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Agglomeration railway systems in Poland

EN64-008 Acatus Plus of Lower-Poland Railway (Koleje Małopolskie) operator on the stretch Krakow Mydlniki – Krakow Lotnisko (km 9.9) before the regular inauguration (13.09.2015). Photo M. Wojtaszek

The second half of the twentieth century brought very potent urbanization processes, linked to an increasing population growth together with an industry growth with declining demand for workers in rural areas. Cities population in the world accounts currently around 54% of the global population (compared with 33% in 1960), in Europe it is 73% and in Poland it is above 60%. Trends are clearly rising (UN data for 2014 [3]). Urbanization is followed by a rapid urban sprawl resulting from fashion – moving to suburbs is a sign of wealth and good social position, together with lack of sufficient investments in affordable housing estates and better life quality in suburbs – larger homes and green areas, lower maintenance costs.

Keywords: agglomeration railway, urbanization processes, passenger railway market, transport systems.

With this trend, however, have emerged transport problems. A home or apartment on suburbs is most often associated with having at least one car. Inhabitants of suburban areas as well as surrounding villages and towns often work in one large city. The road and parking system of major urban centers is most likely to no longer be able to accommodate increased car traffic, which entails congestion followed by: increased air pollution, extended travel times and related problems (including social problems related to congestion – healthy and sedentary lifestyle, as well as reduced time for yourself and your family). The quality of life in cities has further deteriorated, escalating the phenomenon of escaping into suburban areas – as a result of the reduction of urban space (necessary for road traffic and the increasing demand for parking space), the increase of air pollution and noise pollution. Railway

became the remedy for transport problems associated with the urbanization process – giving the opportunity to reach even the city center without any trouble finding parking space and delays related to traffic jams. S-Bahn suburban railway in Berlin, dating back to the first half of the twentieth century, but also the RER in Paris (dating since 1960s) became the model for the agglomeration railway network. With the proliferation of cities in the second half of the twentieth century and the beginning of the 21st, further



45WE-002 as a regional train of the Mazovia Rail operator (Koleje Mazowieckie) near Warsaw West station (27.06.2015). Photo M. Graff

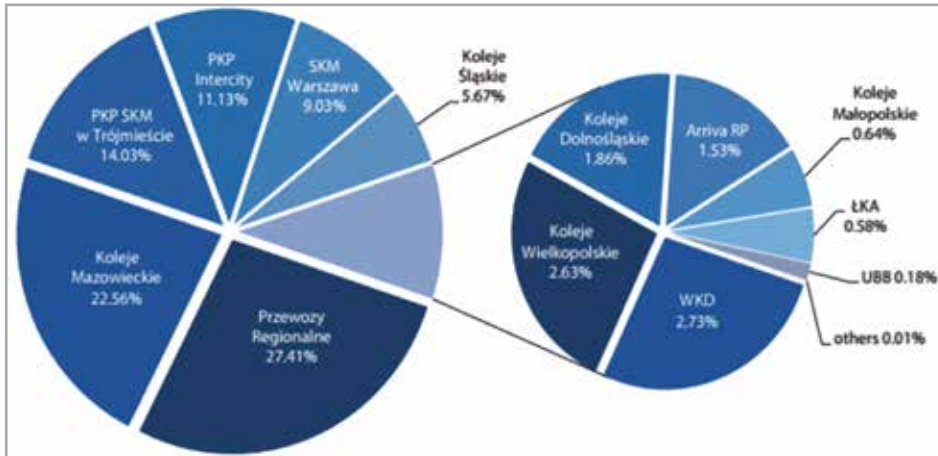


Fig. 1. Share in passenger railway market according to passenger number in 2015 [11]

German, Swedish, British, Austrian, Swiss and other cities were launching agglomeration railway systems.

