

URBAN PLANNING, PUBLIC SPACE & MOBILITY



YOUNG PLANNERS WORKSHOP 2016

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**HOW TO IMPROVE URBAN MOBILITY THROUGH
GENERAL URBAN PLAN?**
THE CASE STUDY OF THE CITY OF ŠABAC, SERBIA

***BY KSENIJA LUKIĆ, BOJAN ALIMPIĆ & BRANISLAV
ANTONIĆ.***

How to improve urban mobility through general urban plan? the case study of the city of Šabac, Serbia

By Ksenija Lukić, Bojan Alimpić & Branislav Antonić.

ABSTRACT:

Post-socialist transition has profoundly changed the cities in former socialist societies in Central and Eastern Europe. Thus, some common “transitional” characteristics have reflected into urban space. One of them is certainly the commercialization of urban space, especially in city centres, but also around new retail zones in urban periphery. This phenomenon is considered among the main challenges for urban development. At the same time, new symbols of market economy and related individualization have arisen. The good example is newly-born “car culture”, i.e. the significant increase of the number of cars. Side by side with spatial commercialization, it has gradually limited pedestrians’ and cyclists’ mobility in the cities.

Serbia is very distinctive here. Due to the Yugoslav crisis in the 1990s, known as a “blocked transformation”, it has had postponed and harsher transition. The conditions for urban mobility have been especially deteriorated in the case of small and middle-size cities, where both mentioned phenomena have caused traffic jams, the lack of parking space and the general pressure to pedestrian and green zones. Furthermore, it is very questionable how to improve mobility in the time of scarce financial and institutional capacities. Therefore, this research aims to clarify which solutions, especially easy-implementable and inexpensive, can be used for the improvement of urban mobility in Šabac as a typical middle-size Serbian city. This is important task due to the inadequate treatment of the mobility in the current general urban

plan of Šabac. The foundation for the research is the theoretical knowledge of urban mobility, which will be customized in relation to Serbian planning and legislative framework. Then, it will be implemented through the study on Šabac. The research is also created to be proactive – the main results and findings of the research will be used for the new general urban plan of Šabac, which is currently in the first stage of preparations.

KEY WORDS:

Urban mobility, post-socialist transition, Serbia, general urban planning

1. INTRODUCTION

Post-socialist transformation of the societies in Central and Eastern Europe has been proved as one of the main global challenges in the last decades (Hamilton et al 2005). Following the notice of H. Lefebvre that urban space is a projection of society (Lefebvre 1968, p. 64), the transformation of society always influences spatial transformation in urban areas. Indeed, post-socialist transformation of all significant levels (economic social, political, cultural) has profoundly changed the cities in former socialist societies (Petrović 2005, p. 11). As a result, this transformation has also produced some common spatial “transitional” characteristics in post-socialist cities (Hamilton et al 2005).

The main change in economic aspect was certainly the introduction of capitalism and market economy in the early 1990s. Together with the rise of mass individualisation (Bartoszewicz and Lorens 2016), it has consequently caused hitherto unknown commercialization of urban space, which has attracted much attention in scientific cycles (Vujović & Petrović 2005). This new urban process has entirely transformed city centres, where retail sector

have flourished after several decades of inaction during socialist era. Furthermore, new retail zones in the form of shopping centres and malls have emerged at the edges of post-socialist cities (Nagy 2001). Bringing new requests for urban development, this new phenomenon has triggered both responsible local authorities and professionals to find new solutions for it (Hirt & Stanilov 2014, p. 5).

Another consequence of economic changes in post-socialist cities has been newly-born “car culture”, i.e. the significant increase of the number of cars due to spatial dispersion and suburbanisation (Hirt & Stanilov 2014, p. 65). As a product of liberal capitalism, car has been seen as status symbol (Bodnar 2011, p. 162). Therefore, the increased number of cars on the streets in post-socialist cities and urban transformations caused by them has gradually limited pedestrians’ and cyclists’ mobility in the cities.

However, the transformation of post-socialist cities during the last 25 years is not a monolithic development. Sizable differentiations and variations between different parts of post-socialist space have taken place in relation to their (post)socialist context. I. Tosics even proposed the “regionalisation” of post-socialist cities through the identification of several sub-types (Tosics 2003).

The place of Serbia in this “post-socialist mosaic” is very specific. Due to so-called “blocked transformation” during the 1990s (Petrović 2004, pp. 149-151), it was the last country in Europe which entirely accepted changes accompanied with post-socialist transition. Since then, urban mobility has appreciably reduced in favour of “car culture” in spite of widespread economic difficulties (Spasić et al 2007). This is especially noticeable in the case of middle-size cities, where the size of a city has never approached

public transport to be developed. Therefore, actions against urban mobility have appeared both legally or illegally here. These problems have resulted with the first-time appearance of traffic jams, the lack of parking space and further pressure to pedestrian and green zones in middle-sized cities. But, this problem with urban mobility has been more visible with the rise of these actions. Nowadays, both professionals and public are aware that this situation needs some solutions. But, it is very questionable how to improve mobility in the time of scarce financial resources and limited institutional capacities (Pantic et al 2013).

