the implementation of tactical activities and to maintain an appropriate level of military security of the country, it will be necessary to increase financial outlays for the development of transport infrastructure, e.g. railway. The aforementioned act guarantees an increase in the defense budget - to at least 3 percent of GDP (Gross Domestic Product)⁵. Therefore, already in time of peace, the requirements for infrastructure investments should be specified, which can later be used for military purposes. Knowledge of transport needs is of great importance for the smooth functioning of military transport by rail. The answer to the reported transport needs may be the market offer of services. However, not every transport need can be reflected in the market disclosure. This is due

³ Pawlisiak M., *Systemy Logistyczne Wojsk, Transport kolejowy w przewozach wojskowych*, Wojskowa Akademia Techniczna, Journal no 51, Warszawa 2019, pp. 123-124.

⁴ www.rcb.gov.pl (as of 14.06.2022).

⁵ Act of March 11, 2022 on the defense of the Fatherland.

to the significant differences between military transport needs and the actual need for transport services.

4. THE IMPACT OF THE RAILWAY INFRASTRUCTURE ON THE SECURITY OF THE REPUBLIC OF POLAND

In order to report on the military security of Poland in the aspect of transporting troops by rail, the current condition of the railway infrastructure should be presented and assessed. In order to introduce infrastructural changes and increase competitiveness, it is necessary to identify problems that hinder the performance of transport tasks. Technical barriers should therefore be identified. Then you can answer the question of how and with what tools to modernize the railway infrastructure⁶.

It is worth starting with explaining what railway infrastructure is. It is best to use the definition from the act on rail transport. It specifies that the infrastructure is „*railway lines and other structures, buildings and devices along with the land occupied for them, located in the railway area, intended for the management, transport of people and goods, as well as the maintenance of the infrastructure manager's assets necessary for this purpose*”⁷. Thus, the railway infrastructure can be divided into nodal and linear infrastructure. The aforementioned division is presented in Fig. 2.

The nodal infrastructure is primarily a network of stations, the so-called traffic stations and such elements as: railway scales, storage yards, ramps, warehouses, railway stations, sidings and various types of devices constituting energy, water and sewage equipment as well as devices allowing to control train traffic. Its main task in the Polish Armed Forces is an efficient process of loading and unloading troops⁸

⁶ Pietrzak K., *Towarowy transport kolejowy w Polsce*, Akademia Morska w Szczecinie, Szczecin 2015, pp. 223-224.

⁷ Rail Transport Act of March 28, 2003.

⁸ Gradkowski K., *Infrastruktura węzłów kolejowych*, Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa 2013, pp. 5-11.

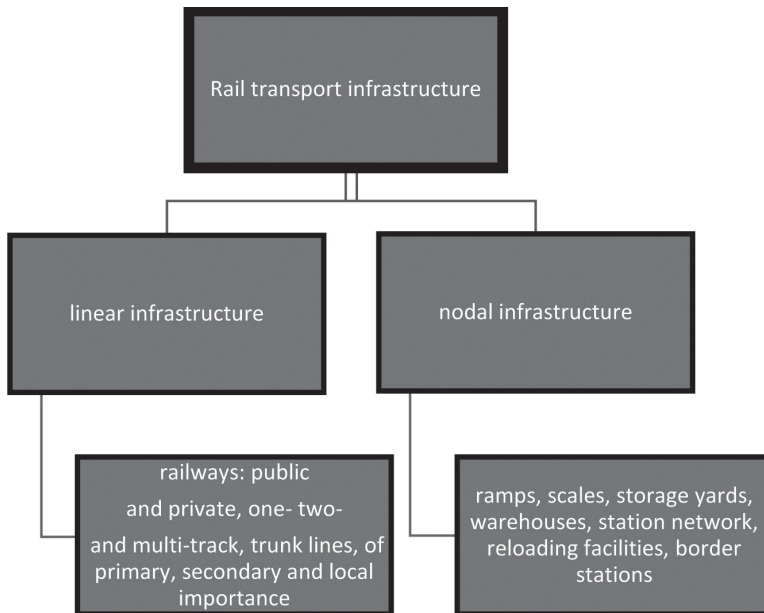


Fig. 2. Division of the railway transport infrastructure and its elements

Source: Own study based on: M. Hajdul, M. Stajniak, M. Foltyński, A. Koliński, P. Andrzejczyk, *Organizacja i monitorowanie procesów transportowych*, Institute of Logistics and Warehousing, Poznań 2015, pp. 32-33.

