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Potential of Recycling Urban Territories

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Abstract. Urbanisation process is dynamic and should respond to the current needs of the society. Most of the urban fabrics of the mass housing estates in the former socialist countries, which have undergone major socio-economic changes, currently need a transformation of their spatial structure. As a result of demographic and urban changes, as well as the former non-complex strategic urban solutions, there are a number of empty spaces in the built-up structures – unused, under-utilized, less functional or dysfunctional. Research points to the potential of unused space for future urban development, with efforts to identify and find the appropriate use for these "dormant urban potentials", which could be utilized for social, economic and environmental benefits; however, it is necessary to examine and to understand the structure of the premises in detail and in the context of differentiated hierarchy and position within the city. The aim of the article is to point to the empty, abandoned spaces in the urban structure of Bratislava, in Bratislava - Ružinov and Bratislava - Nové Mesto city districts and indicate the potential of their transformation to the new functional uses, with an emphasis on the limits of the territory and environmental sustainability. The ambition of the investigated pilot urban studies is to find an innovative town-planning model and possibilities for regeneration of the empty spaces in the fragmented structure of the prefabricated mass housing estate. Urban design proposals for non-functioning premises, undefined and often circumvented territories, forgotten "crevices" in urban fabric, try to seek relevant answers on their transformation in the form of corresponding urban solutions, complementing the existing residential structure with new features, meeting the current needs of the citizens, adding infrastructure for the activities of the local community, promoting a system of green spaces, "free" pedestrian urban landscapes, open to new interpretations of the use of space. The possibilities of recycling the unused territories have been tested through proposals valorising urban structure in order to ensure optimal social and urban development, support the hierarchy and complexity of core areas, prevent the conversion of unused sites in the lucrative areas solely for the achievement of economic gains for investors and gentrification, promote the eco-friendly development with a focus on climate change and protection of ecosystems, and ensure the optimal economic land use. The lessons learned should contribute to the sustainability of the urban structure, the revitalization of abandoned and neglected areas, and support the hierarchical system of the main nodes of the model urban area. The transformation of unused territories, the public semi-public and private spaces, brings compactness and at the same time the diversity to the urban environment, strengthens the system of green infrastructure and the variety of social interactions, which contributes to the increase of the viability, and attractiveness of the entire urban neighbourhood.



1. Introduction

The task of the 21st century should be to prevent the urban expansion of cities, to keep their current borders and their meaningful fulfilment [1]. Unused spaces in the cities will logically play an important role in this endeavour. Free and transformable areas inside the city represent the potential for sustainable growth and prevent the "land-consumption" outside the city [2]. Research, related to the unused areas appear in the U.S., what is connected in particular with massive suburbanization processes of American cities [3], but also in the wider geographical context [4],[5]. Most of the former socialist settlements, which in the past have gone through significant socio-economic and spatial development, face currently needs for transformation of their spatial structure. Because of socio-economic and demographic changes, as well as non-complex urban solutions in the past, there are number of unused, underused, vacant, or less functional spaces within their built up areas. Urban transformation and recycling of these spaces represents an opportunity for their valorisation. Especially socialist mass housing estates face today transformation processes [6] and need guidance on redevelopment of their spatial structure, with the aim to integrate new features into the territory, stabilization and consolidation of fragmented urban fabric. Brownfield transformations usually aim to follow and preserve the identity of the place and the industrial heritage [7], improvements of residential structures aim to respond the needs for additions of various civic amenities, additions of recreation and leisure areas. Reflecting the consequences of current global climate changes, the emphasis is often placed on integration of the green areas in urban tissue, and on creating green corridors, greenways, or on the temporary use of urban vacancies as green spaces [8].

We have examined the urban fabric of the city districts Bratislava - Ružinov and Bratislava - Nové Mesto, in localities Ružinov – Miletičova and Ružinov – Pošeň, with the aim to identify the unused, underused, dysfunctional areas, and to verify the potential of their recycling and valorisation. We have tested the possibilities of the new appropriate uses of these areas and spaces through student urban design proposals.

2. Material and Methods

The city districts Bratislava - Ružinov and Bratislava - Nové Mesto, in localities Ružinov – Miletičova and Ružinov – Pošeň, represent an ideal model to study the potentials of unused spaces in urban structure. It is a socialist mass housing estate from 60-ies and 70-ies of the last century, with a low built up density, absence of civic amenities and key nodes.

