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SATISFACTION OF BIKE SHARING SYSTEM USERS IN NOVI SAD

Keywords

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Abstract

Cycling is a very important mode of sustainable transport. That is why it is very important to create conditions for its more frequent use. Survey has shown that the "NS bike" system is a very important part of the transport system in Novi Sad. Although residents are not completely satisfied with the system they rent bicycles for different reasons. Removing the shortcomings that users see as a problem would probably increase the number of "NS bike" users.

1. INTRODUCTION

In the wake of major climate changes, non-motorized modes of transportation are becoming increasingly popular. In addition to walking, cycling is the healthiest and most environmentally friendly form of travel. For these reasons, bicycle traffic in many cities of Europe represents one of the basic modes of transport in order to satisfy mobility. In the Netherlands, for example, there are about 18 million bicycles for about 17 million inhabitants [1]. In order to increase the use of bicycles, various strategies have been developed that favor this mode of transport, independently or in integration with public transport. Implementation of bike sharing systems in cities is one of such strategies.

Within this paper, the bike sharing system in the area of Novi Sad will be presented. In addition, the survey results of users of this system were given. The research showed user satisfaction with the system, but also highlighted certain deficiencies that need to be improved in the future.

2. THE ROLE OF BICYCLES IN SUSTAINABLE TRANSPORT

Traffic congestions, as well as increasing environmental pollution, are the everyday life of all cities, which has a direct impact on the quality and way of life and the environment. Reducing the use of motorized modes of transport is one of the attempts to solve the traffic congestions. Cycling is recognized as one of the most important mode of sustainable transport. Using a bicycle need significantly less non-renewable resources and requires a smaller area to move than motorized modes of transport. Bicycles do not make noise or pollute the environment. They are more economical than most other modes of transport, as they require an initial investment in the purchase of a bicycle and then seasonal maintenance and servicing. Cycling does not require the use of energy sources. All these advantages distinguish cycling as an important mode of sustainable transport. There are also various negative aspects of using bicycles, which relate to the impossibility of using bicycles in all weather conditions, the lack of infrastructure (parking spaces, bicycle paths, adequate traffic signaling), the limitation of loads that users can carry, the low level of safety in the event of a collision with motorized vehicles, etc. Therefore, it is necessary to create the most favorable conditions for using bicycles, in order to mitigate some of the existing negatives or avoid them completely.

2.1. Bike sharing systems

The implementation of a bike sharing system is one of the ways to increase the availability and use of bicycles in cities. These systems involve a bicycle rental at one location, free of charge or at an affordable cost of transportation, and then returning the bike to another location where it can be rented by the next user. Bike sharing systems are widely supported for use by the public to achieve sustainable mobility goals., The aim is to achieve a higher quality and attractiveness of urban transport compared to individual vehicles by using a public bicycle system. Generally, the application of the bike sharing system enables the possibility of choosing the most favorable transportation route, affordable transportation fees, preservation and protection of the environment, improvement of mobility and interconnection of spaces, etc.

3. "NS BIKE" SYSTEM

Novi Sad has long been a cycling city. In recent years, a new part of the cycling infrastructure has been renovated and partially built, resulting in over 80 kilometers of cycling paths in the city. Bicycle paths pass by the most important city locations, as well as the most important city roads. One of the three corridors of the Eurovelo 6 cycling route passes through Novi Sad. All this contributed to the fact that Novi Sad was declared the world champion in winter cycling in 2018. It was estimated that around 1400 inhabitants of Novi Sad used bicycles as a means of transport for work, school or other activities in that winter [2].

Following the example of European cities, bike sharing system ("NS bike") was developed in Novi Sad in 2011. The system has about 200 bicycles, which can be rented at 16 bike docks (Figure 1). All bike docks are equipped with video surveillance, in order to control activities related to the rental.