The aim of proposed research is to find those solutions which can cope with the problem of “car culture” and related problems in the city of Šabac, as one of typical middle-size cities in Serbia. The accent is on easy-implementable and inexpensive solutions, which are in line with the mentioned negative financial circumstances in Serbian cities. In accordance with the complexity and comprehensiveness of the problem, this research will be connected with urban-planning measures. Hence, the research will be done for a new general urban plan of the city, which is currently in the first stage of preparations. The current General urban plan of the city of Šabac is obsolete by many issues. This is also true with the issue of urban mobility, which is inadequately treated by it (CŠ 2008). Thus, the research can be described as proactive – its study and results will be included in the final version of the plan, giving practical contribution of this research. Before it, the basic urban patterns in post-socialist cities regarding urban mobility at regional and national level will be elaborated. Knowing that urban mobility is still a novelty for Serbia, this effort will be also a theoretical contribution in Serbia.

2. URBAN PATTERNS REGARDING MOBILITY IN POST-SOCIALIST CITIES

During socialism, government suppressed market economy, private incentive and privatisation of urban space. Accordingly, low utilisation of urban space was prevalent in socialist city, even in those places which would be extensively used in capitalist economy (Tosics 2003). This situation was entirely changed after the fall of socialism in the early 1990s. Underused space in cities has become the place of fast commercialization (Nagy 2001). This was supported with the phenomena of individualisation and consumerism. Individualisation, as a global phenomenon (Allmendinger & Tewdwr-Jones 2001), challenged profoundly the societies where it was previously undesirable by Marxist ideology and thereby suppressed by ruling system. The issue of consumerism has been an attention in post-socialist space – it has been considered even as a status symbol (Nagy 2001).

Historic city cores in post-socialist cities have particularly attracted new investments in retail and business sector. During socialist era, these parts of cities were intentionally neglected due to their “bourgeois” past (Murray & Szelenyi 2009). However, with the privatisation and the rise of rents, these parts of the cities have transformed into upscale retail and business areas (Petrović 2009; Hirt & Stanilov 2014). Specialized shops have marked the transformation of the centres, pressuring the retail for low- and middle-income groups to move outside them (Petrović 2005). Parallel with this, physical transformation of the cores has taken place – many inner city areas and neighbourhoods have been renovated (Petrović 2009). Nevertheless, general urban fabric in the cores has not been gradually changed. This means that the street network have stayed in the same shape even it has become overcrowded with new transport at the same time.

One of the main challenges regarding retail sector was the shift from high concentration in inner city centres in socialist cities to decentralisation and dispersion in post-socialist cities (Hirt & Stanilov 2009). Peripheral areas with good transport connections has become especially attractive for a “big-box” retail and international business, changing radial and monocentric form of the cities and initiating new transport routes (Hirt & Stanilov 2009). This shift was extreme in some cases. For example, 45% of retail sector in Ljubljana was concentrated in two shopping malls in 2007, leaving just 18% of it in city centre (Dimitrovska-Andrews 2007, p. 431). Other cities in post-socialist Europe have witnessed similar urban challenges (Petrović 2009). Therein, these patterns were mostly visible in the case of the major cities during the early 1990s, but they have also occurred in provincial cities since then (Nagy 2001). Side by side with the sprawl of low-density residential areas, this dispersion of new retail and business facilities have influenced the necessity of car use (Petrović 2005). Actually, these retail zones have become recognizable by huge car parks in front of their facilities.

One of the main consequences of the rise of retail and business sector and well as housing suburbanisation has been the rise of “car culture”. First, the favouritism of individualisation has also caused clear support to use of automobiles. For illustration, even the major cities with efficient mass public transport system (e.g. metro system) have faced the sharp decrease of the use of this transport mode in favour of cars (Petrović 2009). One of the reasons for such trend was the decrease of financial support to public transport (Dimitrovska-Andrews 2005). The increase of the number of cars in Budapest in the period 1990-1996 was approximately 30% (Bodnar 2011, p. 162). In minor cities, this phenomenon has been even more observable. Generally, all countries in post-socialist Europe witnessed the big increase of the number of cars. In some cases, this number was tripled in just two

decades, from 1985 to 2004 (Hirt & Stanilov 2014). By survey from 2003, the number of registered cars per 1,000 residents was the same in “Western” and “Eastern” Europe (Stanilov 2007).

The actions to cope with this situation are usually related to the extension of relevant transport infrastructure, such as the widening of the streets or new public garages (Petrović 2009). However, local budgets have not been enough to follow the rise of “car culture” with new infrastructure projects (Hirt & Stanilov 2014). Moreover, negative impact from “car culture” has been observed in many ways – more noise and pollution, the overcrowding of streets and traffic congestions, the decline of the quality of open public space, and illegal usurpation of space dedicated for other urban functions (Stanilov 2007; Petrović 2009; Hirt & Stanilov 2014).

