

The Urban Transport Strategy on the Example of the City Bike System in the City of Lublin in Relation to the Covid-19 Pandemic

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Abstract: The city bike system is now an increasingly popular form of communication. In practice, it has become a complement to the public transport system in large cities, and above all in the most crowded city centers. Importantly, the solution, which is a city bike, can contribute to the reduction of urban congestion, air pollution and to the reduction of noise levels. The paper discusses the issue of city bike system functioning in terms of meeting the transport needs in the area of the city of Lublin. The aim of the work is to describe the city bike system and to indicate the conditions for choosing this means of transport among the inhabitants of the Lublin region. A survey conducted among respondents in 2020 was used. The paper presents own research results and expectations of potential users of this system in the context of displacements, as well as the impact of the Covid-19 pandemic on the system functioning in 2020, and the strategy for operating this industry.

Keywords: City logistics, public transport, bicycle rental, covid-19, transport strategy

1. Introduction

Public passenger transport is considered an instrument of the state social policy [1]. Public transport is implemented in order to meet the transport needs of people, especially vulnerable groups, pupils, students and pensioners, as well as employees [2]. However, urban transport is not the only form of travel. Every year, the environmental awareness of city dwellers increases, which prompts them to use alternative forms of travel, such as bicycle transport or the increasingly popular scooters, and walking. One of the possibilities of sustainable transport is non-motorized bicycle transport or the inclusion of bicycles in urban transport [3,4]. For the inhabitants of many cities, bicycles have become daily means of transport around the city as well as more frequently chosen means of transport. In fact,

they are used not only for tourist and recreational purposes, but also as important means of everyday transport related to commuting to work, school or university. Moreover, the use of bicycles is more and more often confirmed by provisions in various documents of integrated programs and implemented spatial development programs. It is worth emphasizing that the city bike as such is increasingly perceived as an alternative to car traffic and public transport in urban areas. Various aspects of bicycle use can be found in the literature [5-24], including city transport strategies [5-12], health benefits [13-15], transport infrastructure [16-21] and others [22-24].

The paper presents functioning of the city bike system in Lublin, located in the south-eastern Poland. Basic information about this system, user opinions and development prospects are also presented. The analysis covers statistical data from 2014-2020 on operating the city bike system in Lublin. An additional aspect discussed in this paper is the epidemic situation in the country, which visibly affected many entities, including city bike system functioning in Lublin in 2020.

2. City Bike as an Element of the Transport System in Polish Cities

In Poland, the city bike system functions from year to year to an increasing extent and in an increasing number of cities and communes. The list of entities in Poland includes many public bicycle rental systems operating in the largest cities and agglomerations of Poland. The exception to that is the year 2020 and the current epidemic situation caused by Covid-19. In May 2018, the city bike system operated in 56 cities, counties and communes. It had 1,774 bicycle stations with access to approximately 18,004 bikes. In 2018, the bicycle rental network in Poland was enriched with 24 systems with 260 stations and 2,283 bikes.

The longest functioning city bike system is the Krakow Wavelo system, which was launched in 2008. The leader in the provision and operation of self-service city bike rentals is a bicycle system licensed by Nextbike GmbH. It has been providing services in this area all over the world since 2004. This entity is present on 4 continents in 25 countries and over 150 cities around the world with a fleet of approx. 40,000 bicycles. The bicycle rental system operates, among others, in: Germany, Austria, Switzerland, Turkey, Cyprus, the United Arab Emirates, Croatia, Azerbaijan, Latvia, New Zealand, the United States, the United Kingdom, Hungary, Slovakia, the Czech Republic and Bulgaria. Access to the maintenance-free bicycle rental is possible 24 hours a day, 7 days a week, from early spring to late autumn. The fee for using a bicycle varies according to local tariffs, while its amount depends on the amount of co-financing of local administrative entities.

Nextbike GmbH has been operating in Poland since 2011. The largest available self-service rental system is the Warsaw Veturilo system with over 300 stations and over 5,000 bikes (being the fifth largest system in Europe). The operators of other city bike systems in Poland are: BikeU, Roovee, Acro Bike, Blinkee, Comdrev, GeoVelo and Romet Rental Systems. In Poland, in 2018 Nextbike

operated in 39 rental systems, having 1,345 bicycle stations and providing access to 14,769 bicycles [25].

