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## THE ROLE OF RAILWAY INFRASTRUCTURE IN SERVICING FREIGHT AND PASSENGER TRANSPORT IN AGGLOMERATION – ON THE EXAMPLE OF POZNAŃ

### Abstract

An appropriate infrastructure is required to efficiently meet the mobility needs of citizens and the needs of business in the implementation of transport processes. This infrastructure must be taken care of by local authorities and other entities. Hence, the role of local government cannot be overestimated in this respect. The development of the rail transport infrastructure should not lag behind the development and changing needs of the city. Adequate development of the railway infrastructure makes it possible to increase the competitiveness of rail transport in cities and agglomerations, both in respect of passenger and freight transport.

The article examines the current state of the railway transport infrastructure in the city of Poznań and in the Poznań agglomeration, paying attention to the potential of its use in the above mentioned transport groups. The aim of the author is to indicate the problems faced by the city today and the directions of railway infrastructure development in the city.

**Keywords:** city logistics, rail transport, rail infrastructure

**JEL:** R41

### Introduction

Problems of modern cities are inseparably connected with the challenges of proper organization of transport. Progressive urbanization makes it possible both in the area of passenger and freight transport in cities. This makes this issue extremely topical and, as cities and agglomerations develop, the search for new solutions and the promotion of good practices plays an increasingly important

role. "The population living in cities is growing day by day and consequently, urban areas are expanding. On the one hand, technology development such as e-commerce offers new services which increase end-customer expectations, for instance, same-day delivery. On the other hand, satisfying all citizens' needs requires enormous resources and infrastructure deployment as well as efficient planning and managerial efforts which are extremely costly" (Neghabadi et al., 2018, p. 866).

## 1. Freight transport infrastructure and vision of urban development

The issue of cargo and passenger transport remains one of the important challenges of city management. Nowadays, efficient transport is not the basis of a high quality of life, being just one of the key elements in assessing how urban centres function. "The selected problems of efficient and effective movement of people and cargo have long been present in the theory of strategic management of local development and in real urban development strategies" (Kiba-Janiak, Witkowski, 2014, p. 164). "Increasing traffic within limited city space leads to negative effects in terms of emissions and congestion. Here, city logistics service providers compete against other road users for the scarce traffic space, which cannot be extended unlimitedly" (Ehmke, 2012, p. 12).

Decisions on the choice of the city logistics model are more and more often the effect of the influence of private entities, including "The overview of the stakeholders represented in the city logistics models suggests that representation of various stakeholders in modelling has increased over the period with more models considering decisions by the private stakeholders such shippers, carriers and receivers" (Anand et al., 2015, p. 711).

Over the years, cities have undergone obvious transformations. Occupying about 1% of the planet's surface area, cities are responsible for the consumption of about 75% of energy and the emission of about 80% of greenhouse gases. Half of the world's population lives in cities today, which raises the question of how to organise procurement and logistics processes in cities. The fastest growing cities double their population in a decade, which means additional challenges. The demographic change, but also transport problems are the reasons why the city is becoming an area where many problems meet at the same time (Bretzke, Barkawi, 2013).

One of the key elements determining the efficiency of both passenger and freight transport remains an adequate infrastructure base. "Efficient movement within the city area is impossible without an appropriate transport infrastructure, both linear and point-based. This infrastructure is organically linked to the urban tissue. Its shape and parameters have a decisive influence on how movements within the city are carried out and is an element limiting the range of possible logistics solutions" (Szołtysek, 2016, p. 78).

The transport infrastructure, combined with the organization of transport at an appropriate organizational level, allows skilful development of the city, and the effect is a constant increase in the quality of life of its inhabitants. "Intelligent, sustainable development of the city takes place with respect to the existing

resources or through their modification, as a result of which the living conditions of the inhabitants and the functioning of other stakeholder groups in the city in its urbanised space are improved" (Nowicka, 2014, p. 3).

It should be taken into consideration that the city is a system, a system of connected points and parts. The individual subsystems of this system cannot be considered independently of each other. When analysing the problems of transport in a city, all its subsystems should be taken into account, in particular with regard to different groups of users or types of transport. It should also be remembered that cooperation between urban and regional self-government is necessary in many aspects because, although it is a city, it is the voivodeship government that may have the right to decide on the railway transport issues.

