

# Reflections of Utopia and the Ideal City in the Development of Physical Structure of Nikšić Aspect of Visual Perception

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**Abstract**—Aspect of visual perception occupies a central position in shaping the physical structure of a city. This paper discusses the visual characteristics of utopian cities and their impact on the shaping of real urban structures. Utopian examples of cities will not be discussed in terms of social and sociological conditions, but rather the emphasis is on urban utopias and ideal cities that have achieved or have had potential impact on the shape of the physical structure of Nikšić. It is a Renaissance-Baroque period with a touch of classicism. The paper's emphasis is on the physical dimension, not excluding the importance of social equilibrium, studies of which are dating back to Aristotle, Plato, Thomas More, Robert Owen, Tommaso Campanella and others. The emphasis is on urban utopias and their impact on the development of sustainable physical structure of a real city in the context of visual perception. In the case of Nikšić, this paper identifies the common features of a real city and a utopian city, as well as criteria for sustainable urban development in the context of visual achievement.

**Keywords**—Physical Structure of Nikšić, Utopia and Ideal City, Visual Perception.

## I. INTRODUCTION

**I**N this paper, the aspect of visual perception of Nikšić is examined in relation to the identity of the city and visual urban culture. Visual experience of an area shapes the identity that becomes a part of the collective memory. Visual aspect is investigated in terms of visual effects to be confirmed by visual perception and sensation, and they are enabled through: complexity, continuity and integrity of the area. Visual image and identity of a city is often associated with real historical inspiration up to abstractions and utopian shaped ideas, which were used by designers of urban plans and developers that turned those plans into a three-dimensional, material reality.

The aim of this study is to identify the elements of utopian visions of cities and ideal models that have inspired the designers of the physical structure of Nikšić as well as the place of utopian thinking in the context of development of a sustainable visual image of the city. The study is limited in the domain of defining the directions of visual achievement. As the experience of a city is a more subjective category, aim of the paper is to find criteria and directions of transformability of Nikšić, which will result in the formation of desirable objective visual elements of reality, but which will also be a

series of elements of a subjective experience of urban space. Under the consideration is the question of the role of utopia and the concept of the ideal city in the context of visual achievement and roles in the development and improvement of the city's existing visual image. Visual image of the city from the aspect of visual and general perception is the dominant issue in space design. In this context, the central question of architecture and utopia is the relation between the structures in a space [1].

## II. RESEARCH BACKGROUND, METHODOLOGICAL BASIC AND THE BASIC HYPOTHESIS

The physical structure of the city interprets the visual image of space with aesthetic perception being just one of the criteria of the visual experience. Visual experience is identified also through functionality, relations, content, dynamics and malleability. In addition, visual perception is a subjective category, but it is possible to define general objective visual effects of a city that contribute to the fulfillment of a number of subjective needs.

Utopian and ideal examples of urban design have often echoed the visual identity of actual cities. Geometry, order, harmony, choice of location, neighborhood, defense function, relationship with nature, visual dominants, public spaces, can be identified in utopian and realistic city plans. Nikšić example demonstrates a tendency to design an urban environment in accordance with certain rules of geometry, order, relationships, harmony, that can be recognized in the visionary ideas of the Renaissance period and beyond. Although utopian examples of cities have not developed the third dimension, it was recognized by the two-dimensionality. In this context, an analytical study of two-dimensional plan of Nikšić has a special place in the paper.

The main hypothesis of this paper is that the real city, through the example of Nikšić, contains within its structure certain elements developed on the concept of utopian and ideal ideas of the perception of urban space. Also, the paper gives review of the relationship between an ideal city and a utopian city. Objective is to identify certain visual effects of space as important factors of the development of a sustainable visual identity, and which are based in the utopian and ideal city schemes. It also points out examples of modern utopian thinking and its role in the sustainable development of cities. Visual perception of space, as an important element in shaping the urban environment, is in the center of the research.

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### III. UTOPIA AND THE IDEAL CITY - VISUAL REFLECTION OF URBAN SPACE

Constructors, architects, artists, philosophers, writers, and other authors, throughout the history of development of cities, and by their treatise, theoretical works, professional discussion, tended to find new models of collective life in the city which would rectify the shortcomings of cities in which they live and to get closer to perfection. Utopian visions had a central role in the theory of urbanism, which is reflected in practice. Through centuries, the Utopians attempted to draw attention to the problem of time and have proposed alternatives for a better life. Visionary moments in the history of urbanism were met with approval and criticism, but certainly they have been applicable as useful inspiration for creating images of realistic urban spaces.

Utopian ideas, throughout the history of development of cities, have largely inspired urban planners to conceive new physical structures, especially since utopia was generated as a higher level of contemplation and direction toward a search for a better world that would be concordant, harmonious, representative, and visually authentic with a tendency of social balance. Despite the imaginary location and absolute freedom in developing fantasia models, artificiality, imagination, utopian city models were distinguished by: order, relationships, harmony, proportion, a sense of dialogue, collaboration, community life.

