



Fridays for Future: Environmental Sustainable Architecture Collection of Research Papers

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Abstract:

This Monograph is originally and especially dedicated to the students of The architecture of the University of Prishtina for Educational, and Not-for-profit purposes. The monograph incorporates research papers published at JOSHA, as a part of FridaysForFuture actions. Seeing the lack of literature in the field of Environmental Architecture, especially in the University of the Prishtina “Hasan Prishtina”, I was inspired by the community of #FridaysForFuture research papers, hence, our small contribution with writing this monograph. The book is a free and not-for-profit purpose, it is indented as basic literature of courses which I taught at the University of Prishtina. In the monograph I have presented research models, design typology, drawings as the cases studies for future generations at the Department of Architecture. There are six papers assembled in one monography presenting the issues regarding the Climate, Environment, and Sustainable Architecture.

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FridaysForFuture

ENVIRONMENTAL SUSTAINABLE ARCHITECTURE

Collection of Research Papers

Language: English

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Special thanks to my colleagues, who their contribution to the monography, who helped me in writing and finalizing this monograph. Without this contribution, this monograph would not be as it is. As well, special thanks to my family for suggestions and for the support to publish this monograph.

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ARCHITECTURE AND URBANISM

**SCIENTIFIC MONOGRAPH
ARCHITECTURAL DESIGN**

FridaysForFuture

**Architectural Design
Faculty of Architecture
University of Prishtina, "Hasan Prishtina" Kosovo**

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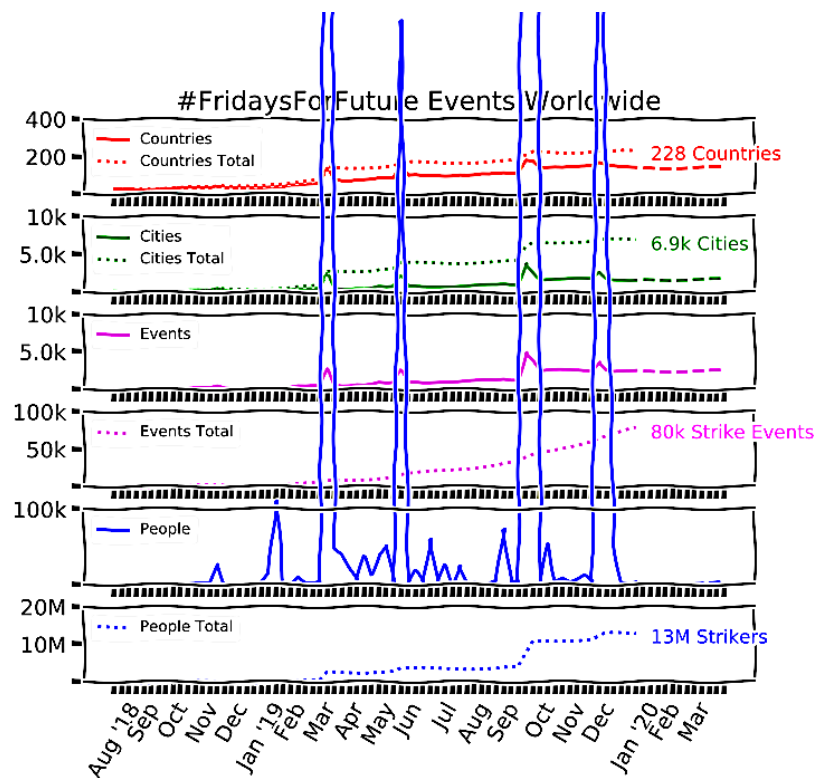
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PREFACE

This Monograph is originally and especially dedicated to the students of Architecture of the University of Prishtina for Educational, and Not-for-profit purposes. The monograph incorporates research papers published at JOSHA, as a part of FridaysForFuture actions. Seeing the lack of literature in the field of Environmental Architecture, especially in the University of the Prishtina “Hasan Prishtina”, I was inspired by the community of #FridaysForFuture research papers, hence, adding a small contribution with writing this monograph. The book is a free and not-for-profit purposes, it is indented as basic literature of courses which I taught at University of Prishtina. In the monograph I have presented research models, design typology, drawings as the cases studies for future generations at the Department of Architecture. There are six papers assembled in one monography presenting the issues regarding the Environment and Sustainable Architecture. This book is intended to serve as a practical guide to design principles, concepts of environmental researched models, and the composition of the design functions.



Source: <https://www.fridaysforfuture.org/statistics/graph>

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January, 2020



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FRIDAYSFORFUTURE - ENVIRONMENTAL SUSTAINABLE ARCHITECTURE
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THE MONOGRAPH PRESENT PROFESSIONAL AND SCIENTIFIC GUIDLINES FOR ENVIRONMENTAL SUSTAINABLE ARCHITECTURE, WHICH ARE DISTINCTED BY THE ENVIRONMENTAL DESIGN THEORY, PUBLIC HEALTH AND SUSTAINABLE PRINCIPLES IN THE ARCHITECTURE. THE MONOGRAPH FILLS A SCIENTIFIC LACK OF BASIC AND ADVANCED UNIVERSITY LITERATURE, FURTHERMORE, THIS BOOK IS ESPECIALLY INTENDED FOR EDUCATIONAL PURPOSES.

THE MONOGRAPH IS DEDICATED TO THE STUDENTS OF ARCHITECTURE, UNIVERSITY OF PRISHTINA, "HASAN PRISHTINA" KOSOVO

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**FRIDAYSFORFUTURE****ENVIRONMENTAL SUSTAINABLE ARCHITECTURE****1.1 Rivers in the name of Sources for the Renewable Energy****Bujar Bajcinovci^{1*}, Modest Gashi², Vlora Aliu¹, Bard Bajcinovci³, Uliks Bajcinovci³**¹ *University of Prishtina, Faculty of Architecture, Kosovo.*² *UN-Habitat, Duty station Mitrovica, Kosovo.*³ *UBT- Higher Education Institution. Faculty of Architecture and Spatial Planning, Kosovo.**Email: bujar.bajcinovci@uni-pr.edu, modest.gashi@unhabitat-kosovo.org, vlora.aliu@uni-pr.edu,
bb34218@ubt-uni.net, ub35398@ubt-uni.net***Abstract:**

Kosovo's water capacities are being ruined in the name of sources for the renewable energy. Surely, those constructions for the renewable energy have sparked fears of the worst wildlife damages and biodiversity of the environment. The study presented in this paper investigated the water resources of Kosovo. Focusing on the river volumes, legislation, biodiversity, sources for the renewable energy, and urban planning issues. The current and possible degraded state of environment in the name of sources of renewable energy are not acceptable, even more, when the water capacities are being ruined and creating cumulative impacts on river systems, disrupting the landscape and beauty of their characters, and affecting the function of their habitats. Surely, hydropower plants are potential of renewable energy, but it must be wise planned and carefully located, never affecting the public health and community wellbeing.

Key words: Rivers, Kosovo, Renewable Energy, Environment, Biodiversity, Urban Planning.

INTRODUCTION

Kosovo's water capacities are being ruined in the name of sources for the renewable energy. Surely, those projects for the renewable energy, especially renewable hydropower frameworks, have sparked fears of the worst wildlife damages of these rivers. Protests against these sustainable constructions have begun to take place in various parts of Kosovo, furthermore, endangering the supply of potable water as well as several environmental hazards of the region. Citizens actions have also been joined by leaders of local and central institutions, civil society organizations and nature lovers [1]. "Cities are complex ecosystems with specific phenomenon's directly reflected in our health, natural resources, economic, social and aesthetic fields. They are open integrated systems and huge organisms with specific and complex



metabolism that transform vast amount of energy, generate huge amount of waste and emanate a number of specific environmental phenomenon's and activities" [2], hence, urban expansion of city development presents spatial evolving framework with each city physiognomy, aiming to achieve the better quality of life, with primary features that affect public health and health wellbeing [2]. Actually, in major cases in Kosovo the law for water has been violated, where it is very clearly stated that concessions and the investments cannot be granted if it concerns resources and violate the use of drinking water.

MATERIALS and METHODS

The study presented in this paper investigated the water resources of Kosovo, where water capacities are being ruined in the name of sources for the renewable energy. Focusing on the river volumes, legislation, sources for the renewable energy, and urban planning issues. The research methods consist of empirical observation through field, and literature review. In order to receive a clearer data, the research is made within spatial regulation, Municipality actions, reaction of ethnic groups, focusing on the bioclimatic environment regarding to the morphology of the affected regions. The data collected include maps, composition of urban structure, attributes of the space, dimensions of locations for these "environmental activities". The additional data for this paper is based on the analysis of the Ministry of the Environment. Protection of water resources is a moral, ethical and human obligation of everyone as water is an essential factor to life, health, food, culture, production and renewable energy. The need for fresh water is one of the greatest environmental issues globally today. Data show that more than 1.5 billion people worldwide do not have access to drinking water, while approximately three billion people do not have appropriate sanitary services. "In view of the current urbanization trend in the world, until 2025 approximately three billion people will need water supply, in Kosovo, as in many other countries of the world, the human health and well-being is increasingly threatened by poor water quality or lack of fresh water. Based on data provided by Kosovar institutions, approximately 80% of the population is supplied from the public water supply system. Protection, preservation and monitoring of the quality of water resources is one of the greatest environmental challenges of our society. Industrial development, urbanization and intensive agriculture are some of the factors causing water pollution. Despite continuous efforts, uncontrolled use of water resources and damage of river beds remain as factors



contributing to the degradation of our water resources” [3]. “As shown in the table 2, about 69.6 % of the population in Kosovo is supplied with water from public systems managed by regional water companies, 29 % from independent systems not managed by regional water companies, and 0.7% of the population does not have access to the water supply system. Based on the performance report of regional water companies, coverage with water supply services in their areas was 82 % in 2013, which is 4% higher than the 2012 percentage, and this trend is going accordingly to the grow objectives” [3].

Table 1. Basic data on rivers and river basins of Kosovo [3,4].

River	Area (S) km ²	Length of river (L) km	Flow (Q) m ³ /s	(q) l/sek/km ²	Slope %	Perimeter of basin (Km)
Drini i Bardhë	4340.14	110.7	61.7		2.1	409.8
Sushica	49.4	17.25			9.4	32
LB.Pejës	464,8	57	10.21	24.13	2.5	128
LB.Deçanit	259,3	53	7.84	42.46	3.2	105
Ereniku	519.3	51.74	12.16	26.73	3.9	109
Istogu	405.3	19.74	6.98		4.5	87
Klina	458.7	72.12	2.8	4.92	4.5	126
Mirusha	336,7	37	1.661		1.7	83
Toplluha	495	34.05	3.44		3.5	108
LB.Prizrenit	247,8	36.07	6.49	29.68	7.4	77
Plava, Restelic	341.86	22.12	5.25	20.79	5.9	90.56
Basin total	4682	110.7	61.01		2.1	409.8
Ibri	4044.21	89.50	36.4	6.39	0.3	436.8
Sitnica	2912	78	13.94	5.38	1.1	276
M.Binçes	1564	76	8.7	5.99	1.5	216
Kriva Reka	640.70	44.5	4.43	7.27	1.2	128
Lepenci	653	50	8.4	14.91	4.6	130
Nerodime	209.4	38.5			2.1	81.5
Total	10 907.00		121.2			

Table 2. Availability of water supply network [3,5].

Nature of supply	Household units	%
Water system provided by public service	204,365	69.6%
Water system provided by other sources	82,609	28.2%
Pipeline water system within building outside household unit	899	0.3%
Pipeline water system outside building	3,413	1.2%
Water supply system not available	2,157	0.7%
Total	293,443	100.0%



Industrial and energetic operators are the greatest users of water. The greatest spenders of water in Kosovo include: KEK, Feronikel and Sharrcem. These operators are mainly supplied with water from superficial accumulating lakes. Some of the smaller industrial operators are supplied with water from the public network, whereas a few of them use well-based independent water supply systems. “The Kosovo Energy Corporation is one of the economic operators that spend most water for energy production purposes. Power Plant Kosova A is supplied with unprocessed water from the Llap River and from the Ibar- Lepenci and Batllava Lake when necessary, while Power Plant Kosova B is supplied with unprocessed water from Ibar-Lepenci. According to data provided by Kosovo Energy Corporation, the corporation used 21 million m³ of water for energy production during 2013” [3]. “New Feronikel is supplied with water for its technological processes from Bivolak Ibar- Lepenci, which is located 17 km away from the industry and which supplies water reservoirs located above the factory, Feronikel uses this water for industrial and drinking purposes. The industrial water is mainly used for electrical furnaces cooling, slag granulation, steam production and for gas and dust cleaning systems in convertors and electrical furnaces. The majority of the industrial water used to cool electrical furnaces is re-circulated, while most water is spent in steaming processes. According to data provided by NewCo Feronikel, approximately 1.2 million m³ of water were spent during 2013” [3]. “The cement factory Sharrcem in Hani i Elezit operates with a closed water system at all points of the production process. This system is supplied with water from sources of the Lepenc River and Dimca stream. Water is spent in this industry for conditioning furnace gases, for cooling processes in the air conditioning tower and for sanitary purposes. According to data provided by the concrete factory SharrCem, 100,000 m³ of water were used during 2013” [3].

DISCUSSION

The hydropower plants currently operating in Kosovo include the plant of Ujman with an energy production capacity of 34 MW and five small plants contributing to the distribution network with a capacity of 11.82 MW [3]. “Other small plants include those in Dikanc, Burim and Prizren. Another operational hydroelectric plant in Kosovo is that of Kozhnjer in Deçan, which has been given with concession and produces a small amount of energy. Kosovo has numerous rivers and streams with a hydro-energetic potential that may be used to produce



electrical energy. The western part of Kosovo has the hydro-energetic potential of Drini i Bardhe, which comprises more than half of the hydro-energetic potential of Kosovo. The most important hydroelectric plant that may be built in Kosovo is that of Zhur located in the flow of Drini i Bardhe with a capacity of 0.377 Twh/year. The flows of rivers Drini i Bardhe, Iber, Morava, Lepenc and Llap have a significant potential for electrical energy production” [3].

Table 3. Basic data on the capacity of planned hydropower-plants [6] [3].

Name of HP	Potential capacity [MW]	Planned production GWh	Flow m ³ /sec	River
Kuqishta	3.9	19.0	6	Peja
Drelaj	6.2	29.6	6.5	
Shtupeq	7.6	37.2	8	
Bellajë	5.2	26.1	5	Deçani
Deçani	8.3	40.7	6.5	
Lloçan	3.1	14.4	1.5	Lloçani
Mali	3	18.6	2.4	Erenik
Erenik	2	9.5	2.4	
Jasiq	1.9	9.9	2.6	
Dragash	2.2	11.5	5	Plavë
Orçush	5.6	29.2	7	
Reçan	1.5	7.9	2.6	Prizreni
Brezovicë	2.1	11.5	4.5	Lepenc
Lepenci	3.5	19.1	7.6	
Banjska	0.3	1.7	0.5	Banjska
Batare	1.1	5.6	2.3	Bistrica
Majanc	0.6	3.1	1.5	Kaçandoll
Mirusha	4.6	28.1	45	Drini & Deçani
Total	62.7	322.8		
Hydro-plant of Zhur	Potential capacity [MW]		Planned production GWh	
Zhur 1	2x 131		342.2	
Zhur 2	42		55.39	
Total	305		397.6	

The table below summarizes the basic data regarding the capacity of planned hydro-plants and their locations. But, according to the officials in Inter-Ministerial Council on Water in the Government, which are declaring: “We have been engaged in this process, although not actively because it is the responsibility of the Ministry of Environment, however we have dealt with, hence, we have essentially betrayed this problem because granting the right to use water for hydropower plants and for all other uses must be granted by concession, and not by water



permit, here we have a legal violation at the outset and this violation was committed by those who issue this permit which is the Ministry of Environment because the concession is different from the permit, because it is a competitive and transparent process. Hence, there are no individual desires for the new hydropower plant locations, but the state and the ministry determine the locations where there are hydropower plant capacities. In Kosovo, no concessions were implemented at all and water permits were issued at the request of investors” [7]. Kosovo as a member of the Energy Community Treaty has pledged to have at least 25% of its energy from renewable energy sources by 2020. Studies have identified more than 77 sites where hydropower plants can be built. These plans were widely accepted by Kosovo institutions, despite the scarce availability of water in Kosovo [1]. It is estimated that Kosovo has 1600 m³/water/year per capita [3]. The main hydrological feature in Kosovo is the unequal and inadequate distribution of water resources in relation to demand. The water energy potential in Kosovo is very low and it has been used until now to a very modest extent [3]. Protected areas are important for nature conservation. “Remarkably, about 1,000 of the 3,000 hydropower projects in the Balkans are planned in protected areas such as National Parks and Natura 2000 sites, which Kosovo is also a member. Furthermore, the law on nature protection prohibits “touch” of national parks, prohibiting the economic use of natural goods” [1].

