

Railway Construction Investments in Poland – Selected Issues

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Abstract. Rail transport generates lower external costs related to environmental pollution in comparison to other means of transport. Sustainable development and environmentally friendly attitudes are increasingly used in present construction projects. Railway investments usually involve large projects in the field of transport infrastructure (megaprojects in transport infrastructure). Construction and modernization encompasses railway lines and overhead lines, engineering structures, buildings and railway traffic control devices. In the case of railway projects, numerous different risk factors that are not reflected in other construction projects may exist. Such investments typically generate high costs and require appropriate methods to manage risk factors. Effective project management relies primarily on the precise recognition of its characteristics, existing conditions as well as political and economic situation in its environment. The paper describes mechanisms related to implementation of railway construction investments in Poland in the context of the financial perspective planned for 2014 – 2020 period. In addition, formal and legal environment existing on the railway market has been analysed.

1. Introduction

Currently, the situation in rail transport in Poland is unprecedented. In accordance with the plans, the national railway lines manager, PKP Polskie Linie Kolejowe S.A. (PLK - the Polish Railway Lines), is going to have 66 billion PLN available for the implementation of planned construction projects in the 2014 – 2020 period [1]. Construction and modernization is going to cover railway lines, overhead lines, engineering structures and buildings and railway traffic control devices. The whole project demands that PLK possesses considerable managerial skills to implement the plan at a specific time, with the assumed costs and the expected quality. Moreover, all the activities also require a selection of the contractor for works based on Public Procurement Law in force in Poland (Journal of Laws of 2015, item 2164, as amended). Analysis of the procedures for selection of public procurement contractors, emerging errors and shortcomings are widely presented in the scientific literature [2–7].

Railway investments are characterized by their distinctiveness in comparison to other construction works and are subject to many random factors, which have a significant impact on extending the deadline and increasing the planned cost [8]. Current funding of infrastructure results in developing enormous pressure on the economy and efficiency of its construction [9]. Railway projects are large in scope and cause high investment costs which generates the need for reliable management of risk factors [10–11]. Recommendations for risk management using the selected methodology and their usefulness in railway constructions were evaluated in [10]. Effective project management depends primarily on being aware of the dependencies of the selected construction investment. It is also



essential to understand both the conditions and the political and economic situation in the project's environment [12].

The aim of the paper is to analyse mechanisms related to implementation of construction railway investments in Poland in the context of the financial perspective planned for the 2014 – 2020 period. Furthermore, formal and legal environment existing on the railway market has been described. The analysis examines subsequent investment stages and conditions on the railway market.

2. Literature review

In Poland, apart from PLK - the Polish Railway Line, there are nine smaller operators and several economic entities supervising their own railway lines for recreational purposes as well as for passenger and freight transport [13]. Each of them has its own business model, which determines the type of conducting construction investments. The owners of railway sidings operate on the basis of freight transport and the main type of construction-assembly works is aimed at modernization of the cargo yards, halls or warehouses. On the other hand, in the case of narrow-line companies, the greatest emphasis is put on the ongoing maintenance and repair of tourist rail infrastructure. The main investor in the railway industry in Poland is PKP PLK, due to the size of its share on the rail transport market (the percentage of operators of the national railway infrastructure is presented in Figure 1) and the type of the company's ownership [14]. In the further part of the paper, railway investments implemented exclusively by PLK are discussed.