3. Identification of the Basic Expectations of Passengers in Terms of Transport Infrastructure

When designing the space for individual elements of the bicycle infrastructure, five main principles should be taken into account [26]:

- cohesion – the bicycle infrastructure should form a coherent whole and connect most sources and goals of traffic in the city,
- directness – the bicycle infrastructure should provide users with the shortest possible connections, enabling them to quickly move around the city, in a way that is competitive to cars,
- attractiveness – the bicycle infrastructure should meet the needs of users, be adapted to the surroundings and be well related to the functions of the city,
- safety – the bicycle infrastructure should guarantee road traffic safety, both for cyclists and other road users,
- comfort – the bicycle infrastructure should ensure a comfortable bicycle ride thanks to the application of high standards of design, execution and operation.

In addition, individual elements of the bicycle infrastructure should be designed and implemented in the city space based on design standards prepared by entities authorized to do so in a given city and then approved by public administration entities. By analyzing the available solutions in the field of transport infrastructure for cyclists, it was decided to check how the past and present elements of infrastructure and organizational solutions have been assessed by people traveling by bike.

4. Data and Methods

The aim of the paper is to describe the ways of traveling by various means of transport, with particular emphasis on city bikes, and to indicate determinants of selecting this means of transport among the inhabitants of the Lublin region. The aim is also to determine the communication behavior, advantages and disadvantages, as well as the reasons that affect the choice of the above-mentioned method of moving for the inhabitants of the Lublin region.

To achieve the set goal, in 2020, own research was carried out using the proprietary questionnaire. The variables grouping the respondents included gender and various age groups.

The respondents were asked, among others, about such issues as:

- means of movement,
- the purpose for which they use city bikes as a way of getting around,
- reasons why they choose city bikes as a way of getting around.

The work covers the characteristics of the following theoretical issues:

- the conditions of the communication infrastructure of the city of Lublin,
- the conditions of the bicycle infrastructure (including the strategic goal and specific goals for the development of this area),
- advantages and disadvantages of the bicycle infrastructure.
- own research in terms of determining the predispositions of choosing a city bike by the inhabitants of the Lublin region.

5. Results and Discussion

The research subject comprised an analysis of the communication behavior of the inhabitants of the Lublin region in the area of using city bikes. The main assumption was to show the factors determining the choice of a specific means of communication.

The research was conducted on the basis of questionnaires completed by their respondents. In order to achieve the aim of the work, a questionnaire study was performed based on the created questionnaire. The applied research method made it possible to easily obtain an appropriate data set and carry out its analysis. The respondents represented various age groups and gender. The total of 140 people took part in the survey. Their answers to the questions included in the questionnaire form were the basis for developing the research results presented in the following part of the work and their analysis.

Among the respondents, the vast majority indicated car (89 people) as a daily movement means, 32 people indicated bus, and 13 people indicated other means of transport (Figure 1). Only a few respondents travel by bike or on foot. The obtained data clearly show that among people who have their own car, it is the most common means of transport of first choice (it was indicated most often in the survey) (Figure 1).

