International Scientific Journal
on Urban planning & Sustainable Development

CONTENTS

Number 27, 2022

International Scientific Journal on Urban planning & Sustainable Development
URBANIZM
published since 2001

Online submission:
www.journalurbanizm.org

ISSN : 1811 6582
journalurbanizm@gmail.com

URBANIZM ISSN 1811 6582, 27, 2022

URBANIZM

ISSN 1811 6582

Number 27, 2022

International Scientific Journal
on Urban planning
and Sustainable Development

Baku, Azerbaijan

Coordinator
Society of Urbanists of Azerbaijan

Organizator
Azerbaijan Architecture and Construction University

www.journalurbanizm.org

URBANIZM

Number 27, 2022

International Scientific Journal

on Urban planning and Sustainable Development

Baku, Azerbaijan
www.journalurbanizm.org

URBANIZM

Objectives

The International Scientific Journal on Urban Planning and Sustainable Development responds on the necessity to relate the fields of urban planning and development in an integrated way and in accordance with the principles of sustainability.

The Journal covers all aspects of planning and development including environmental design and heritage preservation, urban planning and management, spatial planning and sustainable development, innovative design and sustainable society.

It is the aim of the editors of the Journal to create an interdisciplinary forum where all the issues related with the concept of sustainability (urban planning, environmental, spatial, economical and social), are open for scientific discussion.

Editorial Board Members:

Aimes and Scoupe:

URBANIZM, an international scientific and peer-reviewed journal, aims to provide the most complete and reliable source on urban planning and sustainable development, It covers a broad spectrum of cities planning, environmental design, energy efficiency, smart technology, heritage preservation, economic, sociology, education, city management, ethnic relation, land use, regional development, demography, quality of life, pollution, climate change, stratification, design innovation, sustainable construction etc.

Manuscripts and correspondence are invited for publication. You can submit your papers as an email attachment to journalurbanizm@gmail.com

Submission guidelines are available at http://www.journalurbanizm.org

Editorial Office:

Ayna Sultanova str. 11, Baku, Azerbaijan, Az1047, Tel: +994 50 359 7175
E-mail: journalurbanizm@gmail.com ; www.journalurbanizm.org

Authors Instructions:

All material for publication must be submitted in electronic form, in both the native file format and as a PDF file, and be PC compatible. The text area is 230 mm deep and 145 mm wide.
For full instructions on how to format and supply your paper please go to:
http://www.journalurbanizm.org

Subscription Information:

For past and current issues, please contact: journalurbanizm@gmail.com
Ayna Sultanova str. 11, Baku, Azerbaijan, Az1047, Tel: +994 50 359 7175
www.journalurbanizm.org

Frequency and Format:

The International Scientific Journal on Urban Planning and Sustainable Development will be published in one issues per year. All issues will be supplied to subscribers in PDF and paper format (ISSN: 1811-6582).

Submissions:

She International Scientific Journal on Urban Planning and Sustainable Development is a refereed journal. In order to be acceptable for publication submissions must describe key advances made in one or more of the **topics listed on**:

- Regional and Urban planning
- Design of city space
- Problems of historical city centers
- Sustainable development
- Social housing
- Environmental legislation and policy
- Ecosystems analysis and protection
- Natural resources management
- Waste management
- Transport infrastructure
- Air, water and soil pollution
- Remediation and recovery of urban fabric
- Geo-informatics and the environment
- Environmental impact assessment
- Public safety and security
- Architectural modelling
- Cities planning
- Underground urbanism
- Impact of noise and esthetic to quality of life
- Tourism and environment
- Cultural heritage and architectural issues
- Planning in less favourable areas
- Regional economics
- Utilities and networks
- Energy resources
- Education and health
- Passive energy and effective construction
- Urban smart technology

If you are interested in submitting a paper please contact:

INTERNATIONAL SCIENTIFIC JOURNAL ON URBAN PLANNING AND SUSTAINABLE DEVELOPMENT,
AACU, 11 Ayna Sultanova str., Baku, AZ1074, Azerbaijan. Tel: 994 (50) 359 7175,
Email: journalurbanizm@gmail.com

Types of Contributions

Original papers; review articles; research paper; reports of conferences and meetings; book reviews; letters to the editor; forthcoming meetings, and selected bibliography. Papers essentially of an advertising nature will not be accepted.

URBANIZM

Number 27, 2022

Contents

International Scientific Journal of Urban Planning and Sustainable Development
© URBANIZM
ISSN: 1811 - 6582
T. Aliyev, A.L. Lepage, E.F. Huseynov
www.journalurbanizm.org
No. 27, 2022, p.1-12
DOI: 10.58225/urbanizm.2022-27-1-12

URBAN MEMORY AND HERITAGE: THE ISSUE OF CITY HERITAGE IN THE RECONSTRUCTION OF THE CENTRE OF BAKU

TURAL ALIYEV[1], ANNE-LAURE LEPAGE[2], EMIR HUSEYNOV[3]
[1]Ph.D, Faculty of Social Sciences, University of Geneva, Switzerland,
[2]MSc, University of Geneva, Switzerland and Urban planner in Yverdon-les-Bains, Switzerland,
[3]Sc.D, The Society of Urbanists of Azerbaijan.

ABSTRACT

In a context of globalized urban production, it is common to notice a dissociation between urban memory and urban project; some city districts are transformed into a space-museum, an enclave out of time, while others are destroyed and "Dubaised" allowing the rise to interchangeable places around the world.
The city itself consists of material and immaterial elements and the second ones includes what it is called urban memory. Memory can be defined by individuals as the property of retaining and restoring information from the past. Each individual develops his own memory of the city, corresponding to the experiences with the places and depending on its social and historical context. Memory is, by definition, transmitted and therefore it's the transmission of various expressions from the city that allow a person to appropriate the urban heritage. The appropriation of urban heritage is important in the context of the preservation of city assets.
This study examines the complexity of the urban memory of human individuals and the difficulty to grasp its sense for decision makers who are engaged in urban policy. Based on the case of Baku city, the results from this study propose to draw attention to the awareness of the consequences of the misunderstanding of urban memory.

Keywords: urban memory, urban planning, heritage, conversation, oblivion

1. INTRODUCTION

In a context of globalized urban production, it is common to notice a dissociation between urban memory and urban project; some city districts are transformed into a space-museum, an enclave out of time, while others are destroyed and "Dubaised" (Dubaisation - the appropriation of the Dubai's model of metropolization, a mode of urban development where megaprojects led a main role.), allowing the rise to interchangeable places around the world. In this second approach, the city is considered by urban planners thought of in terms of its materiality. The urban form, literally "image of the city" (from Latin *forma*, mold, image, and from *urbs*, city) could be defined as the relationship between buildings and open spaces according to articulations and particular placement towards social, historical, political andgeographical contexts.

However, the city not only consists of material elements but also of the immaterial, which includes what we will call urban memory. Memory can be defined by individuals as the property of retaining and restoring information from the past (translation from material of the Encyclopedia Universalis). Each individual develops his own memory of the city, corresponding to the experiences with the places and depending on its social and historical context. Memory is, by definition, transmitted and therefore it's the transmission of various expressions from the city that allow a person to appropriate the urban heritage. The appropriation of urban heritage is important in the context of the preservation of city assets.

This study examines the complexity of the urban memory of human individuals and the difficulty to grasp its sense for decision makers who are engaged in urban policy. Based on the case of Baku city, the results from this study propose to draw attention to the awareness of the consequences of the misunderstanding of urban memory.

2. THE ROLE OF CITY PERCEPTION

2.1 The ways of memorizing a city.

Humans have always tried to grasp the memory of the city and toward this they have carried out the methods and tools, but also the heritage strategies.

Until the Middle Ages it was the mnemonic method, which was most commonly used among scholars. At the level of a human, based on the mnemonic method, the architectural heritage of the city was unconsciously recorded in his perceptual memory generally through the action of the eye. There would be an eye of the imagination, uncertain of the type of organ located in the brain, which allow us to both memorize and imagine (Figure 1) [1].

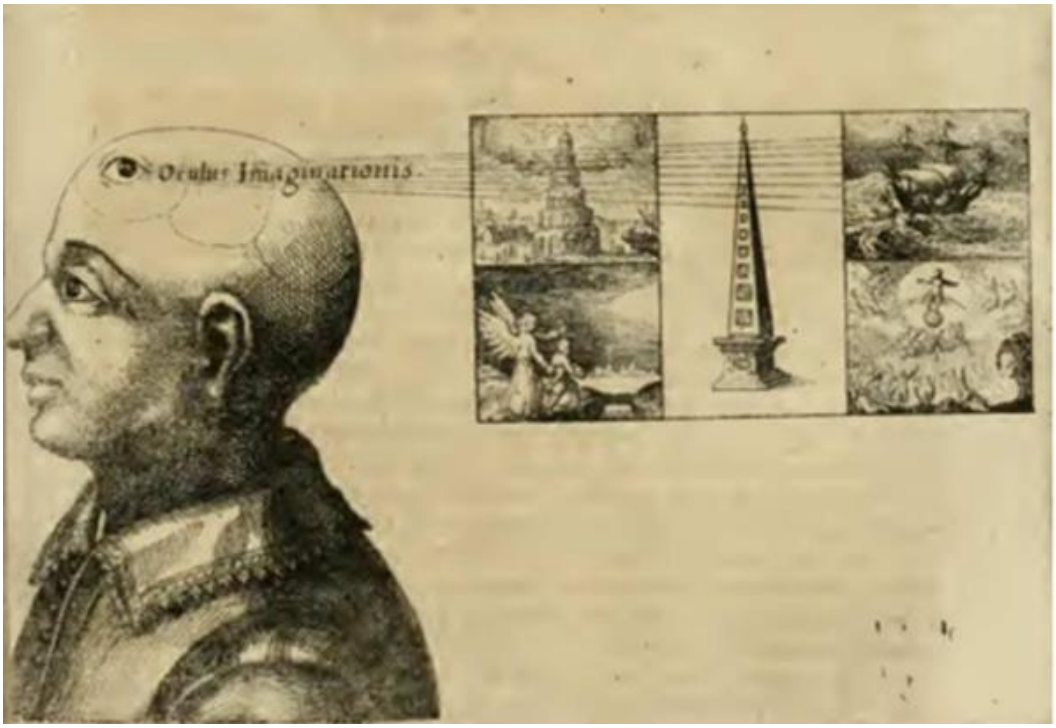


Figure 1. The Oculus Imaginationis (The Eye of the Imagination) as found on the title page of Tractatus One, Section Two, Portion Three of Robert Fludd's Ars Memoriae (Fludd, 1617).

This eye would allow us to grasp the spirit of the world, the spirit of the city, particularly characterized by the urban forms. Further phase is about internalization / memorizing these urban forms. Certain ancient Greek philosophers made memorization as practice, "l'ars memoriae" which could be cultivated by humans.

Furthermore, "l'ars memoriae", developed in the Middle Ages and the Renaissance, demonstrates that there is a close relationship between the memory of an urban cultural community and the spatial forms that symbolize it. These spatial forms are perhaps individual buildings and are more complex elements (landscape); they form cultural landmarks, which supports identification. The individual buildings develop signs of recognition in the urban space, fix memories/perceptions in material realities (places), develop a functional and structural understanding of the city. Space therefore structures memory as well as perceptual/sensory experiences. Certain thinkers argue the memorization is conscious of the urban forms by individuals, considering that it results from the use of the city. There is also a heritage strategy to simplify the understanding of urban memory, which Aldo Rossi calls "theater of memory" [2] giving an example with the transformation of the theater of Nîmes (Figure 2, 3).

Figure 2. Theater of Nîmes with its Ionic colonnades and a remnant of the structure of the fortress.
Source: https://i.skyrock.net/6976/12776976/pics/3000480213_1_5_DQ2poFWR.jpg

Figure 3. The ancient arena of Theater of Nîmes.
Source: www.lin-a.com/gallery/france-gallery-nimes-architecture-temporary-urban-lin-architects/nîmes-arena

With the fall of the Roman Empire, the city established new borders delimited by fortifications. These occupied a smaller territory than under the Roman city. According to S. Mazzella [3], the re-appropriation of the past on the basis of the aspirations of present allows the emergence of a collective memory of social groups. In particular, today many abandoned industrial areas are being rehabilitated into residential areas; the traces of the industrial past are preserved subsequently a collective memory emerges. This suggests that there are different types of city memories:

- individual,
- collective,

- social group memory

that could be activated through appropriate methods.

2.2 Distruction in the perception of urban memory.

Cities experience the phases of urban renewal, which is accompanied by the destruction of buildings. As one of the consequence, people struggle to grasp the urban memory. As urban memory is difficult to grasp by individuals due to destruction, some authors use the sensitive approach of describing the city as a human being [4]. It was used quite early on by authors such as Marcel Proust with Venice, Honoré de Balzac and Victor Hugo with Paris.

Likewise, this particular approach is reflected in the thoughts on the relations between urban form, psychology and memory that are possible to observe in the works of writers from antiquity to the nowadays (Quintilien, Aristote, Paolo Rossi, Francis Yates, Maurice Halbwachs, Sébastien Marot etc.). The most unique comparison between the urban form, psychology and memory is made by Sigmund Freud [5]. The last one compares the city towards a human being which is capable to possess own memory. He mentions different stages of development of the memory of the individual through the records of psychic impressions. The scholar compares the psyche of the human and a city, like Rome, and demonstrates that it is possible to perceive different urban eras in the same place. Freud believed that the conservation of the past time is possible only in the psyche of a human ("therefore, not in the city"). In this regard, Freud also attributes that obliviousness depends on an injury which avoids the conservation of memories in their entirety of the human personality or otherwise, as in our research, the conservation of memory in the city ("context of war etc.").

For Freud, the persistence of all the past stages within the terminal stage is only possible in the psychic field; it is not possible in a city if we consider only the urban space in its materiality and considering that every city follows the same through phases of demolition / destruction. Urban space can't exist if all buildings and shapes are "side by side". It invites us to imagine a city of Rome where the palaces of the Roman emperors "would still rise to their initial grandiosity like in the old days, where the battlements of the castle of Sant'Angelo would still be surmounted by the beautiful statues that adorned them before the siege of the Goths [5]. On the current location of the Pantheon, we would find today's Pantheon, as Adrian bequeathed it to us, as well as on the same ground the primitive monument of Agrippa; and this same place would still to support the church of Maria Sopra Minerva, as well as the ancient temple on which it was built, if we want to translate historical success in space, we are able only to do that by spatially placement buildings side by side." [5].

Despite the functioning of the city, according to Freud, all past stages of the individual can be preserved in his psyche, as long as the brain still be unaffected. Everything that he experiences is recorded, even if it is not possible to remember all the decisive stages in the development of the psyche (the main positive or negative points that affect us, as in cases from shocking death that can lead to the depression or psychological illness).

The Freud's theory indicates that urban forms are charged with history and memory, even if a human personality couldn't perceive them in all their complexity. Preservation of psychological impressions is possible even if it has been attacked (traumas). Even if the city has suffered the phases of the destruction of the material heritage, the immaterial heritage survives (the ability to remember disappears and preserved parts of the urban heritage are the permanent records on the city's hard drive).

Assuming that the city possesses a memory, which is inscribed in and conveyed through urban forms, knowing that, the urban forms have accumulated over time. Urban memory influences the emergence of collective memory through the experiences of inhabitants and observers.

3. GLOBAL ISSUES IN URBAN MEMORY

3.1 Urban memory, associated from the disappeared forms.

Under certain circumstances, the destruction of urban memory can result in the changes in the social and physical environment (fires, wars, new urban projects etc.) which potentially create discontinuities in memory. Potentially, this sort of destruction creates a form of oblivion. Reflecting on "oblivion" as the destruction of traces of memory/urban forms, it occurs universally, it is important to understand the meaning of oblivion.

Sociologist Paul Connerton [6] defines seven types of oblivion that are not to be considered negatively and Bakalchev et *al.* [7] define each of these types of oblivion. Among these types of oblivion is repressive

erasure, that appears in its most brutal form in totalitarian regimes and which serves to deny a historical break or, on the opposite, to mark a historical censorship. Oblivion can be constituent of the formation of a new identity, where the highlighting of a set of shared memories involves equally shared silences. One of such cases is the St. Alexander Nevsky Cathedral in Baku, which was exploded by the Stalinist regime in 1936 in an anti-religious act; later on, a Conservatory was built in its place. The destruction of a dominant form in the urban environment and the immediate reconstruction of a completely different building were intended to accelerate the oblivion of cultural and religious heritage.

The oblivion that results from planned obsolescence is specific to the consumer capitalist system where the preeminence of innovation produces a systematic devaluation of objects, memories and techniques of the past and an accelerated succession of new products.

The oblivion that results in a planned obsolescence is characteristic of the capitalist system of consumption, where the dominance of innovation leads to a systematic depreciation of the objects, memories and technologies of the past and an accelerated succession of new products. The oblivion that results towards to planned obsoleteness is particular to the capitalist system of consumption where the emphasis on innovation produces a systematic devaluation of objects, memories and techniques of the past and an accelerated succession of new products. “Le mieux est I'ennemi du bien” (“the best is the enemy of the good”) [8] .

3.2 Disrupted perception of urban memory and loss of identity.

Opposite to what Freud argued [5], the different stages of the past could be perceived in the city. All the transformations which have taken place in a city (construction, destruction) are recorded in material and immaterial forms. Therefore, the city is the result of a complex environment, the material on the one hand with the ruins, and the immaterial, if we consider the buildings, which have not left visible traces (interim immaterial traces). Keeping in mind, for example, the ruins, which are sometimes built into ancient buildings (see figures 2-3 : stratification of the Nîmes theatre.) The American artist Robert Smithson is inspired by Freud's metaphor. After visiting Rome many times, he admitted: "My trip to Rome was an encounter with European history and took a terrifying turn" [9]. Robert Smithson wrote about the presence of multiple identities, an immaterial memory of the city linked to the different historical periods and their materialization in architecture. However, it is the difficulty of representation, which sometimes leads to this type of practice in urban planning "tabula rasa" (“destruction of historic buildings”) — loss of identity for the residents. Theoretically, urban memory is transmitted through the urban form. The more diverse forms are in the city the better it reveals the richness of the cultural heritage of the people living in this city. Each urban form reveals the perception of citizens, their experience (daily movements), expression of the residents about their city.

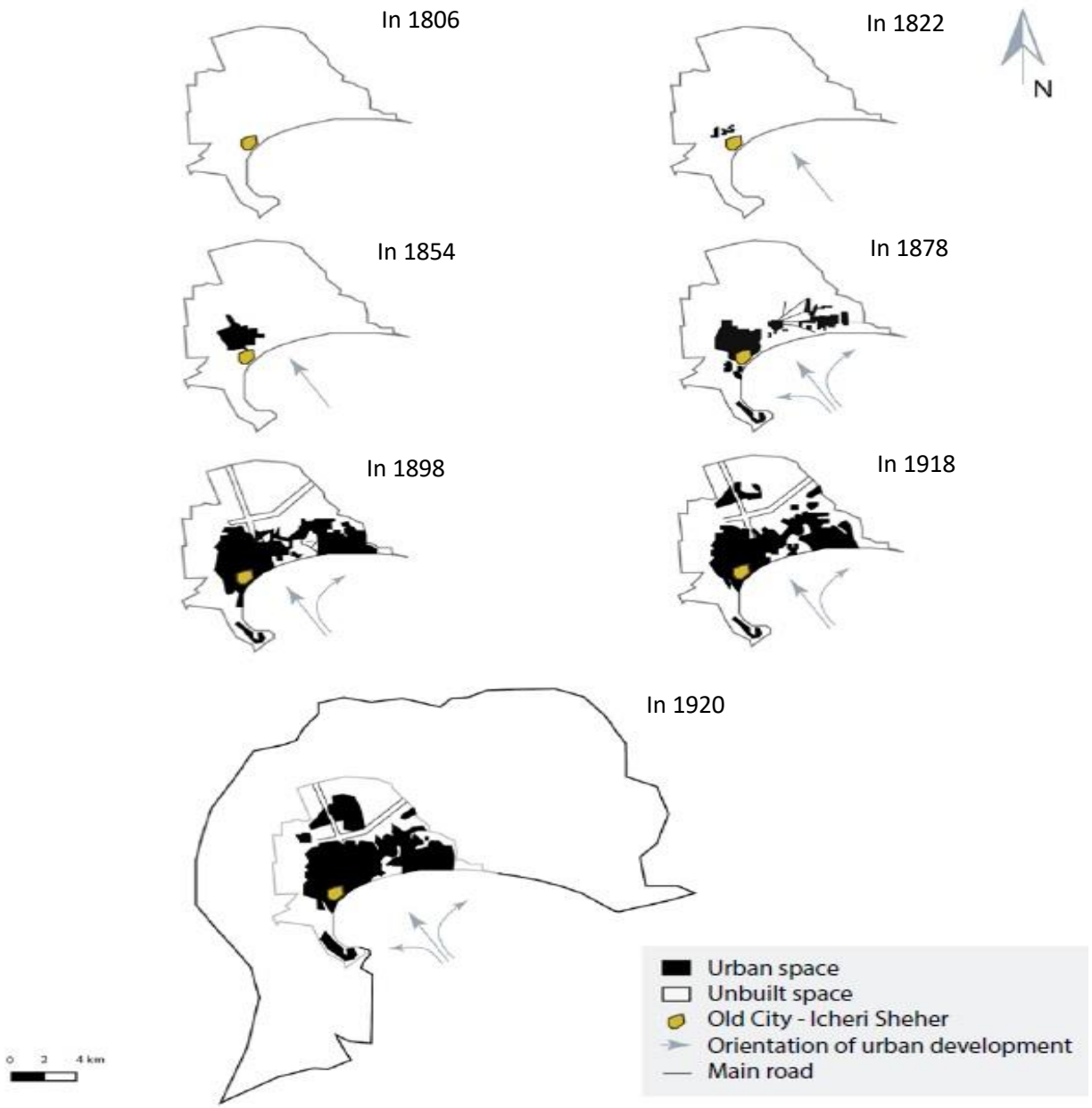
Baku is a city with thousand years of historical past, and currently is experiencing the profound transformations associated with major urban planning projects.

An analysis of the European experience demonstrates that the municipalities of the major cities are also implementing a policy of global urban development projects as well as urban renewal, albeit on a more modest scale than the municipality of Baku. During these projects, the disappearing (demolition of buildings) of the existing buildings is not common reality.

4. BAKU CITY’S FRAMEWORK OF HISTORICAL POTENTIALS

Our approach is based on the analysis of the urban form of a city at the crossroads between East and West, Baku as a Western city. "Baku has its own identity due to the various historical influences, which have been formed as the single entity; it is difficult to compare it with other cities. In fact, this city is quite well preserved and in many respects, it is unique historical city [10].

The English historian Simon Sebag Montefiore compares Baku at the beginning of the 20th century to a "mixture between the city of Baghdad in the Middle Ages, the Chicago of Al Capone and the Paris of the East" [11]. These multiple historical influences have enriched the urban identity of Baku city. Baku was indeed located on the Silk Road, and its location as a crossroads, between Europe and Asia, allowed for the development of an architectural heritage influenced by Zoroastrian, Ottoman, Persian, Sassanian, Arabic and Russian European and Russian cultures [11].



• 1854 European city - westernization of an eastern city, • 1878 Industrial centre, • 1920 Residential core in the north, • 1950 Soviet city, • 2020 Post-modern city.

Figure 4: Evolution of Baku's urban form throughout history.
Source: Tural Aliyev, 2022

The central historical core of Baku city is the Icheri Sheher. This most ancient city is situated on the shore of the Caspian Sea. Its area is only 22 hectares in size, and it contains hundreds of historical monuments, such as the Palace of the Shirvan Shahs, a mosque, public baths and caravanserais. Due to the number of monuments 4 of which have world importance and 28 of which are of local importance this Old City was classified as a UNESCO World Heritage Site in 2000 [12].

One of the interesting observations of this place is that a collection of historical monuments has evoked by its urban structure, in the form of streets that are extremely varied and at the same time unified as a complex mechanism, which is correctly balanced to organize self-microclimate at all times of the year in line with this region location. The unique shapes of the broken street lines of the complex labyrinth are intuitively recognizable to local people. On the other hand, in the condition of the dry, subtropical climate, it works as a spatial structure that is capable to receive a strong wind energy from the Caspian Sea and able to transfer it to good aeration.

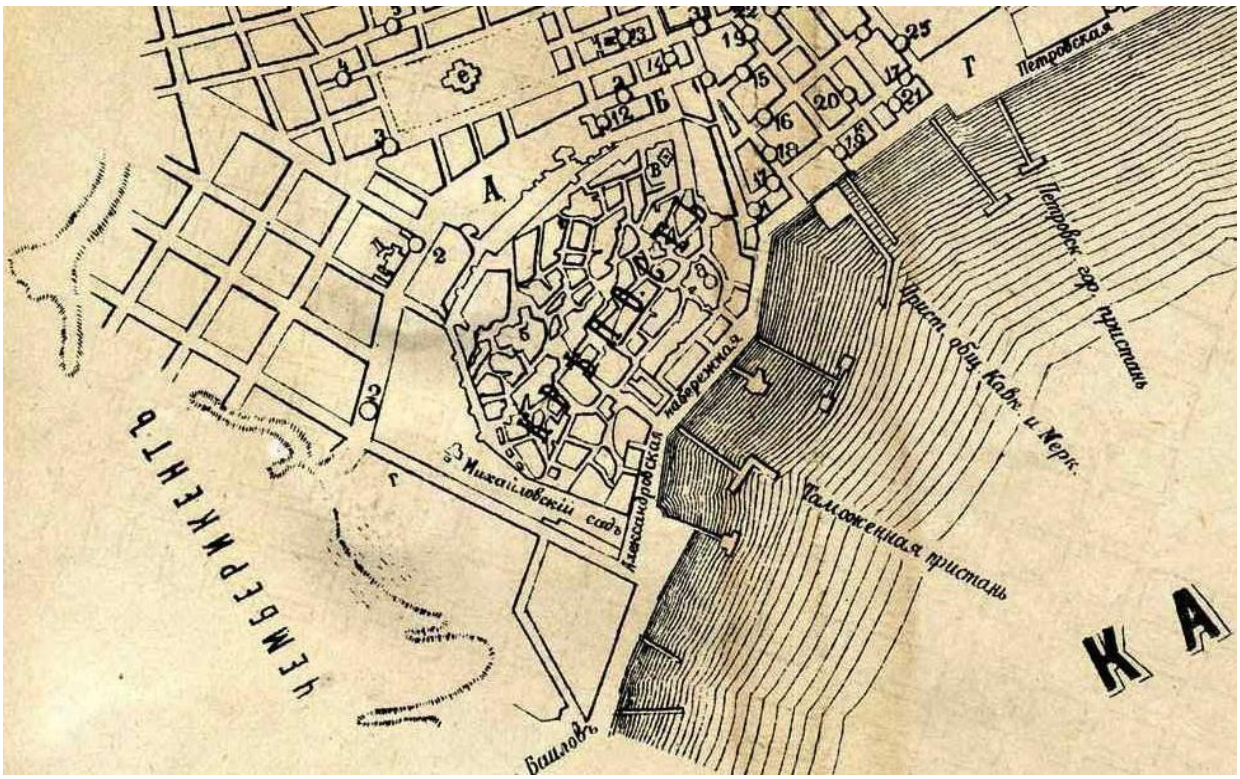


Figure 5: Plan of the ancient city of Baku, 1891 [12].
Source: https://ourbaku.com/ - План города Баку (из справочника 1891г.

Despite the pressure of intensive real estate development and the contradicting tendency of the medieval districts from several European cities such as Paris and Prague, this historic district has been preserved as a coherent ensemble within the fortress walls.

The typical European quarter of that time is borrowed the styles of the Italian Renaissance and Hausmann, characterized by the presence of iconic buildings. The XIXth and XXth centuries allowed the city to form a place of new European style and fully keep the Eastern identity, which is possible to observe in the presence of eastern ornaments on the facades of Western type buildings (for example, the Palace of Ismailiyye).

Figure 5: The main facade "Ismailiyye palace" main façade, architect İosif Ploshko, Baku, 1908 – 1913.
Source: Azerbaijan National Encyclopedia, 2011.

The Caspian Sea coastline (1865-68) set the foundation for the amphitheatrical structure of the city, which is similar to Istanbul, Sidon and Algiers. {Resource online of Sh. Fatullayev-Fiqarov).

At the same time, the "Black City" was created *ex-nihilo* (from Latin meaning "creation out of nothing) 2 km east of the European quarter. At that time, the city had become a major industrial center within the Russian empire due to the presence of oil resources, which attracted foreign investment. Around the periphery of this city, the monofunctional (industrial) districts development was accompanied by workers' housing.