Utopian visions of urban development have an important role in understanding the urbanistic thought in general, directions for sustainable development of the physical structures and visual identity of developed environment. In this context, though often contested and disregarded, utopian visions have emerged from designing a better, more meaningful, more desirable living space. Despite not being directed towards the development of a real city, utopian cities were generated on the actual elements of such, as a reaction to unsatisfactory real spaces, designed for a limited number of people; they usually had streets and squares and representative architectural structures, and though imaginary, their importance is not diminished but is largely contributive, especially to the development of an ideal city, which is an alternative to transformation of real cities. There have designers of the urban area found inspiration, were guided to a higher level of thinking and shaping of collective life and creating of a visual identity.

Generally, utopias can be differentiated as utopias of social orientation and ones that deal with the urban form. Utopian cities on one hand are characterized by rationality and functional organization, and fictionality on the other. Essence of utopia, generally, is in its ambivalence: on the one side by a real character and on the other side by stimulation toward something better. Utopian cities can be linked with the actual planning through certain common features such as geometric street grid, clear spatial conception, harmonious relationship with the environment, ecological balance, monumental and public buildings, and orientation towards nature. Uniformity and standardized forms have support in utopia. The determination of cities within precise boundaries, a

characteristic of utopias, is connected with the idea of community. The concept of a small community, neighborhood, can be correlated with man's need to create a distinctive environment, from the physical forms to the social environment and formatting symbols by which man is better oriented [2].

Although the dominance of utopian ideas and their impact are linked to the period of the Renaissance, in general, throughout history, utopian ideas played a role in the development of urban theory and practice. Sometimes, way ahead of the time they were created in, utopian models of cities and utopian thinking have managed to maintain and provide support for research through key sections of urban planning, as in modern, to those that occurred in recent history, through the 20<sup>th</sup> century, such as Garnier (separation of pedestrians from cars, zoning), Le Corbusier, Wright and others. Many utopias arise as defense mechanisms from the industrial city and its characteristics: speed, production, pollution, urban zoning etc.

Man's need for a wholeness of space is present, according to Gestalt psychology a person needs to experience the whole and then the parts. This integrity is possible, if visual order, harmony, relationship, correlation, proportion, and accord of the elements of the whole are established in the structure of the city. Utopians and designers of ideal cities have achieved order and harmony with geometric regularity, proportion, symmetry, etc. Radial and orthogonal planning schemes are the dominant choice. City form is a visual expression that interprets the richness and beauty of organizing collective life. Urbanist of a utopian city reduces the urban form in its diversity to one dimension; the city is a geometric figure, the image in two dimensions. Notable is the presence of diversity in the concept of urban form, Plato's Republic, Campanelli and others treat the archetype of the magic circle, the circle symbolizes the totality of the psyche in all its forms. The creator of utopia seeks to manifest the ideas of regularity, order, harmony, and integrity through the physical structure of the city. City and the man should be in a dialogue, physical space is not dead matter, but functionally ideal and with the active influence on the user. Simplicity in geometry, except the circle, square as a concept and their combination are primary design elements of urban space. The streets are usually radial and radial-concentric, rarely present is the orthogonal transport network. Expressed regularity of the streets is a characteristic of the utopian city. Since utopias are not real cities, but ideas, schemes do not allow a complete analysis of spatial planning, it is not possible to predict a visual form of the city, except the descriptive display.

Unlike utopia where the space is idealized, problems of the real world are solved; on the other hand, the concept of the ideal city implies the transformation of existing real urban structures in the real circumstances [2]. Despite the indistinctive boundary between utopia and the ideal city, it is clear that each concept strongly influenced the development of urban thought, theory and practice of urban models. The question is, whether the ideal city is in fact a city inspired by utopia? Ideal city is not an imaginary city, which is an

absolute utopia, but it has been developed on the principles of human perception needs in organization of collective life. Ideal city as a transformation of the existing structures directs to the reflection on the ideal visual design, usually based on symmetry and principles of geometry. The ideal city is closer to reality. On the other hand, the ideal city is approaching the limits of the world of utopia, every city has utopian elements. Nevertheless, the dividing line between utopia and the ideal city has not been set.

The Renaissance is a period of revival of cities, and with that, Renaissance utopias. Renaissance architecture was a mathematical science with universal values of pure and absolute relationships. Geometry, symmetry, regular forms are coming to the fore through the plans. Spatial plans strive for perfection, example – Campanella's ideal "City of the Sun". Regularity of the scheme can be achieved at an ideally leveled ground and there was a general opinion that the ideal city is best placed in the plains. Renaissance utopian urbanists often have a problem with locations, relying mostly on the Greek and Vitruvius experiences. As with Thomas Moore, there is occasionally idealization of some known location.