Efficient transport drives the economic development of the city, agglomeration, region. "The economic dimension of urban development has a general reference. It transports itself to other urban realities. The condition of companies located in the city and its prospects are among the most important factors of development. Current barriers to the development of Polish cities seem to confirm this. (...). The emphasis on the development of social infrastructure without constant attention to the economic dimension of the city's existence seems to be a mistake on the part of authorities of many cities. In this context, investment in the technical infrastructure is particularly justified when it contributes to the activation of the urban economic activity and, above all, that which creates the economic base of the city" (Czornik, 2008, p. 115). The arguments about the "economic dimension" of the transport policy seem to be valid especially for freight transport. It is here, apart from the urban function, that a clear function related to the management of resources by private entities using these services appears.

Rail transport does not have to compete with the urban transport system. "The world practice shows that the development of transport links in the agglomeration should be taken by transforming "commuter train" into "Stadtbahn" – "city train", as a full part of the intercity transportation system. Railway lines should be the "overground metro" by which passengers must be evenly distributed on the territory of the city" (Morozova et al., 2016, p. 116).

## **2. Rail transport in strategic documents of the Poznań City Hall**

Transport issues have been present in the strategic documents of the Poznań City Hall for many years. "In order for a transport system to work efficiently, it must be coherent and structured. Therefore, on 18 November 1999 the Poznań City Council signed the Transport Policy of the City of Poznań" (UMP, 2018). Already in the first paragraph of the Vote on Transport Policy (UMP, 1999), attention was drawn to the "fundamental role of transport for the proper development and efficient functioning of the City" (UMP, 1999, p. 1) and its metropolitan functions.

The specific policy objectives include "maintenance and reconstruction of the transport infrastructure", "stimulating the economic and spatial development of the city"; or "reduction of noise, exhaust emissions, congestion inconveniences (...)". Obviously, in principle, the list of objectives consists of a large number of items,

but those listed are the closest to the challenge of organizing the transport of goods within the city. While passenger transport by rail in the city and agglomeration is an increasingly important topic, freight transport is much less researched.

The Transport Policy of the City of Poznań (UMP, 1999) outlined, *inter alia*, the development objectives in the area of freight transport in a multi-branch system indicating:

- “creation of a logistics system offering comprehensive services, including not only basic transport, but also: loading and unloading, delivery and transport operations, storage and warehousing, as well as accompanying services such as sorting and processing of goods, distribution, control, sanitary and documentary services;
- organising combined transport, which in the agglomeration of Poznań should include rail/road and possible river shipping;
- offering door-to-door express services within a guaranteed period of time with specialised rolling stock adapted to the nature of the load;
- improving the quality of freight transport, also with a view to reducing the traffic on roads, especially in inner-city areas” (UMP, 1999, p. 4).

Subsequent stages of the transport policy included legal regulations dedicated to particular transport subsystems of the city. Thus, dedicated documents devoted to the issues of public transport, bicycle, parking or road policy were adopted. Importantly, there are no documents directly related to the issue discussed in this publication. Neither freight transport within a city or agglomeration nor rail transport have been the subject of a dedicated “policy” document. Therefore, the only guidelines for both rail transport and the organisation of freight transport at the city or agglomeration level, are the general documents relating to the areas in question. Table 1 provides an overview of the previously mentioned transport policy supporting documents.

Table 1. Supporting documents for the UMP Transport Policy

Document	Signature date
Sustainable Public Transport Development Plan for 2007–2015 (Poznań Metropolitan Area)	24 October 2006
Cycling Programme of the City of Poznań	15 January 2008
Parking Policy of the City of Poznań	10 June 2008
Road Programme of the City of Poznań for the years 2008–2015	16 September 2008

Source: (UMP, 2018)

The transport policy is not the only document defining the directions of transport development. Attention should also be paid to the regulation of the document called “Study on the Conditions and Directions of Spatial Development of the City of Poznań” from 2008. In this documents it is written that: “The need to upgrade the existing rail network, consisting of main, primary and secondary lines, including stations and stops, is recognized”. In addition, “it is considered advisable to use railway space for the operation of other means of rail transport, including the possibility of introducing a dual system vehicle (rail-tram), taking into account the link between suburban areas and the city centre” (MPU, 2008, pp. 59–60).