As the first step, the present conditions of the urban structure of the localities Ružinov – Miletičova and Ružinov – Pošeň have been analysed, using zonal master plans, aerial ortho-photo maps, and historical literary and visual sources. Field surveys and site visits have been conducted. Various analyses have been elaborated: from analysis of the current links to the wider context of the city, through analysis of the historical urban development, analysis of the current urban functions, transport, typology of buildings, composition, analysis of public spaces and green spaces. The analytical part has resulted in defining problems and potentials of the examined localities and identification of unused spaces. Problems revealed the negative phenomena in the territory, less functional or dysfunctional, vacant spaces. Potentials have pointed to the possibilities of their recyculation and to new uses.

In the next urban design step, using the method research by design, the possibilities of recyculation and new uses have been further verified through urban design proposals, looking for variant solutions of the transformation options and new functional uses. The emphasis was given to the limits of the territory and the sustainability of the environment, taking into account the economic, social and aesthetic aspects. The proposals elaborated by students and providing new insights on the possible future concepts of the further development of the localities Ružinov – Miletičova and Ružinov – Pošeň have been presented in the form of a catalogue and exhibitions to the local municipality and discussed with citizens.

3. Results

As a result of the analytical part of the study, the categories of the main spatial types of urban structure suitable for functional transformation and urban recycling in the urban fabric of Ružinov – Miletičova and Ružinov – Pošeň have been identified: urban nodes (crossroads, intersections, junctions, squares), lines (main avenues, broadways, main streets, green corridors), and areas (residential territories, brownfields and the fringe allotment garden areas) (**Figure 1**).

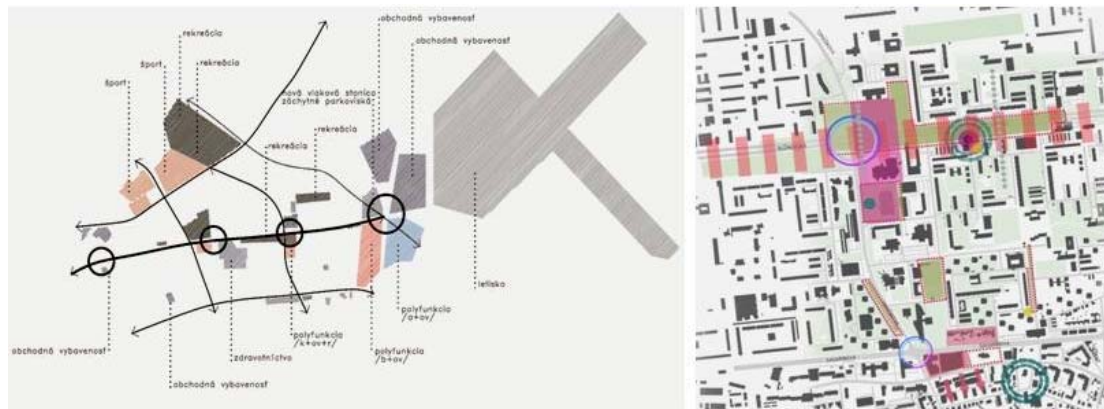


Figure 1. Categories of spatial types of urban structure – urban nodes, lines and areas of in Ružinov – Miletičova and Ružinov – Pošeň, suitable for functional transformation and urban recycling according students M. Lukáčová and B. Feriancová, supervisor A. Sopiřová

In the spatial context of the urban nodes, lines and areas the unused and underused areas have been identified (**Figure 2**, **Figure 3**). The analysis of problems and potentials of unused spaces and dysfunctional areas in urban nodes, along lines and in residential, brownfield and fringe areas resulted in definition of the main aims that should be achieved by urban recycling:

- polyfunction of the main nodes – gravity centres of the city district, by integration of new functions and addition of vital public spaces for social contacts
- humanisation of the main streets, broadways and avenues by addition of polyfunctional parterres in main composition axes and by addition of pedestrian and cycling paths, with supporting and insulating greenery
- consolidation of the existing residential structures by strengthening the functions responding to the actual needs of the inhabitants and by adding infrastructure for activities of local communities, by improvement and recovery of residential environment by limitations of motor-vehicle access traffic and solutions of car parking, by development of pedestrian and cycling connections and by development of recreation, leisure and sport opportunities, and green spaces
- transformation of the former industrial areas to the full-featured residential areas equipped with civic amenities, recreation and leisure areas
- transformation of the fringe allotment garden areas to residential function in predominantly green environment with poles of recreation amenities

These aims have been followed in the design part of the study. The ambition of the student proposals was to transform the urban nodes, lines and areas of Ružinov to a qualitatively higher level. Through urban design proposals various innovative ideas, new uses, and appropriate urban design solutions for recycling the vacant and underused spaces in the spatial context of the urban nodes, lines and areas have been tested (**Figure 2**, **Figure 3**).