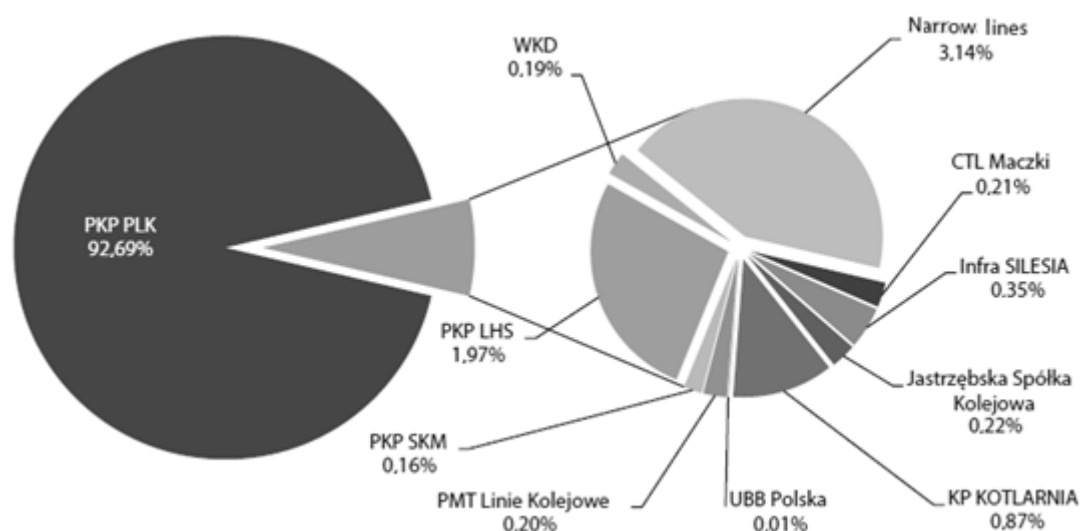


Figure 1. Percentage of operators of the national railway infrastructure. Source: [14].

Being an economic entity of the management board of the Polish government, PLK is obliged to fulfil a number of commitments (discussed in detail in chapter 3a of the article). One of the company's basic tasks is maintenance, modernization and development of the national railway network [14].

The maintenance of railway infrastructure is a continuous local process (small, relatively low-cost repairs of individual structural elements, such as single rail repair and replacement of sleepers) involves activities which do not require obtaining administrative decisions.

Other principles in organizational, economic and administrative terms are the remaining two types of construction and assembly works. Regardless of the nature of the investment or activities undertaken by PLK, the company's overriding goal is to maintain a good condition of the operated railway lines. The state of the railway system infrastructure has been improving, as presented in Figure 2.

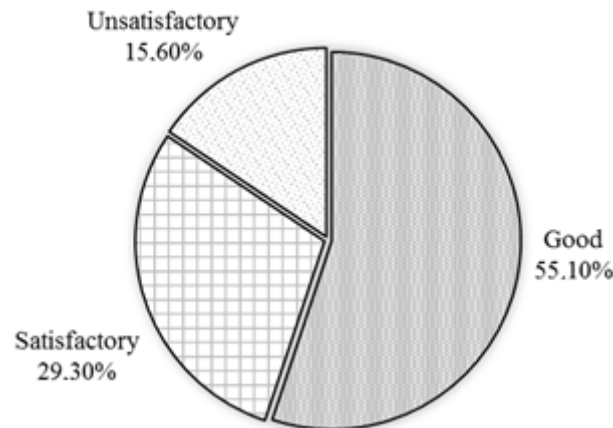


Figure 2. State of railway system infrastructure in Poland in 2016. Source: [13].

According to internal regulations of PLK Instruction Id-1 "Technical Conditions for maintenance of railway lines", modernization denotes a series of construction activities leading to the improvement (increase) in technical and operational parameters of the existing railway lines. Typical modernization activities include redesigning the geometric layout of the tracks (such as straightening vertical and horizontal arches and optimizing the station tracks layout), elimination of single-level intersections (with roads or pedestrian crossings) or construction of new engineering structures, including reconstruction of the accompanying road system. Modernization of the railway line is a more frequently chosen variant of the railway investment [1] as it does not require large financial outlays or long-term administrative proceedings related to obtaining land for development. An additional aspect, prevailing in favour of railway modernization includes logistical considerations and the potential duration of construction (materials can be delivered from the neighbouring track) [15].

The second type of railway investment is construction of new lines. This type of project requires large expenditures, both financial and temporal at every stage of the construction investment process. Each newly built railway line is preceded by a number of specialized studies (feasibility, profitability, etc.) which usually take several years. In addition, there are other conditions that make it difficult to conduct investments, such as: objections of the local population, environmental problems, construction logistics and extended time for obtaining a set of administrative decisions. Taking into account these variables shows that only exceptional factors determine the decision to build new railway lines. In the currently implemented investment programme there is only one task involving construction of a new railway line [1].

3. Analyses of stages of the investment process in railway construction works

Railway investments are complex undertakings, not only due to their organizational or legal nature. Additional difficulties include complexity and uniqueness of railway contracts. Challenge for each of the parties in the investment process are factors such as:

- Uniqueness of the investment – Each construction (modernization) is unique. The implementation includes exceptional ground as well as socio-economic and local conditions. Each element of the designed infrastructure is dedicated only to a given task (the railway line under construction);
- Longevity of the construction – Railway lines and their components (track surface, engineering construction) are designed for many years of operation, even for more than 100 years; much more than for other types of building structures (according to Polish legal act on technical conditions to be met by railway structures and their location);

- Combination of various types of construction branches. Railway investments require close cooperation of almost all construction sectors described in the Polish law [16]. An exemplary diagram illustrating the characteristic works is shown in Figure 3.