Sections of this Study indicate the directions which the development of the infrastructure dedicated to freight transport should take. "It is assumed that railway sidings are integrally connected with the serviced industrial and service areas, and the justification for their construction, maintenance or possible liquidation should result from the railway priorities related to the necessity of their use, as well as from the possibility of fulfilling all the principles set out in the Acts, this "Study..." and government guidelines. Under these conditions, it is possible to locate new railway sidings. The sidings that need to be liquidated because of the development of the street and rail network are listed in the table" (MPU, 2008, p. 60).

These records come from the 2008 Study. Six years later, by the decision of the City Council of Poznań, on 23 September 2014 Resolution No. LXXII/1137/VI/2014 was signed, with an updated, new version of the Study. Both the 2008 Study and the 2014 Study identified specific areas in the city that should take part in the development of freight services. "The basic terminal Poznań-Franowo, potential satellite terminals: Poznań Wola, Poznań Golęcín, Poznań Antoninek and other terminals: Poznań Wschód, Poznań Starołęka, Poznań Krzesiny, Poznań Górczyn, Poznań Strzeszyn are envisaged for cargo transport" write the authors of the earlier Study (MPU, 2008, p. 60).

"The basic terminal Poznań-Franowo is planned for cargo transport, potential satellite terminals may be: Poznań Wschód, Poznań Górczyn, Poznań Piątkowo, Poznań Koziegłowy, and other terminals: Poznań Krzesiny, Poznań Starołęka, Poznań Antoninek, Poznań Wola, Kiekrz" (MPU, 2014, p. 89) – such locations were indicated in the current Study (2014). In principle, the indicated locations are similar, which shows that these areas have been selected consciously and have the potential to be used for the purposes indicated.

### **3. Use of rail for urban transport – challenges and examples**

In the literature on this topic, the concepts of the use of freight transport include, but are not limited to, possibilities of adaptation of the railway transport infrastructure to passenger transport, development of solutions such as urban railway (like the German S-Bahn railway system) or dual-system tram networks. The number of publications devoted to freight transport is much lower.

Obviously this does not mean that freight transport within the city and agglomeration does not have much potential. There are many opportunities here, both with the use of the rail transport infrastructure and, for example, the tram infrastructure. This is a multithreaded issue and there are many challenges here. "Rail freight transport in the city area faces a number of problems due to technical, legal and organisational reasons. This transport can be based on the use of classic railway wagons, logistics platforms and freight trams. Linking all technical means of transport requires a solution to the issues of organisational compatibility and cargo standardization" (Lewandowski, 2004, p. 51).

In the 1980s, the railway transport infrastructure in the City of Poznań comprised several dozen facilities in total. The number of these is gradually decreasing. At present, regular liquidation of railway transport infrastructure elements used

for cargo handling, in particular railway sidings, can be observed in the city area. In the last twenty years, railway sidings for industrial plants in the Podolany area (including the former Officer School, later the Land Forces Training Centre, numerous industrial plants in the vicinity of Jasielska Street or the siding along Podolańska Street, which was in operation several years ago) have been dismantled. The siding at the Poznań Strzeszyn railway station was liquidated along with the current upgrading of Railway Line No. 354.

The noteworthy examples of sidings liquidated in recent years include not only sidings in the north-western part of the city, in the area of Podolany and Strzeszyn, but also, for example, the siding of the Poznań International Fair (Międzynarodowe Targi Poznańskie – MTP). It was disconnected from the railway network (and then liquidated) around 2012, along with the construction of a tram route, the so-called Poznań Fast Tram (Poznański Szybki Tramwaj – PST). The PST new tram section has been included in the city network in the place where the tramway route crossed the rail track leading to MTP.

