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Striking the balance between density and life quality: The application of T.O.D approach for an urban renewal.

F.C.P: Multifunctional tower – Railway district – Blida.

"THE URBAN JUNGLE"

Presented by:

HADJ AHMED Meriem (181832028951).

Groupe: 01.

Directed by:

Dr. AOUISSI Khalil Bachir. (SLA)

Ms. BENDJABALLAH Sarah. (PHD.S)

Ms. OURARI Sahar.

Jury members:

President: Mr. MAROC Mourad. (APA)

Examiner: Mrs. ABDELBAKI Aicha. (APB)

Reporter: Dr. AOUISSI Khalil Bachir. (SLA)

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DEDICATION

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SUMMARY

Transit-Oriented Development (TOD) is a design and planning strategy focusing on creating connected, walkable, and mix-use communities around public transit hubs, whether central or linear ones. The main goal of (TOD) is to promote the use of public transport and gradually abandon relying on individual cars, with the aim of pushing cities towards urban sustainability, by integrating everything related to citizens daily lives, including housing; services; entertainment and commerce, within a close range, usually measured in a 10-minute walk towards and from transportation spots.

This concept came to life in the late 1980s and early 1990s, led by urban planners such as "Peter Calthorpe", and has come to play a crucial role in the urban renewal processes to save neglected and impractical urban areas and wastelands and impel them towards achieving tight connectivity in terms of functions and residents, revitalizing their neighborhoods, and promoting social justice by improving access; reducing chaotic and ill-considered residential sprawl and thus contributing to developing more flexible and livable urban environments.

Through this study, the aim is to revitalize and renew the area surrounding the train station in Blida for the coming years as it represents the future centrality of the city, and change its dense, stagnant and suffocating state into a lively and more sustainable environment, and here the TOD as an approach and principle comes as an answer.

Keywords: Transit Oriented Development (TOD)/ Urban renewal/ Urban planning/ Urban wastelands/ Connectivity / Density/ Livability.

RESUME

Le développement orienté axé sur le transport en commun (TOD) est une stratégie de conception et de planification visant à créer des communautés connectées, marchables et à usage mixte autour des pôles de transport en commun, qu'ils soient centraux ou linéaires. L'objectif principal de ce principe est de promouvoir l'utilisation des transports publics et d'abandonner progressivement la dépendance de la voiture individuelle, dans le but de pousser les villes vers la durabilité urbaine, en intégrant tout ce qui touche à la vie quotidienne des citoyens, y compris le logement, les services, les loisirs et le commerce, dans un cadre à rayon convergent, généralement mesurée à 10 minutes à pied des points de transport.

Ce concept a vu le jour à la fin des années 1980 et au début des années 1990, sous la supervision d'urbanistes tels que "Peter Calthorpe", et a eu un rôle crucial dans les processus de renouvellement urbain pour sauver les friches et les zones urbaines négligées et peu pratiques en les poussant pour parvenir à une connectivité très forte dans les zones urbaines, en termes de fonctions et d'habitants, en revitalisant leurs quartiers et promouvant la justice sociale en améliorant l'accès, et en réduisant l'étalement résidentiel chaotique et inconsidéré, et ainsi en contribuant au développement des environnements urbains plus flexibles et plus vivables.

A travers cette étude, l'objectif est de revitaliser et de renouveler le quartier de la gare de Blida comme il représente la future centralité de la ville, et de changer son état stagnant et étouffant en un environnement vivant et plus durable, et c'est ici que le (TOD) en tant que approche apporte une réponse.

Mots-clés : Développement axé sur le transport en commun (TOD) / Renouvellement urbain/ Urbanisme/ Friches urbaines / Connectivité/ Densité / Habitabilité.

ملخص

التنمية العمرانية المرتكزة على النقل (TOD) هي استراتيجية تصميم وتخطيط ترتكز على إنشاء مجتمعات متصلة، تعتمد على المشي ومتعددة الاستخدامات حول مراكز النقل، سواء كانت مركزية أو خطية .الهدف الرئيسي لـهذه الأخيرة هو تشجيع استخدام وسائل النقل العام والتخلي تدريجياً عن السيارات الفردية، بهدف دفع المدن نحو الاستدامة الحضرية، ودمج كل ما يتعلق بالحياة اليومية للمواطنين، شاملة السكن، الخدمات، الترفيه والتجارة، ضمن نطاق متقارب، يتم قياسه عمومًا بمسافة 10 دقائق سيرًا على الأقدام من وإلى نقاط النقل.

نشأ هذا المفهوم في أواخر الثمانينيات وأوائل التسعينيات، تحت أيادي المخططين الحضريين أبرزهم "بيتر كالثورب"، وكان له دور حاسم في عمليات التجديد الحضري لإنقاذ المناطق الحضرية البور، المهملة وغير العملية ودفعها نحو تحقيق ترابط وثيق يشمل الوظائف والسكان، تنشيط أحيائها، وتعزيز العدالة الاجتماعية عن طريق تحسين الوصول والحد من الزحف العمراني الفوضوي والعشوائي، وبالتالي المساهمة في خلق بيئات حضرية أكثر مرونة وقابلية للعيش الرغيد.

الهدف من هذه الدراسة هو إحياء وتجديد المنطقة المحيطة بمحطة القطار في البليدة باعتبارها المركز الحضري المستقبلي للمدينة، وتغيير حالتها الراكدة، المكتظة والخانقة إلى بيئة حيوية وأكثر استدامة، وهنا يأتي مبدأ (TOD) كإجابة مباشرة.

الكلمات الرئيسية: التطوير العمراني المرتكز على النقل / التجديد الحضري / تخطيط المدن / الأراضي البور الحضرية / الترابط / الكثافة / قابلية العيش.

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CHAPTER I

INTRODUCTORY CHAPTER

I. Introduction:

Since ancient times, the human individual has sought by nature to develop his life and facilitate it as much as possible according to the spectrum of capabilities he can access. In light of this, the transformations that have occurred in man's shelters, surroundings, and camps are stamped on the first face of life practices to the current urbanization patterns seen in major cities. This transformation has not only touched the human dwelling and its facilities but also expanded to include the general urban form.

Without having any clue that things would turn out to be the way they are now, and that those motives for an easier and more comfortable life would slowly move the wheel toward today's world, this human individual was and is still trying and trying tirelessly. While life in cities is based on transactions and service exchanges between their residents, urban density will certainly not be defined as a physical and material accumulation of people and buildings, rather, it carries within it a moral concept of the intertwining of a healthy environment, strong social connections, and a prosperous economy, each embodying its role in creating the scene of truly vibrant urbanism.

So, in a world in which countries have lined up on a track, constantly striving to outdo each other in every aspect, and by projecting what was mentioned above onto a larger and broader scale, the picture becomes clearer about the lights directed towards achieving a balance between the satisfying lifestyle with its constantly rising standards and urban density, all under the framework of sustainable urban development.

Bearing in mind the race towards urban sustainability, many countries and cities have touched on several strategies and practices that seek to make a better use of urban space and transform dense populations into an asset and a positive factor driving their progress and tipping the scales into a more appropriate and equitable standard of living. Among the most prominent strategies, the TOD Approach is topping them as a tool that aims to create ideal communities clustered around public transportation facilities.

This latter is based on characteristics that provide greater opportunities to achieve sustainable urban development, by bringing in the first plan the reinforcement of the link between planning and urban design, developing real estate and investments, as

well as strengthening common housing and mutual urban patterns, generating a unique formula that stimulates economic growth, public health and comfortable living.

Japan has taken an advanced plan to implement TOD as part of its city development projects, especially in Tokyo and Osaka, it has been able to attain a perfect integration between transportation and mixed-use systems to create vibrant spaces and communities around transit hubs. This enabled it to achieve a significant decrease in the rate of dependence on cars and thus reduce congestion and carbon emissions. Singapore and Brazil are other examples that oriented their urban revival towards transportation pivots such as the case of Punggol and Tampines, facilitating the access to facilities and services; transportation spots, and green spaces for the residents.

Curitiba was also able to seal its mark in this field, as it succeeded in reducing pressure and concentricity on the city center by implementing a comprehensive strategy for transportation and urban development along the key structural axis. It is also considered as the first cradle for the creation of the integrated transit network which evolved into the first complete Bus Rapid System (BRS) in the world. These successful experiences have become an incentive for other cities that aim to adopt this approach and reach the desired level on the urban ladder. [1]

II. Problematic:

- General problematic:

While the process of reviving cities and urbanization has become fast. The actual main concern of multiple countries around the world, is focused on how to enhance their cultural competitiveness at both the local and international levels. It becomes crucial to upgrade cities into major centers for economic growth, innovation, and sustainable development, expanding coverage to attract investment and entrepreneurship, developing human resources capabilities, and also shaping infrastructure into templates that align with rising standards of life quality, enlarging the extent to provide synoptic suites of services that meet the evolving needs of the growing population.

1.(Tobias Hager, 2023, Urban development – a sustainable future, By: Topos, Available at: https://toposmagazine.com/sustainable-urban-development/ (Accessed: 02/04/2024, Tipasa, Algeria)).

Here the emphasis is directed specifically toward the behaviors adopted by the transit-oriented development and how it can ensure moderate density and life quality that takes into account the traits of each neighborhood and each different city. Even if the methods are established, the aspects of their application remain different to suit every various situation. Each case has its specific criteria, and each method has its limits and a particular goal scope, for instance, centric internal planning inevitably varies from the peripheral axial one, and areas that witness demographic overcrowding and lack diversity will not witness a similar application to the one applied to spacious environments in which dealing with them is flexible and the sphere for intervention is not obstructive.

Every step and every action require careful guidance through the creation of an accurate framework that includes density; quality and the condition of the intervention area while being cautious in determining the ideal urban density ratio for each case in order to avoid the challenging structural difficulties that arise from every misstep, as the imbalance of one element will cause a major disruption to the entire entity. It is also necessary to highlight the crucial role that design plays in ensuring life fluency or faltering, as controlling density depends on adding, removing, or changing the shape of the units, this must also be systematic; rigorous and far from random, to preserve the practicality of the place, its vitality, as well as its identity.

TOD comes to relieve some of the pressure that continue to affect the authorities who are struggling with the challenges of sustainable development and hinder their efforts to strike a balance between the city's environmental, economic, and social pillars. Here, the conundrum of reconciling urban development without alarming the quality of life in cities that face increasing densification obtrudes itself again, thus, how can we solve it?

- Specific problematic:

Demographic boom does not only have its impact on the environmental and physical scale, causing a disparity in the environmental balance settings; spreading shantytowns and straining infrastructure, but it also represents the main incentive for social pressures which stem from the dilemmas of managing local and material resources, which, in turn, leads to generating psychological tensions among citizens, which increases the rates of health problems and a flaw of security in crowded

atmospheres, threatening the pursuits of a comfortable life within urban neighborhoods.

As we mentioned previously, density is not limited to simple inflation of the population, and since it is also defined as an inhibiting factor in the way of achieving a durable urban development and has enough downsides to cause stagnation in urban life, in the context of the urgent need for intervention, the efforts of local authorities and city planners have become dependent on the TOD practices to create integrated communities and active street lives, by transforming monopolized personal spaces into a unified community space; developing multi-use facilities and areas that promote gatherings; and breaking the barrier in front of the beneficial merging of the diverse society segments, they also aim to direct the focus clearly on public transportation to eliminate the negative facets of traffic congestion and its effects on the environment and its residents, also on providing financing opportunities for reasonable housing to enhance social diversity and avoid zoning and classism.

So, the inquiry that comes to light is:

Can the transit-oriented development approach be an effective and successful factor in reversing the adverse angles of demographic and material density into a thriving holistic urban density? And can its practices be considered as an asset for achieving a higher degree of a leisurely existence?

- Hypotheses:

In order to address the previously stated question, the following hypotheses are proposed to aid aiming the arrow heading for the core of the goals:

- Concentrating the population around transit nodes could contribute in promoting economical vibrancy and vitality by creating new job opportunities; attracting investments and expanding the domain of business, which impacts the overall well-being of the dwellers and helps flourishing the seed of urban density.

- Applying the T.O.D approach, which is rooted on coordinating between the various local concerned authorities could lead to more sustainable urban density by fostering walkability and sustainable mobility and generating more efficient and healthy civilized structures.

III. Objectives:

The principal target is to reach the point of parity between the continuous increase in population density and the sustainable urban environment that seeks to attain a higher degree of a distinctive and easy-going lifestyle, by following TOD strategies during urban planning, built upon:

- Encouraging sustainable means of transportation and boosting the accessibility of public transportation.

- Reducing the use of private cars and alleviating traffic congestion, thus improving air quality and reducing environmental pollution.

- Supporting sustainable development and environmental sustainability in dense cities.

- Developing mixed-use areas that include housing, businesses, services and facilities together.

- Promoting densely packed effective housing and enhancing the social life and mental health of the citizenry.

- Bringing forth new job opportunities and amplifying the economic activity of cities.

IV. Thesis framework:

Under the larger framework of the Urban Architecture Workshop and following the previously outlined framework on how to achieve a balance between urban density and a comfortable lifestyle in crowded areas, by applying the TOD principle with its components and principles, the thesis takes a systematic path around two basic steps that are connected to the following:

1-Reviewing literature: Which in turn is considered the foundation of the research as it includes a comprehensive and detailed review of previous literature that raised topics about:

-Demographic and urban density: Reviewing and analyzing all the facets related to them individually and as a complex, by extracting their characteristics, causes and ramifications, as well as the extent of their impact on the individual and his surroundings.

-Livability and life quality: Bringing to the forefront the efforts of authorities and urban planners to create an environment that meets and keeps pace with the needs and practices of its residents with the aim of improving coexistence and urban integration, which can be achieved by implementing different principles and strategies that flow in the same direction, along with identifying the obstacles and challenges they faced.

-T.O.D approach: Reviewing the origins of the approach, its foundations, and its various applications in the field of urban planning, based on successful experiences of adopting it in several cases and places around the world.

This step enables us to identify the existing gaps in actual studies and develop a theoretical framework as a basis for subsequent practical applications.

The second step is centered around:

2-The application of T.O.D approach:

While aiming to attain an optimal balance and integration between livability and density in the rail way district of Blida, which is known for being overcrowded and witnessing a clear disparity between the distribution of facilities; services and housing in addition to the severe lack of green spaces, which has become a shadow and a threat to the population's living standards and comfort.

By adopting an urban renewal strategy, the TOD approach imposes itself as a perfectly beneficial approach in eliminating all the aforementioned obstacles and renewing the vicinity to become more suitable, through careful and methodical procedure that combine the theoretical conclusions with practical applications to draw inferences about the effectiveness of this approach in finding somewhat radical solutions to solve these cases, in order to achieve topical goals on the one hand and contribute valuable insights in the field of urban planning and urban renewal, on the other hand.

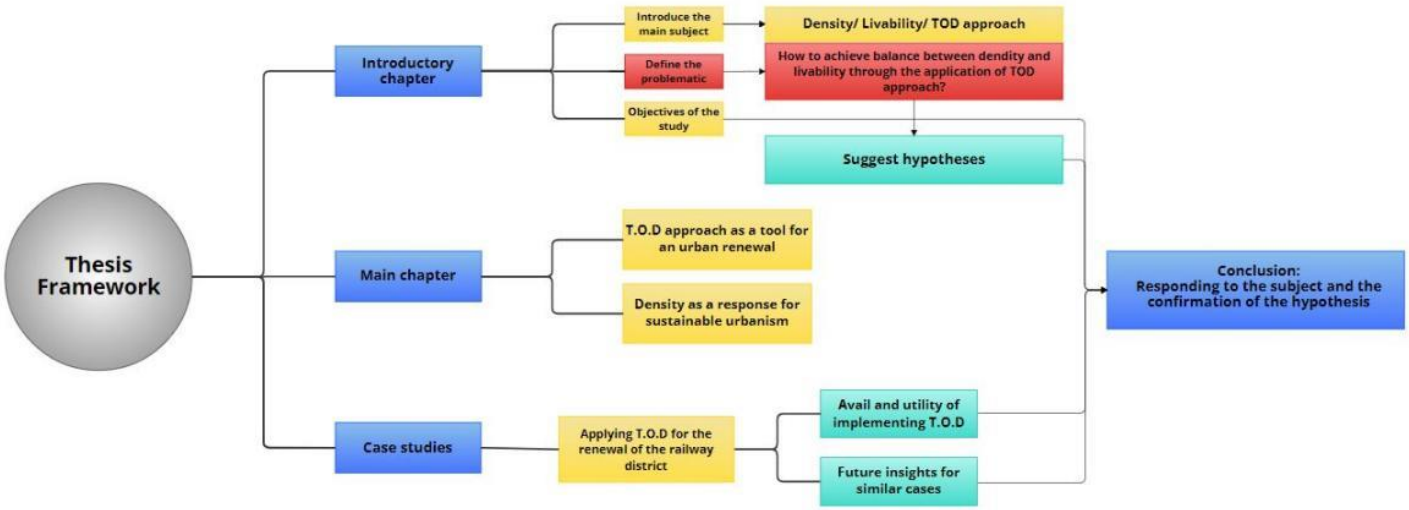


Figure 1: Thesis framework / Source: Author 2024

CHAPTER II

"T.O.D APPROACH AS A TOOL FOR URBAN RENEWAL

I. Urban wastelands and urban renewal:

I.1. Introduction to urban renewal:

The concept of urban renewal emerged as a response to the large-scale relocation and reconstruction experienced in Western cities after World War II. Accelerated urban developments have prompted a massive population flow into cities, resulting in fundamental changes in urban space requirements. It has emerged as a solution to address these changes and address the problems of increasing urbanization, including abandoned urban areas. 2

Urban renewal is the process of reusing resources and rebuilding urban environments with the aim of solving city problems and achieving lasting improvements at various levels, including economic, social and environmental aspects. It also combines improving community well-being, redeveloping commercial areas and achieving other goals that contribute to creating more sustainable and efficient cities. Interest in urban renewal has increased globally as the challenges facing cities, such as social dislocation, economic stagnation, environmental pollution, and declining urban jobs, have worsened. 3

This process includes modifying the structure of urban space and improving the allocation of land resources, that requires expanding the scope of research to include large urban areas, as well as focusing on individual buildings and residential areas. Differences in the economic value of land, which is greatly influenced by site conditions, must be taken into account, accessibility and regional competitiveness also play a major role in determining land development potential, and development projects usually prioritize areas close to urban centers, open spaces, bodies of water, and convenient transportation. In addition to site value, development efficiency is an important economic indicator for urban renewal. Most relevant studies rely on indicators such as building density, floor area ratio, functional integration and input-output ratio to evaluate the effectiveness of urban renewal projects which contribute to creating more sustainable, efficient and prosperous cities. 2

2.(Wang.M, Yang.J, 2022, Sustainable Renewal of Historical Urban Areas: A Demand–Potential–Constraint Model for Identifying the Renewal Type of Residential Buildings, p01).

3.(Huanga.L, Zhengb.W, Honga.J, Liua.Y, Liua.G, 2020, Paths and strategies for sustainable urban renewal at the neighborhood level: A framework for decision-making, p01).

I.2. Historical context:

For more than half a century, city planners, governments and business people have viewed crumbling downtown neighborhoods as a thorny problem. In their view, the health and appearance of cities was crucial, and their chosen solution was “urban renewal.” This term is currently defined as the government program to demolish and replace buildings considered slums. The idea of urban renewal first arose in Western countries, and refers to the necessary and organized transformation of built-up areas that do not meet the functional needs of modern cities in the process of urban development and construction. This includes demolition and reconstruction, functional transformation, comprehensive renovation and protection, and other methods. [4]

Since the 1950s, urban centers in some developed Western countries have experienced environmental degradation, traffic congestion, economic decline, and other problems. City dwellers began to move to the suburbs, and population density continued to decline, leading to a dangerous "counter-urbanization." Many countries and scholars have proposed using residential regeneration, urban transformation and redevelopment to restore the vitality of cities and change the trend of "counter-urbanization". The development of urban renewal as an effective mean of solving urban problems can be divided into the following four stages under the influence of various conditions:

2.1. Massive knockdown redevelopment and slum clearance:

After World War II, a large-scale urban renewal movement was launched in Europe and the United States. Because of the war, a large number of buildings were damaged and people's living environment became poor. Local governments began to pay close attention to resident's living conditions, and many cities developed large-scale reconstruction and urban renewal plans. [5]

4.(Alexander von Hoffman, 2008, The lost history of urban renewal, Journal of Urbanism: International Research on Placemaking and Urban Sustainability, p281, Available at: http://dx.doi.org/10.1080/17549170802532013 (Accessed: 02/04/2024, Tipasa, Algeria)).

5.(Peng Dai, Hui Fu, Xuxu Yang, Song Han, Guannan Fu,Yanjun Wang, 2023, Exploring the urban renewal strategy based on transit-oriented development concept-A case study of Japan and Hong Kong, p02, Available at: https://www.frontiersin.org/articles/10.3389/fmats.2023.1098027/full (Accessed: 02/04/2024, Tipasa, Algeria)).

Under the guidance of the city planning thought advocated by the International Congress of Modern Architecture (CIMA) at that time, which was characterized by “Form planning” and reconstruction using bulldozers, many cities: London, Paris and Berlin, demolished many old buildings in the city center and replaced them with various new high-rise buildings. At the same time, several countries, represented by the United States, also began to focus on urban renewal to improve the living environment. They implemented a series of slum clearance plans through demolition and clearing.

However, the new appearance of the city became monotonous and inhuman, creating a set of social problems that some Western scholars called the "Second Destruction" (World War II is called the First Destruction). [5]

2.2. Urban decline and neighborhood recovery:

From the 1950s to the 1960s, postwar reconstruction was largely complete in Western countries, social work was progressing steadily, and economic development was entering a period of rapid growth, due to continued high economic growth, the demand for land in cities has become increasingly high. At that time, the urban renewal movement was mainly focused on land use intensification in the central areas of cities, while a large number of residential houses and small and medium-sized businesses mixed in were replaced by large commercial facilities and upscale offices on the outskirts of cities.

In this context, the city's central area was once prosperous, the price of land in the central area of the city began to rise, the city continued to expand into the suburbs, traffic congestion pressure continued to rise, the attractiveness of the central area decreased, and many residents moved out. As a result, "Counter-urbanization" has become more dangerous. [5]

5.(Peng Dai, Hui Fu, Xuxu Yang, Song Han, Guannan Fu,Yanjun Wang, 2023, Exploring the urban renewal strategy based on transit-oriented development concept-A case study of Japan and Hong Kong, p02, Available at: https://www.frontiersin.org/articles/10.3389/fmats.2023.1098027/full (Accessed: 02/04/2024, Tipasa, Algeria)).

2.3. Public participation and community planning:

In the wake of the 1970s, urban renewal took a new direction focusing on comprehensive community uplift. A social trend calling for democratic pluralism has emerged in some major Western countries, leading to the emergence of a tripartite model that includes society, government, and private institutions. The idea of public participation in planning, as a manifestation of "Direct or semi-direct democracy", gained wide acceptance among the population. City residents formed their own organizations, committees, and associations to negotiate with the government and real estate developers to preserve their neighborhoods and lifestyles.
In contrast, a “Community planning” model emerged based on bottom-up community participation, a “Voluntary renewal” that emerges spontaneously from the community. Residents sought to improve their living conditions while preserving the culture of their community. “Community planning” was characterized by its small scope and its goal of improving the environment, creating jobs, and promoting neighborhood harmony. [5]

2.4. TOD model of urban renewal:

In the wake of the 1990s, the “Transit-Oriented development” (TOD) model emerged as an urban renewal solution to address the problems of traffic congestion, class division, urban sprawl, and other issues. After years of practice and development, this model has become the basic approach to urban renewal in most countries. Product life cycle assessment provides valuable assistance to achieve balanced development of society, economy and environment at the project planning and implementation stage. It also provides important criteria for developing urban renewal strategies by identifying and regulating the use of energy, materials and environmental emissions, assessing their impact, and identifying and implementing opportunities to improve the environment. [5]

5.(Peng Dai, Hui Fu, Xuxu Yang, Song Han, Guannan Fu,Yanjun Wang, 2023, Exploring the urban renewal strategy based on transit-oriented development concept-A case study of Japan and Hong Kong, p02, Available at: https://www.frontiersin.org/articles/10.3389/fmats.2023.1098027/full (Accessed: 02/04/2024, Tipasa, Algeria)).