Figure 2. Identification of unused and underused areas in urban structure of the locality Bratislava Ružinov – Miletičova on the left, and the proposal of new urban structure on the right, by students M. Lukáčová and B. Feriancová, supervisor A. Sopiřová



Figure 3. Identification of unused and underused areas in urban structure of the locality Bratislava Ružinov – Pošeň on the left, and the proposal of new urban structure on the right, by students A. Brna – S. Bertóková, supervisor S. Bařová

3.1. Main urban nodes and their recycling

The problem of the current state of urban nodes is the lack of their spatial definition and their unclear hierarchy. The results of the student designs offer several ideas to put in missing elements and functions, to enhance the gravity and hierarchy of urban nodes. As for example in the case of transformation of the area of the former market place on Miletičova Street to the full-featured city centre, that preserves the historic values of the area in the form of the original chimney and preservation of the functions of the marketplace. The contemporary architectural and urban design proposals bring in the new quality and, at the same time, contributes to the recovery of the genius loci of the entire district (**Figure 4**). The nodal point Tomášikova – Ružinovská is formed only by a stop of the public transport without a clear spatial assembly and urban composition. Student proposals put in objects of civic amenities that accentuate the central public space and form the multifunctional

Papánkovo Square, integrating underground parking places, pedestrian and cycling routes, concept of greenery and water element (**Figure 5**).

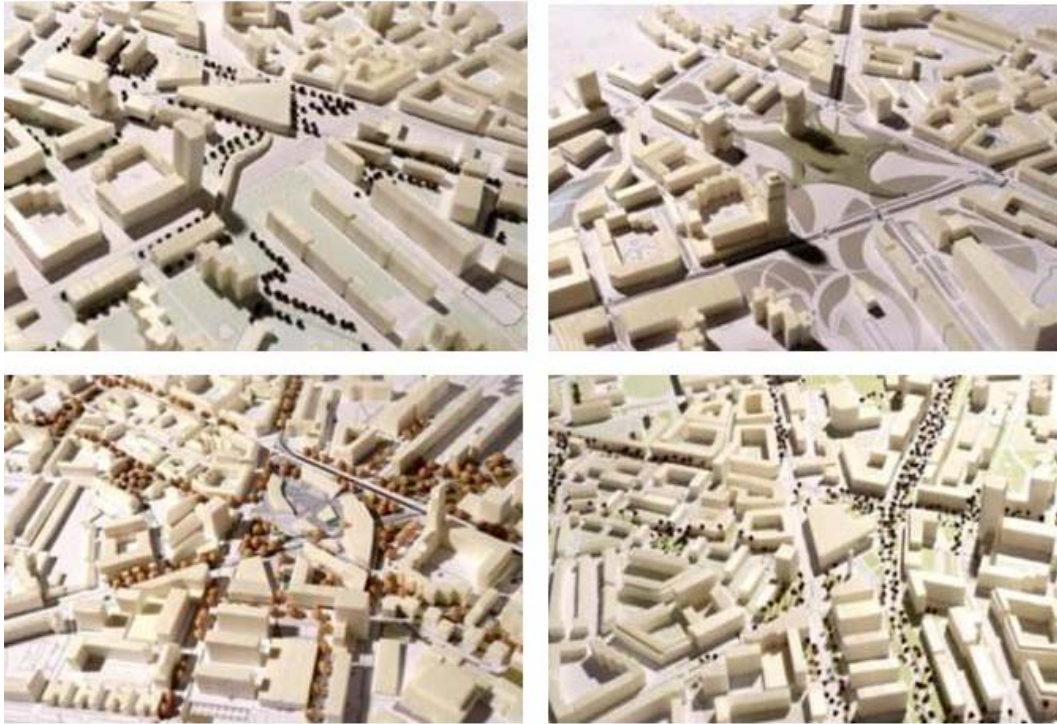


Figure 4. Variants of urban design proposals for the nodal area of the former market place on Miletičova Street in Bratislava Ružinov, by students A. Tokoviczová –I. Rusnáková, supervisor A. Sopiřová; K. Opatovká –V. Pálová, supervisor A. Sopiřová; L. Vaško – M. Vaňo, supervisor L. Štefancová; M. Volná – M. Švec, supervisor A. Sopiřová; (photo of the models: M. Kováč)