Considering previous, the trend regarding pedestrian and cyclist transport have also challenged. They have suffered from the pressure from the increased number of cars (Barnfield & Plyushteva 2015). Although the major streets in old city cores have been pedestrianised and thereby transformed in affluent shopping and tourist areas (Hamilton & Carter 2005), this has not been a dominant pattern in the other parts of post-socialist cities. With limited network, cycling has been in even more severe situation. However, it has been also proved that the reduced number of bicycles in post-socialist streets is not just connected with the accompanying infrastructure; it seems that state of mind towards cycling has been also changed in negative way (Barnfield & Plyushteva 2015).

3. URBAN PATTERNS REGARDING MOBILITY IN POST-SOCIALIST SERBIA

Post-socialist cities in Europe present many regional differences (Wilson 2013). Serbian cities are very distinctive among them and this distinctiveness has shaped the specific characteristics of urban mobility. Generally, they belong to the sub-type of ex-Yugoslavian cities (except Slovenian ones) (Petrović 2005, p. 16).

Distinctiveness of Serbia and, more precisely the space of the former socialist Yugoslavia, has longer past. It is important to mention the influence of the unique system of socialist self-government in former socialist Yugoslavia, which enabled more freedom and decentralisation and which introduced some elements of market economy (Pichler-Milanović 1999; Petrović 2004; Petrović 2005). In the case of urban mobility, this system introduced some elements of market economy, producing thereby better living standard and similar consumer patterns like in the capitalist West (Hirt & Stanilov 2014). Therefore, former Yugoslavia was one of the most prolific socialist countries for the earlier appearance of “car culture”, which first indications were visible in the 1980s (Misanović 2013).

In contrast, the second distinctive characteristic of Serbia comes from the recent turbulent past. One of the main outcomes of the Yugoslavian wars in the 1990s was the huge number of refugees in Serbia. Their accommodation in the times with scarce resources consequently caused the “boom” of already present illegal practice in urban space (Petovar, 2003; Petrović 2004). New illegal residential settlements arose across the outskirts of Serbian cities during the 1990s, producing new level of urban sprawl. These settlements have been formed with fuzzy “urban” fabric and unorganised network of narrow streets, disabling any “normal” solution for urban mobility: decent

infrastructure, public transport, cycle and pedestrian paths, etc. (Petovar 2003; Tsenkova 2008). This phenomenon has further fuelled the use of cars. It has been especially observable in the small and medium-size cities, where public transport has been traditionally underdeveloped. But, even in the case of Belgrade, where the share of public transport in total mobility is traditionally high (more 50% in 2012), the illegally built suburbs suffer from bad transport connection (Misanović 2013).



Figure 1: The usurpation of cycling paths by parked car in Subotica (source: www.subotica.com);

Figure 2: Congested streets and footways in central Belgrade (author: B. Antičić)

The other forms of informal/illegal practice have also taken a place in Serbia and indirectly have triggered mobility. Illegal conversion of the former housing areas into new retail facilities has been very common in Serbia (Hirt & Stanilov 2009). In relation with its illegality it is very hard to plan appropriate plans and actions. In the case of public space, the severe and most obvious problem with parking has occurred in the central districts, where parked cars clog most streets and footways (Stanilov 2007). Furthermore, the number of temporary objects has uncontrollably increased in the 1990s, especially in bigger Serbian cities (Vukmirović & Runić 2013), which have further shrank the space for pedestrians and cyclists.

Historic cores in Serbian cities have faced the same patterns of transformation towards retail and business zones like other post-socialist cities, but in smaller scale due to postponed and still limited economic transition (Hirt & Stanilov 2014). Here, the main pedestrian streets have been especially in the focus of both professional and government interest (Đukić 2011). However, the attempts to improve the state of public space have been generally fragmented and unorganised. The priority is usually given to car. A good illustration for this attitude can be found in the case of one of the renovated streets in old core the city of Sremska Mitrovica in 2010, where the newly-built cycling lines along the street are transferred to parking sites during project. During a conversation with one of the paper authors, the responsible designer of the project explained that this is a “temporary” decision till “adequate moment” in future.

3.1. Urban planning and mobility in post-socialist Serbia

Urban planning is considered as one of key factors in Serbia which can accelerate or inhibit urban mobility in city (Đukić & Vukmirović 2013). But, unprepared post-socialist countries have not been in position to easily customize their planning system to be able to combat which very new socio-economic reality. Thus, urban planning in post-socialist countries in less developed post-socialist countries can be described as “generally weak, passive, reactive, and subordinated to private interests” (Hirt & Stanilov 2014, p. 41). In Serbia, this phenomenon is known as “Investors’ urbanism” (Petrović 2009, pp. 262-263).

Another problem in Serbian urban planning has been the inefficient implementation of urban plans. Currently acting Law on planning and

construction and subordinated legislative acts have had many harmonization procedures last years, based on intention to create more supportive environment for both faster procedures and better implementation. Therefore, the law has made a clear distinction between general urban plans and the plans of general and detail arrangement (PS, 2009-2014). The first ones are strictly strategic documents for major urban settlements (>30,000 inhabitants) which should create a broad framework for further urban planning. Thus, they do not give profound explanations for details, but they are a right place for the introduction of innovations.