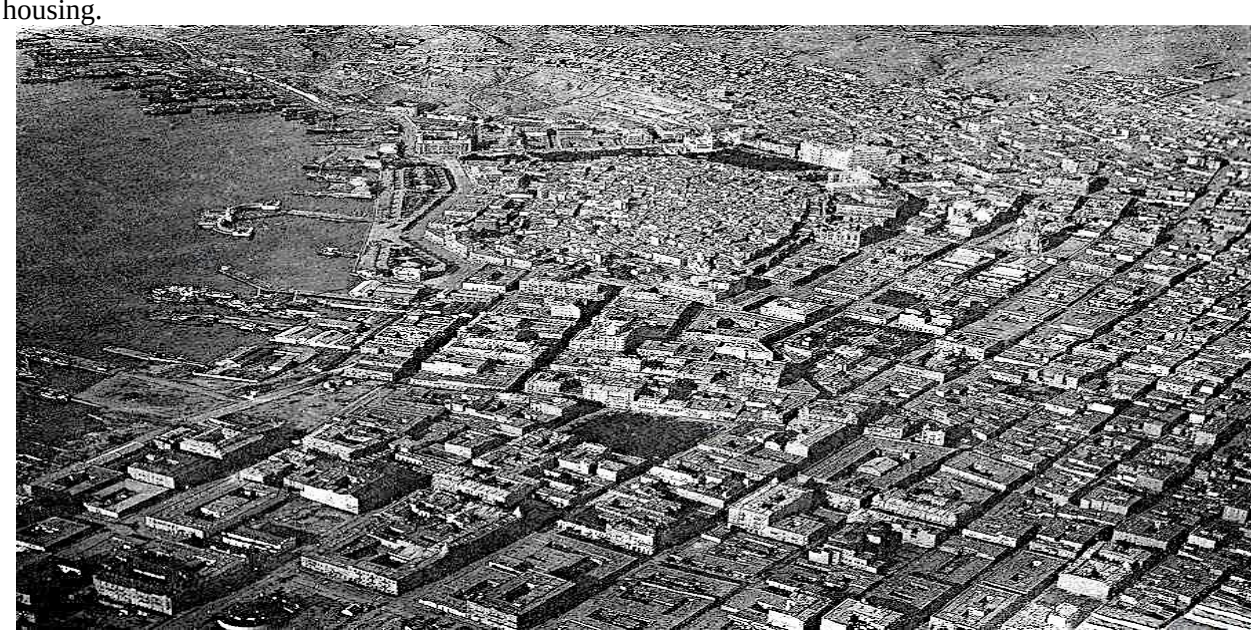


Figure 6: Korbin Kerber, Aerial photo, 1917
Source: Eve Blau, 2018.

The third period is the Soviet era (1920-1991) the city has not lost its medieval eastern and western identities, furthermore it has expanded and prospered on the basis of this urban identity. During the period of Soviet power, much attention has been paid to public spaces in the planning of the city, while the squares were planted a little due to the constant wind blowing from the Absheron peninsula and the arid climate. The presence of many public spaces was linked to hygienic considerations, but also to a conception of the common well-being and social cohesion that was based on an democratic approach. The grid of the "Black City" is orthogonal, and the building consists of large unified closed quarters, as in other Soviet cities blocks. The spaces representing the "Authority of the Soviet Councils" were monumentally emphasized, and their architecture environment borrows only certain traditional Azerbaijani ornaments. Certain places of the Orthodox cult, such as the Church of Alexander Nevsky, have also been destroyed and replaced by buildings with new uses.

Figure 7: Building of the Government House of Azerbaijan, Architects: Lev Rudnev, Vladimir Munc, 1936—1952.
Source: Azerbaijan National Encyclopedia. 2011.

Figure 8: The National Academy of Sciences, architect: Mikayıl Useynov, 1949-1960.
Source: www.azertag.az/xeber/Azerbaycan_Milli_Elmler_Akademiyasi_metbuat_xidmetinin_melumati-1511559

The fourth period was characterised by the fall of the USSR and the change of land ownership (from communism to capitalism). During this period, many public spaces in the city centre disappeared and were replaced by residential buildings. In order to avoid the disappearance of recreation areas in Baku, new public spaces were created, this time in place of the slum areas and industrial landfills of the Soviet period. This strategy is accompanied by the reinforcement of urban inequalities and land speculation.

Since Baku's entry into the XXI century, it has been marked by an urban development influenced with the Dubai model, i.e., the gigantism and eccentricity of the constructions, extreme architecture, and decontextualized urban typologies such as the malls and commercial buildings. The aim is to attract investors and tourists through urban marketing operations. The new projects do not seek to preserve the pre-existing urban memory. Many sites are rebuilt or rehabilitated, contributing to the fragmentation of the existing urban form (the presence of wide boulevards and urban highways), all that to generate a profit.

4.1 Practice in planning.

Actually, much of what is occurring in practice of “today’s architects” leads to the tight placement of many incompatible forms, which supply the kitsch in architectural style. In this regard, the functionality of the city is also defeated. The pace of construction is so intensive that developers are forgetting about parking, local greenery, public areas, etc. The absence of public facilities has a proportional impact on the marketing of the city as well, the lack of which unknowingly affects the entrepreneurs.

The transition to commercial construction has managed to replace urban resources of greening and landscaping, in general by apartment houses and shops.

A visual analysis of Baku’s areas has shown that it is mainly apartments housing (12-16 floors) that are being built. This tendency provides the construction of commercial real estate as well. In fact, many public, inner yard, playgrounds of post-soviet residential housing are occupied by new high-rise residential complexes and irregular placement of garages, parking space. Consequently, this oversupply of residential complexes in the frame of inner area of Soviet’s yards contributes. Due to this development in the city, the urban planners are in fact faced with the urgent purpose towards decentralization of the city.

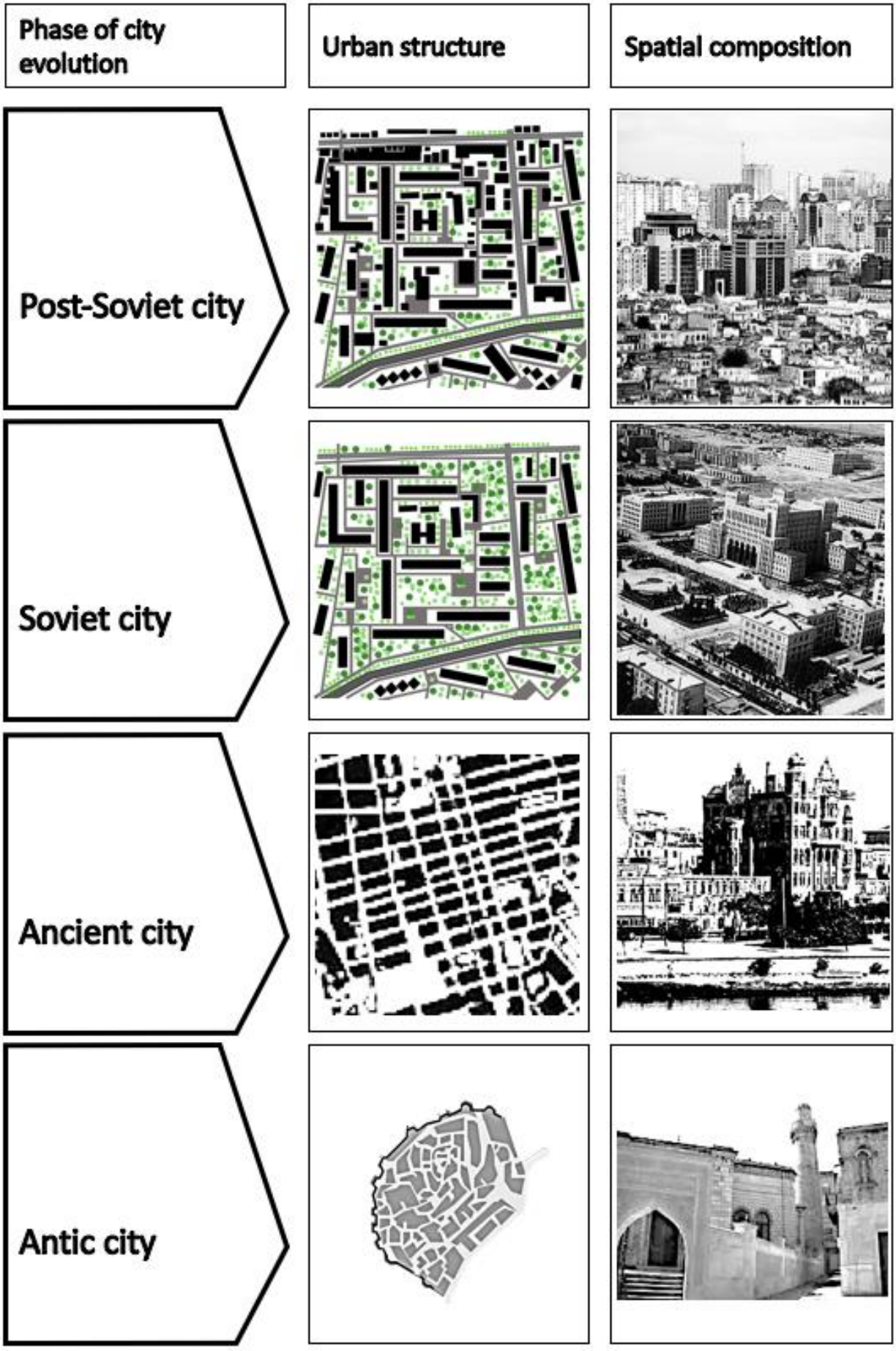


Figure 9: Graphical analysis of the evolution of Baku City: its structural and esthetical features
Source: Emir Huseynov, 2022.

5. CONCLUSION

5.1 Theoretical view

As the analysis in this article demonstrates, hiding urban memory does not produce positive results. From some perspective, the oblivion necessitates or relates the guilt in terms of action as well. All people normally are born with the capacity in one way or another to remember what they perceive during their lifetime. The place where humans have grown and lived is an inseparable part for them.

Psychologically, a person is in a constant search for associative links with the relatives and the dearest, initially inscribed for him/her as time spent in a happy environment with familiar people, objects, and visual connections.

It is a consequence of a person's habits and their structural and functional perception of a place. When a person's visual experience is lost, they lose what they could have used to support their connection with the past. And without awareness of the past, we cannot move forward. Because on a generational scale, going from point 'A' to point 'B' implies a route where the first place is fixed in order to stay on course, and suddenly not be back in the place where the whole journey began.

Architectural heritage carries with it the "genius (spirit) of a place". The spirit sustains people and shapes, the character and essence of places from their birth to their death. Architectural heritage is a trace of history in modern times. Consequently, in the case of Baku City, the architecture of the city is a mirror of the worldview understanding of the citizens. If the city of Baku is presented as a person with its different urban areas, it will have a different identity in its soul. Thus, architecture reveals to us how we should understand the identity of citizens living in Baku.

In case we save the "city spirit", the experience of life, the memories of the past by holistic way with the imagined future – it is up to us to define it.

As Frances Yates pointed out [13] buildings may be less reliable than they seem to us in terms of urban memory. The invisible consciousness warming in architecture (in the mind of people and architects) before it was created is much more powerful. Why should we actually experience the past rather than the future?. It will allow us to preserve our past, which determines our universal future.

Cities as visible political programs, as mirrors of the society and the ruling systems of the countries in which they are located [14]. How can we understand the changes in which everything is allowed? Can we still talk about architecture of the city in the sense of its continuity? Can we still describe the transformation of the city as an emancipation from a certain historic backwardness?

Aldo Rossi pointed out the double nature of the city through history: the city as a material artifact, an artifact structure built through time, and also the city as a collective conception which does not refer only to the real structure of the city but also the idea about it. To that effect, even in periods of decline of cities, it is possible to distinguish the “almost a typological characteristic, of an undefinable order” [15].

The concept of collective memory, which Aldo Rossi introduces in the discourse on the architecture, points out the complementary character of the image of the city composed of a dialogue between material and immaterial values, a synthesis of a series of values referring to the collective imagination: “One can say that the city itself is the collective memory of its people, and like memory, it is associated with objects and places” [15].

Aldo Rossi was the one that apostrophized the enigmatic thought about forgetting the architecture. In his book “A Scientific Autobiography”, he posed the question about forgetting as an alternative title of his autobiographic work: “As I have said, Forgetting Architecture comes to mind as a more appropriate title for this book, since while I may talk about a school, a cemetery, a theatre, it is more correct to say that I talk about life, death, imagination” [16]. “Forgetting is also associated with a loss of our own identity and that of the things we observe; every change occurs within a moment of obsession” [3].

Forgetting means complete or partial, permanent or temporary loss of memories; inability to reproduce or recognize, reconstruct old memories [7].

5.2 Practical view

Restoration or destruction are the alternatives proposed to society. There is no single solution for every situation, each situation has to be analysed precisely in relation to historical, cultural, geographical and other factors.

But what seems to be important at the first, is to have all the necessary information about the value of the historical and cultural building or place. It provides an idea of historical interest and then we must think about the modes of intervention. [17] In the second phase, if the building or place has a historical and cultural value it’s important to preserve or to keep it in a modern image. We also have to consider the

following point: preserving does not mean to attribute new function to the old building without any studies. Indeed, any building cannot admit any function.

"The ideal solution requires planning, the only one capable of identifying the equipment and services that a street, a district, an area, a city requires. Once we have the clarification, the concept of compatibility allows comparing needs to the available building." [18] Or, if the intervention is needed, the mode of intervention does not mean the destruction of all that has been existing through the decades and build new ones. In order to preserve the heritage (patrimonial) dimension, should we leave its precedent function, which will remain in the memories of people? A question more relevant to Baku is, should we keep or modify the elements, which will remind us of the past (industry, harbor, historical inhabited locality or their living experience etc.) of certain places, parallel to the process of renewing?

As we described, the Baku's different urban layers are a value, which creates unique architecture style, the entire districts should be functioning in continuity. In other words, in order to promote one, we shouldn't destroy the other. There is a particular sense when all described layers have their "word" to say while representing the architectural heritage.

REFERENCES

[1] Fludd, Robert (1617). The Oculus Imaginationis (The Eye of the Imagination), Title page of Tractatus One, Section Two, Portion Three.
[2] Rossi, Also (1966). L'Architecture de la ville, chap. III, "La mémoire collective" (trad. Fr. Livre et Communication, 1990).
[3] Mazzella, Sylvie (2019). "La ville-mémoire", Enquête, 4 | 1996, URL : http://journals.openedition.org /enquete/883, consulted on 8 December 2022.
[4] Laurent, Matthey & Olivier, Walther (2010), "The city as body", Articulo - Journal of Urban Research [Online], Book Reviews, 2010, Online since 02 March 2010, connection on 07 February 2017. URL: http://articulo.revues.org/1304, consulted on 8 December 2022.
[5] Freud, Sigmund (2004). Le malaise dans la culture (Civilisations and Its Discontents). Paris: Presses universitaires de France.
[6] Connerton, Paul (2008). Seven types of forgetting. Memory Studies, 1(1), 59–71.
[7] Bakalchev, Minas, Bakalchev, Violeta & Tasić, Saša (2015). Forgetting the City: Tactics of Transformation of the City in Motion, Open Urban Studies and Demography Journal.
[8] Voltaire, Contes (1772). La Bégueule.
[9] Cumming, Paul (2016). Interview with Robert Smithson for the Archives of American Art/Smithsonian Institute" (1972), in Robert Smithson, Collecting Writings, connection on 01 February 2016. https://www.robertsmithson.com/essays/interviews.htm, consulted on 8 December 2022.
[10] Advisory Body Evaluation ICOMOS (2000), UNESCO. URL: hc.unesco.org/en/list/958/documents/ https://azer.com/aiweb/categories/magazine/64_folder/64_articles/64_archdevelopment.html, consulted on 8 December 2022.
[11] Muradaliyeva, Elmira (2014). "Cities of Azerbaijan on the Great Silk Road", article, published on January-February 2014, http://www.visions.az/en/news/545/9b611c58/, consulted on 8 December 2022.
[12] UNESCO (2000). Walled City of Baku with the Shirvanshah's Palace and Maiden Tower. URL : https://whc.unesco.org/en/list/958/, consulted on 8 December 2022.
[13] Yates, Frances Amelia, et Daniel Arasse (1987). L'Art de la mémoire. Paris: Gallimard, p. 14-15.
[14] Foreword, Nowak W. (2011). In: Bardett R, Sudjic D, Eds. Living in The Endless City. London: Phaidon Press Limited, p. 6.
[15] Rossi, Aldo (1982). The Architecture of the City. UK: The MIT Press.
[16] Rossi, Aldo (1984). A Scientific Autobiography. UK: The MIT Press.
[17] Collage 6/16, Patrimoine et densification, journal de Fédération suisse des urbanistes. p. 8.
[18] Corboz, André (1978). Bâtiments anciens et fonctions actuelles : esquisse d'une méthodologie de la "réanimation", Restauro. p. 83.

International Scientific Journal of Urban Planning and Sustainable Development
© URBANIZM
H.Eldek Guner
ISSN: 1811 - 6582 www.journalurbanizm.org No. 27, 2022, p.13-19
DOI: 10.58225/urbanizm.2022-27-13-19

NEW PUBLICITY; CASE STAVROS NIARCHOS CULTURAL CENTER

HIKMET ELDEK GÜNER
Faculty of Architecture, Izmir Democracy University, Izmir, Turkey

ABSTRACT

The Stavros Niarchos Cultural Center, which opened in Athens in 2016, defines a completely new approach to publicity through its design, application, investor viewpoint, and public uses. The Stavros Niarchos Cultural Center also has a 24/7 library with views of the opera halls that are used at specific times of the year, along with a full roof that is used as a park in all weather conditions. This study aims to make a spatial analysis of this project, which overlaps publicity with design.

Keywords: Spatial, Stavros, design, publicity, cultural centre, city

1.INTRODUCTION

Publicity has been one of the concepts that began to be used a long time ago and best expresses social use. Publicity, which Habermas defines as "areas between governmental and private spaces where public opinion is formed due to the fact that the debates between the citizen/user", [1] can be defined as spaces where the public freely uses and socializes, although it varies according to the needs of the user and time [2]. The most basic and important feature of the "Stavros Niarchos Cultural Center", whose design started to be discussed in 1999, is its publicity. The first topic is that how the building will be public, with which functions will support this publicity, discussed with the investor, and local government, and then with the addition of the designer, the publicity was discussed in 3D, and finally, it applied [3].

That area was familiar to Athens, where the culture center was built in 2016, but over time region usage potential changed before its construction. Stavros Nıarchos Cultural Center, located in the coastal district of Kallithea, approximately 4.5 km from the city center, was financed by the Stavros Niarchos Foundation. The building construction, where private and public cooperation was tried for the first time, is costing approximately 566 million Euros and is also a candidate to become a new attraction point in terms of tourism. For Greece, which had recently experienced a difficult economic period, the center has been a very important investment in social and cultural context, with its design, environmental approach, and public uses [4].

As a result of the invited competition held in 2008, the building designed by Renzo Piano Workshop was chosen for implementation [5]. The building was designed as a Cultural Center with the city's largest opera house and national library. Beyond its function, the Cultural Center makes a great contribution to the public space of the city with its environment design that is used extensively by the public.

In many instances, contemporary buildings produced by "Star" architects are the face of cities and trigger architectural tourism [6]. Athens adds new layers with contemporary practices to its cultural and architectural heritage. Located next to the Acropolis hill, Acropolis Museum, which was designed by Bernard Tschumi, has revealed how contemporary design can be integrated with the past [7]. The Stavros Cultural Center represents a significant investment in architectural culture and a new publicity initiative, highlighting a different side of the city, a coastal area, and the Olympic structures that were constructed in 2004, but are inactive and unused today as well as the surrounding area of the city.

2. THE NEWNESS OF THE NEW ROUTE; STAVROS NIARCHOS CULTURAL CENTER

The cultural center, designed by Renzo Piano Workshop, has an open area of 144,000 m2, a closed area of 26,000 m2 and a total area of 170,000 m2 [3]. The cultural center includes a library, performance halls and a city park. The physical relationship of the building with the sea is unfortunately very weak, although it is located in the coastal area. The main reason for this weak relationship is the uninterrupted continuation of the highway and tram along the coast.

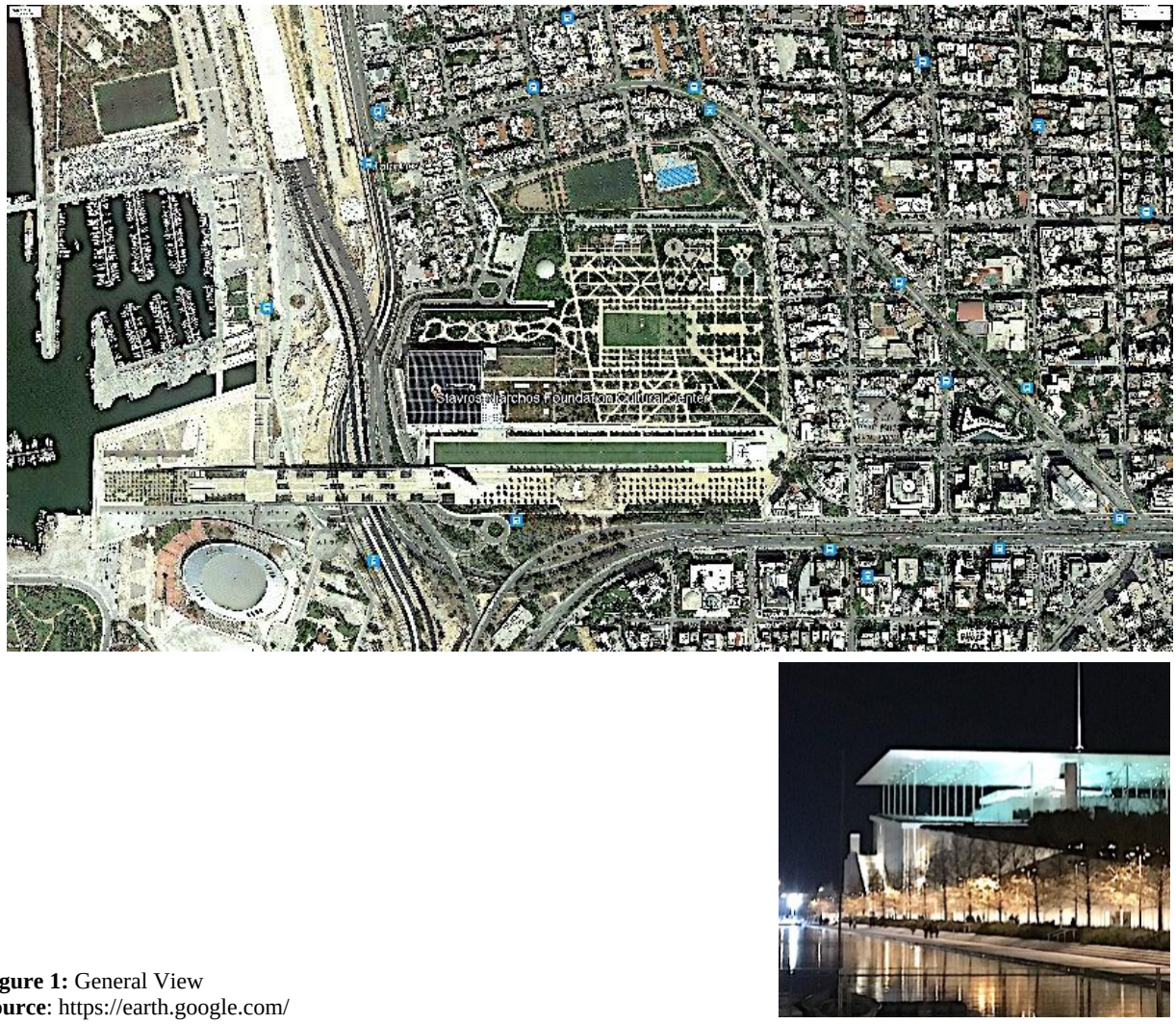


Figure 1: General View
Source: https://earth.google.com/

The building can be perceived first from the top elevation and its long façade by the overpass which the coastal connection is provided. The upper level of the building creates a perception of a heavy, rigid, and massive design, however, upon reaching the entry level, the 400m long swimming pool, the transparent surfaces, the entrance courtyard opened to the public, and the use of thin-section carrier system elements completely undermine the overwhelming effect of the building on the ground floor. Without the use of any overpass, the pool, which is an important part of public use, reminds you that you are related to sea, while increasing the majesty of the building with its mirror effect. The ground level functions, how the library and the performance hall center are separated, how they are connected with the open/closed courtyards and also how the service spaces are made a part of the building can be noticed by examining the floors in detail.

Figure 2: Approach to Cultural Centre
Source: https://earth.google.com/

Figure 3: Balcony

One of the most important points of the building is the city balcony, which allows you to see the Acropolis of Athens as if Renzo Piano designed a viewing terrace for the Acropolis Hill at the other end of the city. The viewing terrace, which starts with a natural green area and continues with the city park of its own top cover, provides a public use for 700 meters starting from the road level to the highest level. The building is perceived as a reading room and a viewing balcony located under the 100mX100m wide top cover and cover, carried by steel columns with a height of approximately 10 meters, built on a sloping green area from the land side.

Figure 4. View from City Park

The center, which leaves a completely different visual effect from the shore and from the land, can leave such different effects from different approach points, it shows designer's planning of how and where the building will be perceived.

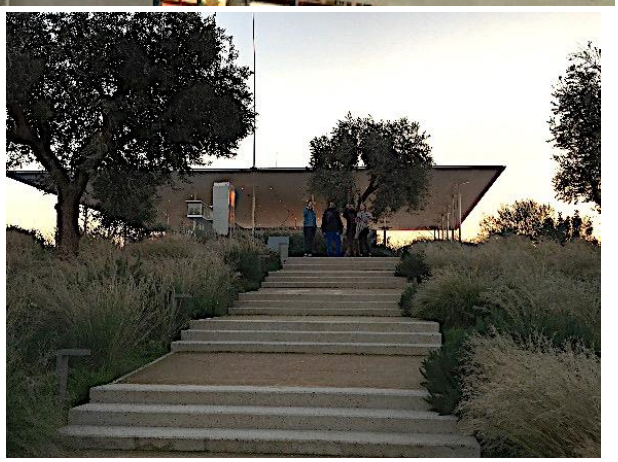


Figure 5. City Park

3. DESIGN - IMPLEMENTATION PROCESS AND CURRENT USAGE

The idea, which to build a Cultural Center for Athens by the Stavros Niarchos Foundation, dated back to 1999 [3]. The design team was selected in the invited competition held in 2008 and the application started in 2011. At the beginning of the process, it was clear that the biggest opera house in Greece would be included in the Cultural Center's program; however, the decision to include a library as a side function was made after considerable research and discussion. In addition to a structure such as opera that can be used at certain time intervals, it was found appropriate to have a library function that is intended to be used by everyone at all hours of the day. Besides the library function, the use of green space allows the continuous use of the building and the area, and the fact that the building is open to the citizens, and the design of the building as a city park has also increased the public use.

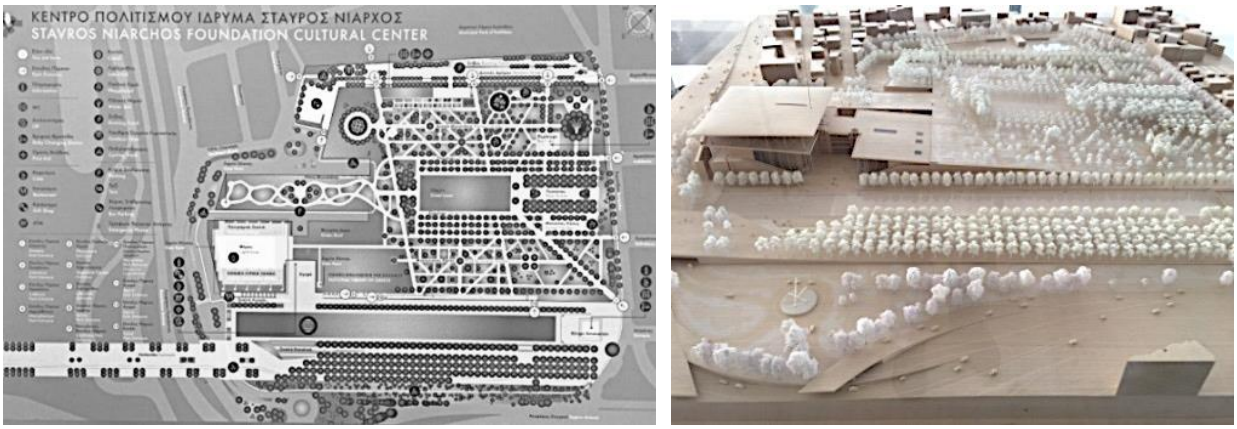


Figure 6: Site Plan and Model

While mentioning in his interviews, Renzo Piano talked about the awareness and usage of city park and the acceptance that it is one of the most fundamental parts of the design from the first design decisions and also the other most effective element of the building is the terrace with the photo-volcanic cover at the top level. This cover, which will also meet some of the electricity needs of the center, is defined by the design team as the “masterpiece” of the building.