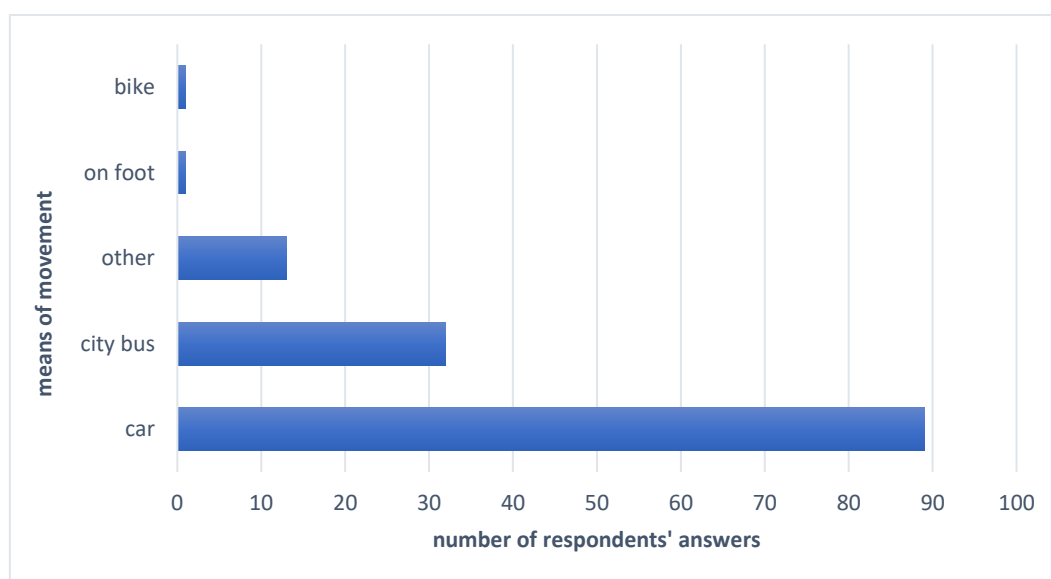


Fig. 1 The manner of moving declared by the respondents. Source: authors

The relatively large number of respondents who indicated the answer that they quite often travel on foot or take the bus is also noteworthy. Occasionally, a large number of respondents travel with someone as a passenger, on foot, while such forms of transport as bicycle (own and from city rentals) and a taxi recorded the highest percentage in relation to the "never" option.

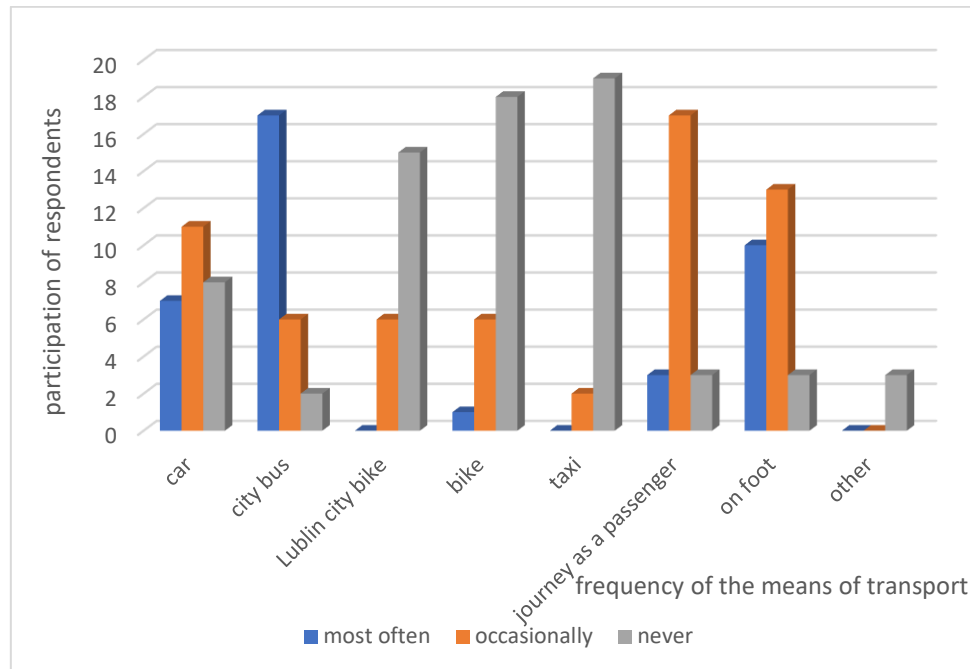


Fig. 2 Choice of means of communication by people who do not have their own car. Source: authors

On the other hand, the results from the second group show great popularity of public transport, shared rides by a passenger car not belonging to the respondents and also walking (on foot). One should pay attention to quite a large number of answers marked "car", which possibly suggests driving company cars. A lot of respondents indicated the fact that they do not use commuting by bicycle and taxi.