Vividness, specificity, dynamics of city landscapes, forming architectonic dominants in the space, clarity, and urban morphology filled with meaning. Tendency to create the ideal is especially characteristic of the Renaissance period. Classic authors such as Vitruvius and the "Ten Books on Architecture", like Plato, inspired the Renaissance architects and urban planners in Europe to plan the ideal cities based on human proportions and geometric order.

Period of Renaissance in Italy begins in the 14<sup>th</sup> and in other European cities since the 16<sup>th</sup> century. Plans of Renaissance cities are radial-concentric "organizational cities." Star-forts around the city are the characteristics of Renaissance architecture, in the function of defense against the enemy.

The first ideal Renaissance city called *Sforzinda*, was created by Florentine architect Filarete in 1475. (Fig. 1) Filarete's *Sforzinda* has perfect regularity, organization, aesthetic qualities. The plan is in the shape of an octagonal star filled with radial communications, interspersed roads and canals, in the center are the square and public buildings in an orthogonal organization. In the center of the square is the tower-vantage, streets are medially intercepted by the square and canals by a church. The city is located on the sea, is a work of art that is to become as rich and as beautiful as possible. The goal is to establish the principles of aesthetic perception and architectural style and decoration.

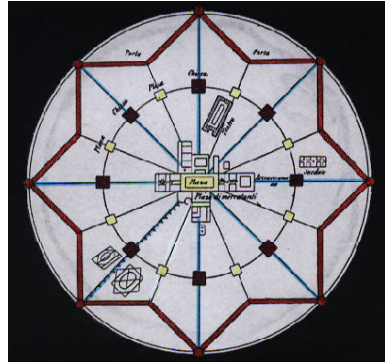


Fig. 1 Sforzinda, Antonio Averulino Filarete, 1457

Radial-concentric example of the Renaissance ideal city designed by Vincenzo Scamozzi in 1593, called *Palmanova* was an ideally envisioned city in accordance with the highest goals of the humanities Renaissance thought - ideal on paper (Figs. 2, 3).

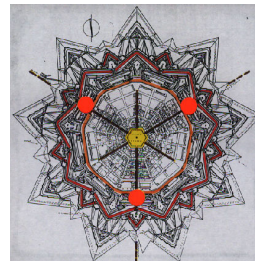


Fig. 2 Plan of Palmanova, Vincenzo Scamozzi, 1593



Fig. 3 Morphological structure of Palmanova, Vincenzo Scamozzi, 1593

A plan with a nonagon basis, the city is designed for 15 000 people, with the defense function that dominates and to which cultural and social functions are subordinated. It is conceived as a self-sufficient settlement, which will be populated by artisans, farmers and traders [3]. Six radial streets leading to the square-center, concentric organization of streets and the formation of solid façade canvas in an ideal composition are the characteristics of the spatial organization. Regular radio-concentric plan and unified architectural treatment represent a paradigm in Renaissance urban planning. In this artificial urban creation all has been spatially, and formally, and functionally determined in advance and forever [4].

Baroque architecture in Europe (17-18<sup>th</sup> century) is characterized by a complex and freely developed architectural

and urban compositions. Developing Renaissance models, new forms and proportions, the indivisibility of architecture and urban planning, geometry and proportions, are the features of designing the visual image of space. As a new element of urban structures, radiating streets appear that start from the square [5]. Tendency is directed toward the new visual effects and emphasizing the basic object. Square is not closed, but visually integrated with the surrounding urban structure [6]. Typical examples of cities in this period, a topic of interest for this study are: *Versailles* in France and *Karlsruhe* in Germany.

Classicism as an announcement relates to the theoretical impact of Vitruvius. Baroque dynamism of movement and surprise was replaced by street simplicity and streamlined architectural creations. Vividness of sculptures and decorations is abandoned; a rectilinear pattern becomes dominant in the spatial organization. Pronounced axiality and connection of the larger number of streets with the square are the main characteristics of this period in France. Typical representative is the square *Etoile*.

#### IV. UTOPIAN VISIONS OF NIKŠIĆ DEVELOPMENT - VISUAL IDENTITY OF THE CITY

The elements of utopian comprehension of Nikšić are associated with the first master plan of 1883. Until then, the city was characterized by dramatic social intersections and rotation of the people who have conquered it and built new places to live, not so interesting in terms of research topics. Given the paucity of literature in the area of urban development of Nikšić in the context of the formation of city's visual identity, analysis to the year 1883 is discussed briefly on the basis of the literature, while the focus is on the analysis of utopian ideas that might have inspired the designer of the first urban plan of Nikšić in the second half of the 19<sup>th</sup> century. Analysis in a broader context refers to the period of urban planning of Nikšić and development of the physical structure based on planning concepts. Emphasis is on the elements that in utopian and ideal cities were important to their formation, such as natural characteristics, the relationship between natural and developed, harmony, order, proportion, regularity, radial pattern, continuity, integrity. In this paper, these elements are identified in the case of development of the physical structure of Nikšić, where they take part in shaping the visual perception of space. Nikšić can be referred to as a fragment of utopia. A realized city by its nature cannot be utopia. Thus, we are talking about elements of utopia in the conceptual strategic planning concept.

