BICYCLE ROUTES AS AN ELEMENT OF RECREATIONAL INFRASTRUCTURE OF RZESZÓW

Rafał **KAPICA**[ABCD], Patrycja **ŻEGLEŃ**[ABD]

Faculty of Physical Education, University of Rzeszów

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- bicycle routes,
- Rzeszów.

Abstract:

The main goal of the paper is to show bicycle paths as important element of recreational infrastructure. The work presents opinions of cyclists, concerning recreational development of Rzeszów. It points at good and bad technical solutions met on bicycle paths. Cyclists' and pedestrians' behaviours on common communicational paths have also been observed and analysed.

INTRODUCTION

A pace of life in a present world makes that people, especially from big cities (urban areas), search for places in which they could relax after work. Many of them choose various forms of open-air recreation, amongst which there are walking, running, and riding a bike or roller-skate. In connection with that, a proper recreational development of urban areas is seen as the necessity nowadays. It is important the process could meet inhabitants' needs and expectations. The main aim of the paper is to show cyclists' opinions about bicycle paths in Rzeszów.

Recreation on a bike

Bike is more and more popular mean of transportation among both adults and youths as well as children. Nowadays, it serves not only as equipment to efficient movement but also as having fun and improvement of fitness. Modern bikes also have been improved in a technological way. Variety of types, accessories, new technologies made it possible that bikes are very friendly to its users. There are also specialized constructions focused on concrete tasks.

Bike is one of the fastest means of transport used on long and short distances. Additionally, riding a bike influences health positively as well as it immunizes the whole body, and plays recreational functions, it serves to active relax and is a way to avoid boredom and escape from daily routine [Wojtasik, Tauber, 2007:22].

Recreation plays many significant roles in human's life. With reference to cyclists the most important roles are as follows:

- regenerative function that means relax and regeneration of psycho-physical strengths,
- compensational function that means complement of lack of movement, play, face to movement needs,
- catharsis function, that lets getting over, escape from daily problems,
- stimulation function, that appears in supporting and stimulating psychic and physical human's development,
- integration function, that means possibility of getting new relationships out of home and work environment, and meeting new people from various environments [Kiełbasiewicz-Drozdowska, 2007:19].

A level of realization of the functions mentioned above proceeds in a different way, depending on many factors such as: place, time, existing infrastructure or frequency of riding a bike.

Bicycle routes in Rzeszów

City systems of bicycle paths belong to tourist and recreational facilities that have a fundamental meaning to meeting people's needs [Kowalczyk, Derek, 2010:27]. First of all, they should enable comfortable and fast connections between different parts of the city. It is significant, especially for people going to work or school by bike everyday [Andersen, et al, 2012:49].

Development of infrastructure for cyclists is needed also because of propagating that form of relax. Lack of infrastructure and facilities can be a barrier to a recreational activity [Salita-Lisowska, 2006:310; Gracz, Sankowski, 2001:256].

The subject of city bicycle routes is mostly analysed in the aspect of cyclists' movement and their numbers. Many research were conducted by city cyclists' associations, for instance in Toruń [Wiśniewski, http://rowerowytorun.com.pl, 15.01.2016], in Poznań [Brudka et al., http://rowerowypoznan.pl, 15.01.2016], or in Rzeszów [Marchewka, http://rowery.rzeszow.pl. 15.01.2016]. The requirements for bicycle paths were described in a very popular and valuable publication titled: „Sign Up for the Bike", written by authors associated in C.R.O.W. – the Dutch organization. The manual concerns projecting friendly infrastructure for bicycles and points five fundamental requirements [1999:23]:

- coherence – bicycle infrastructure should create a comprehensive entirety, and be linked to all the sources and aims of bicycle travels,
- directness – bicycle infrastructure should offer the most direct links, so as access is as short as possible,
- attractiveness – bicycle infrastructure should be projected and adjusted to the environment, so as the ride is attractive,
- security - bicycle infrastructure should guarantee safety of road movement, both for cyclists, and other participants road movement,
- comfort - bicycle infrastructure should enable fast and comfortable transfer of bicycle movement.