The linear infrastructure is made up of railways that are classified according to various criteria. The most common types of railroads are: public and private, single- and multi-track, main, primary, secondary and local roads. Its main task in the Polish Armed Forces is to fulfill the key function of rail transport, which is the transport of soldiers and military equipment from the place of permanent dislocation to the place of tactical operations.

As history and current events show, the railway continues to play important functions in terms of displacing and supplying troops. It is important that you can relatively quickly transport weapons, ammunition, heavy equipment, important raw materials and deploy the troops. These tasks can only be performed if the required level of infrastructure is maintained. Therefore, it is worth considering the technical condition of the railway infrastructure in Poland.

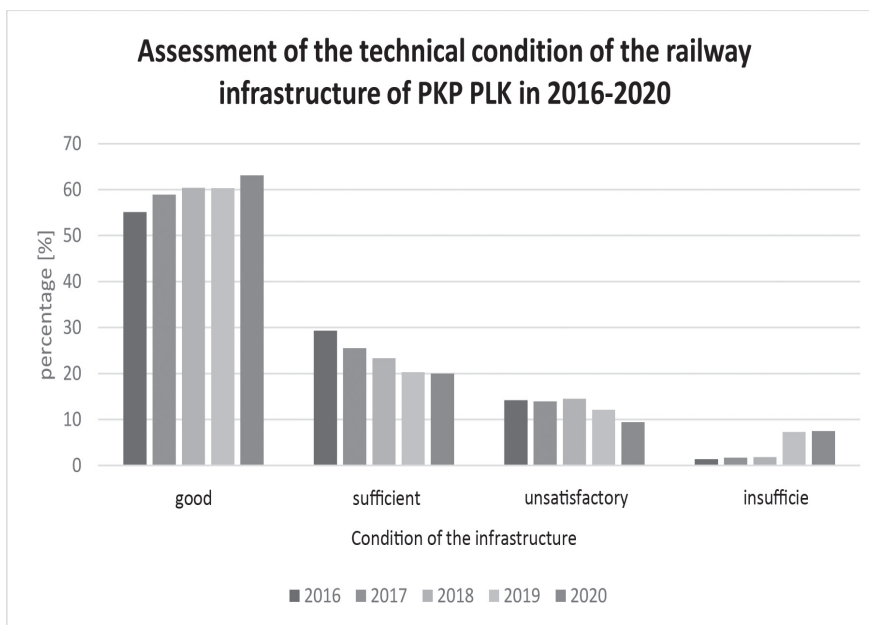


Fig. 3. Assessment of the technical condition of the Polish railway infrastructure in 2016-2020

Source: Own study based on: UTK reports on the safety of railway traffic in 2020.

It can be noticed that the technical condition of the railway infrastructure has been slowly improving in recent years. The intensity of this process is primarily related to the financial outlays of the EU budget. Based on the data of the main manager of PKP PLK from 2020, it can be determined that 63.1% of the infrastructure was assessed as maintained in a good condition, 20% in a sufficient condition, 9.4% in an unsatisfactory condition, and 7.5% in an insufficient condition. Since 2017, a slight increase in the share of infrastructure in good condition has been observed. It is also worth noting that since 2019 there has been an increase in the share of railway infrastructure with unsatisfactory and insufficient technical condition. The aforementioned data show the increasing deterioration of the technical condition of infrastructure, which so far has been classified at a sufficient level and has not been modernized.



Fig. 4. Map of railway exploitation nodes in Poland

Source: Own study using the official website of PLK, <http://mapa.plk-sa.pl/> (as of June 7, 2022)

The technical condition of the infrastructure largely influences military activities. Adequate infrastructure affects the logistical security of own and allied troops in times of peace, crisis and war. Properly logistically secured, the Armed Forces of the Republic of Poland are one of the elements determining the military security of the state. Infrastructure is necessary to maintain high mobility of troops in activities for the benefit of self-defence, as well as in the implementation of tasks resulting from allied duties. The appropriate level of rail infrastructure used for the transport of troops is determined by the location of operational nodes and the density of railroads.

