

PASSENGER TRANSPORT AS A PART OF THE SZCZECIN METROPOLITAN RAILWAY PROJECT – PROBLEMS WITH REACTIVATION THE CONNECTION SZCZECIN–POLICE

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ABSTRACT The aim of the article is to analyze the possibilities of effective implementation of the Szczecin Metropolitan Railways (SKM) concept, especially in relation to the reactivation of the Szczecin–Police railway connection. This is the only one that is currently not carried out. The given article presents the main conditions to be met in order to make this connection efficient and bring the desired effects which means that passengers will be entirely taken over by the rail transport.

Introduction

The spatial expansion of the metropolis that has been occurring for many years and resulting and the separation of places of residence, work and services causes more and more mobility of residents. This requires the local authorities to organize a better and more efficient transport system, both on an individual and collective basis. Mobility of agglomeration residents must be ensured at such a level as to ensure a good standard of living for the

residents, enable economic development of the entire metropolitan area, while minimizing the negative impact on the natural environment (Kozlak, 2013, p.173).

The importance of the rail transport for city and agglomeration transport services in the 21st century has markedly increased. After the period of regression and limitation of the rail transport improvement, a renaissance and further progression took place in the 90s. This concerns the major urban transport means, such as tram or metro, and also the railways, which are increasingly used for suburban and typical urban connections. This is largely visible in big agglomerations (eg. Berlin, Paris, London, etc.). Rail transport is mainly adopted there to link the city center with peripheral areas.

The rail transport in big cities and agglomerations has been gathering importance also in Poland, particularly after joining the European Union. However, the differences with Western European countries are still noticeable. Efforts are being made to incorporate the rail transport into the metropolitan or agglomeration transport services as it has already been existing in Polish cities as Warsaw, Tri-city, Upper Silesia and Łódź.

The idea of creating the Szczecin Metropolitan Railway (SKM) for Szczecin agglomeration also emerged. Due to the studies on further boost of Szczecin, it is expected to spread in four directions: north (left bank of the Oder – towards Police, right bank of the Oder – towards Goleniów), west (towards the German border), east (towards Stargard) and the south (towards Gryfino). Therefore, it is indispensable to name a responsible entity which would make rail transport operate for the connections linking the above towns (Strategia, 2016, p. 69).

The article sketches the SKM concept and it focuses mainly on the reactivation and expansion of the Szczecin–Police connection where rail passenger transport has been suspended. Presently, it is served by public transport or wheeled passenger vehicles.

SKM concept

The concept of the Szczecin Metropolitan Railway (SKM) is concentrated on the creation of a transport services network including the rail transport in the metropolitan area of Szczecin. The network will englobe lines already served in passenger transport as well as those where the transport was suspended in the past (Studium, 2014, p. 9).

The line segments used at present in passenger transport are:

- line no. 351 (Poznań Gł.–Szczecin Gł.) on the section Stargard–Szczecin Gł.,
- line no. 273 (Wrocław Gł.–Szczecin Gł.) on the section Dolna Odra–Gryfino–Szczecin Gł.,
- line no. 401 (Szczecin Dąbie–Świnoujście) on the section Szczecin Dąbie–Goleniów.

In addition, the passenger transport on the line no. 406 (Szczecin Gł.–Trzebież Szczeciński) served on the section Szczecin Gł.–Police will be reactivated. The SKM network design is outlined on Figure 1.

The implementation of SKM includes the modernization of stops and stations, together with the infrastructure of platforms and the construction of parking lots (Park & Ride). In case of existing served connection, the total cost of infrastructure modernization is up to 135 million PLN (Kraśnicki, 2018). The modernization of linear infrastructure will also be held on sections (Koncepcja, 2011, p. 171):

- Szczecin–Stargard – modernization as part of the basic National Railway project; the maximum speed limit for passenger connections will increase from 120 to 160 km/h,
- Szczecin–Goleniów – modernization as part of the basic National Railway project; the maximum speed limit for passenger connections will increase from 120 to 160 km/h,

- Szczecin–Gryfino – modernization as part of the funds of infrastructure managers (PKP PLK SA); adjustment of speed limit up to 120 km/h.



Figure 1. The Szczecin Metropolitan Railway network design

Source: own study based on <http://skm.szczecin.pl/index.php/mapa>.

As part of the SKM project, the Marshall Office plans also the purchase of rolling stock adapted to agglomeration transport services.

Thanks to the implementation of the SKM concept on active sections of the line, the rail transport will become efficient and competitive in the area of :

- the frequency of connections from Stargard, Goleniów and Gryfino to Szczecin,
- the reduction of the journey time,
- the new tariff rates (creating an integrated metropolitan fare and ticketing system).