When talking about the speed of moving by cyclists, it is worth to say that they move very fast. Therefore, to be nice and safe, there have to be suitable conditions, which means separated roads from other means of transport and pedestrians. In this order, bicycle roads are marked in different colours in order to underline its identification in the area [Kowalczyk, Derek, 2010:50]. It is very difficult to introduce such solutions in urban areas because of the existence of other road networks and infrastructure. Even if the problem is solved there is another one – crossing of bicycle paths with roads and pedestrian crossings. As J. Forester [2012:355] points, firstly the main reasons of accidents with a participation of adult cyclists in cities are car drivers. Secondly, there are accidents observed when turning right, left as well as starting in front of lights, running in cyclists because of going too fast, and when is dark.

The next problem seen on bicycle paths is quality of the surface. Flat, level, and clear surface without puddles influences both comfort of riding a bike and cyclists' health and security. It is especially important with reference to young cyclists and women, who have problems with various barriers, curbs, and unevenness [Dębowska-Mróz et al, 2014:1289]. In connection with that, a preferable surface of these paths should be asphalt. Many authors point it, and these are as follows: Ch. Hölzel, F. Höchtl, V. Senner [2012:484]; A. Greinert, S. Fórmanowicz [2011:27]; S. Bell [2008:153]. Every other surface is not only less comfortable, but also it makes that we quaver when riding a bike [Pawłowski, Roliński, Utkin, www.zm.org.pl, 20.04.2015].

The network of bicycle paths in Rzeszów is well-expanded at present. Nevertheless, their directions and the quality of surface do not always fulfill cyclists' expectations. The main line of Rzeszów bike transportation system is southern bypass along the following avenues: Krakowska, Wincentego Witosa, Batalionów Chłopskich, Powstańców Warszawy and Armii Krajowej. The completion of that core are roads along the following streets: Okulickiego, Podwisłocze and Lwowskiej. As A. Liszka [2013:85] points, that links between centre of city and housing estate are very import ant for most of cyclists.

However, green areas located in cities are the most desired places to relax [Pawlikowska-Piechotka, 2009:15]. The place of residence influences meaningfully inhabitants' mood and may be a significant factor of psychophysical strengths regeneration [Bańka, 2002:315].

First bicycle routes in Rzeszów led along Wisłok river from Lisia Góra and Żwirownia (gravel pit) to Lvov Bridge (Most Lwowski). Urban areas near the river are very popular recreatonal places among inhabitants of Rzeszów and other cities in Poland [Roman, Roman, 2014:299]. These are the only recreational routes till nowadays. It is hard to talk about recreation on a bike moving on few meters distance from crowded roads [Forester, 1994:162]. Except bicycle paths, there are many bicycle racks with shape of Maltese cross, symbolizing crest of Rzeszów.

Among bigger investments in cycle infrastructure of the city, one should underline a tunnel under Powstańców Warszawy Avenue as an element of bicycle route along Wisłok river. The solution practically joint previously divided route by southern bypass of the city. Additionally, pedestrian bridge on the Wisłok river was accepted as the path for cyclists' use as well. Previously, pedestrians only were allowed to use it, and all the cyclists who were using it were given fines by the police. At present, in spite of many weaknesses of the route, i.e. it is connected with pedestrians and it is very slippy after raining because of wooden surface, it exemplifies an important connection between left and right cycle network of Rzeszów.

A supplement of cycle transport system in Rzeszów became a network of self-service city bikes' rent, which was established in the end of 2010. The bike can be rented in one of 20 stations, located in different parts of the city. The cyclists also play a significant role in creation of cycle infrastructure by associating in for example Rzeszów Cyclists' Association. Thanks to organization of many cycle events and initiatives, and first of all thanks to an effective influence on town hall decisions, the Association creates municipal space for cyclists with a success.

Rzeszów got award titled „Cyclists' Friendly Commune" in 2012. Moreover, ranking of cities with cycle routes occurred in "Rowertour" monthly. The ranking presents Rzeszów as the city in where there are the greatest number of cycle routes proportionally to its inhabitants. According to cyclists from Rzeszów, the city has got about 65 kilometers of bicycle routes. As it occurs, local bodies declare that there are more such routes in Rzeszów [www.loverower.pl, 30.05.2014]. Bicycle paths in Rzeszów are used for communicational purposes mostly. Unfortunately, they are not ideal. There is lack of crossings and markings for cyclists, and some fragments of routes end before junctions [www.rowery.rzeszow.pl, 30.05.2014]. Many of new trails are made by beveled cobblestone, what is improper because of high level of vibrations while riding a bike.

