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LINEAR LANDSCAPE. THE IDEA OF ACTIVATION OF THE OLD BANJA LUKA - ČELINAC ROAD AS A NARRATIVE ITINERARY.

Abstract

Cities worldwide reshape their urban infrastructure by taking care of healthier and more economical lifestyles. The idea is to reflect the role of urban design and architecture in promoting sustainable urban mobility in Banja Luka and reading of the territory that brings citizens closer to its suburban environment, beyond avoiding constant use of private cars. The study was conducted during the spring of 2021 with a group of students from the Faculty of Architecture. The result is an offer of scenarios for further development of the narrative itinerary in the linear territory between Banja Luka and Čelinac. The study offers prototype conditions that could be relevant in similar contexts and form part of an open discussion on possible approaches to the challenges inside and outside of Bosnia and Herzegovina.

Keywords: sustainable urban mobility, narrative territory, Banja Luka - Čelinac, B&H

ЛИНЕАРНИ ПЕЈЗАЖ. ИДЕЈА АКТИВИРАЊА СТАРОГ ПУТА БАЊА ЛУКА – ЧЕЛИНАЦ КАО НАРАТИВНОГ ИТИНЕРАРА

Сажетак

Многи градови широм свијета трансформишу урбану инфраструктуру тако што воде рачуна о здравијим и економичнијим начинима живота. Идеја чланка је да се размисли о улози урбаног дизајна и архитектуре у промовисању одрживе урбане мобилности у Бањој Луци и читању територије која приближава грађане њеном субурбаном окружењу, избјегавајући сталну употребу аутомобила. Студија је проведена током прољећа 2021. године са групом студената Архитектуре. Резултат је понуда сценарија за даљи развој наративног итинерара у линераној територији између Бање Луке и Челинца. Студија нуди прототипне услове који би могли бити релевантни у сличним контекстима и чинити дио отворене дискусије о могућим приступима изазовима унутар и изван Босне и Херцеговине.

Кључне ријечи: одржива урбана мобилност, наративна територија, Бања Лука - Челинац, БиХ

1. INTRODUCTION

1.1. NARRATIVE TERRITORY

The urban territory of Bosnia and Herzegovina (BiH) and the city of Banja Luka in particular, as an attractive capital of residence, employment and central functions, is not alien to contemporary urban dynamics. Despite its specific situations, urban history and spatial culture, it demonstrates specific local urban phenomena as patterns of behavior that have been studied in theory and in many other urban contexts. Thus, some shared spatial patterns, problems, threats or risks and also potentials or strategies may have been experienced as successful in many other geographical or cultural contexts and their current conformation in the territory. In this sense, the urban territory of Banja Luka is not unfamiliar to contemporary urban processes found in the European city and in other contexts. Those are metropolisation; urban sprawl -also erratic localization of functions- [1, 2]; increased traffic, with consequent over-representation of infrastructure or demand for sustainable mobility [3, 4, 5, 6]; loss of identity [7, 8, 9] in a context that is sometimes predatory towards "land resources", as well as the threat to biodiversity and serious deterioration of urban environment [10, 11].

As we will see in the case study of a suburban space, urbanization patterns correspond to the concept of "horizontal metropolis" developed by Viganò, Cavalieri and Barcelloni where borders, boundaries and flows blur [12]. This extended idea of urbanization suggests that the same is not only about expanding agglomeration areas or creating new ones, but also about incrementation of operational areas (agricultural land, resource extraction sites, forests, physical infrastructures, and logistic system), which lie today "in a condition of geographical interdependence" [13]. As Cavalieri says, "it is via this hyper-connected space where diffusion does not mean dispersion, that each fragment encounters its potential meaning (alongside to its nostalgic dimension), becoming part of an urban whole" [12].

Bernardo Secchi [14] was right in the eighties when he showed the difficulties of contemporary urbanism 'in search of a program'. In fact, urbanism should always concentrate on the experience of territorial transformations as a part of networks of themes revolving around different spaces and social groups. In order to grasp city behavior today and to understand its structure, it may be necessary to have the addition of something (new "material" or new link between what exists): "something capable of re-interpreting and re-inventing it, and by intervening on the gaps in between" [14].

The narrative and multiple nature of what is urban requires us to emphasize numerous mechanisms of observation that are capable of recording and collecting all those special 'objects' that we encounter directly. For this, it is needed to exercise an acute sensitivity -an almost childish curiosity- both towards events, entities and mainly towards the incidents. Furthermore, in the face of the global, administrative and economic tendencies, the natural history of the territory should be a main focus in order to deepen 'study of space' in more definite and timeless logics [15] (Figure 1).

In suburban areas such as in Banja Luka, a "self-organized" process of territorial development is governed by the market, rather than by the urban planning mechanisms, which, effectively, leads to fragmentary development, without integration with environment, in the outsourcing of the activities and the unprecedented combination of functions, or in the corporate and commercial language of the architecture [16]. This leads to urban growth forms of 'diffuse' configuration, conurbation systems or 'filaments' born in relation to a capillary and multidirectional road network, which guarantees a high connection between the different points of territory that increasingly works in an elongated way [16]. For this reason, proposing (linear) narrative systems, which understand the current hyper textual urban logic, but remain in contact to the ground, to its geography and its history, would serve, beyond the environmental paradigm, to provide the spatial and social cohesion that the urban territory seems to claim.

