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THE CITY OF BANJA LUKA – CHALLENGES OF SUSTAINABLE MOBILITY

Key Words

Sustainable mobility;
Sustainable development;
Mobility

Abstract

The increasing problems caused by modern traffic, and apparently a contradictory need to continue development of such traffic, have posed the following question as a challenge to the whole society: How to increase mobility and at the same time reduce traffic congestion, traffic accidents and level of pollution? In accordance with the concept of sustainable development, the idea of sustainable mobility is defined as "the ability to meet the needs of all members of the community to move freely, have access to all activities, communicate, trade and build relationships without sacrificing or endangering other human and environmental values of the present or future generations. " If we compare this statement with the evident consequences of urban traffic, we can easily conclude that the largest number of urban traffic systems has "failed" the sustainability test. In the past three years, the City of Banja Luka has carried out a number of activities, which are just the beginning, but show a clear commitment of the city to develop in compliance with the principles of sustainable activity.

1. INTRODUCTION

All papers will be reviewed by International Program Committee. For text originality, quality and accuracy of data and results responsibility lies sole on authors. It is understood that paper has not been previously published and that authors have employer permission to present the results.

Sustainable mobility as a goal of urban traffic planning, due to the obvious causes of the problem, imposes the need to define a city's transport policy that would reduce negative effects of car use, while increasing accessibility to all urban subdivisions. By applying different transport and land-use policy mechanisms, it is necessary to reduce the need for passenger car travel, encourage redistribution of car travel to environmentally friendly travel modes, reduce distances and improve efficiency of the transport system (Banister, 2008).

Sustainable mobility should meet the mobility needs of the present time without compromising the ability of future generations to meet those needs (Zietsman & Rilett, 2002).

The implementation of a single urban mobility management measure cannot solve urban traffic problems (Vieira, Moura, & Viegas, 2007). A large number of different measures, most commonly fall into the following three categories:

1. Technology innovations
2. Land use policy measures
3. Transport policy measures

How the application of individual instruments has an impact on the demand for travel by various modes of transport and on the reduction of negative effects of transport on the environment has been the subject of the years of research by experts worldwide.

The number of passenger cars in the European cities has increased dramatically since accession to the EU, primarily as a result of rising income levels (Roberts and Taylor 2004). A similar trend of increasing passenger cars in the countries of Serbia, Eastern and Southern Europe was pointed out by many authors even 10 years ago (Bojković et al. 2011; Dargay 2002). Based on the analysis of the number of registered vehicles in Banja Luka, it can be concluded that the number of passenger cars has increased in recent years, so that the number of passenger vehicles has almost doubled compared to 1990.

2. CURRENT STATE

Sustainable and prosperous development requires planning and strategic documents defining spatial development schemes, land use and, in general, development strategies for all areas and systems in the city. Banja Luka is the main administrative center and the most important city in one of the constituent entities of Bosnia and Herzegovina, Republika Srpska. The Presidency of Republika Srpska, the seat of Government and Ministries, the Assembly and the headquarters of many institutions and public companies are located in the central zone of Banja Luka. The spontaneous increase in population, the construction of new settlements, changes in land use, changes in activities and the emergence of new attractions, have all led to very significant changes in the transport system and to the changes in mobility behavior of the residents.

In the last few years, Banja Luka has solved some long-term infrastructure problems by constructing modern, high-capacity roads and intersections, especially

on the Western and Eastern transit routes, but in some parts of the city it is impossible to carry out infrastructure interventions due to property issues, as well as cultural heritage and the environment. In addition, the experiences of other cities in the region, Europe and the world show that problems in the transport system cannot be solved solely by building new capacities for motor vehicles. As well as the problems in the transport system directly affect citizens who travel longer and more uncomfortably, these problems have negative effects on the environment, as well as on the development and utilization of the city's potential. Sustainable urban mobility, which is a product of a sustainable transport system, is a priority of all global strategic documents for sustainable development.

With the analysis of the number of registered vehicles, it can be concluded that in the last years there has been a trend of increase in the number of passenger cars, so in comparison with the year 1990, the number of passenger vehicles has almost doubled (Figure 1). Increasing number of passenger cars and the average age of passenger cars over 15 years is a major problem for traffic safety and environmental pollution.