Figure 5. Example of the urban design proposal for Papánkovo Square in locality Bratislava Ružinov – Pošeň, by students S. Bertóková – A. Brna, supervisor S. Bašová

3.2. *Lines – recyculation along main streets*

The main streets and broadways in the examined area, the city avenue Záhradnícka and the city avenue Ružinovská are less articulated, and less spatially defined, non-complete and functionally monotonous streets, with potential to form a vital urban lines. The width parameters and spatial releases predispose the Ružinovská Street to form a strong urban axis with commercial and civic amenities, green lines and vital open public spaces.

The recyculation proposals of these lines, the former transport corridors, offered transformation to the urban boulevards, with regulated motor-vehicle traffic integrated cycling routes and enhancement of pedestrian movement. To enhance the vitality of these urban axes, the student works proposed to recycle the vacant, unused and less functional areas along these lines, and replace them by various urban functions, commerce, administration, and services.

3.3. *Recyculation of residential areas*

Mass prefabricated housing estate Ružinov from the socialist period over the decades has not been touched by heavy urban and architectural changes. Sporadically implemented interventions only complemented the existing system of urban structure. The system consisted of the isolated blocks of apartment buildings, surrounded by greenery, without clear articulation and hierarchy of public and semi-public spaces. Primary schools and kindergartens are clearly set out in the plan of the housing estate, nestled generally in the middle of the residential structure. The main transport concept was based on the principle of service communications around the perimeter of a residential structure, without interconnection of internal communications.

The transformation of the residential territory of the Ružinov district consisted in the targeted articulation of the spaces in housing estate. Emphasis was given to the functional complexity, improvement of the quality of public spaces including green spaces, and economically optimal usage including additions to residential areas. The supporting functional skeleton of the territory has been created by linkages between local key nodes, by conversion of the parterre of residential buildings located along the main pedestrian routes and the green lines towards multifunctional use. By additions to the existing solitaire residential blocks the compact semi-closed spaces have been created with spaces for relaxation, sport and with community garden plots to revive the community activities. The aim was to improve the quality and attractiveness of living environment for the residents of the housing estate (**Figure 6**).



Figure 6. Additions of new residential blocks form semiclosed public spaces with greenery in examples of urban design proposals for residential areas in the locality Bratislava Ružinov – Pošeň, by students S. Bertóková – A. Brna, supervisor S. Bašová and M. Vizár –M. Zbitáková, supervisor S. Bašová

3.4. *Recyclation of former industrial areas*

The remains of the original industrial and warehouse areas in the urban structure of the housing estate are represented by a single or set of objects, typically located in inefficient, unused, and fenced campuses. In the system of residential area, they represent an impassable territorial barrier and because of bad construction and technical condition of objects a bad social environment. Unresolved ownership relations and environmental burdens hamper their transition to the new functional use and the transition requires forced economic investment. These areas were in the model potential solutions proposed for transformation to residential functions (**Figure 7**).

A special case are the localities where the usability of the site is limited by the legislation, e.g. the protection zones of technical and transport infrastructure, spaces under bridges, unused allotment gardens. These territories were in the model potential solutions proposed to support hierarchical skeleton, and system of green infrastructure.