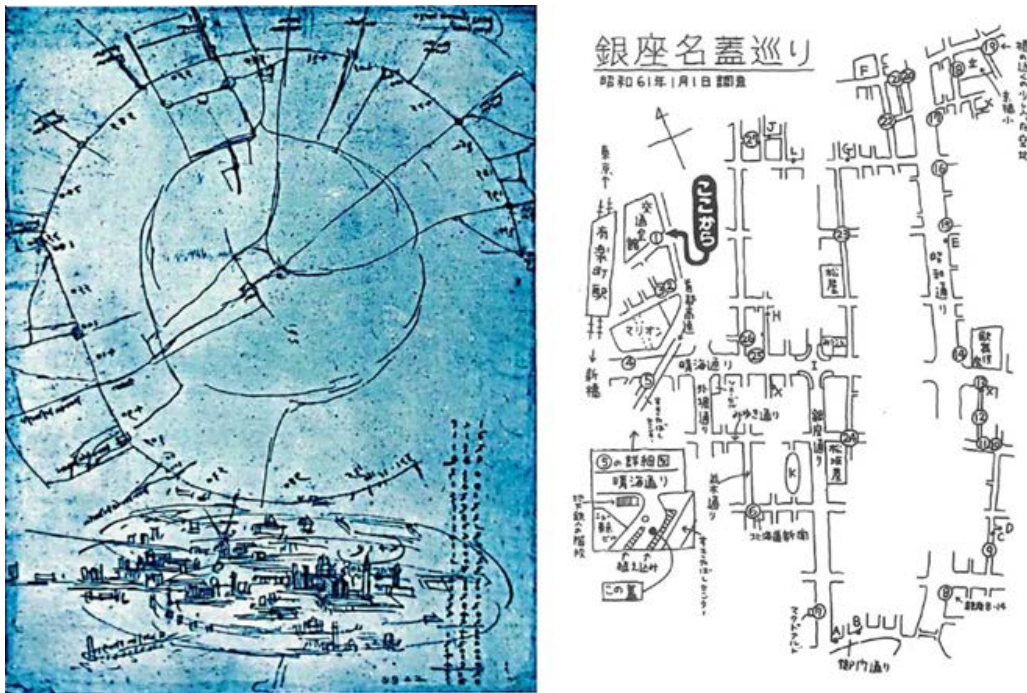


Figure 1. (left) Sketch study by Leonardo da Vinci for the decentralization of the city of Milan, 1497; (right) Street observation map, Ginza district.

1.2. LINEAR SECTION OF THE URBAN TERRITORY

"The men who for the first time traced a path between two places carried out one of the greatest human achievements. They must have often covered the distance between here and there and thereby linked them subjectively: places were objectively linked only insofar as they visibly *printed* the path on the surface of the earth; **the binding will become a configuration of things.**" [17].

In this text by George Simmel, taken from *The Individual and Freedom*, we find the process that we are trying to reflect, between the desire for an alternative and useful "link" between Banja Luka and Čelinac, from the will to the configuration, from teaching and social experience towards urban design. In the contemporary urban scenario that we have defined, this new link obviously transcends the urban scale to always be situated at a "contextual" level, where an important commitment of architecture with landscape is established by the usual ethnographic practices [18], as it was in this case walking or riding a bicycle.

This "looking outside" connects with the initial period that was proposed by André Corboz to understand the approach of urban theories to the problem of urbanization, which aimed to project "the city outside the existing city" [19, 20]. Exemplar references from this period would be the urban fabric of Barcelona projected from the walls of the historical city outward to incorporate the neighboring villages by *Cerdà* in 1859; the urban fabric projected along public transport lines in the *Soria y Mata's Linear City* from 1882; or the network of small towns that would combine the advantages of both rural and urban living proposed according to *Howard's Garden City* from 1902). "There are territories that demand a project. They often scream for one." [21] The Banja Luka – Čelinac cutting line behaves as a narrative element in the urban fabric, a compound phrase that is added to so many existing stories: "A project like a story is to admit time within it. Personal time in which will be devised, material time to be built, multiple times with which it will be understood and related to the previous substrata of the city as a continuous construction [22].

The project of the itinerary, of the street in the territory, is the (re)invention of a channel that conveys a certain urban history in a city or an area. Thus, certain streets or itineraries would bring together more transit desires or intentions than others, determining both their load or level of service, from a functional point of view, as well as the degree of "publicity" of the street, its scalar range [23]. The discontinuous city on which we produce new configurations cannot effectively be read as a unit, since it can never be understood as a whole [24]. This type of urban spaces makes more sense to conceive them in themselves as a space of relationships and in movement, rather than as a relationship between fixed elements [25]. In the same way, new centralities can be deployed that are

no longer in the center, but in belonging to a network, or new civic centers could be constituted at the intersections of the social network and the physical network of the territory [26, 27].

The recognition of a cutting line can both rescue a landscape connected to history and geography and become a functional transformer, inserted in the urban and suburban environment in a natural way. As a consequence of intensive informal urban fabric, Banja Luka has recently increased by the main roads in a few directions, mainly towards Prijedor (M4), Laktaši (M16) and Čelinac (M4). This kind of urbanization is characterized by the unplanned occupation of agricultural land and forests, lack of basic infrastructure, traffic communications, public spaces and facilities causing numerous communal problems, economic ineffectiveness and unsustainability. They grow following the ownership structure of the land, ability to access the plots, economic power of inhabitants and their actual needs (extensions, auxiliary facilities, etc.), traditional patterns of housing and family life, etc. Fragmented physical structure pervades the natural environment while they endanger each other. Those are the reasons we think the strategy of creating linear narrative landscapes with the objective of territory consolidation and solving one of the main problems -urban mobility- could be tested and implemented in the long section of territory between the city of Banja Luka and Čelinac, its small satellite town 15 km towards south-east. In this way we remember how Stefano Boeri raised his Filament City in Hoeksche Waard [28]: each filament followed and progressively covered the profile of the dikes, adhering to clear rules of density and extension and growing at its own pace; in each of these eleven "urban filaments" that made up the new city, the detached houses were combined with a particular activity: handicrafts, retailing, leisure, offices, sport, agriculture, etc. This example sought to anticipate and absorb the dynamics of an uncertain future, without presuming to shape them (Figure 2).