These elements should be thereby developed through the plans of general arrangement, which are used in the case of both the parts of major urban settlements and the entire middle size settlements (towns and major villages). Small settlements (villages with <1,000 inhabitants) are usually planned through spatial plans of municipalities. Finally, the most sensitive urban areas, where both a lot of resources and conflicts can be expected, are developed through the plans of detail arrangement, which are the most detailed and systematic plans in Serbian planning system. Therefore, they represent a usual approach for the development of the main projects in cities, such as flagship projects, the projects of renewal/revitalization, projects for the main infrastructure corridors, etc.

The problems in urban planning and its implementation are followed with the problems in related sectors. For example, the systems of ownership rights and cadastre are also underdeveloped and with many inconsistencies. This is also true with legislative system. For example, Serbian legislative acts on transport forbid the introduction of cycling paths along pedestrian streets and zones. Then, the legislation regarding integrated streets is almost non-existent.

Urban mobility is still a new topic for local authorities and planning agencies in the majority of Serbian cities. Due to the aforementioned problems with traffic congestions in the major cities, urban mobility is only on spotlight in Belgrade and Novi Sad. Belgrade has initiated the programme of sustainable urban and transport planning in the city (SUTP Belgrade) in the last years. It is especially oriented towards the improvement of cycling conditions and the provision of appropriate network of cyclist routes and paths (TIS 2013). Novi Sad has just started with the promotion of urban mobility through relevant discussions and round tables.

4. CASE STUDY – NEW GENERAL URBAN PLAN OF ŠABAC, SERBIA

In relation to aforementioned consideration of urban planning system in Serbia, a general urban plan is chosen as a case study in this paper.

4.1. General data about the City of Šabac and its urban development

The City of Šabac is located in the north-western part of Serbia, at the right side of the Sava River and belongs to Mačva administrative district. An average elevation of the city is 80 m and the terrain that supports the city is a mainly flatland. The population of the city is around 80,000, which includes the city with suburbs. The position of Šabac in the Serbian traffic network is very good. It is located at about 80 km from Belgrade and Novi Sad that are the biggest centres of the country and about 60 km from the Nikola Tesla Airport in Belgrade.

Very suitable configuration of the terrain and the historical period of the formation of the city have caused the extremely orthogonal urban fabric. Although data regarding the first settlements in this area date back to ancient times, and data about permanent settlement with the urban character exist since 15th century, urban fabric that are known today was formed later, in the 19th century. This time was crucial for Šabac - it was among 6 main cities in newly-formed the Principality of Serbia (Kojić 1970). Actually, it is believed that Šabac was the first urban settlement in modern Serbia which got a completely new urban form (Đokić 2009). It was based on the role-model of Habsburg settlements, developed by fortification engineers in south Pannonia.

As a border city of that time, Šabac was located very close to these examples. The current core of the city was formed in orthogonal urban fabric, with quadrant and spacious urban blocks and wide and straight streets. City core formed in the first half of 19th century is recognized by row of objects with luxurious facades positioned at the street's regulation today. These houses belonged to merchant families, since trade was the main activity in the city. Money of rich merchant families made the further transition of the city from Ottoman oriental town to European-looking city was possible.

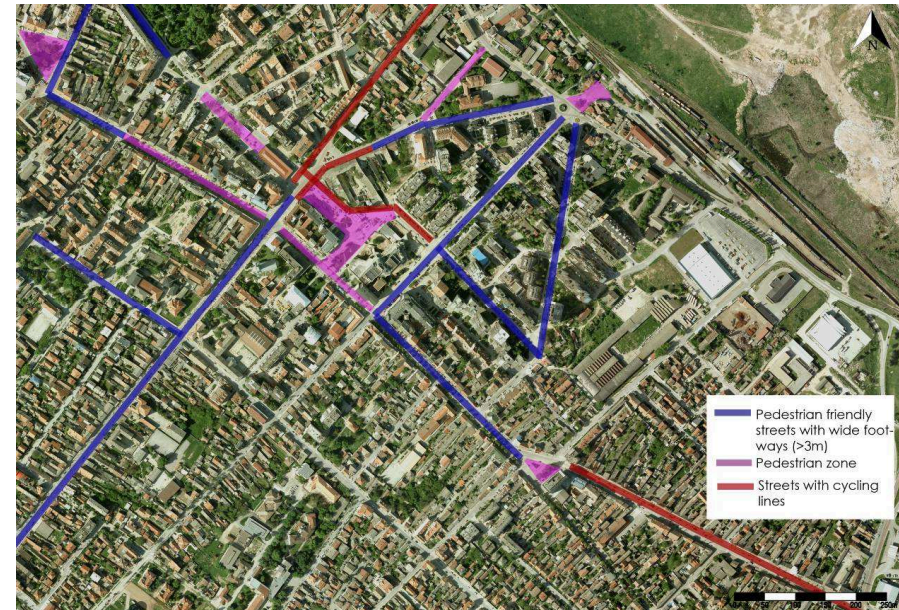


Figure 3: The centre of Šabac – current state (author: K. Lukić and B. Alimpić)

After two World Wars and transit to socialism in mid-20th century, the industry that was built, completely changed the character of the city. Several quarters, entirely adjusted to modernism and modern architecture, were built in the 2nd half of the 20th century. The end of the 20th century brought economic collapse, disintegration of the state and refugee influx, which made its impact on the city's urban patterns. The placement of the refugees happened at the edge of the city, where planning regulation and its implementation were not so strict.