#### **4. Railway infrastructure in the city and agglomeration**

Currently, the infrastructure of sidings in the City and Agglomeration counts, according to the data of the Railway Transport Authority, 30 sidings (UTK, 2019b). There is a clear correlation between the location and the main railway routes passing through the City. Many facilities are located along Railway Line No. 3 (Warszawa Zachodnia – Kunowice) and Railway Line No. 352 (Poznań Starołęka – Swarzędz), i.e. routes constituting: an axis on the east-west line and a link allowing freight trains to bypass the city centre, respectively. On Line 352 there are also railway facilities of the city's hinterland, located in Franowo (the Franowo station is the largest freight station in the region, equipped, *inter alia*, with a shunting hill, where a container terminal operated by PKP Cargo is also located). The detailed location of the sidings is presented in Figure 1. Table 2 presents the list of sidings, together with their users and detailed location. In Table 3 these sidings are divided according to the railway line number in the vicinity of which they are located.

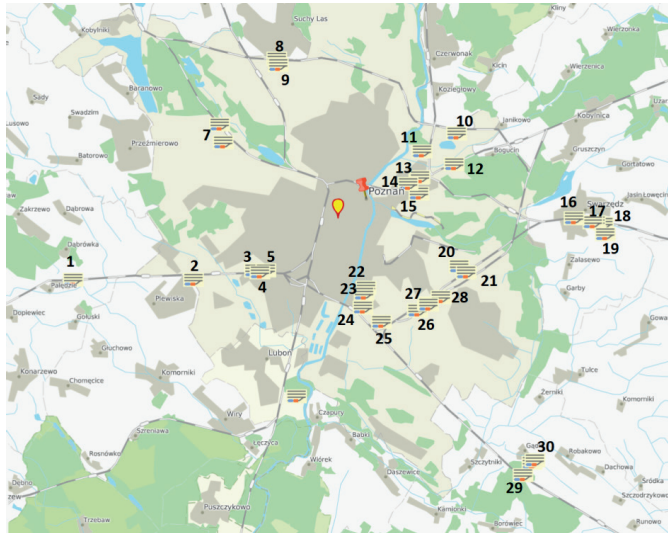


Figure 1. Freight sidings in the city of Poznań and the Poznań agglomeration – location  
 Source: (own elaboration based on: UTK, 2019b)

Table 2. Freight sidings in the city of Poznań and the Poznań agglomeration – users

No.	User	Location	Railway line no.
1	COLAS KRUSZYWA SP. Z O.O.	Palędzie	Palędzie Station, from Track No. 12, Switch No. 22, Railway Line No. 3, at km 318,419
2	Syndyk Masy Upadłości FEROCO S.A. w upadłości likwidacyjnej	Poznań Górczyn	Poznań Górczyn Station, from Track No. 2, Switch No. 45, Railway Line No. 3, at km 312,232
3	Grupa LOTOS S.A. Zakład w Poznaniu	Poznań Górczyn	Poznań Górczyn Station, from Track No. 4b, Switch No. 200, Railway Line No. 3, at km 309,853
4	LOTOS KOLEJ SP. Z O.O.	Poznań Górczyn	Poznań Górczyn Station, from Track No. 4b, Switch No. 17, Railway Line No. 3, at km 309,692
5	LOTOS TERMINALE S.A.	Poznań Górczyn	Poznań Górczyn Station, from Track No. 4b, Switch No. 200, Railway Line No. 3, at km 309,853
6	LUVENA S.A.	Luboń k. Poznania	Luboń Station, from Track No. 3, Switch No. 2, Railway Line No. 357, at km 110,998
7*	THYSENKRUPP ENERGOSTAL S.A.	Poznań Wola	Poznań Wola Station, from Track No. 10, Switch No. 10, Railway Line No. 351, at km 6,994
8	GÓRAŹDŹE CEMENT S.A.	Poznań Piątkowo	Track Group No. 1 – Delivery G: Poznań Piątkowo Station, from Track No. 4, Switch No. 6, Railway Line No. 395, at km 13,577 and Switch No. 23, at km 14,357
9	GÓRAŹDŹE CEMENT S.A.	Poznań Piątkowo	Track Group No. 2 – internal company siding, from Track No. 16, Switch No. 101, Railway Line No. 395, at km 14,629