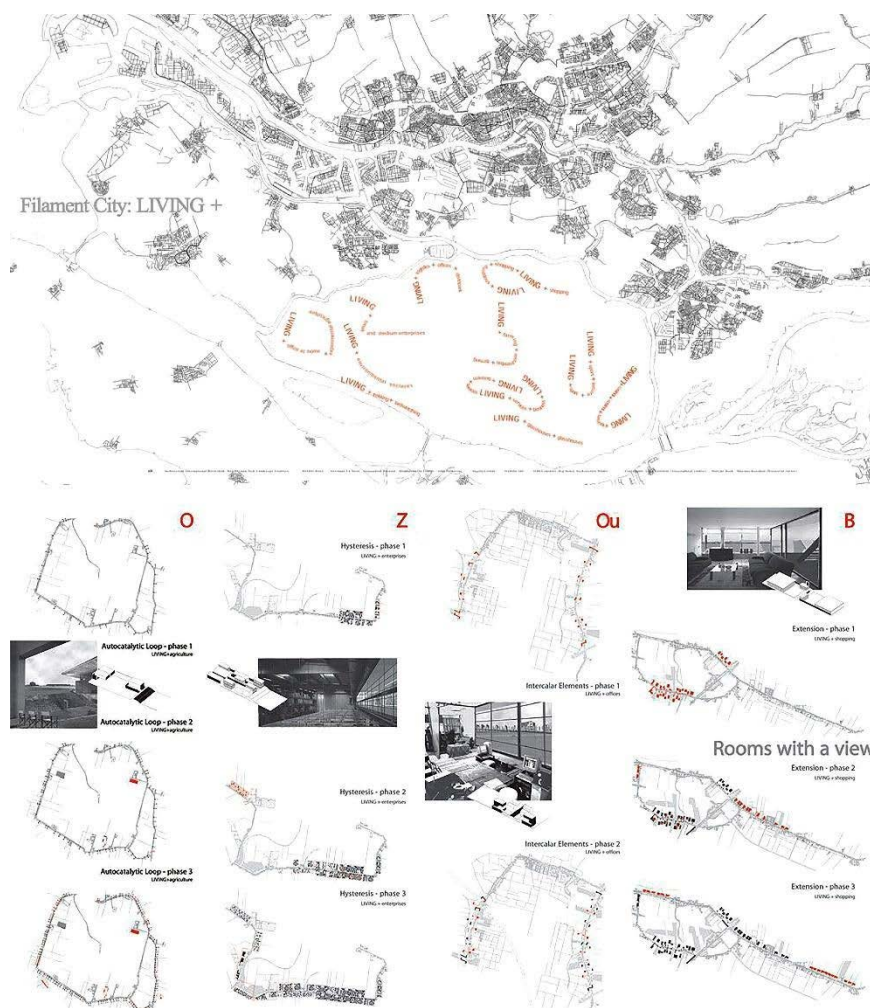


Figure 2. Bands of differentiated density Stefano Boeri. Filament City. Hoeksche Waard, Rotterdam, 1999. [29]

1.3. THE ROLE OF CYCLE ROUTES IN SUSTAINABLE URBAN MOBILITY

The rising ecological concern serves as the metanarrative of the first decades of the twenty-first century. According to above-mentioned Topalović [19], in shifting from the period of Fordist economy to the period of neoliberal globalization, the national territory has been generally abandoned as a relevant scale of planning and replaced by a more flexible or provisional idea of strategic planning and by a focus on select strategic territories. Such strategic planning is located in the framework of global sustainable development and its achievement is about making our cities more livable and our economies more prosperous while reducing carbon emissions [29]. This includes increasing care for sustainable urban mobility, which is currently recommended in the people-oriented sustainability framework of the UN New Urban Agenda [32].

One of the main problems of Banja Luka city is the traffic congestion and as a consequence, noise and pollution-related pollution. Urban transport is one of the biggest problems of modern cities for which there is no universal solution, and it has a major impact, not only on the urban form but on their livability – the quality of their natural and man-made environments [31, 32]. That is why sustainable urban mobility cannot be addressed only within the city or municipal limits and must be seen in a multidisciplinary way and with the application of the principles of integrated urban planning [33].

Urban space can be configured in a very adaptable way and it can be changed relatively quickly by restricting access to private vehicles simply with new street signaling. There have been many examples of high-quality modern pedestrian-oriented areas that were developed utilizing space previously allotted to private vehicles [34, 35].

Many cities such as Copenhagen, Amsterdam, Barcelona, Ljubljana have already started to reshape their urban infrastructure in a way that takes care of cyclists, whether that are bicycle bridges, extended bicycle paths or other facilities intended for cyclists and necessary for this type of traffic. What does the future of our cities and the traffic in them look like? Does a larger number of cyclists in cities mean a shift towards a healthier and more economical lifestyle? [36] If this is true, what will determine the citizens to ride a bicycle if the current infrastructure does not support it and if we do not have a sufficient number of adequate paths for cyclists and bike parking spaces? Architecture plays an important role in promoting sustainable urban mobility. Cities equipped with safe bicycle paths, parking lots and public bicycle facilities encourage citizens to refrain from using cars and to opt for a much more sustainable means of transport – bicycles [37].

Human scale in focus of urban planning and design has as an objective to encourage walking as an integrated urban policy aimed at developing lively, safe, sustainable and healthy cities. Pedestrian movement and cycling becomes a natural part of everyday patterns in urban activity. These can be achieved by increased concern for the human dimension in urban planning and design reflected in different requirements for quality life in a city. Cities with balanced intermodal systems provide mobility for all population groups: pedestrian and human-oriented areas that generate social and public activities, preservation of historic areas, and so forth, should be provided. The advantages of cities with intermodal systems result in more economically efficient, socially integrated, and environmentally livable cities than car-based, unimodal cities [31].

"To reduce car dependency by encouraging the use of alternative modes, the design of a development must not only protect pedestrians but make walking, transit, and bicycle use convenient and attractive. This is achieved by developing layouts with buildings that are clustered or connected by attractive walkways and with bus or rail stations in the "center of gravity" of the development-that is, with easy access to all trip-generating buildings and areas [31.]

Special lanes, paths, and bikeways are the main infrastructure element defining bicycle transportation as a distinct system. With this infrastructure, bicycle transport becomes a much more attractive mode of urban travel. It is much safer and faster than bicycle travel in mixed traffic [31]. However, this implies planning well the soft infrastructure and putting it in communication with other principles of sustainable urban mobility [30] (Table 1): a network of roads, bicycle parking, safe and affordable in the immediate vicinity of important destinations in the city, well-designed encounters with areas or pedestrian itineraries and conscious relationships with means of public transport such as buses and their intramodality. Such intermodal relations also represent a gain in economic, labor and social terms [38].

