

Analysis of the Impact of City Transport on Life Quality in the City of Szczecin

Karolina Kaśkosz

Maritime University of Szczecin, 70-500, Poland

Abstract: This paper looks at public transport in the city of Szczecin. In the recent years, new means of transport have been offered by both external companies and the city. Many city inhabitants have swapped buses for city bikes, scooters and electric scooters available in large cities. A questionnaire survey has been designed to examine the public opinion on the best transport services offered by external companies and whether life quality in the city has improved owing to a wide offering of means of public transport. The paper aims at an analysis and assessment of the city transport services offered and how they influence the quality of life in the city of Szczecin.

Key words: Passenger transport, transport system, city, life quality.

1. Introduction

Many modern cities are highly congested due to the constant need of movement. Alternative means of transport being introduced, such as bicycles or scooters, are aimed at preventing traffic congestion. They occupy less space on the road lane, and in some cities/areas special lanes or paths have been created for them. Due to high traffic congestion, especially in the rush hours, inhabitants of large cities swap their private cars for public transport, including city transport. This choice is also dictated by a number of other benefits, such as social integration, getting to know other cultures and customs, the development of local tourism, reduction of barriers to the mobility of population, an increasing trend in delimitation of cities through new housing developments, and the development of business tourism [1]. However, a number of factors, such as bad weather conditions, delays, low comfort standards, lack of adjustments for people with disabilities or poor layout of bus or tram stops and hire stations, make the quality of public transportation service unsatisfactory

to a large group of users [2]. In order to improve the comfort of city transport, the authorities of the city of Szczecin launched a campaign to introduce new means of public transport that meet the expectations of all users and are available within the city and its surroundings.

City public transport is related to a daily process involving most of the society, typically administered by a self-government authority responsible for its organisation [3]. Obviously, an alternative to city transport is services offered by external entities, such as Uber, Bolt, or EcoShare.

Regardless of the wide choice of means of transport, each city should develop a reliable transport system, structured in consideration of many determinant factors, such as [4]:

- environmental—the impact of transport processes on the natural environment,
- social—the city as a social system,
- economic—related to the regional and national economy,
- spatial—encompassing all urban areas which constitute common assets of the city, and
- infrastructural—taking into consideration all the city infrastructure.

Corresponding author: Karolina Kaśkosz, Eng., research fields: city logistics and city transport.

Depending on the specific character of the region, various determinant factors are taken into consideration in different parts of the world. For example, in African countries, decisions concerning public transport are driven mainly by the environmental factors, whereas in Europe, economic and transport-related factors are given more consideration [5]. In order to achieve high quality of transport services, special attention should be paid to the city's infrastructure, and in particular, to the components of city transport which shape the flow of traffic and the city's logistics infrastructure. This group of objects includes [6]:

- streets and other objects which shape the organisation of road and pedestrian traffic,
- underground, rail and tram tracks,
- overhead power network for the underground trains, trams and trolley buses,
- electricity substations,
- railway/underground stations and bus/tram stops,
- car parks,
- bus and tram depots,
- garages for passenger cars, vans and heavy goods vehicles, located outside street zones,
- loading bays.

City transport is the driving force behind the development of cities. Providing fast and comfortable means of transport, it contributes to the improvement

of life quality in cities [7]. Reliable and punctual public transport, provided both by the city and by external companies, meets the expectations of users and contributes to an increase in their numbers. However, frequent delays and failures cause irritation and reluctance, resulting in decreasing numbers of public transport users [8].

2. Method and Materials

In the recent years, the city of Szczecin has seen a lot of development of the city infrastructure and replacement of outdated means of public transport. Taking into consideration the modern requirements of mobility, public transport is divided into individual and collective [9]. Many private companies have entered the transport market in Szczecin with an offering of modern and competitive types of transport services.

The city transport in Szczecin, under analysis in this paper, offers busses, trams and trains (see Fig. 1, marked in red, blue and black, respectively), which complement one another creating a coherent city transport system.

Apart from the means of public transport offered by the city, there are a number of taxi companies operating in Szczecin, such as Taxi Szczecin, City Taxi, Radio Taxi, or Taxi 4 You. Uber is also present on the local market, offering the transport of both passengers and

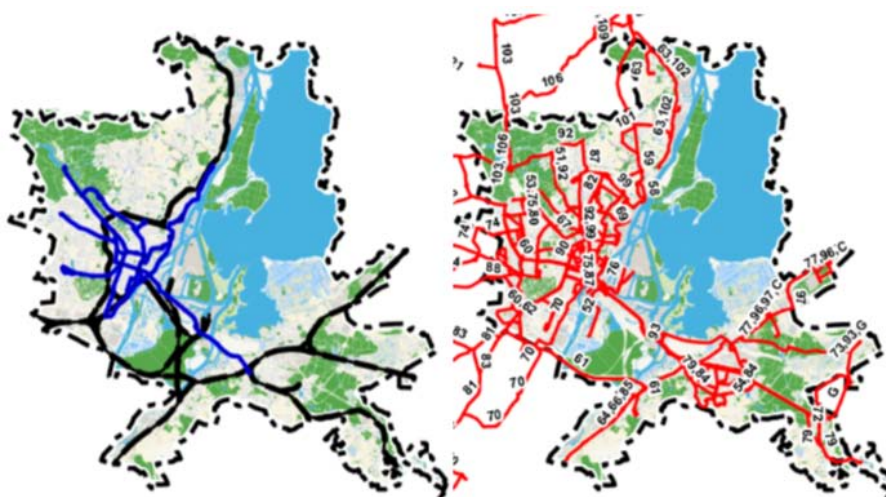


Fig. 1 City transport in Szczecin.

cargo, as well as a fleet of bicycles and scooters for rent, operating under the brand name Lime. Another external company gaining popularity is Bolt, offering taxi services and electric scooters for rent. An analysis of the offering of all the companies operating on the local market will give an image of the quality of transport services in Szczecin and the resulting life quality in the city. The research, aimed at assessing the impact of the city passenger transport on life quality in the city of Szczecin, has been designed as a questionnaire survey. The respondents have been requested to answer a number of questions concerning their transport preferences and how transport influences the daily life in the city of Szczecin.

