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## CHANGES IN TRANSPORT SERVICES FOR THE KARTUZY POWIAT IN POLAND IN THE YEARS 1990–2023

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### Abstract

In many areas of Poland, areas of transport exclusion related to the lack of public transport service or insufficient offer are identified. After 1989, when Poland underwent political transformation and consequent economic transformation, funding for bus and rail transport collapsed. While rail transport experienced a significant regression in connections, regional bus transport can be said to have been completely eliminated. On the map of the whole of Poland, Kartuzy powiat is an exception, where the role of the carrier has been taken over by a private company which offers transport services at a level corresponding to demand, thus positively influencing the transport habits of the inhabitants. The article examines the change in the offer in bus and rail transport in Kartuzy powiat in the years 1990–2023 and shows that the private bus carrier performs tasks that should de facto rest with the state authorities.

### Key words

transport exclusion, railway, regional bus transport, private bus company, Kartuzy powiat.

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## 1. Introduction

Since the 1990s, there has been a regression in the use of buses to provide transport in the districts. The transport offer has been reduced in many cases, which translates into the transport exclusion of a part of the population living in rural areas and smaller towns. An alternative to this state of affairs is the example of the Kartuzy powiat (Pomeranian voivodeship), where a private entrepreneur organises transport services together with the local government at a much higher level than in

other areas in Poland. Thus, there is a need to study the phenomenon and analyse its functioning. The company in question is Przewozy Autobusowe GRYF sp. z o.o. sp.k. (GRYF).

The main research objective of this study is to determine the role of the company in the formation of transport in the Kartuzy powiat area and to check to what extent the services offered by GRYF are available to its residents and passengers. The study is theoretical and empirical in nature. The theoretical part is based on a review and presentation of the available literature on, among other things, network

development directions and transport policy. The empirical part consists, among other things, of the transport accessibility studies presented in chapter four.

The article presents the transport policy of Pomorskie Voivodeship, with particular emphasis on its elements related to the study area (Kartuzy powiat). Then, the current situation of Kartuzy powiat and its transport conditions were characterised. Thus, the period from 1990 to 2023 was examined in terms of rail and bus connections, which made it possible to present the changes that took place after the economic transformation in Poland. A key element of the article is the identification of the importance of the private transport company GRYF and its transport offer.

In the course of this study, publicly available academic articles, newspaper articles made available on websites, GRYF materials (including timetables, fare tariffs), historical timetables from online and archival resources and widely available information found on websites were used. The factual part concerning the company was also created with the help of an interview with its director of transport organisation and control, Mr Bartosz Milczarczyk. The prepared spatial analyses in the form of maps were prepared on the basis of completed BDOT10k data, data from Polskie Linie Kolejowe S.A. (polish railway infrastructure manager), the National Census 2021, and spatial data made available on the GRYF website. They were compiled using QGIS, ArcGIS Pro and the plug-in tool Network Analysis – Service Area, which generates isochrones of pedestrian access from given points.

The article successfully presented the changes in the functioning of public transport in Kartuzy powiat in the years 1990–2023. Thanks to archival and contemporary timetables, a data matrix was obtained which made it possible to show the regression of rail transport and the significantly improved situation in bus transport thanks to the activity of the private carrier GRYF.

## 2. Outline of transport policy in Pomorskie Voivodeship

The Pomeranian Voivodeship is the eighth largest in Poland. It is inhabited by more than 2.34 million people, of whom more than 1.48 million live in urban areas and are mostly people of working age (Rocznik Statystyczny..., 2021). Its main urban centres are: Tri-City Agglomeration (comprising, among others, Gdańsk, Sopot, Gdynia, Wejherowo and Kartuzy), Słupsk, Starogard Gdański, Pruszcz Gdański and

Tczew. Six modes of transport are currently used here to varying degrees. Road, rail and urban transport, together with the infrastructure, are particularly important in serving the daily needs of the residents. Inland waterway and maritime transport are more important for the transportation of goods, and air transport strengthens the region's relations with other cities in the country, as well as internationally for the exchange of tourists

A key point on the voivodeship's railway map is the Pomeranian Metropolitan Railway (PKM) line, which serves part of the tri-city metropolitan area. It is one of the most important transport projects of the Pomeranian Voivodeship local government in recent years. Its main objective was to provide transport within the Trójmiasto (Tricity, especially for the peripheral districts of Gdańsk and Gdynia and the connection to Gdańsk Rębiechowo airport), as well as from the hinterland of Pomerania (the Kościerzyna and Kartuzy powiats) through the creation of a completely new and use of the existing railway infrastructure (Pomorska Kolej Metropolitalna, 2023). The line has both an urban character - providing public transport between city districts - and a regional character, due to the numerous villages and towns served.

The presence of a PKM is strategic for the region. In addition to serving transport-excluded areas that were previously not served by public transport (or to a much lesser extent), the new stops can make the area economically more attractive through easier and quick access to new employees and potential customers. It competes with other modes of transport in the area, especially individual transport and companies offering passenger transport services by road. It also fits in with the concept of sustainability of the transport system by reducing the need to use cars in favour of public transport, walking and cycling (Kopeć, 2014). The project was put into operation in 2015. After a year of its operation, the first figures on the number of passengers transported indicated 2 million people. The following years saw further increases, with passenger numbers rising steadily (Pomorska Kolej Metropolitalna, 2023).