Local authorities plan to build new bicycle routes in the capital of Podkarpackie Province. They are to be along Lubelska, Rejtana Street, and Wyzwolenia Avenue. The routes in the district of main streets, will serve inhabitants who go to work or for shopping by bike. Bicycle path is also planned to be established between Castle Bridge, and pedestrians' crossing on Embankments on Nowy Świat (New World) zone side. This one will serve

inhabitants for recreational purposes as well as all the routes along Wisłok river [www.nowiny24.pl, 30.05.2013].

MATERIAL AND RESEARCH METHODS

The main goal of the research was to get to know cyclists' opinions about bicycle routes in Rzeszów. The main research problem was expressed in the following question: If network and development of bicycle routes in Rzeszów fulfill cyclists' needs?

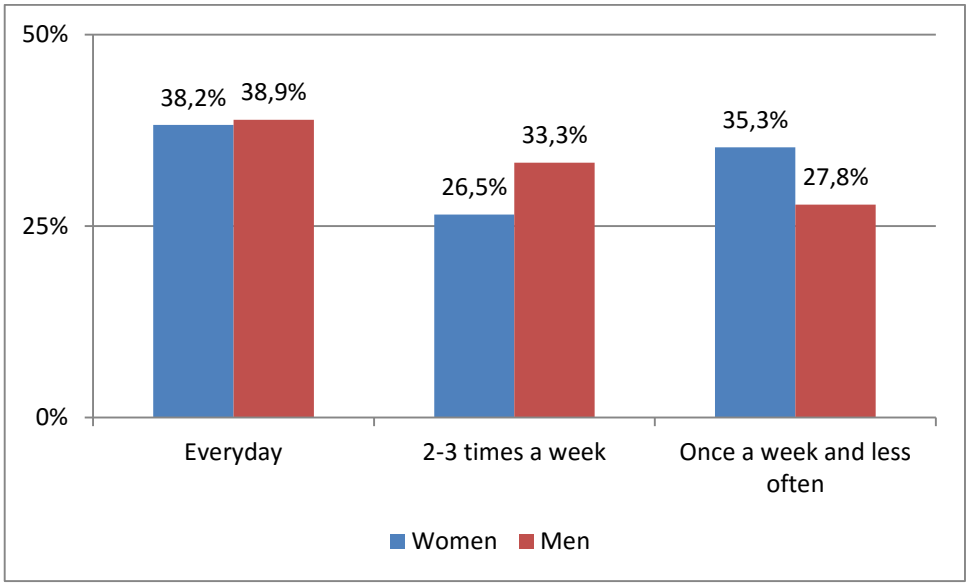
A proper choice of research methods, techniques and tools is significant in the process of conducting scientific research. A diagnostic opinion poll was chosen by the authors as the most suitable research method. A survey technique was also used in the paper. Additionally, an observation method was used when analyzing behaviours of cyclists, pedestrians, and drivers, resulting from their coexistence in the city.

The analysis of the gathered data has been made with use of the SPSS software package for statistical analyses. Missing data have been excluded from all statistical calculations. The accepted level of significance was $\alpha = 0.05$. It means that null hypothesis is considered true or is rejected with the probability of 95%. The "p" value has been used in the presentation of the results. It is the highest ($p \leq \alpha$) level of significance, at which the verified hypothesis can be rejected on the basis of empirical data. In order to analyse the dependences between particular categories, several types of statistical tests have been used. The chi-squared test has been used in the analysis, as well as measures correlation, such as ETA and Pearson's contingency coefficient (C). The ETA value is the measure of the correlation between a nominal variable and a numeric variable. It is contained within the interval from 0 to 1. Values close to zero indicate weak correlation, while values close to 1 indicate strong correlation between these variables. The following classification has been used in the interpretation: 0 means no correlation, 1 - perfect correlation, (0; 0.2) - very weak correlation, <0.2; 0.4) - weak correlation, <0.4; 0.6) - medium correlation, 0.6 and more - strong correlation. For two nominal variables, measures correlation have been taken: Pearson's contingency coefficient, which have the same values as the ETA.