Developmental strategy of Nikšić is based on the idea of developing the ideal radial-concentric city, and the designer found inspiration for this in cities of Renaissance, Baroque, with some ideas dominated by Classicism, especially in the forming of urban pattern, city squares and architectural structures. Sustainable city is possible as integrated, balanced, and compact. Comprehension of the city as a utopian model and ideal structure in Nikšić was present, but this concept was adapted to the conditions and possibilities of the time that has been passing through the city, so today's image of Nikšić is far

from utopian values, but still with the elements of designing space that were typical for utopian planners. Those elements represent still today the highest values in the experience of the physical structure of Nikšić.

##### A. Visual Development of Nikšić 1883 - 1952

Following the liberation from the Turks in 1877, begins a development period of a new city. The first urban plan of Nikšić was created by Joseph Slade Trogirani in 1883 and it was based on the concept of Baroque-Renaissance ideal city. Infrastructure of the city is radial set and in combination with a concentric annular series of streets, forms a complex and strong communication network (Fig. 4).

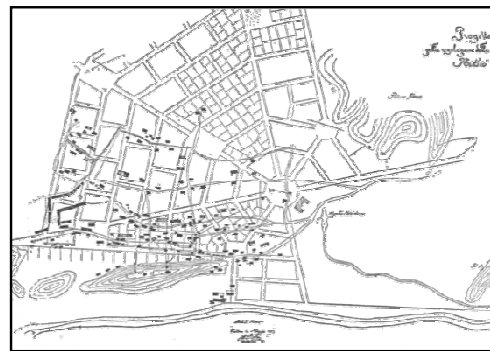


Fig. 4 Plan of Nikšić, Josip Slade, 1883

The dominant transport concept has predestined the future structure of the city, which resulted in development of a closed urban block with a tendency for a meeting place of several streets to result in a square, with streets acting as interruption of visual continuity, but also as the primary interactions of the urban system. Architecture is reduced to typologically uniform structures, predominantly residential uses, with one or two floors, with no special architectural value. The physical structure is dominated by the central square, which was the primary location of meetings and events, representative more by the size and position than by visual indentation, but arguably the most dominant public space of the city. In the first phase of development, Nikšić had 4000 inhabitants. The plan included the surface area for ten times as many users, and much higher concentration of vehicular traffic than needed. However, as number of cars was low, pedestrians had the primary role in traffic, and the streets were gradually formed. Nikšić developed according to a planned concept, continuously, but very slowly. The first half of the twentieth century was filled with wars: the Balkan Wars, the First World War, and the Second World War, which resulted in a discontinuity in the development of the city. Wars have destroyed almost everything previously devised. Traffic network was the only thing to survive and evolve. Physical structures were built on the foundations of the past. Natural values of Nikšić fields were severely jeopardized by war, but the relationship of the developed with nature and its values was of good quality. At each stage of city reconstruction, an

important place was occupied by free spaces and natural elements.

#### *B. Visual Development of Nikšić after 1952 - Industrial Period*

The period after 1952 represents an intensive phase of development. Industry assumes the leading position instead of agriculture, and becomes the most important economic branch in Nikšić. In 1951, the construction of the Steel "Boris Kidrič" begins, the highest industrial center in Montenegro, then the developments for metal processing industry "Metalac", then developments for electric power industry of Montenegro, Lumber-industrial complex "Javorak", then the developments for the bauxite mine, the brewery "Trebjesa" and a series of smaller industrial centers. Places of industrial buildings in the city were favorable, from an urbanistic point of view. The industry has developed rapidly; everything in Nikšić was subordinated to production. Agriculture, manufacturing, trade, tourism and other branches that have dominated in the past, lost importance, while construction industry got intensively developed due to the population growth in the city and general economic development. Nikšić around 1950 had about 15 000 inhabitants, in 1971 about 28 000 inhabitants, and in 1981 this number increased to 50 000. The city was developing according to the urban plan of Sajsel and Boltar in 1958, which was an expansion of the previous from 1883, with a planned orthogonal organization of streets on new areas planned for construction (Fig. 5).