The PKM project is constantly being developed, with new investments being introduced and implemented. Until now, only diesel-powered vehicles have been able to run on the line, but from 2023 they are to be replaced by larger and faster electric trains, due to the electrification of part of the line (Pomorska Kolej Metropolitalna, 2023). Railway line 201 is also to be modernised (part of the PKM connection from Kościerzyna to Gdynia uses this route), where a second track and catenary network are to be built. Communication is to be discontinued

there, but in its place, the so-called Kartuzy bypass is to be created, which will use the modernised existing railway lines, in order to provide uninterrupted transport services for the inhabitants of the region, particularly the Kartuzy poviát (Pomorska Kolej Metropolitalna, 2023).

The company and the provincial authorities are continually analysing the needs of users and developing future-oriented expansion concepts. In December 2022, the Firoga stop was built and put into service, which is expected to relieve the airport in Rębiechowo of the service for IT workers based within the district (Pomorska Kolej Metropolitalna, 2023). A completely new railway line, named 'PKM Południe' (PKM South), is also planned. It is intended to provide transport for the southern districts of Gdansk, as well as villages lying completely outside its borders (pkm-poludnie.pl, 2023). The effect of such an expansion could be to increase PKM's revenue in a previously unserved area, which in the future could change the transport habits of the population there, as well as create competition for bus passenger transport companies.

However, the rail situation does not look as promising everywhere. On the other hand, in other parts of the voivodeship you will also find lines with only freight traffic, where passenger transport is not carried out, and in addition to these there are closed

and impassable lines, which are also impossible to use. Examples include the Kartuzy-Lębork connection or the Wejherowo-Lębork connection via Gniewino (Taylor, 2007). Currently, a large number of these have been completely decommissioned, and many localities have been cut off from the possibility of resuming connections in the future. The regression of the railway network also affected those places where the tracks had not been destroyed by external conditions, but where railway lines were closed to passenger traffic. Thus, the density of the passenger network in the province gradually decreased.

In Prussian times, railway lines covered the province much more densely than today (Fig. 1).

The use of rail transport and the reduction in the number of connections was also influenced by the simultaneous development of wheeled transport – individual and public transport. The 1980s saw further reductions in the length of lines in favour of car transport (Kalinski, 1995). A noticeable improvement in the quality of life, economic growth and increased availability of goods resulted in more cars on the roads, while interest in rail transport declined.

The situation is different in the case of bus transport, which does not need a specially created infrastructure for it. Its advantage is the possibility to travel on existing public roads. Transport by

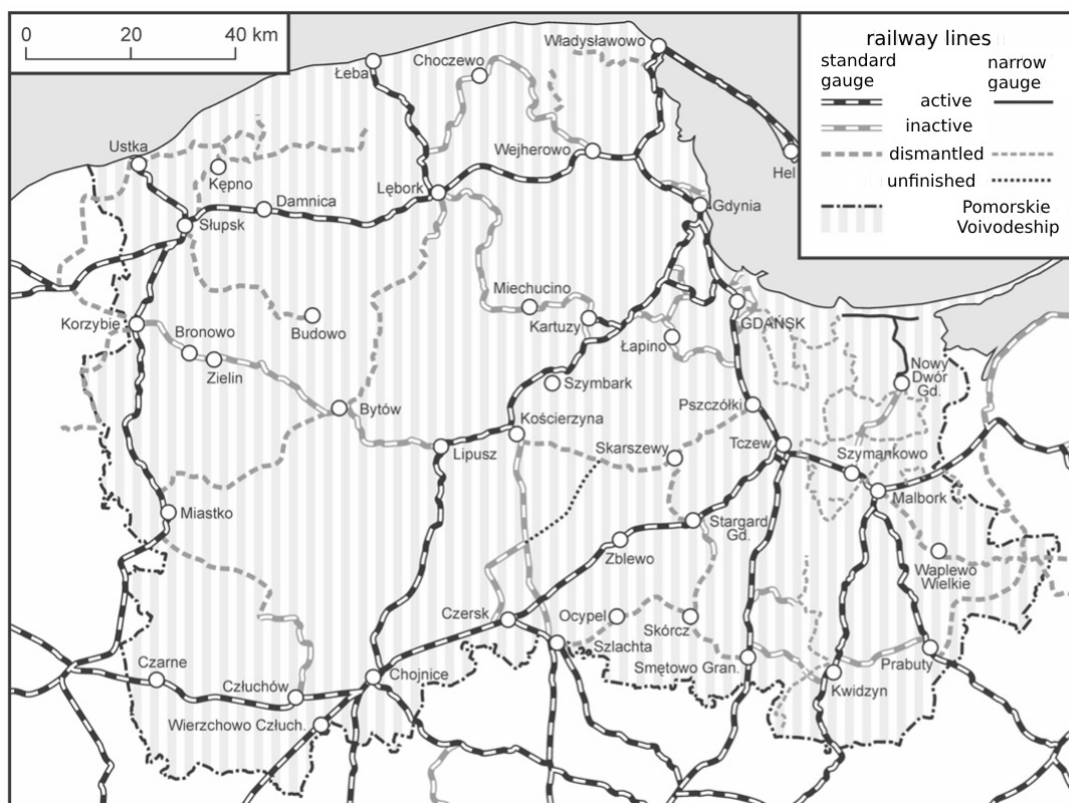


Fig. 1. Railway lines in the Pomeranian Voivodeship in 2021.