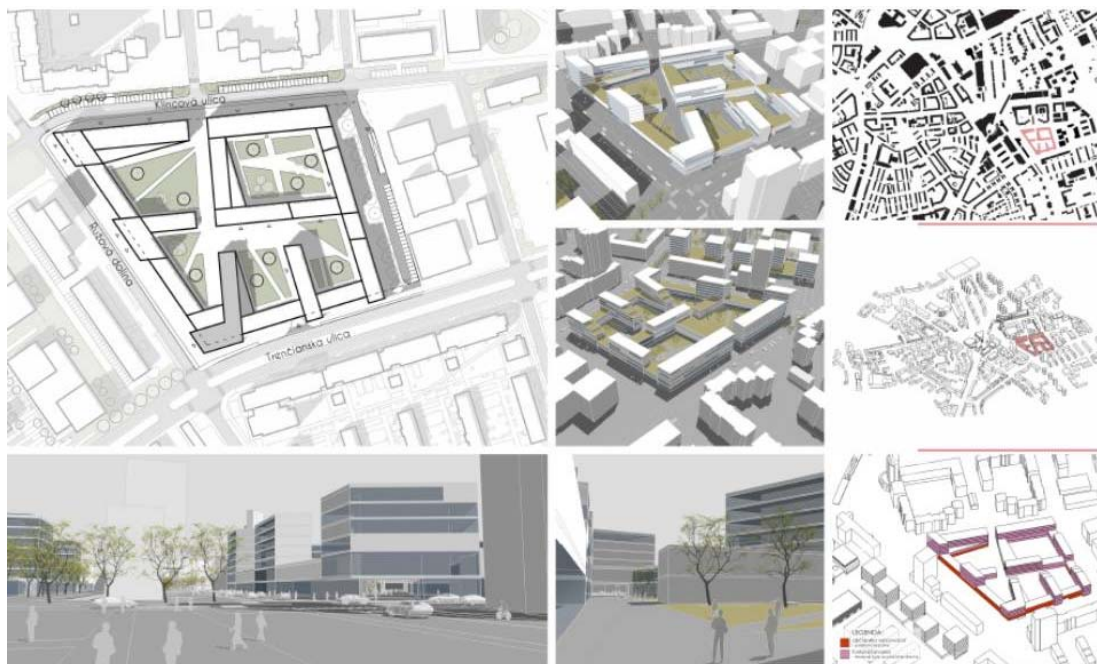


Figure 7. Transformation of dysfunctional industrial area to residential functions, by students L.Gallo – N. Filová, supervisor A. Sopiřová

3.5. *Green infrastructure proposals*

Vast green open spaces belong to the most characteristic features of the socialist housing estates. They were well equipped with children playgrounds and sport grounds, but they had failings and shortcomings, too [6]. Green open spaces in Ruřinov lack spatial differentiation and hierarchy, vast green spaces suffer problems of maintenance, loss of control and safety. Many of green spaces became unused and deteriorated.

The recycling possibilities tested on model territories in Ruřinov have the ambition to contribute to the sustainability of the city – to revive neglected and unused green spaces and to support the hierarchical skeleton of the green space system (**Figure 8**, **Figure 9**). The emphasis placed on the integration of green areas in the urban tissue reflects on current global climate changes in the city. It is considered that they will bring the social benefits of enhancing the process of connecting people and the natural green environment, they will serve as an instrument promoting youth integration and participation in local community [9] and reflecting the public will [10].

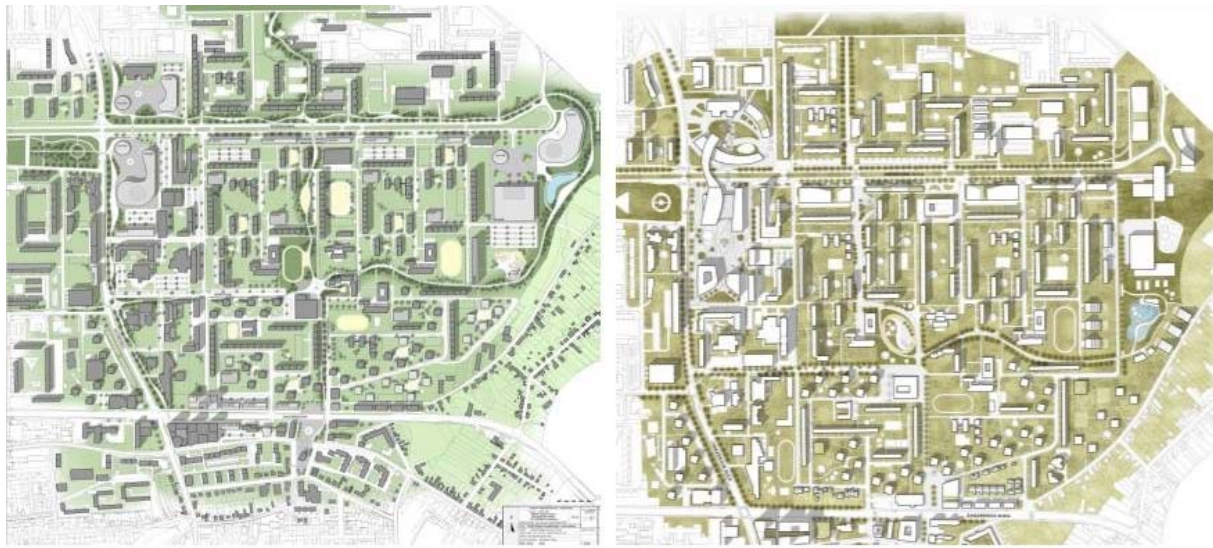


Figure 8. Green spaces proposals in residential areas of the locality Bratislava Ružinov – Pošeň, by students A. Duďajová – S. Trimlová and M. Gogálová – L. Halčáková, supervisor A. Sopirová