CONCLUSION

The current and possible degraded state of environment in the name of sources of renewable energy are not acceptable, even more, when the water capacities are being ruined. Those environmental actions require specific responsibilities and activities, especially when the state is directly linked to the public health and quality of life. Strategic Environmental Assessment for Spatial Planning of the “Bjeshkët e Nemuna National Park”, published by the Kosovo Environmental Protection Agency, an institution within the Ministry of Environment and Spatial Planning, MESP, declares: “The development of new hydropower projects should be discouraged, as they create cumulative impacts on river systems, disrupting the landscape and beauty of their characters, and affecting the function of their habitats.” [8].

Surely, hydropower plants are potential of renewable energy, but it must be wise planned and carefully located, furthermore, never affecting the public health and community wellbeing.

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1.2 Urban Urgency for Air Quality and E-Vehicles: A Case of Prishtina

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Abstract:

The shortcoming of a sustainable urban mobility plan for the city of Prishtina and its linkage to spatial plans in the future will bring serious problems for the city, which will have a negative impact on the quality of life. It is clear that the factual situation of parking spaces in Prishtina is problematic. The need for parking spaces and public parking garages in Prishtina are very immediate. There is no parking plan where there are legal, private parking, illegal parking lots. The current degraded state of environment and urban fabric requires specific responsibilities and activities, especially when the state is directly linked to the quality of life and public health. Potential measures for a healthier environment in public parking spaces, requires underground building concepts, thus, accommodating E-Vehicles, and include a diversity of sustainable system solutions.

Key words: Prishtina, Parking Spaces, E-Vehicles, Spatial Organization, Urban design.

INTRODUCTION

The shortcoming of a sustainable urban mobility plan for the city of Prishtina and its linkage to spatial plans in the future will bring serious problems for the city, which will have a negative impact on the quality of life. Lack of a serious and professional approach to sustainable city planning, uncontrolled expansion and without scientific determined criteria [1]. With the enormous number of gravitated vehicles and the lack of parking spaces and facilities, almost every neighborhood in Prishtina is in the mental state of protecting the parking space [1]. “Cities are complex ecosystems with specific phenomenon’s directly reflected in our health, natural resources, economic, social and aesthetic fields. They are open integrated systems and huge organisms with specific and complex metabolism that transform vast amount of energy, generate huge amount of waste and emanate a number of specific environmental phenomenon’s and activities” [2]. Urban expansion of city development presents a spatial framework, aiming to achieve a better quality of life, with primary features that affect air quality and health wellbeing [2]. According to World Health Organization, Europe, “The epidemiological and toxicological evidence on the effects of transport related air pollution on health has increased substantially in recent decades. Although this includes epidemiological and toxicological evidence, it is only a fraction of the total evidence on the effects on health of urban air pollution. A review of this evidence indicates that transport related air pollution contributes to an



increased risk of death, particularly from cardiopulmonary causes” [3, 2]. Furthermore, “Outdoor concentrations of traffic-related air pollutants (nitrogen dioxide PM2.5, particles with a 50% cut-off aerodynamic diameter of 2.5 mm and soot) were assigned to birthplace home addresses with a land-use regression model. They were linked by logistic regression to questionnaire data on doctor-diagnosed asthma, bronchitis, influenza and eczema and to self-reported wheeze, dry night-time cough, ear/nose/throat infections and skin rash” [4, 2]. Free parking space! This is the most elementary urban need nowadays! Furthermore, there is a lot of stress finding the free parking lot, especially when we have to park after a hard labor day in the vicinity of our residential area, there are increasing number of incidents as a result for finding the free parking space, most of the time the Kosovo Police has had to intervene [1].

MATERIALS and METHODS

The study presented in this paper investigated the Prishtina City, focusing on Urban Planning issues, traffic problems, air pollution and free parking spaces. The research methods consist of empirical observation through field, and literature review. In order to receive a clearer data and information’s, research is made within spatial regulation, shapes of architectural models, focusing on the bioclimatic features regarding to the morphology of the city of Prishtina, urban planning, environmental pollution, and issues of public health. [1, 2].

Table 1. Vehicle registration of 2014-2017- Kosovo [5, 1].

	2014	2015	2016	2017	Grow 2014-2017
Vehicles	236145	281847	260291	273862	+8%
Trans vehicle, 3.5 and over 3.5 Mt	15769	18330	17963	2735	-73%
Trans truck, under 3.5 Mt	26949	30846	31285	288	-935%
Minibus	3161	3212	2841	1690	-47%
Buses	1697	2124	1916	523	-60%
Motorcycles	1540	1849	1790	2535	+64%
Tractors	1036	941	613	1949	+88%
Trailer under 3.5 Mt	250	286	288	32299	+1290%
Trailer 3.5 and above 3.5 Mt	2281	2707	2628	18559	+813%
Total	288828	342142	319615	334440	+86%

According to the data presented in Table 1, it is clear that the number of registered vehicles is increasing every year. Lack of additional data such as the year of production, combustion



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model, producer, origin of the state, does not allow us to find out why this growth trend is happening. Actually, there are increasing number of traffic incidents, altogether also as a result for finding the free parking space. Kosovo Police, through the report of incidents has recorded 49 traffic accidents have been reported across Kosovo within 24 hours, with 24 of them being with injuries. Statistics from this report show that were also a large number of traffic tickets, where the Kosovo Police imposed a total of 849 tickets, Table 2.

Table 2. Daily Report of Kosovo Police for September.1.2019.

Accidents with Fatality	0	-
Accidents with Injuries	24	-
Accidents without Injuries	25	-
Traffic tickets	-	849
Total	49	849

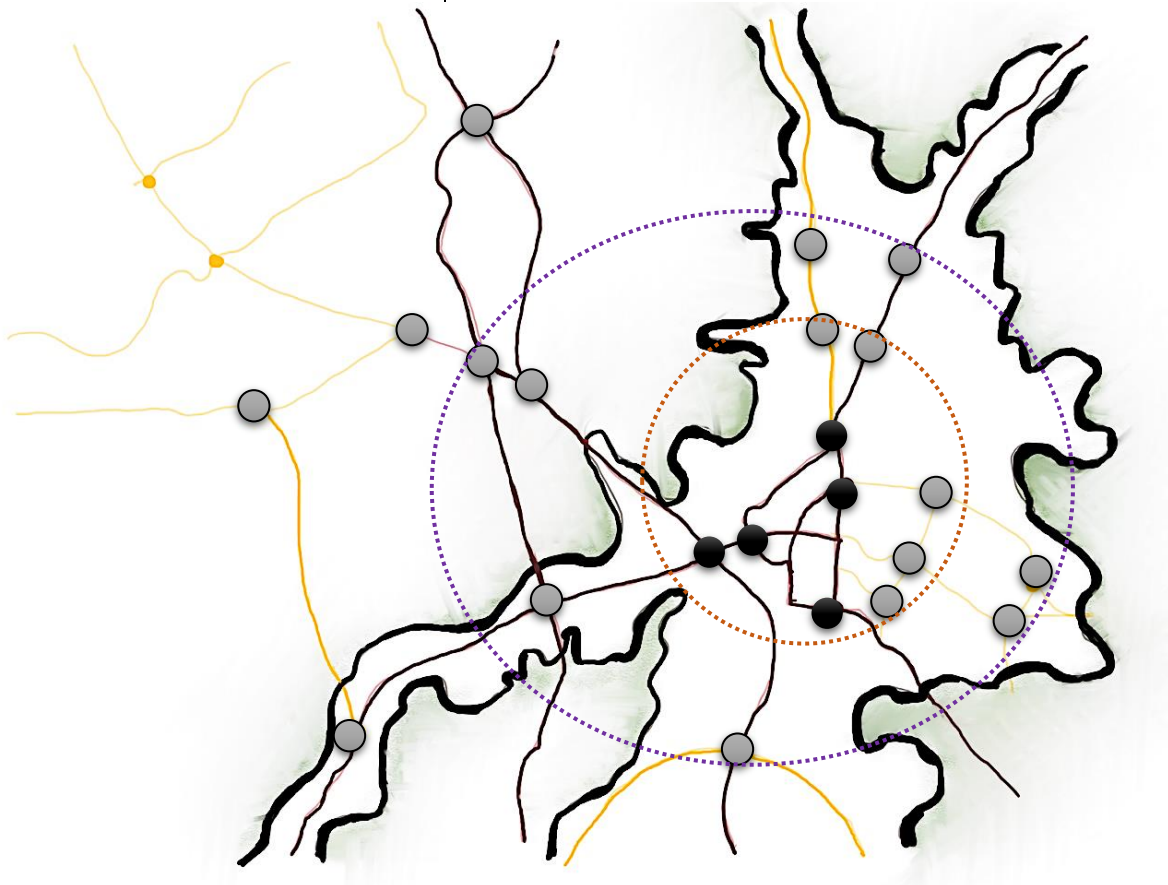


Figure 1. Prishtinas-urban zones, with a drastic requirement for parking spaces. [Authors, 2019]



As we can see in Figure 1, there is a conceptual urban strategy to offer a variety of public parking garages, instead only one and big architectural structure, also, there is need that those type of buildings blend in within an urban composition, preferably incorporated or isolated with a cultivated vegetation. As from urban planning concepts we stand that in those situations, a more suitable are hybrid structures, moreover, parking garages can be realized underground with a closed type of garage. Naturally, those types of architecture structures demand a heavy mechanical ventilation, always preferring the necessity for E-Vehicles as new environmental standard, hence, implementing a new contemporary technology as answer regarding to air pollution [2].

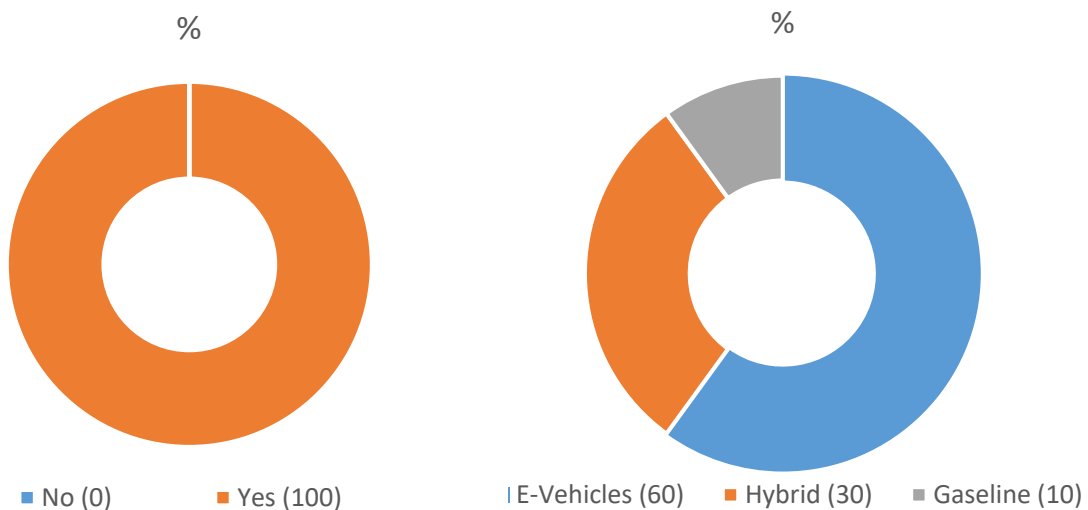


Figure 2. Chart and result from Community Surveys:

- a). Do you think gasoline driven vehicles are the main cause of air pollution in Prishtina?
- b). Which of the vehicles would you most prefer, Electric, Hybrid, or Gasoline?

DISCUSSION

The need for parking spaces and public parking garages in Prishtina are very immediate, moreover, the sustainable urban and architectural design is facing major challenges as a result of many contemporary factors: heavy traffic, air pollution, life style, and economy. On the other hand, Kosovo is also participating in global trends, a process by which regional economies, societies and cultures are integrated through a global network [1].



In January 2017, “Prishtina has again experienced heavy air pollution at a significant and very dangerous amount, according to the recent monitoring through AQI-Air Quality Index [6]. Moreover, the city of Prishtina have continuously raised values of air pollution in this season every year, in the last decades. Nevertheless, the heavy worsening of the air quality has been effectual to the most citizens those days, surely, public health deterioration continues to remain one of the vital worries of the households, they are in constant worry for their children health” [7].

Table 3. Measured Values For AQI, Pm2.5 In Prishtina, 2017 [6, 7].

Per Month [PM _{2.5}]	The maximum value of [AQI]	The maximum amount for an hour [µg/m ³]	Date of maximum value [Date]
January	532	600	29.01.2017
February	259	265	22.02.2017
March	177	146	02.03.2017
April	166	122	14.04.2017
May	108	50	01.05.2017
June	87	31	01.06.2017
July	70	23	01.07.2017
August	82	29	16.08.2017
September	72	31	10.09.2017
October	156	83	18.10.2017
November	241	226	21.11.2017
December	215	285	07.12.2017

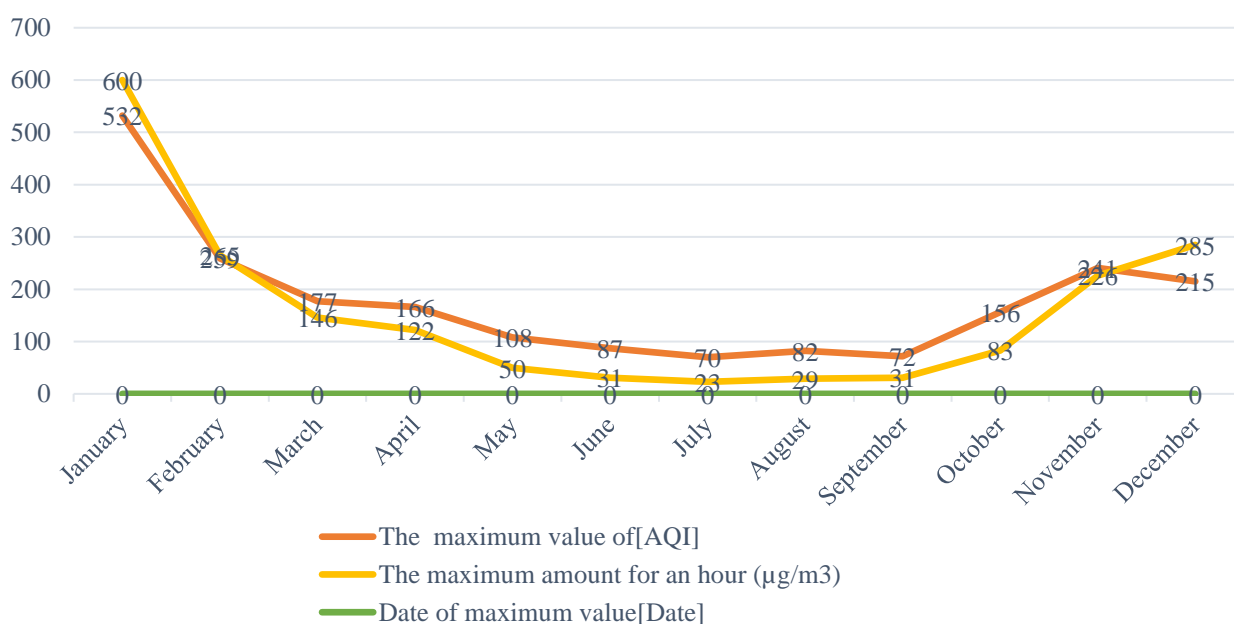


Figure 3. Chart of measured values for AQI, PM2.5 in Prishtina, 2017, [7].



Table 4. Values of AQI, the levels of health concern. Adapted, [6].