Source: D. Otta, 2021.

this mode of transport is characterised by greater accessibility and the number of possible connections, as well as places not served by rail. It was for this reason that the State Automobile Enterprise (PKS) was established in 1945, which played the role of the most important and largest passenger carrier for the decades of the People's Republic of Poland (PRL) (Taylor, Ciechański, 2017).

The services provided by this company steadily increased their spatial coverage and, with it, the annual increase in the number of passengers. Initially, these figures reached values in the order of a few million, but in the following years they improved by leaps and bounds. In the record year 1989, 2.5 billion people were transported by PKS buses across Poland (Taylor, Ciechanski, 2017). This illustrates the potential of the PKS company, and how many people relied on their daily services.

Transport in the Pomeranian Voivodeship has undergone many changes over the last century. At the end of the 20th century, due to the political changes in Poland and the Act on Municipal Self-Government, public transport, for which municipal governments had been responsible since the adoption of the resolution, was also restructured. In cities, provincial enterprises were communalised

in favour of their municipal counterparts. Subsequently, this mode of transport gradually began to decline for two reasons. The first is the political change of the state and the associated economic destabilisation, as well as changes in legislation. The most important one from the point of view of the functioning of State Motor Transport turned out to be the Act on Privatisation of State Enterprises (Ustawa o prywatyzacji przedsiębiorstw państwowych, 1990). The company was divided into 233 independent entities after the legislation came into force (Kaczorowski, 2019). Another reason was individual transport, which was becoming increasingly important and accessible to the citizen. Such impediments limited the further development of bus transport.

In the Pomeranian Voivodeship, too, PKS made urban and non-urban transport possible for many people. Currently, most of these companies no longer exist, and those that remain offer fewer connections than they once did. These include PKS Gdańsk, Gdynia, Słupsk, Elbląg and Bytów. In addition, there are other private carriers offering regional and city transport. The Office of the Marshal of Pomorskie Voivodeship reports that a total of 9 operators (Tab. 1) operated in 2021 (Sprawozdania..., 2023).

Tab. 1. Providing regional passenger transport services in 2021 in Pomorskie Voivodship.

1.	Przedsiębiorstwo Komunikacji Samochodowej w Bytowie S.A.
2.	Przedsiębiorstwo Usługowo Handlowe „LATOCHA” Tomasz Latocha
3.	PKS Gdynia Spółka Akcyjna
4.	Arriva Bus Transport Polska Spółka z o.o.
5.	NORD EXPRESS Sp. z o.o.
6.	Przewozy Autobusowe GRYF Sp. z o.o. Sp. komandytowa
7.	Przedsiębiorstwo Komunikacji Samochodowej Gdańsk Sp. z o.o.
8.	Przedsiębiorstwo Komunikacji Samochodowej Chojnice Sp. z o.o.
9.	Przedsiębiorstwo Komunikacji Samochodowej w Starogardzie Gdańskim S.A.

Source: Own elaboration based on Sprawozdania..., 2023, 2023.

### 3. Delimitation of the study area

Kartuzy powiat is located in the central part of Pomorskie Voivodeship, in the Kashubian Lake District. It borders with seven other counties: Gdynia, Gdańsk (Gdańsk), Gdańsk (Pruszcz Gdański), Kościerzyna, Bytów, Lębork and Wejherowo (Fig. 2). Its location is important in terms of communication with the Tricity. It has both road and rail access. Its central location also facilitates travel within the voivodeship.

Administratively, the area is divided into eight communes, six of which are rural (Przodkowo, Somonino, Stężyca, Sulęczyno, Sierakowice and Chmielno) and two are urban-rural (Kartuzy,

Żukowo). The capital of the county is Kartuzy, which together with Żukowo constitutes its only urban centre. Other more important localities are the seats of individual rural communes. According to the NTS-3 classification, the county is part of the Gdansk sub-region and the Gdansk-Sopot-Gdynia Metropolitan Area.

The Kashubian Lake District is the largest physical-geographical area in Pomorskie Voivodeship. Notwithstanding its proximity to the Baltic Sea and the fact that the region is part of the Pomeranian Lake District lowland, the altitude above sea level exceeds 200 metres. The surface relief occurring here is a result of the activity of glaciers, which is exemplified by the young glacial forms located in

the relief (ground moraines, terminal moraines, drumlins, sanders, extrusions, kames and trough lakes) (Mordawski, 2019). The varied relief of the surface also influences the delineation of pathways due to, for example, orographic barriers in the form of numerous hills or the distribution of lakes.

According to the Statistics Poland (GUS), the Kartuszy poviát's area of 1121 km<sup>2</sup> is inhabited by 139,397 people, i.e. a population density of 124

people per km<sup>2</sup>. 85% of the population live in rural areas, with as much as 59.7% of the population being of working age. The projected population by 2050 is 178,655 (Strategia 2030 Kartuszy), which is the result of a steady population influx and a high fertility rate. Kartuszy County is part of ethnic Kashubia and its linguistic centre, which means that historically it was settled by people who spoke the Kashubian language on a daily basis (Mordawski, 2019).