Urban renewal development stages	Renewal mechanism	Renewal objectives	Renewal methods
Post-WWII-1950s	Leadership of government at all levels	Improving urban physical space	Bulldozer-style mass knockdown reconstruction
1950s–1970s	Spontaneous participation of residents	Upgrading living conditions	Neighborhood self-built
1970s–1990s	Cooperation of community, government, and private business	Upgrading community environment	Small-scale incremental community renewal
1990s to present	Cooperation of government and business	Relieving traffic congestion, coping with urban sprawl, and improving the quality of urban space	Transit-oriented

Table 1. Stages and characteristics of urban renewal development.

Source: 5.(Peng Dai, Hui Fu, Xuxu Yang, Song Han, Guannan Fu,Yanjun Wang, 2023, Exploring the urban renewal strategy based on transit-oriented development concept-A case study of Japan and Hong Kong, p02).

I.3. Urban renewal constraints:

People have always dreamed of vibrant cities, where development and land utilization flourishes. Urban transport and transit projects promised tremendous potential to achieve this dream, but on the ground, the urban renewal process faces serious challenges that hinder its progress.

3.1 Complexity of land tenure:

Land ownership in older urban areas poses a difficult dilemma. In the journey of urban renewal, we encounter intertwined threads of property rights and usufruct rights, distributed among multiple parties with disparate interests. The process of replacing property rights and reintegrating land resources becomes a complex battle that requires a careful balance between the desires of all parties.

A successful development model can achieve a “Win-Win” situation through a hierarchical management and coordination mechanism that takes into account the needs of all stakeholders. There is a need to remove communication barriers between the various intervening parties, and coordinate their interests, values, and functional needs. Determining the path and direction of urban renewal depends on the ability to decipher this complex equation. [5]

5.(Peng Dai, Hui Fu, Xuxu Yang, Song Han, Guannan Fu,Yanjun Wang, 2023, Exploring the urban renewal strategy based on transit-oriented development concept-A case study of Japan and Hong Kong, p03-04, Available at: https://www.frontiersin.org/articles/10.3389/fmats.2023.1098027/full (Accessed: 02/04/2024, Tipasa, Algeria)).

3.2 Deteriorating traffic conditions:

Improving traffic conditions is a vital artery in the body of urban renewal. As the number of cars increases and the desire to own them grows, the streets of our cities become choked with congestion.

Added to this are historical problems resulting from the traditional urban development model that focused on wide roads and large areas, reducing the city's density and weakening the accessibility of the current road network. The crisis is most severe in older urban areas, where travel speeds during peak hours drop alarmingly, and main streets become a major focus of delays. Traffic congestion threatens the long-term economic, social and environmental sustainability of cities.

Therefore, it is necessary to reconsider the traditional urban development model, and move to a comprehensive approach that takes into account the relationship between urban renewal and traffic conditions in the city, with a focus on sustainable spatial development patterns. [5]

3.3 Lack of social justice:

Far from emanating on its own from within society, social justice in the context of urban regeneration comes as the result of a comprehensive redistribution process at a high level of planning and design. We can also understand this process as "Eliminating regional development imbalances." But achieving this fully by local residents and civil society organizations alone is difficult, especially in urban renewal projects that seek efficiency and speed, which can easily exacerbate social inequalities.

Through urban renewal projects, many local governments have revitalized older areas of cities, significantly improving the living environment and infrastructural conditions of residents, and attracting large numbers of middle- and high-income people. However, this in turn led to a rise in land values and housing prices, forcing many low-income residents to move. [5]

5.(Peng Dai, Hui Fu, Xuxu Yang, Song Han, Guannan Fu,Yanjun Wang, 2023, Exploring the urban renewal strategy based on transit-oriented development concept-A case study of Japan and Hong Kong, p03-04, Available at: https://www.frontiersin.org/articles/10.3389/fmats.2023.1098027/full (Accessed: 02/04/2024, Tipasa, Algeria)).

Although some renovation projects allocate a certain percentage of affordable housing to meet the needs of some low-income groups, this percentage is very small and does not make any significant impact. The urban renewal development model that focuses on private cars also causes great expenses, inconvenience in daily life, and transportation difficulties for the low-income class who do not own cars.

Even in urban regeneration projects for functional urban areas and communities located along railway lines, the absence of an effective and complete review mechanism and low public participation in the early stages of planning and design hinder the protection of the interests of the population in general, who are the direct users of housing. [5]

3.4 Serious damage to the historic landscape:

The balance between protection and development has always been a major concern in urban regeneration and modernization. The historical and cultural landscape of the city is an important element in its development momentum, while the development of the city in return provides great support for the protection of these landscapes. From a physical construction perspective, development is also a way to improve protection. Only through some transformation and renewal can urban development be brought in line with the trends of the times while preserving the historical and cultural landscape.

In its historical course, the Old City carries the culture and heritage of the city. These historical and cultural features, rooted throughout time, are the soul of every city. These features have witnessed the development of the city and embodied its unique style and appeal, which is reflected in our psychological memory preserved by the traditional historical and cultural features.

Although some historical and cultural monuments require minor or major repairs over time, their basic physical form has not undergone fundamental changes. But as urban renewal and reconstruction projects progress, these cultural veins rooted deep in the city's history are fading. [5]

5.(Peng Dai, Hui Fu, Xuxu Yang, Song Han, Guannan Fu,Yanjun Wang, 2023, Exploring the urban renewal strategy based on transit-oriented development concept-A case study of Japan and Hong Kong, p03-04, Available at: https://www.frontiersin.org/articles/10.3389/fmats.2023.1098027/full (Accessed: 02/04/2024, Tipasa, Algeria)).

Due to many cities' lacks of experience in protecting historical and cultural relics, huge amounts of these relics have been severely damaged, causing irreparable losses, even as the city's appearance has been rapidly changed through large-scale demolition and reconstruction. 5

3.5 Public space compression:

Many old cities, especially those with high population densities, suffer from neglect in their social and economic structure, industrial patterns and urban spatial characteristics. During the renewal and rehabilitation of these cities, some of the old built-up areas have undergone a massive transformation in their industrial structure. While these areas were dominated by traditional residential and cultural functions, they are gradually being replaced by commercial, office and medical functions. This modernization process also led to the erosion of public spaces, which are the primary carrier of cultural activities.

Traditional neighborhoods are defined by their human scale, while the emphasis on cars in urban renewal has led to increased traffic congestion due to the rise in the number of private vehicles. As a solution to this problem, roads are often inappropriately widened and modern roads constructed during the renovation and rehabilitation process to accommodate more cars. This in turn exacerbates the lack of public space in the city. Moreover, due to real estate developer's pursuit of maximum profit, public amenities and open spaces are often squeezed or even eliminated in some renovation projects, to make way for high-return commercial and residential real estate projects. 5

I.4. Wastelands areas as barrier to urban development:

Heathlands, or wastelands, are a characteristic feature of many urban and industrial landscapes. The term “Wasteland” is commonly used within various discourses related to the redevelopment of empty or unproductive spaces, it encompasses a wide range of meanings, physical assets and environmental characteristics. 6

5.(Peng Dai, Hui Fu, Xuxu Yang, Song Han, Guannan Fu,Yanjun Wang, 2023, Exploring the urban renewal strategy based on transit-oriented development concept-A case study of Japan and Hong Kong, p03-04, Available at: https://www.frontiersin.org/articles/10.3389/fmats.2023.1098027/full (Accessed: 02/04/2024, Tipasa, Algeria)).

6.(Gandy.M, 2015, Marginalia: Aesthetics, Ecology, and Urban Wastelands, By: Routledge, p02, Available at: http://dx.doi.org/10.1080/00045608.2013.832105 (Accessed: 02/04/2024, Tipasa, Algeria)).

The rapid change in global landscapes has led to global environmental concerns, increasing the need to rethink landscape management and environmental protection. This is especially true in areas that have previously witnessed urban development, but are now abandoned or less used.

Instead of consuming more green land, it has become necessary to revitalize these brown lands, also known as "Brown urban areas", and give them new life. This contributes to creating a more sustainable urban environment.

In this context, land conversion policies are an important tool to contain cities and promote urban redevelopment and revitalization. However, the contributions of these policies and the principles they contain have not been adequately evaluated in relation to post-industrial land conversion efforts. [7]

I.5. Key strategies and approaches for transforming urban wastelands:

Green infrastructure and urban wastelands:

Urban wastelands are often marginalized and considered an eyesore, when in reality, these spaces hide huge potential for enhancing green infrastructure within cities. These areas are characterized by diverse vegetation stages, allowing them to provide a rich range of ecosystem services, including maintaining biodiversity, adapting to climate change, and providing recreational spaces. By implementing active afforestation practices on these wastelands, cities can create multifunctional green systems that benefit both residents and the environment.

Planning and development approach:

- Preserving spontaneous natural environments:

This step aims to protect the natural habitats found within the wastelands to preserve biodiversity. These habitats include forests, wetlands, and meadows, and are home to a variety of animals and plants. [8]

7.(Loures.L, 2014, Post-industrial landscapes as drivers for urban redevelopment: Public versus expert perspectives towards the benefits and barriers of the reuse of post-industrial sites in urban areas, p01).5.(Gandy.M, 2015, Marginalia: Aesthetics, Ecology, and Urban Wastelands, By: Routledge, p02, Available at: http://dx.doi.org/10.1080/00045608.2013.832105 (Accessed: 02/04/2024, Tipasa, Algeria)) .

8.(Mathey.J, Röbler.S, 20, Approaches to Developing Urban Wastelands as Elements of Green Infrastructure, Urban wastelands: A Form of Urban Nature, Cities and nature, p420–438).

- Active afforestation:

This action aims to intentionally introduce vegetation into wastelands, and enhance their ecological and aesthetic value. It involves the intentional planting of native trees, shrubs, and grasses.

Native trees, shrubs and grasses can turn barren lands into green lungs, improving air quality and reducing temperatures.

- Realization and acceptance:

This step aims to understand how residents perceive and use different heathland designs. Local community involvement is essential to ensure acceptance and utilization of these spaces.

- Economic feasibility:

Enhancing the value of real estate: Green spaces contribute to enhancing the value of nearby properties, which attracts investments and stimulates economic activity in the region.

Urban wastelands offer an exceptional opportunity to create sustainable green infrastructure within cities. Through thoughtful planning and implementation, these neglected spaces can be transformed into green oases that benefit both residents and the environment. [8]

II. Transit-Oriented-Development (T.O.D) approach:

II.1. Understanding Transit Oriented Development:

Urban transport is the beating heart of cities, pumping vitality into their arteries, and directly affects their economic and social health. Aware of the importance of this axis, the concept of "Transit-Oriented-Development" (TOD) has emerged as an ideal solution to address urban transportation problems and improve land use.

TOD is defined as a modern city planning concept, focusing on sustainable development and smart growth of the area surrounding transportation facilities. [9]

8.(Mathey.J, Röbler.S, 20, Approaches to Developing Urban Wastelands as Elements of Green Infrastructure, Urban wastelands: A Form of Urban Nature, Cities and nature, p420–438).

9.(Boon Hui Yap.J, Chia Yee Chuaa.C, Skitmore.M, 2021, Towards Sustainable Mobility with Transit-Oriented Development (TOD): Understanding Greater Kuala Lumpur, by: Routledge, p01-02, Available at: https://doi.org/10.1080/02697459.2021.1883249 (Accesses: 25/04/2024, Tipasa, Algeria)).

This approach aims to seamlessly connect people to the public transportation network, encouraging them to walk instead of relying on private vehicles. Thus, TOD contributes to reducing carbon emissions and improving air quality, not to mention enhancing social interaction between residents and creating walkable communities. 9

The TOD concept was not born of the moment, but dates back to before the 1990s. But it was not officially proposed until 1993 by Peter Kaltorp in his book The Next Great American City: Environment, Community, and the American Dream. This concept came as a response to the social and economic problems resulting from rapid urban expansion.

The core of TOD's value lies in building vibrant communities and promoting sustainable urban development. It aims to create livable urban environments, where people have easy access to all their basic needs without having to rely on cars.

TOD models vary to suit different geographic locations and climates, from sparsely populated suburbs to densely populated Asian cities. Studies have conclusively proven the benefits of TOD models, including:

Increased reliance on public transportation, promoting a culture of cycling and walking, improve air quality, reducing carbon emissions, creating more vibrant and interactive communities. 5

TOD is a promising approach to address urban transportation problems and achieve sustainable development of cities. By focusing on connecting people to the public transportation network and creating walkable urban environments, TOD paves the way for a brighter future for cities and better well-being for their residents. 10

5.(Peng Dai, Hui Fu, Xuxu Yang, Song Han, Guannan Fu,Yanjun Wang, 2023, Exploring the urban renewal strategy based on transit-oriented development concept-A case study of Japan and Hong Kong, p02, Available at: https://www.frontiersin.org/articles/10.3389/fmats.2023.1098027/full (Accessed: 02/04/2024, Tipasa, Algeria)).

9.(Boon Hui Yap.J, Chia Yee Chuaa.C, Skitmore.M, 2021, Towards Sustainable Mobility with Transit-Oriented Development (TOD): Understanding Greater Kuala Lumpur, by: Routledge, p01-02, Available at: https://doi.org/10.1080/02697459.2021.1883249 (Accesses: 25/04/2024, Tipasa, Algeria)).

10.(Joo Hwa P. Bay, Lehmann.S, 2017, Growing Compact: Urban Form, Density and Sustainability, by: Routledge, ISBN: 9781138680401, p03).

II.2. Principles and components:

II.2.1. TOD Principles:

Through a long journey of research and application, basic principles of the (TOD) theory have crystallized, perhaps the most prominent of which are the principles of the three and five dimensions.

Robert Cervero and Kara Kockelman developed the classic 3D theory (diversity, density, design) after studying urban renewal in the San Francisco Bay Area. This theory has been adopted as a guideline to provide a theoretical basis for the regeneration and redevelopment of old urban areas with high population density.

Over time, the principle of five dimensions proposed by Robert Cervero has gained wide popularity among theorists and city planners, because it contains the following elements:

Density: Increase the density of real estate transit-oriented development as a hub to improve land utilization and provide sufficient passenger flow for the railway.

Distance: Limit development and land use around the station within a reasonable walking range, usually no more than 500 meters, to ensure walking comfort.

Diversity: The transit-oriented development community built around the station as a hub incorporated different types of land uses and urban functions to meet people's daily needs and reduce the proportion of motorized vehicles.

Design: The urban development area around transportation has good environmental design quality and a pedestrian circulation network system.

Accessibility to destinations: Access and convenience of public transportation for residents around the community should be high enough to reduce resident's dependence on cars for transportation. [5]

5.(Peng Dai, Hui Fu, Xuxu Yang, Song Han, Guannan Fu,Yanjun Wang, 2023, Exploring the urban renewal strategy based on transit-oriented development concept-A case study of Japan and Hong Kong, p02, Available at: https://www.frontiersin.org/articles/10.3389/fmats.2023.1098027/full (Accessed: 02/04/2024, Tipasa, Algeria)).

These principles have proven effective in improving the quality of life in urban areas, by promoting walking, cycling, and the use of public transportation, reducing traffic congestion, and providing a more sustainable environment. Many cities around the world are seeking to apply these principles in new urban development projects, in an effort to create cities that are more livable and human-friendly. [5]

II.2.2. TOD Components:

1. Land use planning:

Bases on creating a harmonious mix of uses by integrating commercial and leisure functions with residential, creating a vibrant environment and reducing the need for commuting, it also bases on establishing supportive uses for public transportation by providing adequate parking for public transportation and designing streets that facilitate walking and cycling, focusing growth around public transit stations, reducing car dependence and creating denser, more vibrant neighborhoods.

2. Pedestrian-friendly design:

Rooted on creating short, connected pedestrian walkways, facilitating movement between different parts of the city without the need to use cars and separating vehicle traffic from pedestrian traffic by ensuring pedestrian safety and creating a quieter and more beautiful environment, improving street design quality, connecting ground level to pedestrian uses and upgrading landscape lighting and signage by improve visibility and safety at night and create a welcoming feeling.

3. Enhancing urban density:

Via increasing the population in areas with good services and public transportation, creating a more vibrant and diverse environment, designing compact buildings, and providing green spaces and open spaces within neighborhoods, besides leaving room for expansion and meeting the needs of future generations without compromising the environment. [11]

5.(Peng Dai, Hui Fu, Xuxu Yang, Song Han, Guannan Fu,Yanjun Wang, 2023, Exploring the urban renewal strategy based on transit-oriented development concept-A case study of Japan and Hong Kong, p02, Available at: https://www.frontiersin.org/articles/10.3389/fmats.2023.1098027/full (Accessed: 02/04/2024, Tipasa, Algeria)).

11.(Md. Kamruzzaman, Baker.D, Washington.S, Turrell.G, 2013, Advance transit oriented development typology: case study in Brisbane, Australia, By: Journal of Transport Geography).

4. Parking management:

By providing sufficient parking, but not excessively, encouraging the use of alternative means of transportation and maintaining sufficient green spaces. Moreover, creating graded parking starting at the surface and providing more pedestrian-friendly options. In addition to providing bicycle parking and encouraging the use of bicycles as a sustainable means of transportation.

5. Turn every station into a "place":

Creating a distinctive destination, designing each station as a center for social and cultural activity, transforming buildings into landmarks and using architecture to create a distinctive identity for the city. Additionally, directing attention to sightlines and views, ensuring that all buildings are aesthetically appealing and orienting buildings towards the street, creating open facades on the street which increases the vitality of the city. Likewise providing open public spaces and places for entertainment and social networking. [11]

II.3. The role of T.O.D as a catalyst for sustainable and vibrant urban renewal:

The concept of urban renewal is undergoing a tremendous revolution, going beyond the boundaries of traditional development to include deeper social and environmental dimensions. It has shifted from a purely materialistic, profit-driven approach to a comprehensive philosophy concerned with human well-being and environmental protection.

This transformation embodies the concept of "Transit-Oriented Development" (TOD), which seeks to build vibrant cities, rich in green spaces and efficient public transport, providing their residents with a better and more sustainable life. The TOD concept focuses on the integration of urban renewal and public transportation, recognizing that they are essential components for creating thriving cities. [5]

5.(Peng Dai, Hui Fu, Xuxu Yang, Song Han, Guannan Fu,Yanjun Wang, 2023, Exploring the urban renewal strategy based on transit-oriented development concept-A case study of Japan and Hong Kong, p02, Available at: https://www.frontiersin.org/articles/10.3389/fmats.2023.1098027/full (Accessed: 02/04/2024, Tipasa, Algeria)).

11.(Md. Kamruzzaman, Baker.D, Washington.S, Turrell.G, 2013, Advance transit oriented development typology: case study in Brisbane, Australia, By: Journal of Transport Geography).

TOD as an approach pays special attention to the resident's needs for green spaces, as they are the lungs of the city that enhance the physical and psychological health of its residents. It represents a journey towards sustainable cities that meet the needs of both humans and the environment. By focusing on the integration between urban renewal, public transportation, and green spaces, urban planners contribute to creating vibrant cities, rich in beauty, that enhance the well-being of their residents and contribute to building a better future for future generations.

Urban renewal and TOD are coordinated and unified in their focus on urban development issues, such as alleviating traffic congestion, building roaming systems, and designing public spaces. In the process of urban renewal, all plannings and designs should serve the goal of prioritizing public transportation (Figure2).[5]

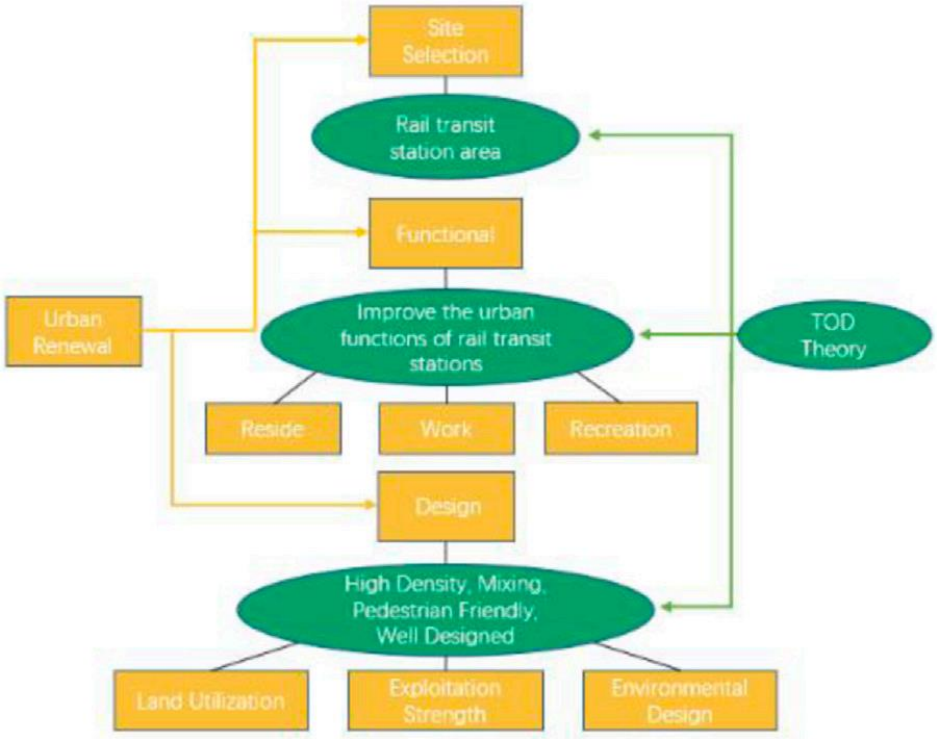


Figure 2. Framework of urban renewal strategy based on TOD concept.

Source: 5.(Peng Dai, Hui Fu, Xuxu Yang, Song Han, Guannan Fu,Yanjun Wang, 2023, Exploring the urban renewal strategy based on transit-oriented development concept-A case study of Japan and Hong Kong, p02).

5.(Peng Dai, Hui Fu, Xuxu Yang, Song Han, Guannan Fu,Yanjun Wang, 2023, Exploring the urban renewal strategy based on transit-oriented development concept-A case study of Japan and Hong Kong, p02, Available at: https://www.frontiersin.org/articles/10.3389/fmats.2023.1098027/full (Accessed: 02/04/2024, Tipasa, Algeria)).

II.4. Challenges and considerations in implementing T.O.D:

II.4.1. Land-use and zoning regulations:

Balancing density and Compatibility: Zoning controls must ensure a balance between enhancing density around transit stations while considering compatibility with existing neighborhoods. Strict or inflexible zoning restrictions can hinder the implementation of transportation-related urban development (TOD) projects.

Mixed-Use Zoning: Encouraging mixed-use development requires rethinking zoning laws. Challenges arise when current regulations prioritize single-use areas, hindering the creation of vibrant and diverse neighborhoods.

Zoning Amendments: Updating zoning laws to accommodate TOD can be a complex process which includes engaging local governments, developers and communities to effectively review regulations.

II.4.2. Financing and investment:

Infrastructure Costs: The development of transport infrastructure (stations, tracks, etc.) requires significant investments. Funding sources, such as public-private partnerships, grants, and tax increment financing, need careful planning.

Value Capture: TOD projects can benefit from capturing increased property values resulting from improved transit access. However, implementing value capture mechanisms (e.g., tax increment financing, development impact fees) can be challenging due to legal and administrative complexities.