The definition of agglomeration (or suburban) railways is difficult to distinguish; these transports are often combined in Poland with regional transport – for economic reasons and for other the benefits. The definitions in the legal acts are also not precise, and in the available statistics, both systems are often analyzed together. The ERRAC (European Rail Research Advisory Council) mentions that suburban/commuter railways cover a maximum travel distance of 15 km and 30 minutes of travel [8]. In Directive 2012/34/EU of the European Parliament and of the Council of 21 November 2012 on the creation of a single European railway area, urban and suburban transport is classified according to the area to be served and „transport services whose principal purpose is to meet the transport needs of an urban centre or conurbation, including a cross-border conurbation, together with transport needs between such a centre or conurbation and surrounding areas”, regional transports are designed to meet the region’s transport needs [1]. The definition mentioned in the Office of Rail Transport of Poland report, in accordance with the European Commission’s recommendations, characterize agglomeration and suburban transport as predicted „to meet the transport needs of a large

urban center/conurbation/metropolitan area, as well as transport needs between such a center and neighboring areas”[4]. Frequency of such services is high (usually at least 4 trains per hour), the distance between stops is relatively small, and the connection network is strongly integrated with the network of other means of public transport. Regional transport „aims to meet the needs of the region’s transport”. The frequency of trains is usually less than 4 per hour and the distance between stops is higher than at case of agglomerations and suburban transport”[4]. The frequency issue is not always rigorously seen as

a criterion for the classification – it may be higher (train every 5-15 minutes), but this is not a sine qua non condition. It is pointed out, however, that regional and agglomeration trains compete primarily with car transport, do not require reservations, require co-financing and are provided on the basis of public service contracts[6].

For the purpose of this publication, it can be assumed that commuter railways are primarily used by people living in areas adjacent to the agglomeration to commute to work in a larger urban center. They and also meet transport needs within the agglomeration, serving as a fast and reliable a mean of transportation, congestion-free and, above all, faster than a car or a bus. Agglomeration railway connections are strongly integrated to the public transport network and allow rapid and effective interchanges. The journey is short, up to half an hour. Due to the usually low commercial speed on railway tracks in Poland despite modernization works – the travel time of 1–1,5 hour should be taken into consideration – on the condition that passengers traveling on these lines are regular (daily or almost daily) and are aimed at reaching the workplace / college. The frequency of connections should be considered as the result of the demand for railway transport – which depends primarily on the journey time and the degree of integration of rail and urban transport – both at the starting and destination points, as well as the transport policy accepted by the transport organizers.

The rapid growth of agglomeration railways is a result of the cities and their suburbs growth. At first this was rather self-reliant – due to the high competitiveness of railways regional railway connections became a natural mean of transportation for those who left city centers and moved to the suburbs or provinces. Prior to the division of the Polish State Railways into smaller companies existed already SKM Trójmiasto and WKD (Warsaw region). The rise of regional and agglomeration railways is related to the formation of regional-government companies: Mazovia Railways (July 2004), SKM in Warsaw (February 2004), Lodz Agglomeration Railways (May 2010), Małopolskie Railways (December 2013). The number of passengers transported is growing. Only in terms of Mazovia region – Mazovia Railways, SKM in Warsaw and WKD – in total have transported 34% of all passengers transported in Poland in 2015 [11].

Railway market development, together with urban transport, is strongly supported strategically and financially by the EU transport policy that focuses on reducing greenhouse gas emissions as well as the negative congestion effects while improving the quality of life in cities, revitalizing their centers and reducing their sprawl. Ac-



27WE-011 as an agglomeration train of the Warsaw City Rail operator (Szybka Kolej Miejska) at Legionowo station (23.04.2014). Photo M. Graff

Tricity (Trójmiasto)

Tricity is a metropolitan area containing 3 cities: Gdańsk, Gdynia and Sopot. Since 2007 Tricity is an official name. Around the Tricity was created the Tricity Metropolitan Area including half of the voivodship population (1266705 inhabitants in 2013) and 16.7% of its area, according to the Pomeranian Spatial Development Plan. This agglomeration includes counties of Puck, Wejherowo, Kartusy, Gdańsk and Nowodwory counties as well as cities Tczew, Łębork [10].