3. Results and Discussions

The survey has been conducted on a sample of 147 city inhabitants. The results, shown in Table 1, have provided data on the most commonly chosen means of city transport and how they influence the quality of life in the city.

From the point of view of the respondents, the city passenger transport services have a positive impact on life quality in Szczecin. Most of the respondents are at the age of 21-40, i.e., belong to the most mobile group of the population who lead the most active life. Most of them prefer public transport services, especially

trams. They have also noted that access to such means of transport as the bicycle or electric scooter is impeded. Regardless of the overall high assessment of life quality in Szczecin, a half of the respondents are of the opinion that the transport services offered do not satisfactorily meet the needs of the inhabitants.

4. In-Depth Analysis

In order to find the reasons for which the transport services offered in Szczecin do not fully meet the inhabitants' expectations, an in-depth analysis is required of both the means of transport and the city road infrastructure.

According to the data of the General Directorate of National Roads and Motorways, there are 119.3 km of national roads in the region of Szczecin [10]. A detailed list of the roads is shown in Fig. 2 below.

According to the data of the Central Statistical Office for 2020, the municipality of Szczecin has 431.9 km of surface roads, 48.6 km of dirt roads and 148.6 km of cycle paths. The city also offers two Park&Ride car parks, which enable the inhabitants to use multimodal transport [11]. At present, many city regions undergo major road refurbishment works which cause necessary changes in the timetables and restricted access to certain locations (Fig. 3).

Table 1 Results of the questionnaire survey.

Questions	Majority of answers
Age	21 to 40 years (78.9%)
Education	Secondary (61.2%)
What type of city transport do you prefer?	Public transport (76.2%)
What type of city transport offered in Szczecin do you use the most?	Tram (53.7%)
On a scale of 1 to 5, how do you assess the quality of city transport?	4—Good (47.6%)
Have you ever witnessed a breakdown of a public bus/tram/train while using the service?	No (51.7%)
On a scale of 1 to 5, how satisfied are you with the city transport service?	4—Satisfied (46.9%)
On a scale of 1 to 5, how satisfied are you with the transport services offered by external companies (Uber, Bolt, PANEK)?	4—Satisfied (57.3%)
Is there a type of transport service not easily available?	No (40.1%) Bicycle (28.6%) Electric scooter (26.5%)
Are you bothered by noise generated by the operation of means of transport?	No (63.3%)
In your opinion, do the transport services offered in Szczecin meet the needs of the inhabitants?	No (49%)
On a scale of 1 to 5, how do the transport services influence life quality in Szczecin?	4—Good (51.7%)

Region	Road number	Length [km]
Szczecin	3	27,9
	6	25,2
	10	8,1
	13	10,9
	31	47,1
	Total in the region	119,3

Fig. 2 List of roads in the region of Szczecin.



Fig. 3 Road refurbishment works at the Rodla Square in Szczecin (15.02.2022).

The determinant factors mentioned above, which shape the transport system, can be used as a basis for an overall assessment of operation of the transport system (collective and individual). An assessment of adjustment of the transport system to users' needs has been made for 2013 and 2015. It results from the study that the user satisfaction index for the collective transport fell within the two years, with 68% of the respondents expressing an opinion that the system of collective transport does not meet the users' needs or meets them to a certain extent only. Individual transport, on the other hand, gained 4.6% in the

satisfaction index within the same period [12]. Based on a questionnaire survey in February 2022, 76.2% of the population prefer using the city transport, in spite of a better service quality offered by external companies, whereas more than 65% are of an opinion that transport services in Szczecin have a boosting effect on life quality in Szczecin. The results might have been affected by the fact that the most numerous group of respondents are young people at the age of 21-40.

5. Conclusions

Mobility is one of the key qualities characterising the functioning of any society. New opportunities are created to boost the quality of transport services. As a polycentric city, Szczecin is characterised by a specific system of transport. On the basis of the questionnaire survey discussed above, conducted on a sample of Szczecin's inhabitants and other users of its transport system, the following conclusions can be drawn:

- The transport services offered in Szczecin, especially those rendered by external companies, are characterised by a high service quality.
- In spite of the fact that quality of the services provided by external companies is assessed better than that of the city transport, most of the population use city transport more often.
- The most commonly used means of transport is the tram, chosen by 53.7% of the respondents.
- In spite of a wide selection of transport services, noise generated by the operation of means of transport does not bother 63% of the respondents.
- In spite of a high satisfaction level regarding transport services, the transport services in Szczecin do not fully satisfy the needs of 49% of the respondents.
- Szczecin has been taking steps to modernise its transport services, such as refurbishment of roads and bus/tram stops as well as replacement of outdated means of transport with modern models.

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