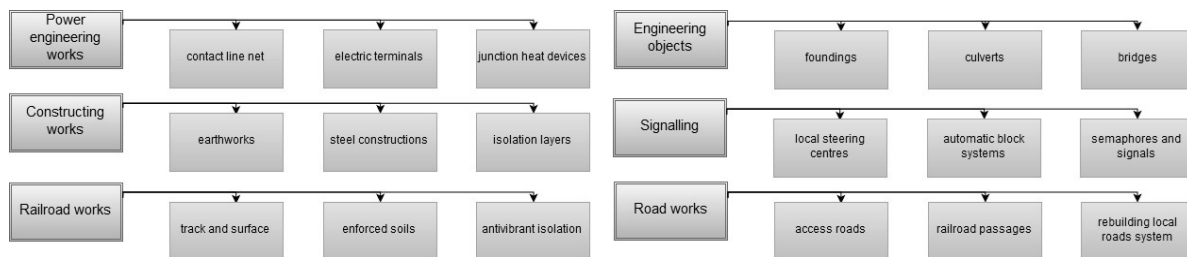


Figure 3. Diagram of typical construction works in railway investments. Source: [16]

Regardless of the nature and type of the facility, three basic stages of the construction investment process can be distinguished [12]:

- Preparing the investment for execution;
- Realization of investments;
- Use (operation of investments).

Individual stages are related to the performance of specific activities, the sum of which is called life cycle of the investment.

Preparation of the investment includes activities related to securing financial resources, preparing investment profitability and feasibility analyses of the study. At this stage, a general plan for the construction is determined and planned, cost estimates are prepared and initial work schedules are set. After accepting the investment proposal by the Investor, a tender is announced to select a Contractor, and the documentation provided forms the basis for the execution of the works.

The stage of investment implementation is related to the preparation of technical documentation (Construction and Executive Project) and a comprehensive performance of construction and assembly works. Implementation of the construction site depends on the complexity of its construction, moreover railway investments last from several months to several years. Completion of the investment implementation stage involves transfer of the facility to the investor.

Usage is the longest stage of the life cycle of an investment and covers the period during which the proper functioning of the construction is assumed. Railway construction works are designed for a period of 50-100 years, during this time only ongoing repairs and maintenance of the infrastructure are assumed, a decision is made to renovate, modernize or complete the investment (end of use of the building).

The boundaries of stages of the investment life cycle are contractual and may overlap. This is due to the fact that some activities are carried out in advance which proves that the contractor is better prepared (for instance, security at the design stage of key materials on the construction site) and it is a guarantee of due performance of the contract.

4. Methodology

Construction and modernization of railway lines on the national PLK network involves taking into account the interests of many groups of people. The structure of conditions is related at various levels. The investor must comply with the concluded international agreements, take into account the current political plans for the development of the transport network in the country and take care of his own interests by planning infrastructure repairs. It is not possible to consider all the postulates. In the planning of construction and modernization, PLK must focus on the most important factors which affect the beginning of railway investments.

In order to identify these factors, a qualitative research technique (an interview method) was applied. Individual interviews were conducted at the end of 2016 in Krakow. Three employees in the management positions of the railway sector took part in them. As a result of the conducted research and studies of regulations and legal acts, three criteria having a large impact on the way and mode of railway investments were selected for further discussion:

- Railway transport strategy in Poland;
- Financing PLK;
- Inequalities in road and rail transport.