Efficient railway transport inside Tricity area and between it and the larger cities of the agglomeration is provided by PKP SKM and Przewozy Regionalne in the area determined by stops: Babi Dół, Cieplewo, Luzino and Reda Rekowo. PKP SKM also reaches Słupsk, Łębork, Wejherowo, Reda, Rumia, Pruszcz Gdańsk and Tczew. Passengers are mainly transported with the old rolling stock EN57 and EN71. Between 2007 and 2014, almost half of the fleet was upgraded and adapted to the needs of people with reduced mobility. In 2016 SKM started operating 2 modern trains Impuls by Newag. In September 2015 were launched new connections of Pomorska Kolej Metropolitalna (PKM). It is a new line serving western parts of Gdańsk and Gdynia and integrated with prior PKP SKM line and operated by this TOC. Since 2016 railway system and urban public transport are integrated by one metropolitan ticket.

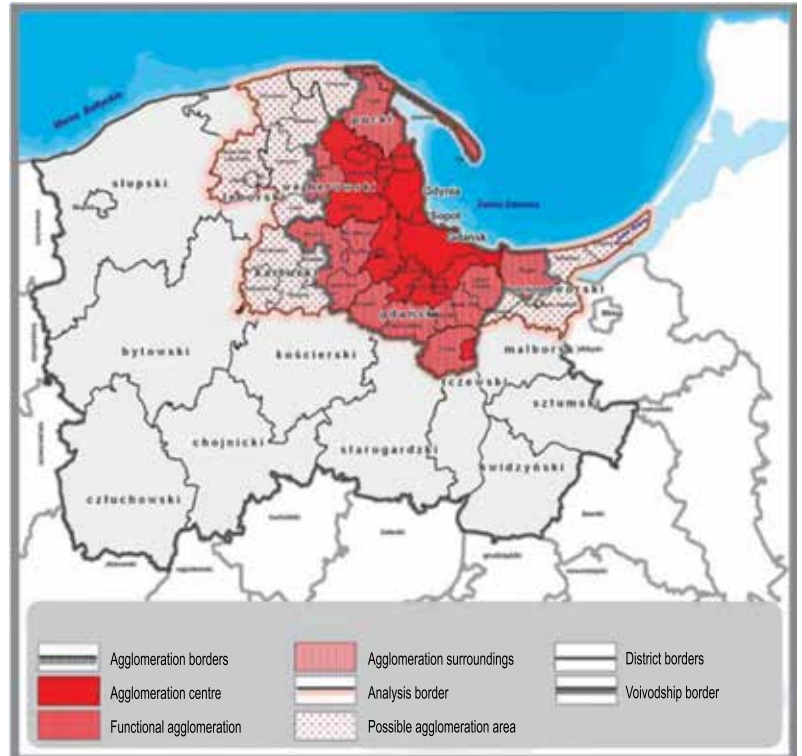


Fig. 4. Tricity agglomeration [10]