Air Quality Index Levels of Health Concern	Numerical Value AQI	Meaning
Good	0 to 50	Air quality is considered satisfactory, and air pollution pose little or no risk.
Moderate	51 to 100	Air quality is acceptable; however, for some pollutants there may be a moderate health concern for a very small number of people who are unusually sensitive to air pollution.
Unhealthy for Sensitive Groups	101 to 150	Members of sensitive groups may experience health effects. The general public is not likely to be affected.
Unhealthy	151 to 200	Everyone may begin to experience health effects; members of sensitive groups may experience more serious health effects.
Very Unhealthy	201 to 300	Health alert: everyone may experience more serious health effects.
Hazardous	301 to 500	Health warnings of emergency conditions. The entire population is more likely to be affected.

“It is clear that the factual situation of parking lots in Pristina is problematic. There is no parking plan where there are legal, private parking, or illegal parking lots. Some anti-dumping measures have been carried out in the past mainly by using robust measures such as the placement of vegetation and metal bars” [1].

CONCLUSION

There is a conceptual urban strategy to offer a variety of public parking spaces and parking garages, also there is need that those type of buildings blend in within an urban composition with a cultivated vegetation [1]. According to the research, “The tree species used for the GAIA-urban forestation project were selected, starting from the green Regulations of the City of Bologna and evaluating important factors such as the potential for absorption of pollutants (CO₂ and PM₁₀), the release of substances volatile and the allergenic specific factors, the first 24 most suitable species have been identified to fulfil this function” [8, 2].

Also, “There is a considerable potential to further develop the beneficial use of vegetation to promote urban environmental quality and citizen health... Trees and shrubs were compared for PM accumulation on the surface” [9, 2].

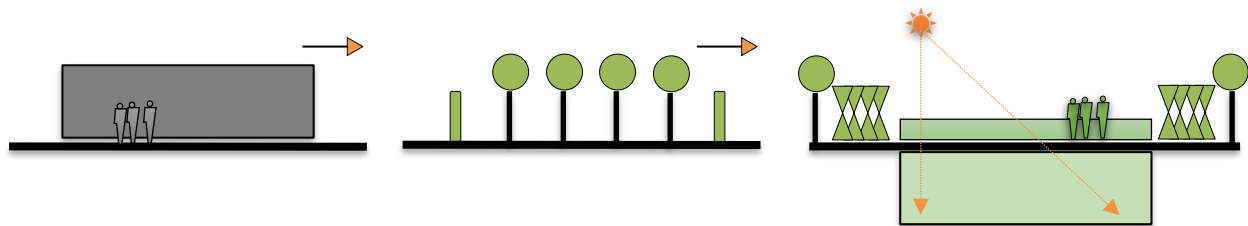


Figure 3. E-Vehicles, Vegetation barriers, Underground parking garages with contemporary environmental solutions for E-Vehicles.

The current degraded state of environment and urban fabric requires specific responsibilities and activities, especially when the state is directly linked to the quality of life and public health. Potential measures for a healthier environment in public parking spaces, requires underground building concepts, thus, accommodating E-Vehicles, and including a diversity of sustainable system solutions.

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1.3 Biomimicry and Biophilic Design: Multiple Architectural Precepts

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Abstract:

Biophilia is the innately emotional affiliation of human beings to other living organisms. Biophilia, like other patterns of complex behavior, is likely to be mediated by rules of prepared and counter prepared learning. The significance of biophilia in human biology is potentially profound, even if it exists solely as weak learning rules. It is relevant to our thinking about nature, about the landscape, the arts. The biophilic design is not only the aesthetic perception, those experiences may be indicative of mental calmness and indirectly influence spiritually. Biophilic design focuses on human adaptations to the natural world. Featuring the natural organic structure, which transforms the perception and understanding of architectural buildings from exceptional one, into an honest and natural blend architecture, respectively, architectural biophilic design emphasizes the ‘genius loci’ an emotional attachment to particular settings and places.

Key words: Biomimicry, Biophilic Design, Architecture, Evolutive, Kosovo.

INTRODUCTION

“Biophilia, if it exists, and I believe it exists, is the innately emotional affiliation of human beings to other living organisms. Innate means hereditary and hence part of ultimate human nature. Biophilia, like other patterns of complex behavior, is likely to be mediated by rules of prepared and counter prepared learning” [1]. “The significance of biophilia in human biology is potentially profound, even if it exists solely as weak learning rules. It is relevant to our thinking about nature, about the landscape, the arts, and mythopoeia, and it invites us to take a new look at environmental ethic.” [1].

According to the Architect Frank Lloyd Wright, as it believed once said: “I go to nature every day for inspiration in the day’s work. I follow in building the principles which nature has used in its domain.” Therefore, these features and multiple architectural precepts are precisely the ethics of biophilic design. Moreover, the biophilic design is not only the aesthetic perception, but also those experiences may be indicative of mental calmness and indirectly influence spiritually. Hence, implementing those principles of biomimicry and biophilic design in



architecture considerably invigorate the key design concepts of the Organic Architecture, and surely these principles should be respected for all those who are interested in architectural design [2].

MATERIALS and METHODS

This paper, present the overview of the biomimicry and biophilic progressive design precepts, focusing on the framework of the contemporary architecture. The research method consists of the nature observation, and literature review. Study were investigated through literature review, technology advancements, documentations and conceptual drawings. The collected data also include implementing the principles in the art media, fractal design, composition of the urban morphology, environment, and mobility.

Nowadays, a contemporary architect should understand the sustainability, environment, and space in relation to the interdependently systems of nature and human development. The concept of biomimicry and biophilic design is based largely on the demands of healthy living, and natural prosperity. Moreover, this unlimited area of creative possibilities continues to develop its multi-dimensional identity, presenting more innovative solutions in the visual architectural perception, strengthened with continuously advanced technology, firstly aimed to the increase of the quality of life and various new life style requirements [3,4].

Biomimicry studies acknowledge further nature models, and assent enthusiasm from these nature designs to work out human development. Surely biomimicry is a new perception of exploring, respecting, and valuing nature. Biomimicry in Architecture introduces a precept of shapes, volumes, and whole functional natural systems, thus, implementing the different established and complementary design rules.

Therefore, the percept of biophilic progressive design should be highlighted as an architecture of evolutionary relations between nature and society. In this context, it is necessary to understand the urban development and the transdisciplinary interaction accomplished between ecology, architecture, human adaptations to the natural world.

DISCUSSION

The dynamism of contemporary cities results in changing rapidly the space conditions. This professional phenomenon creates a new momentum, a concept and a new architecture [3].



According to the Stephen Kellert, “Biophilic design is about creating good habitat for people as a biological organism in the modern buildings and constructions that advance people’s health, fitness and wellbeing. The successful application of biophilic design requires consistently adhering to a number of basic objectives or principles.

These principles represent fundamental conditions for the effective practice of biophilic design” [5]. They include:

1. “Biophilic design requires repeated and sustained engagement with nature.
2. Biophilic design focuses on human adaptations to the natural world that over evolutionary time have advanced people’s health and fitness.
3. Biophilic design emphasizes an emotional attachment to particular settings and places.
4. Biophilic design promotes positive interactions between people and nature that expand our understanding of community to include both humans and nature.
5. Biophilic design encourages ecologically connected, mutual reinforcing, and integrated design solutions” [Excerpt, 5].

In recent decades, we evidently recognize a particular interest of architects in designing with biomimicry in mind, reflecting with nature, thus, providing the urbanites with the ability to appreciate certain health environments, strengthened and accomplished by the high-tech technology.

Hence, as stated by Janine Benyus; “When I introduce biomimicry to architects, designers, and engineers in workshops, it feels like a remembering of something long lost. As I spread seashells and feathers and bones before them, they fall quickly under a spell, exploring life’s designs with the eyes of that child under the maple” [6].

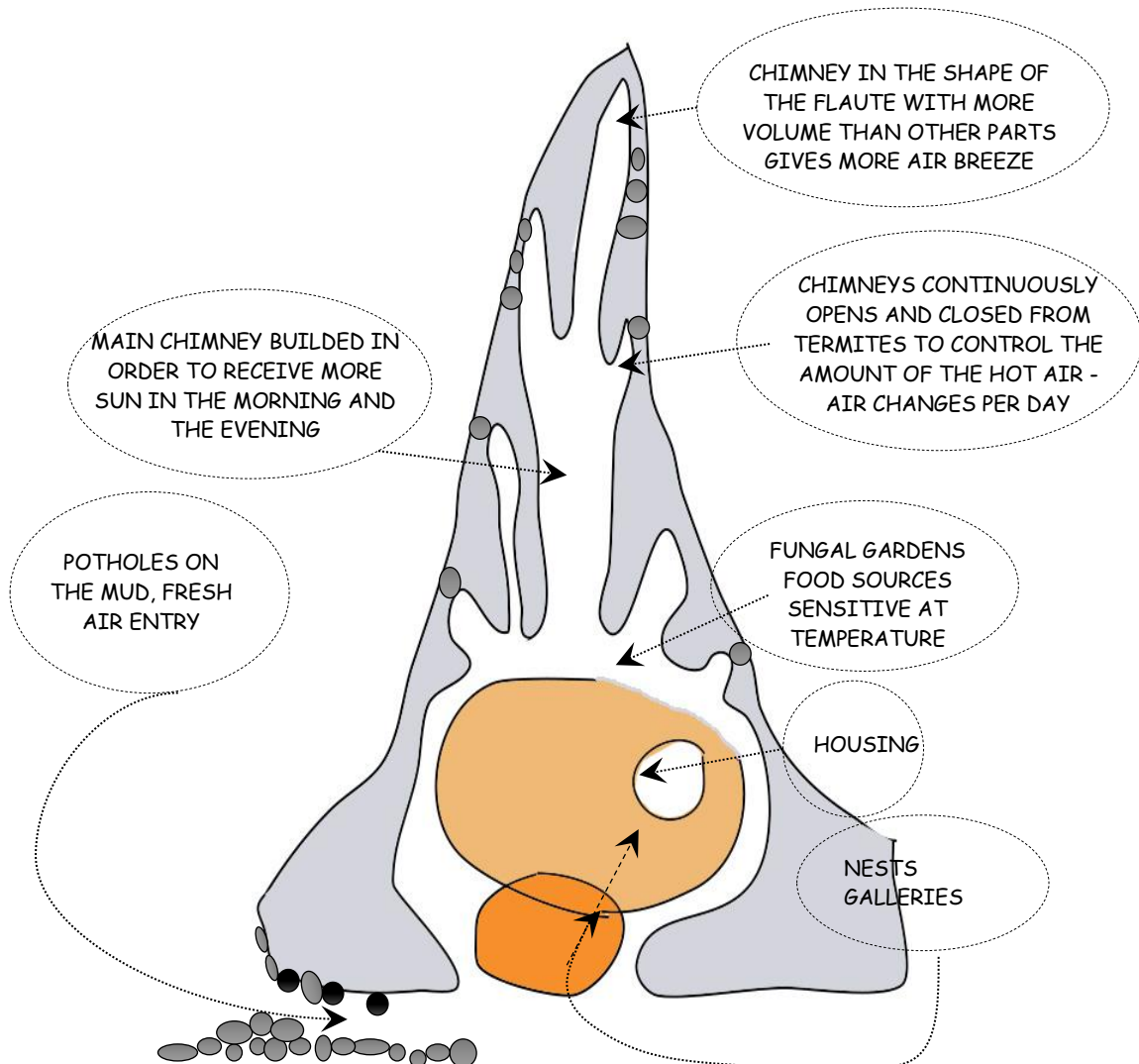


Figure 1. Biomimicry, 'super-organisms'- termite communities.

“Termite communities have co-evolved for millions of years into ‘super-organisms’... Strictly speaking a superorganism is an organism that is composed of other organisms. A superorganism is any aggregate of individual organisms that behaves like a unified organism. Members of a superorganism have highly specialized social cooperative instincts, divisions of labor, and are unable to survive away from their superorganism for very long” [7].

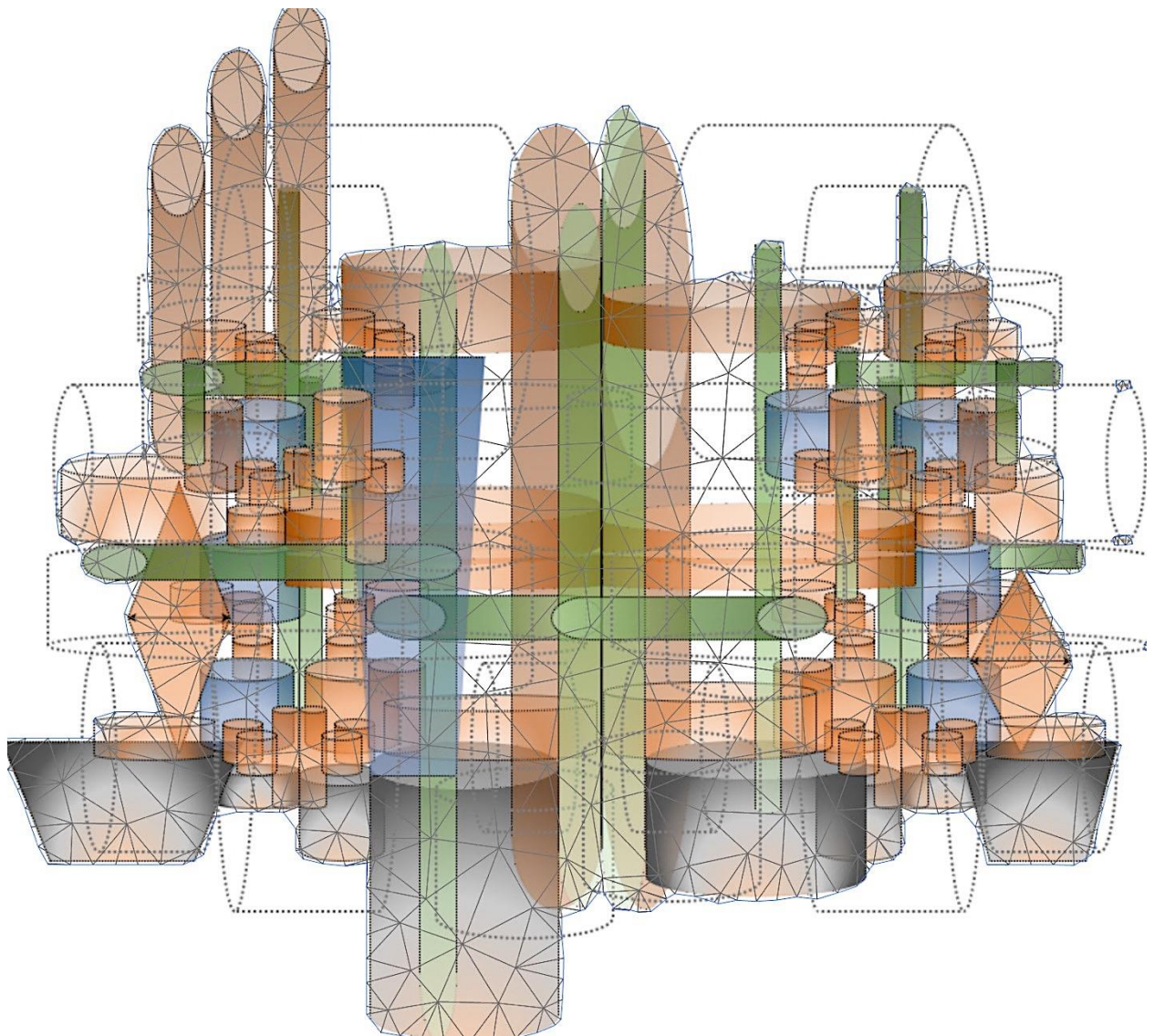


Figure 2. Computer generated Biomimicry, termite communities.

“The time and space relationship in these virtual environments emphasize the understanding of the imaginary of the ‘super-organisms’ in relation to: configurations, space, time, and interactive actions to control the system. However, imagination is a very creative and complex act, especially when used for artistic aspiration. In the understanding of nowadays architects, digital interpretation of imagination represents the framework mechanism to deny the previous traditional archetypes, in the favor of a futuristic and interactive architecture. Of course, all



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these contradictions in the process of architectural creation represent an interesting challenge, and motivation to explore further” [3, 8].



Figure 3. Santorini Village of Oia 2, Greece.
Source: Bruce Harlick, 2012. Flickr, Attribution 2.0 Generic (CC BY 2.0)



Figure 4. Ulcinj, Montenegro.