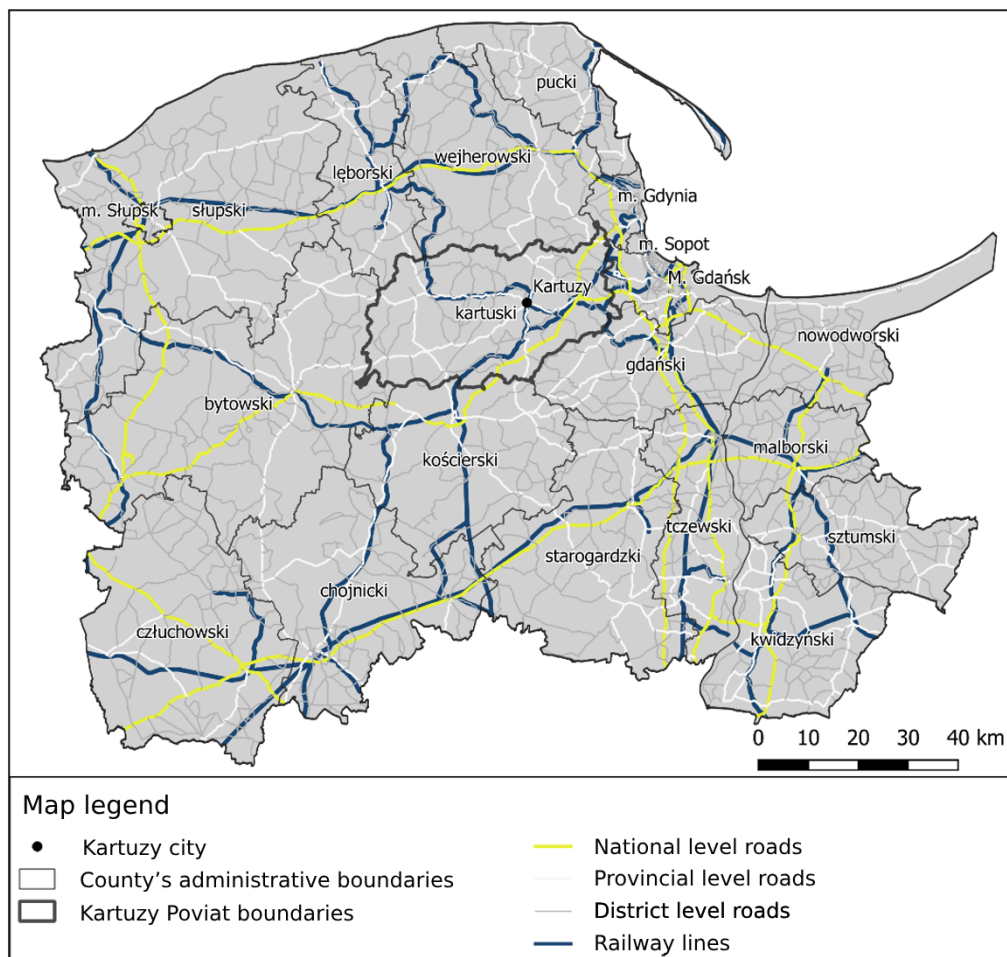


Fig. 2. Transport network in the Pomorskie Voivodeship.

Source: own elaboration.

#### 4. Transport network of the Kartuszy poviát

Within the county boundaries there are national, provincial, district and commune level roads. The DK20 (between Gdynia and Kościerzyna), the S7 (between Żukowo and Gdańsk) and the S6, which are located near the eastern border and connect large urban centres, are particularly important in national and regional transport. They provide optimal conditions for long-distance travel. At the same time, the DK20 and S7 are characterised by the highest intensity of road traffic, including public transport in the county (Plan Transportowy, 2015). Roads of provincial rank include: DW211, DW214,

DW218, DW224 and DW228. They provide an important link between the outermost parts of the county (especially the western side) and the capital. Fig. 3 shows the course of the indicated routes and their intersection in the vicinity of Kartuszy. They intersect all the county seats of the municipalities, thus creating inter-municipal connections. County roads constitute a numerous group of routes serving villages and areas distant from the main traffic routes.

Figure 3 shows the road and rail network within the administrative boundaries of Kartuszy poviát. On the basis of the BDOT10k database, four categories of urban and rural centres were distinguished according to population size.