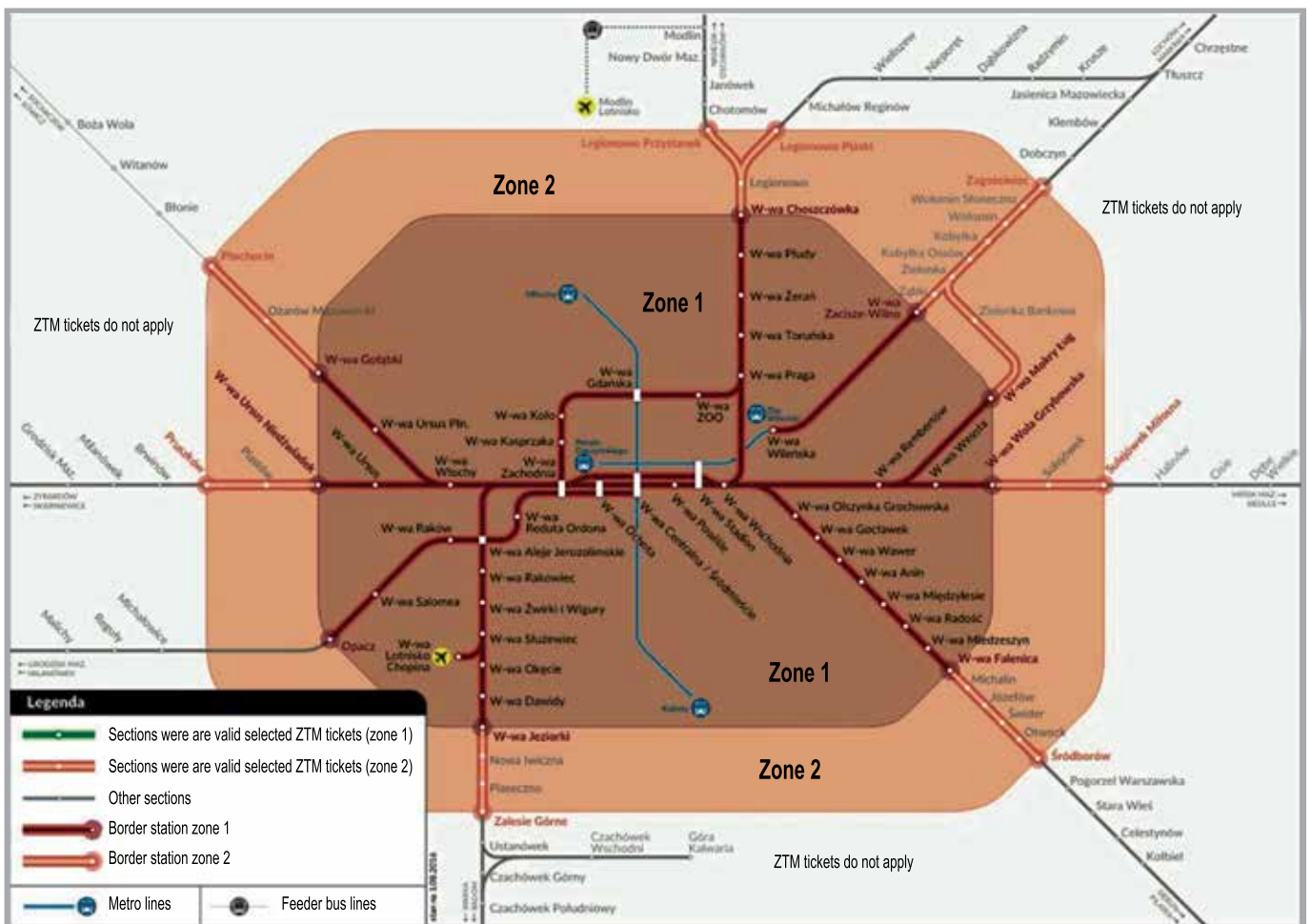


Fig. 3. Common ticket ZTM-KM-WKD area [13]

Lodz Agglomeration

The area of the Lodz agglomeration consists of Lodz Metropolitan Area, including the Zgierz district (cities: Ozorków, Zgierz, Aleksandrów, Stryków, Głowno), Brzeziny district and Pabianice district (cities: Konstantynów Łódzki, Pabianice, Tuszyn, Rzgów, Koluszki) [7].

Transport in agglomeration is since 2014 provided by Lodz Agglomeration Railway, as the basis of a new integrated transport system, the core of which is the railway transport.

Lodz Agglomeration Railway operates only new electric multiple units, produced by Stadler FLIRT3. All 20 trains are air-conditioned and in conformity with TSI requirements. Trains have 120 seats and 158 standing places (4 persons/m²). In 2017 was signed a contract for purchase of similar 14 new trains Impuls II by Newag. This means that the 2nd stage of Lodz Agglomeration system construction has begun. The 1st one included starting operating on lines Lodz–Łowicz, Lodz–Koluszki–kierniewice–Warszawa, Lodz–Sieradz, Lodz–Kutno. The second stage includes connections between Skierniewice–Łowicz–Kutno, Lodz–Piótrków Trybunalski–Radomsko, Lodz–Tomaszów Mazowiecki–Opoczno (after line electrification). Around 2022 Lodz Agglomeration Railway will also start operating in a new railway tunnel under Lodz city center.