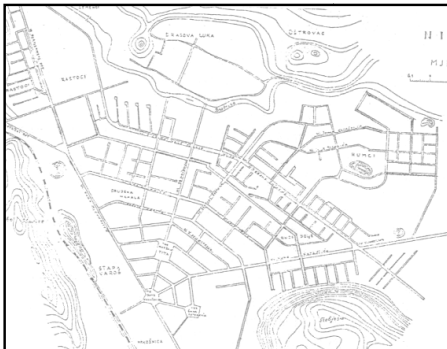


Fig. 5 Plan of Nikšić, 1958

In five decades of industrial development, the city developed in the educational, cultural, sports terms and others, but the discontinuity in developing physical structures of the city through its history, (which is a consequence of the rotation of dominant economic branches) caused disharmony in the visual sense, between urban units. Industrial period has caused the development of standardized housing, functional, formative, and aesthetically reduced, with no special value. Progress and development have not been expressed through architecture and in line with the opportunities that economic development could have provided. Emphasis was placed on quantity with the lack of quality. Today, Nikšić with about 80 000 inhabitants, at the beginning of the 21<sup>st</sup> century, has a weakened industry with underdeveloped metallurgy, metal

processing, food and timber industries. Visually, the quality of urban space has decreased. Construction of new physical structures is reduced, and relational disturbance that has arisen in the intensive development of the city, came to the fore even more.

Developed environment directly or indirectly affects the natural. Industrial development in Nikšić involved the transformation of the landscape and also changes in spatial relationships. Man's activity made significant changes in the forest and vegetation cover as well as in types of soils. There has been a change in environmental quality. Technological advances have accelerated those changes. The stage of city development since 1952 represents the most intense period in its history, but also the most unfavorable one from the aspect of the environment and maintaining a balance between natural and developed. Model of urbanization and industrialization, which was based on the lack of respect for the living conditions, limited the flexibility in development; technological activity caused the reduction in the aspect of humanity. The concept of sustainable development of the city, which includes consideration of the concept of nature, the use of natural resources at every stage of its development and a harmonious relationship between natural and developed, has not been realized through fifty years of industrial dominance in Nikšić. The richness of nature was available for industry needs. Forests, vegetation, waters, have been exploited for the needs of new forms of life; concrete was given advantage over nature.

High quality spatial experience implies complexity, diversity, abundance, dynamics, effectiveness, recognizability, but also logic, clarity, continuity, integrity, coherence and order. For a good sense of space, balancing natural and developed environments plays an important role. Industrial period in Nikšić has caused degradation of the natural environment and discontinuity.

Construction of the railway line Nikšić-Podgorica, construction of highways and connecting Nikšić to neighboring cities, construction of roads needed to transport ore, wood and other raw materials from the natural environment, as well as the intense development of construction industry, have caused a disturbance in the relationship between natural and developed, as well as visual interruptions in the landscape. On the other hand, the formation of artificial lakes for economic needs had a positive impact on the visual identity of the area. Four artificial lakes, as the dominant visual elements of the city, had a positive resonance, as they occurred in parts of Nikšić area with high level and concentration of groundwater. Artificial lakes have enabled the supply of water in sufficient quantities for power generation and industrial production, and on the other hand allowed the reconstruction of the visual identity of the area. In the industrial period, the natural potentials in the segment of development of the physical structure of the city have not been utilized. Construction of facilities that will strengthen relations with the natural elements was neglected, especially when it comes to bodies of water, of which there are many in Nikšić, especially rivers that have remained isolated through five



decades of intensive development of the city. The diversity of the natural environment and the developed monotony, as well as their mutual repugnance caused fragmentation of space, diminishing the importance of humaneness healthy living.

### *C. Overview of Visual Development of Nikšić – Relation between Natural and Developed*

The relationships between natural and developed environments are direct and interactive and the quality of urban area as a whole largely depends on them. These relationships include: permanency, intensity, complexity and harmony, which provides a high level of visual perception of space. Man creates space according to own needs, opportunities, and current social and political situation. Natural conditions determine the initial direction of the space planning. Continuity in space is violated by landscape transformation caused by destruction. Preserving the continuity is possible with construction if based upon integrity and harmony of all elements of the urban system. Integrity is demonstrated by the experience of urban space as such, with the participation of all stakeholders being equal. Natural elements are essential participants in the creation of healthy and sustainable living space. Nikšić is characterized by variable relationship of developed environment toward the natural one, through its stages of development. The visual quality of the natural environment in Nikšić is determined by a variety of natural elements and their complex and flexible relationships. Along with the urban development of Nikšić, the attitude towards nature has changed. Continuity in the relationship between natural and developed has been disrupted over time. Natural areas of Nikšić fields were converted into transport infrastructure, then residential, commercial, industrial and other complexes, plus the establishment of four artificial lakes for needs of the economy. The city has developed more in the horizontal direction, the visual natural identity of the city was modified in parts of the field, while the surrounding areas have until today remained undisturbed. In the development of a city, in a typical natural environment, developed areas should be the complement of nature, and thus developing and promoting the visual identity of the space without reducing the quality of the environment.