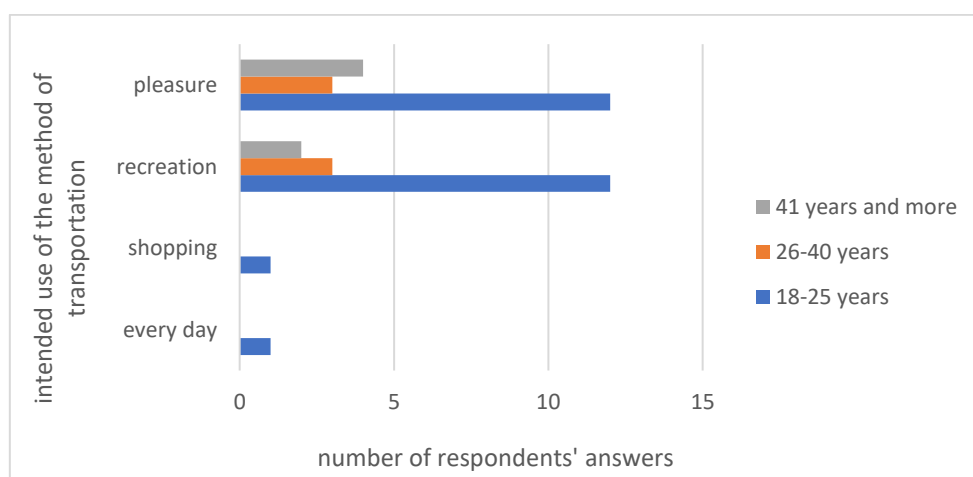


Fig. 3 Purpose of choosing bicycle in the opinion of women. Source: authors

The purpose of choosing bicycle as a means of communication, both among young women (18-25) (Figure 3) and young men (Figure 4), most frequently involved pleasure and recreation. These two goals are also selected in the remaining age groups, although the number of respondents was relatively smaller in the remaining age groups.