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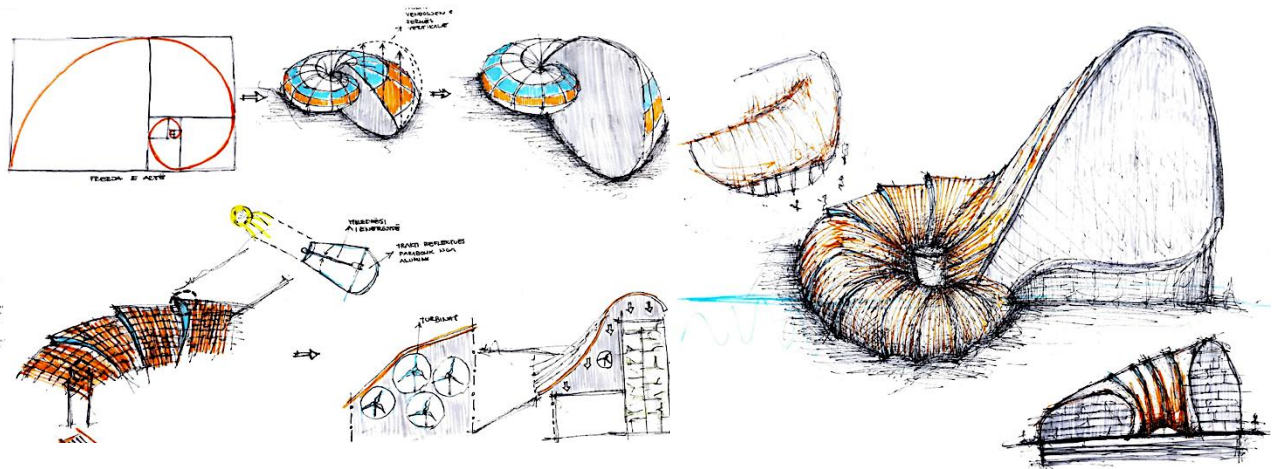


Figure 5. Vertical Farm, Biomimicry Analysis.
Students: Nita Hasimja and Nita Llonçari, 2018. Course: Architectural Design 5.
University of Prishtina, Department of Architecture. Kosovo

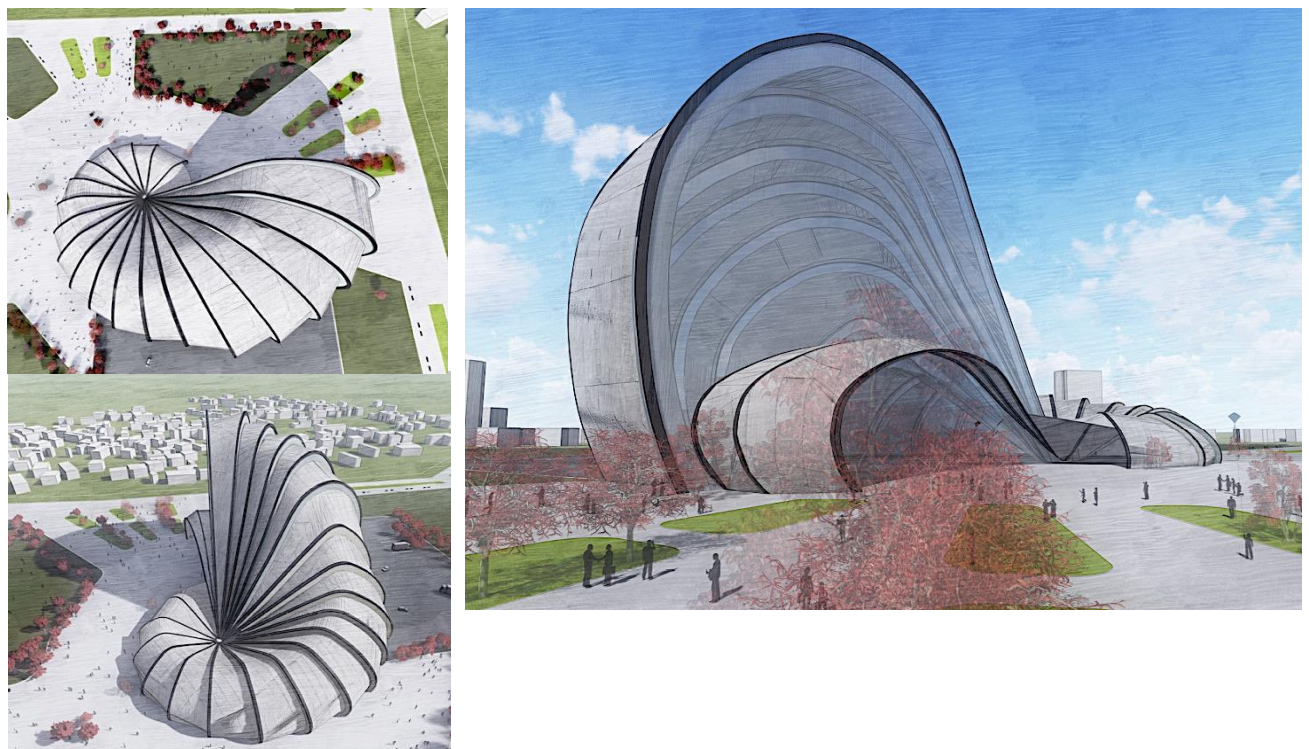


Figure 6. Vertical Farm, Architectural Visualisations.
Students: Nita Hasimja and Nita Llonçari, 2018. Course: Architectural Design 5.
University of Prishtina, Department of Architecture. Kosovo



CONCLUSION

Biophilic design requires repeated and sustained engagement with nature, hence, design focuses on human adaptations to the natural world. Featuring the natural organic structure, which transforms the perception and understanding of architectural buildings from exceptional one, into an honest and natural blend architecture, respectively, architectural biophilic design emphasizes the ‘genius loci’ an emotional attachment to particular setting and place.

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1.4 Interactive Kinetic Architecture: Progressive Design Principles

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Abstract:

Interactive architecture encompasses building automation but goes beyond it by including forms of interaction engagements and responses that may lay in pure communication purposes as well as in the emotive and artistic realm, thus entering the field of interactive art. In the coming decades, new interactive architecture process will continue to be largely implemented in to the urban-architectural environment. Various performative art media also embark on interactive architectural design strategies. Therefore, the combination of sensors, processors and effectors of the variable elements in the architectural structure transforms the perception and understanding of the architectural buildings from passive one into an active evolutive compositions.

Key words: Interactive, Kinetic, Architecture, Progressive, Design Principles.

INTRODUCTION

“Interactive architecture refers to the branch of architecture which deals with buildings featuring the trio of sensors, processors and effectors, embedded as a core part of its nature and functioning. Interactive architecture encompasses building automation but goes beyond it by including forms of interaction engagements and responses that may lay in pure communication purposes as well as in the emotive and artistic realm, thus entering the field of interactive art” [1]. Nowadays, and in the coming decades new interactive architecture practices will continue to be largely implemented in to the urban-architectural environment. Various performative art media also embark on interactive architectural design strategies. In addition, day-to-day life and new lifestyles will implement new virtual networks, thus, interacting with massive data exchange of automated software directed tasks. Some performative art branches like digital movie industry have accelerated so much needed contemporary vision of architects, and designers for progressive design principles. Furthermore, movie industry has adopted very quickly new digital technologies with futuristic prediction frameworks, like the movie The Matrix, which offers a scenario that treats the reality as done in a simulation, its interactive



virtual-real program allows people to access new technology devices experiencing what they think it's a reality, when in fact, only their brain impulses interreact with the loaded matrix programs [2]. However, interactive architecture brings the potential to human personalization into a context that makes people's desires, and needs constantly more active and evolving. This conceptual perception in architectural development with system of framework interactivity create not only human personal engagement with surrounding, but also create the different reference for architectural space. At the core of the contemporary architecture level, architects and digital designers are actually acknowledging the new reality and arguing to the question posed by the "Cedric Price - in the 1960": "What happens if a building or space can be continuously generated and regenerated?" [2].

MATERIALS and METHODS

The study in this paper, present the overview of progressive design principles, focusing on the framework of the Interactive Kinetic Architecture. The research method consists of empirical observation, and literature review. Study were investigated through literature review, technology advancements, documentations and conceptual drawings. The collected data also include implementing the kinetic design principles in the art media, movie industry, composition of urban structure, mobility, and in art movement.

Hence, a contemporary architect needs to be specialized in progressive design principles by applying new digital conceptual design concepts, thus, using conventional technology unconventionally, to explore the manners in which people socialize with each other and with the surrounded space. Nowadays, a contemporary architect should understand the sustainability, environment, and space in relation to the interactivity with software design framework that enables the evolutive structural transformations of a buildings, or targeted features of the buildings. The concept of interactive architecture is based largely on the demands of urbanites, architects, artists and designers of the visual art media, and surely this process of perception transformations will continue.



Moreover, this unlimited area of possibilities continues to develop its multi-dimensional identity, presenting more innovative solutions in the visual architectural perception, strengthened with continuously advanced technology, firstly aimed to the increase of the quality of life and various new life style requirements [3].

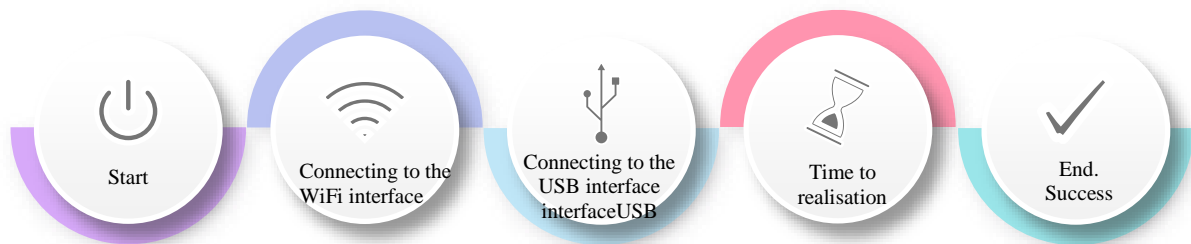


Figure 1. The software implementation process in the interactive structural architecture.

In an era of Information Technology development, architecture professionals have to think beyond the current urban demands, habitat, equipment and technology, so that the space treated by the architectural processes can coexist in a mutual environment between technology and architecture. The actual buildings are generated with the relevant technology of the present requirements, however, the conceptual architectural tendencies for the future will be empowered with invisible networks of the electronic activities in the shape of the surveillance systems, transforming the structural parts of the buildings, hence, also this technology of the future will enable a wide range of the electromagnetic systems, which can be used to change the interactivity of urbanites with urban ambience [3]. Contemporary urban and architectural concepts with interactive methods and systems distribute the need to explore beyond the present demands of urbanists and architects to analyze, examine and describe the opportunities to the unknown future for the communities to use interconnection with the technology. Therefore, the parameters of interactive architecture should be highlighted as an architecture of evolutionary relations between technology and society. It is essential to distinguish between interactive architecture, and interaction with the architecture. In this context, it is necessary to understand the urban development and the transdisciplinary interaction accomplished between cybernetics, architecture, e-control, and communication with the automated systems. This is particularly important in a new digital era where the use of technology is so easily confused with the implemented tradition so far. Nowadays, architectural design research and creative art processes are increasingly intertwined with interactive architecture methodologies [3].



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Designing an interactive structure, is a complex notion, originally arose in the field of architecture more than two decades ago. This design process demonstrates how a whole structural system, controlled by different sensors, processors, effectors and a software interface, can respond to the needs and requirements of the individual and community. Moreover, the nature of such interaction is not linear and in one-way direction, but far more, a multi directional relation between environment, requirements, and users involved in the targeted process. Hence, in regard to the design, inter relationship of the interactive architecture, present a complex technological, conceptual and functional dilemma! In the terms of the perception, this creative realization of the architectural concepts enables users to experience architectural space in a more vibrant and more participatory fashion, transforming the classical and traditional perception of urban and architectural spaces [4].

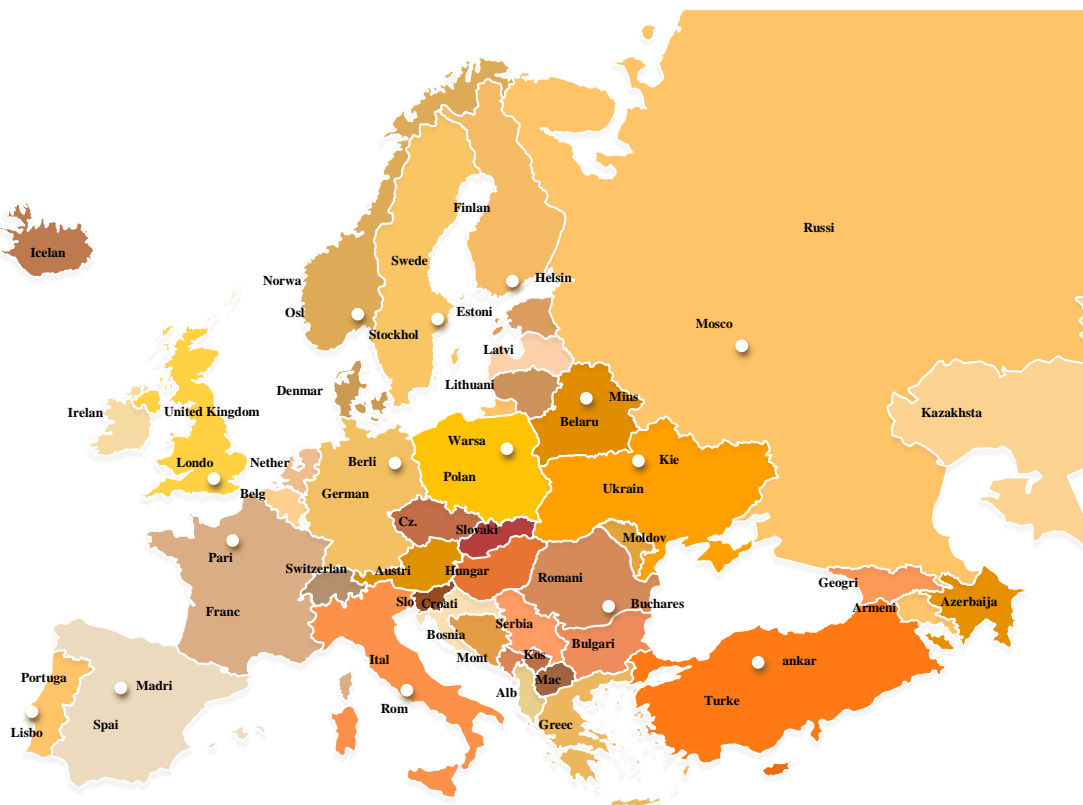


Figure 2. Map of states of the European Continent

Of course, this conceptual digital spirit of the architectural design will involve more than 741,447,158 inhabitants of the continent of Europe, with a total area of 10,180,000 km², and the geographical entirety of 50 sovereign states [1].



DISCUSSION

The inventiveness of contemporary cities results in changing rapidly the space conditions. Traditionally designed buildings often cannot cope with this trend, with the appearance of such ever-changing demands. This professional phenomenon creates a new momentum, a concept and a new type of architectural structures. In these cases, buildings should be able to interact actively with the environment and with the ever-evolving user requirements. Consequently, the realization of architecture would no longer involve the creation and implementing the projects for fixed spatial interventions, but should go beyond, architecture should evolve into making adaptive-interactive design, where creative artistry will focus not only on creating physical structures, but also generating their dynamic interaction between urban and architectural environment.