Figure 1. Level of motorization in Banja Luka in PA/1000 population

Traffic load of the street network, in addition to the increase in the degree of motorization in the city, is influenced by the daily migration of the population of the surrounding areas towards Banja Luka, as the main administrative, economic, educational, sports and cultural center of the Republika Srpska. In addition to daily migrations, the traffic on the street network is also affected by transit traffic, since the main roads pass through Banja Luka, especially from the South and West, connecting the Banja Luka region on the motorway, further to Gradiška border crossing and the European road network.

3. ACTIVITIES

In the last few years, a number of activities have been carried out related to changing the way of travel, ie transport planning is carried out in such a way that it is no longer oriented only towards infrastructure but towards meeting the needs of people in terms of faster, safer, healthier way of life, thus improving the overall quality of life in the city.

Traditional urban traffic planning	Sustainable urban traffic planning
The main goal is infrastructure	Infrastructure is one way to achieve the desired goals
Project planning Strategic and goal planning	Project planning Strategic and goal planning
Non-transparent decision-making	Transparent decision-making and public involvement
The main goals are traffic flow and speed	The main goals are accessibility and quality of life
Focusing on cars	Focusing on people
Meeting traffic demand	Regulating traffic demand
Focusing on large and expensive projects	Focusing on effective and gradual improvement
The task of traffic engineers	Interdisciplinary involvement of the mobility, environment and spatial sectors
Intensive investment planning	Rational investment planning

3.1. "Bike sharing system"

In the spring of 2018, a "Bike sharing system" (Figure 2) was implemented in the city, called "BL bike" with 4 terminals for automatic bike rental and a total of 30 bicycles. In 2019, the system has been expanded by 1 new terminal and 6 bicycles. The tariff system includes three types of tickets:

- ❖ Annual €10 – 30 minutes daily (cumulatively) is free of charge, each subsequent start time is € 0.75, and the amount paid as a membership fee can be used by the user,
- ❖ Monthly € 5 - 30 minutes daily (cumulatively) is free of charge, each subsequent start time is € 0.75, and the amount paid as a membership fee can be used by the user,
- ❖ One-off – €1 is for one hour, there no free minutes.

The largest number of bicycle rentals, ie use of bicycles, is in the period 07-08 and 16-17 hours, which is a confirmation that a certain number of residents have opted to use a bicycle to commute to and from work.

The current number of active users is 1200.



Figure 2. "BL bike" - "Bike sharing system" Banja Luke

3.2. Chargers for electric vehicles

Chargers for electric vehicles have been installed at two locations, each with 3 chargers (2 universal and 1 for Tesla engines) at each location.



Figure 3. Chargers for electrical vehicles

3.3. Time limited parking

Tariff system in the stationary traffic has been modified in such a way that in addition to the first and second parking zones, a "zero" parking zone has been formed in which the parking time of the vehicle is limited to a maximum of two bound hours. This zone comprises the busiest central city parking lots.

3.4. Mini tourist bus

In the summer period, on weekdays from 15-19h, and on weekends from 9-19h, transport to the famous city outing site to the Banj Hill is organized. On a monthly basis, the number of transported tourists is over 3000, and this year the tourist mini-panoramic bus (Figure 4) is equipped with a ramp, so that the excursion site is accessible for disabled persons and mothers with baby strollers.



Figure 4. Tourist mini panoramic bus

3.5. Main street becomes pedestrian zone during summer period

In the Summer on Saturdays and Sundays, the main city street Kralja Petra I Karadjordjevica (Figure 6) closes for four-wheel vehicles and turns into a pedestrian zone, where pedestrians and children play freely, and where different sports, cultural contents and manifestations are organized.



Figure 6. Main street transformed into pedestrian zone

3.6. Reconstruction of the pedestrian zone



3.7. Construction of pedestrian and cycling infrastructure

When constructing infrastructure projects, special attention is paid to pedestrian and cycling infrastructure (Figure 7). The aim is to form a network of cycle paths and lanes in the coming period.