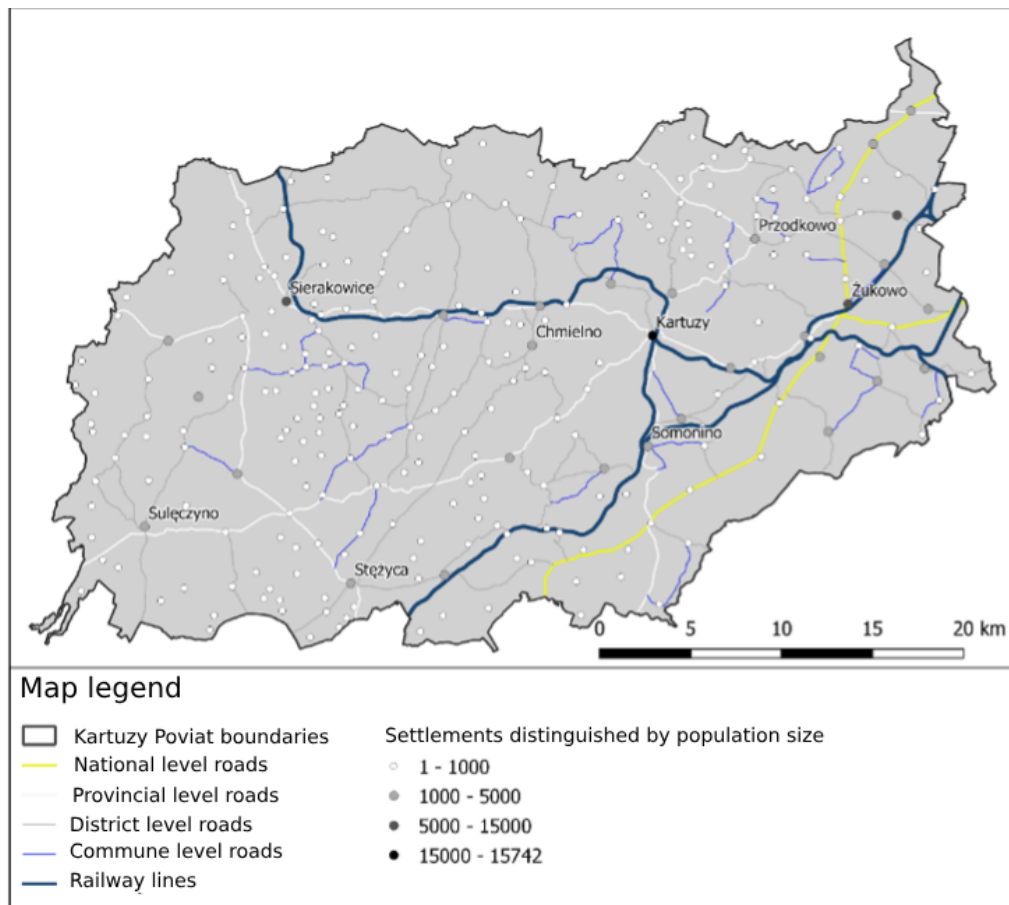


Fig. 3. Transport network of the Kartuzy poviát.

Source: own elaboration.

The lowest tier shows all settlements with a population of up to 1,000 inhabitants. This is the most numerous group, which is widely dispersed within the district boundaries. The second tier of 1,000–5,000 people, contains the larger villages that are concentrated along county roads. The third category includes the town of Żukowo, the seat of the rural commune of Sierakowice, and the village of Banino near the border with Gdańsk. These villages are located near railway lines. The city of Kartuzy is located in the centre of the county, where numerous roads and railway lines intersect. The capital of the county is inhabited by over 15,000 people.

The terrain has had a major influence on the routing of the existing routes, which is particularly noticeable when analysing the course of the county roads, which are routed along a number of trough lakes. Such conditions create constraints on their routing, resulting in longer distances and travel times.

The layout of the railway lines in many sections coincides with the location of the road routes. Such a relationship can be seen in line 229 and provincial roads numbers 211, 214, as well as line 201 and the DK20 road. They pass through the same towns or in close proximity to them. The Kartuzy poviát

Strategy 2030 (referred to as the Kartuzy Strategy in this chapter, Strategy 2030 Kartuzy) identifies the main objectives within the framework of economic and transport development. Included are efforts to improve the county's connections with the metropolis using road and rail transport, support for the expansion of the rail network (in connections from Kartuzy to Lębork, Sierakowice and Kościerzyna), increasing the frequency of the PKM, the development of the road network and the creation of an integrated public transport system throughout the county. Consideration was given to road expansion with the Kartuzy, Żukowo and Sierakowice bypasses, as well as the construction of the Tri-City Metropolitan Bypass and the development of the S6 route.

At Kartuzy poviát level, the organiser of public mass transport is the Kartuzy starost.

## 5. Changes in rail transport supply between 1990 and 2023

There are four railway lines in the Kartuzy poviát, numbered 201, 214, 229 and 234 (Fig. 4). The first of these serves the route from Gdynia to Kościerzyna

(terminating in Nowa Wieś Wielka). The second is a currently unused link between Somonin and Kartuzy with one intermediate station. Line 229 is a connection between Pruszcz Gdański and Łeba via Łębork and Kartuzy. Modernised on the Glinicz-Gdański Kokoszki section, part of the Kartuzy bypass. Line number 234 is a branch line towards Gdańsk via Gdańsk Kokoszki. Line 201, together with section 229 (Borkowo - Kartuzy), are the only active passenger rail links in the county.

Currently, the vast majority of the county is not served by rail. It is accessible to residents of the south-eastern part of the area, along the border of which there are regular services Kościerzyna-Gdynia

Główna and Kartuzy-Gdańsk Wrzeszcz. The area characterised by the weakest access to rail routes is the south-western part of the county, which has no such infrastructure, such as Sulęczyno and nearby rural areas.

Passengers using the PKM stops on the section from Rębiechowo to Borkowo in the municipality of Żukowo are in the most favourable situation, due to the fact that trains run more frequently. This is due to the divergence and separation of the line into two separate lines towards Kartuzy and Kościerzyna after Borkowo. At the other stops, the number of departures drops by about half.