5. Results and discussion

5.1. Railway transport strategy in Poland

The main factor determining the railway investments undertaken in Poland is the country's economic development policy and transport policy in Europe. Joining the European Union, Poland agreed with many contracts and commitments in the field of railway infrastructure construction. The core of the railway transport policy consists of three legal obligations issued by the European Union, in particular:

- Decision no 1692/96 of the European Parliament and of The Council on Community guidelines for the development of the trans-European transport network – an executive document defining a network of 9 transport corridors for Europe's most important passenger and trade routes. According to the assumption, the selected routes are priority railway lines connecting the most important cities, airports, ports and the other economically justified facilities. In Poland, there are two corridors of the TEN-T network: "North Sea – Baltic Sea" and "Baltic Sea – Adriatic Sea";
- European Agreement on Main International Railway Lines (AGC) [17] – The purpose of this Agreement is to create an „international E-rail network” connecting major cultural and industrial centres in Europe. EU Member States have committed to standardize the technical parameters of modernized and newly constructed railway lines. Ultimately, lines falling under the AGC contract should meet the same criteria and be adapted to rolling stock moving the European Union. The document assumes the location of four E lines in Poland: E59 Świnoujście – Chałupki, E65 Gdynia – Zebrydowice – (Petrovice u Karcine), E20 (Frankfurt) – Kunowice – Terespol – (Brest) or E30 (Görlitz) – Zgorzelec – Medyka – (Mostiska).
- European Agreement on Important International Combined Transport Lines and Related Installations (AGTC) [18] – An Agreement resulting from analyses was adopted to increase trade among European Countries. Taking into account the adverse impact of the development of transport, especially road transport, it was decided to take measures to support combined transport. The content of the contract contains amount of information and numerous guidelines regarding planned implementations, both related to legislation and technical implementations in individual countries. In terms of rail infrastructure, the most important railway lines identified have an impact on the international combined transport network and more important facilities. In Poland there are the following:
 - Railway lines (m.in.: CE59, C59/2, CE65, CE30, CE30, C65/1, C65/2, C30/1);
 - Terminals (m.in.: Gdańsk, Gliwice, Kraków, Łódź, Szczecin, Warszawa);
 - Border crossings (m.in.: Ystad – Świnoujście, Frankfurt – Kunowice, Medyka – Mostiska);
 - Ferry ports/seaports (m.in.: Gdynia – Sztokholm, Ystad – Świnoujście);

Implementation of European Regulations into the legislation and national policy was preceded by complex analyses commissioned by the Polish government. As a result of the studies, a comprehensive document was prepared defining a long-term plan for the development of rail transport in Poland, the so-called Master Plan [19]. It defined the way of planning investments, their order and financing, including the expected effects along with possible development scenarios up to 2030.

Prior to Poland's accession to the European Union, investments were planned directly by PLK. A multiannual programme was introduced together with the development of national strategies using UE funding. The first of them was "WPIK" – Multi-annual Investment Programme up to 2013 with a perspective up to 2015, which included modernization of the main railway lines in Poland.

Another, currently implemented, is the National Railway Programme until 2020, with a perspective up to 2023. The programme is to be the largest and most comprehensive programme covering the construction and modernization of all major railway lines, including associated and local connections. During six years of the programme's duration, it is estimated that a record amount of 66 billion PLN will be spent.

5.2. *The National Railway Programme (KPK) budget*

Raising money for railway construction projects implemented by PLK is more complicated than in the case of a private investor, as it requires compliance with statutory provisions and is connected to the national's transport policy.

The PLK is the national manager of the railway network in Poland, and the majority of the company's shares are held by the Polish government [1].

Financing railway investments can be divided into two sources of obtaining money:

- "Internal sources".
- "External" sources;

"Internal" sources: The term "internal sources" is understood as all financial inflows acquired directly by the Polish government and secured for the implementation of the KPK. The total cash is transferred from three different tools of public finances:

- State budget – in accordance with the division included in the content of the State Budget Act approved by the Prime Minister and signed by the President of the Republic of Poland;
- Railway fund – a special purpose fund, resources of which are created from the proceeds from excise duties on fuels, interest rates and from National Bank shares;
- PLK funds – the company's budget accumulated through ongoing statutory activities and financial liabilities incurred towards the implementation of the investment.

"External" sources: For this type of financing, all sources obtained under international agreements are classified. After Poland's joining the European Union, the largest number of international agreements has resulted from the Polish necessity to implement the Community policy. The basic mechanism of the application of financing investments involves the European Union's financial programmes. In the case of railway lines, these are the Cohesion Fund and the European Regional Development Fund.

5.3. *Inequalities in road and rail transport*

Opening the market to motor vehicles in Poland in the early 1990s and the lack of restrictions to their acquisition resulted in a systematic increase in the popularity of this mode of transport. The development of road transport and the lack of effective activities of the national railway lines manager caused a drastic decrease in the interest in rail transport (as shown in Figure 4). Delays and the lack of punctuality of trains also had an impact on this situation [20].