Affordability: Striking a balance between market-rate housing and affordable housing can be difficult, especially in high-demand urban centers.

II.4.3. Community engagement and social equity:

Gentrification and Displacement: TOD can inadvertently lead to gentrification, pushing out existing low-income residents. Strategies to mitigate displacement include inclusionary zoning, rent control, and community land trusts. [12]

12.(Paul S. K., Chatterjee.A, Roy.S, 2020. Issues and Challenges for Transit-Oriented Development in the Scenario of a Developing Country: The Case of Kolkata Metropolitan Area, India, Springer Geography, p65-89).

Equitable Access: TOD should benefit all residents, regardless of income or background. Ensuring equitable access to transit, amenities, and services requires community engagement and targeted policies.

Community Participation: Involving residents, businesses, and community organizations early in the planning process is essential. Inclusive decision making promotes participation and addresses diverse needs.

Cultural Sensitivity: Acknowledging cultural differences and historical context is vital. TOD must respect local heritage and avoid erasing community identity. 12

"DENSITY AS A RESPONSE FOR SAUSTAINABLE URBANISM"

I. Density and sustainable urbanism:

I.1. Introduction to sustainable urbanism:

It is difficult to pinpoint a specific date for the birth of sustainable urban planning, but most scholars agree that it emerged during a period full of challenges, between the late 1960s and the early 1970s. The world witnessed two interconnected crises at that time: environmental and urban:

Environmental crisis: resulting from the accumulation of environmental damage resulting from rapid industrialization, threatening the planet Earth.

The urban crisis: represented by environmental impacts of overgrown cities which caused massive pollution as they expanded during the "Golden age" of urban expansion after World War II, and deteriorating quality of urban life and the dawn of sustainable urban planning:

In response to these crises, the concept of sustainable urban planning has emerged as a solution that aims to create walkable cities, connected by public transportation, and equipped with highly efficient buildings and infrastructure. 13

12.(Paul S. K., Chatterjee.A, Roy.S, 2020. Issues and Challenges for Transit-Oriented Development in the Scenario of a Developing Country: The Case of Kolkata Metropolitan Area, India, Springer Geography, p65-89).

13.(Flint.J, Raco.M, 2012, The Future of Sustainable Cities: Critical Reflections, Bristol, by: Bristol University Press, Policy Press, p31).

Simply put, sustainable urbanism is one that encourages walking, provides excellent public transportation services, and features highly efficient buildings and infrastructure. Compactness (density) and connection with nature (easy access to green spaces) are two essential pillars of sustainable urbanism.

The traditional urban structure conforms to the framework defined by the Charter of the New Architecture Conference, and consists of three main elements: neighborhoods, districts and corridors. According to the charter, neighborhoods are defined as "Small-scale, pedestrian-friendly, mixed-use areas." Districts are similar to neighborhoods in that they are small in size and pedestrian-friendly, but they are usually dedicated to a single use, such as a university campus or industrial park. As for the corridors, they range from "Main streets, railway lines, rivers, and parks, and work to connect neighborhoods and regions to each other." 13

Urban renewal initiatives aim to revitalize cities by improving infrastructure, revitalizing the economy, raising land values, and addressing environmental degradation. But some of these initiatives may cause social exclusion, loss of community identity and destruction of cultural and historical landmarks.

Sustainable urban planning is a continuous journey towards environmentally and human-friendly cities that meet the needs of the present without compromising the rights of future generations. 03

I.2. Importance of density in urban planning:

Cities around the world face increasing challenges related to density and urban form, affecting livability and resource consumption, most of them are undergoing a major transformation, densifying and evolving towards higher density urban forms. They face limited options to meet the demands of population growth, either through developing a more compact city form or suburban sprawl, a combination of the two, or even leaving it unplanned.14

03.(Huanga.L, Zhengb.W, Honga.J, Liua.Y, Liua.G, 2020, Paths and strategies for sustainable urban renewal at the neighborhood level: A framework for decision-making, p01).

13.(Douglas Farr, 2007, Sustainable Urbanism: Urban Design with Nature, p42, ISBN: 978-0-471-77751-9).

14.(Joo Hwa P. Bay, Lehmann.S, 2017, Growing Compact: Urban Form, Density and Sustainability, by: Routledge, ISBN: 9781138680401, p03-05).

Compact urban forms have long been linked to sustainability, making it essential for a deeper understanding of the relationship between urban form, density and sustainability by architects, planners and urban decision-makers.

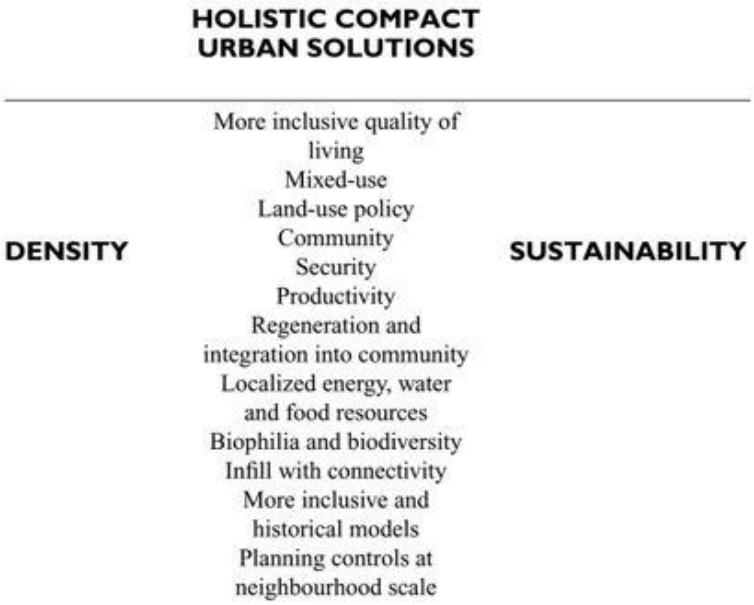


Figure 03. A conceptual model of inter-relationships between density and sustainability.

Source: 15.(Joo Hwa P. Bay, Lehmann.S, 2017, Growing Compact: Urban Form, Density and Sustainability, by: Routledge, ISBN: 9781138680401, p07).

City quality is a combination of tangible and intangible factors, while the urban experience varies greatly depending on context, with degrees of "high, medium or low" density varying significantly.

Population density is not simply a ratio between the number of residents or the number of homes and open spaces in a given area, as Kevin Lynch (1981) points out, an ideal city size, ideal urban density, or ideal daytime temperature cannot be determined, given varying conditions and values. However, urban density is a key indicator for measuring city performance and developing urban policies, as are other urban indicators such as the size of urban renewal areas, accessibility to green spaces or air quality in cities.

In relation to density, Alberti noted that *"We can try to identify some measurable dimensions of performance that can link the spatial form of the city to human purposes and values"* (Alberti, 1996, p. 392). 14

14.(Joo Hwa P. Bay, Lehmann.S, 2017, Growing Compact: Urban Form, Density and Sustainability, by: Routledge, ISBN: 9781138680401, p03-05).

Key concepts of density and sustainable developments include issues of transportation and cohesion, and include discussions of desired "Ideal density," mixed land uses, diversity, use of appropriate technology, just like solar design, greening and rehabilitation of cities, and minimizing the use of limited resources. Many of these discussions take place in the context of developed cities, while others explore different understandings in rapidly growing and developing cities. [14]

I.3. Challenges and misconceptions surrounding density:

Multiple towns are growing rapidly, drawing residents to the city center or pushing them to the outskirts, this growth puts enormous pressure on infrastructure and quality of life. The high cost of living in downtown and inner neighborhoods, coupled with often inadequate design, forces people to live further afield and commute long distances. In some cities, car dependence has led to suburbs extending 50 kilometers or more beyond the city center, creating pressures on time, transportation systems, and energy resources, increasing carbon emissions, and reducing life quality.

The issue of urban density raises many questions and concerns, some view high-density housing as harmful to health and creating social problems, while others see it as essential for sustainability. Furthermore, some believe that high-density housing harms health, reduces land values, creates slums, takes away green space, reduces children's play opportunities, consumes more energy, and produces more greenhouse gases, while others fear that heritage buildings in the suburbs will be destroyed by urban density projects and others believe that the problem of urban density results from population growth, and this must be stopped in cities and population should be transferred to rural areas.

Several urban areas have no choice but to densify, whereas density decisions can positively impact a city's sustainability by reducing waste and supporting transportation demands. However, if this is not done perfectly, it can have a negative impact on the environmental, economic and social dimensions. [14]

14.(Joo Hwa P. Bay, Lehmann.S, 2017, Growing Compact: Urban Form, Density and Sustainability, by: Routledge, ISBN: 9781138680401, p03-05).

We must carefully consider how to use the limited space available, and strive for "Smart densification" that reduces harmful impacts and improves the livability of cities. This is why now is more important than ever to define improved urban models that will guide future planners, architects and decision-makers and help reduce adverse impacts while improving the luxury life of cities. 14

I.4. Community engagement and participation in urban planning:

Community engagement is an important approach to ensuring that all community members participate in the decision-making process, especially regarding built environment issues, through this approach, the diverse perspectives, talents and skills present within the community are leveraged, contributing to effective solutions that meet the needs and aspirations of residents.

Figure 04. Charrettes intensive, hands-on workshops such as this one in North Carolina, are an important component of public input on community design, bringing people from different disciplines and backgrounds together to explore options for development of a site (Photo: Robin Abrams)

Source: 16.(Andrew L.Dunnenberg, Frumkin.H, Richard J.Jackson, 2011, Making Healthy Places: Designing and building for health; well-being and sustainability, p24)

Simply put, community engagement refers to the opportunity for all members of a specific community to participate in providing input about a project or process. In the context of the built environment, this approach focuses on drawing on the experiences and knowledge of community members to learn about their needs, visions, and concerns related to the environment in which they live.

Community involvement offers many benefits, the most important of which are identified as obtaining better solutions, amplifying community involvement that contributes to enhancing community member's sense of responsibility towards their environment and increasing their participation in the decision-making process, which leads to building a more democratic and cohesive society, improving the quality of life of residents, by providing a safer, more comfortable and livable environment. 14

14.(Joo Hwa P. Bay, Lehmann.S, 2017, Growing Compact: Urban Form, Density and Sustainability, by: Routledge, ISBN: 9781138680401, p03-05).

Examples of community engagement mechanisms relevant to the built environment.

Used by governmental or quasi-governmental organizations	Used by nongovernmental or community-based organizations	Used by community-based organizations or groups of residents
Planning commission	*Promotoras* (community health workers)	Community meetings
Zoning board	Church groups	Stakeholder groups
City youth commission	Youth councils	Focus groups
Government-sponsored resident groups (such as neighborhood councils)	Leadership teams (such as environmental or health leadership teams)	Charrettes
		Community key informants

Table 02. Examples of community engagement mechanisms relevant

to the built environment.

Source: 17.(Manal J. Aboelata, Ersoylu.L, Cohen.L, 2011, Community Engagement

in Design and Planning, Making Healthy Places: Designing and building for health; well-being and sustainability, p291).

I.5. The role of density in shaping sustainable urban futures:

Almost everyone, from the literature on sustainable futures namely the Brundtland Report (1987) onwards, agrees on the importance of quality of life now and in the future, achieving this is linked to good governance and optimal management of social, economic and environmental factors, whether in developing or developed cities.

Many argue that high-density housing offers tremendous opportunities to turn population growth into a positive driver of creating new and exciting housing options. Rich architectural diversity that enriches the urban landscape with diverse designs, provides housing options suitable for different income groups, encouraging the use of environmentally friendly technologies on a small scale and promoting social interaction and creativity, contributing to preserving green spaces and refining the urban environment with a rich cultural diversity, keeping in mind supporting the construction of efficient transportation networks which reduces dependence on cars.

As the population increases, competition for basic resources including food, energy, water, and land for urban expansion increases, threatening agricultural space. [14]

14.(Joo Hwa P. Bay, Lehmann.S, 2017, Growing Compact: Urban Form, Density and Sustainability, by: Routledge, ISBN: 9781138680401, p03-05).

Inequality and unequal distribution of wealth can lead to higher crime rates and negative effects on physical, mental and psychological health, which can lead to social and political unrest. Therefore, the planning and design of compact cities must take into account the avoidance of overcrowding and traffic jams, and the provision of a crime-free environment as much as possible, while saving energy and protecting agricultural land.

It is also essential to understand the true potential of high-density housing and what people are willing to sacrifice in terms of privacy in exchange for a sense of belonging, security and other benefits of city life. Discussions are currently underway about new approaches to better assess people's needs in different housing and environmental designs, and to fill gaps in the current property valuation system. It also explores ways to help city decision-makers bridge the gap between what people want and what needs to be designed and provided for a more socially and environmentally sustainable future. [14]

Conclusion:

From an environmental point of view, the transport-oriented urban approach (TOD) contributes significantly to reducing urban sprawl, which is considered one of the most important factors in depleting natural lands and reducing green spaces. This approach promotes optimal use of land through planning that combines housing, work areas, entertainment, and various services within close ranges, which in turn contributes to reducing dependence on private transportation with environmentally harmful emissions

III.Example:

In order to further understand and confirm the concepts that were previously delved into, and for clearer guidance of the processes that will be applied later, this example is chosen as proof of the effectiveness of urban renewal on the one hand, and the effectiveness of relying on the TOD approach during this process on the other hand.

14.(Joo Hwa P. Bay, Lehmann.S, 2017, Growing Compact: Urban Form, Density and Sustainability, by: Routledge, ISBN: 9781138680401, p03-05).

Example analysis: Regent Park – Toronto – Canada:

Figure 05. Regent Park – Toronto - 1980

Name: Regent Park.

Location: Downtown east area of Toronto-Canada.

Client: Toronto Community Housing.

Launch date: 2005-Phase 01.

Completion date: - Phases 1-3: 19 years (anticipated completion 2024).- Phases 4 and 5: 10 to 15 years (anticipated).

Surface: 69 Acre (279233 m^2).

Cost: $1 billion Estimated.

Development partner: The Daniels Corporation/ Tridel Builders Inc.

The Regent's Park regeneration project is an inspiring story of public-private collaboration to revitalize an ancient neighborhood and transform it into a vibrant destination. Through a smart redevelopment plan consisting of five phases, the project seeks to transform Regent Park from a traditional residential area into a mixed-use neighborhood that meets the needs of various segments of society.

Programmatic references:

- **Phases 1-3:**

- High rise condominiums including mixed-use non-residential space on the ground floor (offices and commercial).

- New amenities include Daniels Spectrum, a new arts and cultural center; the Regent Park Aquatic Centre; a new park "The Big Park"; and, the Regent Park Athletic Grounds.

- New retail spaces along Dundas Street East and Parliament Street, including Freshco by Sobeys, Tim Hortons, RBC, and Shoppers Drug Mart.

-New neighborhood services including Main Drug Mart, Dundas East Dental, and the Toronto Birth Centre.

- New spaces for social service agencies such as the TD Centre of Community Learning and Development and the S.E.A.S. Centre (Support Enhance Access Service Centre), Visions of Science Network for Learning, Dixon Hall Neighborhood Services, and Fred Victor.

- The last TCHC building to be constructed in Phase 3 is currently under construction (16 North) and is estimated to be completed in 2024.

The last market building to be built in Phases 1-3 is the Regent Park Presentation Centre. With the completion of Phase 3, 1,818 RGI units and 464 net new affordable units will be built.

Figure 06. Regent Park - Redevelopment phases

- **Phases 4 and 5:**

- Multi - phase mixed-use condominium and rental building consist of 13-buildings including 110 barrier-free units and 53 fully modified accessible suites.

Figure 07. Regent Park – Final proposition

- **Selection criteria:**

- The transformation from a housing dominance area to a mixed-income, multi-use neighborhood.
- Solving security problems across the area.

- **Dilemma:**

- Balancing the interests of existing residents, the need for affordable housing, and the goals of urban rejuvenation.

- **Actions:** In the early 2000s, the City of Toronto announced an overhaul:

- Wider roads with sidewalks.
- Improvements to public transit, and the addition of bike lanes helped connect the area to the rest of the city.
- Courting restaurants, shops and other amenities in order to attract homeowners with the aim of transitioning Regent Park from a purely social housing neighborhood to a mixed-income, mixed-use community.

Figure 08. Peter Dickinson towers at Shuter and Dundas, demolished in 2014.

Figure 09. Regent Park Athletic Grounds, at Shuter and Dundas now.

Conclusion: Despite some initial opposition, the Regent's Park renovation project proved successful and became a model inspiring similar projects around the world. Through careful planning and constructive cooperation, any neighborhood can be transformed into a vibrant oasis that meets the needs of various segments of society.

CHAPTER III:
The application of TOD method on the case of the railway station district in Blida.

"We are realizing that if you have people walk and bicycle more, you have a more lively, more liveable, more attractive, more safe, more sustainable and more healthy city. And what are you waiting for?" **(Jan Gehl).**

I. Railway station district renewal, towards a future urban centrality:

I.1. Introduction:

"The mark of a great city isn't how it treats its special places – everybody does that right – but how it treats its ordinary ones." (Aaron M. Renn,2013).

The study conducted on the area was the main driver to extract and define the morphological and functional characteristics of the urban fabric, according to its urban units, including the built system (Building's typology; function…) and the unbuilt system (Streets; nodes; places …), in order to facilitate projecting the potentials and correcting the shortcomings related to this area.

I.2. Presentation of the city:

- **Total area of the city**: 53.29 square kilometers.
- **Inhabitants:** 163 586 hab.
- **Population density:** 3,071 hab/km^2.
- **Situation:**

- **Regional situation:**

Blida is located in the north central part of Algeria, southwest of Algiers, 50 kilometers from the capital. According to the

1974 administrative division, the Wilaya of Blida is bordered by:

North: The wilayas of Algiers and Tipaza (northwest).

West: The wilaya of Ain-Defla.

South: The wilaya of Médéa.

East: The wilayas of Boumerdes and Bouira.

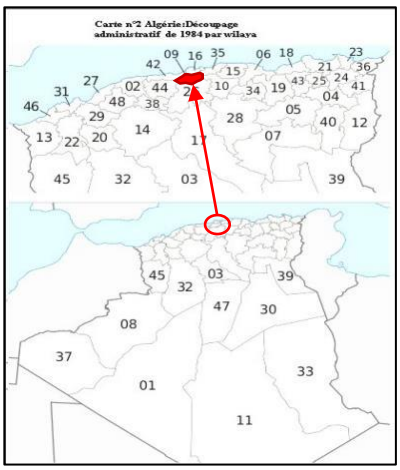


Figure10: National situation of BLIDA

Source: https://www.univoran2.dz/VRPG2/laboratoires/eSource : UDMP of Blida

- **Climatology:**

- <u>Climate:</u>

  The climate is characterized by two seasons: A cold and rainy season and another hot and dry, therefore it is of the temperate and hot Mediterranean type.

- Temperature:
  - Cold season: from November to May with a minimum of 4°C and a maximum of 12°C.
  - Hot season: from June to October with a minimum of 18°C and a maximum of 38°C.
- Prevailing winds:
  - North/West in the winter and North/East and sirocco in summer.

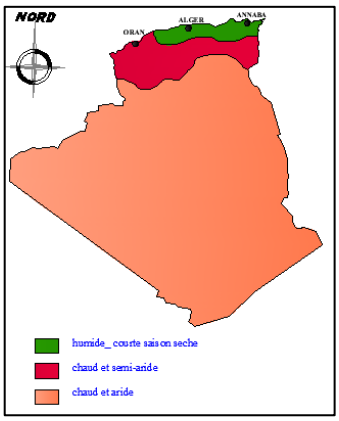


Figure11: Climate map of Algeria

Source: http://earthwise.bgs.ac.uk/index.php/Hydrog%C3%A9ologie_d%27Alg%C3%A9rie

- **Seismicity:**
  - Blida is classified in Zone 2.
  - According to the Algerian seismic regulations (APR 99, Version of 2007), the region is distinguished with high seismic activity.

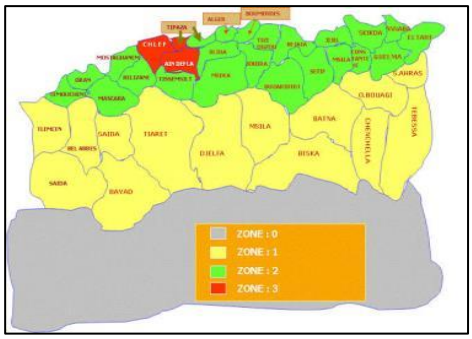


Figure12: Seismic zoning map - Algeria

Source: http://www.structureparasismic.com/MaMaisonParasismique.ht

I.3. Choice of the intervention site:

Following the theme of the workshop -Master 02-Urban Architecture- "Recovering urban wasteland", the index of this study was directed into one of the urban wastelands in Blida, exactly on the railway station district.

I.3.1. Intercommunal situation:

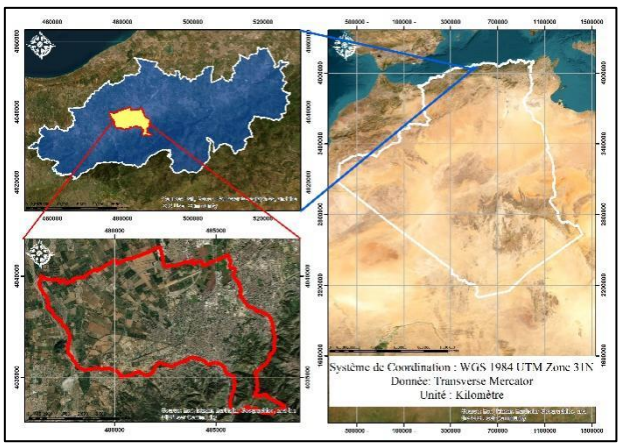


Figure13: Geographical location of Blida city.

Source: UDMP of Blida

The city of Blida is limited in the south by the towns "Chréa and Bouaarfa".

-In the north by the towns "Oued-El-Alleug and Béni-Tamou".

-In the west by the town "Chiffa".

-To the east by the towns "Beni-Merad and Ouled Yaich".

I.3.2. LUP Limits:

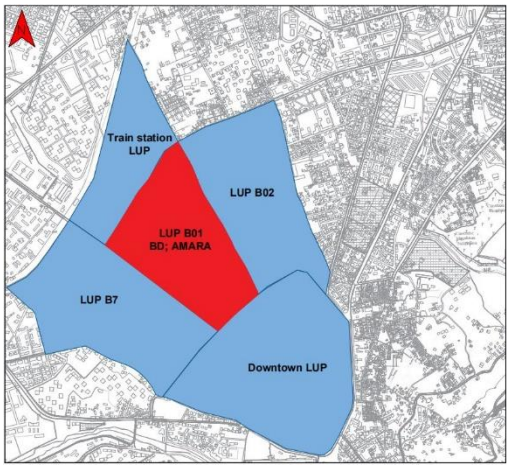


Figure14: LUP limits

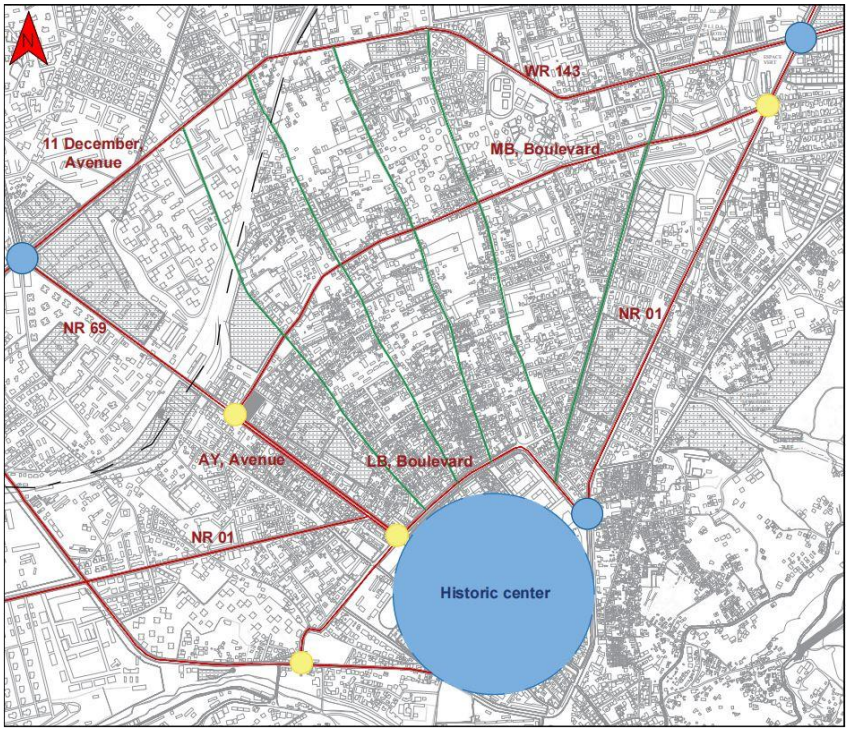
Source: UDMP of Blida-Edited by the author-2024

The B01 BLIDA AMARA Youcef LUP is part of the urbanized area of the city of Blida, as defined by the study of the revision of the UDMP of Blida. It covers an area of 40 hectares.