No.	User	Location	Railway line no.
10	Dalkia Poznań Zespół Elektrociepłowni S.A. / EC II Karolin Dalkia Poznań ZEC S.A.	Koziegłowy	Koziegłowy Station, from Track No. 12, Switch No. 26, at km 4,252 and Track No. 20, Switch No. 21, at km 4,117, Railway Line No. 395
11	Centrozłom Wrocław S.A. Oddział Poznań	Poznań Wschód	Poznań Wschód Station, from Track No. 107, Switch No. 801, Railway Line No. 356, at km 1,054
12	CEMBRIT S.A.	Poznań Wschód – Skandawa	From Station Track No. 7, Switch No. 13, Railway Line No. 353, at km 9,650
13	VOLKSWAGEN GROUP POLSKA SP. Z O.O.	Poznań Wschód	Poznań Wschód Station, from Track No. 22, Switch No. 122, Railway Line No. 3, at km 299,157
14	MARIUSZ GRYGIER M.M.-TRANS / MARCIN GRYGIER „M.M.-TRANS”v	Poznań Wschód	Poznań Wschód Station, from Track No. 20, Switch No. 131, Railway Line No. 3, at km 299,593
15	Kulczyk Tradex Sp. z o.o.	Poznań Wschód	From the access Track No. 301 of Poznań Wschód Station, Switch No. 401
16	Centrum Logistyczno Inwestycyjne Poznań II Sp. z o.o.	Swarzędz	Swarzędz Station, from station Track No. 6b, Switch No. 6, Railway Line No. 3, at km 291,017
17	STENA RECYCLING Sp. z o.o.	Swarzędz	Swarzędz Station, from Track No. 6a, Switch No. 7, Railway Line No. 3, at km 290,997
18	Terminal LPG w Swarzędzu	Swarzędz	From Track No. 251, Switch No. 301, at km 0,107 of PKP CARGOTOR Sp. z o.o. siding (which starts from Swarzędz Station: Track No. 6, Switch No. 6, Railway Line No. 3, at km 291,618)
19	STS Centrum Dystrybucji Samochodów Sp. z o.o.	Swarzędz	From CLIP II siding, Switch No. 301 from Track No. 251, at km 281,755, Switch No. 300 from Track No. 206, at km 289,721 and Derail No. 401 from Track No. 400, at km 289,643, Railway Line No. 3
20	KOMPANIA PIWOWARSKA S.A.	Poznań Franowo	From Track No. 1, Switch No. 951, Railway Line No. 352, at km 0,627
21	PKP CARGO S.A.	Poznań Franowo	From Track No. 403, Switch No. 775 and from Track No. 402, Switch No. 774, Railway Line No. 822, at km 1,783
22	LUVENA S.A.	Luboń k. Poznania	From Track No. 3, Switch No. 2, Railway Line No. 357, at km 110,998
23	„Al Pari” – Piotr Ostrowski, Elżbieta Pieprzycka Sp. j.	Poznań Starołęka	From Track No. 17a, Switch No. 851, Railway Line No. 272, at km 195,304
24	„DRAPOL” Sp. z o.o.	Poznań Starołęka	From Track No. 17, Switch No. 30, Railway Line No. 272, at km 0,634
25	LAFARGE Kruszywa i Beton Sp. z o.o	Poznań Franowo	From Track No. 321, Switch No. 444, Railway Line No. 352, at km 8,371
26	PKP CARGO S.A.	Poznań Franowo	From Track No. 521, Switch No. 524, Railway Line No. 352, at km 7,080



No.	User	Location	Railway line no.
27	MARIUSZ GRYGIER M.M.-TRANS / MARCIN GRYGIER „M.M.-TRANS”	Poznań Franowo	From Track No. 1, Switch No. 512, Railway Line No. 806, at km 0,150
28	PKP Cargo Connect Sp. z o.o.	Poznań Franowo	From Track No. 521, Switch No. 524, Railway Line No. 352, at km 7,080
29	HHLA Intermodal Polska Sp. z o.o.	Gądko	From Track No. 5, Switch No. 22 ab/cd, Railway Line No. 272, at km 185,529
30*	Elewarr Sp. z o.o. Oddział Regionalny w Gądkach	Gądko	From Track No. 5, Switch No. 12, Railway Line No. 272, at km 184,637

\* on the map provided by UTK, the siding is marked with a pictogram twice, in the list it is placed once.