Unfortunately, bicycle transportation in Banja Luka is not developed as a distinct system. In the 1960s, Banja Luka was one of the cities in former Yugoslavia that boasted the most bicycles per capita - in 1965 it had 73,000 inhabitants and 40,000 bicycles and perfect geographical conditions for the development of bicycle traffic. Over the years, the construction of traffic infrastructure has neglected the bicycle as a means of transportation which has changed the habits of Banja Luka

residents. The city center which can be reached on foot in a maximum of half an hour and by bike even faster, was taken over by cars [39]. This is evidenced by the modest cycling infrastructure that was built. Bicycle paths are constructed only along certain routes and there is no clear and connected network that would provide opportunities for the affirmation of bicycle traffic. Apart from the small length of the paths (only 16.86 km in 2019), the problems are maintenance, occupation by improperly parked vehicles, neglected parking lots, etc. However, it is encouraging that in recent times more attention is paid to the use and promotion of bicycle traffic through the development of infrastructure projects and social actions. Study of bicycle traffic (2008) Development Strategy of the City of Banja Luka for the Period 2018-2027 [4], Action Plan for Green City [39] and the Draft of Urban Plan 2030 [38] envisage the development of bicycle traffic in accordance with the plans of sustainable urban mobility (6). In this context, the City of Banja Luka is considering different directions of network expansion. As one of the potential routes, the route Banja Luka - Celinac was imposed as a pilot project, which is the current topic of research. As the first results will show, this direction has much more value than the mere bicycle traffic development. Rich layers of cultural heritage, frequent changes of urban and natural landscapes in a very short time (short length of the section) reveal the whole universe of problems, themes and ideas, around which different narratives are imposed and new ones which could be created along the linear section of the territory.

Table 1. Degree of involvement of the cross-sectional cycle lane project in the Principles for Transport in Urban Life. (Source: Authors' elaboration based on Institute for Transportation and Development Policy (ITDP) (2011). [30])

1. Walk	a) Develop neighborhoods that promote walking
	b) Shorten street crossings
	c) Emphasize pedestrian safety and convenience
	d) Encourage ground-level activity and create places to relax
2. Cycle	a) Prioritize cycle networks
	b) Design streets that emphasize cycle safety and convenience
	c) Provide secure parking for public and private cycles
3. Connect	a) Create dense networks of streets and paths
	b) Create dense public street and path networks that are highly permeable to pedestrians, bicycles and transit
	c) Create auto-free streets, alleys, and greenways to encourage non-motorized travel
4. Transport	a) Support high quality public transport
	b) Ensure frequent, fast and direct transit service
	c) Establish at least one high capacity, high speed transit corridor with dedicated transit lines within walking distance for 80 percent of the population
	d) Locate transit stations, homes, jobs and services within walking distance of each other
5. Mix	a) Plan for mixed use
	b) Plan for an optimal balance of housing, commerce, incomes and services
	c) Provide a variety of accessible parks and open space
6. Densify	a) Match density and transit capacity
	b) Match density to the capacity of a transit system
	c) Maximize transit systems capacity to planned capacity
7. Compact	a) Create compact regions with short commutes
	b) Reduce sprawl by focusing development in areas adjacent to and within existing developments
	c) Co-locate jobs and housing within short commuting distances
8. Shift	a) Increase mobility by regulating parking and road use
	b) Limit parking to discourage driving during peak traffic periods
	c) Adjust car use fees by time of day and destination

2. METHODOLOGICAL APPROACH

2.1. THE ROLE OF CYCLE ROUTES IN SUSTAINABLE URBAN MOBILITY

The project of (re)activating the old road as a (recreational) route for cyclists and pedestrians can have positive effects on development of sustainable urban mobility plans, contribute to closer connection of two urban centers, generate many other urban projects along the route and have other

benefits. Furthermore, urban and architectural project can play an important role in generating and activating new urban routes as attraction points and finally in promoting sustainable urban mobility. The main objective of the analysis is to rethink the possibility of (re)activation of the old road Banja Luka - Čelinac as a recreational, cultural and touristic route that contains rich heritage. While mapping the territory, making an ad hoc development vision and creating urban projects in selected strategic spots, the process allows to set a series of other specific objectives. They basically derive from the methodology used and follow the research process. Those are: new reading of the territory, creating a complementary sustainable urban mobility axis, recovering connection, achieving a certain spatial cohesion, appropriating space, gaining identity (place attachment), recovering cultural heritage, creating interesting routes, achieving closer connection with the landscape and sense of belonging.

The paper is designed as the case study analysis with the two-direction approach - author's interests and teaching experience on the same subject - a linear section of the territory between Banja Luka and Čelinac alongside the Vrbanja river with the old road and the railway connecting those places in the center. The idea is to reflect on sustainable urban mobility in Banja Luka and reading of the territory that brings citizens closer to its suburban and metropolitan environment beyond being healthier and avoiding constant use of cars. The result is an offer of model options that show program and spatial-design proposals for the spatial transformation, which can be potential "triggers" for further development. Based on the analysis of possibilities and the methodology used, the study proposes a number of elements for the old road reactivation. Although focused on the specific urban situation, the study offers prototype conditions that could be relevant in similar contexts and form part of an open discussion on possible approaches to the challenge inside and outside of Bosnia and Herzegovina.

The study also gives the opportunity to interpret the territory and produce greater urban cohesion, a reading or rereading of the urban fabrics of the route to produce the recovery not only of an option of sustainable urban mobility but the reactivation of urban space around this route that recovers the public space, the landscape, rear or underused urban areas and at the same time allows balance with areas or streets that are overexploited or highly used. The project concludes with the analysis of the results of the teaching experience that guides projects along this route, to obtain criteria for their general activation, their incorporation into the sustainable urban planning and the assessment of key points for their landscape, urban and environmental design.