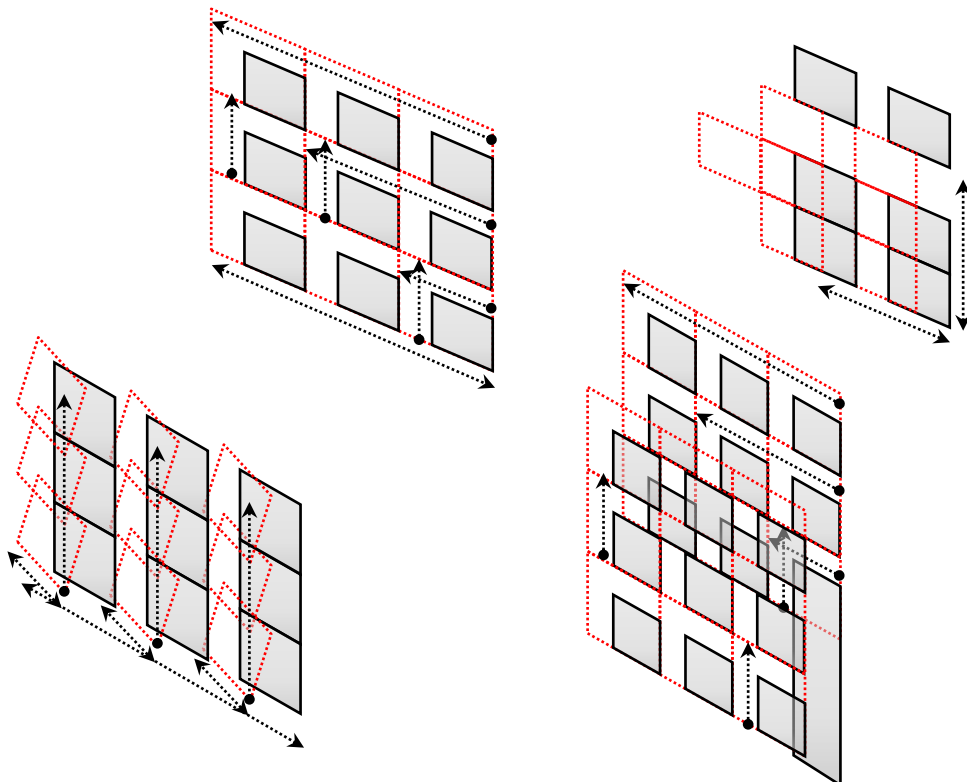


Figure 3. Interactive architecture, moving surfaces of architectural structures in many directions.

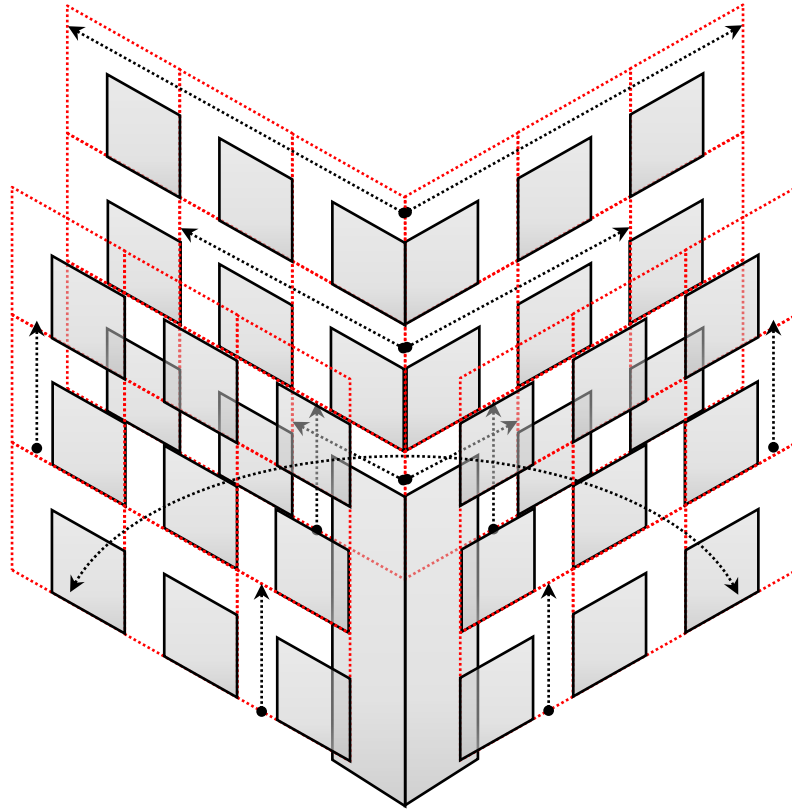


Figure 4. Interactive architecture, ways of moving surfaces of architectural structures in two directions, and under a certain angle.

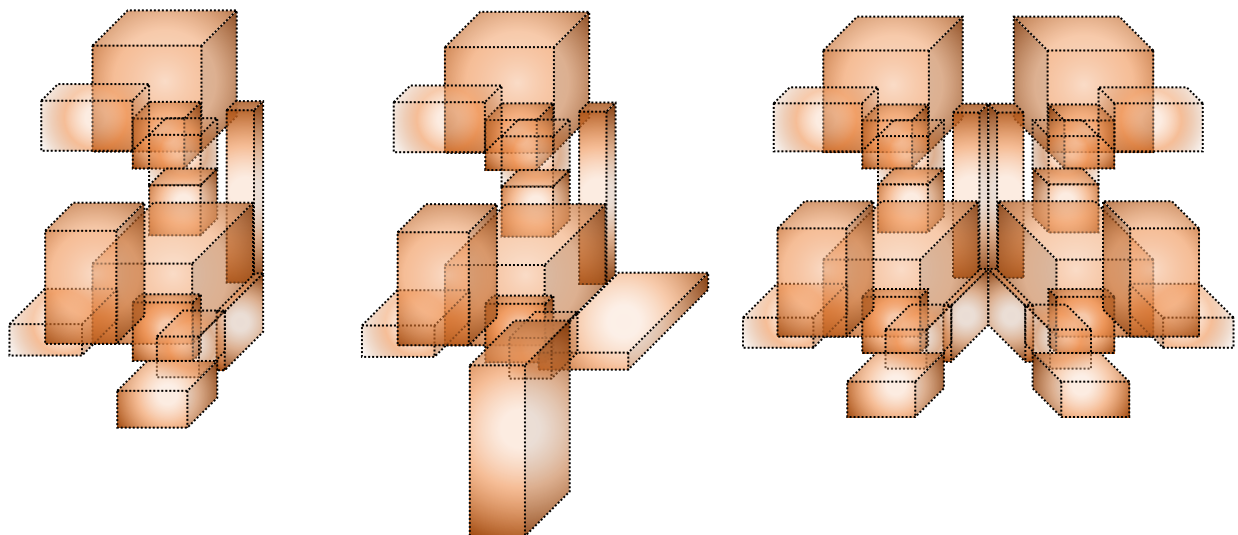


Figure 5. Interactive architecture, the volumetric architectural complexity of functional compositions - complex space structures.

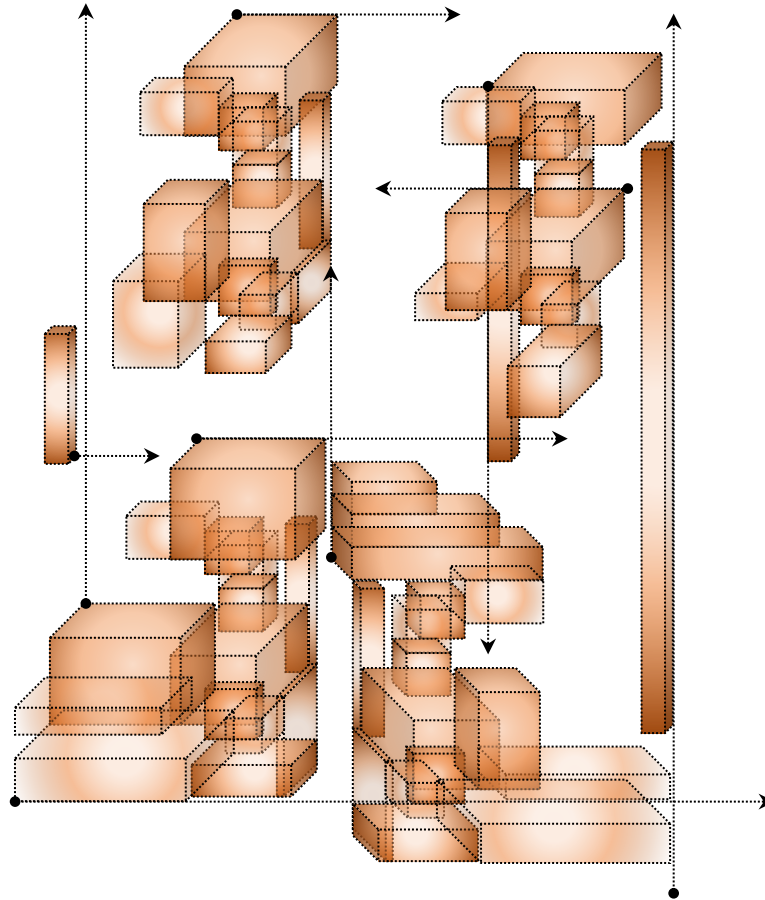


Figure 6. Interactive architectures, architectural development and interdisciplinary evolutionary interaction of cybernetics, architecture, e-control and communication with automated systems.

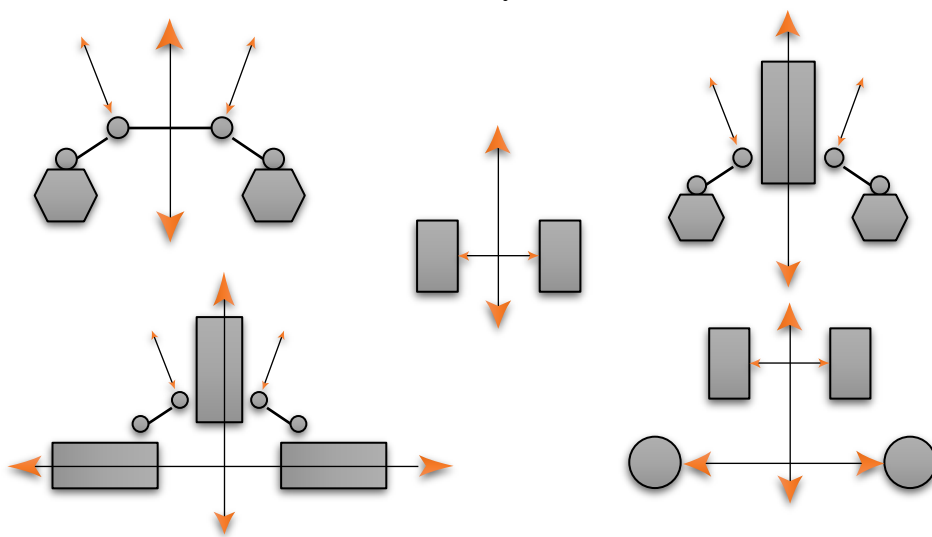


Figure 7. Composition of functional zones of complex structures.

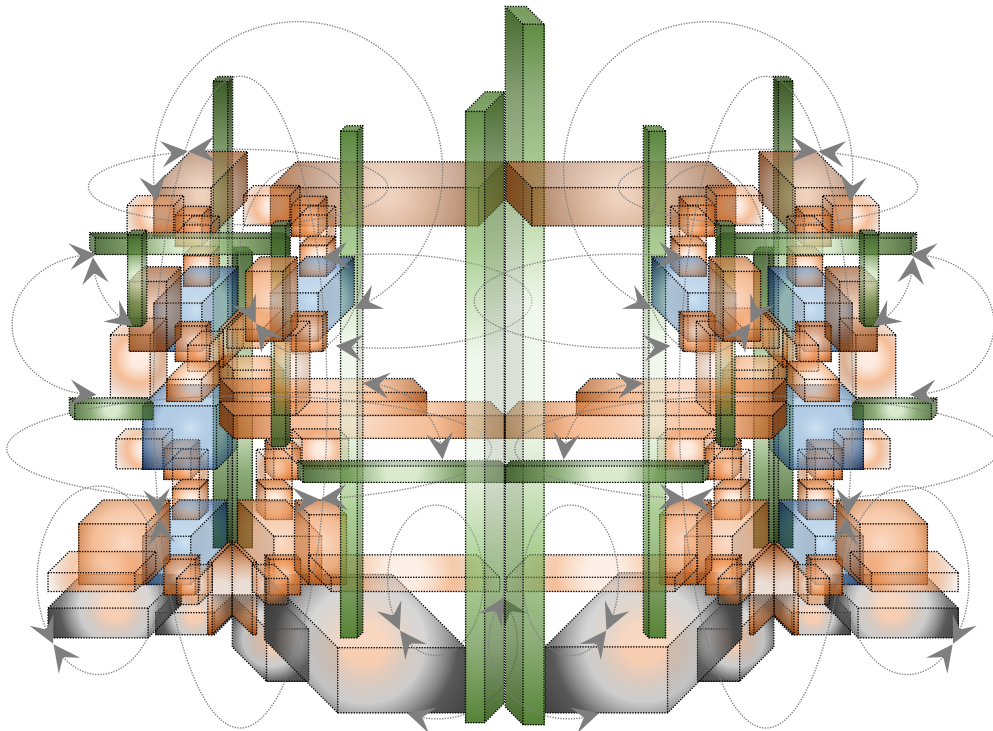


Figure 8. The volumetric architectural compositions of complex space structures.

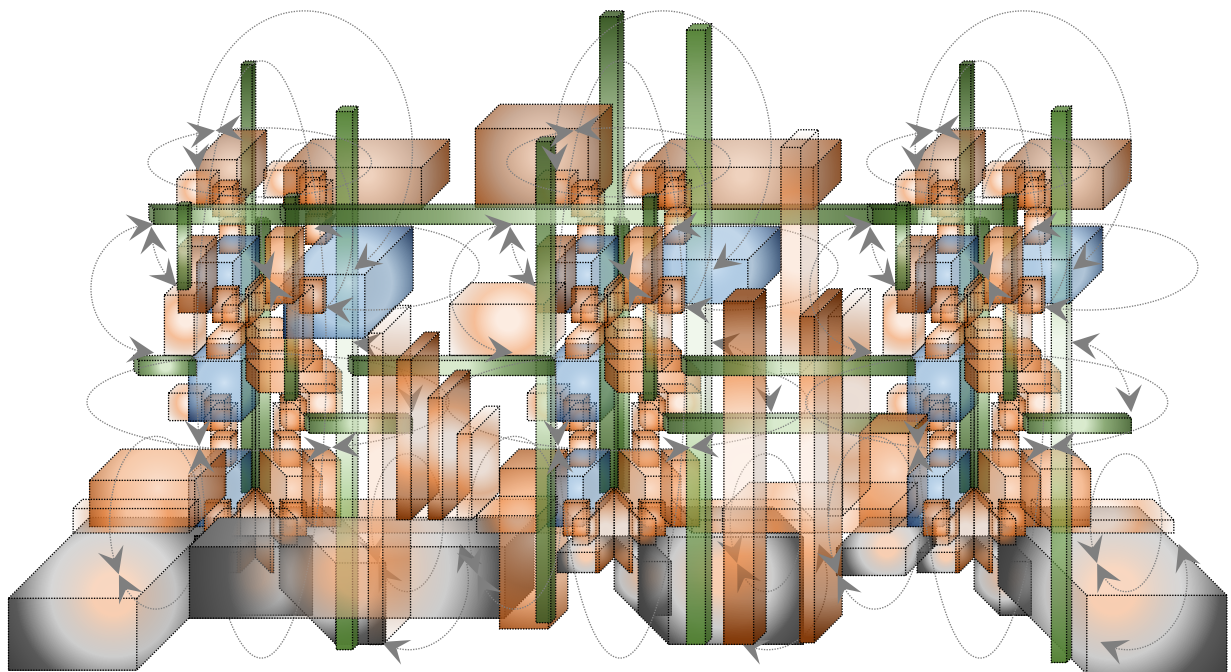


Figure 9. Interactive architecture, compositions of functional volumes of complex structures.