Source: (own elaboration based on: UTK, 2019b)

Table 3. Freight sidings in the city of Poznań and the Poznań agglomeration – by line

Railway line	Route	Number of sidings	Siding numbers (as listed above)
3	Warszawa Zachodnia – Kunowice	12	1–5, 13–19
272	Kluczbork – Poznań	4	23–24, 29–30
351	Poznań Główny – Szczecin Główny	1	7
352	Swarzędz – Poznań Starołęka	4	20, 25–26, 28
353	Poznań Wschód – Skandawa	1	12
356	Poznań Wschód – Bydgoszcz Główna	4	11
357	Sulechów – Luboń	2	6, 22
395	Zieliniec – Kiekrz	3	8–10
806	Poznań Franowo PFD – Nowa Wieś Poznańska	1	27
823	Poznań Franowo PFD – Stary Młyn	1	21

Source: (own elaboration based on: UTK, 2019b)

The sidings are not the only infrastructure components used for handling loads in the agglomeration. In Poznań, there is also potential for the implementation of the so-called “dry port”, the concept of an intermodal logistics hub, as an intermediate link between the seaport and the target customers. This concept is particularly interesting today, when the intermodal transport market is constantly evolving. “The Poznań agglomeration has great potential for the implementation of the dry port concept, as it has the economic and logistics potential to become one of the main nodes of the national intermodal logistics network” (Andrzejewski, Fechner, 2014, p. 11). Andrzejewski and Fechner draw attention to the characteristics of the Poznań agglomeration, which create the potential for the construction of the “dry port”, such as its attractive geographical location, its location in terms of logistics in the transport corridor of the TEN-T network, the variety of a logistics infrastructure (line infrastructure, including rail infrastructure saturation, as well as roads of different categories), the potential for intermodal transport services, the supply of warehouse space or cargo transport services provided by the Poznań airport (2014).

The development of intermodal transport is one of the interesting directions for the development of rail freight transport, not only in terms of transit, but also in relation to the needs of the city and agglomeration.

The Railway Transport Authority in its lists currently indicates four main intermodal terminals located in the agglomeration, owned (operated by) CLIP Logistics Sp. z o.o., Loconi Intermodal S.A., PKP CARGO CONNECT Sp. z o.o. and Polzug Intermodal Polska Sp. z o.o. The Ostsped Intermodal terminal, located in Szamotuły, next to Railway Line 351 (UTK, 2019b) should also be mentioned among the facilities of this type. Detailed parameters of these terminals are presented in Table 4.

Table 4. Intermodal terminals in the city of Poznań and the Poznań agglomeration

Name	Centrum Logistyczno-Inwestycyjne Poznań II (1)	Loconi Intermodal Terminal Poznań (2)	Terminal Kontenerowy Poznań Franowo (3)	Polzug HUB Terminal Poznań (4)
Location	ul. Rabowicka 51b, 62-020 Swarzędz – Jasin	ul. Nowosolska 40, 60-171 Poznań	ul. Ostrowska 300, 61-312 Poznań	ul. Magazynowa 8, 62-023 Gądkki
Owner/operator	Clip Logistics Sp. z o.o.	Loconi Intermodal S.A.	PKP CARGO CONNECT Sp. z o.o.	HHLA / Polzug Intermodal Polska Sp. z o.o.
Mode of transport to be handled	Rail, road	Rail, road	Rail, road	Rail, road
Supported logistics units	Containers, swap bodies, intermodal semi-trailers	Containers 20', 30', 40', 45', HC	Large containers 20', 30', 40', 45', HC, swap bodies, semi-trailers, tank containers, isothermal units	Containers (20'–40' / 40' HC / 45' / TC), swap bodies, semi-trailers
Railway line: Railway Line No.	E-20	Poznań – Rudnicze	Poznań Franowo Station, from Railway Line No. 521	Gądkki Station, from Railway Line No. 272
Total area (ha)	10 ha	1.6 ha	2.8 ha	16 ha
Maximum transshipment capacity (TEU)	135 000 TEU	40 000 TEU	117 000 TEU	385 400 TEU
Storage area (TEU)	4 500 TEU	1 000 TEU	1 800 TEU	1 500 TEU
Number of railway sidings	1	2	1	1
Number and length of railway tracks for loading and unloading	1 527 m	1 x 350 m	2 x 610 m	4 x 610 m
Total length of railway tracks 1435 mm (m)	4 067 m	600 m	1 419 m	3 050 m
Number of railway cranes	0	0	0	0