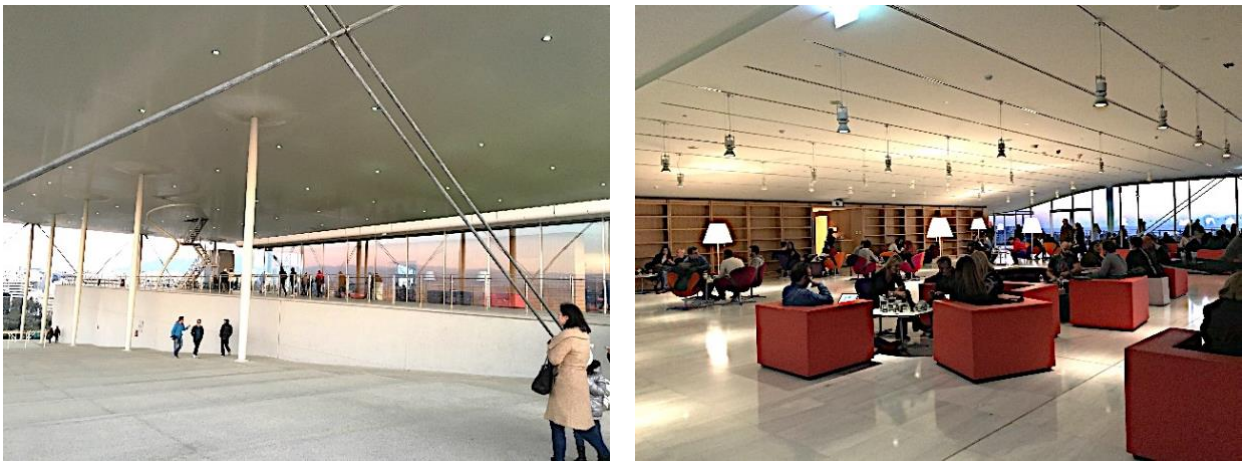


Figure 7: Reading Room

Figure 8: Library

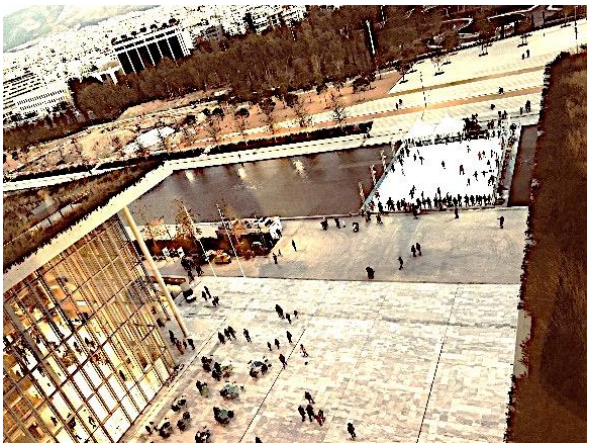


Figure 9: Public Sapce

4. CONCLUSION

Stavros Cultural Center shows that, how it can emerge without sacrificing quality in the context of design and implementation, which makes you question the definition of public use, reminds you of how a building that lives with its users and also emphasizes the importance of investing in an economically. The building shows the power of architecture with its design, application, space and material quality. In addition, Stavros Cultural Center is an example that shows, architecture is a reflection of life, that social formation can gain a three-dimensional appearance by using concrete, steel, stone, wood, etc. The investor and the government can work together in the succeed projects for the citizens, like that case

Figure 10. General View

REFERENCES:

[1] Habermas, J. (2003). Kamusallığın Yapısal Değişimi (Çev: T. Bora, M. Sincar).İletişim,İstanbul, 60.

[2] Gürallar, N. (2009). Kamu – Kamusal Alan – Kamu Yapıları –Kamusal Mekân: Modernite Öncesi ve SonrasıİÇin Bir Terminoloji Tartışması.Mimarlık Dergis, Sayı 350, 52-55

[3] Newhouse V. (2017). Chaos and Culture: Renzo Piano Building Workshop and the Stavros Niarchos Foundation Cultural Centre in Athens.

[4] Ormsby, C., (2014), "Culture throughout Construction at the SNFCC Ste in athens, Greece", October, 2014, Arup Montreal.

[5] Economou A., Outos P. (2016). "The Contrıbutıon Of Natural And Cultural Parks In Sustaınable Development. As A Case Study: The Foundatıon Cultural Center Stavros Nıarxos In Greece. Journal "Sustaıbable Development, Culture, Tradıtıons" Volume 1b/2016.

[6] Patterson M. (2020). Revıtalızatıon,Transformatıon, And The'Bılbao Effect'testıng The Local Area Impact Of Iconıc Archıtecturaldevelopments In North Amerıca, 2000 To 2009. Available from: https://www.researchgate.net/publication/347852537_Revitalization_transformation_and_the_'Bilbao_effect'_testing_the_local_area_impact_of_iconic_architectural_developments_in_North_America_2000-2009 (accessed Nov 20 2022).

[7] Akkurt Birol H. (2010) "Atina'da Çağdaş Bir Kültür Tapınağı; Yeni Akropol Müzesi, Ege Mimarlık 2010/3-74.

Site internet:

[8] www.tr.euronews.com/2015/06/26/atina-ya-566-milyon-degerinde-kultur-merkezi

[9] www.arup.com/projects/stavros_niarchos_foundation_cultural_centre/facts

[10] www.dezeen.com/2016/06/28/renzopianostavrosniarchosfoundationculturalcenterathenshugeartificiallhill/

[11] www.snf.org/en

[12] www.rpbw.com/project/stavros-niarchos-foundation-cultural-center

[13] www.archdaily.com/790678/stavros-niarchos-foundation-cultural-centre-renzo-piano-building-workshop

International Scientific Journal of Urban Planning and Sustainable Development
© URBANIZM
ISSN: 1811 - 6582
A.Hashemi Behramani
www.journalurbanizm.org
No. 27, 2022, p.20-32
DOI: 10.58225/urbanizm.2022-27-20-32

SUSTAINABLE MOBILITY AND THE ECOLOGICAL FOOTPRINT OF THE TEHRAN METROPOLIS UNDER INTERNATIONAL SANCTIONS

ALIREZA HASHEMI BEHRAMANI
University of Geneva, Switzerland

ABSTRACT

This paper is aimed to analyse the existing relationships and controlling functions between ecological footprint and international sanction in case of Teheran city. The analysis begins questioning whether the sustainability of health on our common planet is rightly treated with oblivion to the pernicious consequences from the economic blockade of one country by the global community. The analytic method used is based on developing a conceptual and theoretical framework of reference to review the literature, interviews on the main variables of the research: urban policy, transport system, international sanctions and multi scale governance. It is concluded that while that the existence of more holistic facilitating the development of the rail transport system, the governance and stakeholders put a lot of obstacles and play at a different scale.
The analysis suggests that a holistic approach is required to build urban mobility based on decreasing of ecological footprint by addressing a fuller range of degradation public health, urban politicisation, to process the policy of the multi-scale governance of city, to create the governance that implies geographical proximity, organisational proximity and institutional proximity of stakeholders.

Keywords: Sustainability, governance, mobility, sanctions, Tehran

1. INTRODUCTION

Despite the solution advanced towards the Iranian nuclear issues as a consequence of the Common Comprehensive Plan of Action[1], urban policies have been unable to resolve the problem caused by transport in Tehran, the economic and political capital of Iran. Actually, this city suffers from traffic jams and air pollution problems, which are the result of a transport system based on the individual model, similar to other big cities in the world. But the Iranian case is different from other countries, due to the result of international embargoes, the transport sector, especially the subway, has encountered supply and equipment problems.

In this regard, the decision of the United States to impose international constraints on Iran has also influenced the public transport sector, which has to provide service for populations that do not relate to the political sector. We can assert that the difficulties posed by the unsustainable transport system are more pernicious than the negative effects of the nuclear program. Indeed, it is gradually influencing the health of the residents in a negative way, as it is already the case for a number of cities in Iran, especially Tehran. There aren't official figures on the potential sickness, mortality and ecological impact caused by air pollution in Tehran, but official public health executives estimate that there are 20,000 deaths per year in the city of Tehran (Hashemi, Minister of Health, 2017). Therefore, this figure is sufficient to highlight the seriousness of the case. Besides that, air pollution is a problem that is produced locally, due to a large

[1] The Joint Comprehensive Plan of Action is an agreement signed in Vienna, Austria, on 14 July 2015 between the United States, Russia, China, France, the United Kingdom, Germany and the European Union with Iran. The purpose of this agreement from the point of view of Western countries is to control Iran's nuclear program. For Iran, the agreement is about lifting international economic sanctions that are detrimental to the country.

emission of greenhouse gases, this city has a global impact, which influences the acceleration of climate change.

The decision to impose an international embargo by the United States indirectly damages the whole world. The Tehran Metro Company, despite the obstacles of national policies, as a local player has invested well in the development of subway networks by creating the tunnel and basic infrastructure. Therefore, the main challenge for this company is to complete the number of wagons and signalisation equipment to serve the networks that are already built. In addition to the politicisation of subway development, the reason of this challenge, lies in the lack of interest of big companies in the transport sector to work with Iranian companies as a consequence of the problems posed by the banking relationship, following the embargo and the demand for damage from the US to companies working with and in Iran. From this point of view, coordination with a big international company in the public transport sector has become a major obstacle from a technical and financial perspective to implement the public rail transport project in the capital. A more effective system in Tehran metropolis would decrease the ecological footprint of air pollution that threatens the Earth. A more effective system in the Tehran metropolis would decrease the ecological footprint of air pollution that threatens the Earth. Therefore, it is definitely time for the powers of leading countries and major corporations to intervene as international actors, playing the accepted role of controlling climate change, in order to help Tehran city to solve the issue caused by this vehicular transport system. We need to intervene as researchers who think about governance and development of the territory to improve the quality of life of the inhabitants, to shed light on the influence of the role of international actors on the sustainability of development of the city at the local level and also on its impact at the global level. Firstly, this paper will analyse the obstacle to the development of Tehran's subway network at two scales: national and international. It means examining how international governance achieves the coordination of actors to improve public health policies and to invest in environmental measures.

2. MOBILITY AND THE ROLE OF MULTI-SCALE GOVERNANCE

Sustainable urbanism "thinks of the city as an interlocking of scales, which requires tools adjusted to each level of political and practical intervention" (Da Cunha, 2004). In this regard, research in the political field allows us to approach governance as a modality of action that aims to replace and complement the traditional governmental model (Pescueux, 2007). "The system of governance benefits from the capacity of the politics, the ability to make decisions and to mobilize resources" (Le Galès, 1995). The term “governance” refers to all the processes involved in the political management of society at different scales, from local to international (Boisseaux, 2011). "It includes the processes through which citizens articulate their interests, exercise their legal rights, perform their obligations and arbitrate their disputes" (Osmet et al., 2008). While governance has long been associated with urban management, it is nowadays a process by which local urban governments, "in partnership with other public institutions and different parts of civil society, respond to social needs by improving participation, the rule of law, transparency, responsiveness, consensus building, equity, effectiveness, efficiency and accountability" (United Nations Population Fund, 2002). Today, the idea of participatory governance is quite obvious. In this logic, Stoker uses governance as a strategy to highlight the needs to reform the state, aimed at rationalising its functioning and establishing new forms of partnership with the citizen (Stoker, 1998). The notion of city governance is defined in this context as "a process during which a rebalancing takes place in the exercise of urban power to the detriment of states, elected officials, urban institutions and actors from civil society" (Jouve, 2005). It presupposes the existence of rulers, but it adds to them certain forums where everyone is able to formally participate and contribute their opinion (Blondiaux, 2004). In this perspective, Ascher (2001) observes that urban governance implies an enrichment of representative democracy by new deliberative and consultative procedures. Nowadays, the governance of cities has become more complex, in a context of population growth (United Nations, 2002) and consequently, in a process of metropolisation. The metropolitan regime is considered the fourth urban revolution (Da Cunha and Both, 2004). It is a contemporary form of the urbanisation process that follows the multiple interactions between the different scales of spatial planning, provoking several transformations in the configuration of territories. The process of generalised urbanisation without form, without limits and without respect for the natural environment (Ascher, 1995) was intimately linked to this phenomenon. In the context of metropolisation, the notion of proximity loses its physical dimension in favour of a more temporal dimension (Ollivro, 2000). From this point of view, "the transport networks maintain relations, direct or indirect, immediate or retroactive, of a causal or congruent nature" (Offner and Pumain, 1997) in the metropolitan area. The new morphology of urban

spaces, caused by mobilities and daily interactions, increasingly represents the importance of multi-scale governance. The change of scale of mobility calls for the construction of adapted political actions (Lefevre, 2010). Multi-scale governance brings together a multitude of actors. These are those who are mobilised by the importance of urban practice on different scales. The actors work together, because urban practice is a co-production. In this respect, the meeting and coordination of a multitude of actors present the complexity of the games of actors who have their own interests, logic and goals. In this context, Jouve argues that the problem facing urban governance today is the aggregation of actors and their strategies (Jouve, 2010) in an increasingly politicised world. In this perspective, objective 17 of Sustainable Development Goals (SDG) presented by the United Nations on a global scale requires a partnership between different actors at different scales and more particularly on a global scale in the following fields: finance, technology, capacity building, trade, policy and institutional coherence, multi-stakeholder partnerships, data, monitoring and accountability. (Agenda 2030, 2017) The transport system, and in particular public transport infrastructure, plays a crucial role in meeting the objectives of sustainable development in all three dimensions: economy, environment and society.

3. URBAN MOBILITY IN TEHRAN

The cars have become the symbol of individualistic values, associated with freedom, asserting social status and extending the individual sphere (Pini, 2005). Tehran, like other cities in the world, was characterised by walkability. The use of carriages was thus reserved for the royal family and senior officials. The 20th century began with the constitutional revolution of 1905 and the discovery of oil in 1908. Therefore, the constitution forced the government to pay attention to civil codes. In 1913, the Municipality published a regulation on vehicle traffic, it is the first time when the car was officially mentioned. After the First World War, and more precisely from 1919, the number of automobiles increased considerably in Tehran, which resulted in the emergence of the first road regulations (Habibi and Hourcad, 2005). Since 1945, the car has become an integral part of urban politics and has become part of people's daily lives. To meet this modernist interest, the country's leaders developed a nationwide car assembly industry in Tehran called “Peykan”, which had a mature market.[2] The lack of measures to improve public transport creates a dependence on the vehicles. Since 1990, the spatial sprawl of the city has continued with a new specificity: Tehran is becoming a city of highways (Hashemi, 2016). For that reason, the car market continues strongly to grow. In fact, it has become an important sector in the Iranian market. The decrease in the cost of mobility as a result of the industrialisation of the transport system and thus more specifically the subsidy, rather on oil, encourage the use of the car. The last century has seen the expansion of the 'central dense zone' and the integration of increasingly distant peripheral units into the city's operating area (Acher, 1995). After the Islamic Revolution, following the problems caused by the revolution and thus during the Iran-Iraq war, the car market closed its port to imports in order to preserve the local industry and therefore oavoid the outflow of foreign specifications to Iran. This interdiction has created a closed market with no competition resulting in a lack of improvement in product quality. In order to break the monopoly in the industrial market, car companies from France[3] and also South Korea[4] entered the Iranian market, but in a very limited way.

The Iran Khodro industry, which is the main producer of cars in Iran, has launched since 1997 a project of one hundred percent Iranian cars called Samand, which means "horse"(www.ikco.ir/fa/Intro.aspx**)** The price is affordable and leasing is attractive for the Iranian car model, which is built and assembled in Iran, encouraging the car as the preferred transport in Iran.

Despite its quality, it must be said that the local production of cars, which is a result of the market monopoly and forced by foreign companies, fails to meet the demands, desires and needs of Iranian society in terms of car use. Moreover, those produced in Iran generally consume twice as much energy as the world standard car.

This huge energy consumption results in significant amounts of GHG. Even today, the economic policy in Iran to keep the value of the national car market has defined a significant tax on the import of cars.[5] This is a policy that changes every year and has become an area of fragmentation in the city. In this respect,

[2] Peykan was derived from the 1966 Hillman Hunter, designed and manufactured by the British Rootes Group. The design was introduced in Iran by the Iran Khodro company. The car enjoyed great popularity in Iran from the late 1970s until the 2000s. (https://www.ikco.ir/fa/Intro.aspx)

[3] Peugeot and Renault are two companies active in the Iranian market.

[4] KIA is the South Korean company that benefits from the Iranian market.

[5] The tax is calculated between 100-120 percent of the car's value.

Iranian society has the desire to use a quality car with a good comparable price to the international level. From this point of view, in planning for the public transport system, we should not neglect the strength of the car myth, a symbol of freedom of consumption and a measure of social prestige in Iranian society.

In order to improve the quality of production, Iran's vehicle industry has started to work with large companies in the world. However, following the international sanction against Iran's nuclear program, these companies left the Iranian market in order to protect their business. Since the removal of the sanction in 2015, international companies have resumed their activities in Iran. Nevertheless, the international banking system imposes constraints on the Iranian market. This problem is exacerbated by the decision of the new US government to abandon the deal with Iran.[6]

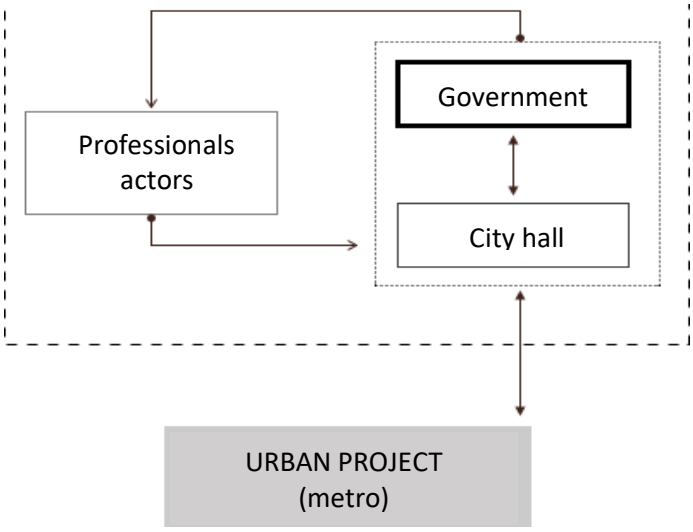
As a result of the US decision, the major international companies in all fields, and especially in transport, have left the Iranian market. The result of this decision has a direct impact on public health issues and global warming, as Iran's automobile production sector is unable to improve the quality of its production in order to preserve the environment from GHG.

Saidi explains that the issue of transport in a megacity of 8 million inhabitants such as Tehran is a major urban fact. Despite a variety of transport options, a car is still by far the most common mode of travel. The type of urban planning, the lack of public transport and the low price of fuel essentially justify the predominance of this mode of mobility. Far from being limited to the United States, car dependency (Deboulet, 2005) has become the spearhead of many urban policies in Tehran. But the debate on the priority contributed to public transport or to the car is intense among public authorities (Mina Saïdi, 2015).

Despite the importance for the policy maker, the public transport system is totally neglected, or even very much underestimated compared to the main public investment in Tehran. Tehran's bus and subway companies, benefiting from state funding and subsidies, offer very low transport tariffs. But the underdevelopment of public transport in Tehran demonstrates the importance of the role of the private car. On the other hand, the growing mobility expectations of Tehranis intensify the differences between city dwellers through unequal access to transport services.

3.1 Urban politicisation threatens the rail transport system

Iran, particularly the metropolis of Tehran, has started the substitution of a policy based on individual transport to an urban policy focused on public transport. This has initiated a strong development intensity of suway tunnel construction since 1990. The urban growth, and the considerable increase in the dependence on the car, have forced the establishment of an extensive and reliable underground network with low fossil energy consumption in Tehran. Following diagram demonstrates the model used at the point of decision for the construction of the underground networks which started in 1978 in the north of Tehran. (**Figure 1)**



- The mayor is chosen by the Minister of the Internal Affairs. It is the government that runs the city.
- The professional actor performs the role of the master opener and advisor in the case requested by the municipality.

Figure 1: The model of urban governance until 1979 **Source**: Alireza Hashemi Behramani, 2018

As a consequence of the Islamic Revolution, 1979, and the war between Iran and Iraq during 1980-1988, the implementation of the metro had been considerably slowed down and obstructed due to the:

[6] US President Donald Trump issued a warning on 7 August 2018 to countries that would persist in trading with Iran after sanctions against Tehran were reinstated on Monday night.

- Problem due to the revolution.
- Context of the war.
- Negative view of the idea of subway development as a result of its dependence on the West.

However, following Akbar Hashemi Rafsanjani's comments, this project began to develop again in 1988 on the basis of the plan already defined at the time of the Shah. It is interesting to see that Hashemi, using different staff in the Iranian political system has tried to convince the professionals who were against this project.

- He proposed the project to the governor of Tehran at that time as an elected official.
- He spoke about it at the superior level of decision making in the Iranian parliamentary regime.
- He knew well that to have a successful project, it was necessary to have the participation of the people. He used his role in the Friday prayer ritual in the capital to launch the demand for the construction of a metro system by the people. During his Friday ritual, he also drew a picture that shows the advantage of the metro. Moreover, Hashemi said that "the metro, as a transport tool", could solve the problem of social segregation in the city.[7] According to the major slogan of the revolution, "the country's leaders must meet the need of the lower class".

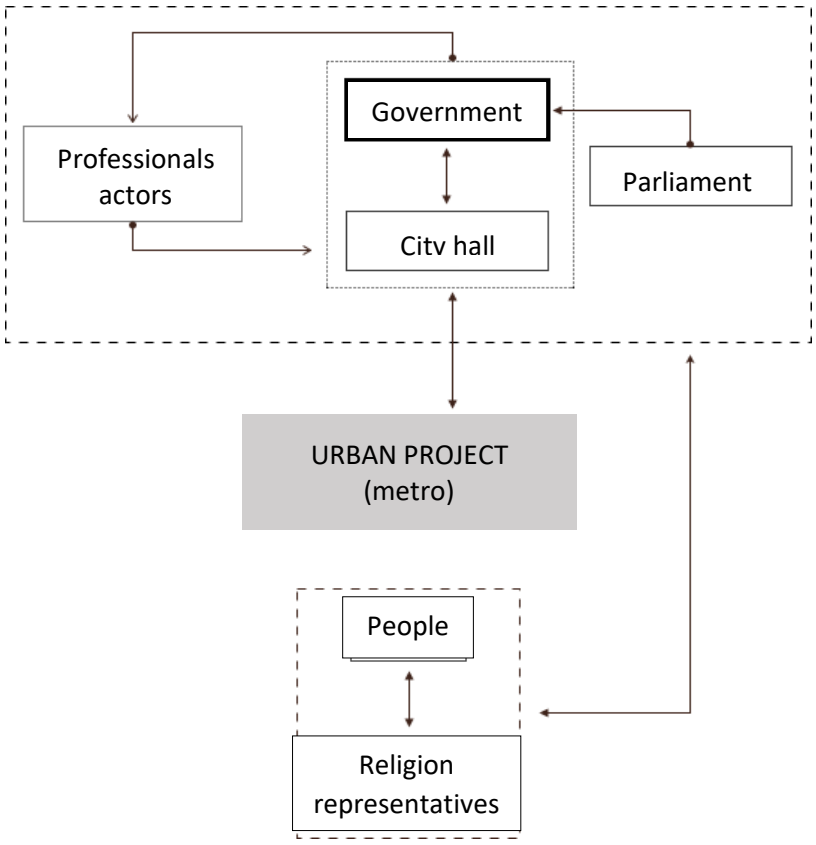


Figure 2: Governance used by Akbar Hashemi Rafsanjani for metro development
Source: Alireza Hashemi Behramani, 2018

Finally, the first subway line connecting Tehran to Karaj (a satellite city) was inaugurated in March 1999 (with the progressive opening of all its stations). Following the change in the configuration of Tehran, the French company Systra, together with the Tehran Metro Company, carried out studies on how to extend the transport network by 2030, with the central objective of integrating and serving the entire Tehran metropolitan area. The plan constitutes the framework for the sustainable mobility system of the Tehran metropolitan area in order to move towards a polycentric organisation of the city. It also proposes a hierarchical network with four express lines, 8 urban lines and 5 grid lines. The proposed network should look like the map below.

The new plan has been well accepted by stakeholders. The subway and the extension of the number of its lines are now part of an overall plan to reduce the difficulties related to inter and intra urban travel. Thus, they reduce the risk related to the individual transport system in the Tehran metropolitan area.

[7] Hashemi represents the metro in this way and explains more about this type of public transport. This speech is known as the underground sermon among Iranian people.

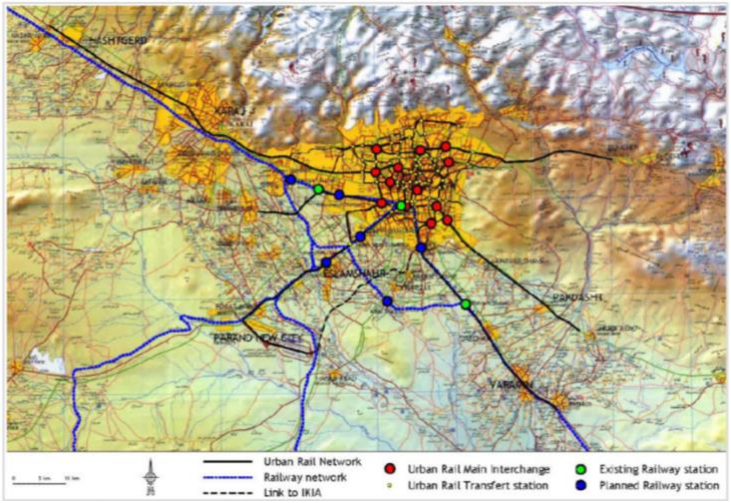
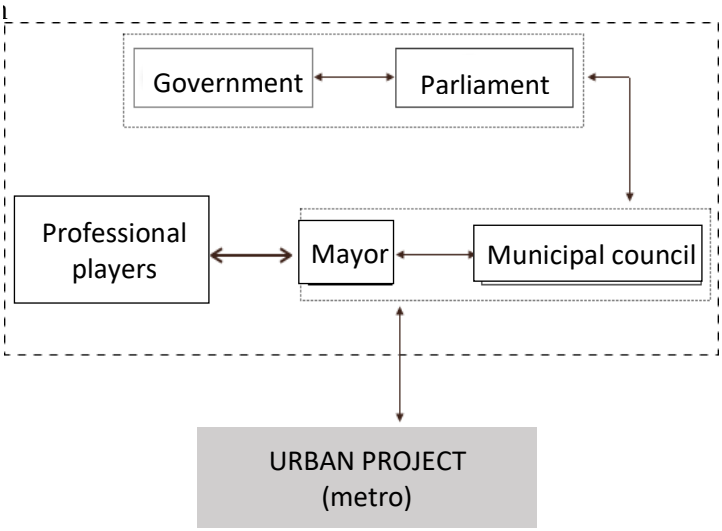


Figure 3: Rail transport horizon in Tehran metropolis
Source: Metro Master Plan, 2007

Figure 4: The subway network
Source: Metro website, 2018

The Tehran metropolitan area spread out as a result of the large investment that was made on the highways construction for the inside and outside of the city centre. The metropolitan territory of Tehran was fragmented by this development pattern. However, the city centre, specifically the bazaar area, has recovered its functionality following the establishment of a metro line linking the city's north and south. Despite the progress made in the development of the metro network in Tehran, particularly with the partial opening of the lines, the network is still very underdeveloped in relation to the immensity of the city and the requirement of the project. The metro construction speed has not kept matching the need for metropolitan travel.



- From 1998 onwards, the population chooses the municipal councillor.
- After this decision, the mayor is elected by the municipal advisers.
- In cooperation with professional actors, the municipality prepares and manages the city.
- The government and the parliament play the role of supervisors of the municipality.
- The participation of the population remains in the municipal election

Figure 5: The model of urban governance 1998
Source: Alireza Hashemi Behramani, 2018

Several reasons for the slow process of development are driven by municipality, despite available budget for other city's projects the most particular is a lack of financial resources. Municipality has always preferred the development of infrastructure for individual vehicles, instead of investing in public transport. Justification for this claim had been in the words of Tehran Mayor, Mohamad Bagher Ghalibaf at the end of 2016[8], regarding the municipality's success in completing the network of city roads according to the general transport plan. Therefore, the construction of a double levels highway in Tehran reflects the importance of the individual transport system in this city. Mr. Mohesn Hashemi Bahremani[9] affirms that "Due to the same funding of the double levels highway, it is possible to construct one metro line on the north-south direction of capital" (2016, Interview by Alireza Hashemi Behramani). According to our study,

[8] Mohamad Bagher Ghalibaf the Mayor of Tehran between (2005-2017).
[9] Director of the Metro Company between (1998-2011) and Head of Tehran City Council since 2017.

in addition to the financial problem of the subway project, the politicisation of the development of this network on both national and international levels represents a major constraint to these developments. The following tables show the constraints caused by the politicisation of subway network development in different historical periods of Iran.

Time period	National level	International level
Before the revolution	• The power of the individual transport sector slowed down the progress of metro construction. • The metro corporation was not an organ of the Ministry of Internal Affairs, nor of the municipality, nor of the Ministry of Transport.	• As a result of the relationship with Western countries, the master plan of the metro was drawn up by a French company. • On the technical and equipment level, they had international support.
Revolution - 1987	• The metro project was abandoned by the revolution due to financial problems. The metro was then perceived as a project imposed by Western countries. • Akbar Hashemi Rafsanjani started the project in order to convince actors who were against the metro project by mobilising 3 different positions: the member of parliament, the head of parliament, the Imam of the Friday prayer	• There is a lack of interest from Western countries to work with Iran following the Islamic revolution and the Iran-Iraq war.
1987 - 2000	• The significant progress of the metro project as a result of the support of the President Akbar Hashemi Rafsanjani. • In order to improve the cooperation and coordination of the activities of this company, it is no longer part of the Ministry of Interior. This metro construction project has become an organ of the Tehran Municipality.	• The coordination with western countries, mainly France and Germany, allowed to start 2 areas: consulting and equipment. • A strong relationship with China following the financial support of this country for the preparation of the equipment as a wagon. • The acceleration of coordination at international level.
2000 -2010	• The metro project finds a similar sister project called monorail. It is a project proposed by the mayor of Tehran, Mahmood Ahmadi Nejad, without the favourable opinion of transport professionals. • The monorail project was not successful and slowed down the construction of the metro, because it limited the metro budget. • It also started disagreements between the actors of public transport development. Due to the fact that the mayor saw the metro management as the reason for the failure of the mono-rail project. • The politicisation of metro development is launched.	• Coordination with different countries continues without constraints.
2010 - 2020	• The competition of the national political sphere is imposed on the Tehran metro because the success of this project became equal to the success of the political party that is against the then president. • The mayor, Mohamad Bagher Ghalibaf, from Tehran in order to decrease the constraint of imposed by politics changes Mohsen Hashemi Bahremani, as a symbol of the opposite of the president. • The metro project in speeches has become the priority in the city's projects. But in practice, due to the politicisation of this project, the mayor, as the main actor in the city's development, is financing other projects such as the double-decker highway and the Milad tower, which are considered to be a clientelistic base of development. • Since 2018, we can see actors who are well in the same direction either at the local and municipal level or at a national level.	• The international sanction against Iran's nuclear programme is embodied in all areas specifically in the sanction of the banking relationship. • Coordination is diminished and in many cases, international companies have abandoned their contracts. • Since 2015, international sanctions are removed, but banks, following the fear of the United States, refuse to work with Iranians. • Since 2018, the United States has left the agreement with Iran despite the unfavourable opinions of other countries. The Situation has changed again. The banking constraints following the claim by the USA force international companies to abandon the Iranian market despite the existing economic and ecological benefits.