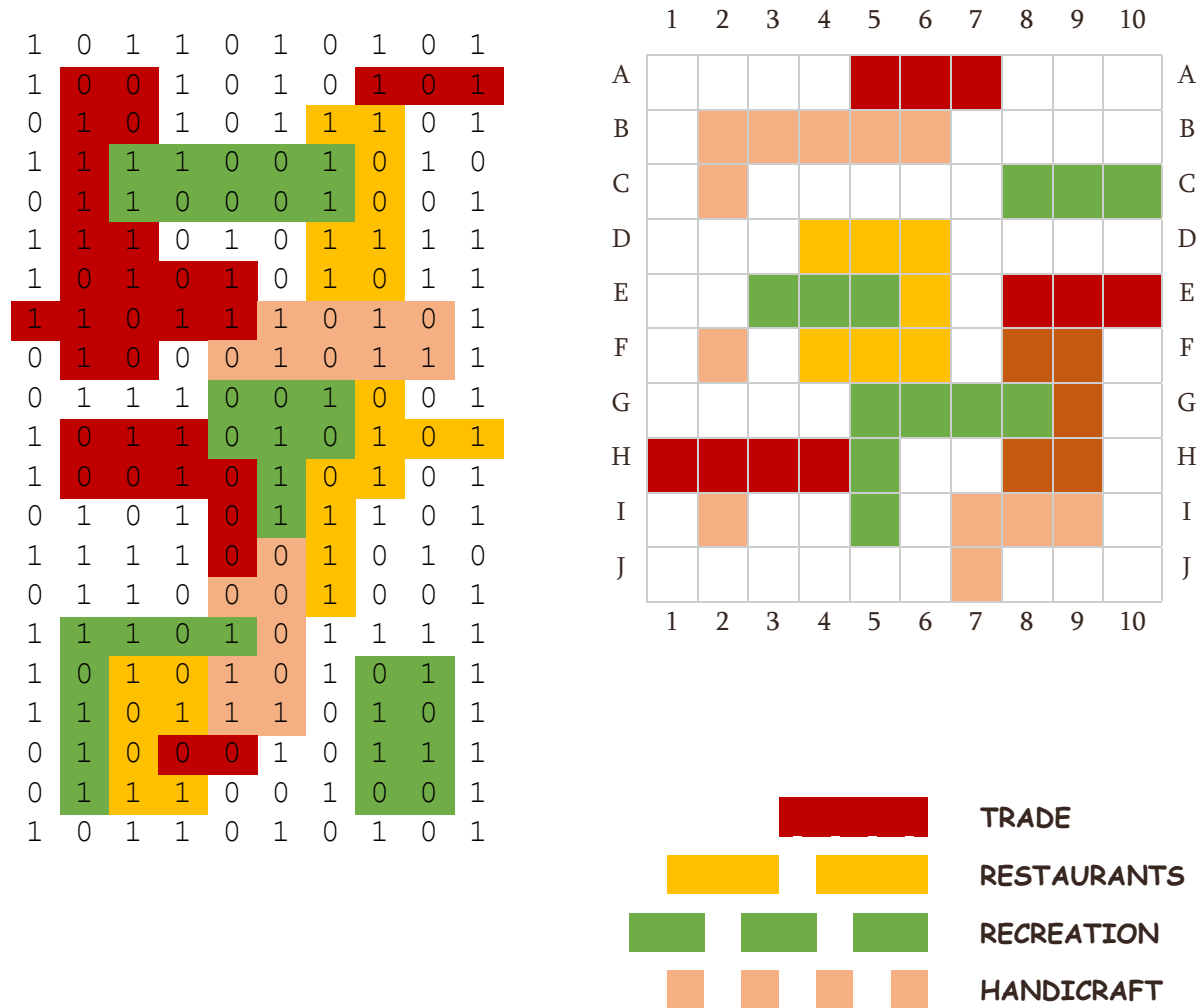


Figure 10. Interactive matrix, compositions of functional areas of complex structures.

In recent decades, we evidently recognize a particular interest of architects in designing computer game environments and structures, providing users with the ability to create certain interactive environments, accomplished by the technology of the computer-generated imagery. In those games, according to the designer Katie Salen, we can see the connection between the role of creation, imagination and the development of architecture. Therefore, games on the one hand, and interactive architecture on the other hand, share methodology, share techniques, share opportunities to orient the architecture practice in the direction of understanding virtual space in the context of volumetric and structural interaction, Salen, 2006 [5,6]. The time and space relationship in these virtual environments inspire the participants imagination and emphasizes the understanding of the imaginary of the wholeness's in relation to:



configurations, space, time, and interactive actions to control the game. However, imagination is a very creative and complex act, especially when used for artistic aspiration. In the understanding of nowadays architects, digital interpretation of imagination represents the framework mechanism to deny the previous traditional archetypes, in the favor of a futuristic and interactive architecture. Hence, in this style of the approaches to the imaginative creativity, we do not focus solely on the creation of the avant-garde, but also to oppose, revolt, and discharge the barrier design rules. Of course, all these contradictions in the process of architectural creation represent an interesting challenge, and motivation to explore further [6].

CONCLUSION

Featuring the trio of sensors, processors and effectors, embedded as a core part of its nature and functioning motion of the variable elements in the architectural structure, transforms the perception and understanding of architectural buildings from that passive one, into an active architecture composition, respectively, the targeted feature can now change with an automated software in order to satisfy the individual requirements or community needs.

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1.5 Anxiety and Urban Stress for Parking Spots

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Abstract:

The lack of a sustainable urban mobility plan for the city of Pristina and its linkage to spatial plans in the future will bring serious problems for the city, which will have a negative impact on the quality of life. Lack of a serious and professional approach to sustainable city planning, uncontrolled expansion and without predetermined criteria, social cohesion and services have brought the city to a critical point of development. It is clear that the factual situation of parking lots in Pristina is problematic. The need for parking spaces and public parking garages in Pristina are very immediate. There is no parking plan where there are legal, private parking, illegal parking lots. Therefore, it is important to provide data on the basis of which will be the best solution for parking regulation and categorization. Moreover, there is a solution, but we have to pay! Urbanites, both private and commercial, will have to rent out a variety of parking spaces through the urban zone from commercial vehicle parking operators.

Key words: Prishtina, Parking Spots, Urban Stress, Spatial Organization.

INTRODUCTION

The lack of a sustainable urban mobility plan for the city of Pristina and its linkage to spatial plans in the future will bring serious problems for the city, which will have a negative impact on the quality of life. Lack of a serious and professional approach to sustainable city planning, uncontrolled expansion and without predetermined criteria, non-compliance with the planning hierarchy, lack of synergy between areas of housing blocks, approval of the number of neighborhoods without any study on access, space, environment, social cohesion and services have brought the city to a critical point of development. With the enormous number of gravitated vehicles and the lack of parking spaces and facilities, almost every neighborhood in Pristina is in the mental state of protecting the parking space. The scenario for the active city is good because with Prishtina's dynamics it needs to be channeled towards the city for its urbanites, with the promotion of active movement, cycling, sustainable urban transport, parking and a sustainable vehicle movement network [1]. Cities are complex organisms, it can be conceptually considered that cities are locally and regionally specific [2], but, some universal features are the same for every city or urban space. Free parking space! This is the



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most elementary urban need nowadays! Furthermore, there is a lot of stress finding the free parking lot, especially when we have to park after a hard Labor Day in the vicinity of our residential area. "Stress has been defined as any external (to the body) stimulus that threatens homeostasis, the normal equilibrium of body functions. High levels of stress lead to disease and even death because they compromise homeostatic mechanisms" [3]. Actually, there are increasing number of incidents as a result for finding the free parking space, most of the time the Kosovo Police has had to intervene to stop fighting's, while the participants suffered light bodily injuries, for which medical treatment was offered. Lately, the situation has become more drastic when the police reports that in Suhareka town three people after a dispute over a parking lot for vehicles, start fighting. One of the suspects has also used a firearm, suspected of having been injured by a casual citizen. The victim received urgent medical treatment. Stress situations for finding the free parking spot goes even worse when two officials of the Municipality beat up for parking space, even the parking lots for the municipality workers are dedicated! Similar situations, where a woman and her husband say they were attacked by a neighbor for taking the parking spot his been waiting for. "In January 2016, the AA polled 25,000 drivers, with the results suggesting Londoners have the highest parking-related stress levels. Of all the capital's drivers surveyed, 36 per cent said they get anxious about parking. Almost a quarter said they postponed or abandoned journeys altogether because they panicked, they wouldn't find an available space near where they live" [4]. The Automobile Association Developments Limited (GB) with Driver Poll surveys in September 2015, there were 24,739 responses to the motoring panel survey between 14 and 22 September 2015, "one third of respondents (32%) agree that parking availability on their street is so bad they worry about finding a space when they return. When driving to work, just over one third of respondents worry about being able to park (36%), or avoid using their car at lunchtime for fear of losing their parking space (37%)" [5]. Also, with Driver Poll surveys in January 2016, there were 26,463 responses to the January 2016 motoring panel survey between 18 and 25 January 2016. "A large proportion of AA panel members (91%) agree that car parking spaces are often too small compared to the size of modern cars. Just under three quarters (74%) often worry about the possibility of their car getting damaged while it's parked and a further half (51%) generally try and park in the quietest part of the car park to reduce risk of damage to their car. Only half (48%) of respondents read the terms and conditions of parking very carefully when parking in an unfamiliar car park" [5].

**MATERIALS and METHODS**

The study presented in this paper investigated the Prishtina City, focusing on free parking spot issues, and traffic problems. The research methods consist of empirical observation, and literature review. In order to receive a clearer data and information's, research is made within Centre zone area, focusing on free parking spots and possible anxiety for finding one on the city of Prishtina, environmental pollution, and humongous traffic rhythm with urban fulmination for parking spaces. Case study were investigated through literature review, urban city documentations and drawings. The data collected include maps, composition of urban structure, and attributes of space, dimensions of location and traffic activities. The additional data for this paper is based on the analysis of the Municipality of Prishtina archives.

Table 1. Vehicle registration of 2014-2017- Kosovo [6].

	2014	2015	2016	2017	Grow 2014-2017
Vehicles	236145	281847	260291	273862	+8%
Trans vehicle, 3.5 and over 3.5 Mt	15769	18330	17963	2735	-73%
Trans truck, under 3.5 Mt	26949	30846	31285	288	-935%
Minibus	3161	3212	2841	1690	-47%
Buses	1697	2124	1916	523	-60%
Motorcycles	1540	1849	1790	2535	+64%
Tractors	1036	941	613	1949	+88%
Trailer under 3.5 Mt	250	286	288	32299	+1290%
Trailer 3.5 and above 3.5 Mt	2281	2707	2628	18559	+813%
Total	288828	342142	319615	334440	+86%

According to the data presented in Table 1, it is clear that the number of registered vehicles is increasing every year. Lack of additional data such as the year of production, combustion model, producer, origin of the state, does not allow us to find out why this growth trend is happening. Also, it is not clearly known what is the role of Law no. 05 / L-132 for vehicles published on 11.05.2017 no: 15/2017 where it cites the registration of vehicles older than 10 years [1].

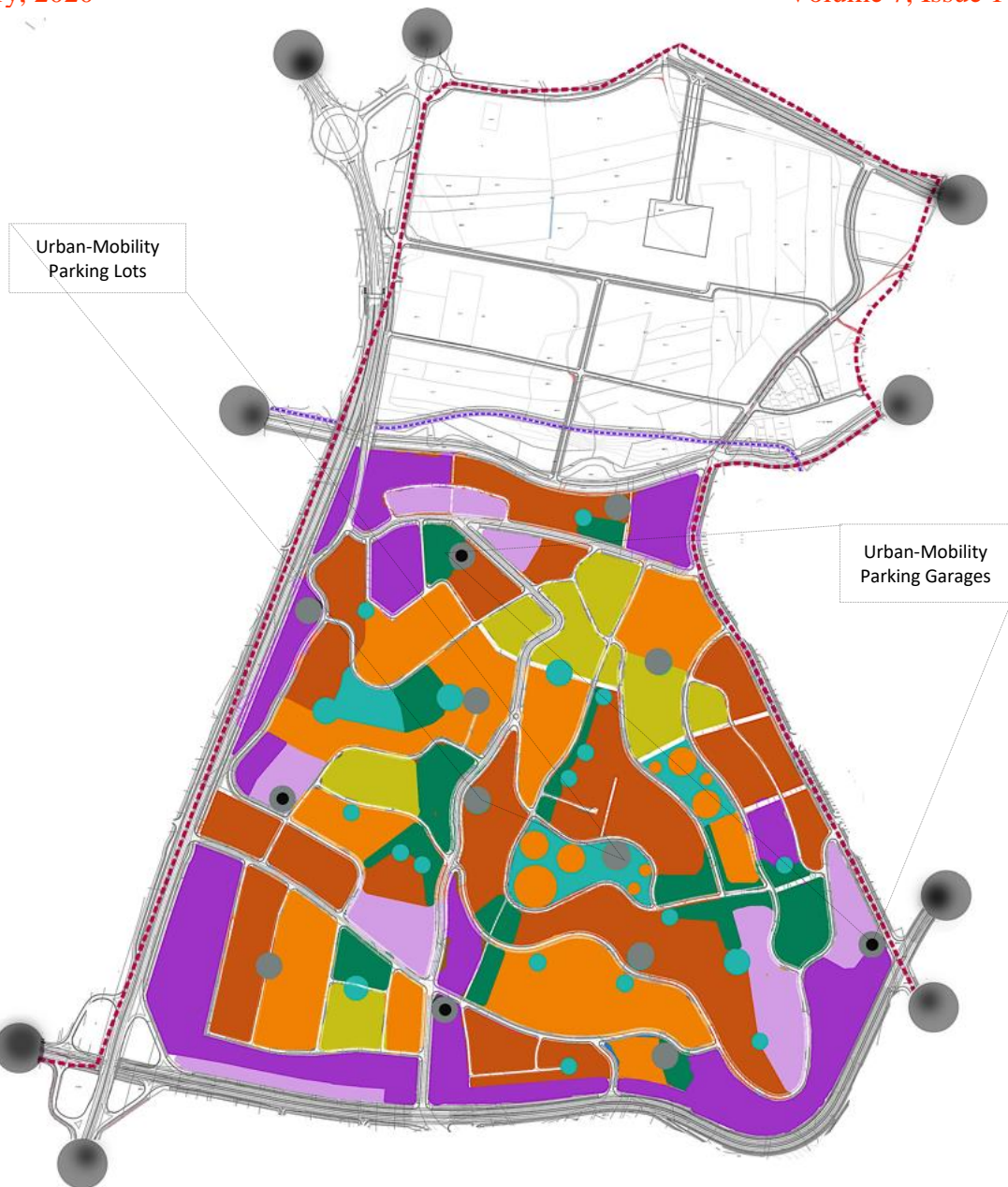


Figure 1. Urban zone with preferred parking garages lots. [M. Prishtina; Bajčinovci, B. 2019]

DISCUSSION

The need for parking spaces and public parking garages in Prishtina are very immediate, moreover, the sustainable urban and architectural design is facing major challenges as a result of many contemporary factors: heavy traffic, air pollution, life style, and economy. On the other hand, Kosovo is also participating in global trends, a process by which regional economies, societies and cultures are integrated through a global network.

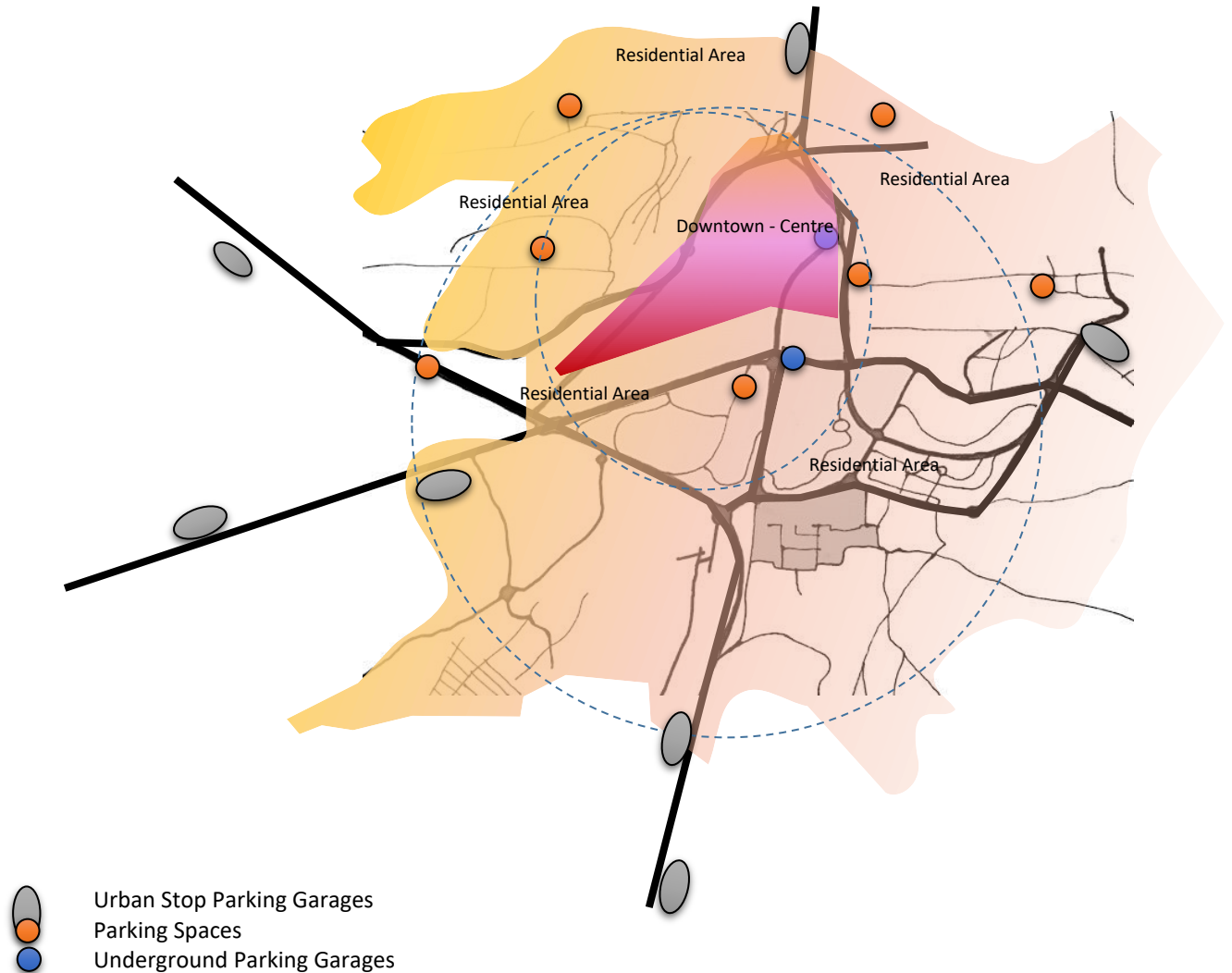


Figure 2. Proposal of Parking Spaces, and Underground Parking Garages, Prishtina [1].