Figure 9. Green infrastructure proposals in the form of green corridors and greenways in the locality Bratislava Ružinov – Miletičova, by students M. Volná – M. Švec, supervisor A. Sopirová

4. Conclusions

Student proposals tried to outline and validate the visions for the transformation and recycling of unused and underused territories in the urban fabric and contribute to the sustainability of the housing estates of Bratislava city districts. The aim of the solutions was to indicate the possible transformation scenarios that emphasize the importance of the well-defined spatial and functional structure, creating a hierarchical skeleton of core areas and interconnected urban nodes. Targeted recycling focused in particular on the intensification of urban fabric and core nodes, articulation of public areas and the revitalization of the green areas. Additional features and functions have complemented the existing residential structure, in order to meet the current needs of the population.

The proposals differed in the degree of transformation, and in the concepts of service solutions. Progressive and comprehensive transformation of unused territories from the main public to the micro-spaces, has indicated the possibilities of consolidation of the urban structure, transport segregation, recovery of the territory and green infrastructure, and the possibilities of gains of new social benefits for the people. The recycling cycles are important in improving the use of urban structures and they

strengthen their vitality. It is assumed that sensitive and comprehensive transformations of unused territories from the public through the semi-public to private spaces, bring greater diversity to the urban environment and, at the same time, the opportunities for social interaction increasing the viability and the attractiveness of the housing estate, as well as its social and economic sustainability.

Acknowledgments

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References

- [1] R. Koucký, "Metropolitní plán (Metropolitan plan)" Praha: IPR, 484 p., 2014.
- [2] L. Vitkova, The principle of density regulation as a way towards sustainable city growth. Case study - master plans of selected cities in Slovakia, *Architektura & Urbanismus*, vol. 48 (1-2), pp. 2-23, 2014.
- [3] R. Trancik, "Finding Lost Space," New York: VNR, 246 p. 1986.
- [4] S. Lee, S. Hwang, D. Lee, "Urban Voids: As a Chance for Sustainable Urban Design," *Proceedings of the 8th Conf. Int. Forum Urban.*, 22–24 June 2015; Incheon, Korea, D007, 474-489; doi:10.3390/ifou-D007, 2015.
- [5] M. Nefs, "Unused urban space: conservation or transformation? Polemics about the future of urban wastelands and abandoned buildings," *City & Time*, vol. 2 (1), pp. 47-58, 2006.
- [6] K. Kristiánová, "Post-socialist transformations of green open spaces in large scale socialist housing estates in Slovakia," *Procedia Engineering: World Multidisciplinary Civil Engineering-Architecture-Urban Planning Symposium, WMCAUS 2016 Prague*, vol. 161, pp. 1863-1867, 2016.
- [7] K. Kristiánová, K. Gécová, E. Putrová, "Old industrial sites - conversion to parks: Potential of Bratislava," *Procedia Engineering: World Multidisciplinary Civil Engineering-Architecture-Urban Planning Symposium, WMCAUS 2016 Prague*, vol. 161, pp. 1858-1862, 2016.
- [8] J. Adamková, "Temporary green areas as part of public spaces," *Člověk, stavba a územní plánování 6, Praha ČVUT, pp. 6-10, 2012.* (in Czech)
- [9] A. Jaszczak, G. Vaznonienė, B. Vaznonis, Green infrastructure spaces as an instrument promoting youth integration and participation in local community, *Management Theory and Studies for Rural Business and Infrastructure Development*, vol. 40 (1), pp. 37–49, 2018.
- [10] T. Pavelka, A. Tóth, Public Will versus Development Pressure in Urban Landscape Transformations. *Landscape transformations of the post-communist countries conference proceedings, Prague CVUT*, pp. 127-131, 2013.
- [11] I. Silaci, L. Vitkova, Public Spaces as the Reflection of Society and its Culture, *World Multidisciplinary Civil Engineering-Architecture-Urban Planning Symposium, WMCAUS 2017, Prague, IOP Conference Series-Materials Science and Engineering*, vol. 245, pp. 1-6, 2017.