Figure 7. Construction of cycling infrastructure

3.8. Mobility week

The celebration of the European Mobility Week is organized in such a way that at least one event or activity promoting sustainable mobility is organized each day of the week: distribution of membership cards for "Bike sharing", organization of lectures on sustainable mobility, cycling (Figure 8), rollerblading, sports competitions on the main street, walking to the Banj Hill, awarding promotional prizes, setting up bicycle parking, etc.



Figure 8. Bicycle Race

3.9. Sump

The SUMP defines the following general and / or comprehensive goals:

- ❖ Active mobility and a car-free lifestyle,
- ❖ Ecological and safe city
- ❖ Efficient city

and, in line with these goals, various infrastructure and soft measures were proposed to create a sustainable traffic system in Banja Luka.

3.10. Application "BL BUS"

The "BL BUS" application for smartphones and tablets (Figure 9), provides users, passengers with real-time information necessary for using public passenger transport and is one way to make public transport more attractive and of better quality. The application is designed for the Android and IOS platform and is a step towards improving the public transportation system in the City of Banja Luka.

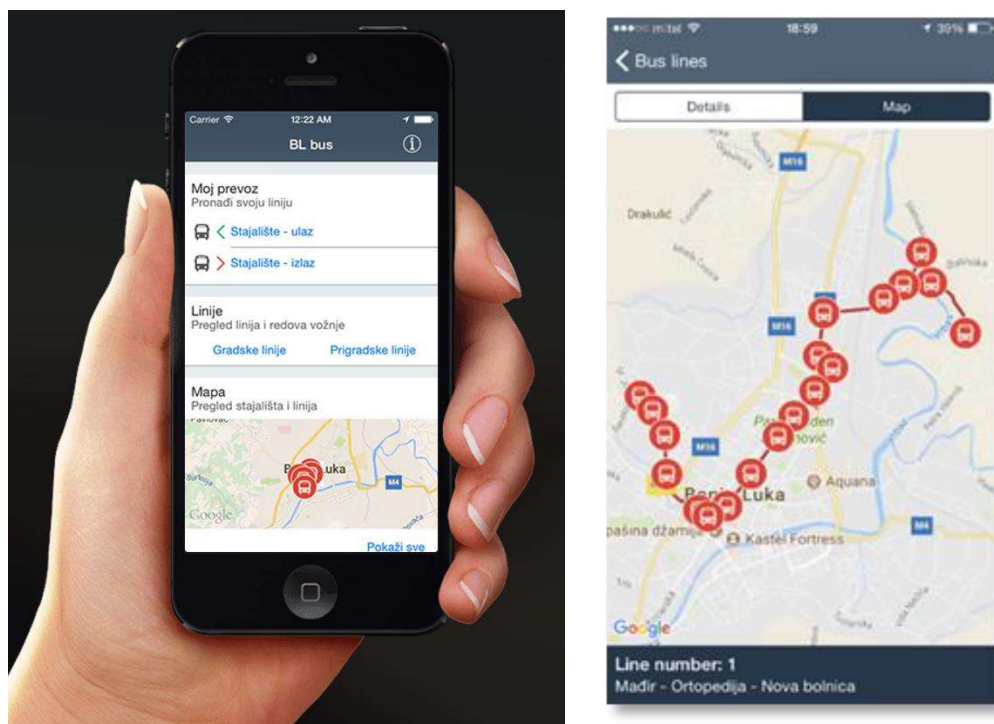


Figure 9. Applicaitn "BL BUS"

3.11. Round table

As a member of the "CIVINET Slovenia-Croatia-Southeast Europe" network, Banja Luka hosted a roundtable on sustainable mobility (Figure 10), which brought together a large number of experts from Southeast Europe.



Figure 10. Round Table organized by the City of Banja Luka

4. CONCLUSION

In 2018, in the European Urban Mobility Week, Banja Luka won 1st prize in the category City in Transformation, organized by the CIVITAS Forum Conference, held in Umea, Sweden. Banja Luka, as the only local community from BiH that is a member of the Civitas Network, has been recognized as a city that has implemented a number of different measures in a very short period of time to promote urban mobility. In doing so, it demonstrated its commitment to sustainable development, as well as to improving the environment and quality of life in the city.



The award showed that Banja Luka is on the right track, and it is an acknowledgment of past activities and an encouragement for further work.

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