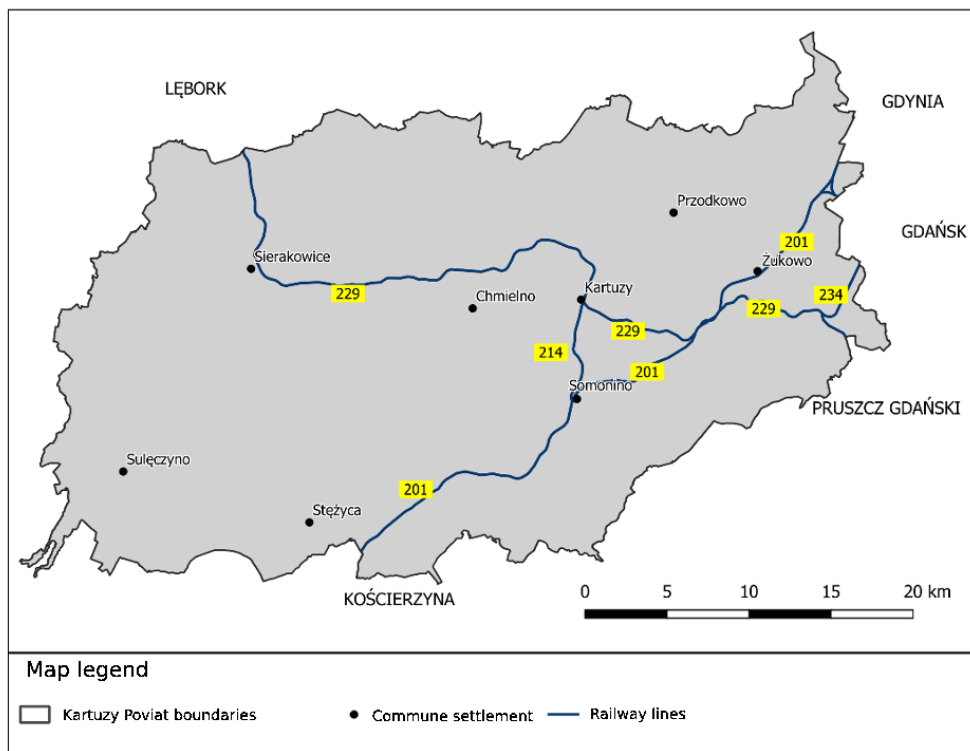


Fig. 4. Railway lines located within the boundaries of Kartuzy poviát.

Source: own elaboration.

Passengers are served at 14 stations and stops on line 201: Rębiechowo, Pępowo Kartuskie, Żukowo Wschodnie, Żukowo, Borkowo, Dzierżążno, Kartuzy, Babi Dół, Kiełpino Kartuskie, Somonino, Sławki, Wieżyca, Krzeszna and Gołubie Kaszubskie. There are also 13 out-of-service stations in the district, which are part of disused railway lines. These are Kamienica Królewska, Sierakowice, Mojusz, Miechucino, Reskowo, Garcz, Prokowo, Leszno Kartuskie, Żukowo Zachodnie, Otomino, Stara Piła, Niestępowo and Leżno (Railway Base – Stations, 2023). The number of all stations is 27. They pass through 4 villages of the municipal authorities (Kartuzy, Żukowo, Sierakowice and Somonino) and near Stężycza and Chmielno.

These conditions mean that the county has great potential for using railways as a means of public

transport over short and medium distances. Also important are the connections to the Tricity, for which the Kartuzy poviát is a labour and educational base.

Between 1990 and 2022, train running and line use have changed. In order to carry out the analysis, data from the National Railway Database, available online at [bazakolejowa.pl](http://bazakolejowa.pl), was used. The portal provides historical timetables in the form of photographs and digital tables.

The railway timetable for the 1989–1990 season was in force between the months of May of both years. Timetables for 2 connections were implemented then. The first connection Pruszcz Gdański-Kartuzy-Łębork was on line 229. According to the table numbered 441, at Kartuzy station in the

direction of Lębork the daily number of arrivals was 13 and departures 11. Passenger traffic was carried out around the clock, both in the early morning and late evening. In the direction of Pruszcz Gdański, the frequency of arrivals and departures remained at a similar level, with the number of arrivals and departures being 12 and 14 respectively. The station functioned both as a departure, terminal and intermediate station. Connections were offered on the length from Lębork to Pruszcz Gdański, but also on shorter distances, for example from Stara Piła to Kartuzy.

The second connection operated on line 214 was Kartuzy-Somonino (Railway Depot 446, 1990), which

is listed under the number 446 in the source table. Despite the relatively short distance between the start and end stations for a railway, a high number of connections was achieved. At the time, 17 passenger trains arrived at Kartuzy station and 15 departed. This indicates a higher number of connections than in the case of the relationship on line 229. The only intermediate station in this relationship is Leszno Kartuskie, and the journey between the start and end of the relationship is less than 15 minutes.

Summary data on the number of rail passenger services from Kartuzy station are shown in Table 2. A total of 42 arrivals and 40 departures were made.

Tab. 2. Number of passenger train journeys from Kartuzy station in 1990.