While industry suffered and eventually collapsed, retail zones were growing. Trade was new opportunity for people that lost their job in industrial sector during the economic sanctions to Serbia that lasted several years in the 1990s, as well as a way of survive for the new inhabitants of the city - refugees. As a consequence of economic changes, several dominantly

residential streets, that connect city core to its suburbs, transferred into mixed-use streets with stores or small businesses in the ground floor and apartments in the upper floors. Commercial sector in the city expanded even more since the beginning of new millennium. When economical and political situation became stable, Serbian market opened and retail sector “exploded”. Šabac was no exception, resulting with expanded retail zone of city core and several retail zones at the main traffic corridors towards other cities nearby.

Nowadays, four types of city quarters can be recognizable in urban space:

1. Old city’s core (city centre),
2. Modernist quarters characterized by big superblocks and with high density and wide green areas,
3. Mostly single-family residential zone without retail,
4. Suburbia that emerged by transformation of rural areas with both urban and rural elements.

4.2. Mobility on local level

Vehicular transport functions very well, with minor jams at peak hours (7-8 AM, 12, 3-4 PM). Streets form the network which follows orthogonal urban matrix of the city. The width of the street is usually adjusted to its traffic intensity, except in a few cases. The most loaded streets are the ones that are the main corridors to the cities nearby.

Pedestrian movement is directly related to the attractiveness of the location, thus the most intensive directions are at the city core. In 2006, the main street in Šabac was declared as pedestrian zone by local decree and it has been the most important and most attractive route for pedestrians since then. Most of the streets in the city center have wide footways that enable

comfortable use. The intensity of pedestrian movement is lower at the periphery than at the centre and the quality of footways in residential areas can vary - in some quarters is very comfortable, while in the others footways do not exist. A lot of pedestrians also use the streets towards riverside of Sava.

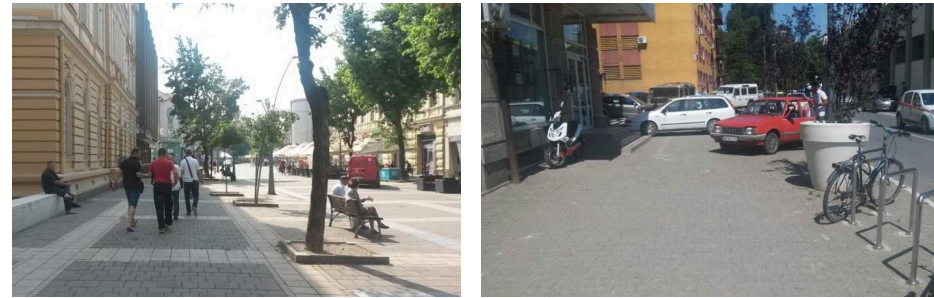


Figure 4: The main street in Šabac: example of good pedestrian environment (author: Ksenija Lukić)

Figure 5: one of the central streets in Šabac: example of footway occupied by cars (author: Bojan Alimpić)

With mainly flat terrain and streets of wide regulation, followed by long tradition of using a bike as transport device, Šabac has the potential to develop as a bicycle-friendly city. However, that potential has not been used properly so far. Currently, network of bicycle paths, which connects different parts of the city, does not exist. It is interesting that spatial and urban plans have considered connections between city centre and suburbs rather than connection between city quarters. As a result, implemented bicycle infrastructure is partly developed. Thus it requires a new, systematic approach.

Public transport is organized by bus lines. Bus stops are distributed based on location importance, but like bicycle infrastructure, a certain deficiency in

public transport routes occurred. Suburbs and city centre have a very good connection, with great number of routes during the day and public buses on these directions are being used frequently. On the other hand, city's quarters do not have proper connection between each other and the use of these routes is very low.

During several decades of socialism, urban planning in the field of transport and mobility was based on supporting vehicular transport. Consequently, the entire streets had wide regulation, which left enough space for comfortable footways and greenery. However, wide footway does not automatically mean an attractive space. Hence, many streets developed during the 1970s and the 1980s remained empty, without high significance in urban fabric and despite their wide regulation. During the last decade of 20th century, several quarters in suburbs were developed. The aforementioned "blocked transformation" was reflected in building environment by developing series of quarters at the edge of the city in illegal or semi-legal way. These quarters were exclusively residential and with narrow streets. In these conditions, street was practically reduced to roadway which put car/vehicle in focus. Footways were built either very narrow or were not built at all.

Since 2014, there has been a strong citizen initiative of citizens to develop other, more "green" ways of transport on first place, like public transport, cycling and walking. This has influenced the political will of city government. The city has been actively working on developing projects that 'reserve' public space on streets for pedestrians and bicycle lines. These intentions should be incorporated into the new General urban plan for Šabac (currently in progress). Practice has shown that political support is the very important factor to make changes in built environment.