Figure 6: The constraints caused by the politicisation of subway network development
Source: Alireza Hashemi Behramani, 2018

Tehran has become the symbol of a city of individual mobility with no less than 30 urban highways with a length of 500 km in this huge city where more than 30% of the area is taken up by lanes and car parks (Municipality of Tehran, 2018). The number of daily trips made by Tehranis is impressive: 12 million (Traffic Police, 2018). In the current state of Tehran, there is no doubt that it is difficult to move around in this megalopolis of nearly 15 million residents, which is so congested and suffocating due to the dense and chaotic traffic (Mina Saidi-Sharouz, 2015). The population of the city's periphery is growing at an

incredible rate. Migration from other provinces of Iran is gradually beginning to settle in the new cities as "dormitory towns". These cities are accessible just by the road and sometimes highway links. The new residents of these cities may suffer from a social and spatial fragmentation that has been imposed by national and international governance. Today, more than ever before, the municipality is improving its relationship with the population in order to restore the lost trust. In this perspective, at the national level, the municipality encourages the latter to participate in different urban projects through various representatations (urban, economic, religious, cultural, etc.).

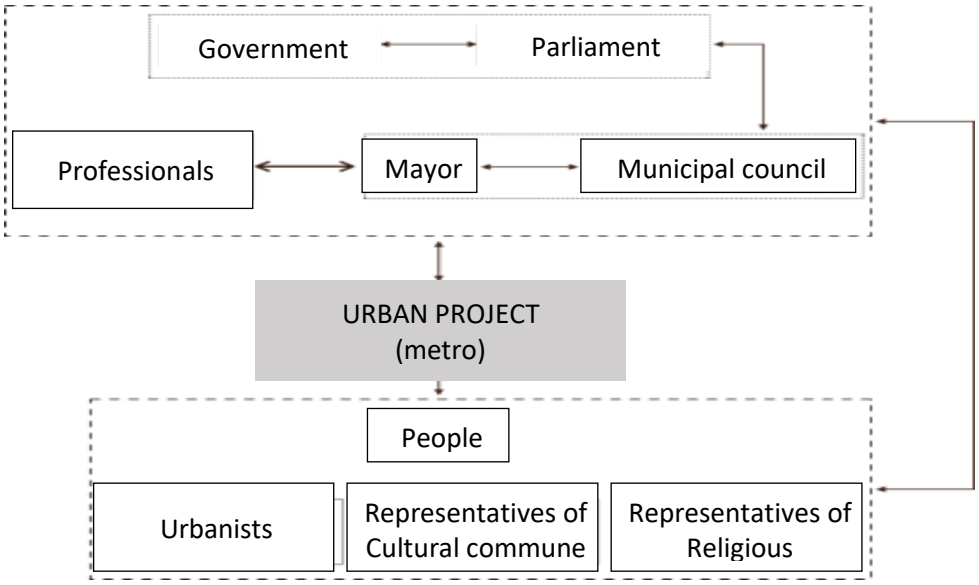


Figure 7: The model of urban governance to accelerate metro development
Source: Alireza Hashemi Behramani, 2018

4. POLLUTED AIR: THE CAUSE OF THE DEGRADATION OF PUBLIC HEALTH QUALITY

Global greenhouse gas (GHG) emissions covered by the Kyoto Protocol reached almost 49 billion tonnes of CO2 equivalent in 2010 according to data from the Intergovernmental Panel on Climate Change (IPCC). Between 1970 and 2010, emissions increased by 80%, essentially due to the doubling of energy consumption in the world over this period. The huge majority of these emissions are related to the consumption of fossil fuels. Transport is the reason for a considerable amount of non-renewable resource consumption and greenhouse gas emissions.

Transport is the reason for a considerable amount of non-renewable resource consumption and greenhouse gas emissions. It holds the second largest share (29%) of total energy consumption. According to the report of the US Energy Information Agency in 2010, almost 30% of the total energy distributed in the world was used for transport, most of it in the form of liquid fuels (International Energy Outlook, 2010).

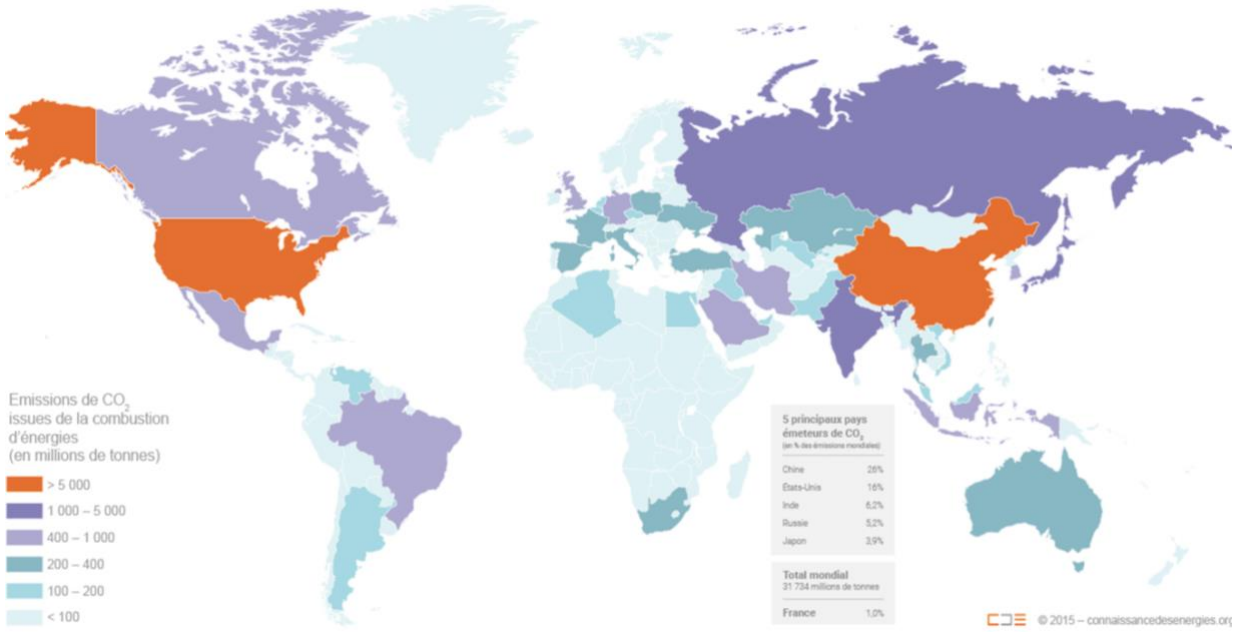


Figure 8: Map of greenhouse gas emissions from energy combustion by country
Source: Energy Literacy, based on IEA data (2010)

In this sense, Iran's capital has been affected by a strong wave of pollution for several years. The concentration of fine particles (PM2.5) reaches up to 185 micrograms per cubic meter in the south of Tehran and 174 in the centre on certain days (http://airnow.tehran.ir/map/gmap.aspx). For comparison, the World Health Organisation (WHO) recommends a level of less than 25 µg/m3 on average over 24 hours (https://www.deplacementspros.com). The reason for air pollution is the so-called "thermal inversion" phenomenon, which is also influenced by the geographical location of the city of Tehran.[10]

- Cold air at high altitude blocks the warm and polluted air: More precisely, the temperature difference between the mountains and the plains causes the air to flow from the mountains to the plains (north to south) at night and from the plains to the mountains (south to north) during the day. After sunset, the mountainous parts of the city cool down faster than the southern parts, (Micholet, 2014) due to their stony mountain surface, therefore the cold air moves gradually and slowly towards the southern part of the city carrying all the dust and smoke in suspension. Immediately after sunrise, the mountainous areas of the city start to heat up, the air rises and there is a demand for air from southern areas to replace it. The air is stuck in thermal inversions, without circulating or mixing with the outside air, and pollution from industrial centers, cement factories, refineries and cars remains in the city, limited only to drift from north to south.
- The development model of the Tehran metropolitan area: the air pollution of the capital is reinforced as a result of the morphology of development and the misplacement of the difference in appropriation. For example, industries producing construction equipment are concentrated on the plateaus at the southern end of Tehran. Factories and industries are located in the west. To precise the development trend of the Tehran metropolitan area, which is rather focused on the east-west axis towards the west, two additional elements should be considered. The winds blowing from the south and west bring the smoke from the industrial area and also the residential area which is located in the west of the metropolitan area towards the centre of Tehran metropolis. For this reason, the majority of the city which is located in the metropolitan area of Tehran and more specifically the city of Tehran located in the east of this region suffers from air pollution problems.

  We can confirm that the city of Tehran has indeed entered a state of dangerous air quality for the city's residents. This year, the absence of rain due to climate change at the beginning of the autumn has further exacerbated the problem. The authorities have to take measures to reduce the amount of pollutants in the atmosphere by considering different policies either in the short term or in the long term.

[10] Tehran is a city that is situated between the mountains to the north and the desert to the south.

The long-term policy vision	The policy envisaged in the short term (some days)
• Possibility of traffic within a pre-defined limit following the even and odd car registration number.	• Suspension of the sale of the city centre access permit, valid for one day.
• Possibility of circulation within a pre-defined limit following the registration number of the odd and even car.	• Restrictions on traffic of even and odd car numbers per house
• Determining a 70km radius from Tehran city for polluting industrial activity.	• Interdiction on traffic for the trucks.
• The provision of petrol with less harmful emissions corresponding to Euro 4 standards11.	• Closing of schools and in some cases offices.
• The construction of a highway bypass in order to control freight traffic through the capital.	• Restriction of the daily closure of mines and cement plants in Tehran province.

Figure 9: Policies to reduce air pollution
Source: Alireza Hashemi Behramani

The impact of air pollution is clear in the health field. According to health researchers, we can observe increased cardiovascular and respiratory mortality, and hospital admissions for cardiovascular and respiratory diseases, COPD[12] and thus acute myocardial infarction for short-term exposure (Naddafi et al. 2012).

In addition to the above mentioned issues, the problem of climate change caused by the emission of greenhouse gases, directly and indirectly, influences public health. From this point of view, the need for action at the international and national levels is clear to all stakeholders and the population.

4.1 Improving public health using governance

At the international level, environmental governance has been successful in controlling climate change. In this process, the COP21 agreement proposes two types of commitments to reduce greenhouse gases. It is necessary to have a commitment from each country at the local level and at the international level. For example, at the international level, we can see the financing of the action against climate change.[13] On the other hand, the fund called the Green Climate Fund is intended to help developing countries to make efforts to reduce GHG emissions.

Despite Iran's acceptance of the proposed commitments under the COP21 agreement, we do not see any significant progress. The Environmental Research Group at the University of Tehran states that despite existing potentials among players and the population, the economic problem imposed by the US sanction does not allow them to act in this way. Furthermore, Iran cannot receive the financial assistance offered by the COP21 agreement as a result of the banking sanction imposed by the US.

The following table shows some examples of approaches developed by the city of Tehran with the cooperation of international companies in the field of transport in order to reduce the impact of air pollution on the climate. Unfortunately, the cooperation following the sanction have been cancelled or are under serious threat.

Company name	Field of activity
• The Stadler Rail Company from Switzerland.	• Cooperation agreement for the construction of underground railway carriages.
• The Japan International Cooperation Agency (JICA).	• Supply of air pollution measurement and analysis equipment to support environmental improvement in Tehran.
• The Amberg Company from Switzerland.	• Agreement to carry out a feasibility study for the construction of a railway tunnel.

Figure 10: Activities threatened by international sanction.[14]
Source: Alireza Hashemi Behramani**,** 2018

We have seen that sanctions against Iran have directly influenced public health in the city of Tehran. In the face of this challenge, it is important to take advantage of the advice of the COP21 agreement,

[11] There is no car that uses diesel in Iran, except for the heavy truck.
[12] COPD stands for chronic obstructive pulmonary disease.
[13] The 100 billion dollars per year of funding from developed countries to the South must constitute a floor from 2020.
[14] This list shows just a few examples of cooperation contracts that are threatened by the sanction. There is a significant number of relationship in the field of public transport, in order to keep the economic security for companies working with Iran, we do not publish more examples.

which gives importance to non-governmental stakeholders: companies, communities, NGOs, etc. (COP21, 2015) in order to continue building a more sustainable world. In this regard, international stakeholders and more active Iranian stakeholders must present risks created by the US sanction against the public health of the Iranian people and the world.

- The Iranian player is in action: At the international and national level, in order to solve the problem of developing the transport system, especially by rail, the government needs to make it a coordination priority to respond to the problems posed by the traffic that impacts public health. The Tehran City Council is the main stakeholder in the development of the public transport network. Due to its presence in different international organisations, it is necessary for the municipality to raise this issue in order to eliminate the international sanction that impacts the health of the city's citizens.

Organisation	Description
Asian Mayor's Organization	• To encourage cooperation between cities, municipalities and local governments across Asia ; to increase prosperity and improve the quality of life of citizens; • Strengthen urban management through the expansion of city-to-city cooperation and multilateral collaborations among cities; • Promote and facilitate citizens' participation in achieving sustainable urban development; • To support best practice benchmarking in urban management among Asian cities to address their common challenges; • To promote and facilitate networking among cities, municipalities and local governments through the exchange of information and experiences in areas related to urban management; • To encourage interaction and cooperation among Asian cities and citizens in various fields, including cultural, social, economic, political, environmental and scientific.
Organisation	**Description**
Creative Cities Network	• The UNESCO Creative Cities Network (UCCN) was created in 2004 to promote cooperation with and between cities that have identified creativity as a strategic factor for sustainable urban development. The 180 cities that currently form this network work together towards a common goal: to place creativity and cultural industries at the heart of their development plans at the local level and to cooperate actively at the international level.
World Association of Major Metropolises	• The largest association of major cities in the world.

Figure 11: International organisation capable of influencing the sanction the United States
Source: Alireza Hashemi Behramani, 2018

- ***The international player in action:*** Today, all cities and most companies are starting to use different policies in order to reduce their impact on the environment, which from the financial prospective is expensive and the issue is difficult to establish at the policy level. The case of the development of Tehran's rail transport sector, which met with problems imposed by the international policy sector, resulted in a good outcome regarding GHG reduction. We may wonder why companies in the transport sector and banks that spend money to reduce their ecological impact and finance projects that do this should accept arbitrary sanctions.

In fact, this is the opposite of the policies that they have chosen to follow. Researchers working to raise awareness about global warming, public health and public transport should not remain silent in the presence of this problem that threatens the planet due to geopolitical decisions.

5. CONCLUSION

Multi-scale governance is recognized not only as a process of coordination of stakeholders, but also of appropriation of resources in order to have a new form of territoriality. In this context, the territory is not reduced to a simple spatial and administrative level, but is instead imposed as a permanent social construct. In other words, that governance implies geographical proximity, organisational proximity and institutional proximity of stakeholders. From this point of view, today, while the world aspires to achieve ambitious objectives, including the Sustainable Development Goals and the Paris Climate Agreement, sanctions against different countries, most particularly for Iran, the geopolitical problem threatens the partnership and

governance at the international and local level. The importance of developing subway networks in the city of Tehran is very obvious to all the concerned stakeholders. Moreover, as a result of the change of scale of Tehran city entering the process of metropolisation, we observe the importance of rail transport in this metropolitan area. Unfortunately, the governance and stakeholders play at a different scale, instead of facilitating the development of the rail transport system, they have put obstacles in the way of meeting public interests.

- **At the national level**, the problem of the politicisation of the development of the rail transport system is also impacted by the metropolitan process. In this regard, it is negligible to create a new mode of governance. It means possessing a metropolitan-wide transport organisation to better coordinate and cooperate with the development of the rail transport system. This lacks legalisation by Iranian law in order to benefit from a regional scale governance.
- **At the international level**, the company involved in the development of the transportation system must escape the geopolitical strategies imposed by the politicians and the sanction of the United States that target the health and public economy of the Iranian people. In this prospective, a coordination model based on humanity interest must replace the coordination model based on geopolitical interests. In order to achieve SDGs 11 and 17 which are accepted by all countries of the world, powerful countries such as France, China, England and Russia must come up with an international mechanism that facilitates exchanges and partnerships which are necessary for public health.

In conclusion, we could say that the problem of air pollution in Iran is not only a local problem. It influences global warming on a global scale. This is why it is necessary to operate on a global level in favour of local levels and vice versa.

Human beings are parts of a single body,

They are created from the same essence,

When one of these parts is affected and suffers,

The others are not able to find peace and calm,

If the misery of others leaves you indifferent,

And yet without the least sorrow!

Then: It is unthinkable to call you a human being.[15]

REFERENCES

[1] Ascher, F. (1995). Métapolis, ou l'avenir des villes, In : Les Annales de la recherche urbaine, N°71, Gares en mouvements. pp. 169-170.
[2] Ascher, F. (2001). Les nouveaux principes de l'urbanisme, La n des villes n'est pas à l'ordre du jour, l'Aube, La Tour d'Aigues.
[3] Boisseaux, S. Faure, A. Leresche, J. Muller, P. Nahrath, S. (2011). penser la territoriale des changements d'echelle. 5eme Congres international des Associations Francophones de Science Politique, Apr 2011, Bruxelles, Belgique.
[4] Da Cunha, A. (2004). pp. 5-28 dans Jakubec J (eds.) Le Développement durable, Un bilan multisectoriel provisoire.
[5] Da Cunha, A. et Both, J. (2004). Métropolisation, villes et agglomérations : structures et dynamiques socio-démographiques des espaces urbains. Berne/Neuchâtel: Office fédéral de la statistique. ISBN 3303020841.
[6] Deboulet, A. (2005). La gestion de la ville par automobile.
[7] Ghazi Zadeh Hashemi, H. (2017). conférence de la santé publique, 2017
[8] Hashemi, M. (2017). Élection municipal de la ville de Téhéran, program de la maire pour la ville de

[15] The poem by Saadi, the Iranian poet, which is promoted in the United Nation.

Téhéran.
[9] Hourcade, B., Habibi, M. (2005). Atlas de Téhéran Métropole. Téhéran : TGIC-CNRS.
[10] Le Gales P. (1995). Du gouvernement des villes à la gouvernance urbaine. In: Revue française de science politique, 45e année, n°1, pp. 57-95.
[11] Lefevre P. (2009). Métropolisation et gouvernance urbaine : les dynamiques territoriales du nou- veau régionalisme dans les agglomérations de Los Angeles et San Francisco. Géographie. Uni- vériste Toulouse.
[12] Naddafi. K, Hassanvand. M, Yunesian. M, Momeniha. F, Nabizadeh. R, Faridi. S, Gholampour. A, (2012). Health impact assessment of air pollution in megacity of Tehran, Iran, Iranian Journal of Environmental Health Science & Engineering.
[13] Nicolas Michelot. L'influence des topoclimats sur la pollution de l'air aux particules dans le sud- ouest des Alpes-Maritimes. Géographie. Université Nice Sophia Antipolis, 2014. Français.
[14] Offner J.-M. et Pumain D. (1997). Réseaux et territoires, significations croisées. In: Annales de Géographie, t. 106, n°597, pp. 549-551.
[15] Ollivro, J. (2000). L'homme à toutes vitesses, In: Les Annales de la recherche urbaine, N°88, 2000. Des métiers pour la ville. pp. 157-158.
[16] Osmet, A. et al. (2008). Analyses et propositions du groupe de réflexion sur la gouvernance urbaine.
[17] Pesqueux, Y. (2007). Gouvernance et privatisation. PUF, pp.259, La politique éclatée.
[18] Pini, G. (2005). De la mobilité à la mobilité durable: politiques de transport en milieu urbain. In DA CUNHA A. et al. (dirs.), Enjeux du développement urbain durable. Lausanne: Presses polytechniques et universitaires romandes, pp. 77- 102.
[19] Saidi-Sharouz, M. et Guérin-Pace, F. (2011). la mobilité quotidienne des femmes dans la ville de Téhéran : entre visibilité et invisibilité, L'Espace géographique, vol. tome 40, no. 2, pp. 176-188.
[20] Stattictque de la police de trfic, 2018.
[21] Stoker, G. (1998). Cinq propositions pour une théorie de la gouvernance, Revue Internationale des Sciences Sociales, n°155, pp. 19-30.[1][1]Stone, C. N. (1993), Uurban regime and capacity of govern. Political Economy Approach. Journal of Urban Affairs, 15: 1–28.

Site internet:

[22] https://www.ikco.ir/fa/Intro.aspx (2019)
[23] http://airnow.tehran.ir/map/gmap.aspx (2018)
[24] https://www.connaissancedesenergies.org/sites/default/files/pdfactualites/co2_emissions_from_fuel_combustion_2014.pdf (2018)
[25] https://www.connaissancedesenergies.org/fiche-pedagogique/cop21-conference-sur-le-climat-de-paris (2019)
[26] http://www4.unfccc.int/submissions/indc/Submission%20Pages/submissions.aspx (2019)
[27] https://www.iea.org/publications/freepublications/publication/CO2EmissionsfromFuelCombustionHighlights2017.pdf (2019)
[28] https://www.deplacementspros.com/Importante-pollution-de-l-air-a-Teheran_a46160.html (2019)

International Scientific Journal of Urban Planning and Sustainable Development
© URBANIZM
ISSN: 1811 - 6582
Dunja Kovari-Binggeli
www.journalurbanizm.org
No. 27, 2022, p.33-44
DOI: 10.58225/urbanizm.2022-27-33-44

TOWARDS A GOOD URBAN CLIMATE – 12 RULES FOR STRATEGIC AND SPATIAL INTERVENTIONS

DUNJA KOVÁRI-BINGGELI
Co-founding partner of SA_PARTNERS, Switzerland

ABSTRACT

Global climate change results in an increasing number of extreme events such as heavy precipitation and droughts, prolonged heat and the associated formation of heat islands in cities around the world. Cities and municipalities are however vulnerable to such extreme conditions and rapid changes and need to develop innovating ways of coping with these challenges. In this paper, we argue that a good urban climate is a stepping stone to a livable environment for healthy communities and that the promotion of climate-adapted developments can lead to significantly more robust and resilient cities and communities. By producing a practice-oriented know-how and illustrating our points with three concrete urban design and planning projects, we not only point out the relevance of integrating urban climate considerations into urban design and planning projects, but also take a step forward in bridging climate research with urban planning and design practices.

Keywords: Urban climate; climate adaptation and mitigation strategies; cross-sectional planning; climate-adapted urban design; resilient planning.

1. INTRODUCTION

Global climate change results in increasing extreme events such as heavy precipitation and drought, prolonged heat in cities and the associated formation of heat islands around the world. Cities are however vulnerable to such extreme conditions and rapid changes. The longer they are exposed to the consequences of climate change, the more challenging it becomes for cities and municipalities to ensure a pleasant and livable urban environment. Especially in previous decades climate change has manifested itself most evidently as a raise in near-surface temperature [6]. Urban climate has therefore become an increasingly relevant topic, shaping the urban settlements. Measures to promote a good urban climate compensate the consequences of global climate change and lead to significantly more robust and resilient cities and communities.

There are many reasons to promote a good urban climate. First of all, it is beneficial for the economy. Green technologies and smart solutions provide important impulses for a competitive economy. Investing in a good climate means investing in a healthy economy. A good climate has also increasingly become a societal and cultural theme. Climate change has established itself in the consciousness of the society and is leading to a shift in values, everyday culture and politics. A good climate also means a higher level of physical and mental well-being for the population. According to the World Health Organization, climate change is the biggest health threat facing humanity today [19]. Promoting a good urban climate can therefore mitigate the negative impacts of climate change on public health. A good urban climate is a stepping stone to a livable environment for healthy communities.

The benefits of a good urban climate are apparent. However how do we actually achieve it in today's cities? In our in-house Spacelab, we are looking for climate-adapted urban solutions that aims for the robustness and resilience of our cities and communities. Our research aims to produce a practice-oriented know-how that generates simple and applicable solutions for a better urban climate, and therefore establish a bridge between climate research and urban planning & design practices. This paper not only reveals the

findings of our research, but also exemplifies them in three of our selected urban design & planning projects.

2. URBAN CLIMATE: A CROSS-SECTIONAL TASK

In the center of our approach, the urban climate is understood as a cross-sectional task with multiple interactions and synergies between different disciplines [see figure 1]. The interdisciplinary approach requires a well-established dialogue between the urban climate related issues and the other relevant fields of urbanism such as mobility, urban design & planning, politics, economy etc [2,17]. Moreover, it is key to our approach to assure the interaction between different scales. The greatest and broadest possible impact is achieved when the urban climate is integrated into the higher-level plans at the strategic, conceptual level and is concretized at the appropriate phase of the subsequent planning and design processes.

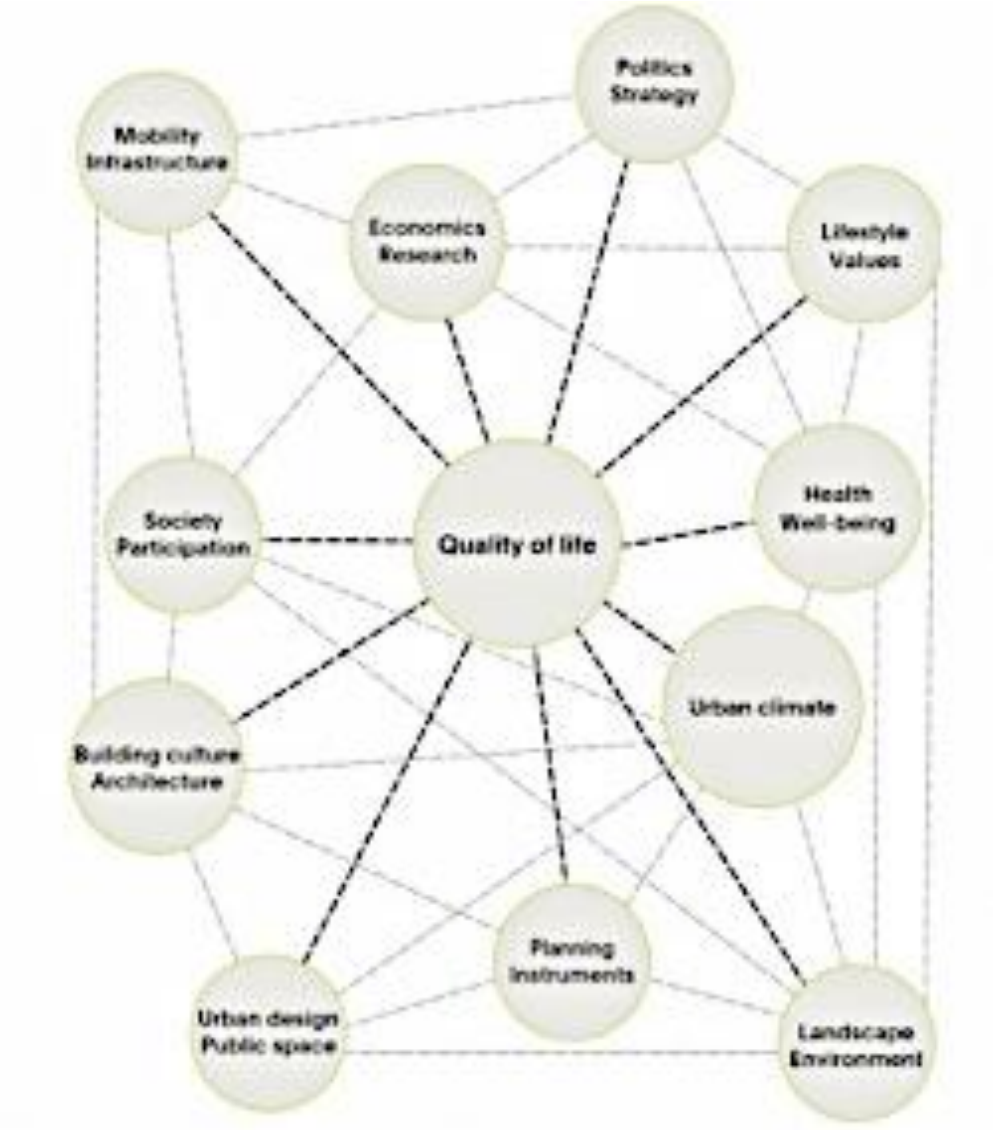


Figure 1. Urban climate as a cross-sectional task [8]

3. 12 RULES FOR A GOOD URBAN CLIMATE

Urban climate being a complex phenomenon, one of the main challenges of our research is to decipher and simplify its complexity and translate it into guidelines for easy implementation. For that reason, we gathered 12 simple rules for a good urban climate, that aim to guide the design and planning processes towards a climate-adapted urban planning and design. By applying these rules, one can contribute to a good

urban climate and at the same time improve the livability of the urban space. The 12 Rules for a good urban climate are:

1] Avoid soil sealing
2] Promote greenery
3] Encourage natural green spaces
4] Ensure an adequate ventilation
5] Arrange buildings correctly
6] Prioritize shading
7] Optimize the choice of materials
8] Develop networks of open spaces
9] Benefit from water
10] Enable smart solutions
11] Collaborate with the business community
12] Encourage participation

4. TIPS FOR EFFECTIVE IMPLEMENTATION

In order to apply the rules for a good urban climate in design and planning processes, they are translated into spatial actions and tips for implementation. The tips for a good urban climate are divided into six key areas of action: Buildings, open space, greening, sealing, emissions, participation. Figure 2.