Lodz Agglomeration Railway is since its beginnings integrated with urban city transport in Lodz and in all region cities served by this TOC. This integration includes timetables and integrated ticket Wspólny Bilet Aglomeracyjny. It is also integrated with car and bicycles transport – modernized station offer parking for both of this transport means. In plan is integration with Lodz Voivodship public bicycles system which is to be build in 2018 in several cities served by Lodz Agglomeration Railway. Since April 2017 in Lodz it is possible to travel on Lodz city public transport tickets. Lodz Agglomeration Railway tickets are honored in reverse in Lodz city public transport.

Cracow Agglomeration

Koleje Małopolskie are the youngest TOC in Poland. This company started operations in December 2014 on the line Wieliczka – Cracow Main Railway Station. Now Koleje Małopolskie operate lines Wieliczka – Cracow Main Railway Station – Cracow Airport, Cracow Main Railway Station – Tarnów, Cracow Main Railway Station – Nowy Sącz/Krynica. Koleje Małopolskie operate 18 electric multiple units owned by Małopolskie voivodship: EN77 Acatus II, EN78 Impuls, EN79 Impuls.

Koleje Małopolskie has a unique in Poland own bus system integrated with railway system. There are 6 bus lines: Byszyce–Wiel-

iczka, Hucisko–Wieliczka, Grajów–Wieliczka, Węgorzce Wielkie–Wieliczka, Węgrzce Wielkie/Swiątniki Górne–Wieliczka, Świątniki Górne–Wieliczka. Bus timetables are integrated with railway system (train awaits the bus). For commuters it is possible to buy one integrated ticket – Małopolska Karta Aglomeracyjna, It is valid for Koleje Małopolskie and Przewozy Regionalne systems, city transport in Cracow and Tarnów. It allows free access to P&R parking in Cracow and Tarnów. It is also possible to travel on an Integrated Ticket: for Koleje Mazowieckie and urban transport in Cracow.

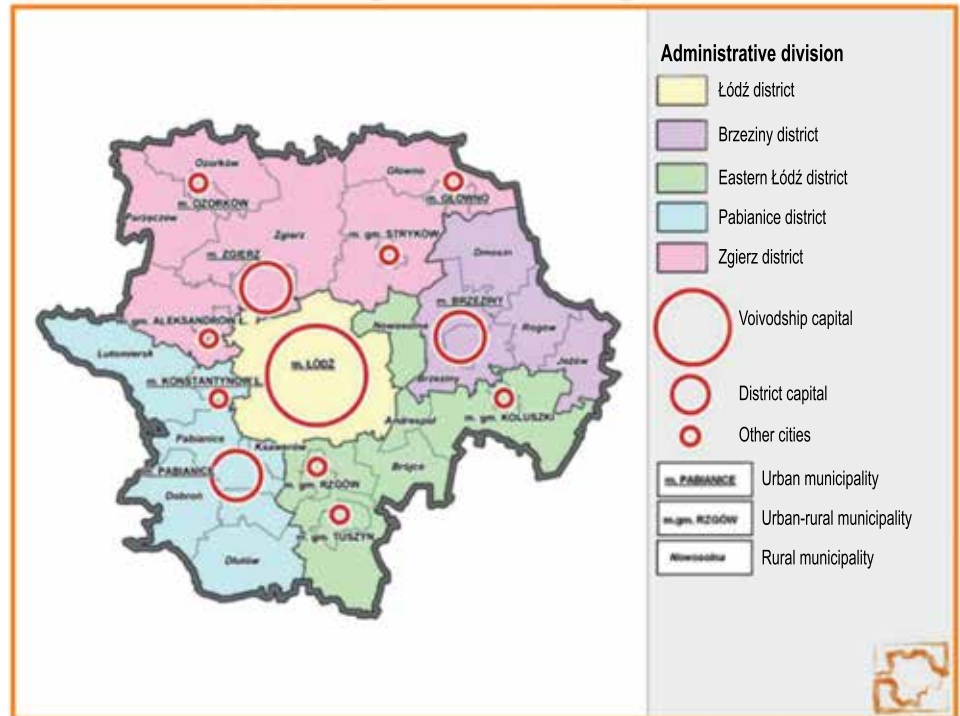


Fig. 5. Lodz Metropolitan Area [7]