2.2. TWO DIRECTION APPROACH TO (RE)ACTIVATION OF THE BANJA LUKA - ČELINAC ITINERARY

This specific territory was approached from two directions. The first one is the author's research based on their interest in the urban structure and urban form of Banja Luka city, its urban periphery, informal urban fabric and hinterlands as well as the landscape of the city, territory and the water. Those interests overlapped with the actual strategic development directions of Banja Luka city stated in the Development Strategy of the City of Banja Luka (Banja Luka - capital, regional center, modern, European city, Business-Friendly, Smart City, Green City - an environment with a favorable business environment, a city of modern technologies and greenery) [4] and the Draft for the New Urban Plan of Banja Luka 2020-2040 [5]. In this framework the authors formed the research by design studio project following the concept of sustainable urban development [10] on a wider territorial scale searching for the connections between the inner urban zone and satellite neighborhoods. The second comes from the teaching experience at the Faculty of Architecture, Civil Engineering and Geodesy, University of Banja Luka. The study was performed with 22 students of the 4th-year of architecture - attendees of an elective course *Urban structure and reconstruction* during 15 weeks of the summer semester in the 2020/21 academic year. Project partners were the Center for Environment, the City of Banja Luka and the Municipality of Čelinac and European mobility week.

2.2.1. Reading the territory

The analysis is based on the blog post *Fifteen kilometers of a seemingly quite ordinary road*, by Boris Maksimović, a local author published on the *Club of travelers'* portal [41]. The most important thing about the narrative genre is its linearity, the temporal deployment of its ideas [42]. By describing the old road between Banja Luka and Čelinac, Maksimović reveals different layers of the rich cultural heritage which this specific territory condenses. Sola-Morales [42] highlights the mental importance of such a linear territory in construction of its urban map. It is a joy to follow, how the overlapping of itineraries and points, of torn cuts in the urban fabric, compose the total image of a city that, however, is always imprecise in its limits. By reading the text following the road, we read a complex history of the place that left deep traces in the territory.

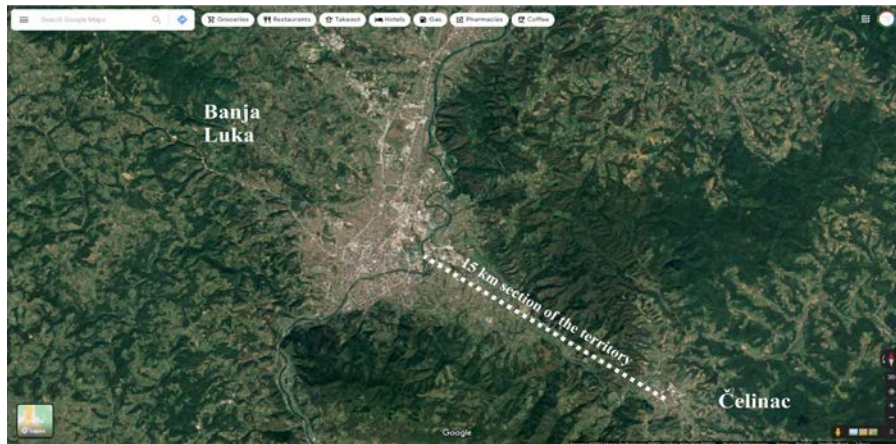


Figure 3. (left) Sketch study by Leonardo da Vinci for the decentralization of the city of Milan, 1497; (right) Street observation map, Ginza district.

By going out from Banja Luka, Maksimović describes distant views to Rebrovac, Petrićevac and Pavlovac settlements, relating their names to Bible stories. While entering Ada neighborhood he recalls the miraculous sunset viewpoints on the road from one side and high chimneys of Incel factory from the other side. In this unusual comparison, he writes about only one (known) fate of almost 15,000 former workers of the failed socialist factory. The road continues through the suburban settlements of Vrbanja and Debeljaci, where the heritage (mosques, churches and cemeteries) of Serbs, Bosniaks and Croats intertwine, testifying about the complex fate of these three peoples, their constant conflict and consequences which it has for generations. The road then crosses the railway and different sceneries appear: an old stone railway bridge over Vrbanja river on the east side, Gradina lake and Bijeli potok execution site on the west side. The mythical Zmajevac hill is above, the archeological site of an ancient fortress stands on the opposite side, the narrow-gauge railway Banja Luka-Čelinac-Maslovare is at the foot of the river, and Zeleni Vir (a large settlement, picnic area and famous beach) stretches along Vrbanja river. As a break from intensive heritage layers, a wide agricultural field opens at the end of the route, while entering Čelinac, which is urbanizing rapidly thanks to favorable living conditions near the big city.



Figure 4. Characteristic sections of the territory: (1) Exit from Banja Luka city without clear orientation towards the route direction, (2) Entering urban periphery of Banja Luka city with the huge traffic problems and dangerous conflicts, and the long sequence of peripheral landscape with tiny individual housing in informal urban fabric, (3) rural sequence with the rarely built structure and natural landscape with the rich built and natural heritage sites, (4) The end of the route in urban fabric of Čelinac.

2.2.2. Project as a method

The research-by-design method is based on simultaneous design procedures in opposing scales, assuming the overall significance of concurrent perception of the whole and its parts [42]. The methodology reveals the inherent physical layers of a given territory on a much deeper level as urban design projects communicate with a bigger scale of the city and the territory. It goes beyond the limits of the city and penetrates deeply in the landscape, making the scale as the project itself. It is research beyond the boundaries of architecture showing the importance of new interdisciplinary constellations that should be built up. The strength of the approach is design studio-project with the advantage of synthetic thinking about territory beyond narrow specialization [28]. Except for the research-based course work, the analysis goes further with a more technical investigation that overcomes the limitations of a teaching methodology. It uses the strategy of improving the landscape without building [43].

The design studio-project was set as a series of tasks arranged in an approximately regular rhythm from the simplest to the complex ones, resulting in development of conceptual design for an urban and architectural intervention on the route. The project of (Re)Activation of the old road route *Banja Luka - Čelinac in the function of sustainable urban mobility* used a series of research-by-design techniques and was designed as follows:

- Analytical part - (1) Mental map, (2) Field trip, (3) Analytical map (physical / traffic, natural, social, cultural, economic structure ...)
- Development strategy - (4) Master plan for activating itinerary with mapped locations of activation projects in the function of recreation, tourism, leisure, culture, (...) (5) Concept of planning and design approach (textual and graphic explanation) and
- Urban design - (6) the concept design proposal through (a) the situation of the selected area of intervention in relation to the immediate context (R 1: 1000) (b) Composition plan of interventions (paths, buildings, open spaces, bridges, piers, platforms, stairs, ramps, etc.) with a clearly presented design solution of functional units and all accompanying descriptions (R = 1: 1000/1: 500); (c) Characteristic bases of selected projects (R = 1: 250); (d) Characteristic cross-sections (R = 1: 250); (e) Characteristic design details (custom scale); (f) Spatial representations of selected projects (3d, montages, mock-up photos ...) and (g) Free contributions of the author's choice.