The above illustration shows the currently existing exploitation nodes in the territory of the Republic of Poland. It can be noticed that the location of exploitation nodes does not meet the needs of the Polish Armed Forces. The location of military

training grounds and military units differs significantly from the location of the nodal railway infrastructure.



Fig. 5. Map of railway lines in Poland

Source: Own study using the official website of PLK, <http://mapa.plk-sa.pl/>
(as of June 7, 2022)

Above is a drawing showing the currently existing railway lines and their location in the territory of the country. By analysing the presented illustrations, it can be concluded that the railway infrastructure is developed, but it does not harmonize with the places where military units are stationed. The priority for the Polish economy should be to ensure the transport needs of the Armed Forces. The spatial incompatibility of exploitation nodes and railway lines with proving grounds and places where military units are stationed is a significant obstacle in the performance of tasks in military operations. Under the conditions of subliminal impact on our security, one should take into account the possibility of an emergency operational need, e.g. for a quick and efficient strengthening of border security in the form of an additional military component. The chances of developing a country's military security are greater when a given country or region is saturated with linear and nodal

infrastructure. Infrastructure is the backbone of any economy⁹. Hence, ensuring its appropriate technical and operational parameters is particularly important in the military aspect. The priority should be to continuously invest in the railway infrastructure in order to improve the logistical security of troops, and thus the level of the country's military security.

5. CONCLUSIONS

The aim of the article was to present **the possibility of using rail transport to transport troops and its impact on the military security of the Republic of Poland**. Rail transport should be used for military transport, in particular for the transport of heavy military equipment. It is worth adding, however, that the use of rail transport by the Polish Armed Forces depends on the current situation in the country and in the world and on the tasks carried out by military institutions. With the use of rail transport, troops can be transported relatively quickly and the assigned tasks can be carried out efficiently and safely. It should not be forgotten that the efficiency and timeliness of military transport by rail is determined by the quality of the infrastructure. In order to ensure the correct conditions for the implementation of tactical activities and to maintain an appropriate level of security during the transport of troops, it will be necessary to increase financial outlays for the expansion of the rail infrastructure.

It is the network of railroads and service nodes that determine the state of military security of the Republic of Poland. The appropriate condition of the infrastructure significantly affects the logistic security of own and allied troops in times of peace, crisis and war. The Armed Forces of the Republic of Poland, well logistically secured, are the guarantor of the state's military security.

REFERENCES:

- [1] DU-4.4.1(B) *Zasady przewozu wojsk transportem kolejowym*, Ministerstwo Obrony Narodowej, Dowództwo Generalne Rodzajów Sił Zbrojnych, Warszawa 2014.
- [2] Ustawa z dnia 11 marca 2022 roku o obronie Ojczyzny
- [3] Gradkowski K., *Infrastruktura węzłów kolejowych*, Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa 2013.

⁹ Neider J., *Transport międzynarodowy*, PWE, Warszawa 2012, pp. 12.

- [4] Hajdul M., Stajniak M., Foltyński M., Koliński A., Andrzejczyk P., *Organizacja i monitorowanie procesów transportowych*, Instytut Logistyki i Magazynowania, Poznań 2015.
- [5] Kurasiński Z. (red.), *Kompendium logistyka wojskowego*, Wojskowa Akademia Techniczna, Warszawa 2014.
- [6] Neider J., *Transport międzynarodowy*, PWE, Warszawa 2012.
- [7] Pawlisiak M., *System logistyczny determinantem bezpieczeństwa Sił Zbrojnych Rzeczypospolitej Polskiej*, Wojskowa Akademia Techniczna, Warszawa 2016.
- [8] Pietrzak K., *Towarowy transport kolejowy w Polsce*, Akademia Morska w Szczecinie, Szczecin 2015.
- [9] Pietrzyk-Wiszowaty K., *Transport kolejowy w systemie obronnym państwa*, Akademia Sztuki Wojennej, Warszawa 2018.
- [10] Zalewski P., Siedlecki P., Drewnowski A., *Technologia transportu kolejowego*, Uniwersytet Szczeciński, Szczecin 2005.
- [11] <http://www.plk-sa.pl>
- [12] <http://www.gov.pl>
- [13] <https://www.utk.gov.pl/>

Dominik Piękoś
Military University of Technology in Warsaw
dominik.piekos@wat.edu.pl