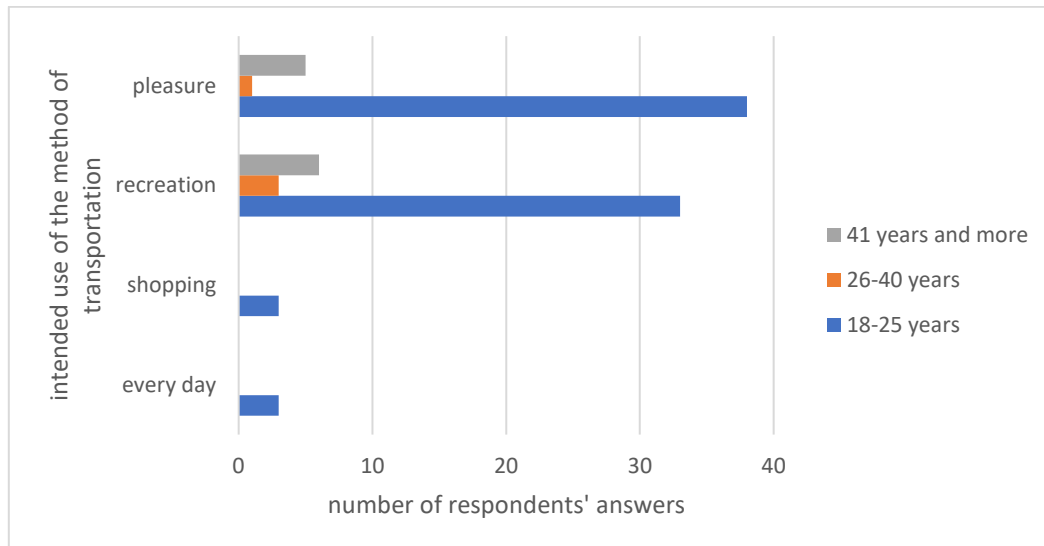


Fig. 4 The purpose of choosing bicycle in the opinion of men. Source: authors

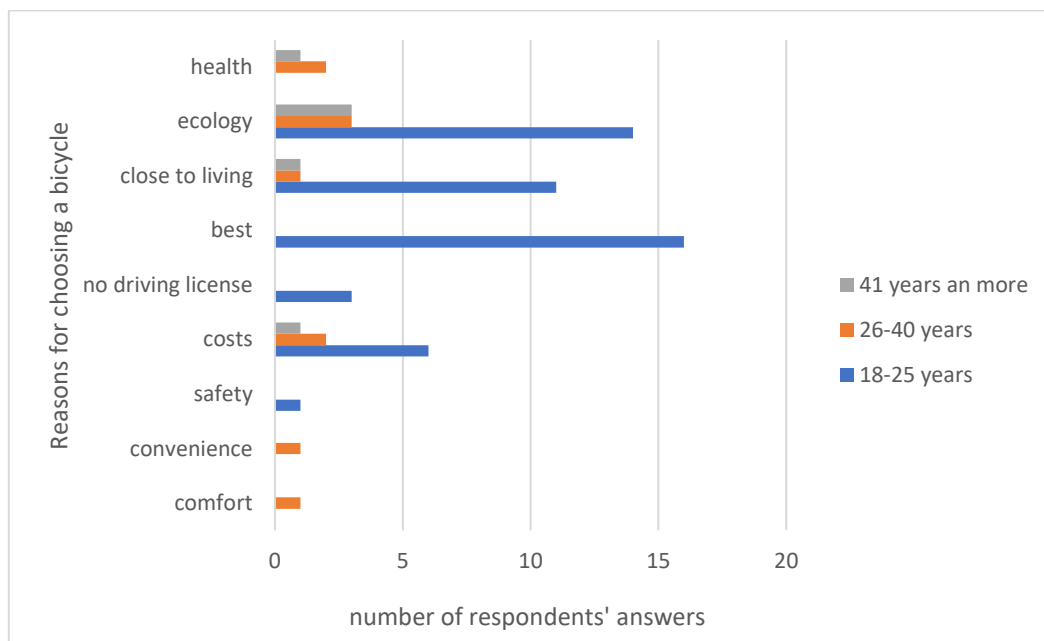


Fig. 5 Reasons for choosing bicycle in the opinion of women. Source: authors

On the other hand, among the main reasons why the respondents choose city bike when traveling, young women (18-25 years old) stated the best means of communication, ecology and a close place of residence, in the 26-40 age group and over 41 years of age, this was related to the issues of ecology, costs and health (Figure 5). On the other hand, men in the 18-25 age group indicated ecology, health issues and costs, the 26-40 age group considered health and ecology as important issues, while respondents over 41 indicated health and ecology (Figure 6).

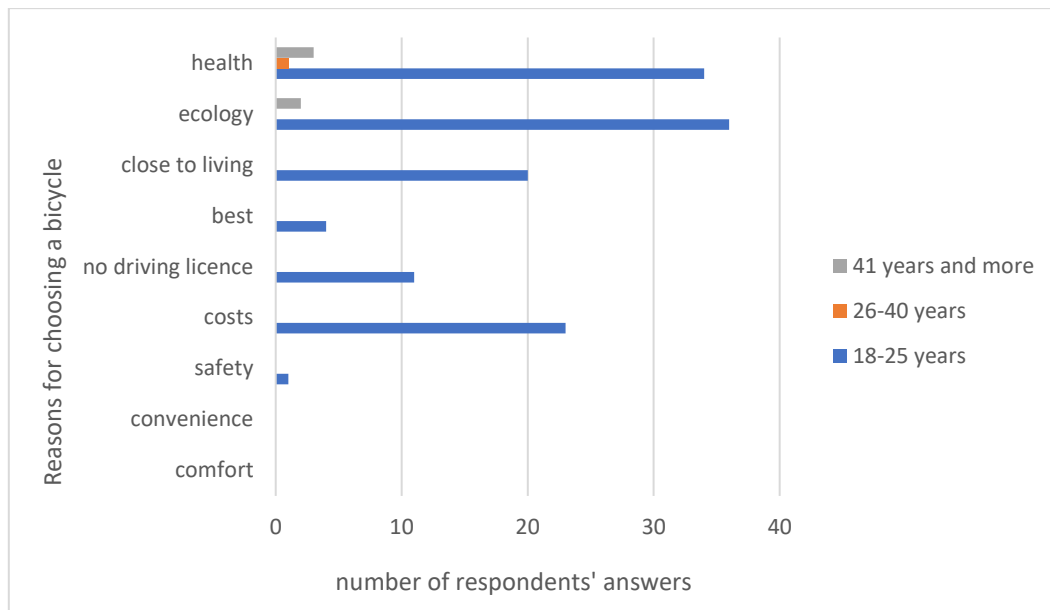


Fig. 6 Premises for choosing bicycle in the opinion of men. Source: authors

In Figure 7 were shown the reasons for choosing bicycle as a means of traveling in the opinion of all respondents.