2.2.3. Mapping experience

An important means of engagement with the territory comes through ethnographic practices such as walking or cycling, for example [42]. As Sola-Morales [41] states, both moving and walking continuously belong to the territory. Territory is a social and cultural fabric that architects are familiar with. This enables the architect-researcher to identify, abstract and pinpoint a specific problem, object or idea, while remaining comprehensive. By using the notion of map design process mapping-based research methodology was created. This kind of methodology provides: Synchronization of general and specific references of the problem; Accessibility of a diverse field of external information that architects must understand and format; Interpretation of the thinking process as a means of communication and spatial performativity. By the use of the mapping tool as digital simulation, instruments of communication and a medium for exploration of spatial relationships, new possibilities and borderline values of connecting nature and architecture are emerging which, on different levels, result in changes in the character of the landscape itself [43, 44].

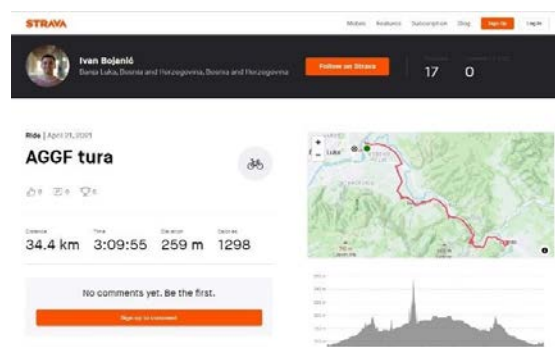


Figure 5. Recording of the Mapping done in April 2021 - the bike tour Banja Luka-Čelinac-Banja Luka guided by Ivan Bojanić (BKM) performed on April 21 (STRAVA android application, screenshot) [46].

Mapping was performed on two occasions: (1) by authors in June 2020, taking a one-day bike tour while enjoying the landscape alongside the river on a warm spring day; (2) by both authors and students in April 2021, taking a bike guided tour provided by Ivan Bojanić - a student of architecture, member of the Center for Environment, an NGO from Banja Luka [45] and a member of Banja Luka Critical Mass - a citizens' initiative created in the summer of 2017 with the aim of informing and educating all traffic participants in order to increase traffic safety, popularize bikes as a means of transport and advocate for improving cycling infrastructure and legislation. By March 2022, it had been held 44 times [45].

In promoting any idea, including project ideas and thus the idea of sustainable urban mobility, its visual presentation is very important. Regardless of the value of the idea, it is often rejected because it is incomprehensible and abstract for its consumers, i.e., the main stakeholders (local administration, local community and potential users) in everyday discourse. Therefore, project-mapping technique is used as a reflective tool for the project communication with users and a starting point for the dialogue about further possibilities regarding the subject.



Figure 6. Photo gallery of the mapping experience showing: (1) Typical situation in suburban neighborhood; (2) Dangerous conflict cross road between Medeno polje and Debeljaci neighborhood; (3) A conflict crossroads in Zeleni vir and close to Zmajevac, without any orientation signs, map or urban equipment; (4) Center of Čelinac in front of the city hall without any urban equipment for bikes; (5) A section of the territory showing parallel position of the railway, the old road route and Vrbanja river; (6) heritage building of the old railway bridge in a green natural surroundings of the Vrbanja river valley. Photos by Igor Kuvač took in June 2020 and April 2021.

3. ANALYSIS OF THE RESULTS AND FURTHER DEVELOPMENT

15 kilometers of the quite ordinary road Banja Luka-Čelinac were observed in the function of connecting the city of Banja Luka and its small south-eastern satellite, the town of Čelinac, on the principles of sustainable urban mobility and territorial integrity. Conclusions were drawn following the two approaches carried out: (1) the one from the students' projects and (2) the elaboration of a cartographic type and synthesis done by the authors.

Design research process was guided towards a vision and strategic plan of the sequence of the territory and specific urban design project that relates and reflects towards the territorial scale, where the synthesis was made possible through a qualitative and contextual approach [8]. Synthesis of data was made with the aim of structuring the urban design concept of the chosen spatial framework and developing the concept of intervention. Analytical approach, creative manipulation of place and

program was the core of the task [44]. The results were evaluated throughout the whole process, from empirical investigation in situ, research, strategy development up to design [43]. At the level of strategic thinking, all development visions and master plans start from the potential of space, which is reflected in (1) natural conditions (natural morphology, continuity of the green natural structure, scenic landscape, and the flow of the Vrbanja River); (2) infrastructure potentials (four parallel traffic routes – Vrbanja river, the old road, the main road and the railway); (3) potentials of cultural heritage; and (4) spatial problems and conflicts as greatest challenges to be resolved. Master plans were made with few different development visions based on envisioning narrative itineraries of the route: Route of the river, Adrenaline route, For bike/fairytale Čelinac (ser. Za (bajk)oviti Čelinac), and Cross-train route.