Reactivation of the Szczecin–Police connection

The reactivation of passenger transport for the connection Szczecin–Police encounter big doubts regarding its efficiency. In this case, it is necessary to meet certain conditions in order to achieve the goal of attracting the passengers to use the rail transport instead of public transport (buses and wheeled passenger vehicles).

As part of the SKM project, the revitalization of the 406 line will have the biggest contribution from the SKM budget. The indispensable actions must be taken to fulfill the desired goal. Three of them could be enumerated:

- time and journey fare,
- frequency of connections,
- good access to the train station in Police

Time and journey fare

The shortest connection between Police and Szczecin is served by public transport – buses no. 101 (it takes 36 minutes) and 107 (it takes 37 minutes). The bus stops for those lines are located on Rodła Square in the center of Szczecin.

Journey fare from Szczecin to Police is included in the urban ticketing system, which is based on the time fare. The price of a single ticket depends on the journey time once the ticket is obliterated. For the connection in question, the price of a single ticket is 4.00 PLN (approximative journey time up to 60 minutes).

Simulation of a journey from Police to the center of Szczecin by SKM:

- journey time by tram from the Szczecin Niebuszewo interchange junction to the Rodła Square stop (the terminus of buses no. 101 and 107) – 9 min,
- transfer time from a train to a tram at the Szczecin Niebuszewo interchange junction – approx. 10 min.

Taking into consideration that the journey time by train and tram should be comparable to the time by bus (36–37 min.), we get the result that journey time by train doesn't exceed 18 min. For the data where there are 8 stops on the Police–Szczecin Niebuszewo section and the stop time at one of the stops is up to 1 min. we get respectively the calculation:

- commercial speed (including stopovers at stops) $V_h = 46.7$ km/h,
- technical speed (without stopovers at stops) $V_t = 84.0$ km/h.

The above calculations (simulation) show that it is possible to achieve the desired speed, in other words the comparable journey times for the discussed connection.

Frequency of connections

The number of journeys for buses no.101 and 107 departing from Police to Szczecin during given hours is shown in Table 1.

Table 1. Number of journeys for buses no. 107 and 101 during given hours on weekdays from Police to Szczecin

In hours	Number of journeys	
	line 107	line 101
1	2	3
4–5	2	1
5–6	6	2
6–7	10	3
7–8	10	1
8–9	7	2
9–10	6	1
10–11	6	1

1	2	3
11–12	6	2
12–13	6	1
13–14	7	2
14–15	9	2
15–16	10	2
16–17	8	2
17–18	7	1
18–19	6	2
19–20	5	1
20–21	4	2
21–22	3	1
22–23	3	1

Source: Timetable taken from the Municipal Transport and Roads Management in Szczecin (<http://www.zditm.szczecin.pl>).

As it results from the Table 1, there is a significant difference in frequency of buses no. 101 and no. 107. This is due to the fact that line 101 departs from another part of the city of Police (old city). The departure of bus no. 107 is in the housing estates (new city). At present, over 80% of inhabitants live in new town in Police. That's why there is a difference in frequency of both buses.

SKM trains must keep the frequency of the bus no. 107 for the comfort of the passengers benefiting from the offer of the public transport.

Good access to the train station in Police

One of the most serious challenges related to the reactivation of passenger rail connection between Police and Szczecin is to ensure attractive access to the railway station in Police. The existing railway station in Police is located in the old city, far away from the new housing estates. As part of the discussed project, the construction of a new railway station in Police located in close proximity to the new housing estates is desirable. Two variants of the location of this station were proposed.

In the first option, there was a plan to create a branch line 406 with three stops in direction of new Police in northern part. In the second option, the branch line going through the southern part and ending up with a stop located in the central part of the new city was planned. The decision has already been made that only the "Police Piłsudskiego" stop will be built in the future. However, this resolution could constitute a major obstacle because the distance between the planned stop and new housing estates is still considerable. This location may not attract the inhabitants of the new housing estates to benefit from the mentioned railway connection.

Conclusions

The considerations presented in the article could lead us to the conclusions listed below :

- a) the creation of the Szczecin Metropolitan Railway is to be considered as a very good idea that realizes the premises of Polish and the European Union transport policy including the promotion of rail transport as part of public transport services;
- b) Incorporation of the active connections (Szczecin–Stargard, Szczecin–Goleniów and Szczecin–Gryfino) in SKM project would certainly assure the increase of the passenger transport;

- c) reactivation of the connection between Szczecin and Police is characterized as a challenge because the takeover of the passengers requires actions that would ensure precise journey time, integration with the public transport system of Szczecin, competitive ticket prices and frequency of connections;
- d) a serious drawback for reactivation of the connection linking Police with Szczecin constitute the second location variant with construction of a new railway stop in Police; it would discourage passengers from using the railway transport to travel to Szczecin.

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