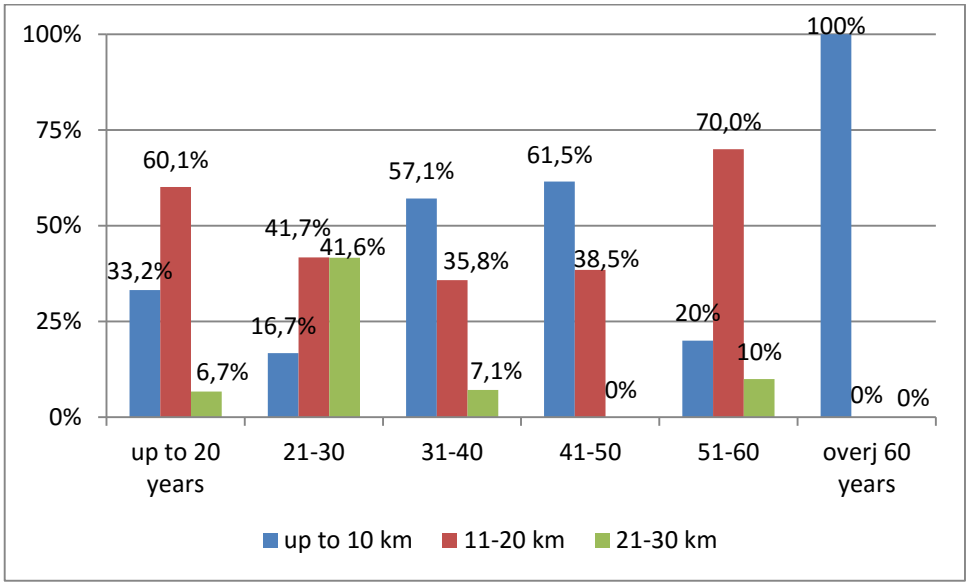
Survey research were conducted in July and August, 2014. A choice of trial group was made randomly, and all the survey questionnaires were fulfilled by the respondents on bicycle routes by Wisłok river. They were informed about research anonymity. The respondents fulfilled the questionnaire willingly with a hope that it improves a condition of bicycle paths in Rzeszów. Generally speaking, 70 people took part in the research, representing various ages. There were 34 women (48,6%) and 36 men (51,4%) among the respondents.

RESEARCH RESULTS

Most of the respondents, i.e. 38,2% of women and 38,9% of men rides a bike everyday. However, 26,5% of women and little more men (33,3%) ride a bike 2-3 times a week. More women (35,3%) than men (27,8%) ride a bike once a week or even less often. The differences between sexes of the respondents are statistically insignificant, but they show a frequency of riding a bike (graph 1).



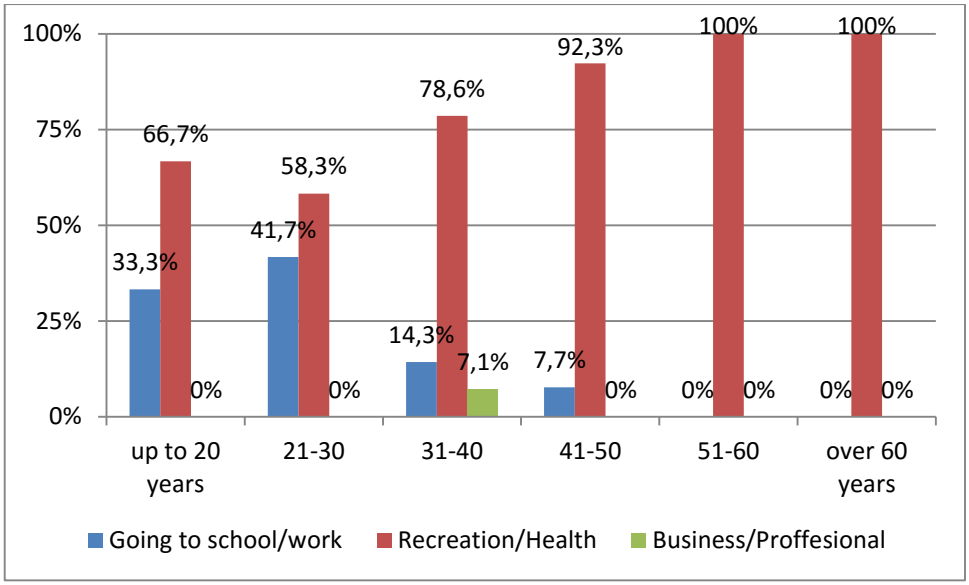
Graph 1. Frequency of riding a bike according to the respondents' sex (statistically inessential)
Source: on the base of the authors' research



Graph 2. Distance made during one trip according to the respondents' age
(p = 0,001; ETA = 0,55)
Source: on the base of the authors' research