4.3. Issue of mobility in current plans

Analyses presented in this paper are based on personal experience of the authors engaged in local urbanism, the experience and the knowledge of experts from Agency for building environment "PLAN" in Šabac, as well as on relevant existing plans: Spatial plan of municipality (2011), General urban plan for Šabac and its suburbs (2008) and Plan of general regulation for Šabac (2012). All listed plans have elaborated the issue of mobility through transport development. When it comes to mobility, the most important interventions from General urban plan for Šabac and its suburbs (2008) are:

- New regulation proposes that every new structure had to provide its own parking space –one parking place per residential unit. This regulation efficiently stopped the trend of using public space and footways as "unofficial" parking lots;
- Transport bypass was planned and constructed around the city that successfully relocated heavy transport far from the city and simplified route to the industrial zone.

Within current studies and plans, the focus is still to develop vehicular transport, while pedestrian mobility is neglected. Public transport has been developed under the issue of simplicity of bus routes rather than the needs of citizens. When it comes to bicycle movement, plan has conceptually pleased needs of citizens for creating basic bicycle routes, but did not come with systematical solution about increasing safety of bike-riders in traffic. General impression is that all of the listed plans were very analytical about transportation infrastructure, aiming to establish strict hierarchy of streets in the city. However, the missing part is a qualitative analysis and the treatment of a street as a public space.

4.5. Existing state - Street typology

Considering a street as the main and the most present element of open urban space, it is chosen for the further analysis. The typology of existing streets in Šabac thereby is formed. It also strives to simplify the entire analysis. The typology is formed on the basis of several key characteristics, which are usually divided into physical and functional ones in local practice (Nikezić 2007).

Table 1: Key characteristics for the formation of street typology in Šabac

FUNCTIONAL CHARACTERISTICS		STREET TYPE	PHYSICAL CHARACTERISTICS
The dominant function along a street (the name of types)	>	<	Total width of a street (street regulation)
The importance of a street in urban network	>	<	Roadway width (including parallel parking)
The frequency of vehicular transport	>	<	Footway width (both sides)
The frequency of cycling transport	>	<	Alley and urban greenery
The frequency of pedestrian travel	>	<	The presence of parking
The presence of public transport	>	<	The presence of cycling paths

In relation to chosen characteristics, 8 types of existing streets in Šabac are identified:

- Type 1: Residential Street A
- Type 2: Residential Street B
- Type 3: Residential Street C
- Type 4: Mixed-use Street A
- Type 5: Mixed-use Street B
- Type 6: Industrial street
- Type 7: Special Street 1 – The main street with retail facilities
- Type 8: Special Street 2 – Alley-street

Table 2: Existing street typology in Šabac

CHARACTERISTIC \ TYPE	TYPE 1	TYPE 2	TYPE 3	TYPE 4	TYPE 5	TYPE 6	TYPE 7	TYPE 8
Transport importance	Transit	Thor.*	Local	Transit	Thor.*	Transit	Special	Thor.*
Vehicular transport - frequency	+++	++	+	+++	+++	+++	-	++
Bicycle transport - frequency	++	++	+	++	+	+	-	+
Pedestrian travel - frequency	++	++	+	+++	++	+	+++	+++
Public transport	Yes	No	No	Yes	No	Yes	No	No
Total width of a street	24 m	15 m	9.5 m	19.5 m	12 m	~ 50 m	22 m	12 m
Roadway width (with parallel parking if it exists)	14 m	7 m	6 m	9.5 m	7 m	9.5 m	-	7 m
Footway width (both sides, with alleys if they exist)	10 m	7.5 m	3.5 m	10 m	5 m	2.5 m	22 m	2 m
Parking (2 – both sides, 1- one side)	Yes (2)	Yes (1)	No	Yes (1)	Yes (1)	No	No	Yes (1)
Cycling paths	No	No	No	Yes	No	No	No	Yes

* Thor. - Thoroughfare

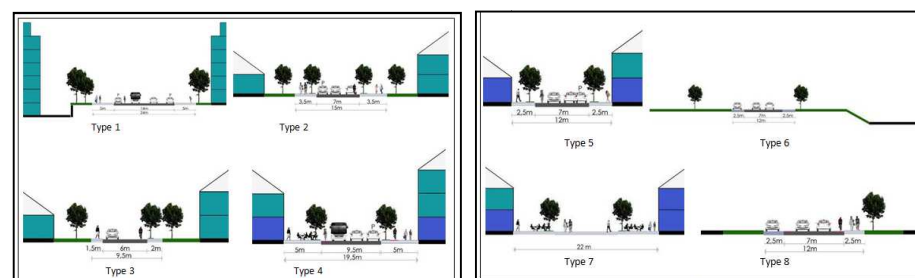


Figure 6: The sections of street types in Šabac (author: Ksenija Lukić and Bojan Alimpić)