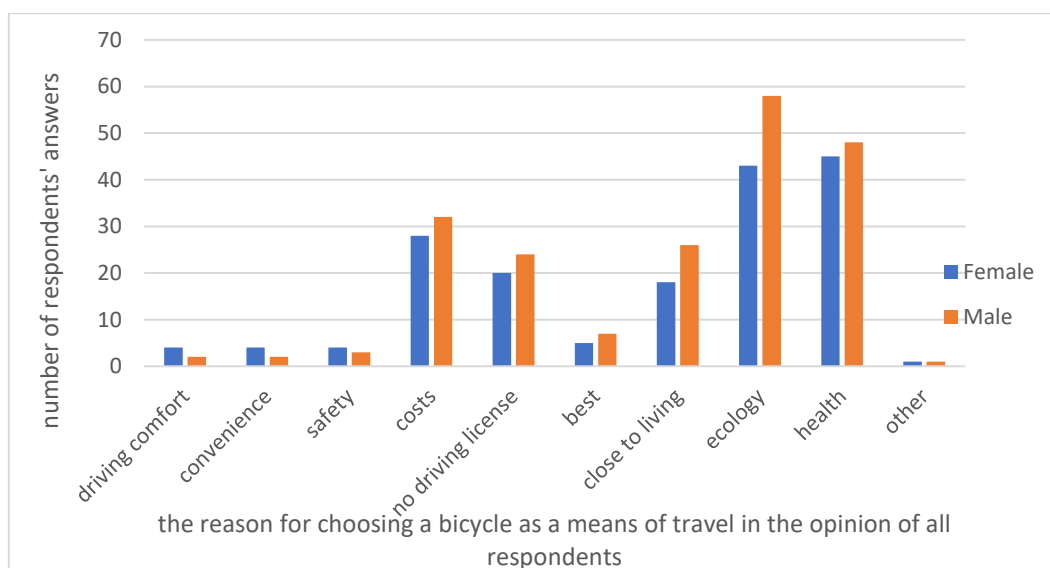


Fig. 7 Summary of the reasons for choosing bicycle as a means of traveling in the opinion of all respondents. Source: authors

To sum up, for both women and men, issues of ecology and health are of major importance in choosing bicycle as a means of communication (Figure 7).

6. The Situation of the Lublin City Bike System in the Face of the Covid19 Crisis

The year 2020 was a very difficult year for many industries due to the global situation related to the Covid-19 epidemic. It turned out to be particularly difficult for the transport industry, which applies both to international transport - closing air transport for many months, and to urban public transport - restrictions in the number of passengers in vehicles, a reduced number of people traveling to school

and work. Only the courier services industry managed to sustain in this situation due to the increased activity in online shopping. The situation was similar in the field of bicycle rental services. Sanitary restrictions resulted in less activity of potential customers, but also temporarily shut down this type of activity. The year 2020 was specific for the Lublin city bike season, which traditionally started on March 21. However, due to the spring wave of the Covid-19 epidemic, all system operations were temporarily suspended from April 1, 2020 to May 6, 2020. The operator of the city bike program encouraged people to travel by city bikes with care and proper hygiene, recommending the use of protective gloves. The system operator, Nextbike Polska, disinfected bicycle components such as handlebars, saddles, cables, shifters and terminals. The two-wheelers were disinfected at least twice a day as part of the daily service.

The epidemic situation was reflected in the statistics on bicycle rentals. In the period from March to the end of September 2020, the number of rentals exceeded only 221,000. In the same period of the previous year, the number of rentals had exceeded 511 thousand. In the current season, lovers of two wheels could use 911 bicycles, including 20 children's bicycles and 5 tandems, at 93 self-service stations located in Lublin and Świdnik [27]. As can be seen from the cited data, the year 2021 was very difficult for many areas of the transport industry, including urban transport, which also affects the financial conditions of local governments. In times of the epidemic, bicycle as an individual means of transport fulfills its role perfectly. It allows one to avoid public transport, it is a safe and healthy means of moving around the city and getting to work.