The intervention area is located in the north-east side of the historical center of the city of Blida, and includes 3 parts in a surface of 31416 m^2:

- One part belongs to the LUP B01 AMARA Youcef.
- The 2nd part belongs to the LUP of the train station.
- The 3rd part belongs to the LUP B7.
- Its situation makes it subject to the town planning regulations of each of the 3 regions.

I.3.3. Accessibility and urban mobility:



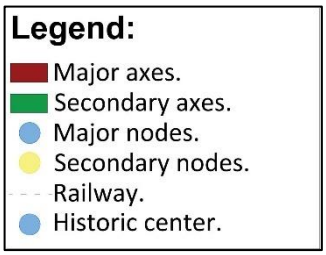


Figure15: Accessibility and urban mobility

Source: UDMP of Blida-Edited by the author-2024

The mobility from and to the study area follows the 3 structuring axes of the city expansion:

1- Larbi TEBESSI Boulevard.

2- Mohamed BOUDIAF Boulevard.

3- 11 December Avenue.

I.4. Sequential analysis of the boulevards " Mohamed BOUDIAF & AMARA Youcef ":

Given that the study area contains two major axes “Mohamed BOUDIAF Boulevard” which is considered as a limit of the second expansion of the city of Blida, and “AMARA Youcef Avenue” which leads directly to the historical center of the city, it was crucial to apply an analytical sequential survey to both streets, with the aim of framing their effects on the functional urban distribution and the life within the borders of this sector.

I.4.1. Mohamed Boudiaf Boulevard:

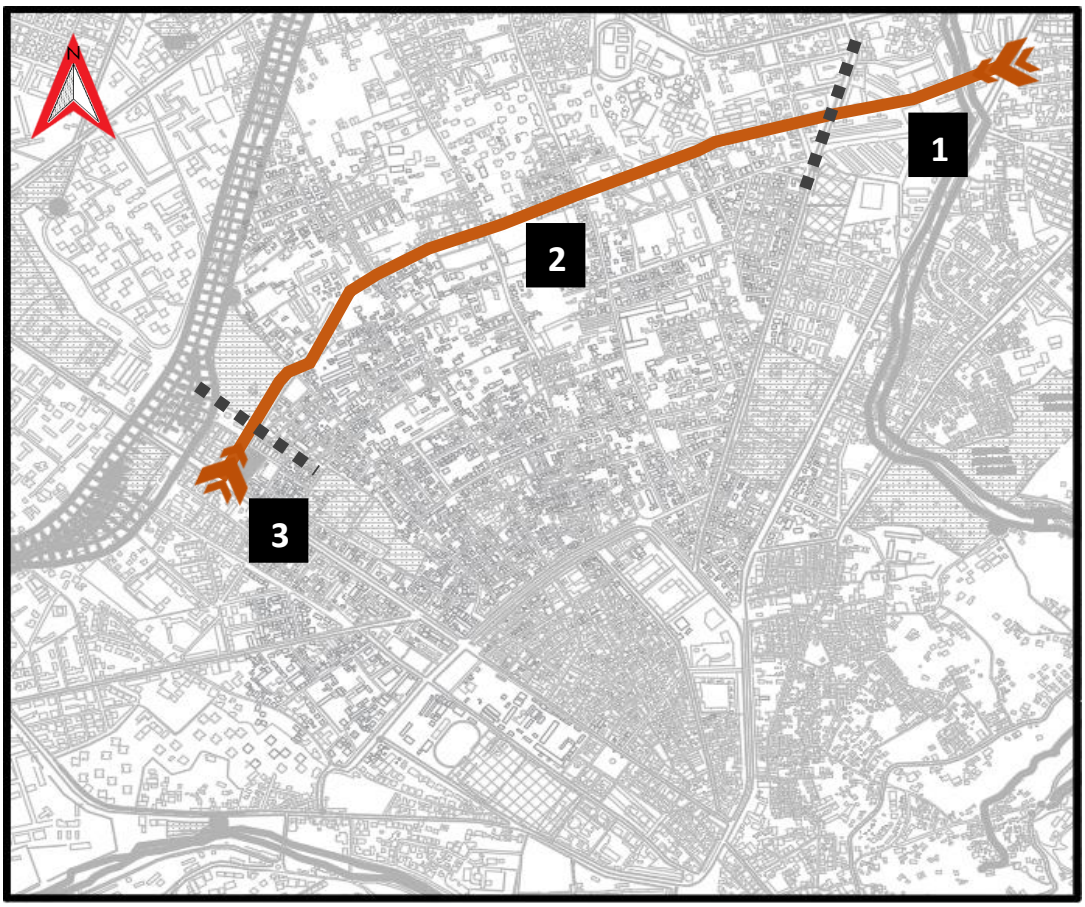


Figure16: Sequential analysis of “Mohamed BOUDIAF Boulevard”

Source: UDMP of Blida-Edited by the author-2024

Sequence	Characteristics			
	Flow	**Security**	**Noise level**	**Brightness**
01: Opening	Reduced pedestrian and high mechanical flow.	Presence of security (Police).	Medium noise level (110 to 130 db).	Bright spaces (2000 to 2500 Lux).

	Mental image	**Social practices**	**Feeling**	**Functional dominance**	**Nodes reading**
	A certain sense of openness at the entrance to the boulevard.	Pedestrians on the sidewalks of the boulevard.	A busy street like there is something has to be done.	Facilities and services (Hospital; university campus…).	The nodes direct pedestrian and vehicles towards Facilities and buildings.
02: Concavity	**Flow**	**Security**	**Noise level**	**Brightness**	
	Strong mobility and traffic.	Presence of security.	80 to 120 db.	1500 to 1900 Lux.	
	Mental image	**Social practices**	**Feeling**	**Functional dominance**	**Nodes reading**
	High activity and clearly directed visions.	Shopping and Youth dominance.	A strong movement, very good interaction between citizens.	Commerce and education.	Intersection that gives a clear and sharp image of the buildings.
03: Closure and respiration	**Flow**	**Security**	**Noise level**	**Brightness**	
	Strong mobility and high mechanical flow.	Presence of security (Road signs).	High noise level (Up to 140 db) (Presence of the train station).	2000 to 2500 Lux.	
	Mental image	**Social practices**	**Feeling**	**Functional dominance**	**Nodes reading**
	Openness to other fields and other directions.	Pedestrian and cars towards the nodes.	Reduced movement, like an exit to another movement.	Housing and services.	A good interaction between nodes & built environment.

Table03: Sequential analysis of "Mohamed BOUDIAF Boulevard"

Source: Author-2024

I.4.2. AMARA Youcef Avenue:

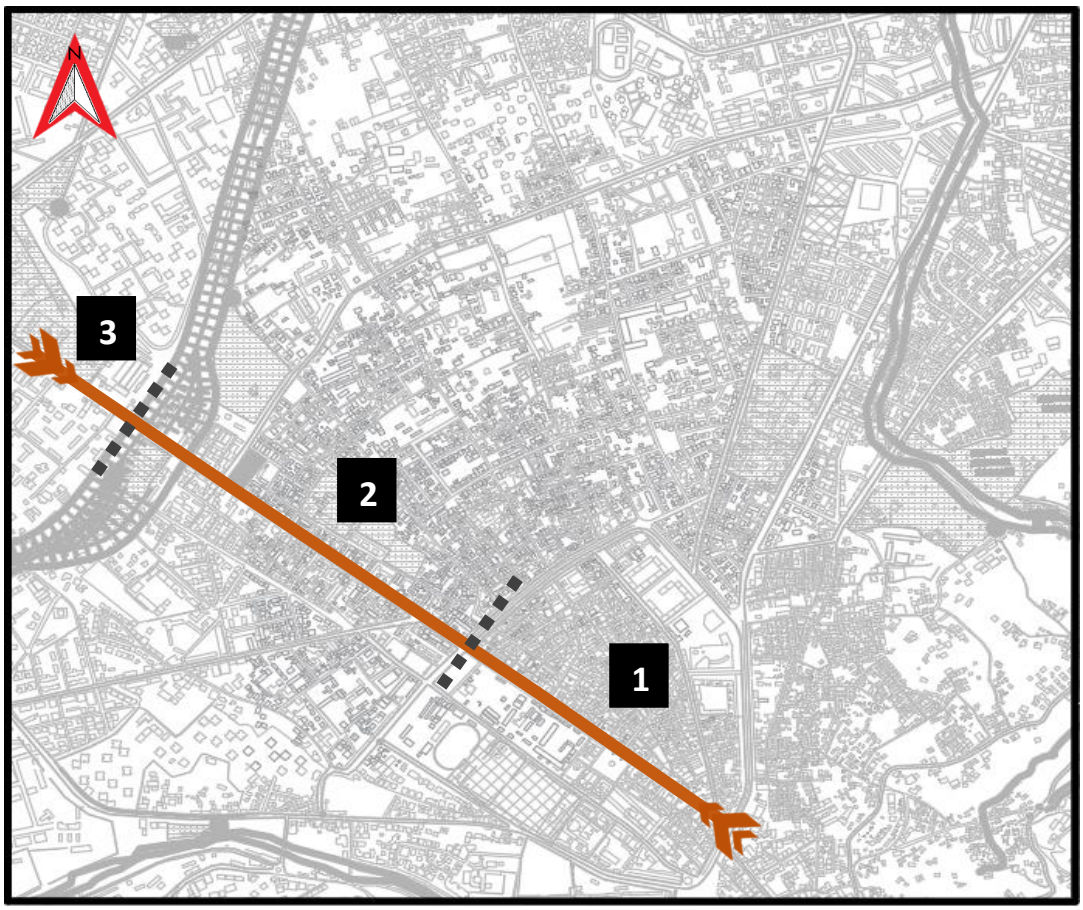


Figure17: Sequential analysis of "AMARA Youcef Avenue"

Source: UDMP of Blida-Edited by the author-2024

Sequence	Characteristics				
	Flow	**Security**	**Noise level**	**Brightness**	
	Extra high pedestrian flow.	Security reduced.	120 to 130 db.	Dark and narrow spaces (800 to 1200 Lux).	
01: Concavity	**Mental image**	**Social practices**	**Feeling**	**Functional dominance**	**Nodes reading**
	A sense of overcrowding because of the famous down town vibe.	Pedestrians all over the roads, remarkable elderly age class.	Busy streets, a glimpse from the past.	Traditional housing and commerce.	Pedestrians and vehicles towards houses and 1st Nov place.

	Flow	**Security**	**Noise level**	**Brightness**	
	High mobility and flow frequency.	Presence of security.	110 to 130 db.	2000 to 2500 Lux. (Except inside the tunnel).	
02: Respiration	**Mental image**	**Social practices**	**Feeling**	**Functional dominance**	**Nodes reading**
	Highly active and functional axis.	Shopping, working and a mixture of different age classes.	A strong movement, very good interaction between the citizens.	Commerce, education and services.	Intersection that gives a clear and sharp image of the directions.
	Flow	**Security**	**Noise level**	**Brightness**	
	High pedestrian + mechanical flow.	Presence of security (Road signs).	High noise level (Up to 140 db) (The train station).	2000 to 2500 Lux.	
	Mental image	**Social practices**	**Feeling**	**Functional dominance**	**Nodes reading**
03: Open ending	A jump from individual traditional housing to collective high-rise buildings.	Pedestrian on the sidewalks and cars towards on the axis towards the tunnel.	Such a noisy sequence, it's like whenever we get closer to the end it gets further, an exit towards the unknown.	Housing and services.	A good interaction between the nodes and the built environment.

Table04: Sequential analysis of "AMARA Youcef Avenue"

Source: Author-2024

I.5. Morphological study:

-The intervention area is located exactly in the southwest extremity of the second extension of Blida "Mohamed BOUDIAF Boulevard".

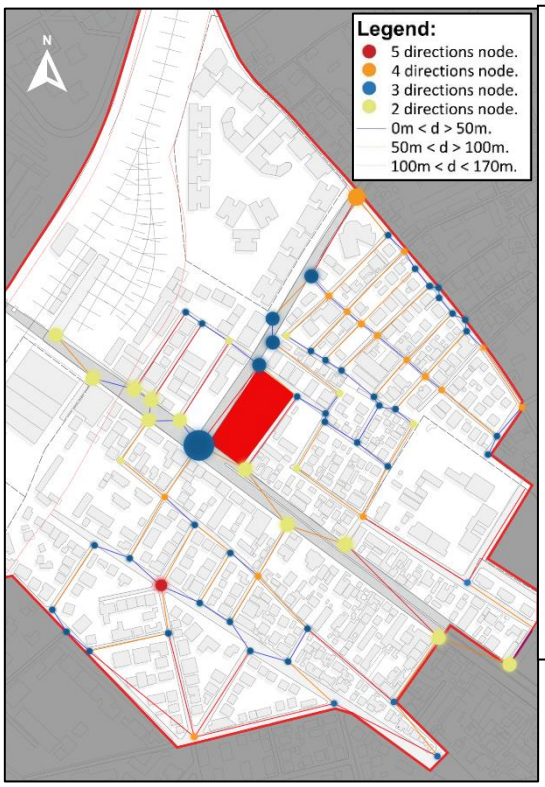
-The railway station stands as the major landmark in this situation, which also represents the perfect factor in the selection of the approach that should be implemented during the urban renewal.

Figure18: Delimitation of the study area

Source: UDMP of Blida-Edited by the author-2024

I.5.2. Physical structure of the intervention area:

- **Unbuilt system:**



- **Nodes:**

-The most important node is in the intersections of the structuring axes "MB" and "AY" where the centrality overlap.

-The intersections along Mohamed Boudia Boulevard pose a multitude of traffic problems especially congestions because of the narrowness of the streets, despite the presence of the street police and road signs.

- In contrast, the widening of AMARA Youcef Avenue contributes greatly in reducing congestions and accidents.

Figure19: Nodes system

Source: UDMP of Blida-Edited by the author-2024

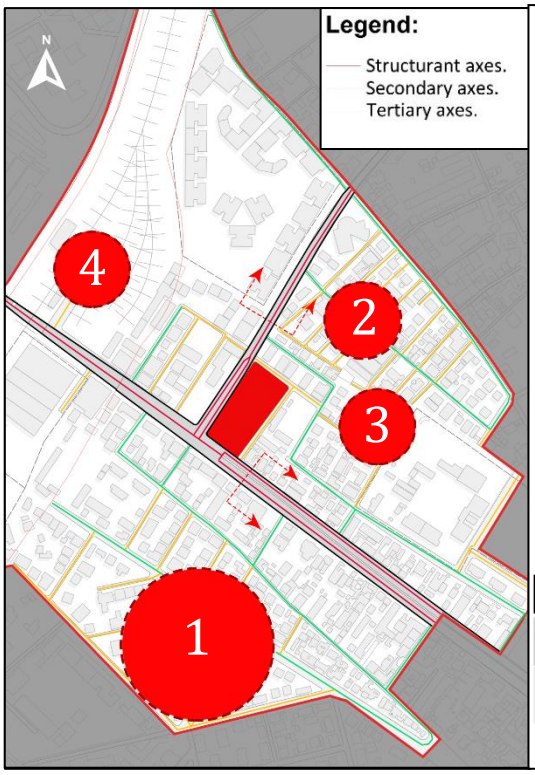


Figure20: Delimitation of the study area

Source: UDMP of Blida-Edited by the author-2024

- **Street system and layout quality:**

- The two boulevards “Mohamed BOUDIAF” and “AMARA Youcef” despite they do not match the characteristics of boulevards or avenues but they have the same importance in regional and territorial connection terms.

- Secondary pathways within the area that also structure space and connection between buildings and facilities.

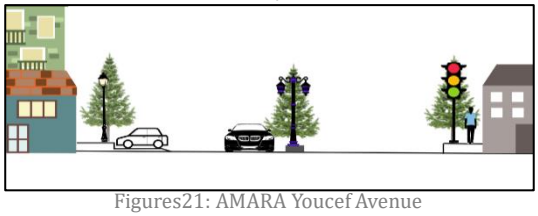
The hierarchy of the roads contributes greatly to ease the mobility, which makes the area fluidly accessible.

	AY.Avenue	MB.Boulevard 01	MB.Boulevard 02
Height/Width Ratio	0,5	0,6	2,06
Comments	Future centrality at least H/W=1	It does not match the characteristics of a boulevard.	

Table05: Characteristics of the axes / Source: Author-2024

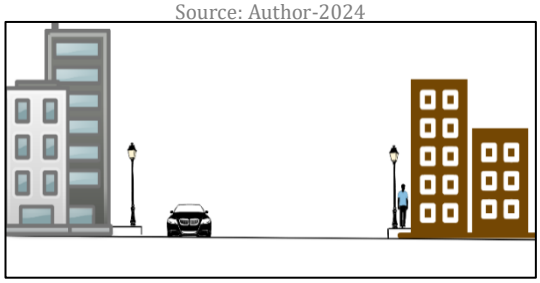
Number	Form	Type	Description
1		Loop system	Double exit system
2		Linear system	Linear systems from one point two another hierarchy
3		Mesh system	Orthogonal geometry
4		Impasse	Linear dead-end system “Cui-de-sac”

Table 06: Street forms / Source: Author-2024



Figures21: AMARA Youcef Avenue

Source: Author-2024



Figures22: Mohamed BOUDIA Boulevard

Source: Author-2024

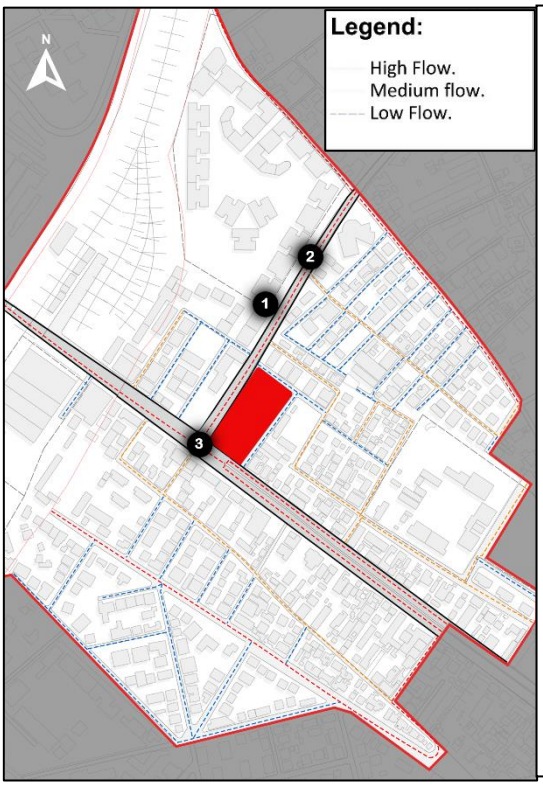


Figure23: Delimitation of the study area

Source: UDMP of Blida-Edited by the author-2024

- **Flow:**

Pedestrian flow: is superimposed on the tracks where there is commercial flow.

-Concentration of pedestrian flow for most of the day, on second section of "MB" Boulevard which affects and slows down the movement of vehicles inside it.

-Very low pedestrian flow on the secondary and tertiary roads.

Mechanical flow: the main flows are on Structuring axes.

- Very imploring flows on the "MB" and "AY" Boulevards and the secondary roads leading to them which pose important problems of bottling.

- **Street security:**

1. Unrestricted space, a neighborhood with open islets.
2. Presence of movement, with heavy traffic all over the day.
3. Absence of DMT, all the roads are crossable.

Testimonials from residents:

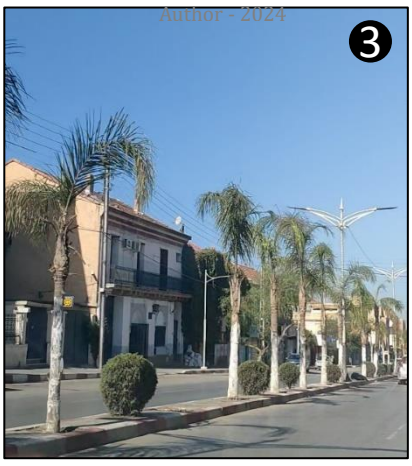
A very strong pedestrian mobility compared to other areas of the city, a security presence in all seasons.

Schedul	Flow
5h-7h	Low
7h-10h	Medium
10h-12h	Hight
12h-13h	Hight
13h-16h	Hight
16h-19h	Hight
19h-23h	Medium

Table 07: Flow frequency / Source: Author - 2024

Source: Author - 2024

Source: Author - 2024



Source: Author - 2024

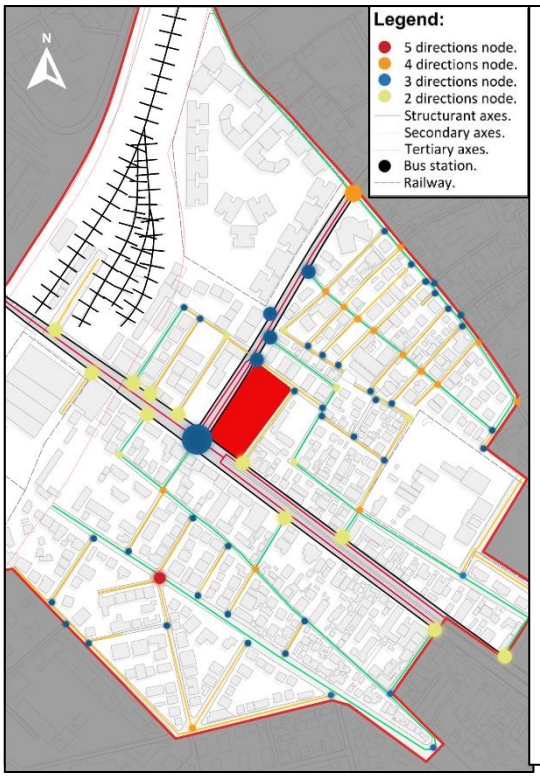


Figure24: Mobility

Source: UDMP of Blida-Edited by the author-2024

- **Mobility:**

The access to the intervention area is provided by three types of roads: Main roads "AMARA Youcef Avenue, Mohamed BOUDIAF Boulevard", the railway, and secondary roads: narrow roads between the different blocks.

-The important axis Mohamed BOUDIAF Boulevard, as an important economic axis on the scale of this city. It also has a significant impact on the intervention area, especially during rush hours, creating a great deal of congestion.

-The station, as a complex facility, causes an overload on the structuring axis AMARA Youcef.