Name	Centrum Logistyczno-Inwestycyjne Poznań II (1)	Loconi Intermodal Terminal Poznań (2)	Terminal Kontenerowy Poznań Franowo (3)	Polzug HUB Terminal Poznań (4)
Lifting and handling vehicles	5	4	3	6
Parking spaces for trucks	600	0	5	16

Source: (UTK, 2019a)

The location of the four terminals described above is shown in Figure 2. Intermodal terminals are located under numbers 1–4 and the location of the transshipment station (terminal, shunting hill) Poznań Franowo under number 5.

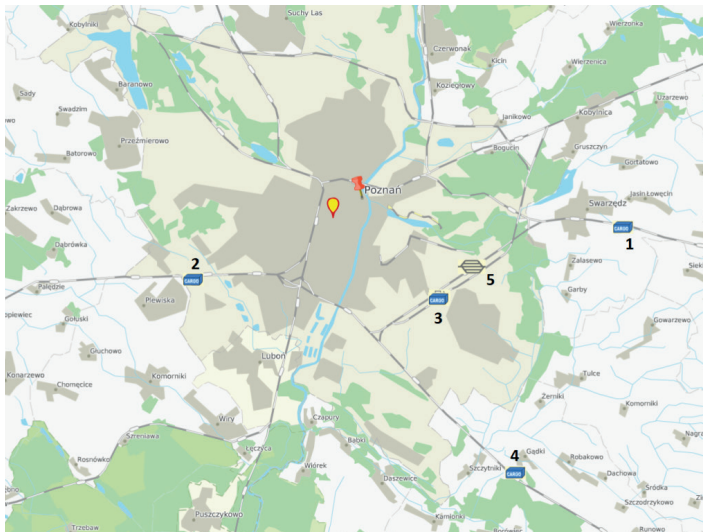


Figure 2. Intermodal terminals in the city of Poznań and the Poznań agglomeration – location  
Source: (own elaboration based on: UTK, 2019b)

## 5. Potential for the use of infrastructure in passenger transport

Although the creation of the agglomeration railway (called the Poznań Metropolitan Railway, [Poznańska Kolej Metropolitalna – PKM]) has been discussed in Poznań for a long time, it is only in recent years that activities in this area have been intensified. “Despite the favourable layout of the network, good technical performance of the routes and high capacity, rail is still underutilised, especially in the city area and its immediate hinterland” (Bul, 2016a, p. 13).

Over the years, the idea has remained in the concept phase, and it is slowly becoming a reality. “The determination of all levels of territorial self-government

units to establish the PKM system should be stressed. Activities carried out by the Poznań Metropolis Association are of key importance in this respect. Thanks to the implementation of the “Masterplan for the Poznań Metropolitan Railway” project, it has already been possible to determine the basic parameters of the system and prepare concepts for its operation” (Bul, 2016b, p. 29). The first trains with the PKM logo have already appeared on the routes, although at present we can rather speak of rebranding the already serviced regional routes, and a fully-fledged urban railway system is still in under construction.

The railway infrastructure in the city of Poznań and the Poznań agglomeration offers great potential for use in passenger transport, which is one of the elements of the origin of the PKM project. The following figure (Figure 3) shows a current map of stations and passenger stops used in regular passenger traffic. This figure contains stations in the city of Poznań.



Figure 3. Stations and passenger stops in Poznań – passenger traffic  
Source: (ZTM, 2019)



Figure 4. Passenger stations and stops in the agglomeration – passenger traffic  
Source: (ZTM, 2019)

The above Figure 4 shows a schematic view of stations and stops operated within the framework of a common railway, tram and bus ticket, within the ZTM Poznań (public transport network operator). In practice, this area is wider than the area commonly considered as an agglomeration, but it may be a valuable comparative material, as it indicates the actual extent of the transport impact within the transport system of the Poznań agglomeration.

It is worth noting the potential for the development of passenger networks, both with the use of the existing infrastructure and new facilities. Two examples are given here.