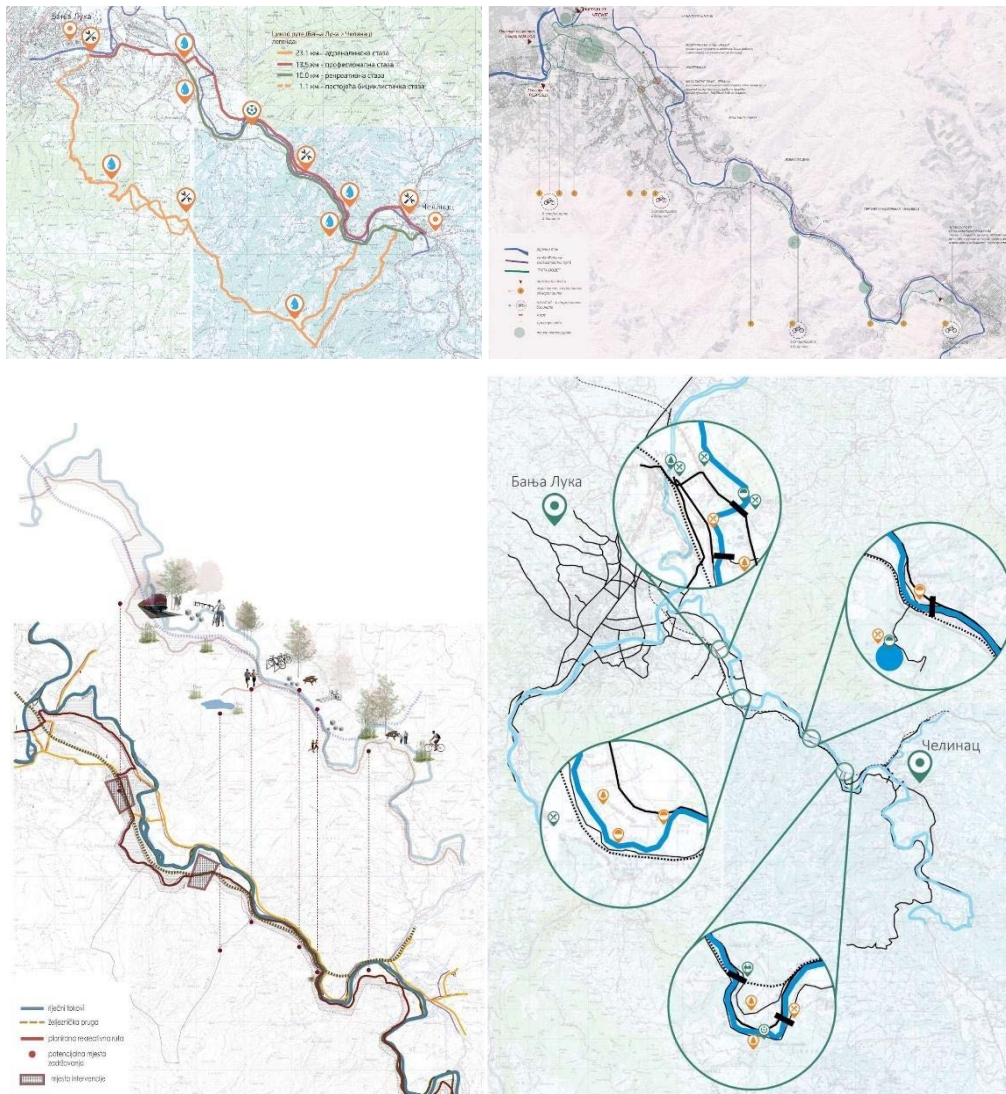


Figure 7. Master plans with the key locations showing the main problems and biggest development potentials

The mobility analysis shows a few very different sections which determine different characters of sequences and rhythm of shifts between landscapes. Except for the route gates (entrances) in Banja Luka and Čelinac characterized for their urban fabric, there are few other characteristic landscapes identified through the strategic thinking based on specific spatial patterns and potentials. Those are: (1) peripheral moments in the almost 5 km long sequence exit from Banja Luka, (2) the long sequence of the characteristic rural landscape near the big city; and finally (3) completely preserved natural landscape just before the entrance to Čelinac, a kind of greenway as Trkulja et al. define it [11].

The analysis resulted in the three main themes/ conclusions:

(1) Competitiveness. It is possible to cross 15 km by bike in about 90 minutes at an average speed of 10 km/h, which is a significant difference in speed compared to other modes of traffic on the same

route. The same route can be crossed in 15-20 minutes by car, and in 30-40 minutes by suburban bus. In addition, it is possible to use railway transport with a travel duration of about 30 minutes. The advantage of bike traffic and the proposed route is that it can be easily combined with all other types of traffic - walking, bus, railway, and even car, which contributes to the flexibility of mobility as one of the main characteristics of sustainable urban mobility.

(2) Conditionality. Regardless of the quality and justification, the success of the route project itself and its function is conditioned by numerous factors. These are: (1) networking with the existing and planned bike and pedestrian network; (2) penetration into the urban fabric of both connection places; (3) intersection with significant frequency routes of other transport modes, as potential places for intermodal terminals; (4) projects that activate strategically selected locations along the route, define its intensity and rhythm of movement; and (5) the possibility of partial use of the route, i.e. the possibility of entering and exiting several places, changing direction of movement and choosing alternative routes.

(3) Added values. The analysis shows that the activation of the 15 km long recreational route between Banja Luka and Čelinac certainly contributes to the development of sustainable urban mobility in the area. Except for the benefits of sustainable urban mobility, the reactivation of this old road has many other functions such as recreation, sports, tourism, culture, excursions, leisure, etc. On the other hand, it is the spatial development in the direction of urbanization, neighborhood construction and ancillary functions, such as secondary and tertiary centers. Furthermore, it opens many other topics in its further planning, development and use.



Figure 8. *Four types of projects: 1) Heritage; 2) Facility; 3) Mobility; 4) Public space*

3.1. CARTOGRAPHIC APPROXIMATION

About 20 urban-architectural projects dealt with the activation of several cultural, tourist, sports-recreational and finally bike routes along this old road. The projects try to respond to the needs of modern life of people and their mobility in cities with a focus on enjoying the abundance of open space, rich natural structure and layers of cultural heritage. Very different typologies deal with slowing down the traffic, intermodal traffic terminals, services, recreational and other centers in the function of healthy ways of movement and sustainable use of space. They are complemented by small-scale projects such as viewpoints, beaches, river approaches, etc. Projects are grouped into a few different solution packages depending on the scale and objectives: (1) mobility, (2) heritage, (3) public space and (4) facilities.