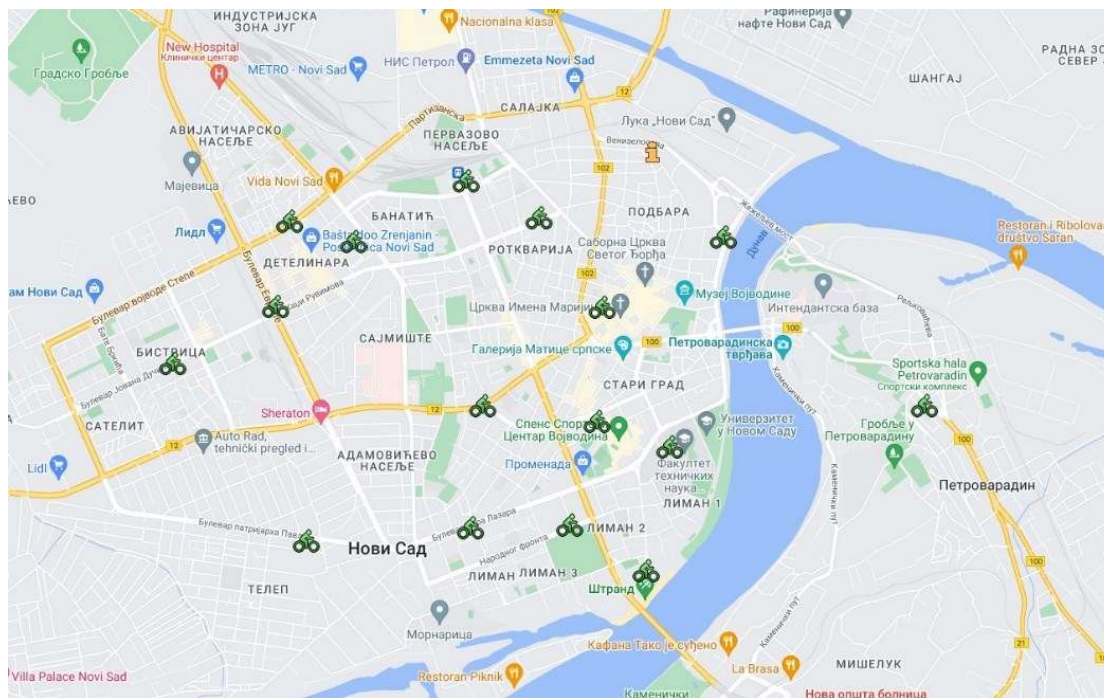


Figure 1. Positions of bike docks on the area of Novi Sad (source: [3])

Docking systems are automated, so bike rental is available 24 hours per day. The system operates in a certain seasonal period, mainly from April to November. All NS bike users must be registered. Registered persons receive a user card or a code with which they rent bicycles. The price of renting bicycles for each initial hour is 25 cents, that is, 1.45 EUR per day, while the seasonal subscription (cumulative two hours per day during the season) is 9.4 EUR.

Through the existing android application, it is possible to check information in real time about the locations of bike docks, about currently available bikes, as well as the number of free places for bike rental.

3.1. Research and results

The survey of the "NS bike" system users was carried out in June, 2022, during a seven-day period, by direct interview. The research was conducted at selected bike docks on locations of high attraction. A total of 428 users were surveyed. Some results of survey are shown in the continuation of the paper.

Out of the total number of respondents, the majority of users are women (53.8%), while 46.2% of respondents are men.

The largest number of the "NS bike" system users is in the age group of 20 to 30 years (37.4 %) and 30 to 40 years (33.2 %). 16.6% of users are into the age category of 40 to 50 years, and 10.1% of surveyed users are over 50 years old. The youngest users, i.e. users under 20 years of age, participate in the age distribution with 2.7%.

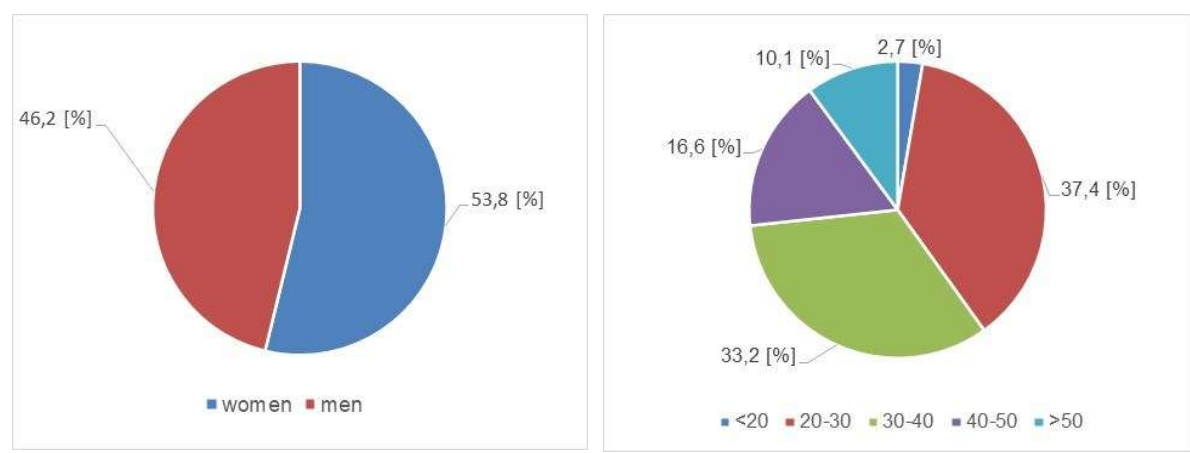


Figure 2, 3. Percentage of respondents per gender and age

When asked how often they rent a bicycle, most respondents answered 4-5 times a week (62.7%). The smallest number of respondents rent a bicycle 1 or less per week (2.8%), 2-3 times 28.6%, and 5.9% of users daily.