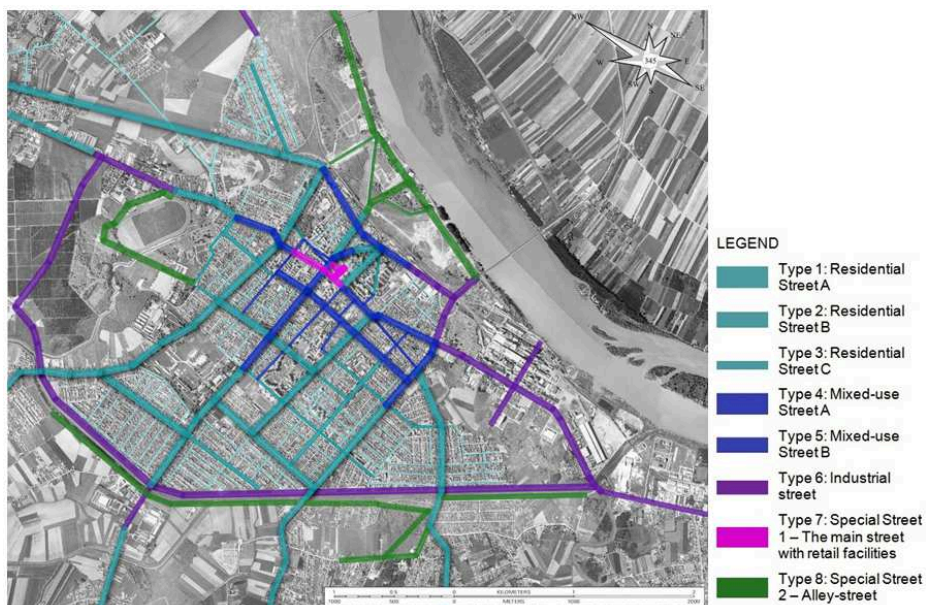


Figure 7: The typology of existing streets in Šabac (author: K. Lukić and B. Alimpić)

4.6. Existing state – The main challenges

The elaboration of existing state of streets in Šabac refers to several challenges for the improvement of urban mobility in the city:

- Street network is well-organised, but more adapted to cars than to other street users;
- Parallel parking is a common phenomenon in many streets, which disables the possibilities to form more space for bicycle paths and urban greenery;
- The lack of public transport in city limits;
- The lack of qualitative and comfortable pedestrian and bicycle paths in those streets which are the major links between city centre and the main landmarks, such as riverside.

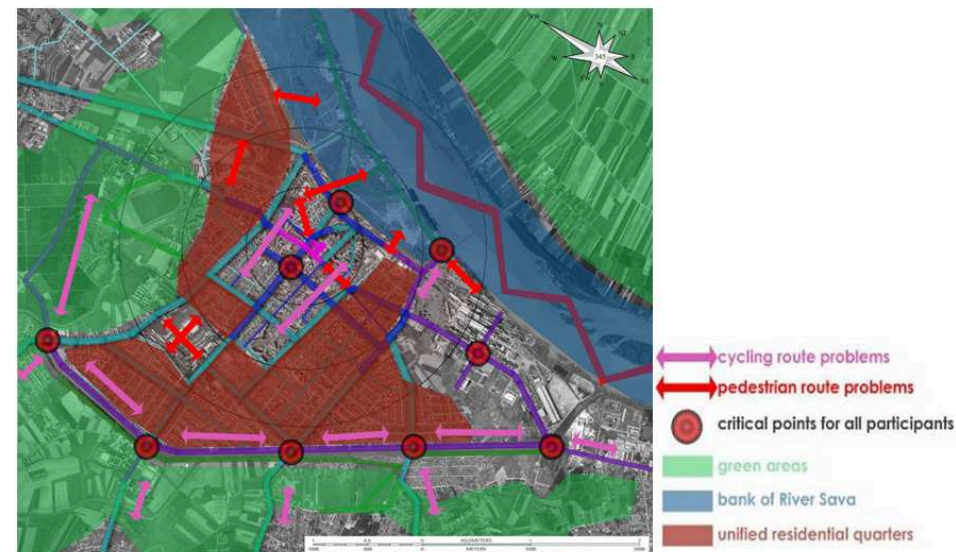


Figure 8: The main challenges for the improvement of urban mobility Šabac (author: K. Lukić and B. Alimpić)

4.7. Proposed solution for better urban mobility

In accordance with aforementioned facts and challenges for urban mobility in Šabac, the main interventions target following elements:

- The significant reduction of parallel parking along streets in inner city centre. This move will provide new space for pedestrians and cyclists. The long-term parking should be moved in the inner space of nearby big urban blocks, which is insufficiently used today;
- The extension of pedestrian zone in current contact zones. This will be done especially towards west and northwest, where two city landmarks (the main park and the highest tower) are located.
- The creation of the adequate network of cycling paths, which will follow the main flow of travellers in the city. This especially covers extended

pedestrian zone, new integrated streets and the main traffic corridors which connect centre and periphery and, particularly, important landmarks at the city periphery (moistly sport and leisure zones);

- New public transport should follow that previous proposition, i.e. it will enable good connection between centre and periphery for the inhabitants who are not able to use cycling and pedestrian “solutions” (elderly, disabled persons, parents with young children, etc.);
- A new urban bypass is inevitable to allow the “relaxation” of the main transport corridors from heavy transport. This will leave more space for pedestrians and cyclists in existing corridors;
- The transformation of the main street in Šabac, which should also include cycling paths. It is a pedestrian street now, but its dimensions and inhabitants’ needs point that the inclusion of these paths is very recommendable. Due to inconsistency in Serbian legislative (pedestrian streets cannot include cycling paths), a special local decree should be enacted to enable this action.