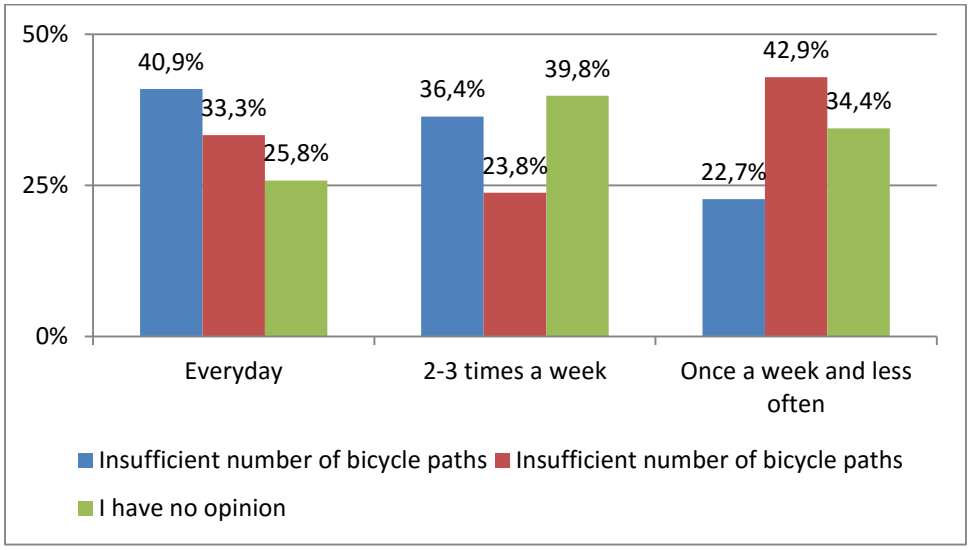
As graph 2 depicts, the age of the respondents influences daily distance meaningly. The oldest persons, over their 60s, cover the shortest distance during one trip. Each of them cover less than 10 kilometers distance. The lower age of the respondents the longer distance, with the exception of the respondents up to their 20s. One can explain the fact that the youngest cyclists attend to school, and bike is treated by them rather as a mean of transport than recreation. The results shown on graph 3 seem to confirm the thesis. Going to school or work is declared by the respondents up to their 20s(33,3%) as well as in the age of 20 and 30 years old (41,7%). Riding a bike for recreational purposes dominates among senior respondents. The majority of respondents are satisfied with number of benches and places for relax located near to bicycle trails in Rzeszów. More than 83% of respondents (83,3%) over their 60s,

92,9% persons between 31-40 years old, 91,7% respondents between 21-30 years old, 76,9% respondents between 41-50 years old, and 70% respondents between 51-60 years old said that the number of benches is enough (with p= 0,001, C= 0,425).



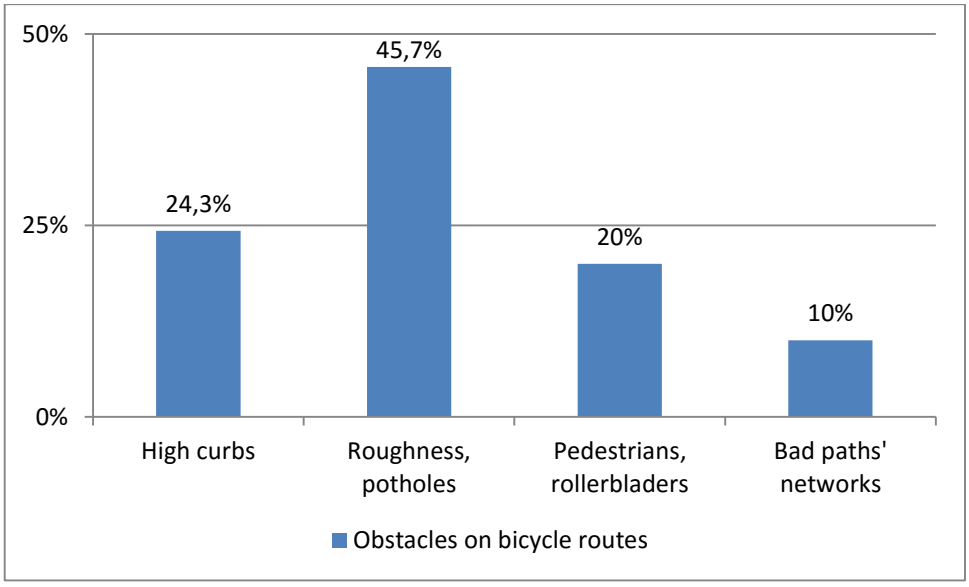
Graph 3. Purposes of riding a bike according to the respondents' age
(p = 0,005; C = 0,39)
Source: on the base of the authors' research

The respondents were also asked if they have any suggestions where new bicycle trails should be built. A significant diversity of answers was noted on p=0,04 and C=0,35 level. The respondents were exceptionally consentient about the location of such trails – they pointed at the centre of the city and the right edge of Wisłok river. Only 18,3% of the respondents in the age between 31-40 years old pointed at the suburbs as a good location for new bicycle routes.