"The chief function of the city is to convert power into form, energy into culture, dead matter into the living symbols of art. A city should raise diversity and individuality of regions, cultures and personality to the highest level of development." [7] Two-dimensional and three-dimensional space must be in accordance. Through the two-dimensional plan, basis of the city's architecture is set. The plan defines the quantity, facilities, programs, locations of architectural structures and so on, but the plan also sets its formativeness, its developed and public areas and their relationships. Well thought out planning concept does not always result in a desirable urban image. Nikšić is characterized by the lack of visual achievement and lack of imagery through all phases of converting the two-dimensional plans into a three-dimensional reality.

### *D. Visual Structure of Nikšić in the 21<sup>st</sup> Century Reflections on a Ideally Envisioned Plan*

Utopian cities located in the plains, have given inspiration for the development of an ideal city on a spacious field. Radial-concentric structure of the street network in line with the natural values pointed to the possibility of developing a city of high visual value. Geometrically precise established roads, urban blocks, buildings along the street front as continuous series, with a tendency towards harmony, unison, cooperation. The central square as the dominant visual element, but also a place of social processes, as well as 4 smaller ones, as focal points of the city are designed to complement the totality of impression.

Utopian planners and creators of ideal cities depicted the visual character of the future area through perfect planning schemes, the relationship of natural and developed, setting the dialogue at all levels in order to achieve the integrity and continuity of space and with an emphasis on the public spaces of the city. In this context, visual structure of Nikšić will be analyzed through two levels in order to analyze the visual complexity of space:

1. The planning matrix of the city
2. The physical structure of the city (Fig. 6)



Fig. 6 Physical structure of the city of Nikšić, 21<sup>st</sup> century

#### 1. The Planning Matrix of the City

The character and level of visual complexity of Nikšić, at the end of the first decade of the 21<sup>st</sup> century, is based on the principles of its planning matrix from 1883. Natural framework, in which the plan was designed, was characterized by flat terrain, four rivers, three lakes on the edge of the plain, two elevations in the interior with high vegetation complexes and a series of tree alleys within urban units have, to some extent, determined the direction of the visual development of the city. Flat terrain is one of the elements of visionary ideas design, which has likely had an impact on the choice of the ideal plan structure of Nikšić. The relationship between natural and developed was logically designed by the plan and was achieved in the first stage of formation of the urban structure, but in parallel with the development of the city, it got weakened, despite the development of highways and connecting with the neighboring urban areas. Public spaces were the center of the action and key sites of social processes. They had the advantage over other elements of city design.

Vehicular traffic was reduced. All was pedestrian-appropriate. Central square was a focus of the atmosphere, a key hub of events, representative more by the size and position than by visual indentation, but arguably the most dominant public space of the city. With increasing population, the structure of the city was developed in the horizontal direction. This has not deviated from the basic concept until the Second World War, after which the city lost a large extent of the existing visual identity, which had to be remade. Since 1952, begins a new period in the development of the city under the new plan by Sajsel and Boltar, which relied on the concept of the previous one, but deviated from the radial strictness when it comes to the occupation of new areas.

Development of Nikšić into an industrial and economic center created the visual complexity of the city, but it was expressed through visual partiality. Visual complexity was manifested through several features of individual physical structures than through integrity of the area. The results were visual interceptions between the spatial units that were created in different time periods. To date, these interruptions remain distinct. Planning matrix of Nikšić today is characterized essentially by radial concept, partly disordered by certain spatial units of the city and orthogonal elements of spontaneity. "Disorder" refers to the urban units created by intense development in the period of industrial dominance.

## 2. Physical Structure of the City

In the 21<sup>st</sup> century, an era of great technological opportunities and advanced means of visual communication, visual perception criteria are extremely demanding. Achievement of the physical structure of the city in terms of visual complexity today includes: complexity, diversity, abundance, effectiveness, recognizability, as well as logic, clarity, continuity, coherence, integrity, order. "It is necessary to use such elements capable to excite the senses, to fulfill our visual desires, and expose them in such a way that the perception through our own eyes excites us, moves us with its tenuity or harshness, noise and calmness, indifference or interest" [8]

Exploring visual complexity of urban space of Nikšić, it can be concluded that they were not developed in accordance with the development and possibilities of society. In the first significant stage of city's development, in the late 19<sup>th</sup> century, there was no real emerging complexity of the visual space. Physical structures were reduced, architectural structures of similar typology and geometric regularity, spatial units were characterized by closed block systems, and focal points were represented by squares, again with incomplete visual achievement. However, as the city evolved under a well conceived plan, the order was there, and the traffic network was the key to integration. In addition, the requirements at that time were more reduced and it can be said that the city met the requirements of the user. The next characteristic phase in the development of Nikšić is the period of industrial development, when "technological world" had a negative impact on the visual development of the city. New urban units were created, which were not strongly interacted with the past, and the