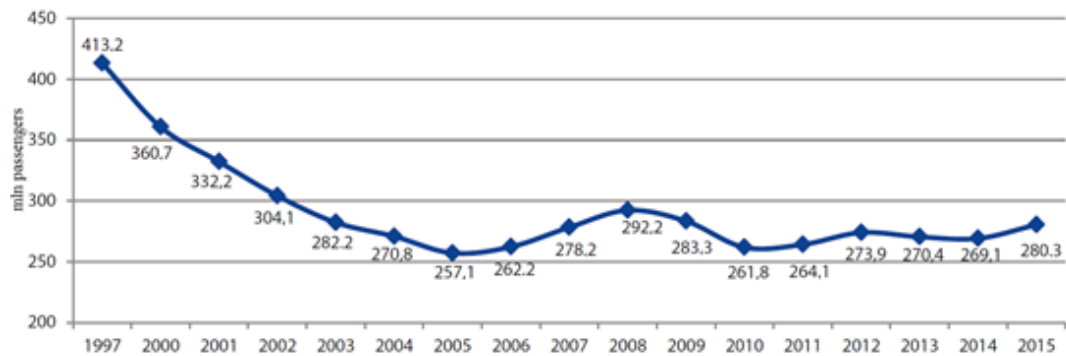


Figure 4. Number of passengers transported by rail in Poland in 1997-2013 period. Source: [20].

Inequality of road and rail transport is deepened by various types of disproportions in the functioning of the infrastructure. By comparing the share of paid infrastructure, transportation of one branch at the expense of the other can be observed (Figure 5). In detail, there is a difference in the amount of paid infrastructure, against the background of the infrastructure of state importance. All public railroads in Poland are paid, while 99% of public road infrastructure in Poland is free. Comparing the share of the infrastructure of state importance, it can be observed that 65% of public railways are of national significance, while only 5% of public road infrastructure is part of important national road network.

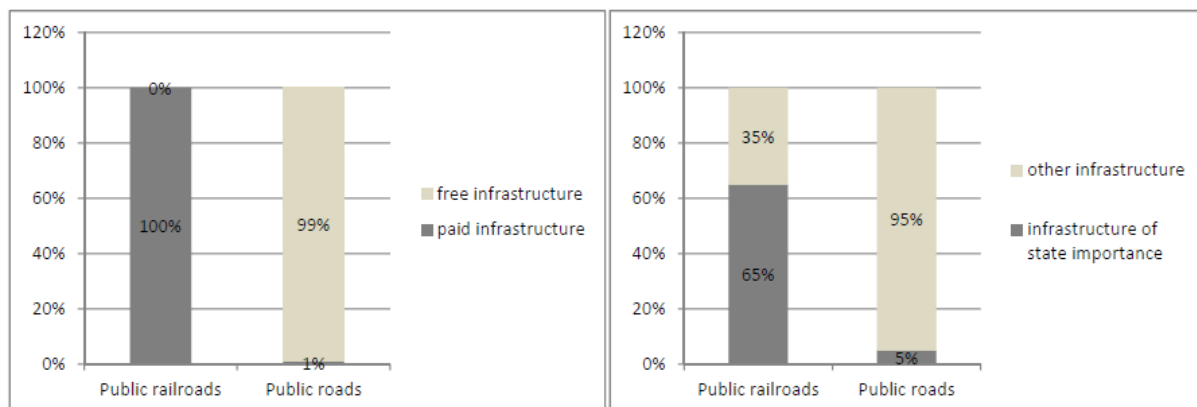


Figure 5. Share of paid infrastructure in Poland. Source: www.prokolej.org

Increasing number of cars and greater use of road transport causes a higher level of pollution. Development of railway investments can bring positive impact on environmental protection because of decreasing number of cars, improving public transport, and decrease in pollution, vibrations or noise. Development of rail transport can contribute to improvements in the quality of the environment.

6. Conclusion

Organization of railway construction projects planned for 2014–2020 period in Poland requires involvement of many parties in the investment process. Each railway investment is a separate project with different features and conditions.

Becoming acquainted with the investment stages properly, success can be guaranteed in spite of their complexity. The national railway lines manager, aware of these conditions, undertakes numerous initiatives to mitigate the risks or to introduce legislative improvements. Despite satisfying current needs, it should be remembered that many issues (not mentioned in the article) still require changes or are contradictory to the expectations of participants in the investment process [21].

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