The Poznań Podolany passenger stop was opened for passenger traffic in 1932. The design of the stop included two platforms, a waiting room building with a ticket office, an inn on the side of the Podolany estate and descent from the platforms on the escarpment. Currently, there is no trace left of the former station, originally named Poznań-Golecin, and later Poznań-Podolany (Zubielik, 2013). Together with the decision to upgrade Railway Line No. 354, it was also decided to rebuild this stop. The construction of this stop has been in progress since 2017, first of all the platform edge was built on the track in the direction of Piła. In the spring of 2019 the construction of the platform in the direction of Poznań Główny station started. The implementation of the railway upgrading project is also one of the elements of the infrastructure development for the future agglomeration railway. As part of the project, four new stops are built: Poznań Podolany, Poznań / Suchy Las / Os. Grzybowe, Złotkowo and Bogdanowo / Gołaszyn. The first three are located in the area of Poznań, therefore, they will constitute valuable infrastructural support for the Poznań Metropolitan Railway.

This is an example of infrastructure reconstruction (Poznań Podolany) and construction of a new one (Os. Grzybowe and Złotkowo) for the agglomeration railway. "The upgrading of the line between Poznań and Piła is financed under the Regional Operational Programme of the Wielkopolska Region. The net value of the project is about PLN 500 million. The amount of co-financing from the European Union is about PLN 425 million net, i.e. 85% of the task value" (Railway Market, 2017). The current state of progress of works on the construction of the Poznań Podolany passenger stop is presented in Figures 5 and 6.

Another interesting example is the siding of Wojskowe Zakłady Motornizacyjne – WZM (Military Motor Works). "Wojskowe Zakłady Motoryzacyjne S.A. is an enterprise which has been present on the Polish armaments market since 1945. (...) The plant is located on the international A-2 Warsaw – Berlin route, has its own railway siding and is adjacent to the international airport. (...) The basic activity of (...) the plant is the repair and modernization of armoured, tracked and wheeled equipment as well as passenger cars, off-road vehicles, trucks and buses" (WZM, 2019).



Figure 5, 6. Construction of the Poznań Podolany passenger stop, as at 19<sup>th</sup> October 2017 and 31<sup>st</sup> March 2019

Source: (own archive)

In 2007, on behalf of the voivodeship (Marshal Office of the Wielkopolska Region in Poznań), the concept of using this siding to service passenger traffic at the Ławica Airport was developed. The route is planned based on the use of the existing Poznań – Szczecin railway line (4.6 km section), the newly designed branch track (1.0 km), the existing railway WZM siding track (0.6 km) and the extension of this siding – the newly designed section of the track towards the airport (3.0 km). A line with a total length of 9.29 km would have four stops in total – two for local traffic and two directly at the airport (UMWW, 2007). Analyses conducted by the local government started a long discussion on the optimal way of organizing the public transport for the Poznań airport. The analysis was based on three basic concepts: access with the use of a railway siding, construction of a tram line or change in the traffic organization on roads and separation of bus lanes (Bojarski, 2007). In the following years bus lanes were separated in selected sections of Bukowska Street (which is an access road to the airport), to this day other concepts (tram, extension of the siding) have remained only in the planning phase.

## Conclusions

No railway freight transport management strategy is defined at the level of the city and the agglomeration. The Poznań Metropolitan Railway project is in progress, but there are no system solutions for freight transport. The development of the railway transport infrastructure lags behind changes in the functions of individual areas of the city. At the same time, the needs of the city (conditioned by economic development and increased mobility of residents) require development in this area.

It should be noted that the closure of freight sidings is a natural consequence of the closure of industrial plants. New production, commercial and service facilities (including logistics real estate) are often built at a considerable distance from the rail transport infrastructure and use it to a very limited extent. This

worrying phenomenon, together with the reduction in the transport of goods within an agglomeration by rail are the reasons why there is a risk of an increase in congestion and road transport overburdening.

While a regression can rather be observed in the case of freight transport, there is an increase in the importance of railways on the agglomeration map as far as passenger transport is considered. The implemented Poznań Agglomeration Railway project, combined with the purchase of rolling stock and the construction of new stops give hope that the role of the rail transport in providing transport services to the city and the agglomeration will increase in the forthcoming years.

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