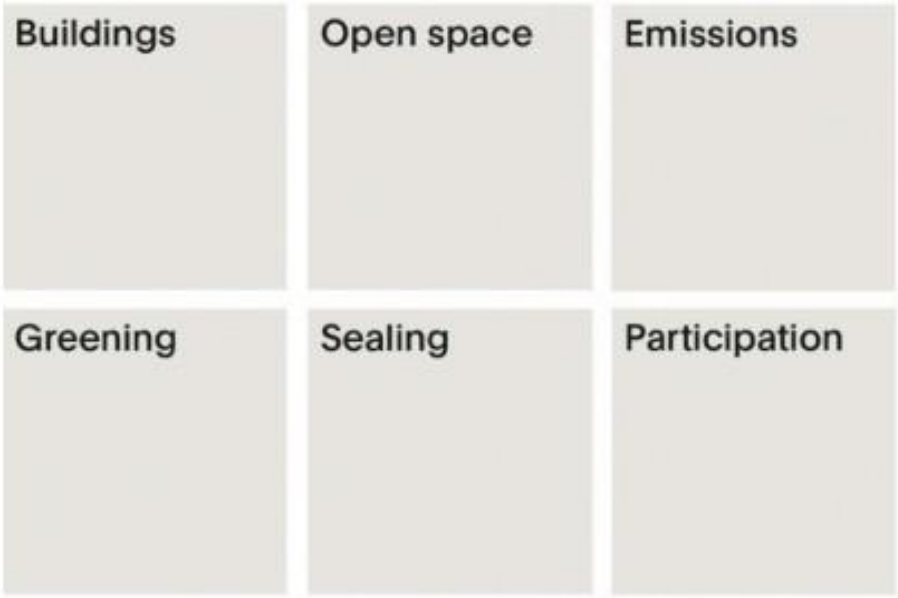


Figure 2. Key areas of action [8]

4.1 Buildings

Buildings affect the urban climate through waste heat and emissions. They block natural airflow, trap solar radiation, and increase air temperature due to their impermeable surfaces. However, when designed with climate-adapted solutions in mind, buildings have the potential to act as urban climate infrastructure, actually mitigating heat rather than causing it. Well-arranged buildings shade paths and squares within the settlement, and encourage cold air circulation [7]. Especially the high- rise buildings can be used to regulate the urban microclimate once located considering the natural airflow. There are also measures to be taken in building scale. Suitable building materials reduces the residual heat from surfaces reflecting the sunrays. Roof and façade greenings can modify the city ecosystem and mitigate the urban heat island effect. Moreover they improve the building insulation prominently and therefore can decrease the use of air-cooling systems [1]. Immediate surroundings of the buildings such as unsealed courtyards and backyards have also proven to mitigate the near-surface temperature raise [7].

4.2 Open Space

The successful protection, creation, and development of open spaces is one of the key elements required to achieve a good urban climate. Parks, unpaved, and biologically active green areas of every size can help cities adapt to climate change by cooling and enhancing the quality of air, providing shade, and offsetting the urban heat island effect. A well-connected network of open spaces serve as air corridors. They bring fresh air and cool down the surrounding settlements [7]. Water is also an important element of the open

spaces in urban areas that help reducing the local temperature and increase the retention capacity during heavy rainfalls [11].

4.3 Greening

Greenery compensates the impacts of climate change in cities. Vegetation in general counteracts the local negative climatic effects of the built environment. Greening can be implemented in various scales from vertical and horizontal greening of buildings to large scale areas of forestation. Many uses in urban fabric such as public spaces, parking lots and even public transport infrastructure offer potential for greening. Greening does not only contribute to the quality of the stay, but also supports the biodiversity and local fauna of urban spaces [18].

4.4 Sealing

Unsealed surfaces help balancing the urban temperature. When designing squares, parking lots and driveways, surfaces that can drain water must be used. They have a cooling effect through the evaporation of water. At the same time they store less heat than sealed surfaces [15].

4.5 Emissions

Air pollution from traffic, industry, commerce and heat generation plants affect the urban climate. It is possible to reduce emissions, and therefore improve the urban climate through smart solutions. Some examples to these smart solutions are; encouraging sustainable and smart modes of transportation through urban policies and climate sensitive design, promoting technological advancements and digitalization, smart ways of collecting and reusing water.

4.6 Participation

The success of urban climate policies depends upon participation by the citizens and the relevant actors. They often require the design of inclusive planning processes and broad acceptance on the part of the population [14]. So only together with all relevant stakeholders and the participation of the citizens, can urban climate policy work to its full potential. In order to enhance participation, new forms of collaborative digital platforms can be developed. Digital platforms encourage implementation among key stakeholders [13].

4.7 Examples from the Practice

To illustrate the theoretical concepts behind practical implementation, three exemplary projects from our urban design & planning agency are presented: the toolbox for the “sponge city” demonstrates the importance of using multi-scalar strategies to promote a good urban climate, the spatial development concept of the Swiss town of Rheinfelden highlights an integrative approach to climate as a cross-sectional task, while the vision for an urban district in the Swiss city of Bellinzona shows how the themes of greenery, biodiversity and circularity can be integrated into an urban design project.

5. A TOOLBOX FOR THE “SPONGE CITY”

The concept of “sponge City” - Sponge city is a bioclimatic and context-specific urban planning concept, that aims to increase urban flood protection in restoring degraded environments or designing natural habitats, with a focus on their resilience to water [12]. A well-designed “sponge city” is a closed water loop. A closed loop helps mitigating the frequency and severity of the flood risk, improves water quality while increasing the reuse of water and reducing water waste. It also improves air quality and reduces the near-surface temperature and therefore contributes to a good urban climate. Its benefits are not limited to infrastructural matters. The “sponge city” also provides relaxing amenity spaces such as urban parks and water squares for its inhabitants with its well-thought open spaces while increasing the biodiversity. Figure 3.

Figure 3. Benefits of the "sponge city" **Source**: own figure.

Especially in the areas with rich natural waterscape, the toolbox provides guidelines for designing with water by introducing a water sensitive urban development scheme, the "sponge city", while offering eco-sustainable living spaces through relevant nature-based solutions for mobility, recreation, production and education strategies.

Nature based solutions - Nature-based solutions [NBS] is an umbrella term that describes approaches that "use nature and natural processes for delivering infrastructure, services, and integrative solutions to meet the rising challenge of urban resilience" [16]. NBS can provide multiple benefits to cities while targeting various societal challenges [3]. Moreover they also contribute to restore biodiversity, create opportunities for recreation, improve human health, water and food security, and support community wellbeing and livelihoods. Especially amid the climate crisis, NBS are increasingly seen significant to mitigate the impacts of climate change [4].

The toolbox for the "sponge city" is composed of various NBS with a special focus on water bodies that can be applied across spatial scales in urban areas. Examples include small scale green spaces and blue elements on buildings such as façade greenings or retention pools, green and blue corridors, larger areas with wetlands and forests, sheltering cities from flooding and improving availability and quality of water. Figure 4.

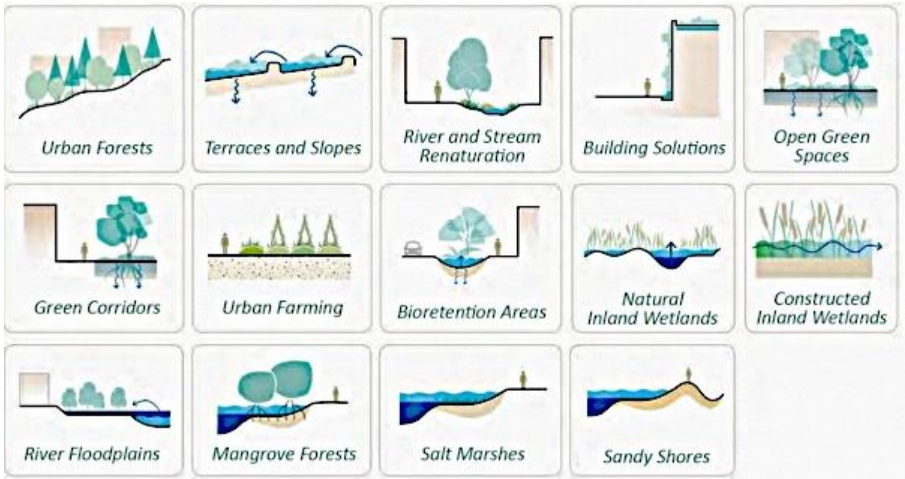


Figure 3. Benefits of the "sponge city" **Source**: own figure

The toolbox introduces a multi-scalar strategy with three key areas of intervention: Buildings, public spaces and streetscape, large scale landscape elements. Figure 5].

Figure 5. "Sponge city" key areas of intervention [source: own figure]

Building solutions include adding green surfaces to building roofs and facades, creating opportunities to capture, store, and reuse storm water, improve air quality, and reduce temperatures. [1] They provide urban flooding and heat reduction benefits, and at the same time they can reduce costs by enhancing efficiency of climate control systems in buildings. The water- sensitive street design is composed of bioretention areas, underground water storage and rain sewer, use of permeable and reflective materials. [16] Figure 6.

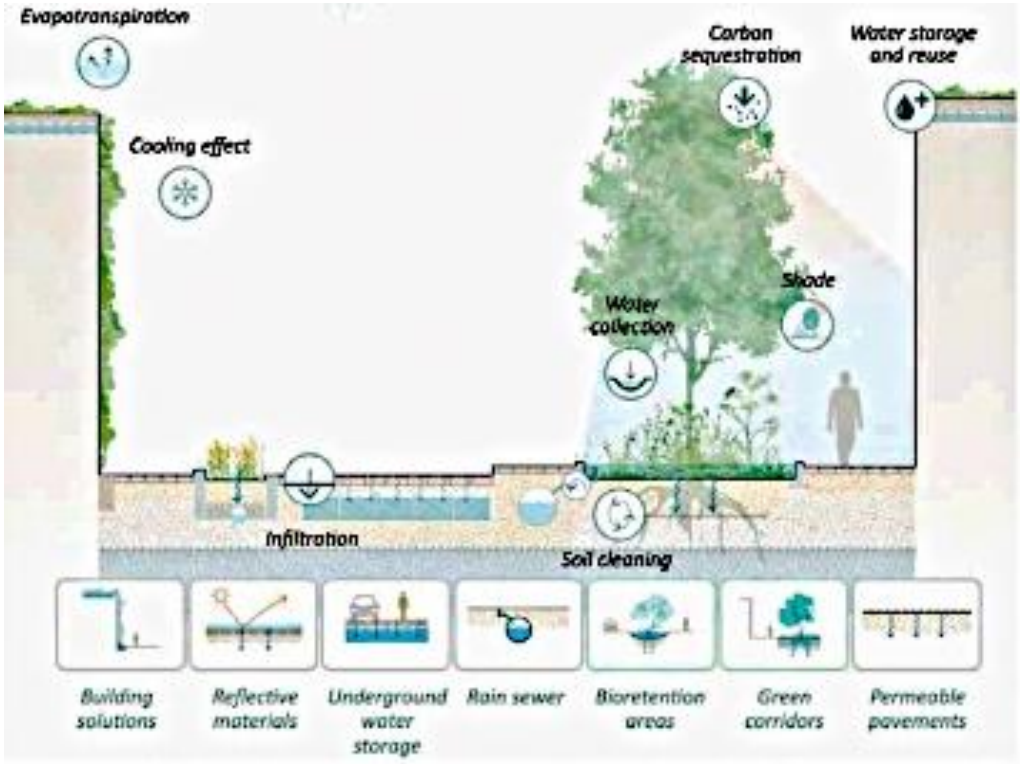


Figure 6. Exemplary street design with "Sponge city" principles [16]

Large scale landscape elements also play an important role in shaping the sponge city. Riverbed is safeguarded with the introduction of wetlands. Natural or engineered, wetlands are highly diverse ecosystems that form an interface between land and water. They supply valuable ecosystem services, working as a natural sponge against flooding and drought and help mitigate the consequences of climate change [11].

The tools for the "sponge city" can be applied to various contexts based on the local needs and opportunities. Once implemented, they improve the urban climate and contribute to the resilience and robustness of the area.

The tools for the "sponge city" can be applied to various contexts based on the local needs and opportunities. Once implemented, they improve the urban climate and contribute to the resilience and robustness of the area.

6. TOWN OF RHEINFELDEN – CLIMATE-ADAPTED SPATIAL DEVELOPMENT CONCEPT

The spatial development concept serves as the most important instrument for integrative planning, coordination and control of spatial development and forms the basis for subsequent land use planning. Between control and "laissez-faire", it ensures on the one hand a robust basic framework for the development of the city and the surrounding landscape and at the same time leaves room for flexibility. It shows long-term perspectives and secures room for maneuver for the next generation. Climate-friendly development as a cross-sectional task and central component of the spatial development concept plays an important role.

Climate-adapted spatial development concept - The project approaches the climate-adapted urbanism through a multi-scalar perspective of urban planning and process design. The implementation of efficient measures is of great importance for a good urban climate. Urban planning strategies have a key role during the implementation. The cities and municipalities can play three main different roles in implementation of climate-adapted strategies: active initiation, consultation and incitation. Figure 7.

Figure 7. Cities' and municipalities' role in the implementation of climate-adapted strategies [8]

Active initiation means that the municipality takes the lead in implementation of a certain strategy. In the case of consultation, the city or municipality advises actors, e.g. from the private sector, on the implementation of measures already planned in order to promote a good urban climate. Finally, the city or municipality can motivate and train third parties to implement new measures.

The spatial development of the town of Rheinfelden is embedded in the context of national, cantonal and regional developments in Switzerland. Rheinfelden is part of a tradition of high-quality, holistic planning and development and continues this tradition with the climate-adapted spatial development concept.

Climate-adapted urban development - Strategy and vision - In its spatial development concept, the town of Rheinfelden gives high priority to the urban climate as an integral part of sustainable and resource-saving urban planning at the strategic conceptual level. The promotion of a good urban climate is a common thread running through the development concept. Different aspects of the development such as landscape, mobility, built environment are tackled as different layers of the climate adaptation strategy. Figure 8.

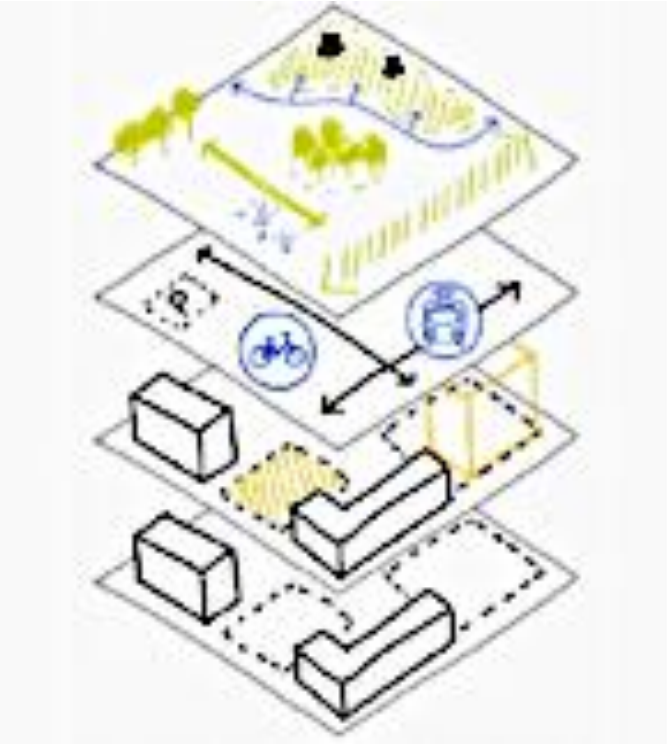


Figure 8. Layers of the climate adaptation strategy [8]

Methodology – urban climate support area - In coordination with urban development, landscape as well as mobility and accessibility layers, a large-scale urban climate support area is developed in the town of Rheinfelden. It consists of areal, linear and punctual climate structures. Figure 9.

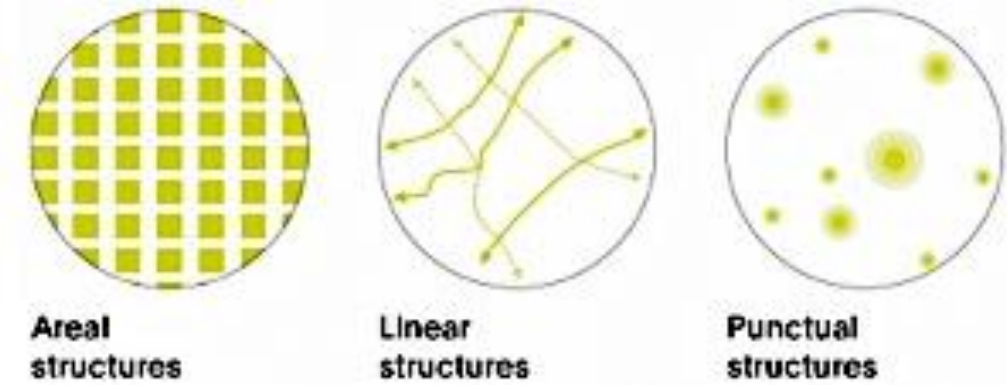


Figure 9. Areal, linear and punctual structures of the climate-adapted spatial concept [8]

Areal structures can be exemplified as zones, large-scale open spaces, forests. Linear structures are composed of green and blue corridors, streets and paths, as well as conceptional connections. Punctual structures, on the other hand, are point interventions. They represent a green building, an unsealed courtyard, pocket park or simply a point of intersection, connection to the river, entrance to a city etc [see figure 10]. The examples can be diversified depending on the context. Once these three structures are overlaid in the urban context, a comprehensive strategy for climate-adaptation can be created.

Figure 10. Town of Rheinfelden - Climate-adapted spatial concept [source: own figure]

Designing with trees - Urban trees play an important role in mitigating heat in urban areas and its adverse impacts on human health and urban infrastructure [7]. Trees provide shade and reduce air temperature, increase air humidity, adsorb air pollutants and reduce CO2 emission improving the quality of stay of an urban space [10]. The benefits of tree planting can be maximized through targeted and integral site design. For example collective parking strategies can help landscaping by freeing up space for trees in streetscape via reducing the on-street car parking. Protecting the exiting trees and integrating them into the design of the city are also important in urban transformation processes. Strategic areas are allocated for reforestation that will contribute to the natural restoration of the area.

Green and blue fingers as air corridors - Once efficiently designed, green corridors improve urban ventilation, allowing for cooler air to penetrate into the more densely built areas, and thus reducing the urban heat island effect. Green and blue elements are the protagonists of the spatial development concept. A well-connected green and blue network is essential to allow the cool air to reach into the residential neighborhoods, and therefore mitigate the urban heat island effect especially in denser settlements. An extensive green and blue network with a long-distance climate-enhancing effect.

Climate-adapted street design - Street, when designed climate-conscious, can improve the local climate. They can help minimizing the demand on energy intensive air-conditioning in vehicles and adjacent buildings. Greenings on urban streets are other important elements of the climate adaptation agenda that can help mitigate water pollution by absorbing and filtering storm water. In addition to green spaces, the permeable paving on streets also allows the storm water to reach landscape areas nearby while reducing storm water runoff. Adequate space for trees are reserved at the early stages of the planning process. A climate-adapted street design improves the street aesthetic and the quality of stay while delivering benefits to the community.

7. GREATER ZURICH AREA - URBAN LIVING LAB BELLINZONA

The project "Porta del Ticino - Urban Living Lab" is a pilot project on a national level that aims to create a sustainable, climate-friendly and livable urban district at a central inner-city location near the Bellinzona train station in Switzerland. The project aims to transform a large-scale former industrial area into a mixed-use neighbourhood while reinterpreting its industrial legacy with contemporary programs centered on an ethos of sustainability. Figure 11. The project focuses on adaptability and robustness - resilience - to future changes and extreme climatic, economic, social events. There are three main concepts that formed the climate-adapted scheme of the project: a robust green strategy, biodiversity and circularity.

Figure 11. Bellinzona Porta del Ticino areal view, **Source**: own figure

A Green oasis in urban center - The neighborhood is designed with a comprehensive green strategy. The backbone of the scheme is the "Allmend", a new, green area in the middle of the district, that is one hectare large [see figure 12]. Green areas of one hectare or more achieve a long- distance cooling effect [9]. Therefore, the Allmend is planned to act as a natural air conditioning system not only for the new development but also for the surrounding districts of the City of Bellinzona. The Allmend serves the population as a climatic compensation area that embodies various functions such as a community meeting place as well as an agricultural area for urban farming and local production.

Another important element of Porta del Ticino's green strategy is the roof and facade greenings. The buildings are planned to have horizontal and vertical green surfaces that will improve the local air quality, regulate the local air temperature and function as a thermal insulator, therefore reduce average household energy use. Green roofs moreover play a key role in water management via absorbing excess storm water. The buildings within the project area are also predominantly used for urban and vertical farming promoting local agricultural production.

Designing with biodiversity - Natural landscaping is an important factor in promoting biodiversity. Native plant species provide an important source of food and additional habitat for the local fauna. Ecologically diverse structures on the Allmend, community gardens and green roofs and facades also contribute to the diverse flora and fauna not only in the area of development but also for the whole City of Bellinzona.

Figure 12. Axonometric drawing of the green strategy, **Source**: own figure

Closed resource cycles - Porta del Ticino is designed as a closed circular system of resources. The value of the circularity is "maintained in the form of energy, labour and materials by keeping [them] circulating in the economy and reducing the dependency on raw materials" and waste [5] and therefore contribute to the robustness and resilience of the scheme. In the project, circularity manifest itself by means of energy production, local food production and water and waste management. The large portion of the required energy is produced by the photovoltaics on the roofs and on suitable parts of the facades. Rainwater is stored in courtyard ponds and green roofs and piped to greenhouses and community gardens. Organic waste is collected, processed and recycled as fertilizer in greenhouses and community gardens to close the neighbourhood's food production loop. figure 13

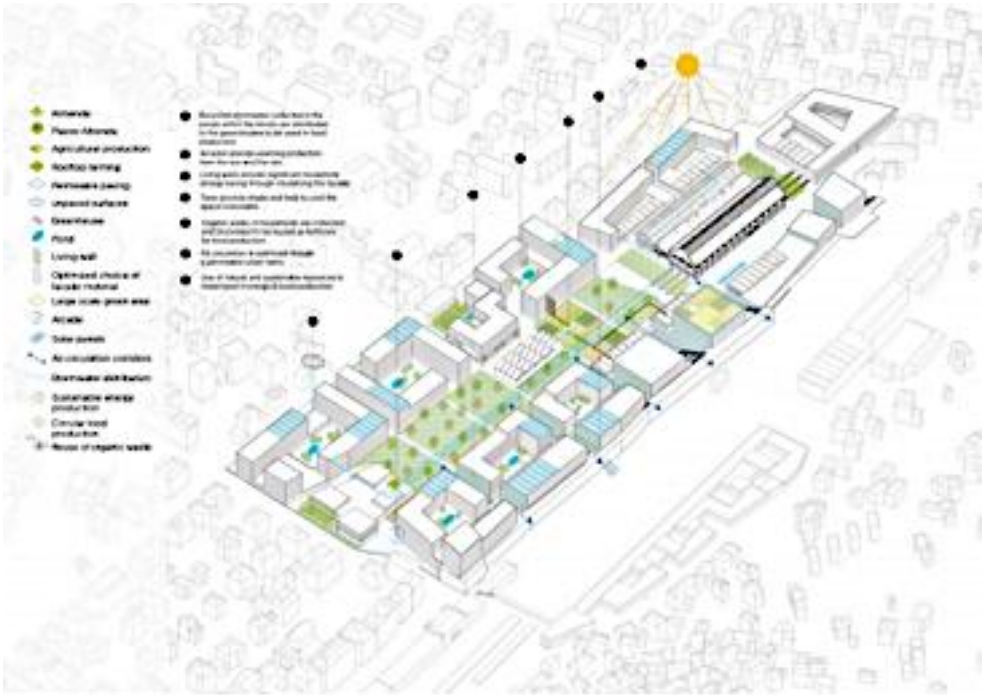


Figure 13. Closed resource cycles, **Source**: own figure

Participatory and resilient communities – The participation of the citizens play an important role in implementing the rules for the good urban climate. Porto del Ticino is a living lab suggests participatory strategies and a new form of collaborative digital platform, the Allmend app, that allows the future inhabitants to participate in planting activities, forming the community gardens, waste and water management strategies for the neighbourhood. Moreover a wide variety of public spaces such as farmers' market, series of urban squares are proposed that help building resilient communities. figure 14

Figure 14. Building participatory & resilient community building [source: own figure]

8. CONCLUSION

The findings of our research show that a good urban climate compensates the consequences of global climate change and lead to cities that are significantly more resilient to changing circumstances and extreme conditions. It is possible to improve the urban climate through urban planning and design actions. Our research and climate-adopted urban planning and design projects illustrate the possible contribution of our profession in reaching the good climate in cities. Three exemplary projects that touch upon different aspects of the climate research provide tips for simple implementation for establishing more resilient and robust cities and communities.

REFERENCES

[1] Barriuso, F., & Urbano, B. 2021. Green roofs and walls design intended to mitigate change in urban areas across all continents. 13 4, 2245.
[2] Fallmann, J., & Emeis, S. 2020. How to bring urban and global climate studies together with urban planning and architecture?. Developments in the Built Environment, 4, 100023.
[3] IUCN. 2020. Global Standard for Nature-based Solutions. A user-friendly framework for the verification, design and scaling up of NbS. First edition. Gland, Switzerland: IUCN. Retrieved from: https://portals.iucn.org/library/sites/library/files/documents/2020-020-En.pdf.
[4] Kiss, B., Sekulova, F. & Kotsila, P. 2019. International Comparison of Nature-Based Solutions. Naturvation: Project Report.
[5] O Callaghan-White, L. 2021. https://www.iiea.com/blog/resilience-and-the-circular-economy.
[6] Pachauri, R. K., & Meyer, L. A. 2014. Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change.
[7] Ruefenacht, L., & Acero, J. A. 2017. Strategies for cooling Singapore: A catalogue of 80+ measures to mitigate urban heat island and improve outdoor thermal comfort.
[8] sa_partners Agency for urban design and planning. 2020. 12 Rules for a good urban climate. Retrieved from: https://sapartners.ch/assets/docs/downloads/201005_Stadtklima-Brochure-Final-Englisch.pdf.
[9] Swiss Federal Office for the Environment. 2018. Hitze in Städten: Grundlage für eine klimaangepasste Siedlungsentwicklung. Bundesamt für Umwelt, Bern. Umwelt-Wissen, Nr.1812: 108p.

Site internet:

[10] UNEP, IUCN, TNC, WRI, Green Community Ventures, U.S. Army Corps of Engineers. 2014.
[11] https://wedocs.unep.org/20.500.11822/9291.
[12] UNEP. 2014. Green Infrastructure Guide for water management: Ecosystem-based management approaches for water-related infrastructure projects. UNEP. 2021. https://wedocs.unep.org/ bitstream/handle/20.500.11822/36586/SSRC.pdf?sequence=1&isAllowed
[13] United Nations Human Settlements Programme UN-Habitat. n.d. https://unhabitat.org/sites/ default/ files/2022/11/digital_rights_guide_web_version_14112022.pdf.
[14] United Nations Human Settlements Programme UN-Habitat. 2022. Retrieved from: https://unhabitat.org/sites/default/files/2022/06/wcr_2022.pdf.
[15] Vienna Environmental Protection Department. 2018. Retrieved from: https://www.lifetreecheck.eu/ getattachment/2fff480d-c43d-4bb1-3ef9b0ea6e7e/attachment%22.
[16] World Bank. 2021. https://openknowledge.worldbank.org/handle/10986/36507. 17 World Bank Group. 2011.
[17] https://climate-adapt.eea.europa.eu/en/metadata/guidances/guide-to-climate-change-adaptation-in-cities/11237802.
[18] World Health Organization. 2017. https://www.euro.who.int/__data/assets/ pdf_file/ 0010/342289/ Urban-GreenSpaces_EN_WHO_web3.pdf.
[19] World Health Organization. 2021. https://www.who.int/news-room/fact-sheets/detail/climate-change-and-health.

International Scientific Journal of Urban Planning and Sustainable Development
© URBANIZM
ISSN: 1811 - 6582
Ecehan K. Sozgen
www.journalurbanizm.org
No. 27, 2022, p.45-59
DOI: 10.58225/urbanizm.2022-27-45-59

RE-THINKING THE URBAN: THE THEORY OF AFFECT AND URBAN INTERIORITY AS A WAY OF THINKING NEW POSSIBILITIES

ECEHAN K. SOZGEN
Faculty of Architecture and Design, Pamukkale University, Denizli, Turkey

ABSTRACT

Body interacts with the space through undefinable, unpredictable actions and behaviors. Predictability disappears when the performativity of the body is taken into account. By dissolving and decoding the boundaries of space, the body challenges spatial dichotomy and prepares the new possibilities of thinking and understanding. Space becomes productive with new lines of escape and possibilities. Design as a temporary moment of intensity in the rhythm of daily life, on the other hand, recalls the affect that has been postponed in the academic field in architecture. At this point, *affect theory* together with *the concept of interiority* create a new discussion on space by questioning the existing theories. Affect plays a role in the spatial production of urban interiority; at the same time, urban interiority nourishes the affect.