Graph 4. Respondents' opinion about number of bicycle paths according to their frequency of riding a bike
(p = 0,001;C = 0,47)
Source: on the base of the authors' research

An opinion about number of bicycle routes in the city depends on the respondents' riding a bike frequency. Insufficient number of bicycle paths was pointed by 40,0% of those who ride a bike everyday, 36,4% of respondents riding a bike 2-3 times a week, and 22,7% of those who ride a bike once a week or even less often. The problem was pointed mostly by young people, between 21-30 years old – 75%, 31-40 years old – 78,6%, and 51-60 years olds – 70% (with p=0,014, C=0,399). The respondents from other age groups underlined a small number of bicycle paths not so often. The most satisfied respondents with the number of bicycle routes in Rzeszów are those who ride a bike once a week or even less often (graph 4).



Graph 5. The most popular obstacles on tourist routes in Rzeszów (statistically inessential)
Source: on the base of the authors' research

The most important barriers when riding a bike that were pointed by the respondents, are as follows: a bad condition of surface (45,7%), high curbs, and street lamps located on routes (24,3%). 20% of respondents also indicated inattentive pedestrians and rollerbladers. 105 of the respondents mentioned about bad connections between separate fragments of routes.

SUMMARY AND CONCLUSIONS

From cyclists' and pedestrians' observations occurs, that bicycle routes assignation from sidewalks, causes dangerous situations, both for cyclist, and pedestrians. The solution causes, that some pedestrians see the part for cyclists as an element of sidewalk, and they usurp the right to walk on it. Pedestrians think that they do not take a part in a traffic, but it is not true. On the other hand, the cyclists often use the whole sidewalk not respecting the division. Such behaviours are observed in area of bus stops and hairpin bends through the so called "curve cutting".

Bicycle route assignation causes, that neither cyclists' part nor pedestrians' part have correct size/broadness. Such a situation can be observed on Wisłok river embankments, next to Podpromie Hall. The route is wide enough, however sidewalk' wideness does not let pedestrians to pass with baby carriages. It results in pedestrians coming in bicycle route very often.

To follow in the wake of physical division of bicycle routes and sidewalks, there should be clear marking of the surface both for pedestrians, and cyclists. The problem of choice the correct way concerns the two groups of users. The examples of coming in/driving in the

marked bicycle route/sidewalk can be observed near to Lisia Góra playground. Many of such behaviours occurs from unclear marking, therefore the best solution seems to be coulouring the surface of bicycle route.

On the sidewalks without assigned bicycle routes, such as: bridges and footbridges, cyclists very often are not aware of the duty of giving a way to pedestrians. Therefore, adjusting speed and style of riding a bike to pedestrians' movement seems to a clue issue. The change of behaviours needs time and also conducting many social actions.

Areas along two riversides of Wisłok are the most attractive recreational areas in Rzeszów. In connection with that sidewalks and bicycle routes located in that area are the most popular among inhabitants. Additionally, one can observe a decrease of bicycle routes' capacity in the area of Wisłok river bay, especially during sunny off days. The situation is difficult because of lack of bridge in the up part of the bay, that would join bicycle paths on the two riversides. It results in swinging cyclists' motion on one route, increasing their number on the chosen way.

The most important conclusions occurring from the research are as follows:

- similar number of male and female inhabitants of Rzeszów ride a bike as a recreation,
- Rzeszów inhabitants ride a bike for recreational and relaxing purposes. Young people use the bike as a mean of transport to school or work,
- persons who do not use bicycle routes are the group of those who are the most satisfied with the condition of them,
- there is a lack of bicycle routes in the centre of the city as well as on the right side of Wisłok river, it means on the biggest "green areas" in Rzeszów,
- bad condition of bicycle routes' surface and high curbs are the biggest problem for its users. The respondents also said, that pedestrians and rollerbladers do not disturb the as much as infrastructural barriers do.

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