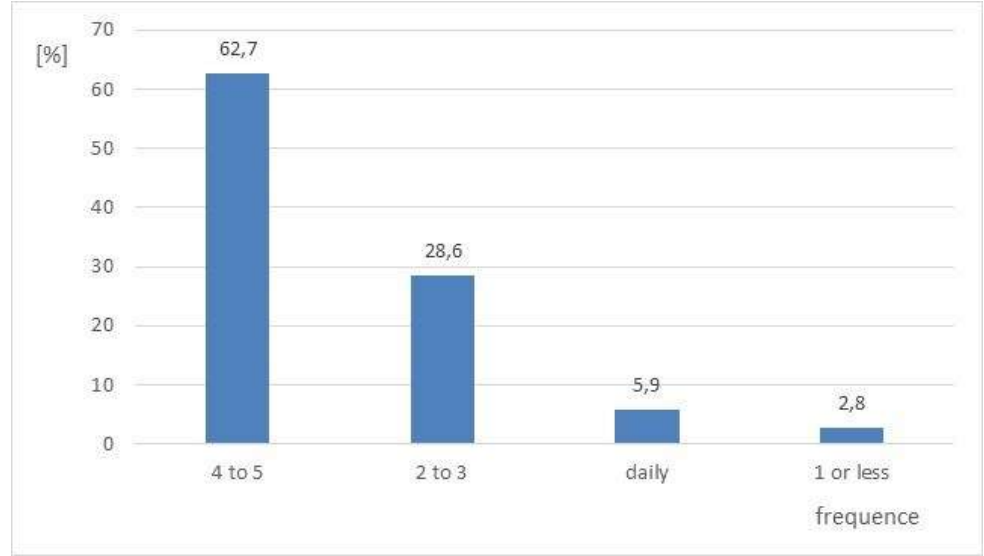


Figure 4. Frequency of bicycle use

Respondents were offered to rate the existing "NS bike" system with grades from 1 to 5. The largest number of respondents rated the system with a rating of 3 (46.1%), while the fewest respondents rated the system with a rating of 1. Figure 5 shows the percentage of users who are "NS bike" system rated 1, 2, 3, 4 or 5.

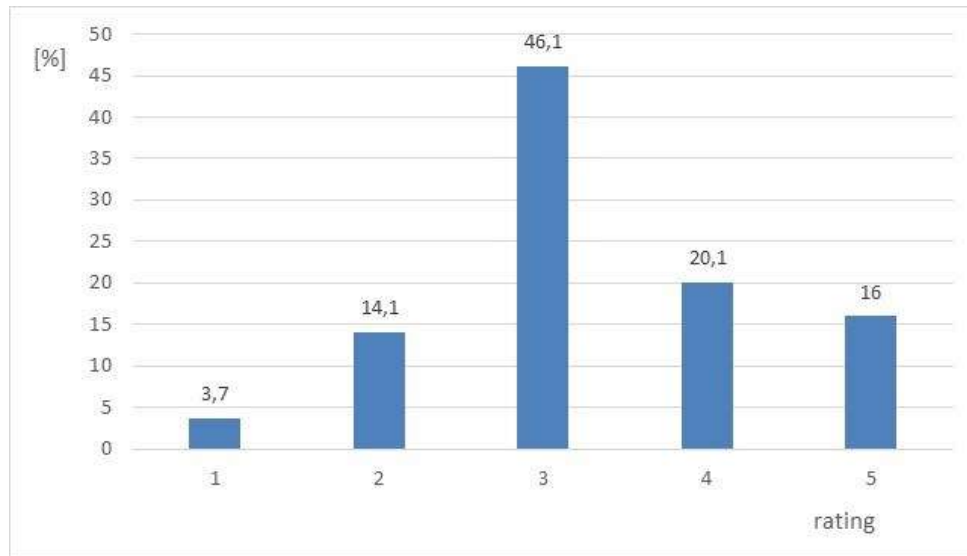


Figure 5. Rating "NS bike" system

In the next question, users of the "NS bike" system were offered options, which they should evaluate according to their own attitudes. Respondents were supposed to number the listed items in order of importance, which have an impact on their use of the "NS bike" system. The order of the offered answers is shown from the most important to the least important (Figure 6).