Exploring the neglected dimensions of our daily lives and the relational aspects of experience that produce and shape it, thinking about body, subjectivity and desire with non-representational theory in the focus of space: this is where the study turns towards the theory of affect. It produces a new understanding of relationality and space built with interactions between human/non-human, body and city, reflecting on different subjectivities and a different perspective to understand the city. It lays the groundwork for the appropriation of cities through their affective capacities and layers.

In any case, it is not enough to think on urban space and architectural practice within disciplinary boundaries; they are in a constant state of formation and construction under the influence of different parameters. This study aims to rethink the concept of urban interiority through affect theory and aims to multiply questions about different becoming and possibilities rather than seeking answers.

Keywords: affect, urban interiority, subjectification, politics of desire.

1. INTRODUCTION

Although our primary encounters with the architectural and urban environment are complex and directly, they are still analogue. Because our bodies meet with the corporeal of the physical environment as actors and a condition of subjectivity. It is insufficient to analyze the space through the conventional and static body theories on space; hence, the body solves spatial boundaries and hierarchies and produces new relations. The solving of the Cartesian thinking system, which tries to understand human beings based on the separation of body and mind, has questioned the acknowledged canons of the body and space. Since the 1980s, under the transformative effect of body theories on space, new theoretical initiatives developed around affect theory has begun to problematize the relationship between affect and space more and more.

The affect theory opens a new discussion on space by questioning the existing perspectives and a series of delayed problems in the academic field. The first and basic question is that at what point does current urban and space theories limit the views and methods in understanding the space? At this point, space theories and "spatial turn" play a key role. Since the 1960s, with the shift of paradigm in understanding the space and the urban, new paradigms are being built and investigations and questions are still ongoing. In Deleuzian terms, the space is a becoming; it is not a given and complete. In this respect, affect theory based on relationality and becoming has come to the fore in recent years in space

and urban studies as an intellectual tool for a new way of looking. With the theory of affect, it is aimed to include a new way of looking at the urban space, to reveal its intellectual boundaries and to think about the possibilities of the urban interior in theory and practice. The study aims to explore the possible positions of affect theory in the perception of "urban interior" and how the concept of affect can work as an interface. Another problematic that activates the thought is the current ambiguous, flexible and implicit dimensions of the *urban interior* conceptualization. Re-reading the concept of urban interior through the texts including sometimes explicit and sometimes implicit assumptions, revealing the densities of thought and thinking about the new possibilities are among the main objectives of the study. In summary, the study aims to reveal "new lines of escape" through singularities, when viewed from Deleuze's intellectual horizon.

In this direction, the research questions were determined as follows:

1. What are the limitations of contemporary urban theory and space theories and why is there a need for a new reception method and perspective?
2. What is the viewpoint of affect theory towards the urban and space? What methods, tools and sub-concepts does it use to establish this view? What are its philosophy and practices?
3. What are the identifiable phenomena that suggest the presence of affect in the urban interior?
4. How does the concept of affect work as an interface in the conceptualization of the urban interior?
5. Does affect play a role in the spatial production of urban interior space in the practical field? If yes, what is it?
6. What are the possible positions of the urban interior when approached from the perspective of affect theory?

In line with these goals, the transversal methodology developed by Felix Guattari in the 1960s is used as a method in the study, and it is aimed to make visible, re-conceptualize and associate tacit knowledge with cross-disciplinary readings. Readings on affect and body theories on space through transversal methodology describe a path that traverses interiority, urban and space theories, and tracing different texts from different disciplines. Through this method, which is used to understand and explain spatial practices and discourses related to daily practices and sociological behavior patterns, it seems possible to read the spatial equivalents of affect theory through the accumulation of different disciplines, whether they are related or unrelated.

The study argues that space cannot be understood independently of affective forces, so the construction of the research begins with a critique of space theories. It returns to basic texts on spatial theories and re-reads. Rather than ignoring established theories, it desires to be able to offer a wide range of deviations and alternatives that move thought elsewhere. Then it leans towards non-representational theory. Considering that space is networked and its temporalities are rhythmic and non-linear, the need for a new insight and perspective is clear. While the non-representational theory offers the opportunity to overcome the silences and absences of unrepresented dimensions and layers and make them visible, on the other hand, it displaces the fixed gaze and produces new ones. Through the channel opened by the non-representational theory, urban is reconsidered. It is aimed to reactivate the spatial configurations, densities and practices that provide a kind of becoming, opening and discovery, by looking from the perspective of affect, which is underappreciated in the academic field of architecture. The affective perspective constantly problematizes the relationships between actions and passions, desires, subjectivities, and emotions. For this reason, one pillar of the affect theory is the processes of subjectification, and the other pillar is the philosophy of desire.

According to this content, it is planned to define the problem, purpose, scope and limitations of the study in the introduction. In the second part, the three components of the network that constitute the theoretical framework of the study; (i) spatial turn, (ii) non-representational theory and (iii) affect theory are searched in the literature. Then, their place in the study and the context in which they will be discussed are explained. In the sub-headings of affect theory, the body, the construction of subjectivity and the philosophy of desire will be discussed. In the next part, the methods and tools developed to comprehend the space through subjectivity, desire and affect theory will be examined and spatial examples will be given. The discussion will finally focus on the new possibilities of the concept of urban interior when considered with affect theory. The concept of urban interiority establishes its own existence with a break from the Cartesian paradigm. It is predicted that the knowledge of space, which is aimed to be reproduced through affect theory, will make it possible to read the concept of urban interiority with new terminologies. In the evaluation and conclusion part, it will be questioned how the theory of affect can contribute to the theory and practice of architecture, and the new perspectives and expansions that the concept of urban interiority will open after following its own lines, processes and

occurrences will be discussed.

1.1 Theories on Space and Spatial Turn

The concept of space and its changing conceptions date back to Ancient Greek philosophy and form its own conceptual framework. Space, which is one of the main problematics of philosophy, is constantly ontologically and semantically fringed with the concepts it is associated with and is always under construction. With these fringes and borrowings from different disciplines, the concept of space makes possible new expansions in the field of architecture, both theoretically and practically.

The concept of space was handled in an architectural context by the German sculptor Adolf von Hildebrand at the end of the 19th century, close to our current understanding. The sculptor, who wants to exhibit his productions, is in search of how the visitor perceives the art product. His analysis put the concept into circulation. Similarly, von Hildebrand's contemporary August Schmarsow approaches recognition through the psychology of space. Von Hildebrand and Schmarsow invented the concept of space in 1893 and put it on the agenda of art and architecture.

The process from the beginning of the 1900s to the Second World War covers the understanding of modern space and architecture as art [16]. This period is a quarter century in which the modern world was founded, the architectural space was canonized. Leading architects of the period, especially Le Corbusier and Russian constructivists approach architecture as it is an artistic activity. A design approach based on fluidity and dynamism dominates the period. The physicality and rationality of the space are in the foreground. As Le Corbusier emphasized in his book published in 1923, the aim is to create a dynamic, constantly moving mental collage that is perceived differently by movement. It can be said that Picasso was the pioneer of this approach; discovers collage technique in painting and ends the figurative approach in his portraits. Collage technique refers to the bringing together of more than one perception in the mind and brings the concept of simultaneity to the fore. This approach evolves into an uninterrupted understanding of space; its leading figure becomes Villa Savoye. Various practices and fluid space theories have begun to take place in the discipline of architecture. On the other hand, it is possible to say that the concept of architectural space gained a permanent position and a pedagogical content in the discipline of architecture with the Bauhaus in Germany. The understanding of "architecture produces space" gains popularity. From the 19th century to the 20th century, it began to take place in discourses where the main concern of architecture was to establish space. Therefore, the 20th century can be remembered as the beginning of a century when the search for modern space and practice turned into theory and tried in different geographies.

The Post-war period, marked by 1960-1990, describes an environment which is based on critique expansion of criticism on modernist understanding of space and in which space discussions are opened with the concept of place. Europe has just come out of the war and was destroyed. Intellectuals migrating from Europe started to experiment with new architecture in new geographies. In order to meet the Post-war need, modernist ideals on mass housing and planning theories fail. The streets and urban space that lost their scale and context were now described as "uncanny". Rational, modernist design and planning has been the perpetrator of this failure as it has moved away from people and life. The critiques introduced a new concept: "Place". The pursuits of belonging and ownership, spending time, and collecting memories have led to thinking about the possibilities that make space a "place". From the 1960s to the 1990s, this concept becomes an important concept of the postmodern theories. Discussions on place expand especially with the developments in the field of social sciences. Architecture, which is associated with behavioral sciences, anthropology, phenomenology, psychology, environmental sciences and many other disciplines, also receives great contributions from philosophy. Ontology as the philosophical study of being (such as German philosopher Martin Heidegger) have produced reflections and new perspectives in architecture. Christian Norberg-Schultz, Henri Lefebvre, Michel de Certeau, and Pierre Bourdieu appeared as the leading figures of this manner. Henri Lefebvre, the first thinker to discuss the production of space, introduced a theory of space and tried to combine the concepts of physical space (nature), mental space (formal abstractions related to space) and social space (human action, conflict and sensory phenomena) [44]. He revealed a thought that transcends the physical dimension of the space. While suggesting that space is a social product, he mentions the importance of daily practices. Michel de Certeau, on the other hand, takes a closer look at everyday life and talks about the impossibility and lack of grasping the space on maps or plans. With the discussions produced by many different thinkers over space, the concept of space expanded its borders with daily life, practices and experience. The period also opened the door to new theories with the 1968 Movements and social dynamics.

From the early 1990s to the present in which digital technology infiltrates all areas of life is defined as "the process" [16]. By adding another dimension to the architectural space, virtual space brought the concept of non-place to the agenda instead of the concept of place. Bernard Tschumi radically transformed architectural knowledge with her understanding of cinematic and temporal "event" architecture, flows, vectors, intermediate-spaces, deprogramming techniques and spatiality conceptualization. Thus, discussions about space has been expanding on another axis, over "territory" and "field" theories. Field and territory in which the energy is active have been no longer defined by the boundary, but by the blurred transitions on the increase or decrease of the power. On the other hand, the distinction between interior-exterior or private-public became unclear and needed a conceptualization that transcends dualities. Therefore, discussions of Robert Venturi over the contradictions of space, Edward Soja's narratives of "third space", "soft space" in Gilles Deleuze and Felix ' "plateaus", Michel Foucault's conceptualization of "heterogeneous space" reveal that boundaries are melting and space is transforming into more plural, transitive and inclusive content.

The way of conceptualizing architectural space, which came with modernist thought and modern planning practices, lasted until the 1960s, and rational and normative approaches shaped urban and space theories. Up to this breaking point, both theories are object-oriented and rationalistic, immanent to the Cartesian thought. This understanding has been eroded; instead, intensity, affect, and event are mobilized against the old orders of structuralism. There is a paradigm shift which is called in the early 1990s as "spatial turn" (Figure 1).

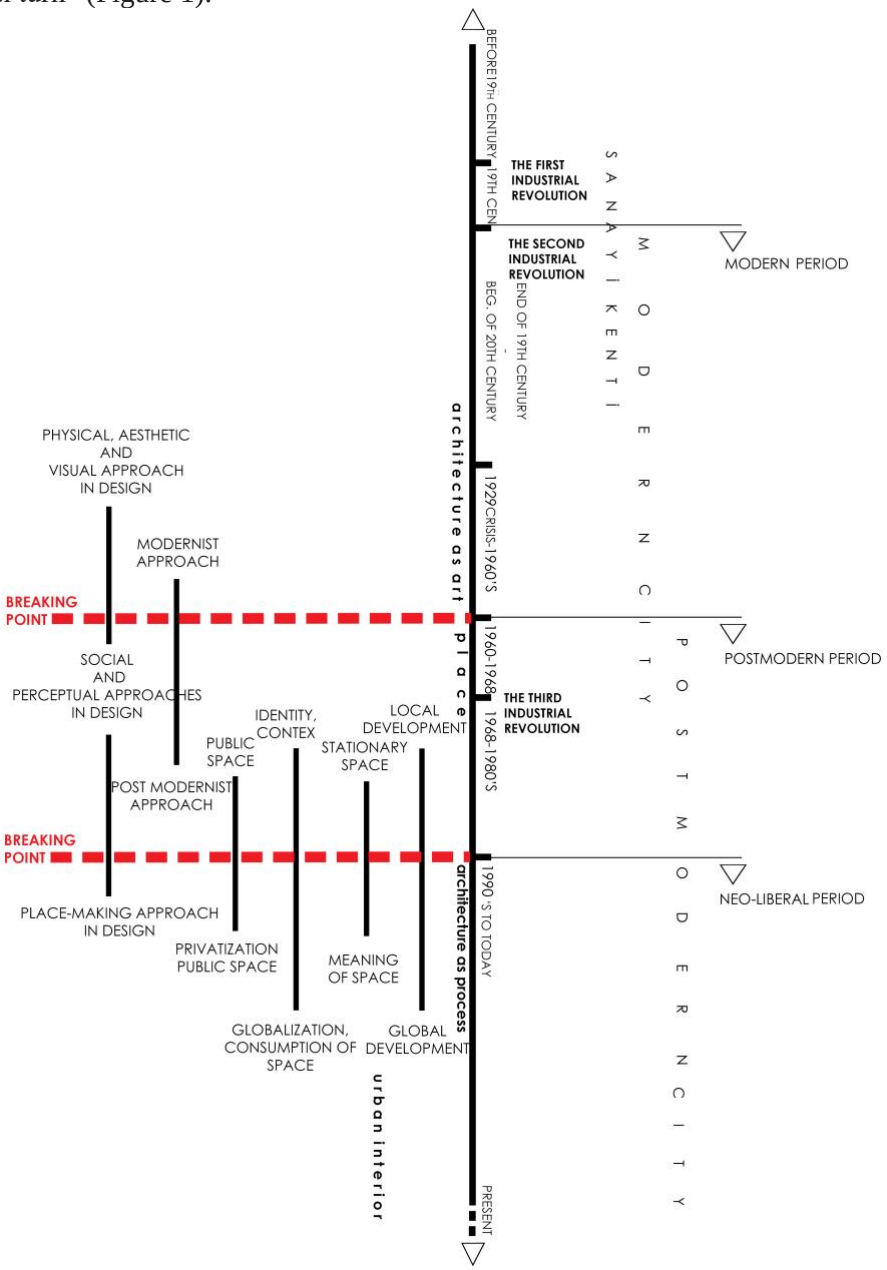


Fig. 1. Timeline of spatial approaches

Although this paradigm shift marked the 1960s, it seems possible to mark a new break with the Theory of Affect in current space theories. It is possible to talk about a return to subjectivity, desire and emotions by transcending the mind-body duality. Affect is a phenomenon that has been postponed in the academic field until the 1990s. Until recently, approaches that are grasped with the mind and that solve the causality relations with consciousness suppressed desire, emotions and subjectivity, and ignored it. Rethinking the city and space through affect begins to dissolve some boundaries; the dichotomy of interior-exterior, public-private loses its meaning. The Theory of Affect expands the possibilities of looking at the city and space through multiple lenses by transcending rationality and normativity. The theories of space are once again confronted with what they have ignored.

1.2 Non-Representational Theory

Until the first half of the 20th century, scientific knowledge was produced on the basis of objectivity, rationality and universality, through and mediated by representational theories and based on the fact that things can be represented objectively. The way of understanding of the space has shaped the search for how to represent it and the forms of representation that focus on the formal relations of existing physicality have become predominantly used in architecture and planning disciplines. The representations produced in relation to the way of understanding the space could only convey the information within the limits of this understanding.

The plane of immanence, on which information about the space is produced, has gradually started to fix and limit the way of comprehending the space with its own limitations. Representational theories miss the things interstices of everyday life, movement and becoming. They curtains what they cannot represent. Whether there is a complete overlap or distance between truth and representation is already debatable. Considering the power of the dominant discourse to determine representation and to manipulate reality in the context of representation's relationship with power, it can be said that representation determines dichotomy. Non-representational theory makes it possible to infiltrate these structures and values those which resist representation. Non-representational theories, which are widely used in many different fields of social sciences, allow exploring different dimensions of knowledge by opening new perspectives. With different theoretical and methodological approaches, it establishes new perspectives to grasp the knowledge and make it visible. It opens diverse dimensions and layers of spatial awareness and drags them into a new field of thinking.

The introduction of non-representational theories to the literature coincides with the mid-1990s with books and articles written by Nigel Thrift. He internalizes and rewrites the following issues from theories on space while laying the foundations of non-representational theory in his book *Non-Representational Theory: Space, Politics, Affect*. Along with these assumptions, Thrift directs his criticisms to the theory of space: (i) "the first is that everything, but everything, is spatially distributed, down to the smallest monad", (ii) "there is no such thing as a boundary", (iii) "every space is in constant motion, there is no static and stabilized space" and (iv) "there is no one kind of space" [41]. He conceptualizes space as "fluid forces" that have no beginning or end and that produce new cultural conventions, techniques, forms, genres, concepts, and even senses.

Thrift suggests that non-representational theory is an umbrella term for theories and practices that involve aspects of life that resist representation [42]. These are the theories that return to affect, movement, sensation and becoming as a condition of an existence. Space, which gets rid of its tendency to objectify with static parameters, is re-conceptualized as dynamic and productive; it emphasizes affect, process and relationality beyond rigid physicality. This conceptualization of space is based on the idea that it enables a process of becoming. Rather than reinterpreting social life, it demands to expand and open up possibilities for the experience to unfold differently.

It can be said that Deleuze and Guattari's philosophy forms the backbone of non-representational theories. These theories make expansions such as actor-network theory, biological philosophy, new materialism, performance theory, feminist theory and, critical theory. These theories do not try to create an alternative epistemological or ontological framework, but try to expand the existing framework with practice [8; 31].

De Certeau points out that most of the daily life practices are hidden in an invisible layer and they are missed or sometimes, just ignored [10]. Non-representational theory, which stands out in relation to life and its immanent, focuses on daily life, routines, rapid encounters, embodied movements, precognitive triggers, practical skills, and sensory arrangements, as İlhan Tekeli mentions [38]. Practice, body, individual's activism and subjectification process are added to these themes [36]. Non-representational theory is an approach to understanding life and space in terms of activity and experience rather than

representation. “What?” The interrogative is replaced by “how?” takes [26].

Thrift presents the seven main principles of non-representational/trans-representational theories as ideal qualities: (i) captures the “onflow” of everyday life, (ii) be anti-biographical and pre-individual/pre-subjective, (iii) concentrates on practice, action and performance, (iv) in relational-materialistic perspective, (v) be experimental, (vi) has emphasis on affect and sentience, and (vii) an innovative ethics [42]. According to Tekeli, non-representational theories mean more action, more imagination, more light and more joy with these seven principles [38].

1.3 Affect Theory

Towards the end of the 20th century, with the spatial and “affective turn”, many fields such as philosophy, ontology, ethics, psychology, social sciences and politics, including different perspectives and practices, expanded the discussions about culture, sociality, subjectivity, identity and body and brought the affect theory on the agenda as an interdisciplinary field of study. The theory, developed by Nigel Thrift and others on the philosophy of Lyotard and Deleuze, are not existence-based, but becoming-based. It is relational and is “an active force, a fluid and dynamic process that is continually made and remade” [7].

Ayşe Uslu Özer, in her study titled *“Understanding Affect from the Perspective of Philosophical Background of the Affective Turn in Social Sciences”*, defines the framework of affective theory as a field of discussion that challenges the conventional dualities between emotion-mind, body-mind, human-non-human, discourse-affect, circulation-representation, psychic-social and biological-political [32]. Unlike the readings made on the conscious actions of the body within the framework of the mind-body dichotomy, emotions oscillate between mind and body, actions and passions. It is the unconscious dimension of experience; it is an unfocused, a mood rather than an emotion [38]. It engages the unconscious and is focused on states of being able to act and be unconsciously. It is not something that can be intervened/planned based on consciousness. It can also be read as a set of embodied practices that produce behavior [42]. Michael Hardt sees the reasons for this focus, which started from Spinoza and mostly built on Deleuze’s works, as studies focusing on the body and exploration of emotions, especially within feminist theory.

The concept of affect, which basically emerges in the discipline of philosophy and psychology, receives the following responses according to Merriam-Webster Dictionary:

1. Transitive verb. to produce an effect upon (someone or something)
2. Transitive verb. to put on a false appearance of (something) : to pretend to feel, have, or do (something)
3. Noun. a set of observable manifestations of an experienced emotion : the facial expressions, gestures, postures, vocal intonations, etc., that typically accompany an emotion
4. Noun. the conscious emotion that occurs in reaction to a thought or experience
5. Noun. feeling, affection

In the first chapter of his *Spinoza Üstüne Onbir Ders, (Eleven Lectures on Spinoza)*, Deleuze dealt with Spinoza’s concept of “affect” together with the concept of “affection”; going down to the Latin roots of both concepts. He underlined that these two concepts, which are often used interchangeably, are essentially separate [13]. In the Philip Goodchild’s book titled *Deleuze and Guattari: An Introduction to the Politics of Desire*, Spinoza’s concept of “affectus” translated into French and English as “affect”, and the concept of “affection” as “affection”. The definition of affect in the book is: [affect]: a feeling or emotion that exerts a force; a pure pre-personal state of emotion that is not defined in relation to a consciousness that experiences it; a capacity to affect or being affected [21].

Bille & Simonsen, in the effort to de-psychologize the concept by approaching affect as a noun (rather than an adjective or verb) and to separate the concept of “affect” from a subject-oriented psychology focuses on some questions: “How does affect, as a noun, actually work? Are affect and emotion the same? Are affect and atmosphere the same?” [5]. These shifts and lack of clarity in meaning between different concepts are striking because one appears in the form of a conceptual pair expressing the other. This distinction, which is read in connection with the post humanist thought in Gilles Deleuze’s biophilosophy, is interpreted by Brian Massumi through the definition of affect as follows:

“Affect is an excess of continuity invested only in its own continuation, before and after the context as well as the personal pre- and post-context. Seen as a field of density [29]."

In this sense, affect is an autonomous and self-generating entity that is primarily thought of as processes of circulation, flow, or transference. It is that which arises through a relational encounter; it is event-based and action-based. Therefore, no subject, object or place is the only driving force of this

movement [44].

Theories about affect in various fields of research, based on Spinoza's observation on mind and body in his *Ethics*, have focused on the power of both body and mind to affect and be affected. Deleuze and Guattari's legacy of affective thinking was influenced by Spinoza, who emphasized the body and vitality. Spinoza opposes ideas that prioritize consciousness. Massumi reconsiders Spinoza's thoughts on the body and reveals a Deleuzian understanding of affect. Due to the immanent relationship of movement and sensation, the body is freed from a static materiality; treated as both a moving and a feeling entity. However, affects are not beings that are read, they are experienced away from the state of consciousness [32]. According to Massumi, affect is "the intensity experienced by the body as it passes from one state of experience to another and the increase or decrease in bodily capacities during this transition" [2]. Thrift, on the other hand, defines affect as a series of flows moving through the bodies of humans and non-humans [42].

Deleuze, who separates affect from emotion, thinks affect as a state of circulation rather than being something concrete, countable or visible, and states that it should be considered as a means of creating meaning between bodies [2]. Indeed, affection itself is a process of creating meaning [42]. Paralelly, place gains meaning with encounters that enable affect [38]. Commitment can foster feelings of belonging; or it can lead to alienation by gaining negative meanings.

Thus, affect has been a subject of micro-biopolitics by linking and conditioning thinking, emotion and perception in various combinations. It is a hidden mechanism of control and a governmental instrumentalisation. Military trainings, by bodily conditioning that helps control fear, are an example [40]. While affect has recently entered the records of urban studies, it has already become instrumental, allowing for politically complex interventions. This channel puts the complex relationship between power, subjectivity and affect on its agenda. The main factor that determines the relationship with bio-power is the affects; power is nested deep in people's consciousness, subjectivity and bodies [32]. It is necessary to note that affect is able to operate at the capitalist level, within its valuation mechanisms and subjectivation processes.

With his critique of the romanticized reading of affects, Massumi argues that power proceeds first and foremost through processes of subjectification [29; 24]. It addresses the power and political relations that operate through collective bodies. Similarly, while Slaby and von Schreve argue that affect emerges as a governance tool; Maravall locates the origins of such function of affect in the baroque [37]. Accordingly, what makes the Baroque distinctive and original in this context is that it values what is supposed to escape the mind -the passions- instead of breaking directly from the dominion of reason. Baroque is the period when, according to Maravall, those who want to expand their power first realized that people must act by considering the extrarational workings of their affective powers [24].

Since affect is based on bodily processes and relationships, it is necessary to look at the developments in body theories on space. Before the establishment of affect theory, Marcel Mauss and Pierre Bourdieu paved the way for thinking about the body in their immanent social contexts and understanding the body in the network of relationships [32]. Their common belief is that bodily practices should be understood in the context in which they are produced, disciplined, and socialized. As the determinant and condition of social life, through affects, "habitus" makes every encounter unique and diverse. Defining affect as "power to act" requires "thinking about the ontology of bodies and emotions in terms of movement, multiple temporalities, dynamism, bodily intensities, acting and being active" [32].

On the other hand, thanks to scientific methods and tools, the body has expanded as a set of micro-geographies. Performance notations allow small movements to be recorded, analyzed, and recreated. From the detailed forms of speech analysis to the intimate areas of proxemics, from gesture analysis to the mapping of body language and even the body itself, it has become possible to take records of the smallest gesture and expression of the body, and to approach affect theory with methodological innovations.

According to Özer, the body-based autonomous character of affects is accepted by most theorists as a process that disrupts social logic, frustrates expectations about it, and in this sense, opens holes in social signification processes [32]. Affects escape consciousness and displace established models of knowledge with their autonomy, their power to "emerge", their capacity to produce the unpredictable. It escapes the "sociolinguistic characterization" and cannot be captured in the semantic and semiotic order [29].

Affect is a state of relationality that is defined through subjectivity. It describes an area excluded by Cartesian thought; it does not exclude reason and rationality to understand space, but concentrates too

much on desire and subjectivity (Figure 2). It should also be remembered that the processes of subjectivity and subjectivation are constantly under construction. It is an area where subjective narration comes to the fore, and which is viewed from within. Although affect does not give concrete information about the city, it recommends and establishes a new way to comprehend it.

Fig. 2. Affect and the sub-concepts as relevant

1.3.1. Subjectivity, Subjectification and Politics of Desire

The rise of postmodern thought, which marked the 1980s with the erosion of modernism, brings into body, subjectivity and desire against universality, objectivity and rationality. The body, which was shaped by the ideals of Enlightenment and Cartesian understanding, needs to go beyond the given limits to handle it beyond its biological existence, and to read and understand it layer by layer with its multidimensional structure. The body is in constant transition and relational. Signification processes are grasped through force relations expressed through bodies; goes beyond the meanings produced in consciousness. The body has never been a subject, but it makes possible the construction of the subject's conditions and processes of meaning.

The processes of subjectification show differences according to periods. To be a subject in ancient Greek philosophy means to exist as a subject of truth; the existence of the subject is closely connected with the experience of spirituality and is shaped around the principle of self-concern. With Christianity, self-practices were reorganized on the basis of obedience, subject to the principle of obedience to God. It is a state of self-abnegation. The modern period, on the other hand, borrows from Christianity the techniques used by modern authority to govern individuals continuously and permanently. The relationship between the subject and truth, which is detached from spirituality, on the one hand, makes it possible to establish a new form of subjectivity: the modern subject. As Foucault states, in order for the subject to reach the truth, it does not need to make ethical transformations on its being, and access to the truth does not change the subject's way of being by creating effects such as peace of mind, happiness and salvation [20]. The conception of self-concern has also broken away from the field of philosophy. Therefore, in modern period, knowledge was then the only condition for the subject to reach the truth; it was in the influence of Cartesian thought which is a dominant and determinant. This post-Socratic Greek philosophy is criticized by Deleuze for replacing life with thought; the human body is ignored and desires are belittled [17].

Foucault talks about two opposing modes of subjectivation process in his studies and tries to understand the processes of subjectivation by focusing on how the subject is produced through knowledge and power relations in his pre-ethical studies. He emphasizes how the subject is formed and determined by power and deciphers the system that encodes the subject. Later, in his ethical works, he

draws attention to an active process of subjectification based on self-forming of the individual [19; 3]. Foucault's conceptualization of self-concern is the individual's effort to shape his or her own subjectivity; the gaze is changed from the outside, from others, from the world, etc. to turn itself. This relationship with the self is "the way of considering things, standing in the world, taking action, being in relationship with others … it is an attitude towards oneself, towards others, towards the world" [20]. It is the state of making oneself the subject of an attitude. In Foucault's "subjectification process" conceptualization, which rediscovered the notion of the subject, it is not a return to the subject. It is the creation of modes of existence or, as Nietzsche says, the invention of new possibilities of life. He desires existence not as a subject but as a work of art [3; 12]. The affect theory distances itself from the phenomenological and psychological frameworks that center the subject and work from the inside out, and shifts emphasis to the focus of subjectivity. According to Deleuze, "subjectification isn't even anything to do with a 'person': it's a specific or collective individuation relating to an event (a time of day, a river, a wind, a life…). It's a mode of intensity, not a personal subject. It's a specific dimension without which we can't go beyond knowledge or resist power (pouvoir)" [12]. Subjectivity is incomplete, hence it is a process in motion.

Subjectivity is political because of its relations with power and desire. In Deleuzian thought, oedipalized representation produces a dominant mode of subjectivity. The oedipalized subject is in the world of limits and prohibitions; it shapes its relations within the network of normative situations determined by power [12]. Modes of domination, internalized firmly within the subject, shape the oedipal structure of desire in cooperation with the law, and in private enterprise [21]. Escaping from the oedipal structure and seeking new types of subjectivity and new states of consciousness are prerequisites for approaching Deleuze's theme of desire. In Deleuze's thought, "desire" is handled with a Nietzschean reading and is based on the concepts of body, desire and will to power. Desire, separated from need, instinct, and interest is directed towards the unconscious. It is the plane of immanent relations. It's a driving force. It is a prerequisite for knowledge.