- **Built system:**

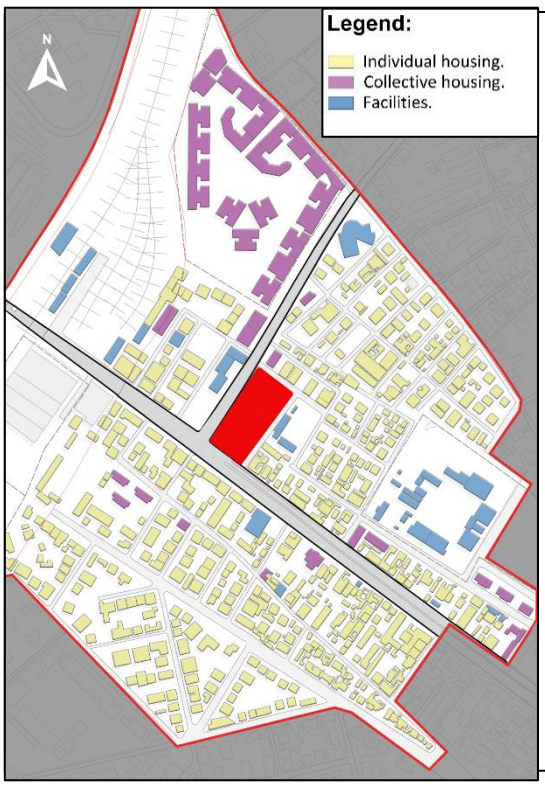


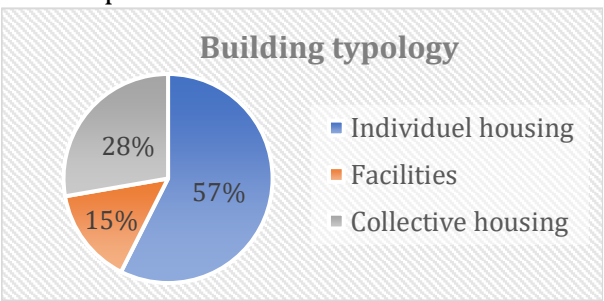
Figure25: Buildings typology

Source: UDMP of Blida-Edited by the author-2024

- **Building typology:**

- This is an urban zone that is essentially composed of buildings for individual and collective housing, as well as services; businesses, and facilities.

- The ground floor structured by large openings, intended for commercial activities in order to communicate with the urban space.

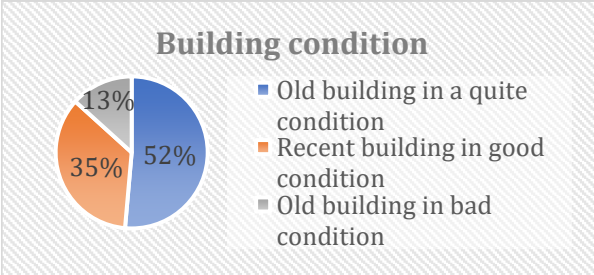


Source: Author-2024

- **Building aspect and condition:**

-The old buildings represent the majority in this study area because it belongs to a historical district that dates back to 19th century."

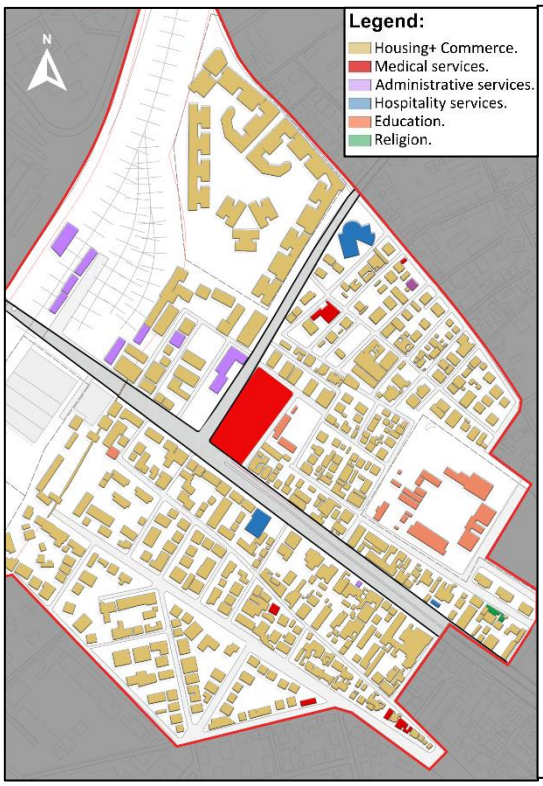
-The state of the building is from medium to good because the colonial building represents the majority in this sector.
-Demolition is recommended for buildings that do not have architectural value.



Source: Author-2024

Figure26: Buildings aspect and condition

Source: UDMP of Blida-Edited by the author-2024



- **Functional structure:**

-Residential function dominates the urban functions in the area and represents 80% of the neighborhoods.
-Lack of cultural and leisure facilities.

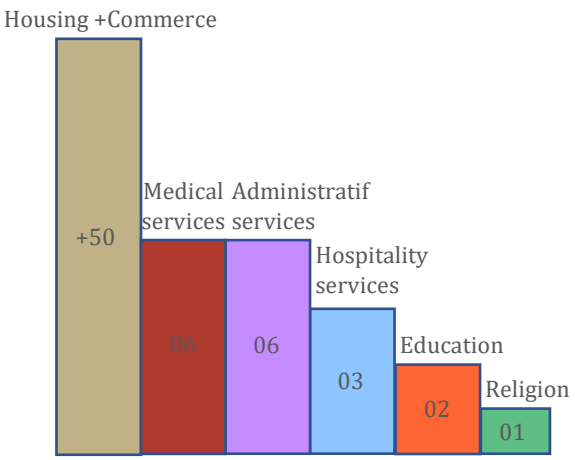


Figure27: Functional structure

Source: UDMP of Blida-Edited by the author-2024

Figiure28: Diagram of functional structure

Source: Author-2024

- **Urban fabric permeability:**

-The majority of the study area is full and compact because it is a historically urbanized area from the colonial era.

-Absence of open & public spaces, urban developing; street furniture and pedestrian paths, as this sector is a sector of a future urban centrality.

-Most of the zones represented in this card characterized with high compactness and housing dominance.

-Solid / Void ratio failed and lot of muffled surfaces.

Figure29: Urban fabric permeability

Source: UDMP of Blida-Edited by the author-2024

- **Green weft and yards:**

-The study area suffers from a lack of green spaces.

-The density of buildings and the absence of open spaces make the city compact, which prevents introducing public spaces to make it more porous.

-Public gardens are in a state of marginalization.

-Most of open spaces are designated for car parking.

-The railway yard represents almost 30% of the unbuilt surface.

Figure30: Green weft

Source: UDMP of Blida-Edited by the author-2024

I.5.3. Syntactic approach:

- **DEPTHMAP:**

In order to obtain objective analysis results with quantifiable data as presented in the space syntax, the software used was originally developed by Alasdair Turner of Space Syntax Group (University of London) as Depthmap, now open-source and available as DepthmapX.

- **Connectivity:**

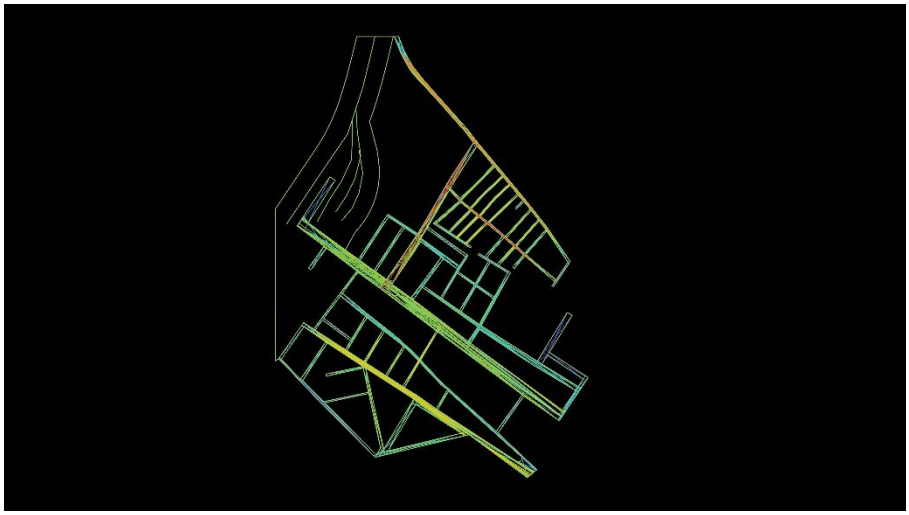


Figure31: Connectivity card / Source: Author-2024

- The existing connections are insufficient across the different axes of the study area. While the level of connectivity along Mohamed BOUDIAF Boulevard is higher compared to the other roads.

- **Integration:**

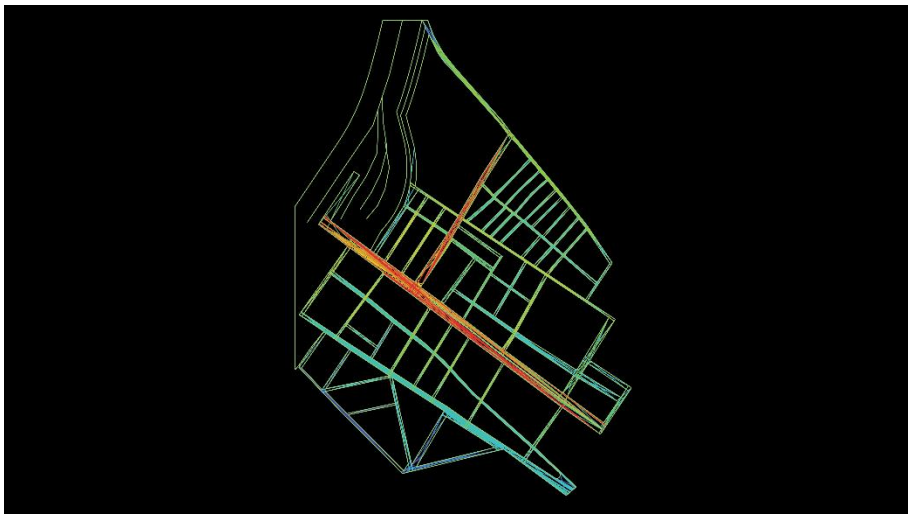


Figure32: Integration card / Source: Author-2024

- The level of streets integration varies mostly between medium and low intensity all over the study area.

- The structuring axis Mohamed BOUDIAF represents the highest integration.

- **Visibility:**

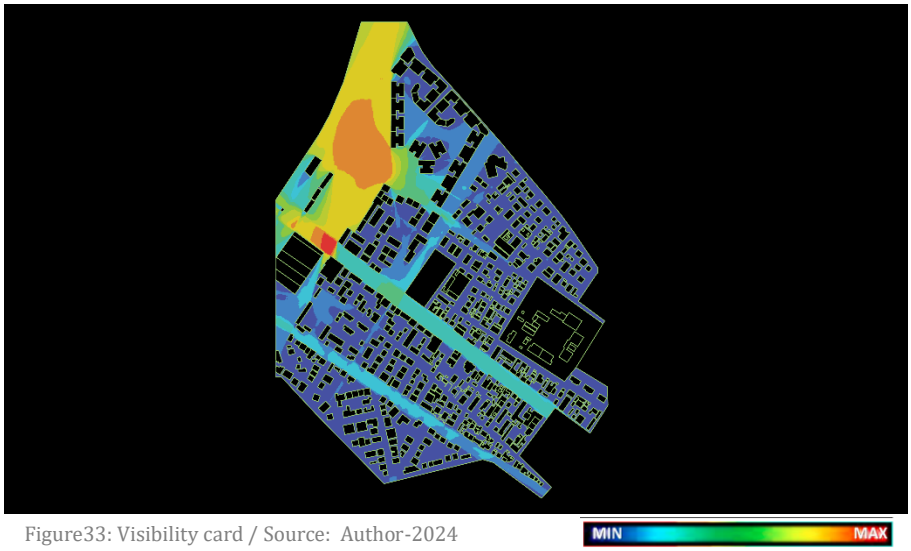


Figure33: Visibility card / Source: Author-2024

-Visibility inside the study area hits her max in the railway yard.

-The level of visibility has a direct connection with the level street width and block's layout.

I.6. Synthesis:

Anomalies	Recommendations
○ Lack of porosity and permeability. ○ The dominance of the residential function (individual and collective housing). ○ Rareness of green and public spaces. ○ Low integration, and connectivity across secondary roads.	➢ Ensure morphological admixture. ➢ Ensure functional admixture. ➢ Insertion of green network as a priority action. ➢ Rehabilitation of the roads and sidewalks.

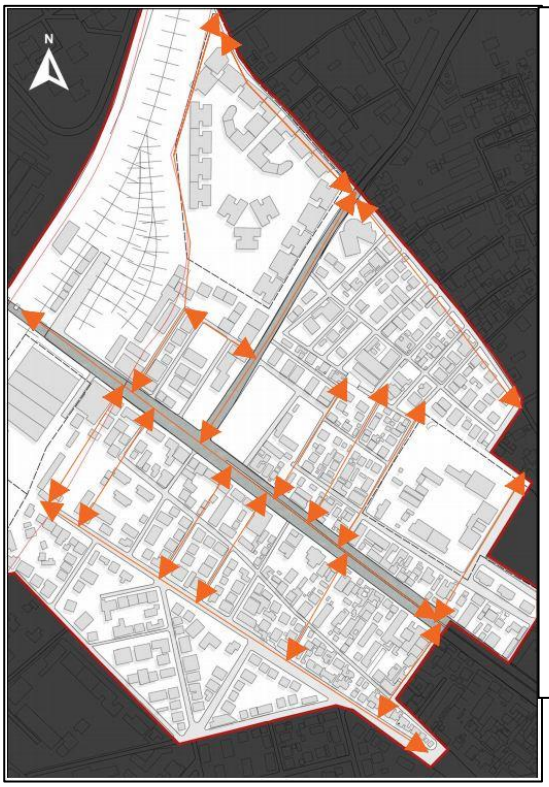
○ Congestion and air pollution (High mechanical flow). ○ Missed land optimization.	➢ Reorganization of the transport stations and spots; highlighting and reinforcing them as they represent strong landmarks + promoting walkability. ➢ Converting horizontal distribution (Individual housing tissue in bad condition) + urban wastelands into vertical distribution.

II. TOD facing a stifled urban fabric to achieve urban diversity:

II.1. Introduction:

In order to emend all the aforementioned anomalies in a solution that combines all the recommendations above, applying the T.O.D approach for an urban renewal of the railway district appears optimal, especially with the train station as the closest transit spot.

II.2. Accessibility and mobility:



- **Acting on street system:**

-Opening new secondary road which connects "AMARA Youcef Avenue" with "Mohamed OUALI Street" to reduce the overload on "Mohamed BOUDIAF Boulevard".

-Directing attention toward bicycle paths and the rehabilitation of the roads and sidewalks in order to promote walkability.

-Opening impasses and tertiary roads and connect them with secondary and structuring axes to ensure the hierarchy of the street system and strengthen roads connectivity and integration all over the study area.

Figure34: Applying TOD on street system

Source: UDMP of Blida-Edited by the author-2024

II.3. Permeability and respiration:

- **Acting on built system and green spots:**

-Ensuring various spacing between the buildings in order to relieve pressure off congested spaces.

-Open the islets to ensure better connection between the street and improve the ratio STREET/BLOCK.

-Organization of parking spaces.

-Insertion of a green corridor and laying out green and public spaces, taking into account all age classes in the society.

-Proposal of roof gardens for individual houses following social consultation and community engagement.

Figure35 Applying TOD on fabric permeability

Source: UDMP of Blida-Edited by the author-2024

"The enclosure, or the outdoor room, is perhaps the most powerful, the most obvious of all the plans to instill a sense of position, identity with the environment.... it embodies the idea of place" (Gordon, Cullen.), This postulate is concretized by prospect theory and the concepts of "Open islet" (Portzamparc, Chistian).

Resilience called "Robustness" (BENTELY, 1985) means the flexibility of buildings surrounding open urban spaces, with the advent of sustainable development the term has become "Resilience" (BENTELY, 1985) (EVANS, 2001) (CARMANA, 2003), This means that a place is resilient if it has the ability to change and adapt to new social, technological or economic conditions. The presence of roads encircling the islets, and the well-defined definition of common spaces, and public spaces reduces the possibilities of extension and thus ensure resilience.

By applying the concept of "Open islands" to undeveloped and free spaces, we can introduce convergence and divergence into the urban landscape. This ensures the urban space is not residual but rather maintains a dialectical relationship with the built environment, fostering the necessary variety.

II.4. From "Mono" to "Multi" - functionality:

- **Acting on functional system:**

-Injection of different functions in order to alleviate housing dominance.
-Reconversion of the train station into multi-modal station.
-Ensuring functional diversity and increase street animation.

- Administrative center.
- Cultural center.
- Multi-storey parking.
- Youth center.
- Fitness center.
- Library.

-Rehabilitation of the urban façade, by integrating modern facades with colonial style facades in a way that preserves the identity of the place.

Figure36: Applying TOD on functional system

Source: UDMP of Blida-Edited by the author-2024

II. Comparative synthesis:" Simulation of axial and visibility cards"

The difference between the initial state the study area was in before applying the T.O.D approach and what it turned into after implementing it, appears clearly on the axial cards, as the actions taken to the street system led to its improvement in terms of integration and connectivity.

- **Connectivity:**

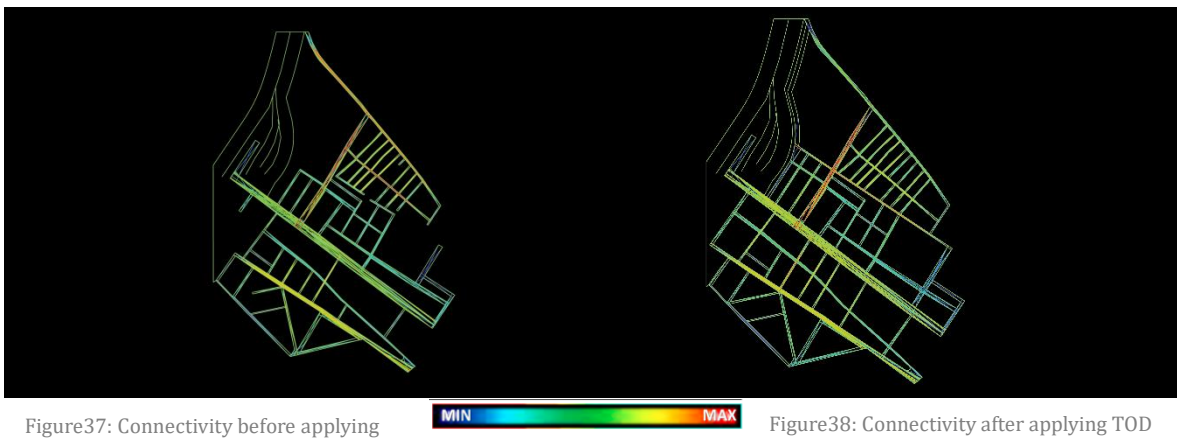


Figure37: Connectivity before applying TOD

Figure38: Connectivity after applying TOD

Source: Author-2024

- **Integration:**

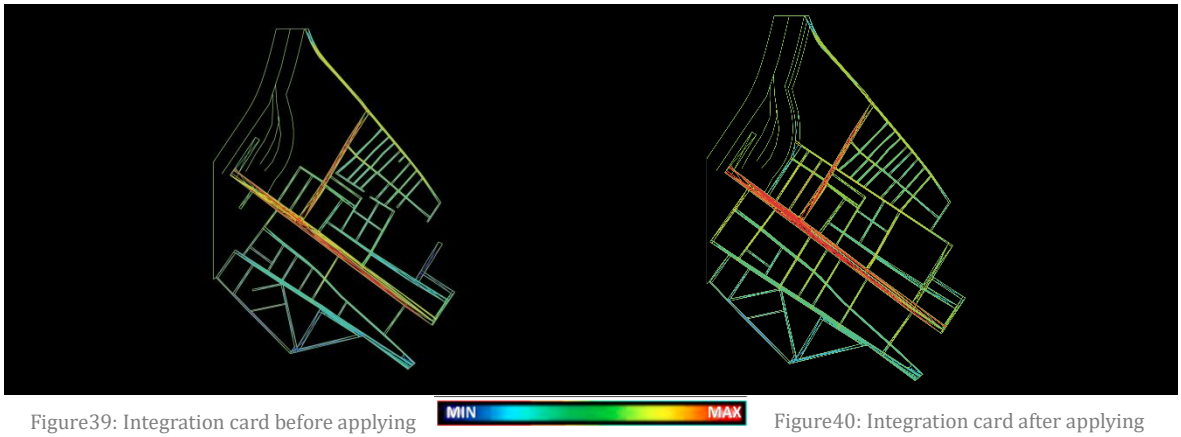


Figure39: Integration card before applying TOD

Figure40: Integration card after applying TOD

As the visibility card clearly illustrate that the urban fabric has breathed again, shedding the weight of its congested past, particularly in the area surrounding the station likely due to the proposed changes to the building facades and green spaces.

- **Visibility:**

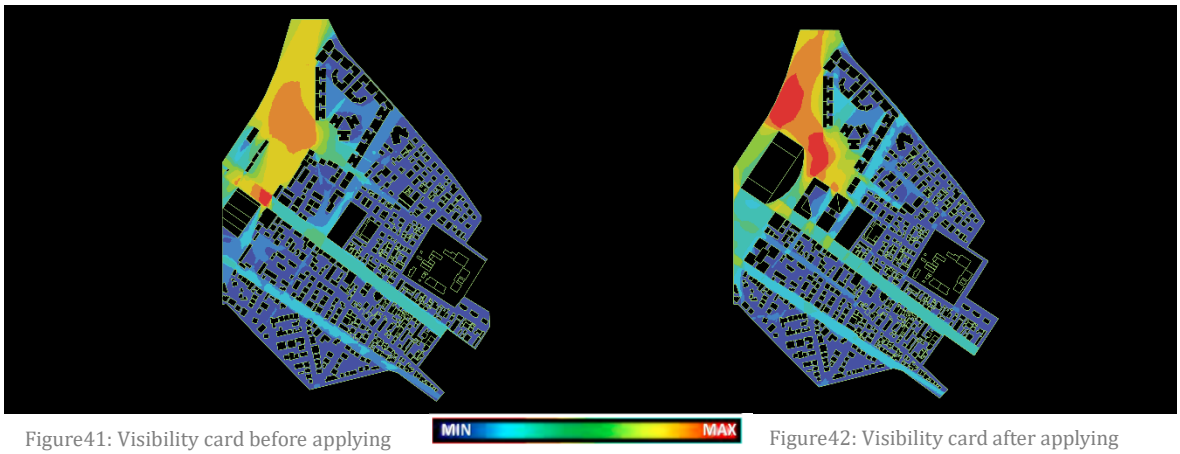


Figure41: Visibility card before applying TOD

Figure42: Visibility card after applying TOD

Conclusion:

The results of implementing the TOD approach are evident in significantly improving the quality of life of residents. By providing diverse options for safe and sustainable mobility, this approach encourages a healthier, more physically active lifestyle.

In summary, the Transit-Oriented Development (TOD) approach is proved as an effective strategy for creating sustainable, environmentally, socially and economically balanced district. It is not only limited to planning infrastructure and facilities, but is also concerned with improving the quality of life of residents and creating attractive and prosperous urban spaces.

Consolidated Master Plan:

Everything mentioned previously appears. clearly in the following Master Plan:

Figure43: Consolidated Master Plan

Source: Author-2024

GENERAL CONCLUSION

Now we can conclude and confirm that urban renewal, as much as it is optional in many areas, it also takes the place of inevitability and obligation in other urban areas and cities, and as much as it is necessary to frame it and rely on an approach with its well-established principles, emphasis has been placed on reducing random urban sprawl.