Direction	Lębork	Pruszcz Gdański	Somonino	Total
Arrivals	13	12	17	42
Departures	11	14	15	40
				82

Source: Own elaboration.

The next timetable analysed was in force in 2000. As a decade earlier, 2 connections were operated here on lines 229 and 214. The Kartuzy-Lębork railway connection was a variant of the relationship, which a decade earlier also reached Pruszcz Gdański as the starting station. During this period, the length of the connection and the extent of the line's operation were reduced, thus depriving the county's residents of transport to the east of its capital. The frequency of the service also changed. It was now possible to travel from Kartuzy to Lębork six times a day. The same figure applies in the reverse direction. The network of connections was significantly

restructured and, among other things, extremely early and late hours were removed, as well as many during the day.

The pre-existing Kartuzy-Somonino connection was also in place in 2000. At that time, 12 arrivals and departures each were made. Compared to the beginning of the previous decade, there was also a reduction in train services here (Table 3). The sum of all incoming and outgoing connections from Kartuzy is 36, and this is a significant decrease compared to the previous period.

In 2010, there was no timetable for passenger trains in Kartuzy. There were no connections from previous years towards Somonino and Lębork.

Tab. 3. Number of passenger train journeys from Kartuzy station in 2000.

Direction	Lębork	Somonino	Total
Arrivals	6	12	18
Departures	6	12	18
			36

Source: Own elaboration.

In 2023, Kartuzy had direct passenger connections to Gdańsk Wrzeszcz station. The connection was made possible by the PKM project, and the Pomeranian Voivodeship Self-Government was responsible for establishing the transport offer. The connection uses line 229, and then near the village of Gliniec (before Borkowo station) it changes to number 201. This connection provides access for passengers from Kartuzy to previously un-served villages in the county, as well as more efficient access to the Tricity.

There were also journeys to Gdynia Główna, which were an extended variant of the previous connection. They run only at the earliest hours in the morning and the latest in the evening. In total, 17 trains arrive and depart from here daily (Tab. 4). In future, due to the renovation and electrification of line 201, the route from Kartuzy towards Gdańsk and Gdynia is to be routed using the Kartuzy bypass, which will re-use lines 229 and 234, which have been out of use since 2010.



Tab. 4. Number of passenger train journeys from Kartuzy station in 2023.

Direction	Gdańsk Wrzeszcz	Gdynia Główna	Total
Arrivals	6	12	18
Departures	6	12	18
			36

Source: Own elaboration.

During the period under review, changes can be observed in the rail service to the district capital and the region in which it is located. Among the most important of these is the frequency of connections. The highest was recorded in the 1990s, when a total of 82 arrivals and departures were recorded. The next decade saw a reduction in this number, as well as in the direction of travel, to completely abandon public transport in this form in 2010. It was not until the PKM project involving the modernisation of the line that communication from Kartuzy railway station was restored after many years.

Directions that were once used were completely abandoned in favour of new connections to Gdańsk and Gdynia. The once-frequent trains from Somonino have ceased to function, and the 15-minute journey to Kartuzy has lengthened by an hour and forces passengers to change trains. One can also notice a completely different approach in current railway policy, which has moved away from connecting the county with its capital to the provincial capital, where Kartuzy residents find employment. The decommissioning of line 229 has made it difficult for people living in the extreme eastern and western areas of Kartuzy powiat to reach its centre, forcing them to use other means of transport.

The rail network has great potential due to the routes established in the past, the infrastructure in place and the continuously developing PKM. It ensures that passengers can reach towns and cities many kilometres away in a short space of time. It significantly improves the county's communication with the Tricity, but can also be used for intra-county travel.

## 6. Changes in regional bus transport supply between 1990 and 2023

At present, regular public bus transport in the Kartuzy powiat is run by three carriers: the GRYF company, ALBATROS Mieczysław Tryba and the Municipal Enterprise. Such services used to be run by PKS (old national company). The remainder of this section presents the results of a comparison between bus services operated by the then PKS and the current GRYF transport offer (GRYF Trasownik, 2022). The archival data refers to the acquired timetables for

1991/1992 for Kartuzy with the following table numbers: 170, 7595, 8011, 8013, 8015, 8048, 8050 and 8051. The GRYF timetables are current as of December 2022. The study is intended to visualise changes in bus frequencies between the capital of Kartuzy powiat and the centres of the seats of the municipalities within its boundaries.

The main problem that emerged while conducting the study was the lack of a publicly available database for PKS timetables for the Kartuzy powiat area. In the case of Chapter 5, rail timetables are made available on the [bazakolejowa.pl](http://bazakolejowa.pl) website. There is no bus equivalent of the online archive. The data on which this subsection is based comes from a private collection provided courtesy of Dr. Ariel Ciechański. The timetables provide an overview of the bus services present in 1991/1992 and their routes.

The analysed archive tables include journeys on routes covering Gdańsk, Gdynia, Kartuzy, Sierakowice, Sulęcyno, Słupsk, Lębork, Bytów and Szczecinek, as well as smaller towns in between. Buses ran daily from early morning to late evening. Information on the number of courses from and to the bus station in Kartuzy is given in Table 5.