architecture of buildings disrupted the relationship of culture and the city. This was in contrast to the fact that the city and culture are "encounter of meaning." "Architecture should not sacrifice the basic sense of comfort, well-being, health, it should raise awareness of the role and value of the environment that inspires and mimes" (Koch) [9]. Housing architectural objects of collective typology, as the most common ones, were made in a period of industrial domination, and have not exercised the necessary visual and other effectiveness, requirements and services were not in concert. The center of visuality has moved from city squares to large industrial complex located on the outskirts of the city, where visual effects have increasingly lost quality and interaction. Further development of the city, until now, has not drastically changed its image from that period. The city developed horizontally, and new surfaces belonged mainly to residential purpose. Of the public facilities, visual benchmarks are the building of "Municipal assembly" and hotel "Onogošt" because of its expressed verticality and position in the central area of the city, as well as several cultural, health and education facilities, and decades-constructed and unfinished building "House of the revolution" that achieves a negative visual representation on each observer. This facility is one of the aggressive visual effects, which can cause negative effects on the nervous system [10]. Natural visuals dominate the edge of the city, but without a well established visual relationship between natural and developed. It can be concluded that Nikšić is one of the cities which is yet to complete its imagery, since it has a good basis for the formation of more complex and permanent visual effects, remodeling of the existing and the establishment of a stronger interaction between them. Nikšić's advantage is that it has space that is not "preoccupied", horizontally nor vertically, as well as physical structures that are built on planning grounds, which has to date remained largely preserved.

### *E. Continuity and Integrity of Urban Space*

Given the perceptual need of the observer for a more comprehensive visual coverage of an area, special emphasis is placed upon continuity as an essential element for the formation of city's image integrity. Continuity implies the interaction of all elements of urban complexity. In Nikšić, continuity is more present in the old part of the city, which is seen in the formation of the facade of planes of street arrays in a closed system of the urban block. In terms of traffic, its presence is manifested through clearly structured infrastructure network and direct connection of the central and peripheral parts of the city, whose visual effect is complemented by the elements of tree alleys, forming a more enjoyable articulation of direction. Continuity is achieved in the natural environment part of the city, but not in the interaction of natural and developed on peripheral part of the urban area. It can be concluded that in Nikšić the visual continuity is achieved in segments, but there is no presence of a general visual continuity of the city to speak of, provided that there is a basis for improvement and development as a whole.

Desirable morphological image of the city implies unity, integrity, homogeneity. "Throughout the set, layout must be designed so that we can cover all objects that it forms at a glance" [11]. In the perception of the space integrity, the key word is relationship. The dialogue between the elements of the whole, harmony in terms of size, color, material, the relationship between indoor and outdoor, public and private, natural and created, developed and undeveloped. There are no disruptions, empty-spaces, partial cross-sections. Functionalist approaches in space design have resulted in malleability undesirable to the viewer. Nikšić is one of the cities whose structure was developed more on the basis of functionalism, which led to the creation of ambient and structures with insufficient preferable visual effects and content. The advantage of Nikšić in achieving epithets of city integrity is the optimality of the size of the occupied territory. However, it is necessary to realize a number of interventions in the area, for the integrity aspect to be fulfilled. In this context, special emphasis is placed upon the public open spaces of the city.

#### *F. Visual Inspiration for Public Spaces of Nikšić-Case of Squares*

The master plan for public spaces in the structure of Nikšić is inspired by Baroque and Renaissance ideas of arrangement of public spaces, but they have not managed to be carried out in accordance with the initial ideas. In this context, the Square of Šaka Petrović with surrounding structures in Nikšić (Fig. 8) is a distinctive feature of the city plan modeled on Versailles from the Baroque period (Fig. 7). Versailles is characterized by unity of urban planning, architecture and landscape architecture, which emphasizes harmony between natural and created. Versailles is characterized by stellate and serrated squares and three-way alleys.

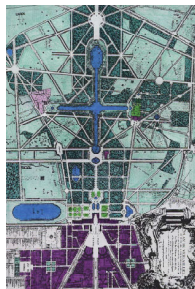


Fig. 7 Plan of Versailles

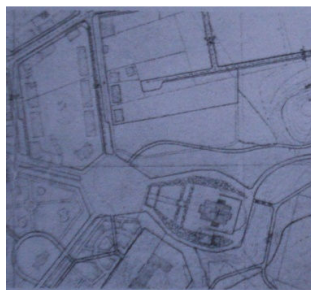


Fig. 8 Šako Petrović Square, 1965

On the other hand, Square of Sava Kovacevic was inspired by models of the French classicist period. Example is the *Etoile* square (Fig. 9) with highlighted axially and linkage to as many streets as possible. Similar characteristics are featured in the Sava Kovacevic Square in Nikšić (Fig. 10).