Deleuze and Guattari's philosophy of desire, which they discussed in *l' Anti-Oedipe and a Thousand Plateaus*, criticizes the philosophy of desire, which is discussed in the psychoanalytic framework [14]. It denies that desire arises from a lack or a miss and is born on a transcendent plane through a pre-existing lack. On the contrary, he argues that desires are regulated and organized on an immanent plane, within social production. For this reason, the representative approach in psychoanalysis is criticized and free associations in the schizophrenic process are examined instead. With the Freudian approach, the affect placed in the psychoanalytic framework is based on the theme of desire and impulse. A schizo (schizophrenic) is a person who cannot be coded and can escape from being coded [15; 17]. It is code breaker. It reveals a schizoanalytic subjectivity that superimposes multiple layers of subjectification.

Also, bringing together the concepts of "desire", "production" and "machine" borrowed from Freud and Marx with a new perspective, Deleuze and Guattari argue that "humans are desiring machines". In line with these considerations, Goodchild explains the machinic relation of desire as follows: "Desire, a concept deterritorialized from adult sexuality while not losing its erotic character, becomes applicable in any context or relation: it is a spontaneous emergence that generates relationship through a synthesis of multiplicities, the third element of the immanent relation" [21]. Desire is the mechanic relation itself, in respect of both its power of coming into existence and the specific multiplicity to which it gives a consistency. On the other hand, in becoming, desire is neither active nor passive, neither internal nor external, neither imaginary nor real. It releases what is neither personal nor individual, neither said nor shown, components that can be contained in a phantasm or event [11]. There is neither resemblance nor imitation, but rather an exchange of affects – the unconscious, which always lies outside the individual, is shaped by the affects that seize it. According to him, when events, relations or occurrences on the plane of immanence meet each other and produce a new relation, they produce desire; then desire produces new relationships on the plane. Desire can only be spoken of when it produces affect.

2. SPATIALITIES OF AFFECT THEORY AND SUBJECTIVITY

Space is a plane of entanglement, a place where intersections of both human and non-human intermingle and mobilize each other to produce new things. It is an experience beyond what can only be seen, tasted or smelled, it is the embodiment of an intensification in which the indescribable is felt [28]. Deleuze argues that the material of architects is emotions. Instead of forms, they contemplate possibilities, the possibility of affect. In this section, studies that rethink space from the perspective of

subjectivity and affect will be mentioned. These relations are discussed under two separate headings, ranging from the evaluation of spatial productions and practices, to the research of experience, to affective research and recording forms, to affective writing. The reason why spatial readings are handled under two separate headings is not that subjectivity and affect are unrelated; few examples in practice are already detached by clear conceptualizations of subjectivity and affect.

2.1 Subjectivity and Space

When space is considered as a subject on its own, it discovers and produces new subjects. The production of subjectivity takes place through different channels, and subjectivities produced "collectively" through space are directly related to architecture and design practices. On the other hand, as the actor of space, performance and practice, the subject and forms of subjectivity become problematic. Çoruh and Uluoğlu discuss the production of design practice on the axis of subjectivity [9]. In relation to the subject's position, subjectivity manifests itself in the production of a practice. Subjectivities produce different practices, and practice is directly related and immanent to space. The relationship of subjectivity with space and design practice emerges here.

Moreover, Richard Sennett discussed urban subjectivity in the "Interiors and Interiority" section of the symposium with the title of *Symposium on Architecture: Interior Matters* held in 2012 [35]. He states that urban space is much more closely related to interiority than a physically defined interior. In his words, "Interiority is actually linked to the exterior rather than interior. Interiority is a subjective experience and behavior in exterior space… Subjective feelings link to exterior condition." In George Simmel's book *Metropolis and Mental Life*, he addressed walking around the city with a mask and the feelings and emotions hidden behind it. This interior world is hidden from the outer world; this is a state of urban subjectivation. He claims that loneliness among crowds is the most intense moment of solitude in which feelings and emotions are exposed and stimulated. The urban space is a plane where these stimulations take place and which makes them possible. In the effect of overstimulation, interiority and subjectivity are experienced more deeply. According to Sennett, urban subjectivity is not based on a retreat from the outside like Benjamin's collector, but on the freedom to observe without interacting with the world [35]. It is a reflexive and an intellectual commitment. He refers to an "immanent world of relations". Suzie Attiwill, on the other hand, criticizes the preservation of interior/exterior distinction and the assumption of interiority as personal subjectivity, while interiority is associated with urban environmental dynamics in narratives focused on subjectivity and space [4]. Instead, he emphasizes collective individuation, which broadens the discussion on a different axis from the a priori one.

Besides, Situationists discuss the subject with the focus on transforming the relations between subjectivity and urban environment, interiority and exteriority. As they manifests, "With the Situationists, all the doors are resolutely open; because everything happens outside, there is no longer room for either interior or interiority. Henceforth subjectivity is lived or expresses itself externally; it is collective or it is nothing. It is detached from all individual representation, and consequently from all literary practice" [25].

Beyond, studies on construction of subjectivities on urban space and modes of subjectivity varies. Iain Borden, in his book *Skateboarding and the City*, problematizes skateboarding, which he sees as a sport and a way of life, and how skateboarders experience the city and space through their actions. John Urry, on the other hand, reconsiders the urban space with the concept of tourist gaze. He captures trips to specific places and embodied likes via mobile images. Alternatively, in the focus of digitalized society and space, digital humanities bring different forms of representation based on data with digital tools. To sum up, the city is a source of data; it is "a body without organs". Data is constantly produced by actors. For that matter, different approaches to the city dissolves established boundaries through non-representational theory and leads to the search for new tools to collect and record data and produce knowledge.

2.2. Affect and Space

The first traces of affect related to place are found in the field of philosophy; Machiavelli, Rousseau, Kant and Hegel discussed the relationship between place and affect. Afterwards, emotions and affect have taken place in the literature as the subject of science; Charles Darwin's *The Expression of the Emotions in Man and Animals* in 1872 prepared the subtext of the conceptualization of affect by addressing the political dimension of the liberation, suppression or living of desires. Affect was also implicited but not clearly defined in the studies of Georg Simmel, Richard Sennett, Walter Benjamin, and Jane Jacobs. The work of Kathleen Steward, Joyce Davidson, Liz Bondi, Lesley Caldwell, AbdouMaliq Simone, Mick

Smith, Steve Pile, and Robert Levy are theorists involved in the interdisciplinary study of space and affect. Besides, architect Peter Zumthor's writings on atmospheres, James J. Gibson's studies on ecology and perceptual systems, and Joy Monice Malnar and Frank Vodvarka's studies on sensory design contributed to theoretical construction [27].

Space is a becoming by a fluid and temporary choreography of perceptual and affective relations. Zumthor proposes nine guiding principles for this choreography: (i) the architectural dimension of the space, (ii) materials and relationships, (iii) soundscape, (iv) real and perceived warmth, (v) objects, (vi) the way architecture incorporates movement and temporality, (vii) thresholds rather than duality of transitions such as interior-exterior, (viii) perceived distances, scale and details, and (ix) light-shadow [46]. Joy Monice Malnar and Frank Vodvarka, on the other hand, analyzed the body-space interaction with sensory mapping [27]. Although sensory tendencies are handled in a cause-effect relationship, these and similar studies have contributed to the ontological construction of body, experience and affect in the field of design. Thrift presented these and some other studies (*Flesh and Stone* by Richard Sennett, Walter Benjamin's studies, etc.) as exceptions and criticized the ignorance and postponement of emotional records in urban and spatial studies [42; 34]. While the relationship of the concepts such as identity, belonging, ownership, which is directly related to the urban space, with affect is obvious, the neglect in the current literature may be associated with the limitations of Cartesian thought, which is the context in which the studies were produced. Therefore, the important point to note is: "so, the city as a sea of faces, a forest of hands, and an ocean of lamentation: these are the building blocks of modem urbanism just as much as brick and stone" [42]. Thrift describes cities as "maelstroms of affect" and asserts that affect is a vital element of them. He suggests re-looking at the pages of novels and the track lines of poems in order to trace the affect in the cities. The affective record of them range from the advent of modern criminology to social scientific studies of urban anxiety and fear of crime. In theory and practice, these records are also produced through language: the misanthropic city, the friendly place, the menacing street, etc.

Based on Massumi's explanation, Derek McCormack explains the conceptual differences between affect, feeling and emotion [30]. He states that affect (as a pre-personal density), feeling (as this intensity registered in a sensing body) and emotion (as a sociocultural expression of the felt intensity) are different but relational.

On another axis, affect tends to practical theories. For this reason, expansions on the performative dimension of affect theory are predominant in the literature. Hence, concepts such as emotion as social practices, affective practices and affective habitus come to the fore in these expansions [23, 45, 33]. In particular, there are also another related concepts discovered through affect theory in the planning discipline such as everyday urbanism, guerrilla urbanism, inclusive and democratic urbanism, performative urbanism and urbanismo afectivo…etc [43].

Alternatively, Blanchot draws attention to banal experiences and everyday life [6]. Referring to him, banal experiences are forces that build endless and productive relationships, intensifying to produce "vitality" that plays on the thresholds of consciousness and unconsciousness to discover new traces of experience. The experience of banality transcends the everyday life [22]. The spaces of daily life, covered with various hidden affects, open the door to the imperceptible depths of the subconscious.

De Certeau focuses on walking in his work titled *The Practice of Everyday Life* [10]. He argues that the city becomes "an urban text"' articulated through walking. Thrift deals with how de Certeau's argument brings to the fore kinetic appropriation arising from the practice of walking, and how footsteps create a "collection of innumerable singularities" rather than a sequence [10; 1]. Based on de Certeau's arguments, Thrift claims that exploring by walking allows discovering and reproducing the unrepresented.

Jobst & Frichot takes a distinctive approach to the topic by focusing upon the importance of thinking and designing the street as a new organ of affective consolidation and attraction, with an intriguing differentiation built on an emotional policy that takes advantage of bodily slowdown [24]. Disciplined street offers an experience where time is linear and flows fast; on the contrary, he grounds the need for an experience that slows down time and spends time with Lazzarato's conceptualization of elastic publics.

It is possible to find records of affect as a temporary moment of intensity in the rhythm of daily life in novels. Texts written through an affective language explore how affect becomes instrumental in order to analyze and comprehend space. Özlem Türe Abacı, in her article titled *Affect, Spatial Practices, and the City in Agatha Christie's "They Came to Baghdad"*, discussed and conveyed Baghdad as a "fluid city", based on Thrift's thoughts on "affective cities" and "spatiality of affect" in relation to the city, individual and affect [1]. The increasing levels of anxiety and insecurity of Baghdad, which coincide with the type

of the novel, are processed through the affective relations between space and corporeality, such as fear, doubt, anxiety, need for security, loss of place and direction; spatial references are constructed coincidentally with affective representations of the city. She discovers the boundaries that the female character must cross in a male-dominated space on the one hand. The female character develops an affective image of the city with his feelings and emotions about spaces defined by gender codes, which in Thrift's reading corresponds to the "cognitive map" of the city. She sticks to his intuition rather than methodical reasoning and learns to read the codes of the city.

Similarly, in his book *Modernism, Space and the City: Outsiders and Affect in Paris, Vienna, Berlin, and London*, Andrew Thacker revisits London, Paris, Vienna and Berlin as cultural formations with the concept of "geographical emotions" [39]. The concept is used to refer to an articulated theory of affect and mood about how cities are experienced internally, and is broadly constructed with expansions such as spatial phobias, sensory responses to urban geographies, and mood. In the same book, Ford Madox Ford's *The Soul of London* is notable for its handling as a (affective) geography that captures the "feel" of a city semantically and ontologically before the concept of "affect" was invented [18]. He argues that "loci of passion" are the soul of the city. Adapting the idea from Raymond Williams, he claims that cities have their own "emotional structures" (their typical sounds, smells or sights, etc.). These structures are something unrelated to architecture or planning.

3. CONCLUSION: NEW POSSIBILITIES OF URBAN INTERIORITY

The theories of space, which were formed by the Western philosophy and built within the framework of transcendental and rationalist causality, experienced an epistemological break in the 1960s. Until this time, theories based on major discourses and assumptions, in which the meanings of the concepts are fixed, are the products of rational thought that eliminates the possibility of the concept being in another formation. Producing definitions for concepts, which fix and freeze, prevents seeing the multiple dynamics in them. They have been persistently maintained and not subject to change.

While the 1980s marked a period in which the modernist canons were questioned and even started to collapse, it is thought-provoking that urban is still discussed over the concepts of the previous century. In this period, which made room for doubts, the plane of thought was built on the melting of borders and flows. It's about describing conditions and exploring possibilities within conditions, rather than drawing boundaries. Currently, in post-structuralist thought, when talking about a continuous state of being, the boundaries defined through dualities such as inside-outside become meaningless. Dualities have already been abandoned and the border itself must be problematized.

The concept of *urban interiority* includes the possibilities and potentials of breaking dualities such as interior-exterior, private-public and interdisciplinary distinctions. From a Foucauldian point of view, this concept is an in-between that does not fit within the borders of disciplines and cannot take place in the rational modernist world. It is defined as the reconciliation zone of artificial borders such as public space-private space, interior-exterior or interior design-urban design. "Urban interior" combines two different words and forms a new one. Two words, *urban* and *interior*, which have different meanings and definitions in their own contexts, came together, became ambiguous and opened the door to a new world of meaning. It describes a new phenomenon that combines the definitions or traits of two existing concept. This scalar and semantic in-between can also be seen as ambiguity. The content of the concept is not fixed, not crystallized. It is flexible; can move in any direction.

The discussions on urban interiority is about interiorizing city, domesticating it, and personalizing it, or about routes, routines in general. Certainly, there is more to discuss, more to ask. The concept of urban interiority is based on correlations and builds its semantics through Deleuzian concepts such as coexistence, unexpected mutations, fluidity, permeability, transitivity, continuity, territory, assemblage and similar concepts that transcend dualities (Figure 3). Affect theory, differently, offers affect, desire and subjectification as new sub-concepts to rethink urban interiority. Therefore, the main motivation of the study has been to explore how the concept of urban interiority is thought and how it can be rethought today.

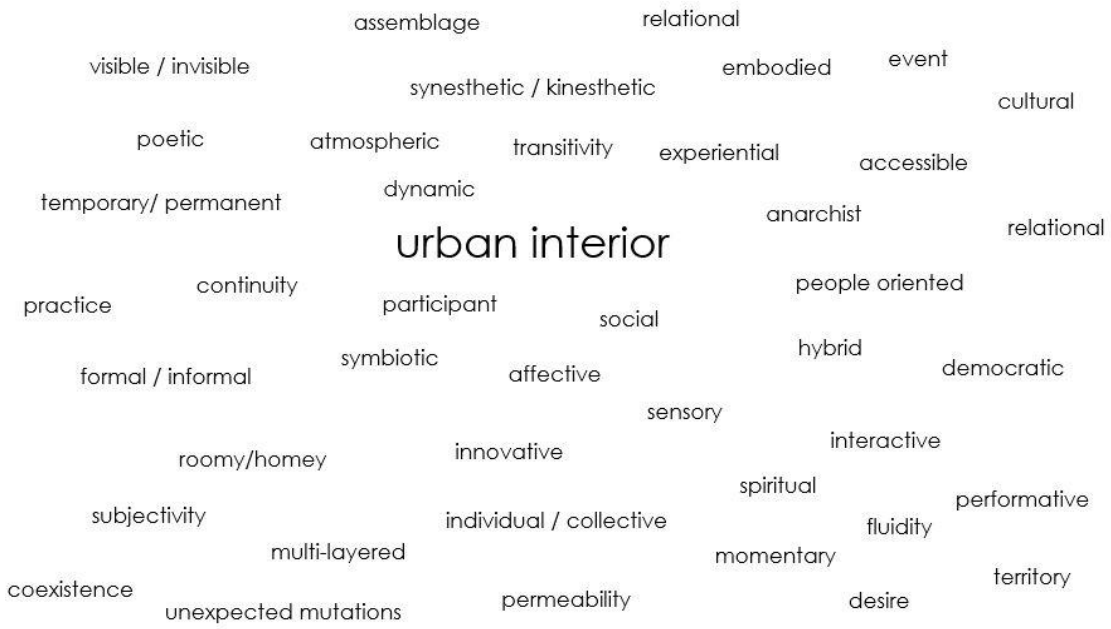


Fig. 3. Urban interior and relevant sub-concepts that transcend dualities

This study tries to be positioned outside the normative framework, in search of alternatives other than thinking about the physical environment, interior space and its terminologies within the framework of dualities such as interior-exterior, public-private. Rethinking the city through the body dissolves some boundaries. Interior and exterior, private and public constantly touch each other, infiltrate and borrow parts from each other. Beyond the mind-body dualism, tracing the spatial, behavioral and social continuities of the body, which includes ambiguous borders and different intermediate values and levels of concepts such as privacy, publicity, subjectivity, openness, contains an opportunity to explore the unique continuities of the space. Affect theory and urban interiority together that breaks and violates the modernist thought suggests a new way of thinking. The immediacy of affect, its autonomy, its powers of emergence and its capacity to produce the unpredictable open a new perspective for different conceptual practices in body, space and urban theories. It searches for something ignored or missed in city.

In Deleuzian terms, in order to discover "the line of escape", the study moves into a heterogeneous discourse with a schizoid wandering action between singularities. The nomadic reading following the escape line aims to reveal the dynamics of the urban interiority in relation to affect, subjectivity and desire. It moves away from the phenomenological and psychological frameworks that center the subject, and focuses on subjectification processes and overlaps this with interiorization processes.

REFERENCES

[1] Abacı, Ö. T. (2020). Affect, Spatial Practices, and the City in Agatha Christie's "They Came to Baghdad". Kültür Araştırmaları Dergisi, (6), 1-15.
[2] Akalın, A. (2007). Duygulanım ve Duygulanımsal Emek Üzerine Notlar. Birikim, 217, 114-121.
[3] Altınkaya, D. D. (2020). Foucault ve Öznellik. ETHOS: Felsefe ve Toplumsal Bilimlerde Diyaloglar 13(2), 14-35.
[4] Attiwill, S. (2018). Urban interiority as collective individuation. The Stories of Interior: Multiple Perspectives on Interiority, 53-62.
[5] Bille, M., & Simonsen, K. (2021). Atmospheric practices: On affecting and being affected. Space and Culture, 24(2), 295-309.
[6] Blanchot, M. (2015). The Writing of the Disaster. Lincoln, NE: University of Nebraska Press.
[7] Buser, M. (2014). Thinking through non-representational and affective atmospheres in planning theory and practice. Planning Theory, 13, 227-243.
[8] Cadman, L. (2009). Nonrepresentational theory/Nonrepresentational geographies. In R. Kitchen & N. Thrit (Eds.), International encyclopedia of human geography (pp.456-463). Oxford, England:

Elsevier.
[9] Çoruh, D. O., & Uluoğlu, B. (2018). Bir karşı-özneleşme [yeniden-özneleşme] pratiği olarak tasarım. Erciyes Üniversitesi Sosyal Bilimler Enstitüsü Dergisi, 32(44), 163-193.
[10] De Certeau, M. (1984). The Practice of Everyday Life. Berkeley: University of California Press.
[11] Deleuze, G. (1990). The Logic of Sense (1969) (trans. Mark Lester, Charles Stivale.)London: Athlone.
[12] Deleuze, G. (2006). Müzakereler, çev. İnci Uysal, Norgunk Yayıncılık, İstanbul.
[13] Deleuze, G. (2006). Spinoza Üzerine Onbir Ders, (trans. Ulus Baker). Kabalcı, İstanbul.
[14] Deleuze, G., & Guattari, F. (1987). A Thousand Plateaus –Capitalism and schizophrenia (trans. Brian Massumi) University of Minnesota Press.
[15] Deleuze, G., & Guattari, F. (2009). Anti-Oedipus: capitalism and schizophrenia. Penguin.
[16] Erk, G. K., & Uluoğlu, B. (2013). Changing paradigms in space theories: recapturing 20th century architectural history. International Journal of Architectural Research: ArchNet-IJAR, 7(1), 6-20.
[17] Erkan, Ü. (2019). Gilles Deleuze felsefesinde temel kavramlar ve yeni toplumsal hareketler. OPUS International Journal of Society Researches, 13(19), 2627-2652.
[18] Ford, F. M. (1905). The soul of London: a survey of a modern city. London: A. Rivers.
[19] Foucault, M. (2012). Cinselliğin Tarihi (trans. H. Uğur Tanrıöver). İstanbul: Ayrıntı Yayınları.
[20] Foucault, M. (2015). Öznenin yorumbilgisi: Collège de France dersleri 1981-1982. (trans.Ferda Keskin). İstanbul: İstanbul Bilgi Üniversitesi Yayınları.
[21] Goodchild, P. (1996). Deleuze and Guattari: An introduction to the politics of desire. Sage Publications Ltd.
[22] Gregg, M., & Seigworth, G. J. (Eds.). (2010). The affect theory reader. Duke University Press.
[23] Jackson, P., & Everts, J. (2010). Anxiety as social practice. Environment and Planning A, 42, 2791-2806.
[24] Jobst, M., & Frichot, H. (Eds.). (2020). Architectural affects after Deleuze and Guattari. Routledge.
[25] Kauffman, V. (2002). Angels of purity. In T. McDonough (Ed.), (trans. John Goodman). Guy Debord and the Situationist International. Text and Documents. MIT Press.
[26] Kemp, S. (1996). "Reading difficulties", in Analysing Performance: A Critical Reader Ed.P Campbell (Manchester University Press, Manchester) pp 153-174.
[27] Malnar, J. M., & Vodvarka, F. (2004). Sensory design. U of Minnesota Press.
[28] Manning, E. (2020). What Things Do When They Shape Each Other? The Way of the Anarchive, Durham & London: Duke University Press.
[29] Massumi, B. (2002). Movement, Affect, Sensation: Parables for the Virtual. Durham & Londra: Duke University Press.
[30] McCormack, D. (2008a). Engineering affective atmospheres: On the moving geographies of the 1897 Andree expedition. Cultural Geographies, 15, 413-430.
[31] Okur, M., & Bilgili, M. (2021). Kültürel coğrafya bağlamında temsil ve temsil ötesi teoriler. Ege Coğrafya Dergisi, 30(1), 187-194.
[32] Özer, A. U. (2016). Sosyal bilimlerde duygulanımsal dönüşün felsefi arka planından bakarak duygulanımı anlamak. Ethos: Dialogues in Philosophy and Social Sciences, 9(1).
[33] Reckwitz, A. (2012). Affective spaces: a praxeological outlook, Rethinking History: The Journal of Theory and Practice, 16:2, 241-258.
[34] Sennett, R. (1996). Flesh and stone: The body and the city in western civilization. WW Norton & Company.
[35] Sennett, R. (2017). Interiors and Interiority. a+t. Independent Magazine of Architecture Technology, Interior Matters SOLID Harvard Symposia on Architecture (47), 10-19.
[36] Simpson, P. (2020). Non-representational theory: Key ideas in geography. New York: Routledge.
[37] Slaby, J. and von Scheve, C. (2019). Introduction: Affective Societies – Key Concepts. In:J. Slaby and C. von Scheve (Eds.), Affective Societies: Key Concepts. London and NewYork, NY: Routledge, pp. 1–24.
[38] Tekeli, İ. (2019). Temsili olmayan kuramların gelişimi planlama anlayışımızda ve kente bakışımızda ne tür değişmeler yaratıyor. Efil Journal, 2(7), 8-37.
[39] Thacker, A. (2019). Modernism, space and the city: outsiders and affect in Paris, Vienna, Berlin, and London. Edinburgh University Press.
[40] Thrift, N. (2004). Intensities of feeling: Towards a spatial politics of affect. Geogr. Ann., 86 B (1): 57-78.
[41] Thrift, N. (2006). Space. Theory, Culture & Society 23(2–3). 139-146

[42] Thrift, N. (2008). Non-Representational theory: space, politics, affect. Routledge.
[43] Viderman, T., Knierbein, S. (2020). Affective urbanism: towards inclusive design praxis. Urban Des Int 25, 53-62.
[44] Wells, T. C., Mark, L., & Sandoval, J. (2020). Affect, space, and everydayness: a reconsideration of waste in academic inquiry. Taboo: The Journal of Culture and Education, 19(3), 27-42.
[45] Wetherell, M. (2012). Affect and Emotion: A New Social Science Understanding. London: SAGE Publications.
[46] Zumthor, P. (2006), Atmospheres: Architectural Environments – Surrounding Objects. Birkhäuser (Basel), 2006.

International Scientific Journal of Urban Planning and Sustainable Development
© URBANIZM
Erdem Yildirim
ISSN: 1811 - 6582 www.journalurbanizm.org No. 27, 2022, p.60-71
DOI: 10.58225/urbanizm.2022-27-60-71

A.I.’s VISION OF FUTURE CITIES

E. YILDIRIM
Faculty of Architecture, Dokuz Eylül University, İzmir, Türkiye

ABSTRACT

Not only has artificial intelligence become ingrained in our everyday lives, but it has also been put to beneficial use in a wide variety of scholarly fields. Over the course of the past few decades, artificial intelligence has developed into an essential component of the optimization strategies utilized in the urban planning and design field. With the diversification and development of algorithms, although artificial intelligence has not yet begun to visually shape our cities, it has begun to be utilized as a design and planning derivative from urban design to planning scale, particularly in the context of smart cities. On the other hand, thanks to advancements in areas of machine learning, neural networks, deep learning, natural language processing, and computer vision, artificial intelligence can now generate authentic images based on texts that are provided. In this study, the perspectives of future cities obtained by text-to-image generation algorithms are analyzed. The visuals obtained with the open-source Stable Diffusion artificial intelligence's predictions about the future are presented in conjunction with numerous AI related contemporary design terms; smart city, sustainability, eco-design, biomimicry, and topology optimization. At each stage of history, the image of the cities of the future first appeared in literature and art before becoming a reality. Synthesizing contemporary works of art and literature in the millions of images that make up artificial intelligence's libraries today can inspire designers to construct our future.

Keywords: city, future, artificial intelligence, text-to-image generation

1. INTRODUCTION

Artificial intelligence (AI) has been around for a while now, but it has only just begun to ingrain itself into our everyday lives. Due to the development of hardware technologies, it is now possible to work with huge amounts of data for artificial intelligence, such as medical imaging, animal conversation, predictive maintenance, natural language processing, financial forecasting, etc. Recently, in visual fields of art and design, algorithms that turn written words into images are accessible to many users have invaded media. Thanks to Text-to-Image Generation Machine Learning model that takes a natural language description as input, can generates an image that matches the inputted caption. As a result of advancements in Deep Learning and Neural Networks, such models began to be created in the middle of the 2010s [1]. The automatic creation of realistic visuals from text would be interesting and valuable, but AI systems were still a long way from achieving this objective. However, general and potent recurrent Neural Network designs have been created to train text feature representations that are discriminative. Meanwhile, deep convolutional Generative Adversarial Networks (GANs) have begun to generate images of certain categories of design field [2]. In 2022, the output of advanced text-to-image models, such as OpenAI's DALL-E 2, Google Brain's Imagen, and StabilityAI's Stable Diffusion, began to approach the quality of actual images.

AI has been used to get performance advantages in a variety of scales and fields of design. We may also envision AI being applied to the planning of large-scale operations, particularly urban design and planning. Smart City concept is the most popular research and application area for AI’s performance optimization in management and design [3]. In contrast to the prevalent use of AI for urban design in the presence of management and maintenance in the past, there are now AI applications for designing and planning cities in 3-D [4] [5] [6] [7]. In the majority of studies on future cities, contemporary urban design concepts such as sustainability and biomimicry have a close relationship with technology via AI.

1.2 Interest and Objectives

Over time, there have been changes in how AI is classified. In spite of this, the findings of the majority of research indicate that there are in fact three categories of AI. The first of these is known as "Artificial Narrow Intelligence," and it is designed to perform a particular task. The second concept is known as "Artificial General Intelligence," and it functions as a replacement for human succinctness. The final possibility is called "Artificial Super Intelligence," and it describes a scenario in which machines possess intelligence and cognitive capabilities that are superior to those of humans. This study is centered on the use of "Artificial Narrow Intelligence" in the visual representations accomplished through a text-to-image generation model. The scope of this study is the mutual ground of artificial intelligence, urban design and visual art fields. To accomplish this, contemporary urban design and planning terminology were fed into an AI that generates images from text. The purpose of this study is to enable professionals and students in the field of urban design and planning to use generated images as a source of inspirational muse.

In this study's second chapter, the path to Text-to-Image Generation AI is outlined. The chronology of the evolution of Machine Learning is elucidated, and the primary algorithms and techniques that enable the Text-to-Image Generation are mentioned. The third chapter discusses the variety of AI applications in urban design and planning. The selected concepts share the aspect that they are congruent with AI. Then, the Text-to-Image Generation approach of Stable Diffusion is used via DiffusionBee software, to generate visual representations of future cities using contemporary fields of; Smart City, Sustainability, Eco-Design, Biomimicry and Topology Optimization. According to the relationship between design and terminology, AI-generated images are finally discussed.