The results show that in the case of the analysed bus timetables, there are no courses to Somonino. Thus, only 6 of the 7 seats of municipalities belonging to Kartuzy County are served. The reason why there was no bus service on the Kartuzy-Somonino relation at that time may be due to the existing railway connection, described in the previous subsection. The number of courses for the remaining relations is uneven and ranges from a dozen to several dozen per day (exception – Sierakowice).

The highest number of possible connections was recorded for Żukowo and Przodkowo, which is related to the fact that the route to Gdańsk and Gdynia was routed through these towns. This demonstrates the high interest in this route and at the same time translates into increased accessibility to these towns from Kartuzy. 53 buses a day passed through Żukowo in both directions, and 48 to Przodkowo and 43 return.

The smallest number of journeys is recorded by Chmielno (11 each in both directions), and Sierakowice, for which there were 9 arrivals and 14

Tab. 5. Number of bus routes from Kartuzy railway station in 1991.

Direction	Żukowo	Przodkowo	Sulęcyno	Sierakowice	Chmielno	Stężycza	Total
Arrivals	53	48	18	9	11	14	153
Departures	53	43	21	14	11	14	156
							309

Source: Own elaboration.

departures from Kartuzy respectively. There were 18 buses from Sulęcyno against 21 returns. Stężycza, like Chmielno, has 14 possible connections each during the day.

An inconsistency in the number of arrivals was observed for some relations. The solution to this discrepancy can be found in the different return routes of the buses. A total of 153 arrivals were recorded in Kartuzy from the county boroughs, compared to 156 departing from the capital. The

sum of these records results in 309 buses passing through Kartuzy every day.

For the current routes, the data was obtained from the GRYF website. There are 12 bus lines serving connections from Kartuzy to the seats of municipalities in the district, these are lines numbered: 2, 3, 4, 7, 8, 11, 12, 13, 14, 801, 806 and 810. The connections offered for weekdays from Monday to Friday were taken into account. A summary of the results is presented in Table 6.

Tab. 6. Number of bus routes from Kartuzy railway station in 2022/2023.

Direction	Żukowo	Przodkowo	Sulęcyno	Sierakowice	Chmielno	Stężycza	Somonino	Total
Arrivals	23	26	15	32	10	3	12	121
Departures	22	25	18	34	12	3	18	132
								253

Source: Own elaboration.

In 2022, bus services are offered to each of the county's municipal seats, including Somonino, which did not have one in 1991. There is also a decline in the number of journeys to particular destinations, as well as a change in the best accessible towns. In the 1991 timetable it was Żukowo, while today it is Sierakowice.

Sierakowice is in the best situation, with as many as 32 arrivals and 34 departures from Kartuzy. Thus, one can see a change in the rank of this centre as a destination point for transport and thus an improvement in its accessibility. On the other side is Stężycza, for which only 3 buses a day to and from Kartuzy were provided. The transport accessibility to this village has therefore been significantly reduced compared to 1991. The connections to the aforementioned Żukowo and Przodkowo have also been reduced by around 30 and 20 buses. For Somonino, Sulęcyno and Chmielno a dozen or so courses each were provided. There were 121 arrivals in Kartuzy from other municipalities and 132 departures. In total, the number of total journeys for 2022 is 253, which is 56 fewer than before.

The difference between the historical connections and the current ones is evident not only in the number of connections to the individual seats of the municipalities, but also in the length of the entire

route. Bus lines were run over much longer distances than at present. Buses were available that stopped in larger villages on their way to distant cities such as Gdańsk, Gdynia, Słupsk, Kościerzyna, Lębork, Bytów or Miastko. Passengers had the option of making journeys to neighbouring counties, as well as those outside the Pomorskie Voivodeship. The results of the differences in the number of journeys were visualised in the form of two maps (Fig. 5).

## 7. Summary

The aim of the study was to determine the changes that have taken place in the transport service of Kartuzy powiat in the years 1990-2023 and to identify the role in shaping the public transport of Kartuzy powiat by the private bus operator GRYF. As a result of the research, it was possible to establish that the company is important for the transport service of the inhabitants and that its offer contributes to reducing and counteracting transport exclusion. The services offered are to a large extent economically and temporally accessible to the district's residents.

First part of the study introduced the current transport and spatial policy of the Pomeranian Voivodeship and provides the context for the

study. It shows that the voivodeship has adequate documentation and vision for the development of infrastructure, and upcoming investments are about improving the road and rail situation. After 1944, the railways underwent drastic changes and reductions, while after Poland's system change, which resulted in economic transformation, PKS went bankrupt, and with it dozens of bus routes. The current authorities are aware of the problem, hence the legislation of strategic documents and investments treating public transport. Despite this, there are also a number of functional deficits that effectively limit the use of public urban and regional transport.

The second part focused strictly on the Kartuzy powiat area informs about its location and

conditions of its functioning and characterises the existing transport network. It is well developed only in the relations between the Tri-City and Kartuzy and Kościerzyna, in other areas it presents a worse standard or very poor condition, as in the case of disused railway lines. Historical and current railway and bus timetables were analysed. The period studied, 1990–2023, for rail traffic presents a significant decline in the number of train services, as well as a change in the routes served. The situation is less dramatic for bus traffic in the county. It has also been reduced but, through the GRYF company, continues to play an exceptionally large role in establishing local and regional transport by sustaining many bus relations.

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