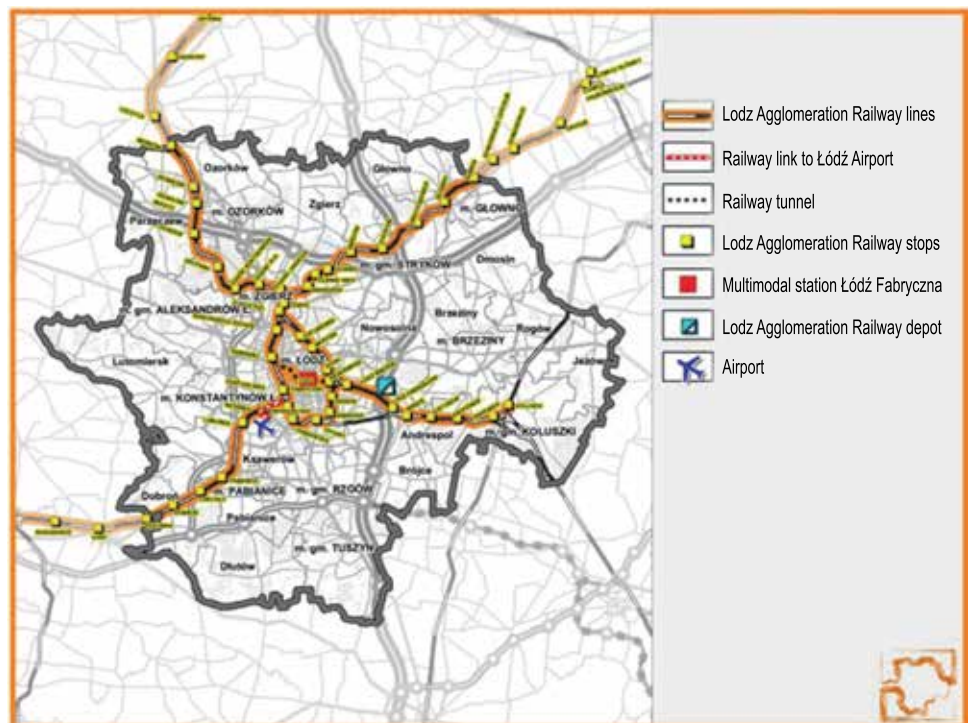


Fig. 6. Lodz Agglomeration System [7]



Fig. 7. Małopolska Karta Aglomeracyjna – validity are [5]

Legend

- Zone 0
- Zone I
- Zone II
- Zone III
- Other stops

Exception! Zone monthly tickets are valid also to Kraków Lotnisko station

Summary – current state and development prospects

Agglomeration railway systems in Poland are very diverse – in view of their integration to the city public transport level, origins, further development plans. Their boom and increasing market share are quite remote in time, but as far as the number of railway passengers in Poland continues to decline, number of agglomeration and regional passengers is growing.

According to the CER assessment, agglomeration railways, together with a further urbanization increase will become a main passenger transport market, competing with bus and car transport. CER, however, points to the fact that this transport will require further subsidies – both for investments and services – until all other means of transport costs become fully internalized. It is also desirable to have greater control and urban mobility planning in the longer term [9].

Agglomeration railways in Poland further development will require above all investments in multimodal transport – Park & Ride parking, further stops construction, feeder bus network integration, but also the integration of rail and urban transport – the construction of efficient interchanges. It will also require changes in transport organization which should decidedly decrease car traffic (especially older vehicles that do not meet the latest engine standards) and create pleasant streets and markets for cities inhabitants.

First and foremost, however, further development of the agglomeration railways will require a close coordination of transport policy activities so far separate on different transport organization levels. This will enable a full agglomeration railways potential by providing a coherent and reliable public transport with an offer fully competing with ever-growing car transport by providing door-to-door transport using all accessible new technologies – especially in IT communication.

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