Higher density under the TOD approach facilitates diverse housing options, making urban areas more inclusive and accessible. This diversity attracts a wide range of residents, enhancing social interactions and community engagement.

Furthermore, the increased population density supports local businesses, cultural activities, and public spaces, contributing to a dynamic and economically robust environment.

By highlighting the principle of TOD, as it proved effective in the case of the study and the positive results that were achieved, it was confirmed that the choice of implementing this principle was and still correct, and the suffocating state that the region was in was transformed into a more effective, flexible, and suitable for a leisurely living.

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LIST OF FIGURES:

LIST OF TABLES:

LIST OF ABBREVIATIONS:

T.O.D: Transit **O**riented **D**evelopment.

BRS: Bus **R**apid **S**ystem.

N: Number.

H: Height.

Ol: Open **L**ength.

Cl: Closed **L**ength.

FSC: Floor **S**pace **C**oefficient.

ANNEXES

ANNEXES:

Morphological interpretation and diagnostic of the study area:

- **Grid delimitation:**

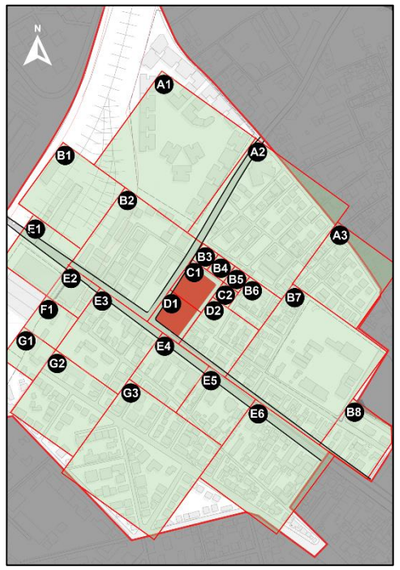


Figure: Grid of homogenous zones

Source: UDMP of BLIDA, edited by the author 2024

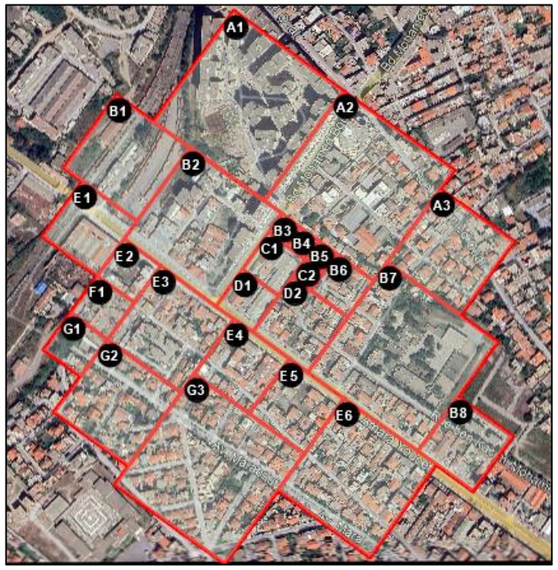


Figure: Grid of homogenous zones

Source: Google earth, edited by the author 2024

Interpretation 01: Porosity index:

According to the histogram, the greater the number of visible facades in an urban zone, the higher its porosity and permeability index.

The majority of urban zones are gathered in a linear manner around the trend line, representing the same building typology (Individual buildings), the zones that make the difference are:

- A1, with a different building typology (Collective housing), different distribution of blocks, and a great interaction of the ratio Block/Outdoor space representing the pinnacle of porosity, which confirms a higher degree of visibility compared to the other zones.

- B7, despite its amount of permeability especially in the MS surface, but it's still inadequate to its projected surface, the same case for G3 and A2.

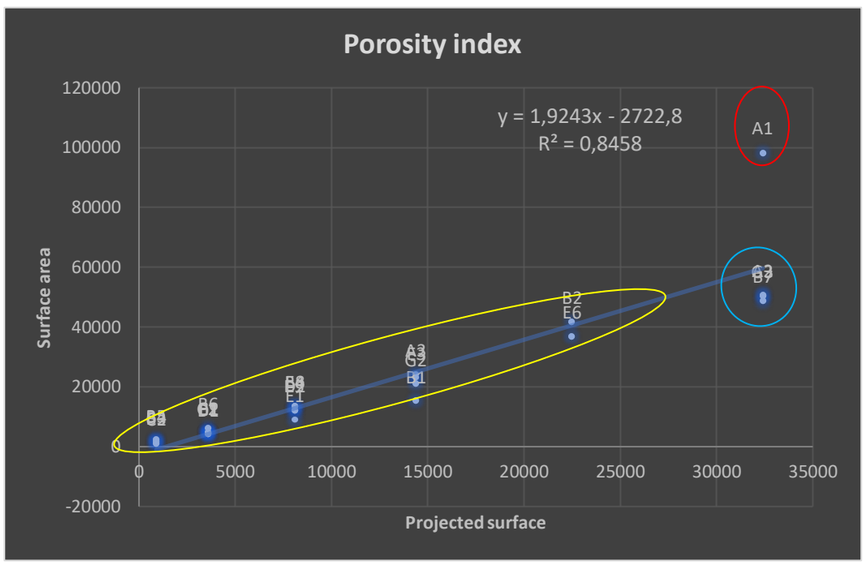


Figure: Porosity index graph

Source: Author 2024

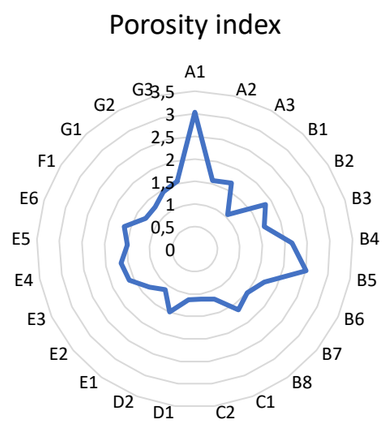


Figure: Porosity index radar

Source: Author 2024

Figure: 3D perspective of the study area

Source: Author 2024

Interpretation 02: Diversity index:

- According to the histogram we can distinguish 3 classes:

- Group of the zones: B1; C1; C2; D1; E1 representing the lowest template (RDC),

Most of the buildings are sheds.

- The zones B4 and B5 with the lowest stage of diversity.

- Group of the majority of the zones representing individual housing with different templates (RDC; R+1; up to R+5).

- And the zone that made the difference again A1, representing collective housing with the greatest diversity stage.

- Lack of harmony between the different templates.

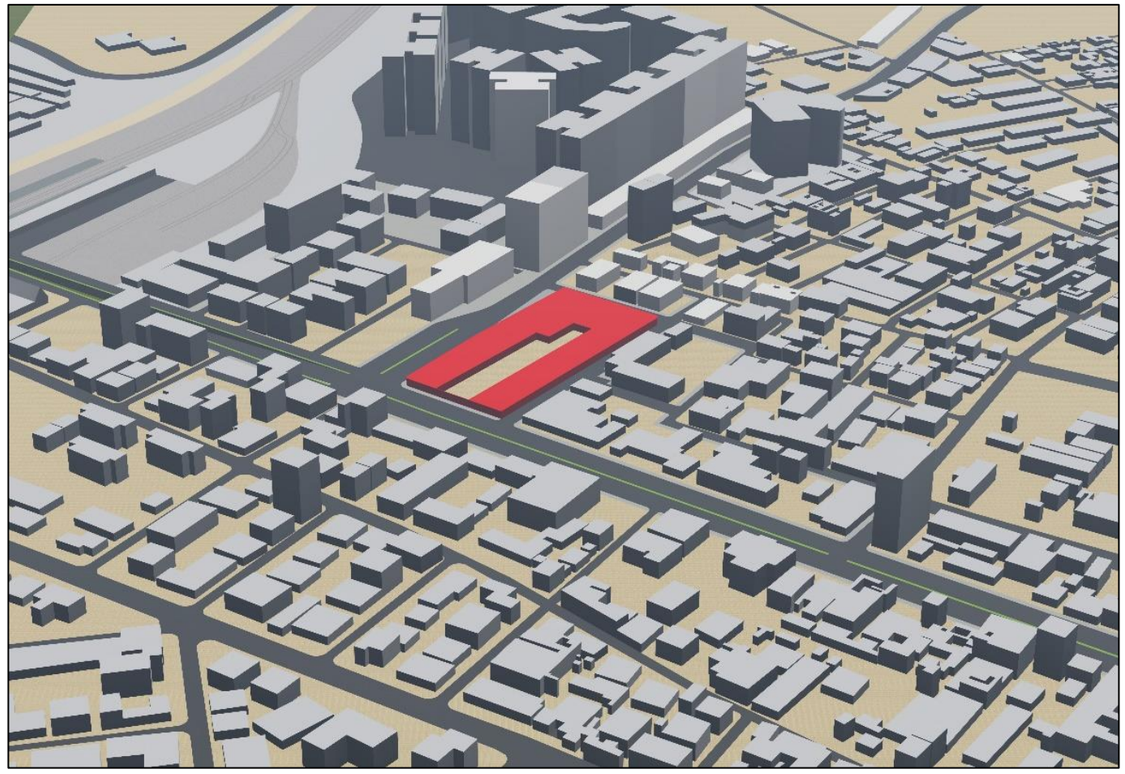


Figure: 3D perspective of the study area

Source: Author 2024

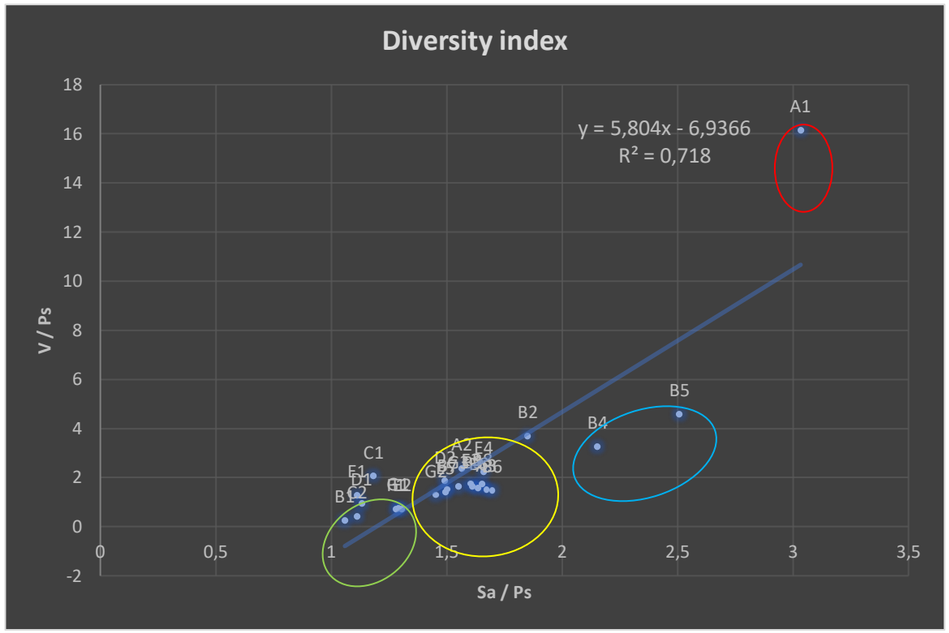


Figure: Diversity index graph

Source: Author 2024

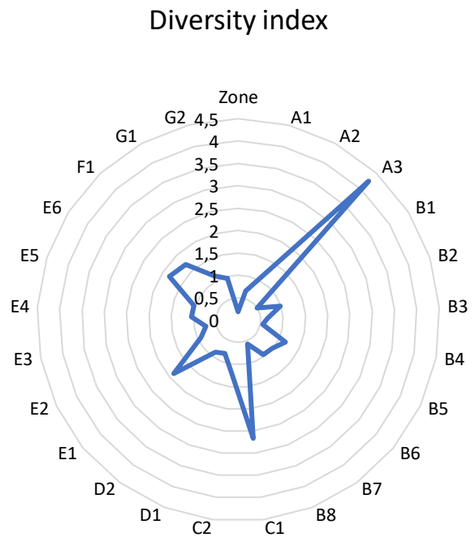


Figure: Diversity index radar

Source: Author 2024

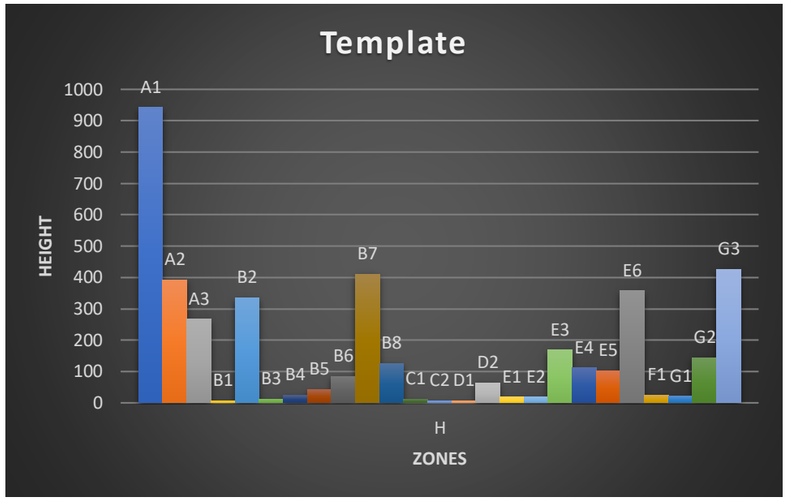


Figure: Template diagram

Source: Author 2024

Interpretation 03: Street animation:

- According to the histogram and the radar scheme we can star the zones B1 (train station) and A1 (Commercial activities) with the highest street animation level.
- The points E4; D2; E6; B7; A2 ambivert zones, a balance between open and closed lengths.
- The rest of the zones are mostly introverted, which is the case of most of individual buildings.
- We can recognize the open lengths highlighted as red paths in both connectivity and integration cards.

Also the flow card allows us to open the vision to detect open lengths, the more there exist spots that interacts with the street with people, the more the high flow and march ability can be marked off.

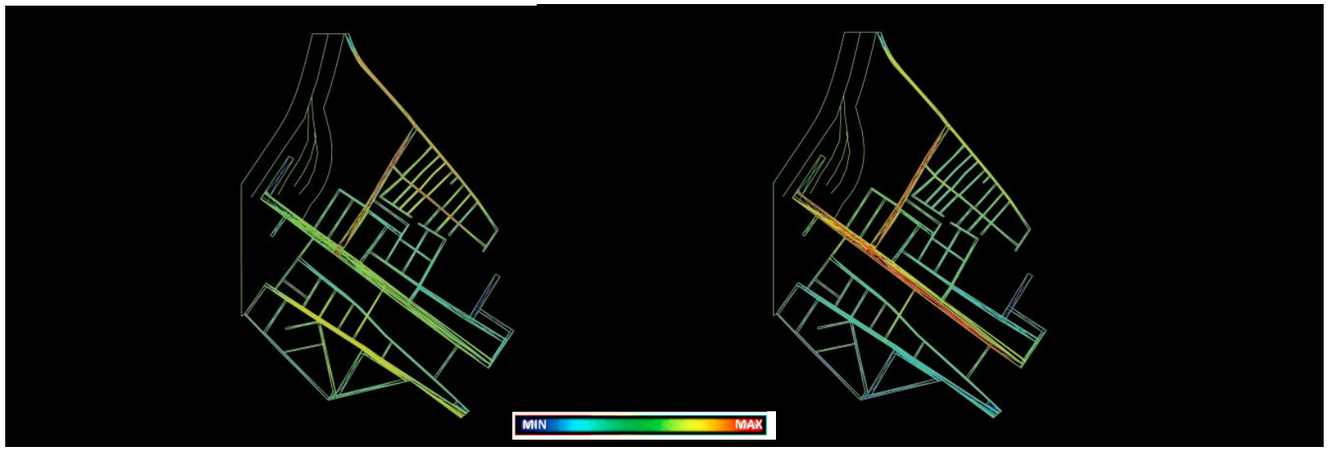


Figure: Connectivity card

Source: Author 2024

Figure: Integration card

Source: Author 2024

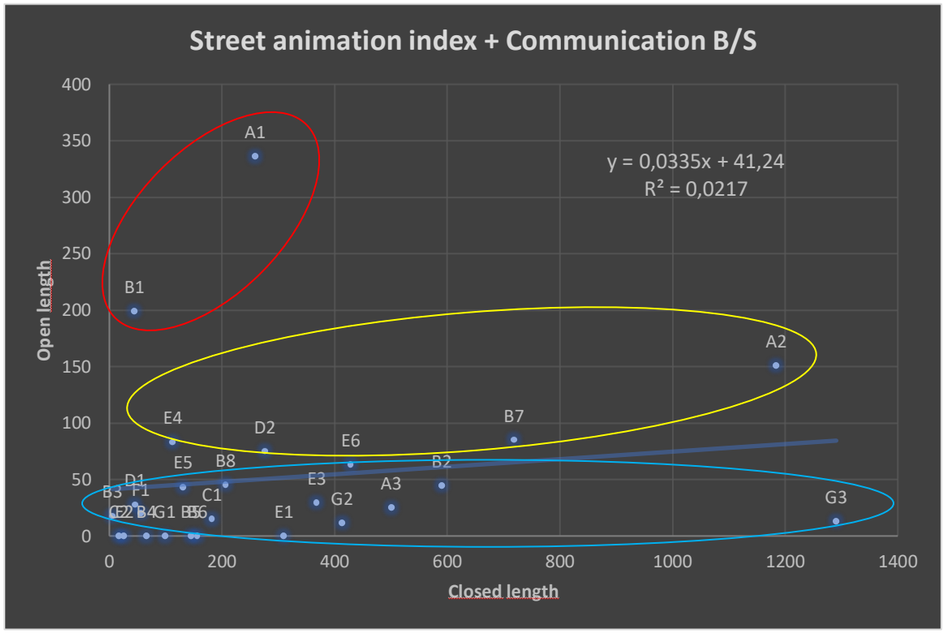


Figure: Street animation index

Source: Author 2024

Legend:

---- High Flow.
---- Medium flow.
---- Low Flow.

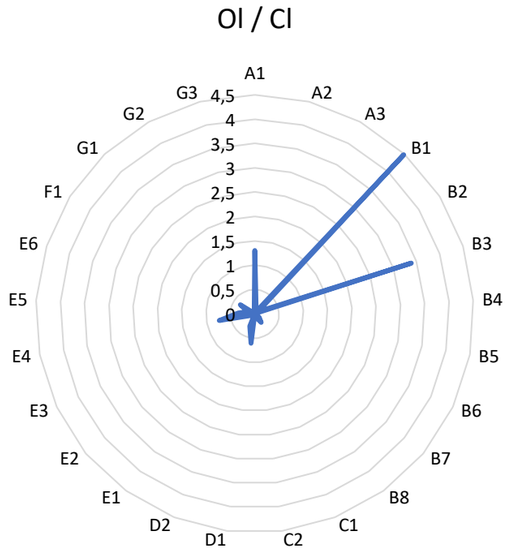


Figure: Street animation index radar

Source: Author 2024

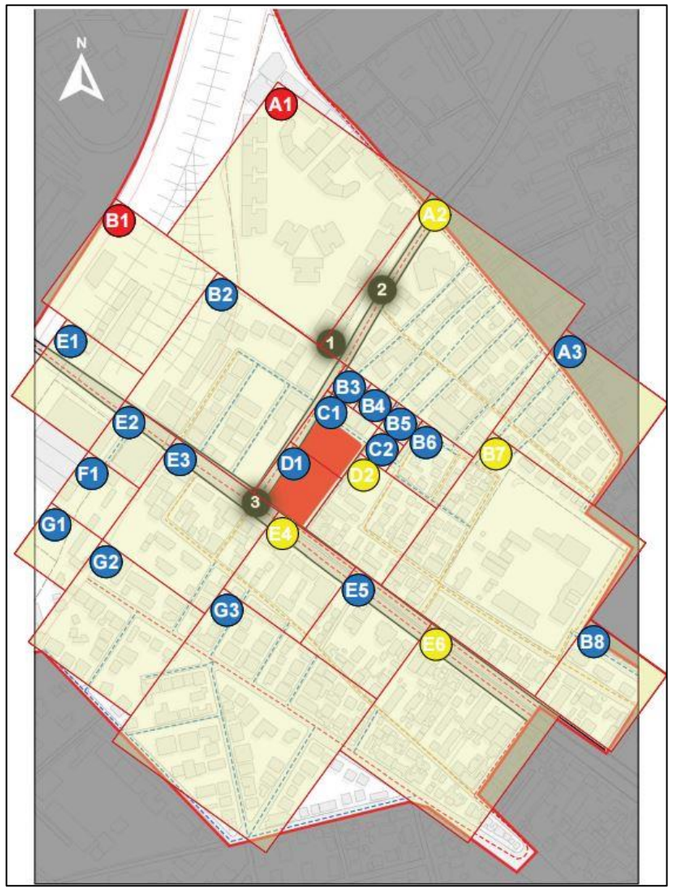


Figure: Grid of homogenous zones on flow card

Source: Author 2024

Interpretation 04: Land use index:

- According to the radar scheme and the histogram:
- The zones B1; C2; E1; E2, land occupation by the sheds; the train station (Servitude) and land availability justifying low land use amount.
- The points C1 (Sheds) and B5 (Individual housing) refer to the zones where the building surface is almost equal to the projected surface, representing the highest land use amount.
- The rest of the zones, vary in term of function and an average land use between (0,002 and 0,005).
- Lack of permeability in the majority of the urban zones.
- Missed land optimization.

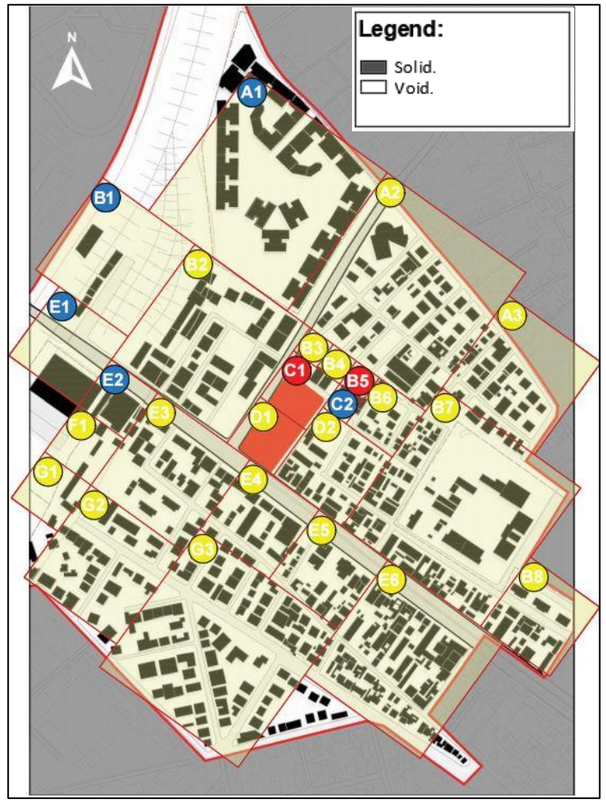


Figure: Grid of homogenous zones on Solid/Void ratio card

Source: Author 2024

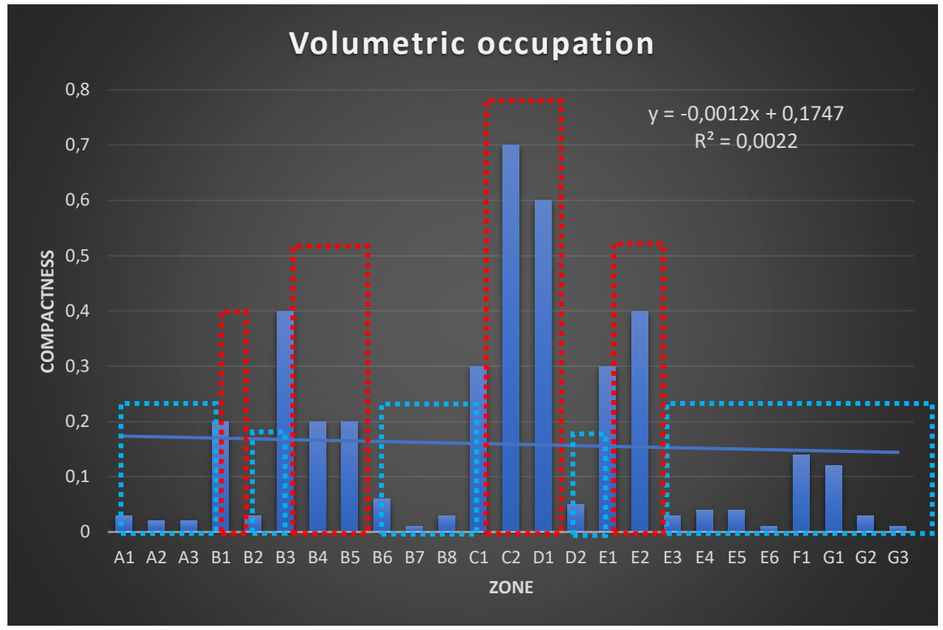


Figure: Volumetric occupation diagram

Source: Author 2024

Interpretation 05: Volumetric occupation:

- According to the radar scheme and the histogram, the zones represented with bleu frame which are under the trend line, are characterized with low compactness, representing housing dominance.
- On the other hand, the zones represented with red frame, and which are above the trend line, mostly represent the zones of sheds with high compactness.
- Solid / Void ratio failed and lot of muffled surfaces.