2. THE PATH TO TEXT-TO-IMAGE GENERATION

2.1 History of A.I.

Throughout the first part of the 20th century, science fiction popularized the idea of artificially intelligent robots. It began with the "heartless" Tin Man from The Wizard of Oz and continued with the humanoid robot that posed as Maria in Metropolis. By the 1950s, a generation of scientists, mathematicians, and philosophers had incorporated the concept of artificial intelligence into their cultural consciousness. One such individual was the young British polymath Alan Turing, who investigated the mathematical possibilities of AI. Turing proposed that people use available information and reason to solve problems and make decisions; thus, why can't robots do the same? This was the logical structure of his 1950 paper, Computing Machinery and Intelligence, in which he described how to construct intelligent machines and how to evaluate their intelligence [8].

Allen Newell and Herbert A. Simon produced the first artificial intelligence software in 1955, which they dubbed "Logic Theorist." This program had proven 38 of 52 mathematical theorems, as well as finding new and more elegant proofs for several axioms. John McCarthy, an American computer scientist, originally adopted the term "Artificial Intelligence" at the Dartmouth Conference in 1956. For the first time, AI was recognized as an academic discipline [9]. The researchers then prioritized the development of algorithms that can solve mathematical problems. The first chatbot was created by Joseph Weizenbaum in 1966 and was named ELIZA [10]. The first intelligent humanoid robot, called WABOT-1, was constructed in Japan in 1972 [11].

The period between the years 1974 and 1980 was the initial AI winter period. AI winter refers to a period in which computer scientists faced a severe lack of government funding for AI research.

After the AI winter, it returned with Expert System. It was programmed such that expert systems emulate the decision-making abilities of human experts. In 1980, Stanford University hosted the first national conference of the American Association for Artificial Intelligence [12].

The period from 1987 through 1993 was the second AI Winter. Investors and the government ceased sponsoring AI research due to its high cost and ineffective results.

This pause ended in 1997 when BM Deep Blue, the first computer to defeat a global chess champion Gary Kasparov. With the introduction of the Roomba vacuum cleaner in 2002, artificial intelligence made its debut in household products. In 2011, IBM's Watson won Jeopardy, a game show in which it had to tackle difficult questions and puzzles. Watson had demonstrated that it could comprehend natural language and quickly solve difficult problems. In 2014, the chatbot "Eugene Goostman" triumphed in the famous "Turing test". And lastly, Google DeepMind defeated Lee Sedol in 2017 in the game of Go, which has a 5000-year history and is the hardest board game in the world with more game possibilities than atoms in the universe [13].

AI has reached a tremendous level of advancement now. Deep learning, big data, and data science are currently booming as a field of study. Currently, firms such as Amazon, Google, Facebook and IBM are utilizing artificial intelligence to develop cutting-edge technologies. These activities include visual perception, speech recognition, decision making, and translation. Systems capable of accomplishing such tasks are steadily making the move from research labs to industrial use.

2.2 Essential Algorithms for AI Imagination

Following is a description of the most important terminology as well as the methods used to understand Text-to-Image Generation. A process of learning sits at the core of AI. The algorithm is given options to choose from, and goals are set during this learning process. Machine learning, or ML for short, is a subfield of artificial intelligence that gives computers the A process of learning sits at the core of artificial intelligence. The algorithm is given options to choose from, and goals are set during this learning process. It has ability to automatically learn from their past mistakes and improve themselves without being specifically programmed to do so. Examining data, identifying patterns within the data, and making predictions are all capabilities of algorithms that use machine learning. These algorithms are designed to continuously improve themselves through learning and the application of that learning to new datasets [14].

An further crucial technique for AI is the Artificial Neural Network, often known as an ANN, which replicates how the human brain processes and analyzes information. The ANN is at the heart of artificial intelligence because it enables self-learning capabilities and serves as the foundation of the technology. Artificial neural networks are designed to function similarly to the biological neural networks found in the human brain. Sensors can be thought of as the artificial analogues of neurons, which are the fundamental building blocks of the brain. A very large number of sensors will be grouped together to form ANNs [15].

Deep learning, also known as DL, is a subfield of machine learning. Robots are given the ability to learn through the processing of data thanks to the use of artificial neural networks. DL gives computers the ability to solve difficult problems, regardless of the diversity or organization of the dataset they are using. In this scenario, learning takes place whenever there is a continuous feedback loop that is used to modify the operations of the algorithm. Every appropriate action is rewarded by the system, while every inappropriate one is punished. The system makes an effort to adjust behaviors in order to increase rewards [16].

The subfield of artificial intelligence known as Natural Language Processing (NLP) is responsible for giving computers the ability to read, comprehend, and imitate human language. Most voice assistants employ NLP. Machine language is used by computers to communicate. This is a complicated language that only uses ones and zeros, and it is not easy to understand. In a similar vein, computers have a hard time understanding human languages. NLP makes use of sophisticated algorithms in order to transform unstructured linguistic data into a format that can be understood by computers [17].

Computer vision, also known as CV, is a subfield of computer science that attempts to model the human visual system in order to give computers the ability to "see" and understand the content of still images or videos. Through the use of computer vision, machines are able to identify the contents of images, which paves the way for object detection and labeling. A crucial element that enables driverless cars is CV. Vehicles that have CV can see other vehicles, signs, and lane markings, which enables them to move forward in a safe manner and prevents them from colliding with any obstructions. The automatic tagging function that can be found in some of the social media platforms are yet another application of computer vision [18].

2.3 Text to Image Generation Techniques

The term "Text-to-Image Generation" is used to describe computational methods that can translate human-written textual descriptions, like keywords or phrases, into visually represented concepts with similar semantic meaning as the text. In the beginning, researchers in the field of picture synthesis used supervised methods and Text-to-Image correlation analysis to find the best possible fit between the text and the visuals.

Images used for tasks like picture classification typically have a single, obvious object that needs to be labeled. Comprehending complex scenarios with computers could make this problem much more challenging. One of these responsibilities is to caption images. There are two sources of difficulty here. First, the system needs language and commonsense knowledge modeling in addition to object recognition in order to generate a semantically meaningful and syntactically fluent caption. This allows the system to recognize important semantic concepts in the image, understand their relationships, and compose a coherent description of the image's overall content. Moreover, due to the complexity of the scenes in the image, it is

impossible to capture all the fine-grained, nuanced differences between them with the basic category property [16].

When computer scientist Ian Goodfellow developed generative adversarial networks (GANs) in 2014, that was the real turning point [19]. Two neural networks compete to produce these. The first one, called the generator, creates new images, while the second, called the discriminator, compares them to a set of examples used in training. This is analogous to a fake painting being presented to an art critic as the real thing. If the output images are lower quality than the images in the dataset, the discriminator will continue to reject them. When the training is complete, the discriminator can be turned off while the generator keeps producing high-quality results. The projects that Refik Anadol has worked on, which employ numerous varieties of GANs, are fascinating examples of this method in action [20].

One of the more recent accomplishments in the field of machine learning is Image Recognition, also known as Machine Vision. However, visual 'hallucination' is a relatively new phenomenon. In 2015, a Google engineer named Alexander Mordvintsev made the revolutionary discovery that a neural network could be trained to work in reverse. It could now create illusory images as well as recognize real ones. This allowed him to develop the computer vision program DeepDream, whose hallucinatory effects caused a major uproar in the artistic community.

Diffusion modeling is the newest and most effective method for creating images. An extensive mathematical background is necessary for the diffusion model. To put it succinctly, you start with an image and keep on adding noise to it without ever checking your work. Each new stage is treated as the starting point. Each of these processes can be carried out separately from the others and without reference to any earlier pictures. There is nothing original in the resulting image, just random noise. Diffusion modeling is used by the vast majority of Text-to-Image Generators like Dall-E2, Midjourney and DiffusionBee. Dhariwal and Nichol argue that the diffusion model is a superior method for image synthesis [21]. Thanks to advancements in hardware for processing massive datasets and advances in machine learning algorithms, AI can now "dream" in the visual domain [22]. The 'Diffusion Model' and open-source Text-to-Image Generation technology has given designers a new window into the creative process, mostly for concept design.

3. A.I. IN URBAN DESIGN AND PLANNING

3.1 Smart City

Urban planning has studied a range of advanced analysis methodologies with varying degrees of adoption over the past several decades. Geographic Information Systems (GIS) is arguably the most well-known; nevertheless, database management systems (DBMS), decision support systems (DSS), planning support systems (PSS), and expert systems (ES) receive varied degrees of prominence and acceptability.[23]. The development of AI continues to flourish in the context of Smart City, and as a result, there is a significant push to incorporate these technologies into urban environments [24] [25] [26]. This phenomenon, which some can refer to as Urban AI, is based on prior technology advancements in cities [27]. Emerging optimization methods that handle Big Data in parallel can solve a variety of urban design's most complicated problems.

AI is being used to help regulate traffic, improve waste management, and predict air quality in many urban spaces. Security cameras can identify people by analyzing their facial structure and alert authorities when a crime is about to occur [28]. It can be used to design responsive urban environments that are driven by strategies backed by real time data. AI is used within the robots or applications that offer passengers important information, for example. It is also employed to create real-time spreadsheets that tally passenger volume and bus schedules. Some waste bins contain AI-based sensors that help notify authorities when they are nearly full and need to be emptied [29]. AI can also help urban planners create more efficient transport networks across the city using traffic data and stats. Recently, with the introduction of smart equipment that can connect to the internet (Internet Of Things [IOT]), AI can aid the urban planning process in numerous ways [30]. Different types of autonomous and self-learning systems are currently being integrated into modern computing systems; and as computing systems in general are now a part of urban lives and urban places and spaces. These advancements are also related to the smart city initiative, which attempts to incorporate more sophisticated digital technology into urban surroundings [31].

3.2 Sustainability in Urban Design

In an endeavor to build enduring places, sustainable design honors and fosters the capacity of communities and larger urban systems to reduce their environmental effect. Central to this paradigm is an ecological approach that takes into account not only the natural environment but also the human factor locally and globally [32]. The report 'Sustainable Urban Development in the European Union: A Framework for Action' and the Leipzig Charter outline the principles and strategies for a national and local government sustainable urban development policy [33]. During the process of constructing the sustainable development paradigm over the last decades, the incorporation and integration of the urban dimension has gained importance, while it has been acknowledged that the majority of the most severe environmental threats are exacerbated by the high density, activity, and consumption patterns of urban life. Thus, several methods, procedures, and tools for assessing the sustainability of urban areas have arisen in an effort to determine how cities may become more sustainable. Indicators are increasingly employed because they give a strong foundation for decision making at all levels and contribute to the establishment of sustainable self-regulated systems in which development and the environment can be combined [34].

Regarding actual 3D urban design, a promising paper developed a Smart Design framework with urban design decision-making reinforced by AI-assisted design. The Smart Design framework views urban design as a process of emergent pattern formation with contextualized and dynamic goals. The framework incorporates design thinking, advanced artificial intelligence search techniques such as genetic algorithms, urban scale performance simulations, and participation to enhance decision-making. The framework combines the concepts of Science for Design and Design in Science through four major stages [5].

3.3 Urban Eco-Design

Design and assessment tools are valuable aids for bringing together stakeholders and challenges surrounding a design object. Specifically in the fields of sustainable urban planning and sustainable buildings and structures, these tools serve as a guide for establishing a common language and disseminating and developing new knowledge. The concept of eco-design can serve as a response to rising environmental challenges, energy efficiency, and sustainability, in line with Sustainable Development Goals (SDGs). There are seventeen SDGs environmental targets, including clean water and sanitation, affordable and clean energy, and climate action [35]. The following concepts underpin Ken Yeang's definition of bio-climatic. The integration of the grey (engineering), blue (water), red (human), and green (landscape) infrastructures in projects of all scales; the bio-integration of the building as an artificial element into the biosphere; the eco-mimesis, repeating nature's patterns such as solar energy and waste equals food; the re-linking of ecosystems by connecting existing natural areas; and, finally, the monitoring for correcting and enhancing the existing built environment [36].

Urban Eco-Design, or environmentally friendly urban development, is enabled by simulations in immersive virtual reality, planning and scheduling data, and intelligent traffic scheduling and path planning algorithms. Intelligent sensor networks, data-driven planning technologies, and virtual simulation tools are necessary for the development of sustainable smart cities. Automated predictive maintenance operations are optimized by spatiotemporal deep learning algorithms, real-time positioning systems, image data fusion techniques. Block-chain-based virtual worlds are improved by sensor data fusion, real-time data modeling, and cognitive computing systems. Data-driven predictive maintenance systems are helped by multi-sensor data fusion methods and machine learning [37].

3.4 Biomimicry in Urban Design and Planning

Otto Schmidt, an American engineer, coined the term biomimetic (from the Greek bios, "life," and mimesis, "to imitate") in 1950 to describe a new field of study that looks to nature for inspiration and then employs biologically inspired strategies to address human challenges [38]. Biomimetics is an interdisciplinary field that encompasses numerous scientific fields, including biology, chemistry, electronics, informatics, medicine, physics, mathematics, and art, among others. According to biomimetics, living organisms and engineers have the same objective: to construct a structure using the least amount of energy or material [39]. Buck's research paper discusses the significance of biomimicry as a design methodology in the context of urban infrastructure planning and design [40]. In his study, he examines the application of biomimicry principles to urban infrastructure issues by analyzing case studies that employed biomimicry-inspired designs as opposed to "mainstream" infrastructure approaches. Biomimicry is presented as an ontology of the city that encourages innovative and collaborative urban infrastructure design and management, complementing dominant future city paradigms such as the "smart" city. In another article on urban design, Kokturk et al. also employ the shortest route function of the biomimetic approach [41].

In the current application of biomimetics to urban design, breakthrough information technologies assist the comprehension of the intricate mechanics of ecosystems as well as their imitation in urban planning and management. Throughout context of this, an ontology connecting diverse terminologies and knowledge in biology, ecology, and engineering is necessary. Based on an appropriate ontological basis, information technology can contribute further to the social application of biomimetics [42]. In conclusion, ecological consciousness is founded on 3,8 billion years of life and 542 million years of evolution. As life in all its diversity evolved in a vast outpouring of biological creativity, the history of evolution is a record of design strategies. This creativity has enormous potential for solving complex problems such as in urban design and city planning. Biomimicry encompasses a wide range of design solutions based on algorithms that imitate organisms found in nature.

3.5 Topology Optimization in Architecture

Architecture is the building block of the discipline of urban design and planning. The physical appearance of the buildings naturally shapes the perception of the city, particularly from a human perspective. The author predicts that the buildings produced by Topology Optimization (TO) algorithms will alter the appearance of future cities.

TO is a method of form optimization that uses computational models to optimize material arrangement within a user-defined space for a given set of loads, conditions, and constraints. TO maximizes the performance and efficiency of the design by removing unnecessary material from regions that do not need to carry significant loads in order to reduce weight or address design challenges such as lowering resonance or thermal stress [43]. Although TO has a wide range of applications across industries, in engineering it is used during the design phase of new product development to optimize the form and increase the stiffness-to-weight ratio. Frequently, topology-optimized designs include free-forms and intricate shapes that are difficult or impossible to produce with conventional manufacturing techniques [44]. However, TO designs are ideally suited for additive manufacturing technologies, which have less stringent design requirements and can rapidly reproduce complex shapes at no additional cost beyond the initial investment.

Integrating structural engineering fully into the architectural design process does not guarantee good architecture or innovative space and forms, but it makes their existence possible. Now, more than ever before, engineers embrace the natural world and use its logic poetically to realize architecture's potential [45].

4. VISIONARY OUTPUTS OF AI FOR FUTURE CITIES

In this section, images of urban areas generated by the Stable Diffusion algorithm are analyzed. The images were obtained by utilizing the open-source software DiffusionBee. This program, like most other Text-to-Image Generation platforms, allows for the creation of visuals using commands written in grammatically correct and meaningful sentences. The capabilities and biases of text-to-image methods as they pertain to the built environment are detailed in a recent study [46]. The team discovered that the evaluated model DALL-E 2 has significant potential to aid human experts in this domain, even without further domain/task-specific dataset fine-tuning. In addition, they found that the evaluated model can effectively generate images in multiple domains relevant to urban scenes, such as natural real-world scenes, abstract representations such as posters, paintings, and cartoons, and realistic renderings in relevant format domains.

In a different preprint-stage study, the team proposes a large-scale, pre-trained model-based approach to reproducible urban scene sensing [47]. As an outline, the paper presents a vision language and semantic pre-trained model for street view image analysis. This allows for the acquisition of text-image urban scene objective descriptions in the physical space from the human perspective, including entities, entity attributes, and entity relationships.

These studies are significant from the standpoint of optimizing algorithms for their field, but their output images are insufficient for predicting the future appearance of cities as they are not intended to this. However, the purpose of this research is to generate objective visuals using concept terminologies as keywords, and not a particular image of well-structured sentences. In order to accomplish this, the key terms discussed in Chapter 3 of this paper are prompted individually and sequentially.

Only the term ‘future city’ is used as a command in the Figure 1. As a combination of millions of images feeding the algorithm, the fact that artificial intelligence constructs the city of the future radially is the first striking aspect. This may be because this design concept, which we observe frequently, particularly in the

modernism movement, takes up too much space in the artificial intelligence library. The image clearly displays the continuity of the axles and the distribution of the building plots. In accordance with the radial order, the water channels are oriented towards the city's center. The browner hue of the sea in the region that appears to be a fatigue in the lower left corner of the image can be interpreted as a reflection of the negative aspects of our civilization.

Fig. 1. Prompted text; future city

The terms 'future city' and 'smart city' are used as prompts in Figure 2. The first thing that attracts the attention about this image is how certain structures have become more distinct and amorphous. Although the orthogonal layout is largely maintained in the design, it is evident that the parcels have been adapted to the shoreline.

Fig. 2. Prompted text; future city, smart city

The terms 'future city', 'smart city' and 'sustainability' are given as prompts in Figure 3. Compared to the previous images, it is evident that the green areas has grown much larger. This image depicts the evolution of the concept of sustainability from its etymological meaning to a green-based lifestyle. Curvilinear building forms are also an architectural and urban design response to the concept of sustainability.

Fig. 3. Prompted text; future city, smart city, sustainability

In the fourth image, the command term "eco-design" has been added to the chain. In this image, the green areas are significantly enlarged, the geometric design is ordered orthogonally, and the tall buildings are distributed uniformly across the landscape. The vast variety of building typologies are an additional remarkable aspect. However, AI may correspond to the interpretation of biological forms in the term 'Eco', where the circulation is incomplete in certain building parcels that appear to be defectively designed.

Fig. 4. Prompted text; future city, smart city, sustainability, eco-design

The addition of the term biomimicry to Figure 5 evident in architectural works. As stated previously, contemporary research at the intersection of biomimicry and urban design mostly focuses on the distribution of urban infrastructure. Since the concept of biomimicry has been in architecture for a very long time, the obtained image can be defined as the quantity of such images in the image library.

Fig. 5. Prompted text; future city, smart city, sustainability, eco-design, biomimicry

The inclusion of the term "Topology Optimization" in the sixth and final image has a significant effect on the formation of urban and architectural forms. This image conveys an excessive qualities regarding not only architectural products, but also urban design and planning. The clarity and hierarchical structure of the transportation axes at a macro scale are evident. In the subdivision of green areas, the observed hierarchical circulation structure becomes organic, and the axial order is disrupted. It can be said that the density of high-rise buildings is nearly evenly distributed across the area, and even this diffused distribution creates green spaces that are equally accessible throughout the city.

Fig. 6. Prompted text; future city, smart city, sustainability, eco-design, biomimicry, topology optimization

5. CONCLUSION

In conclusion, AI would be more advantageous to society if it could be applied to the most complex tasks, such as urban design and planning. It is anticipated that urban designers and planners will use intelligent assistants to evaluate a broader range of potential outcomes in the future for the purposes of

sustainable management. Utilizing spatial and data analytics enabled by AI enables us to gain profound insights into public space and amenity consumption trends. This is particularly important in areas where land is scarce and data-driven planning is necessary to optimize our limited land resources. In addition, promising researches are piloting the use of AI models to study and predict future town demography, project future demand for social community services, and evaluate location and service catchment alternatives for facilities [48].

Throughout history, literacy and artistic depictions of future cities have preceded their actualization. Synthesizing contemporary works of art and literature within the millions of images that make up the libraries of artificial intelligence today can inspire designers to build our future. When describing the cities of the future, literature and art continue to incorporate subjective inspirations. Important influences on this imagery are the cultural, political, and social values of the writers or artists who created it. But AI is neutral. This digital consciousness, fed by millions of data in its library, is able to depict created images as more neutral and participatory than the created by humans.

Currently, the Text-to-Image Generation model can only serve as an inspiration for concept design. According to recent research, however, Text-to-3D will be possible in the near future [49] [50]. Due to the evolution of GAN algorithms, the subject scales of these studies are increasing in size [51]. With the exponential growth of hardware and software technologies, Artificial Intelligence Aided Design (AIAD) made possible to construct buildings and, eventually, cities that are the most intricate structures our civilization has ever produced.

REFERENCES

[1] Vinyals O., Toshev A., Bengio S., Erhan D. – "*Show and Tell: A Neural Image Caption Generator"*Arxiv, 2014

[2] Reed S., Akata Z., Yan X., Logeswaran L., Schiele B., Lee H., *Generative Adversarial Text to Image Synthesis*, Proceedings of The 33rd International Conference on Machine Learning, 2016

[3] Allam Z., Dhunny Z.A., *On big data, artificial intelligence and smart cities*, Cities, 2019, 89, 80–91

[4] Zhang Y., CityMatrix - *An Urban Decision Support System Augmented by Artificial Intelligence*, Mater, Massachusetts Institute of Technology, 2017

[5] Quan S.J., Park J., Economou A., Lee S., *Artificial Intelligence-Aided Design: Smart Design for Sustainable City Development*, Environ Plan B Urban Anal City Sci, 2019, 46, 1581–1599

[6] Quan S.J., Urban-GAN: A*n Artificial Intelligence-Aided Computation System for Plural Urban Design*, Environ Plan B Urban Anal City Sci, 2022, 0, 1–16

[7] Ye X., Du J., Ye Y., MasterplanGAN: *Facilitating the smart rendering of urban master plans via generative adversarial networks*, Environ Plan B Urban Anal City Sci, 2022, 49, 794–814

[8] Turing A.M., *Computing Machinery and Intelligence*, Mind, 1950, 59, 433–460

[9] Newell A., Simon H.A., Current Developments in Complex Information Processing, Rand, California, 1956

[10] Weizenbaum J., ELIZA-A *Computer Program for the Study of Natural Language Communication Between Man and Machine*, Commun ACM, 1966, 9, 36–45

[11] Shirai K., Fujisawa H., *An Algorithm For Spoken Sentence Recognition And Its Application To The Speech Input Output System*, IEEE Trans Syst Man Cybern, 1974, SMC 4, 475–479

[12] Wielinga B., The FINITE STRING *Newsletter Announcements, American Journal of Computational Linguistics*, 1980, 6, 121–123

[13] How Google's AlphaGo Beat Lee Sedol, a Go World Champion - The Atlantic, n.d.

[14] Bernstein P. – *"Machine Learning"* RIBA Publishing, London, 2022

[15] Abdi H., Valentin D., Edelman B. - "*Neural Networks"* Sage, 1999

[16] He X., Deng L., *Deep Learning for Image-to-Text Generation: A Technical Overview*, IEEE Signal Process Mag, 2017, 34, 109–116

[17] Nadkarni P.M., Ohno-Machado L., Chapman W.W., *Natural language processing: An introduction, Journal of the American Medical Informatics Association*, 2011, 18, 544–551

[18] Brownlee J., Deep learning for computer vision: image classification, object detection, and face recognition in python, Machine Learning Mastery, 2019

[19] Goodfellow I.J., Pouget-Abadie J., Mirza M., Xu B., Warde-Farley D., Ozair S., et al., *Generative Adversarial Nets*, Adv Neural Inf Process Syst, 2014, 3, 2672–2680

[20] Anadol R., *Space in the Mind of a Machine: Immersive Narratives*, Architectural Design, 2022, 92,

28–37
[21] Dhariwal P., Nichol A., *Diffusion Models Beat GANs on Image Synthesis*, In: 35th Conference on Neural Information Processing Systems, 2021, 1–15
[22] *WDCH Dreams* - Refik Anadol, n.d.
[23] Sanchez T.W., Shumway H., Gordner T., Lim T., *The Prospects of Artificial Intelligence In Urban Planning*, International Journal of Urban Sciences, 2022, 1–16
[24] Hollands R.G., *Will the real smart city please stand up? Intelligent, progressive or entrepreneurial?*, City, 2008, 12, 303–320
[25] Aurigi A., de Cindio F., Carmona P.M. – *"Augmented Urban Spaces: Articulating the Physical and Electronic City"* Ashgate Publishing Limited, 2012
[26] Willis K.S., Aurigi A. - *"The Routledge Companion to Smart Cities*" Routledge, 2020
[27] Luusua A., Ylipulli J., *Urban AI: Formulating an Agenda for the Interdisciplinary Research of Artificial Intelligence in Cities*, DIS' 20 Companion: Companion Publication of the 2020 ACM Designing Interactive Systems Conference, 2020, 373–376
[28] Marvin S., While A., Chen B., Kovacic M., *Urban AI in China: Social Control or Hyper-Capitalist Development in the Post-Smart City*, Frontiers in Sustainable Cities, 2022, 4, 1–11
[29] Sherman S. - *"The Polyopticon: a diagram for urban artificial intelligences"* AI Soc, 2022
[30] Angelakis V., Tragos E., Pöhls H.C., Kapovits A., Bassi A. – *"Designing, Developing, and Facilitating Smart Cities: Urban Design to IoT Solutions"* Springer International Publishing, 2016
[31] Luusua A., Ylipulli J., Foth M., Aurigi A.: *"Urban AI: Understanding The Emerging Role Of Artificial Intelligence In Smart Cities"* AI Soc, 2022
[32] Kazimee B.A., *Sustainable Urban Design Paradigm: Twenty Five Simple Things to Do to Make an Urban Neighborhood Sustainable*, In: Mertin-Duque, J.F., Wadhwa, L. (Eds.), The Sustainable City II, Brebbia, CA, 2002
[33] Gil J., Duarte J.P., *Tools for evaluating the sustainability of urban design: A review, Proc Inst Civ Eng Urban Des Plan*, 2013, 166, 311–325
[34] Rosales N., *Towards the Modeling of Sustainability Into Urban Planning: Using Indicators To Build Sustainable Cities*, In: Procedia Engineering, Elsevier Ltd, 2011, 641–647
[35] Amir S., Bonifacius N., Poerwoningsih D., *Eco-Design Concept of Street Corridors As A City Image Forming*, In: IOP Conference Series: Earth and Environmental Science, IOP Publishing Ltd, 2022
[36] Yeang K., Lehmann S., Meeting with the Green Urban Planner: *A Conversation Between Ken Yeang and Steffen Lehmann on Eco-Masterplanning for Green Cities*, Journal of Green Building, 2010, 5, 36–40
[37] Beckett S., *Smart City Digital Twins, 3D Modeling and Visualization Tools, and Spatial Cognition Algorithms in Artificial Intelligence-based Urban Design and Planning*, Geopolitics, History, and International Relations, 2022, 14, 123–138
[38] Eggermont M., *Biomimetıcs As Problem-Solving, Creativity And Innovation Tool*, Proceedings of the Canadian Engineering Education Association (CEEA), 2011
[39] Benyus J. – *"Biomimicry: Innovation Inspired by Design*" Harper Perennial, New York, 1997
[40] Buck N.T., *The Art Of Imitating Life: The Potential Contribution Of Biomimicry In Shaping The Future Of Our Cities*, Environ Plan B Urban Anal City Sci, 2017, 44, 120–140
[41] Köktürk G., Tokuç A., Altun T.D., Kale İ., Özkaban F.F., Andiç Çakır Ö., et al., *Experimental And Numerical Shortest Route Optimization In Generating A Design Template For A Recreation Area In Kadifekale*, In: Green Energy and Technology, Springer Science and Business Media Deutschland GmbH, 2020, 779–798
[42] Uchiyama Y., Blanco E., Kohsaka R., *Application Of Biomimetics To Architectural And Urban Design: A Review Across Scales*, Sustainability (Switzerland), 2020, 12, 1–15
[43] Beghini L.L., Beghini A., Katz N., Baker W.F., Paulino G.H., *Connecting Architecture and Engineering Through Structural Topology Optimization*, Eng Struct, 2014, 59, 716–726
[44] Sun Y., Xu L., Yang J., Lueth T.C., *Automatic Design In Matlab Using PDE Toolbox For Shape And Topology Optimization*, In: ASME International Mechanical Engineering Congress and Exposition, Proceedings (IMECE), American Society of Mechanical Engineers (ASME), 2019
[45] Yildirim E., *Topology Optimization in Architecture Practices*, In: Bicer, O.P., Gurani, F.Y. (Eds.), Research & Reviews In Architecture, Planning And Design, Gece, Ankara, 2022, 117–139
[46] Seneviratne S., Senanayake D., Rasnayaka S., Vidanaarachchi R., Thompson J., *DALLE-URBAN: Capturing the urban design expertise of large text to image transformers*, Preprint, 2022
[47] Zhang Y., Zhang F., Chen N., *Migratable Urban Street Scene Sensing Method Based on Vision*

Language Pre-Trained Model, 2022

[48] Zhongwen H., *AI in Urban Planning: 3 Ways it will Strengthen how we Plan for the Future*, Urban Redevelopment Authority, 2021

[49] Koh I., Architectural Plasticity: *The Aesthetics of Neural Sampling*, Architectural Design, 2020, 92, 86–93

[50] Liu Z., Wang Y., Qi X., Fu C.-W., *Towards Implicit Text-Guided 3D Shape Generation*, In: Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), 2022, 17896–17906

[51] Wang C., Chai M., He M., Chen D., Liao J., *CLIP-NeRF: Text-and-Image Driven Manipulation of Neural Radiance Fields*, In: Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), 2022, 3835–3844