4. CONCLUSIONS AND RECOMMENDATIONS

The results demonstrate the strength of the methodology used and confirm the success in thinking about sustainable urban mobility and the spatial polygon of research. Therefore, the methodology set, and the conducted experiment can be a good example for thinking about this and other similar areas in other contexts, and that it can have positive effects on the development of the territory in the desired directions. The methodology carried out has possibilities for the orientation of "urban policies" aimed at improving sustainable mobility (proposing different types of public transport and their mutual adaptation, and the development of intermodal terminals); the urban environment, urban

cohesion, the recovery of heritage, the incorporation of collective urban functions, etc. The three main conclusions were drawn as a project as a tool, problem-solving project and landscape project.

Table 2. Relation between the project type, the specific approach to the territory and the intensity of contribution to the specific objective (problem-orientation). M- Mobility; P- Public space; H- Heritage; F- Facility. Darkest gray- the most intensive relation; Lightest gray- the less intensive relation.

PROJECT	TYPE	DETAILS	M	P	H	F
Adrenaline route	M	Master plan with a few small-scale supporting projects providing a new alternative route with a stronger intensity.	Lightest gray	Lightest gray	Lightest gray	Lightest gray
Traffic bypass	M	Slow down the motor traffic in a sequence by giving advantage to biking and walking and providing the possibility to use facilities and enjoy the landscape and heritage by the road.	Lightest gray	Lightest gray	Lightest gray	Lightest gray
Cycling passarella	M	A bike and pedestrian shortcut from Medeno polje to Debeljaci avoiding the traffic jam at the busiest sequence of the main road.	Lightest gray	Lightest gray	Lightest gray	Lightest gray
Intermodal terminal 01 and 02	M	Existing train or bus stops are merged into one intermodal stop with additional bike stops and supporting facilities plugged in.	Lightest gray	Lightest gray	Lightest gray	Lightest gray
Public beach in Česma neighborhood.	P	Urban design project for the confluence of the Vrbanja and the Vrbas, large open green area from where the route continues to develop.	Lightest gray	Lightest gray	Lightest gray	Lightest gray
Landscape Gate in Česma neighborhood.	P	Urban design project treats a wide area on both sides of the Vrbanja river, which in a complex system combines pedestrian and bike communications and directs them to Čelinac and other places in the Vrbanja valley.	Lightest gray	Lightest gray	Lightest gray	Lightest gray
Public beach in <i>Zeleni vir</i> neighborhood.	P	The central place is one of the biggest neighborhoods on the route and one of the most popular river beaches in the area.	Lightest gray	Lightest gray	Lightest gray	Lightest gray
Multifunctional modular stops	P	Two projects which offer additional functions on strategic points on the route. Their modularity opens up flexible organization.	Lightest gray	Lightest gray	Lightest gray	Lightest gray
Old railway bridge viewpoint 01 and 02	H	The most attractive heritage building attracts two view point projects to enjoy both natural and cultural heritage layers and bike stops.	Lightest gray	Lightest gray	Lightest gray	Lightest gray
<i>Zeleni vir</i> viewpoint	H	The conflict crossroad becomes both a viewpoint, bike stop, an orientation and tourist info point.	Lightest gray	Lightest gray	Lightest gray	Lightest gray
Vrbanja river viewpoint	H	One of few public space projects with focus on natural heritage of Vrbanja river and its beauty to enjoy the landscape and the territory itself while commuting	Lightest gray	Lightest gray	Lightest gray	Lightest gray
Adrenaline park	F	A complementary project to the adrenaline route, an alternative route connecting Banja Luka and Čelinac via the Ponir hill	Lightest gray	Lightest gray	Lightest gray	Lightest gray
Bike service stops	F	Bike sharing system, service and parking stops supporting the bike route	Lightest gray	Lightest gray	Lightest gray	Lightest gray

4.1. PROJECT AS A TOOL

We conclude that the project is a powerful tool to make a positive shift in observing, thinking, imagining and envisioning territory, and finally, in researching and planning. By using three-dimensional presentation in numerous iterations and variations, it is possible to observe previously unseen, unbelievable and to open completely unexpected perspectives. Starting from the only one premise, the project can spare to immense opportunities. Projects consider the importance of qualitative characteristics of a given territory.

4.2. PROBLEM-SOLVING PROJECT

The project itself cannot contribute to everyday home-work commute on the Banja Luka - Čelinac route as it took too much time compared with other types of transport and the scale of the area. It is concluded that the route along its entire length is primarily recreational and cultural and as such has also an important role in sustainable urban mobility development. Except for contributing to sustainable urban mobility, the project itself has many other substantive qualities and dimensions, which is worth for. It is an urban project that addresses a range of spatial issues and conflicts. They are classified into four project groups:

- Mobility projects are highlighting entrances and exits from the city; traffic solving of problematic intersections, crossings over the main road M4 (Banja Luka - Doboj), crossings over the railway in several places, etc. The project also contributes to the development of a network of recreational routes, their networking in intercity and regional directions of movement; directing the movement of cyclists outside the narrow urban area towards a natural and healthier environment, etc.
- Public space projects are highlighting the potential of a vast open public space along the road following the river. In addition to activating open space, they contribute to improving the ambient quality and increasing the tourist offer.
- Heritage projects are concentrated on activation of specific places with the values of natural or cultural heritage. They emerge on strategic points to highlight important viewpoints to protect and to enjoy the heritage in the same time providing a kind of sustainable urban mobility services.
- New facilities projects are focusing on facilitating the usage of the route at specific locations giving them basic utilitarian functions as intermodal terminals, urban equipment and mobiliary, bike services, bike sharing spots and bike parking places.

4.3. LANDSCAPE PROJECT

Finally, it is a landscape project. Surrounded by a natural landscape, but also historical and cultural layers, it is a unique landscape alley characterized by a mild undulating morphology, a rhythm of fine curves, a shift of the green structure of the courtyards, forests, fields, orchards, river banks and informal suburban settlements. By development of an urban route, urban territory is connected with the surrounding natural landscape. This is especially important as landscapes and hinterlands represent significant and necessary spatial potential of the city. The idea of the surrounding natural landscape of the city can serve as a key common ground for its development especially in the function of recreation. The strength it has for an urban form due to the continuity of a certain line, of the section of the territory of a certain axis.

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