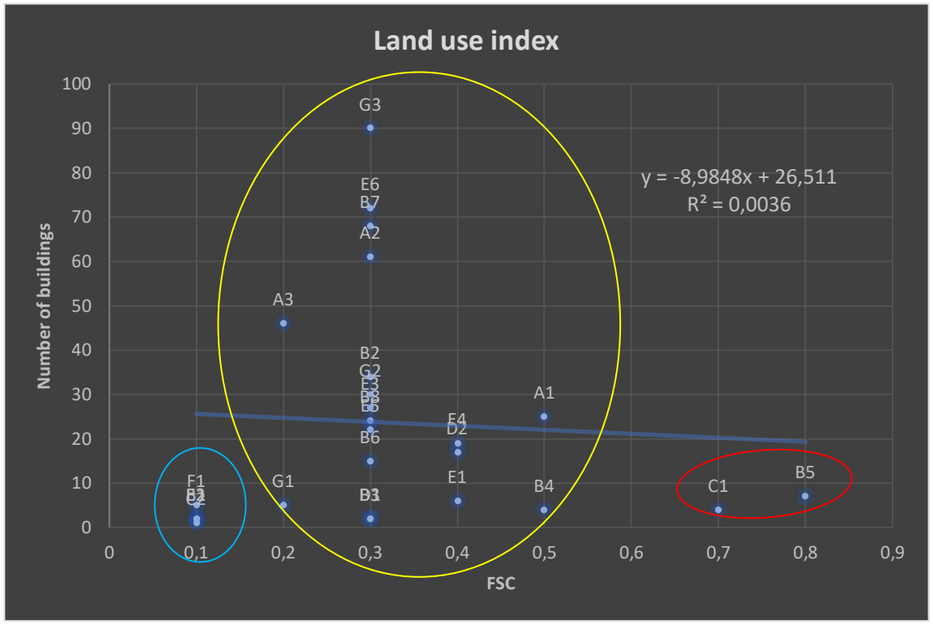


Figure: Land use graph

Source: Author 2024

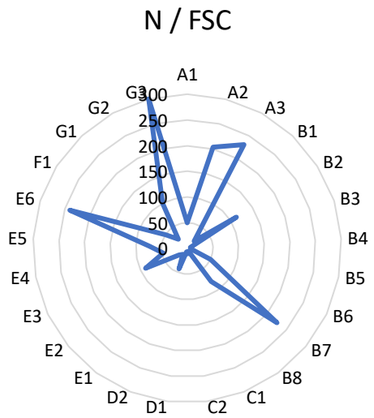


Figure: Land use index radar

Source: Author 2024

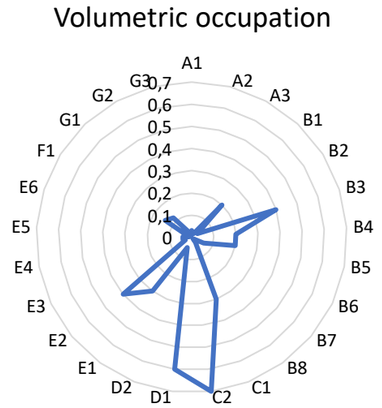


Figure: Volumetric occupation index radar

Source: Author 2024

Interpretation 06: Masses distribution:

- Very vast paradox in the distribution of the volumes over the number of buildings; lack of formal diversity so we can distinguish:

- The zone A1, with huge volume spread over only 25 buildings function as collective housing.

- A3; A2; B7; E6; G3, characterized with a significant number of building (up to 90) and low volume due to the functional structure on these areas (Housing; commerce focused in the RDC and educational campus).

- The rest of the zones represent a high concentration of individual buildings, with low template and low volume, this justifies also the compactness detected in these zones.

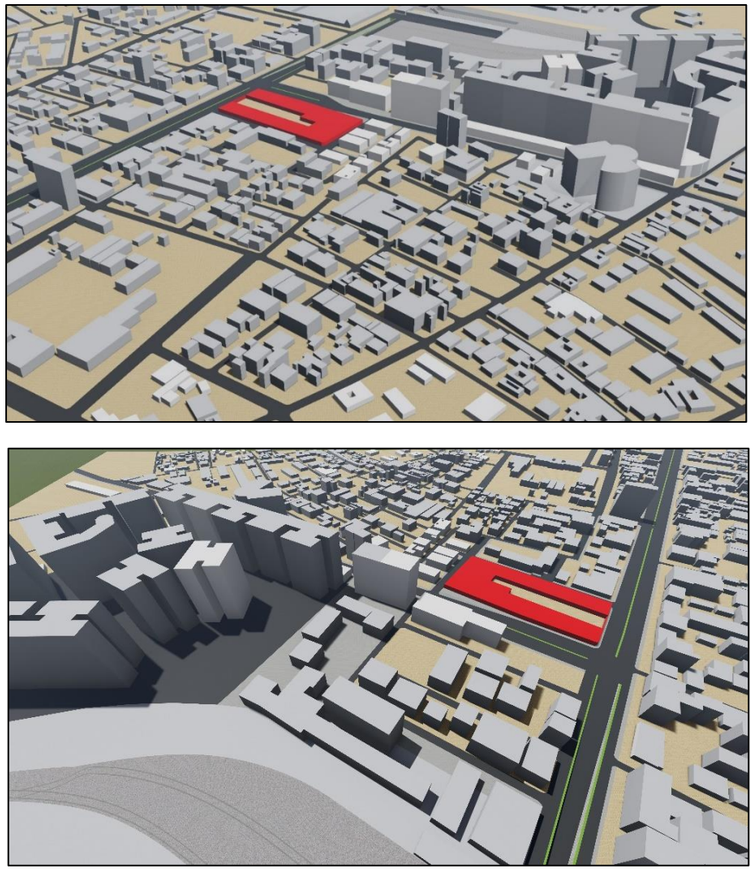


Figure: 3D perspective of the study area

Source: Author 2024

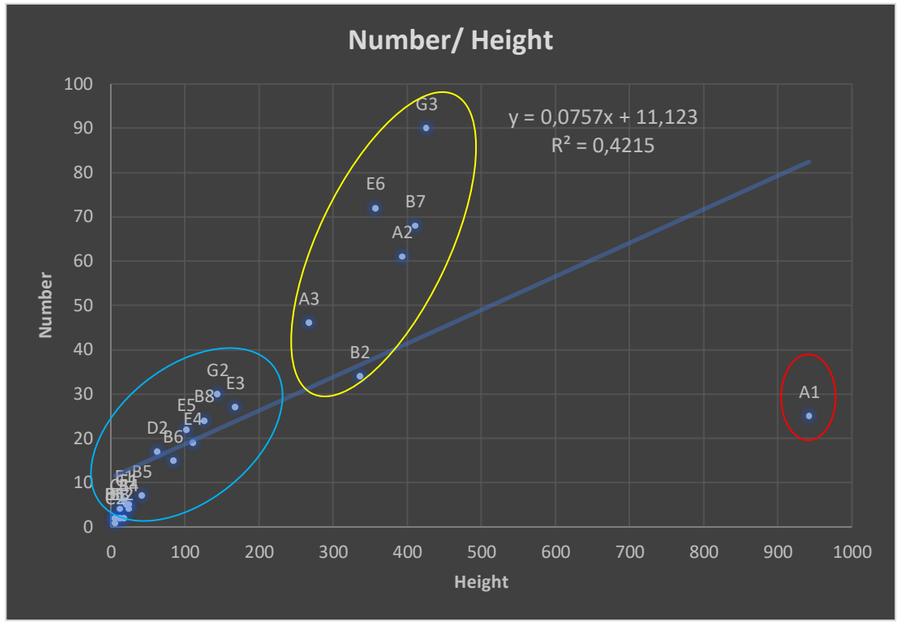


Figure: Number/Height graph

Source: Author 2024

Interpretation 07: Number/Height ratio:

- The zone A1, takes the lead with the highest template (R+12), a zone dedicated to collective housing.

- The group of points: A2; A3; B2; B7; E6; and G3, represent the zones of different activities (Housing / Administrative and service structures) with an average height (260m to 450m) due to the variation of the templates which gets up to R+8.

- The rest of the zones are detected with a height level qua the lowest (Under 200m), owing to the dominance of individual housing dating from the colonial era where the template can't exceed R+2.

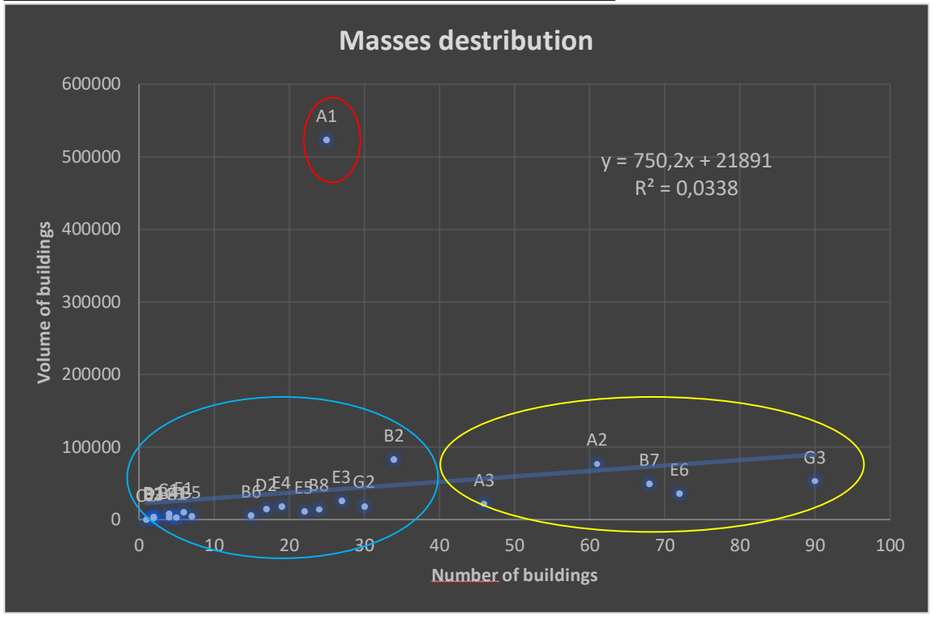


Figure: Masses distribution graph

Source: Author 2024

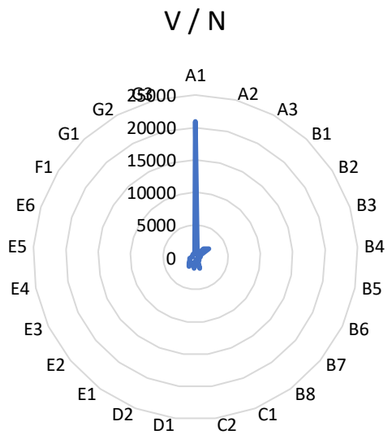


Figure: Masses distribution index radar

Source: Author 2024

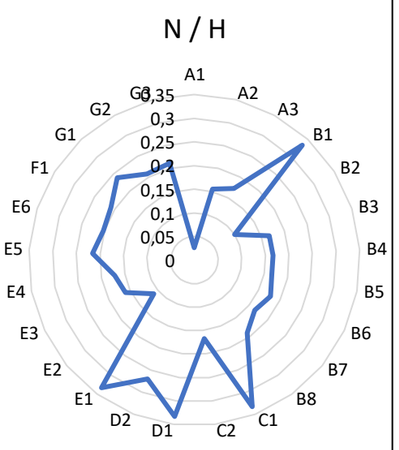


Figure: N /H ratio radar

Source: Author 2024

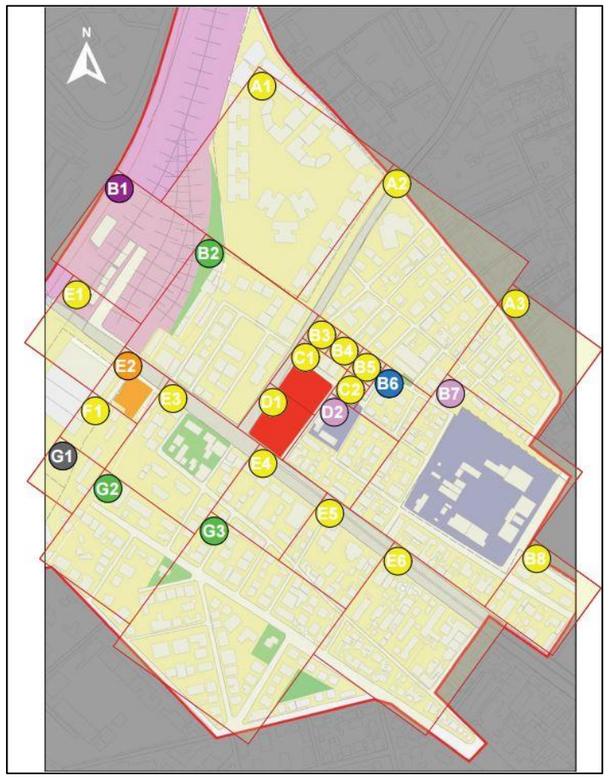


Figure: Grid of homogenous zones on unbuilt system card

Source: Author 2024

Interpretation 08: CBS

- According to the histogram; the radar scheme and the card of unbuilt system, we can distinguish the following:

- The zones A1; B1; B2; B7; D2; G1; G2; G3 are characterized with a hight CBS degree due to the presence of the big surface of outdoor spaces in A1, the train station yard in B1, The green spaces in B2; G2; G3, and the School yards in both D2 and B7.

- The CBS degree of the rest of the zones is identified by the parking yards only.

- All the study area with all its zones is stamped with the immense lack of green weft and natural spaces.

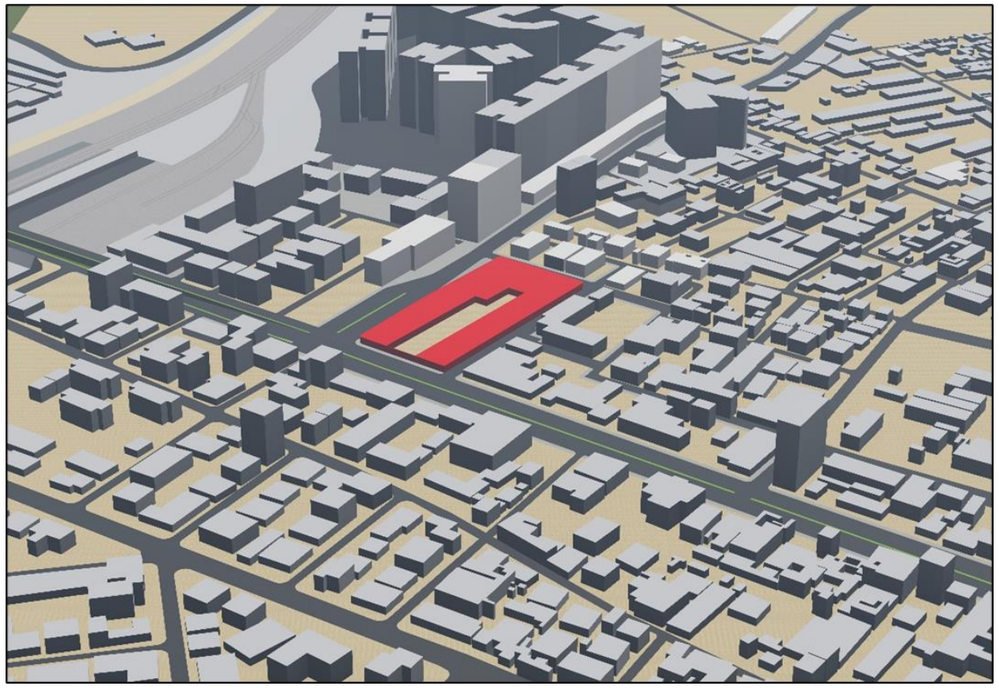


Figure: 3D perspective of the study area

Source: Author 2024

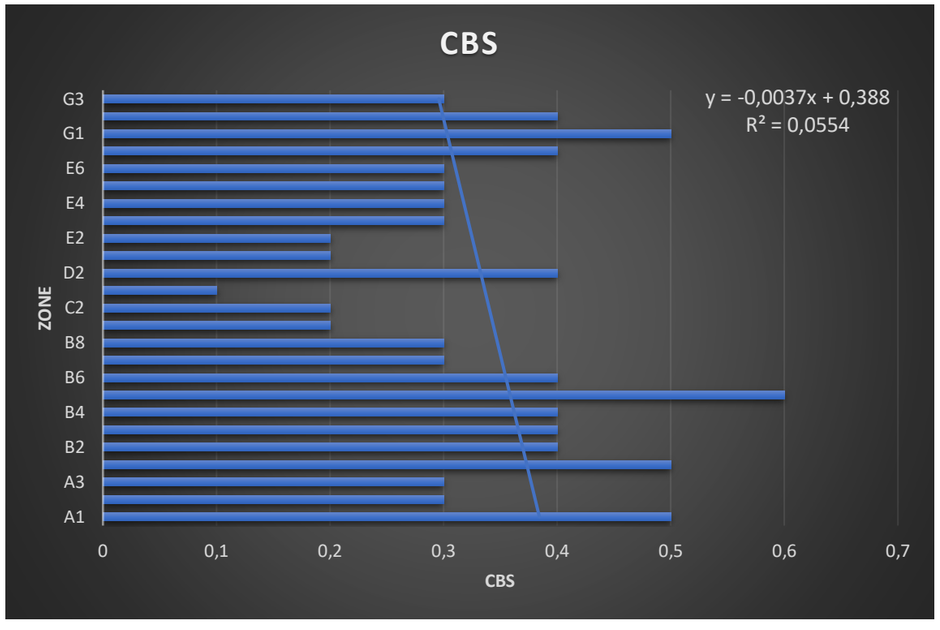


Figure: CBS diagram

Source: Author 2024

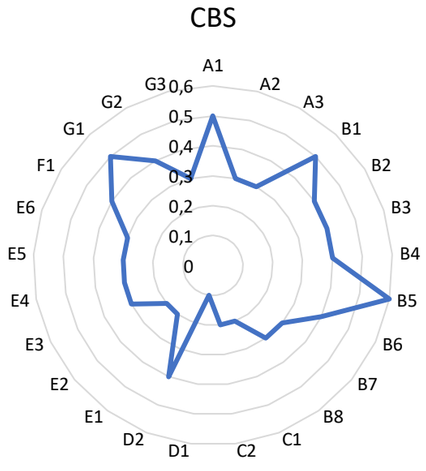


Figure: CBS radar

Source: Author 2024

Figure: 3D perspective of the study area

Source: Author 2024

Reference example: Antwerp Residential Tower – Antwerpen –

Figure. Antwerp Residential Tower

Name: Antwerp Residential Tower

Location: Antwerpen, Belgium.

Client: Nieuw Zuid - Triple Living.

Architects: C.F. Møller Architects and Brut.

Launch date: 2014.

Completion date: 2020.

Surface: 15,000 m^2.

Cost: $ 52,306,872.

Awards: 1st prize in international competition, 2014.

Belgium:

The tower forms a distinctive architectural masterpiece that adorns the skyline of the growing New Zuid neighborhood in Antwerp, becoming a symbol of the fusion and harmony between modernity and the city's ancient history. Its design departs from the traditional style of high-rise buildings, and instead focuses on creating a vibrant environment that enhances communication and interaction between residents,

embodying the concept of “vertical community” with all its meanings of inclusion and belonging.

The tower's design concept was derived from an "Inside out" perspective, where the social characteristics of the building become the main driver of the design. Designers recognize the challenges high-rise buildings face in creating a sense of community among residents, where encounters are often limited to lobbies and elevators. Therefore, the tower's design offers innovative solutions to enhance social interaction without compromising residents' privacy.

Programmatic references:

The building, stretches 24 stories high, includes:

- 135 apartments (11.500 m^2).
- 900 m^2 offices.
- 550 m^2 retail.
- 150 m^2 common areas.
-+3.850 m^2 private terraces and balconies.
- 430 m^2 common roof garden and terrace.
- 850 m^2 garden.
- 5,500 m^2 basement car park.

Apartments range from smaller suites for students to larger family units, and each group of similar apartments opens towards balcony spaces.

- Creating “vertical mini-communities” through balconies, glass winter gardens and roof terraces.
- Shared facilities such as a bicycle workshop, a laundry, and a dining room.
- Roof landscape on the fifth floor.

- **Selection criteria:**

- The diverse range of functions (Programmatic approach).
- Innovative and sustainable construction techniques (Diverse Housing Types; Collective Green Spaces; Integration of Social Facilities).

Dilemma:

- Create a "vertical social community," with a variety of apartment types suitable for different residents, from students to families.