In the context of the strategy for the city bike industry, it should be stated that back in the 2018 season, bicycle lanes or paths were used - as they were named - almost exclusively by cyclists. A year ago it was different - users of electric scooters (sharing or private) also became visible users of bicycle paths. Currently, if not for the Covid-19 pandemic, the percentage of the so-called personal transport equipment (PTE) on bicycle lanes would certainly be much larger. However, the coronavirus will one day go away, and the PTE and micro-mobility will remain. Some of today's cyclists will probably replace their two-wheeler with their own scooter or other PTE. A whole group of new users who do not want to pedal will join this, but they will be happy to ride on an electric motor - instead of finding their way through the city by car or waiting for bus.

The public city bike system is present in as many as 100 cities in Poland. In total, access to this service in their place of residence is allowed approximately to 12 million people, who were served by over 26,000 two-wheelers in the past season. The number of registered bicycle users across the country has exceeded 2.6 million (of these, 900 thousand are users of the Warsaw Veturilo). This shows an impressive position that the shared city bike has made in Poland in less than a decade. After years of development and records, it seems to enjoy unflagging popularity. Unfortunately, the report "Sharp braking of the city bike", published by the Mobile City association, shows that bike sharing

is in a crisis. The Mobile City took a closer look at 15 of the largest city bike systems in the country. 13 of them recorded a decrease in the number of rentals - on average in this group by as much as 19%. In the largest Polish system, the Warsaw Veturilo, consisting of 5.5 thousand bicycles, rentals decreased by 18% - despite the 3% increase in the number of vehicles offered. In some cities, declines exceed 30%.

All tested systems recorded a decrease in efficiency, i.e. the number of rentals per one offered vehicle. It was on average as much as 24%. City bikes contribute to the development of sustainable transport, cleaner air and unloaded traffic in cities. However, one can clearly see that something has faded. This situation creates the context for strategic decisions concerning the future of bike sharing in three large Polish cities, as expected in 2022. As a result of the operators' business problems, Kraków and the Tri-City have remained without city bikes since autumn.

The Mobile City report considers several hypotheses. One of the main ones - offering electric scooters for minutes - is not directly confirmed by the data. Other options include too slow growth of bicycle infrastructures in cities, cyclists' concerns about safety, a discouragingly low quality of city bike systems or ineffective tender procedures.

7. Conclusion

City bike is an increasingly used method of transport in cities [28,29]. It is not only a sustainable mode of transport [13,30], also has health benefits.

According to own research, the main means of transport in Lublin is passenger car. This may be due to a lack of infrastructure and certain limitations of public transport (insufficient coverage in neighboring communes). On the other hand, bicycle transport in Lublin should be treated rather as recreation and leisure. Bicycle is rather not chosen as a means of transport to work, more often as a means of transport to study places. It is influenced by cycling education conducted by the city in schools under the Cycling Policy [31], as well as by the academic character of the city.

On the basis of the research analysis, the most important conclusions were formulated:

- among the respondents, the vast majority indicated car as a daily way to travel to work or study,
- bus was indicated as a means of transport in second place,
- still a few people travel by bike or on foot,
- among the respondents who indicated bicycle, the purpose of choosing it as a means of communication, both among young women and young men, was mostly pleasure and recreation, similar trends were shown by respondents from other age groups,
- for those who have their own car, it is most often the means of transport of first choice,
- some respondents pointed to the great popularity of public transport and carpooling,

- among the main reasons why the respondents choose city bike when traveling, young women (18-25 years old) indicated that it is the best means of communication, taking into account ecological issues and life in close proximity to nature,
- in the age group of women between the age 26 and 40 and over 41 years of age, the issues of ecology, costs and health were of the greatest importance when choosing bicycle,
- on the other hand, men aged 18-25 indicated ecology, health problems and costs, the group of 26-40 and over 41 indicated health and ecology,
- for both women and men, environmental and health issues are of paramount importance when choosing bicycle as a means of communication.

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