On the other hand, Kosovo is also participating in global trends, a process by which regional economies, societies and cultures are integrated through a global network of political ideas, communication, transport and market sharing. According to the data from the Kosovo police, “Pristina with the current infrastructure cannot be withstood a flow of 120,000 vehicles within 24 hours, especially in the hours when the population goes and comes from work, school and other needs such as hospitals, various institutions” [2,7]. “I am tempted to dwell on the importance of the parking lot. I enjoy it as an austere but beautiful and exciting aspect of the



landscape. I find it easy to compare it with such traditional vernacular spaces as the common: both are undifferentiated in form, empty ... But on another level, the parking lot symbolizes a closer, more immediate relationship between various elements in our society: consumer and producer, public and private, the street and the dwelling” [8,9]. Furthermore, “While ordinary places, such as parking lots, may not be aesthetically pleasing to all, they do serve the purpose they are intended to fulfill, and sometimes a lot more. In the American context, parking lots may be the most common regularly used public outdoor open space... Parking lots are one of the few places that cars and pedestrians share and coexist in” [9]. It is clear that the use of urban traffic is indispensable. Obstacles in the urban transport, wild competition by illegal car operators significantly impede the sustainable development of urban public transport. However, the functionalization of urban public transport is economically viable with these capacities operating in Prishtina, whereas in the days of the weekend it is clear from the visual state and from the data that the number of usages is significantly lower in both directions. The factual situation counts for the mobility have continued with the parking process. It is clear that the factual situation of parking lots in Prishtina is problematic. There is no parking plan where there are legal, private parking, illegal parking lots. Some anti-dumping measures have been carried out in the past mainly by using robust measures such as the placement of metal bars. Therefore, it is important to provide data on the basis of which will be the best solution for parking regulation and categorization. Surveys were conducted in 10 areas of the city of Prishtina. For this issue are engaged students who have identified the number of parking lots and occupancy, their occupation interval over the day. The first results show that over 50% of the use of the parking lots are occupied of the daytime period, which means that they are used by the residents of the area, hence, occupied as well from employees within the zone where the count was performed. Usually, there are hot and cold parking spots, “Looking for parking takes in average 15 to 20 minutes in the busiest cities. Car parking keeps us from what’s next in our lives. Meetings, friends, family, shopping. We invest a lot of time in parking, and the reward is to simply go doing what you were supposed to do from the very beginning” [10].

CONCLUSION

There is a conceptual urban strategy to offer a variety of public parking spaces and parking garages, also there is need that those type of buildings blend in within an urban composition



with a cultivated vegetation. Moreover, there is a solution, but we have to pay! Urbanites, both private and commercial, will have to Rent Out a variety of parking spaces through the urban zone, including driveways, private off-street parking spaces, lock-up garages and spaces from commercial vehicle parking operators [11].

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1.6 Humongous Traffic Rhythm: Urbane Fulmination for Parking Spaces in Prishtina

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Abstract:

Cities are complex organisms, it can be conceptually considered that cities are locally and regionally specific. Prishtina in 1486-1487 had only 392 houses and 10 neighborhoods, while in 1689 it was spatially developed with 4000 houses. Prishtina became Kosovo's administrative center in 1947, where it had begun to be developed with institutional and urban infrastructure. The cardinal changes that occurred after the 1999, and beginning of the new millennia was many! The study presented in this paper investigated the Prishtina City, focusing on urban planning issues, traffic issues and urban data. The research methods consist of empirical observation, with an accent to the urban traffic structure. The lack of a sustainable urban mobility plan for the city of Prishtina and its linkage to spatial plans in the future will bring serious problems for the city, which will have a negative impact on the quality of life and wellbeing of every citizen living and visits Prishtina. With the enormous number of gravitated vehicles and the lack of parking spaces and facilities, almost every neighborhood in Prishtina is in the mental state of protecting the parking space. There is a conceptual urban strategy to offer a variety of public parking spaces and parking garages, also there is need that those type of buildings blend in within an urban composition. As from urban planning concepts we stand that in those situations, a more suitable are open air structures. Prishtina like the other cities must consider to implement a strategy of underground building structures as a whole functional urban system. The current degraded state of environment and urban health in Prishtina, requires specific environment activities.

Key words: Prishtina, Traffic, Parking Spaces, Urbane Fulmination, Architecture

INTRODUCTION

Prishtina: Human and Spatial Development

Prishtina in 1486-1487 had only 392 houses and 10 neighborhoods, all these houses were builded only with one storey. In the years 1569-1570 Prishtina began to expand with 29 neighborhoods and with 629 houses of the same type, while in 1689 it was spatially developed with 4000 houses. The oldest neighborhoods of the city of Prishtina was: Hynilerëve, Çekliqëve, Kacallarëve, Llokaqit, Kollaçit, Pozderës, Katër Llullave, Xhamisë së Llapit, Tophanës, Muhaxherëve, where some of them are still known today, with the same name, but obviously the structure of construction and exploitation has changed [1]. The city of Prishtina after World War II had won the most important economic and administrative-political function,



where this city was declared as the capital of Kosovo in 1946, hence, Pristina became Kosovo's administrative center in 1947, where it had begun to be developed with institutional and urban infrastructure. While with the city plan in 1953 the town had plagued entire neighborhoods along with downtown, where was the center of the city of Prishtina, furthermore those actions had led to the destruction of the urban old structure [1].

The cardinal changes that occurred after the 1999, and beginning of the new millennia was many! The city before 2000, had reached the maximal growth of population in 1991, approximately 200,000 inhabitants, according to registration. The traffic worked quite well with the existing infrastructure, and was not such a big problem for the community until the number of motor vehicles were increased at the beginning of the new millennium [2]. The planning department of the municipality of Prishtina came up with different ideas and concepts in terms of resolving or addressing traffic problem, by converting existing roads into one-way drive. However, with insufficient funding the idea became part of the history. The city of Prishtina always lacked parking places, as such parking garages were more than needed. Moreover, there were too many conceptual challenges, and in 2005 the Department of Urban Planning and Construction of the Municipality of Prishtina, decided to bid an open public parking garage, located near the campus of the Clinical Hospital Centre of Prishtina [3]!

MATERIALS and METHODS

The study presented in this paper investigated the Prishtina City, focussing on Urban Planning issues, traffic problems and urban data. The research methods consist of empirical observation through field, with an accent to the urban traffic structure. In order to receive a clearer data and information's, research is made within spatial system, shapes of architectural models, focusing on the traffic features regarding to the morphology of the city of Prishtina, urban planning, environmental pollution, and humongous traffic rhythm with Urbane Fulmination for parking spaces. Case study were investigated through literature review, urban city documentations and drawings. Graphic documentation contains photos, handmade drawings of the urban composition. The data collected include maps, composition of urban structure, bioclimatic features and attributes of space, dimensions of location and traffic activities. The additional data for this paper is based on the analysis of the Municipality of Prishtina archives.



Table 1. Type of roads - Kosovo 2005-2010 [4].

Type of street level of Kosovo	2005	2006	2007	2008	2009	2010
International	0,0	0,0	0,0	0,0	0,0	0,0
Highways	630,4	630,4	630,4	630,4	630,4	630,4
Regional	1.294,7	1.294,7	1.294,7	1.294,7	1.294,7	1.294,7
Total	1.925,1	1.925,1	1.925,1	1.925,1	1.925,1	1.925,1
Asphalted	1.666,2	1.666,2	1.666,2	1.666,2	1.666,2	1.666,2
Without Asphalted	258,9	258,9	258,9	258,9	258,9	258,9
Total	1.925,1	1.925,1	1.925,1	1.925,1	1.925,1	1.925,1

Table 2. Type of roads - Kosovo 2011-2017 [4].

Type of street level of Kosovo	2011	2012	2013	2014	2015	2016	2017
International	38.0	60.4	80.4	80.4	78.0	98.0	108.0
Highways	630,4	630,4	630,4	630,4	629.0	629.0	630.4
Regional	1.294,7	1.294,7	1.294,7	1.294,7	1305.0	1305.0	1305.0
Total	1.963,1	1.985,5	2.005,5	2.005,5	2.012,0	2.032,0	2.043,4
Asphalted	1.843,0	1.865,4	1.885,4	1.885,4	1.922,0	1.942,0	1.953,4
Without Asphalted	120,1	120,1	120,1	120,1	90,0	90,0	90,0
Total	1.963,1	1.985,5	2.005,5	2.005,5	2.012,0	2.032,0	2.043,4

Table 3. Vehicle registration of 2014-2017- Kosovo [5].

	2014	2015	2016	2017	Grow 2014-2017
Vehicles	236145	281847	260291	273862	+8%
Trans vehicle, 3.5 and over 3.5 Mt	15769	18330	17963	2735	-73%
Trans truck, under 3.5 Mt	26949	30846	31285	288	-935%
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Trailer 3.5 and above 3.5 Mt	2281	2707	2628	18559	+813%
Total	288828	342142	319615	334440	+86%



According to the data presented in Table 3, it is clear that the number of registered vehicles is increasing every year. Lack of additional data such as the year of production, combustion model, producer, origin of the state, does not allow us to find out why this growth trend is happening. Also, it is not clearly known what is the role of Law no. 05 / L-132 for vehicles published on 11.05.2017 no: 15/2017 where it cites the registration of vehicles older than 10 years. Furthermore, in relation to the traffic safety: Existing road infrastructure in Kosovo, age and working condition of the vehicles, non-adapting with traffic regulations, low awareness of the consequences of accidents, insufficient number of traffic police officers to cover all key traffic points, have increased significantly the number of accidents in Kosovo, and especially with drastic increase in fatal accidents. The data from the "Road Safety Strategy and Action Plan" drafted by the Ministry of Infrastructure presents the real increases in accidents in Kosovo. However, it is worth mentioning that from 2014 when this document has been drafted there is an increase in the number of fatalities. According to official sources in 2017 there were 119 fatality cases caused by accidents and an increase of 20% compared to 2016 where there were 100 fatalities. Year 2015 is recognized as the year with most cases of fatality in the last four years with a total of 129 people.

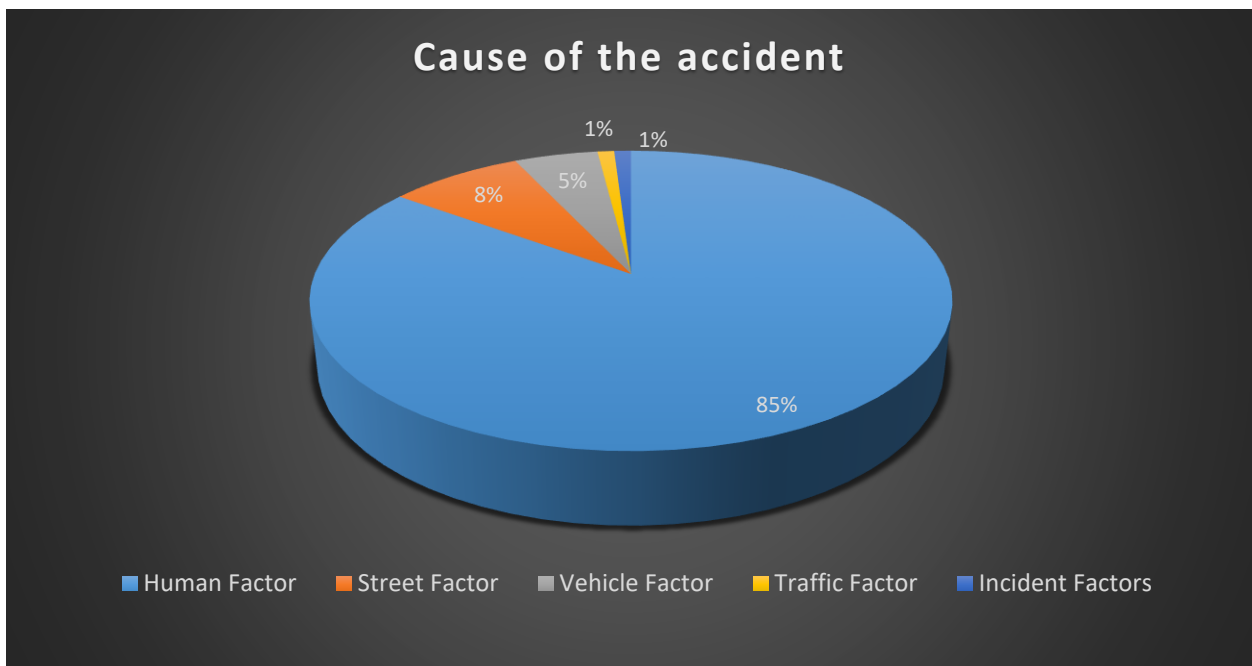




Table 4. Vehicle registration of 2014-2017- Kosovo. Cause of accident Chart [6].

Year	Accidents with material damage	Accidents with injuries	Fatality Accidents	Dead Persons	Injured people
2004	5,097	1,326	141	170	2,053
2005	10,963	2,506	145	155	4,206
2006	11,436	3,013	156	178	4,789
2007	12,987	3,901	127	139	6,264
2008	11,313	3,850	118	133	6,427
2009	14,330	4,730	152	176	7,984
2010	12,594	4,327	158	175	7,731
2011	18,888	4,490	130	157	8,321
2012	19756	4555	116	121	8561
2013	13878	4960	104	119	9817
2014	10333	4876	111	127	9713
2015	17,722	-	109	129	-
2016	18, 541	-	100	110	-
2017	16,422	-	119	137	5789

Indicators for the number of deaths are calculated for every 100,000 inhabitants, and for every 100,000 vehicles. In Kosovo up to now, for every 100,000 inhabitants are 9 dead, and for every 100,000 vehicles are 47 dead for the total number of 297,392 registered vehicles in Kosovo. Disturbing are the numbers of pedestrians, dead and injured. For 2015, 2016, 2017, and 2018 year there are missing final data for the number of dead pedestrians, but if we refer to the data from the traffic safety strategy, the situation by 2014 is as below:

Table 5. Pedestrians, Injuries and Death - 2014 [6].