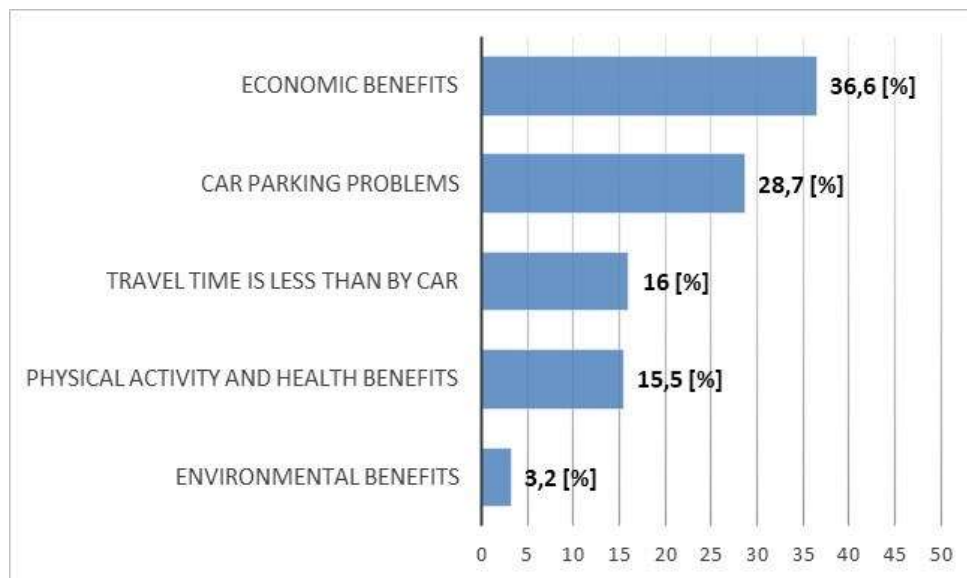


Figure 6. The most common reasons for using the "NS bike" system

The surveyed users mentioned the negative sides of the "NS bike" system also and many of them gave recommendations for improving this system. Users single out the small number of bike docks and the lack of bicycle paths in certain parts of the city as the biggest drawback. They also point out the insufficient number of bicycles

in the system as a major drawback. In addition to these shortcomings, users believe that the operating season of the "NS bike" system should be extended. A younger user population suggests the introduction of electric bicycles, as well as electric scooters, as well.

4. CONCLUSION

The implementation of the "NS bike" system in the area of Novi Sad is one of the quality measures that leads to the improvement of the quality of life in the city. It has been shown that such a system is needed by the city, but its constant improvement also contributes to the long-term survival and functioning of the "NS bike" system. However, despite the investment in the "NS bike" system and the increase in the number of bike docks, the network of existing stations is still not sufficient for the metropolitan area of Novi Sad. The comments of surveyed users of the "NS bike" system about the lack of bike docks are completely justified, because in some parts of the city, these stations do not exist at all. In addition, the distance between the bike docks is far above 200-400 m for the central part of the city, which is usual for most implemented bike sharing systems.

The lack of cycling infrastructure is another of the shortcomings that the surveyed users singled out. Although in recent years the city has been investing in the expansion and improvement of bicycle lanes, there are a large number of city roads, where cyclists use the pavement with motorized traffic. This functioning of bicycle traffic contributes to the deterioration of the cyclists safety.

An important fact that was obtained from the survey is that the majority of users of the "NS bike" system use bicycles for economic reasons. The residents of Novi Sad still do not have a sufficiently developed awareness of the importance of using bicycles as a sustainable mode of transportation although the problem of environmental pollution has been promoted for many years. Therefore, it is necessary to work on the promotion of cycling as a mode of transport and highlighting all the benefits and advantages that arise from its use.

Certainly, the introduction of electric bicycles would contribute to the attractiveness of the "NS bike" system. It is reasonable to assume that electric bicycles would increase the number of users of all ages. The use of electric bicycles would be interesting both for the younger population and for the elderly, due to the reduced effort required to operate these bicycles. It is only necessary to analyze how the introduction of electric bicycles would affect the financial management of the "NS bike" system, since their use requires greater investment.

Long-term experience has shown that the "NS bike" system has proven to be an important part of the transport system of Novi Sad. Therefore, it is necessary to continue working on its improvement.

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