Significant element of a successful plan is its implementation. Therefore, focus is on measures that are affordable for Šabac. Some of the stated interventions require better organization of already existing system rather than making a new one - good example for this is proposed better network of public transport, which functions at average level and could be improved to advanced one. Furthermore, the transformation of some street types can be done relatively easy by smart use of colour, street design, calming elements for vehicle traffic, and horizontal and vertical traffic signs. The extension of existing pedestrian zone requires political decision and local decree more than expansion of spatial capacities, and same applies on inclusion of cycling paths in the existing pedestrian zone.

The previously formed types should be improved to enable proposed interventions:

Table 3: Planned street typology in Šabac – the main interventions

TYPE	THE MAIN INTERVENTIONS	SECTIONS
Type 1 Residential Street A	<ul style="list-style-type: none"> • The construction of bicycle paths at the both edges of roadway • The reduction of parallel parking • The major improvements of urban greenery – “green barrier” between vehicles, pedestrians and housing • Better urban design 	
Type 2: Residential Street B	<ul style="list-style-type: none"> • The construction of bicycle paths at the both edges of roadway • The reduction of parallel parking • The introduction of public transport • Better urban design 	
Type 3: Residential Street C	<ul style="list-style-type: none"> • If streets are wider that 9 m, that they can stay in existing shape, with interventions on urban design • If streets are narrower that 9 m, that they can will be transformed in integrated streets, with the elements of traffic calming 	

Type 4: Mixed-use Street A	<ul style="list-style-type: none"> • The reduction of parallel parking • The major improvements of urban greenery - "green barrier" between vehicles, pedestrians • Better urban design 	
Type 5: Mixed-use Street B	<ul style="list-style-type: none"> • The reduction of parallel parking • The integration of cycling elements into roadway, with accompanying solutions • for traffic calming 	
Type 6: Industrial street	<ul style="list-style-type: none"> • The construction of cycling paths • The introduction of protecting vegetation • The widening of existing footways 	



LEGEND	
	Type 1: Residential Street A
	Type 2: Residential Street B
	Type 3: Residential Street C
	Type 4: Mixed-use Street A
	Type 5: Mixed-use Street B
	Type 6: Industrial street
	Type 7: Special Street 1 – The main street with retail facilities
	Type 8: Special Street 2 – Alley-street
	New Recreation lines
	New circle bus line
	Town centre circle bus line

Figure 9: Proposed street network in Šabac – colours follow the previous table (author: K. Lukić and B. Alimpić)

Type 7: Special Street 1 – The main street	<ul style="list-style-type: none"> • The introduction of cycling paths through the construction of new lines and/or the adaptation of the part of existing pedestrian zone • The extension of existing pedestrian zone • zone • Better urban design 	
Type 8: Special Street 2 – Alley- street	<ul style="list-style-type: none"> • The suspension of parallel parking • The widening of footways • The integration of cycling elements into roadway, with accompanying solutions • for traffic calming • The formation of alley 	

5. CONCLUSION

The paper clarifies the main challenges which are faced ahead of urban mobility in Serbia at both national and local level.

At national level, the challenges can be divided into two groups. The first group is proposed to 'normally' developed urban fabric, where the most noticeable problems are related with bad management of the open urban space. The special actions and interventions should be addressed to the most problematic issues, such as the general clog of streets by parked cars and informal use of this space by retail. But, the main issue is probably to set all these actions in organised way, to enable the formation of a decent management system and thereby the real support to the adequate network of "smart" types of transport (cycling, walking, public transport, etc.).

The second group of the challenges refers to illegal settlements, which are more visible in the case of the main cities. Nevertheless, these locations seek

more profound actions and interventions. The past experience has proved that the interventions in these settlements are a very complex “venture”. Therefore, all interventions should respect all elements which are not a problem for development. The rational solutions, such as elements of integrated street/traffic, will probably be used here.

Local level is presented through the case of the city of Šabac. It gives an illustrative model for urban mobility in middle-size cities. It is important to accent that the main problem in this case is not an insufficient street network or the street dimensions – they are usually adequate for the improvement of urban mobility. In contrary, the task is how to organise the entire system in better way, with special attention to the formation of appropriate cycling network and better urban design, which will initiate mobility. Finally, better management of street space (in relation to parking) is also a significant issue.

These actions and interventions at both national and local level need more developed legal and strategic framework. Generally, the creation of a policy for better urban mobility is desirable. But, it should also had to include “soft-measure” documents, such as design guidance, the-best practice presentations and the documents with comparison of different experiences and solutions.

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