Age	Dead	Injured
0-12 Age	7	327
13-18 Age	2	149
Over 19 Age	30	740
Total	39	1216

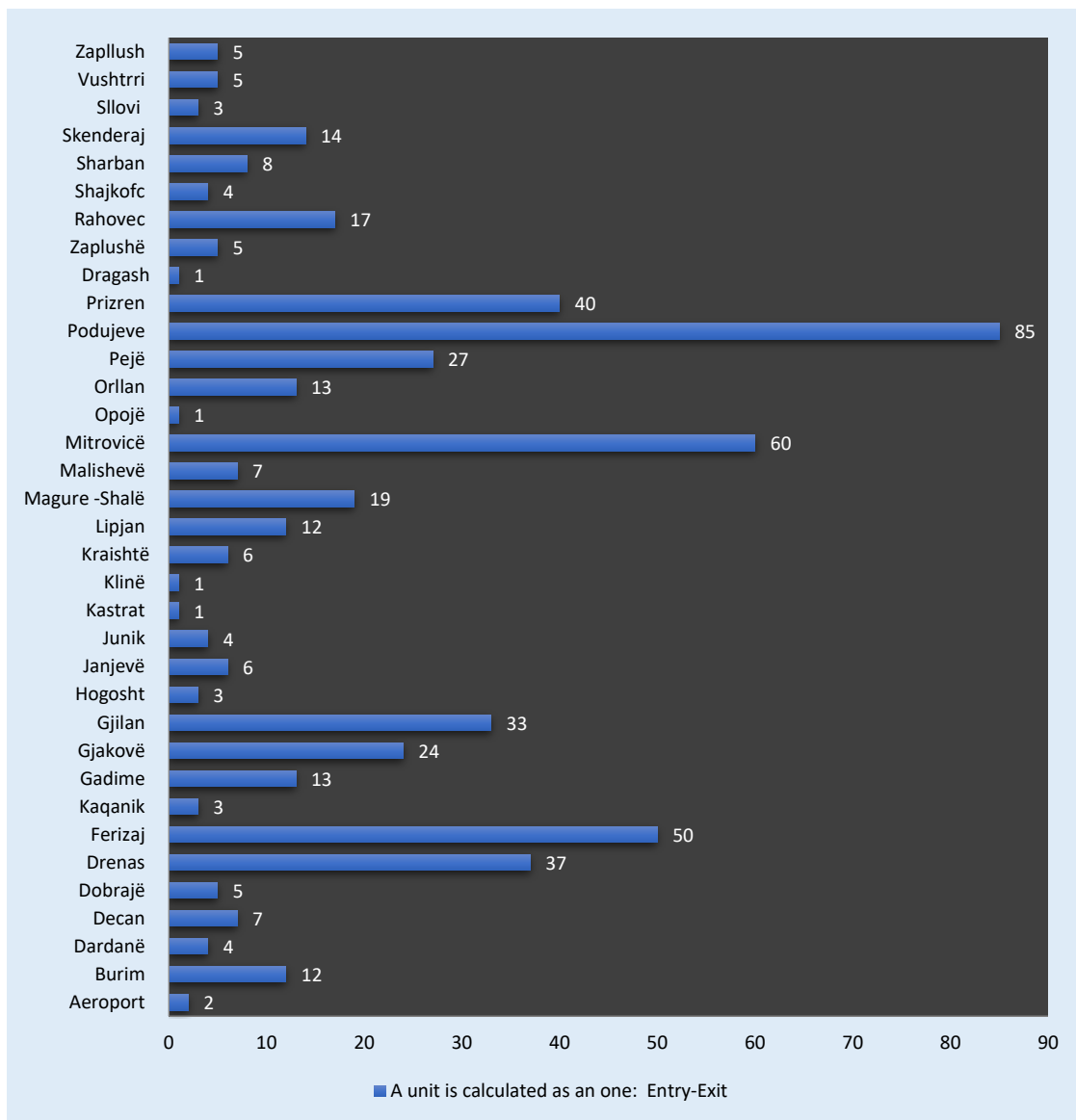
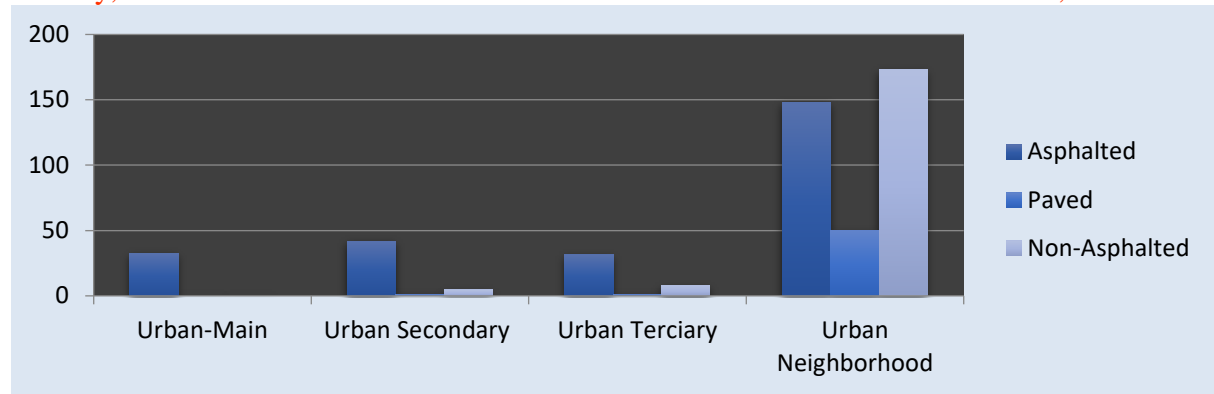


Figure 1. Traffic – Urban roads level in Prishtina Municipality [6].

Figure 2. Traffic – The Bus Station operations in Prishtina [6].



Prishtina Municipality, as the capital of Kosovo, in addition to the existing number of vehicles, it simultaneously gravitates to a large number of vehicles from other municipalities of Kosovo. The Bus Station in Prishtina is known as a public company, with its position in the western part of Prishtina, also known as the largest bus station in Kosovo. According to the data provided by the company, the total number of buses entering at the national level is 534. Data on the circulation of vehicles in the main arteries that gravitate towards the city and vice versa (ie in both directions) are as follows:

1. Direction Fushë Kosovë 40 000 - 50 000 vehicles / 12 hours;
2. Direction Mitrovica / Kastriot 20 000 - 30 000 vehicles / 12 hours;
3. Direction Podujevë 10 000 - 20 000 vehicles / 12 hours;
4. Direction Ferizaj 20 000 - 30 000 vehicles / 12 hours;
5. Northeast traffic on the 'B' road 20 000 - 30 000 vehicles / 12 hours.

Actually, in total, approximately 135,000 vehicles are circulating in these roads within 12 hours.

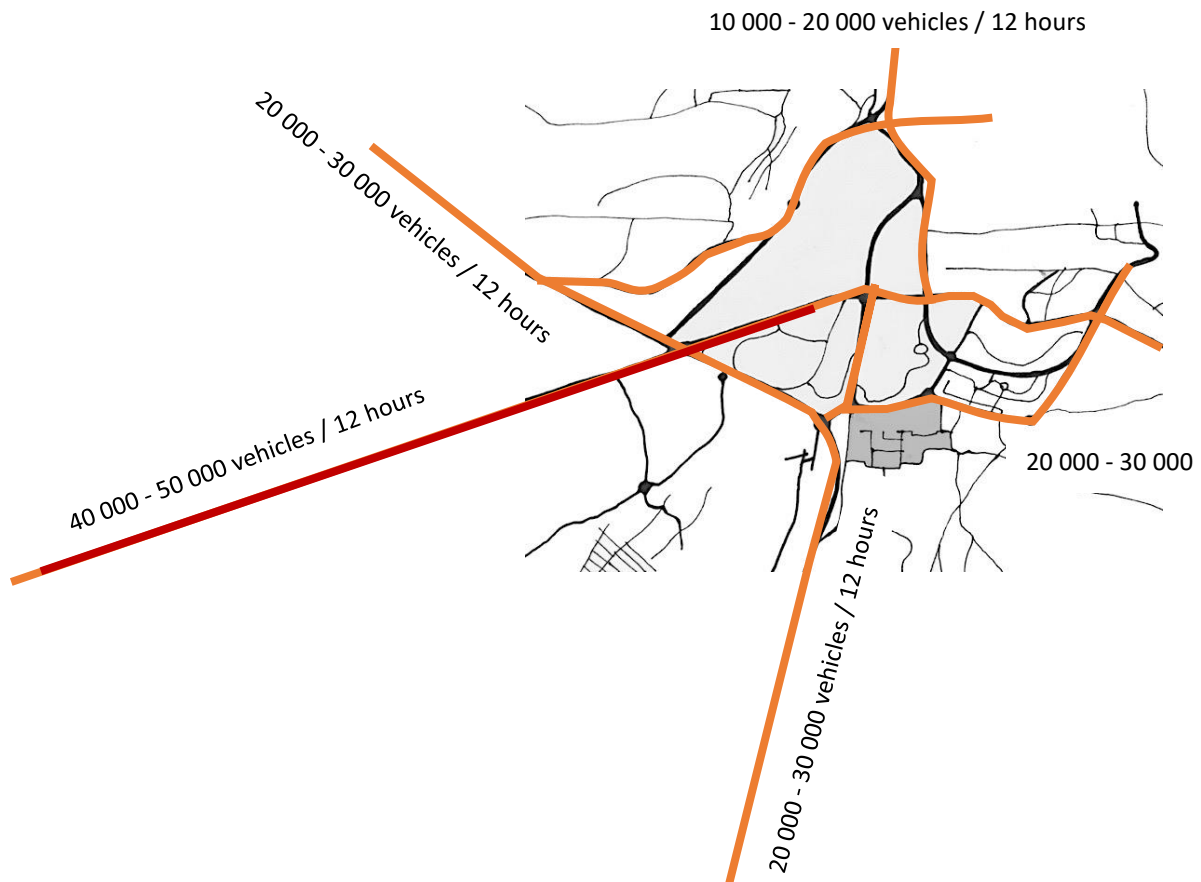


Figure 3. Traffic – Main road arteries and Humongous Traffic Rhythm, Prishtina



According to Urban Development Plan - Pristina 2012-2022, in Prishtina there are a total of 3650 parking lots which are distributed in 31 locations. Compared to the number of the vehicles which gravitates the city of Prishtina those parking spaces does not meet nearly the necessary parking spaces of the city of Pristina. Urban Regulatory Plan - Prishtina - Center has foreseen the required amount for parking spaces depending on the source of traffic ranging from homes, where a parking space is foreseen for a residential unit and continuing with larger buildings such as hotels where there is a minimum of 3 parking spaces for one bed.

1. Homes for a family, residential buildings	1Parking/Unit
2. Youth homes	1Parking/20 Beds. Min 2P
3. Hotel	1Parking/3 Beds. Min 3P
4. Homes for older adults	1Parking/10 Beds. Min 3P
5. Office buildings, administration	1Parking/30 m ² Net usable area

DISCUSSION

The lack of a sustainable urban mobility plan for the city of Pristina and its linkage to spatial plans in the future will bring serious problems for the city, which will have a negative impact on the quality of life and wellbeing of every citizen living and visits Prishtina. Lack of a serious and professional approach to sustainable city planning, uncontrolled expansion and without predetermined criteria, non-compliance with the planning hierarchy, lack of synergy between areas of housing blocks, approval of the number of neighborhoods without any study on access, space, environment, social cohesion and services have brought the city to a critical point of development. The concept of 'road extension is a solution', 'one more opening floor to the road' has led to increasing number of fatality accidents and the lack of space for children's games in the neighborhood. With the enormous number of gravitated vehicles and the lack of parking spaces and facilities, almost every neighborhood in Pristina is in the mental state of protecting the parking space. Therefore, some initiatives known as strong measures, such as placement of metal bars against illegal parking, are promising but those are short-term solutions. The municipality of Prishtina is now in the public hearing phase for a sustainable urban



mobility plan. The scenario for the active city is good because with Prishtina's dynamics it needs to be channeled towards the city for its urbanites, with the promotion of active movement, cycling, sustainable urban transport, parking and a sustainable vehicle movement network.

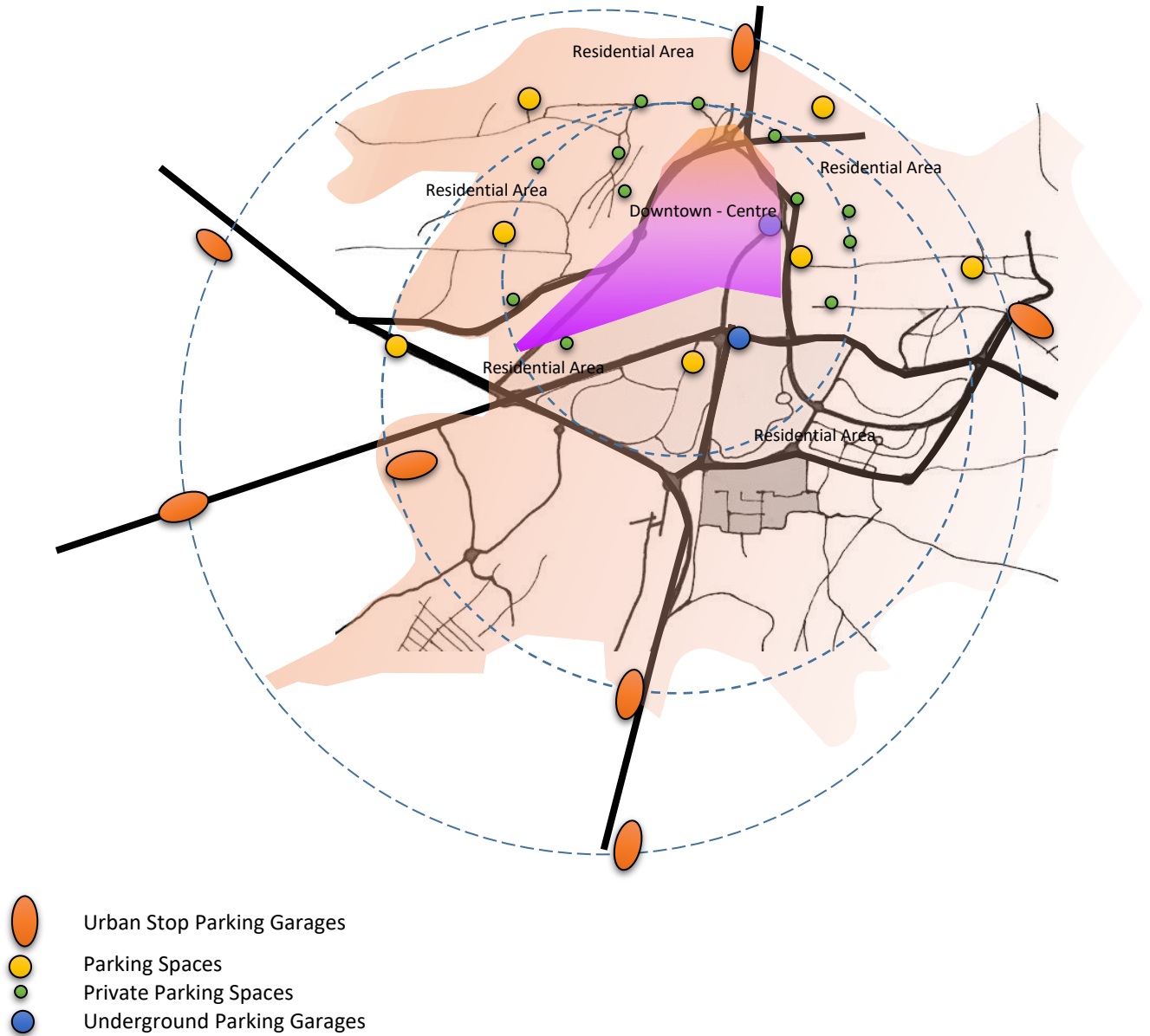


Figure 4. Proposal of Urban Stop Parking Garages, Parking Spaces, Private Parking Spaces and Underground Parking Garages, Prishtina

**CONCLUSION**

There is a conceptual urban strategy to offer a variety of public parking spaces and parking garages, instead only one and big architectural structure, also there is need that those type of buildings blend in within an urban composition, preferably incorporated or isolated with a cultivated vegetation. As from urban planning concepts we stand that in those situations, a more suitable are open air structures, moreover, parking garages can be realized underground with a closed type of structure. Naturally, those types of architecture structures demand a heavy mechanical ventilation, urban security, high level of implemented and maintained hygiene, hence, demanding the e-vehicles, always preferring to implement a new nanotechnology filters as a contemporary technology answer regarding to air pollution. Prishtina like the other cities must consider to implement a strategy of underground building structures as a whole functional urban system, avoiding urban resettlements [7]. The current degraded state of environment and urban health in Prishtina, requires specific responsibilities and activities, especially when the state is directly linked to the quality of life and human development.

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CHAPTER II

Climate Change: What We Evidence!



Figure 1. Drained Batllava lake, Kosovo, March 2014.

Scientific Consensus on Climate Change: “There is currently a strong scientific consensus that the Earth is warming and that this warming is mainly caused by human activities. This consensus is supported by various studies of scientists' opinions and by position statements of scientific organizations, many of which explicitly agree with the Intergovernmental Panel on Climate Change (IPCC) synthesis reports.”¹

¹ https://en.wikipedia.org/wiki/Scientific_consensus_on_climate_change Accessed: 9 January 2020.



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