Fig. 9 Etoile Square, French



Fig. 10 Sava Kovačević Square, Nikšić

In addition to the squares of baroque and classicism, the potential inspiration for Nikšić planning matrix comes from the German plan for the city of Karlsruhe, which is characterized by a radial organization, a castle in the center of the composition, the royal residence with the landscaping (Fig. 11)

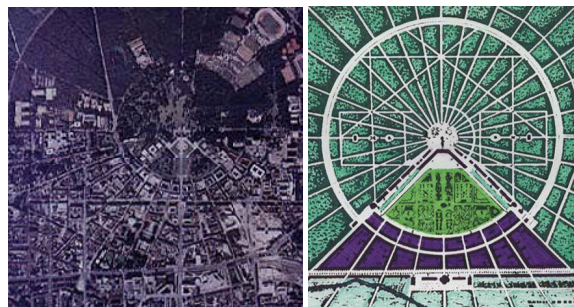


Fig. 11 Plan of Karlsruhe, 1715

Nikšić's squares are characterized by rectangular geometry, dominance, integration with the environment.

Although presented here are actual cities that have inspired the designer of Nikšić to realize the first master plan, it is clear that each of these models has elements of utopian and a tendency towards developing an ideal city. In this sense,



Nikšić too is characterized by an imaginary ideal functioning in accordance with user needs.

#### V. ROLE OF UTOPIAN VISIONS IN THE DEVELOPMENT OF A SUSTAINABLE CITY IN THE 21<sup>ST</sup> CENTURY

The complexity of the 21<sup>st</sup> century possibilities indicate the need for further development of cities of complex visual culture that will allow a recognizable visual city identities. This can be achieved by thoughtful analysis of the requirements and possibilities of a specific environment with a following implementation of successful and productive interventions in a space. Studies have shown that the city's achievement regarding the urban visual culture cannot be achieved without a good planning concept, without clear and strong relations of all parts of the area, with special emphasis on the design of spatial elements. It was concluded that Nikšić has a good plan basis, but which did not result in a desirable visual image of the city in a way that could have been expected from predisposition that the city had in the adoption of the plan and its consistent implementation throughout all stages of development. On the other hand, it was concluded that Nikšić is not a preoccupied city and that it offers great opportunities for growth and transformation in the direction of restoration and improvement of the visual cultural identity as implied for a modern city. Utopian ideas and thoughts were reflected in the visual images of Nikšić, but only in the early stages of plan realization into a three-dimensional reality.

Generally, as utopian visions arose in periods of major urban issues, it is clear that a city of the 21<sup>st</sup> century faces great challenges due to global processes and dynamic social, technological and other transformations. Utopian ideas in the 21<sup>st</sup> century, such as ecological urbanism and others, can significantly contribute to the development of sustainable physical structures of cities, which are increasingly taking on the label - *global city*.

In order to support sustainable development of Nikšić it is necessary to establish a new system of values and give a human and healthy living space back to the city and its users. In this context, it is necessary to build environmentally friendly buildings, develop multi-functional and flexible spaces, achieve visual quality of the city (through: malleability, complexity, authenticity, integrity, availability, balance, order), to bring more natural elements into the developed environment, and establish a visually better relationship between natural bodies of water and open spaces and the developed environment. City lacks the aesthetic quality and variety. It is necessary to restore to the people a feel for a space and community that they are denied. On the other hand, the developed environment, which has an indirect impact on environmental health and human health (through pollution of air, water, soil), requires an intense relationship with nature. In addition, it is important to take measures for quality progress of city functions. Formation of multifunctional space decreases vehicular traffic, which directly affects the reduction of the primary causes of environmental pollution. In this context, utopian ideas could

have a significant impact on the further development of Nikšić.

#### VI. CONCLUSION

Utopian and ideal examples of designing cities have influenced the determining of conceptual planning strategies for Nikšić development. This has remained expressed to date. However, industrial processes, social transformation, historical intersections, stagnation etc. have influenced the development of the city's physical structure throughout history and reflected negatively on its perception. Rapid industrial and economic development of Nikšić after the World War II has caused inhumanity of the living space and disregard of living conditions. While on the one hand the modern era has made progress in the speed of construction, on the other hand it had a negative impact on the culture and environmental quality. Mono-functionality, aggressiveness, fragmentation and degradation in the area disrupted the relationship between man and the city, a sense of value, beauty, unity, that were crucial at the time dominated by utopia. This reflected on the general character of the city, its culture and identity. Disturbed relations between natural and developed led to disruption of the social, psychological and physical health of the people. Now, at the beginning of the 21<sup>st</sup> century, when the needs of the city and its inhabitants are getting more complex, it is necessary to remove the consequences of the industrial revolution and create conditions for sustainable development. Planning and design of the living space should be based on: multi-functionality, diversity, attractiveness, continuity, integrity, balance, order. Special emphasis has to be put on the preservation, renewal and proper management of natural resources, and the establishment of intensive relations between natural and developed. This is the way to achieve a healthy and humane living space with a distinctive visual identity. In this context, the utopian ideas of urban development can be of great importance for the design of recognizable urban structures of a sustainable future.

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