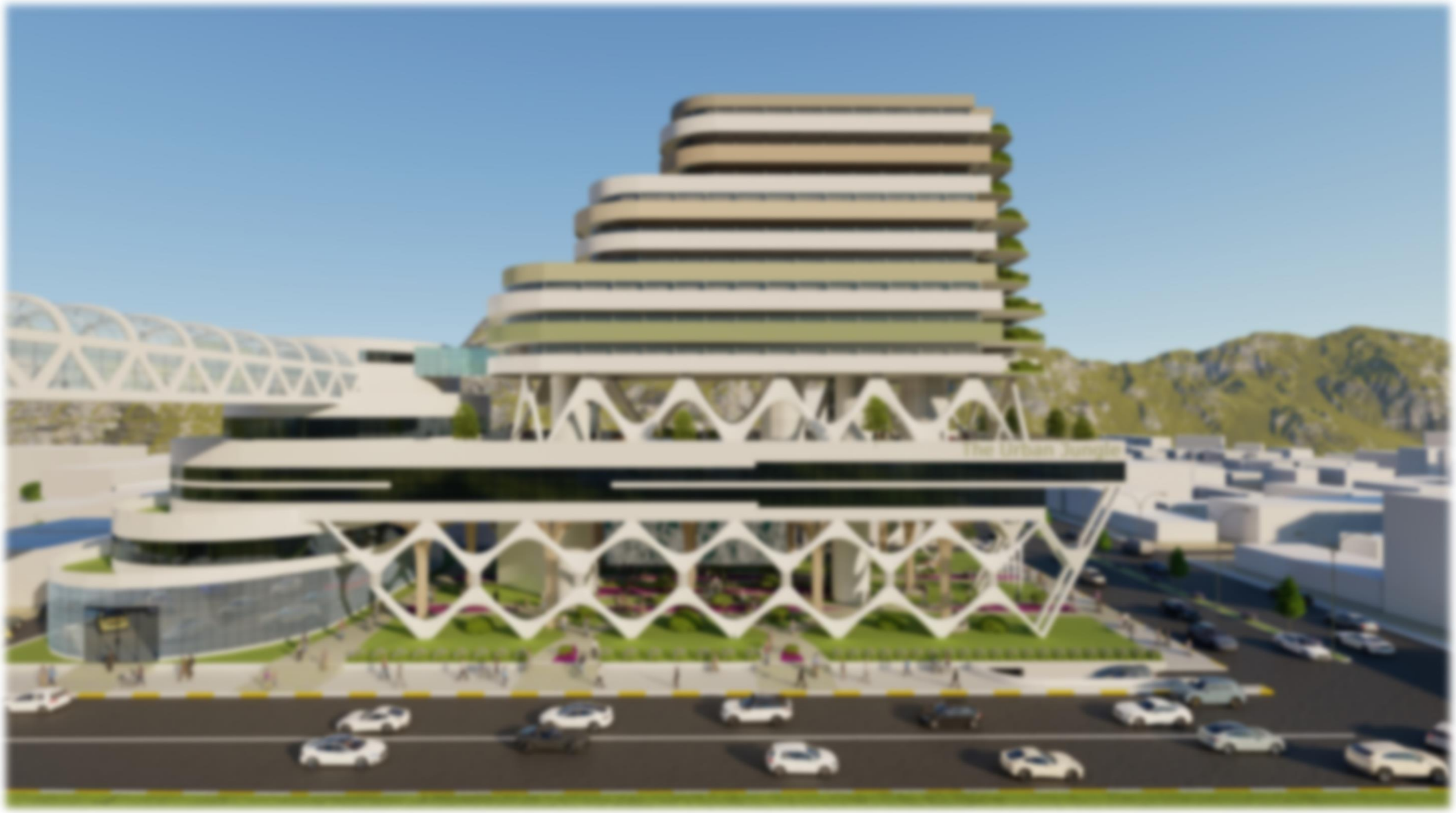
- Foster a sense of community and social interaction among its residents.

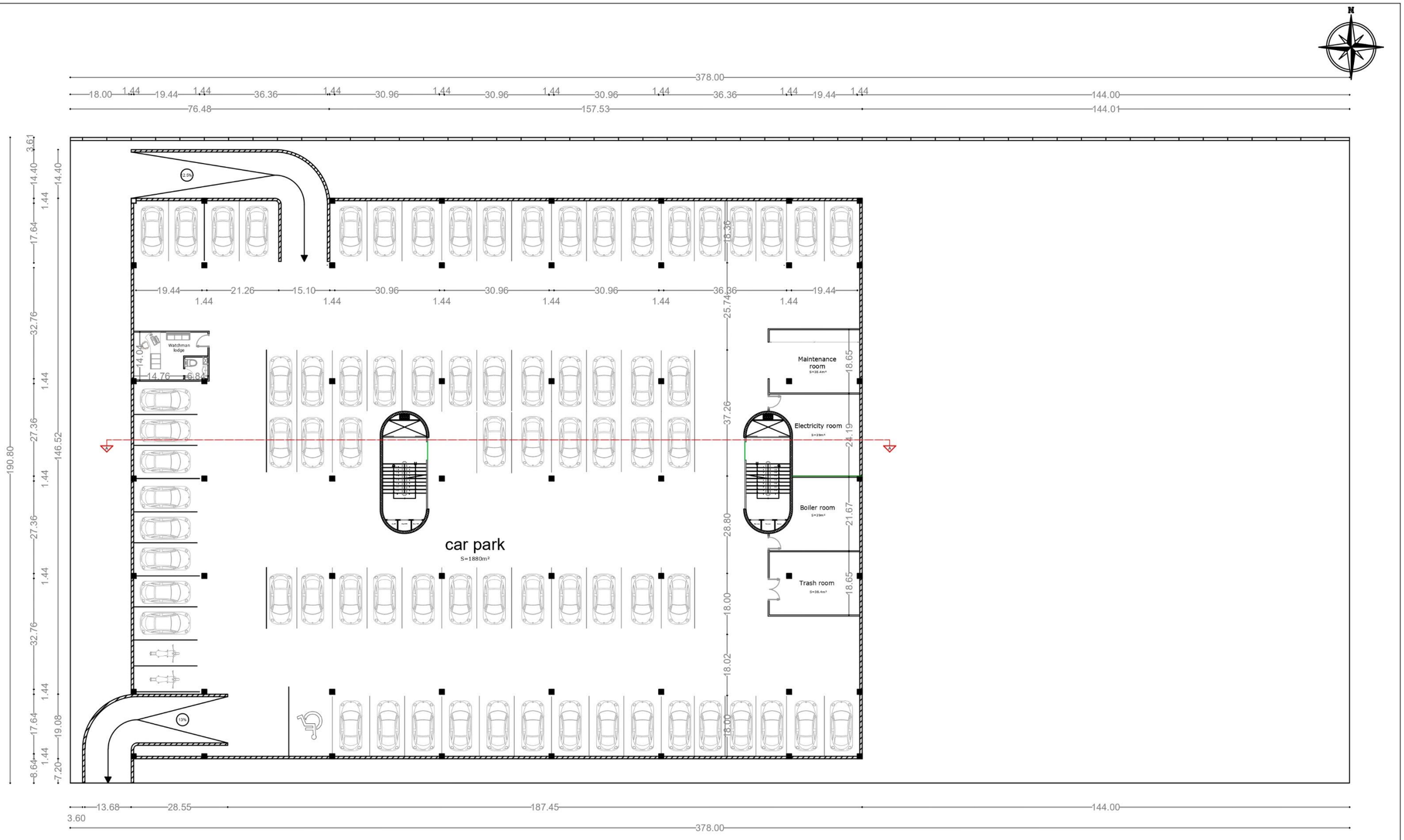
Specificities:

- Private balconies.
- Glass winter gardens, and roof terraces.
- Shared facilities such as a bicycle workshop, a laundry, and a community room.
- Roof landscape on the fifth floor.

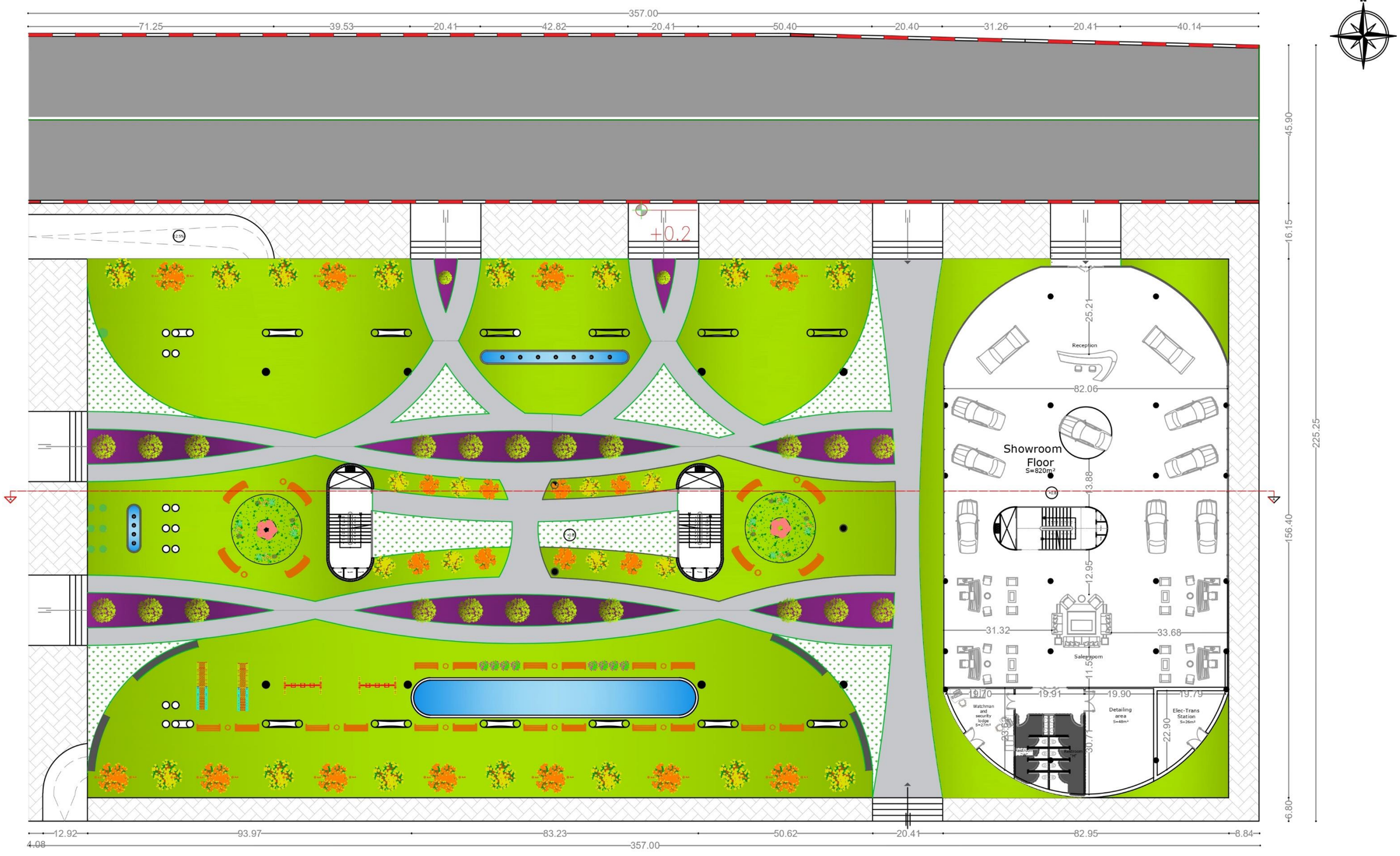
Conclusion: The tower is an integral part of Antwerp's growing New Zuid neighborhood, its design focuses on promoting diversity and social encounters, with an emphasis on creating vibrant shared communities. By offering attractive shared facilities and a stunning rooftop view, the tower provides a unique residential experience that meets the needs of various residents.

THE URBAN JUNGLE

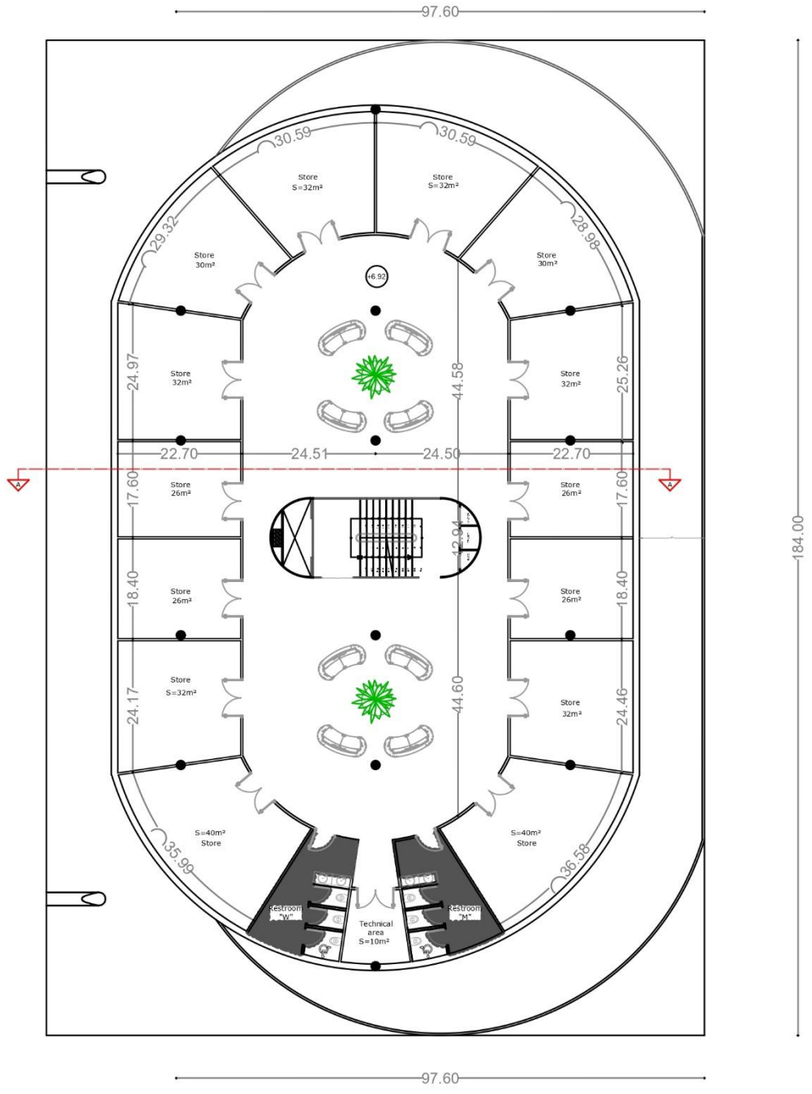


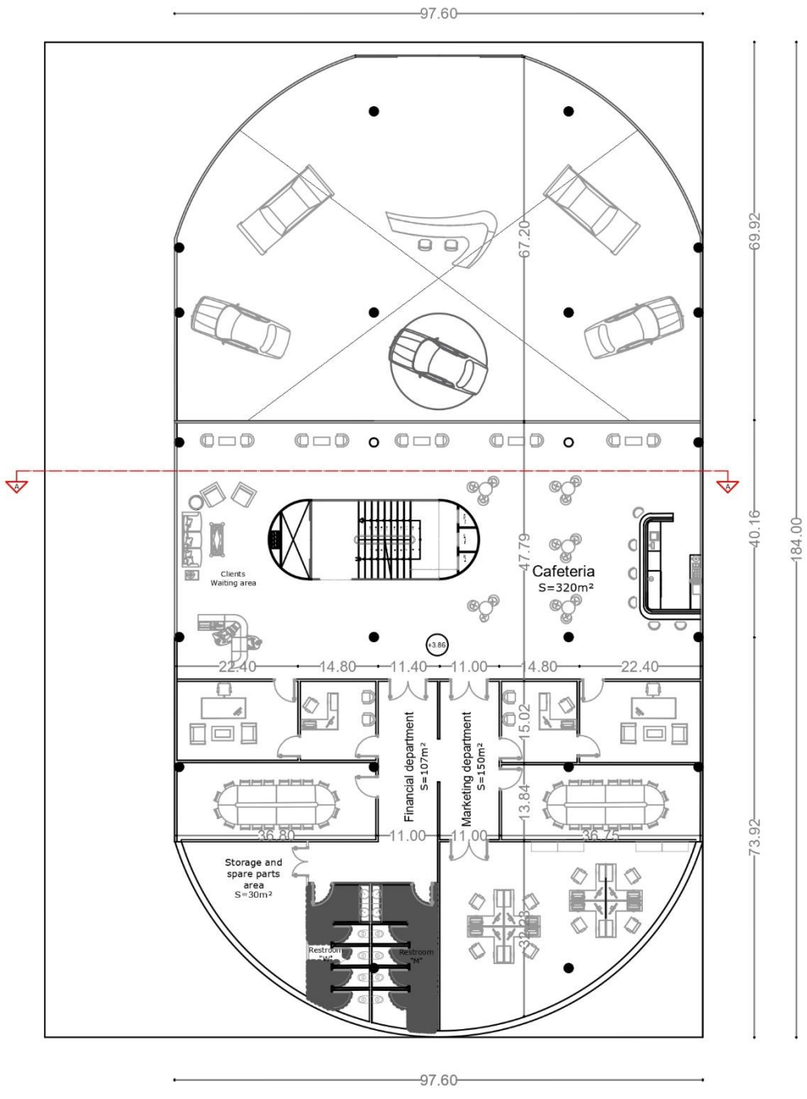


Institute of Architecture and Urban Planning - BLIDA 01		
Urban architecture 2023-2024	HADJ-AHMED Meriem	
Group 01	Basement floor plan	Scale: 1/250



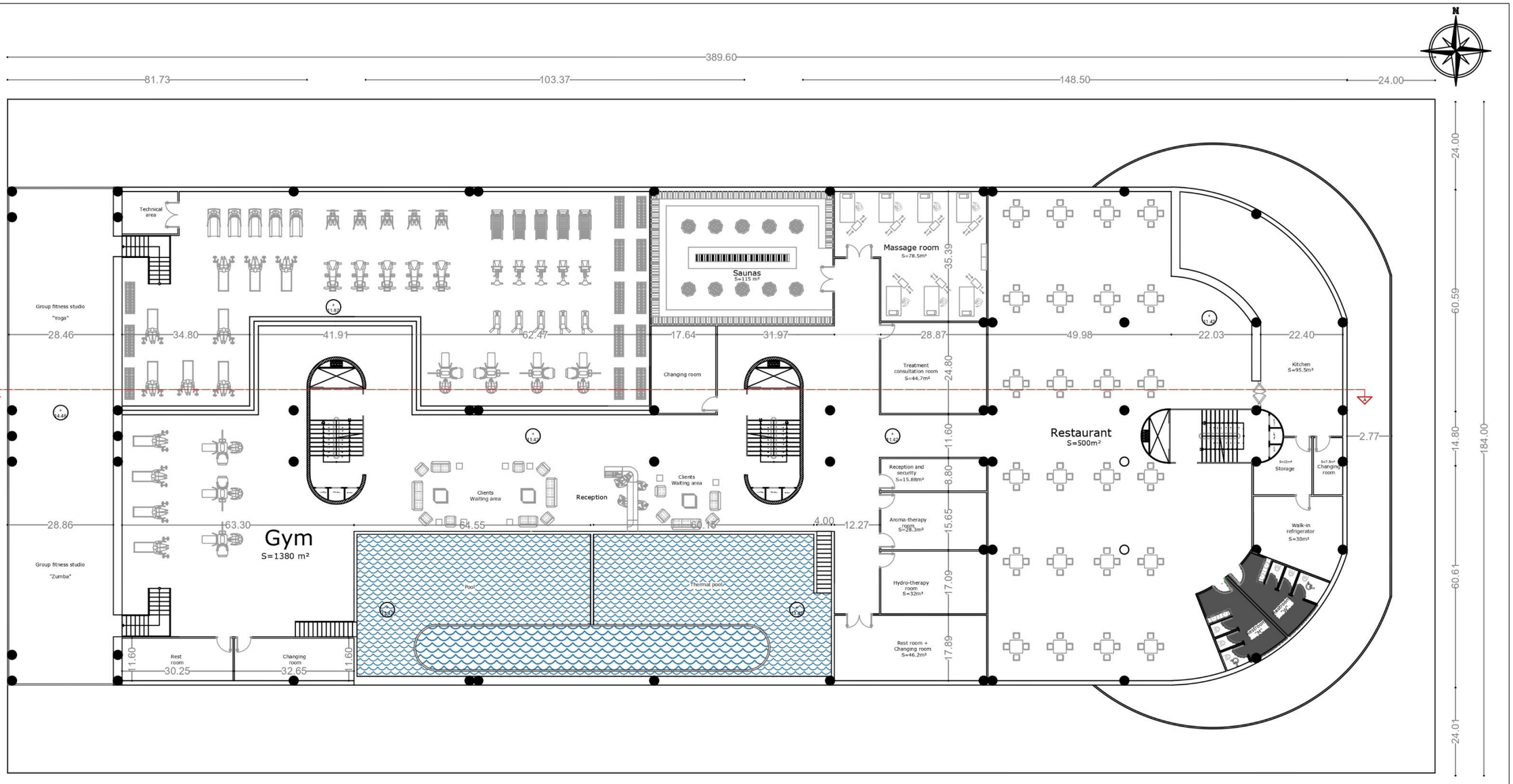
Institute of Architecture and Urban Planning - BLIDA 01		
Urban architecture 2023-2024	HADJ-AHMED Meriem	
Group 01	Ground floor plan	Scale: 1/250



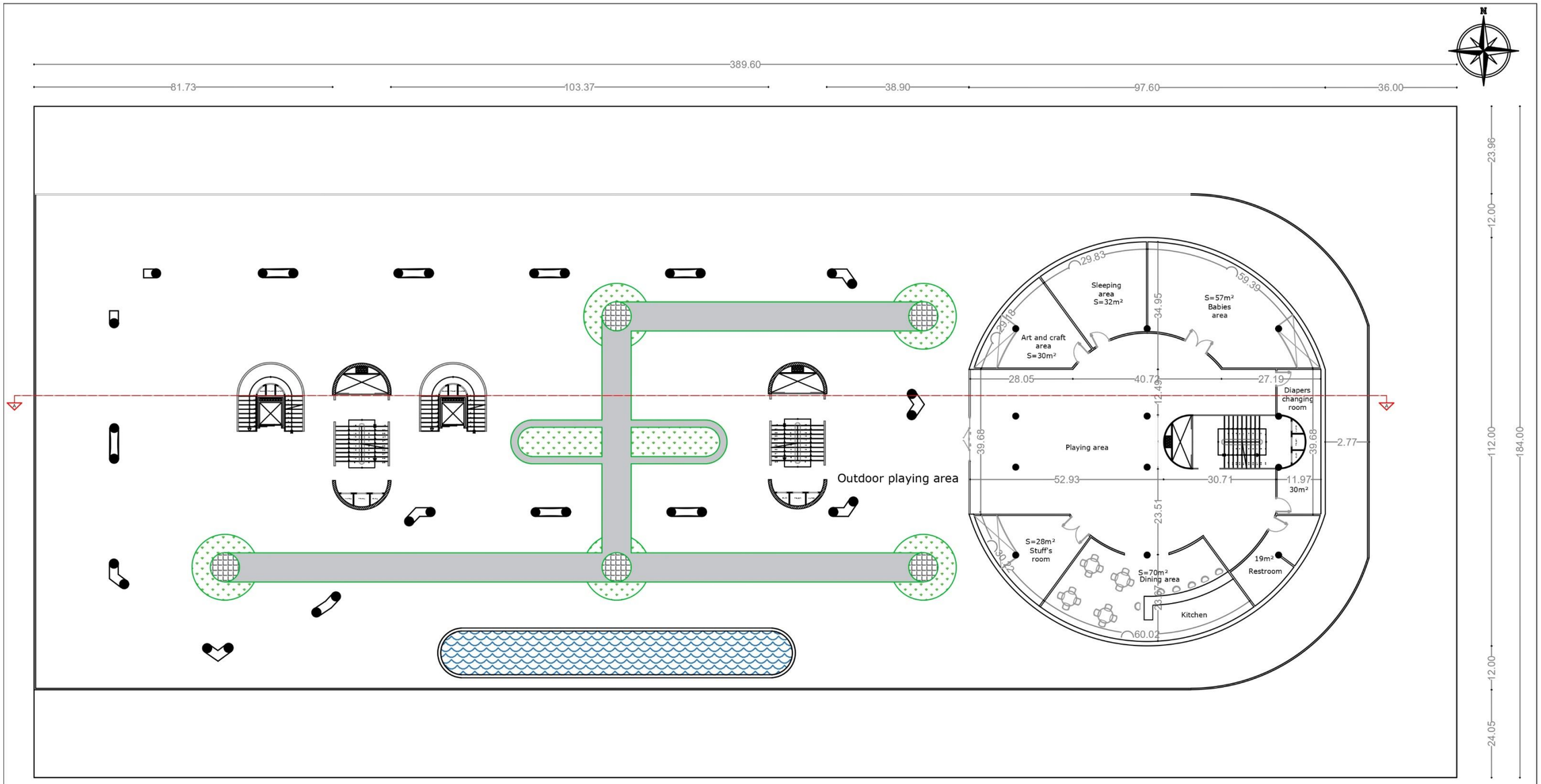


Institute of Architecture and Urban Planning - BLIDA 01		
HADJ-AHMED Meriem	Urban architecture 2023-2024	
Scale: 1/250	Second floor plan	Group 01

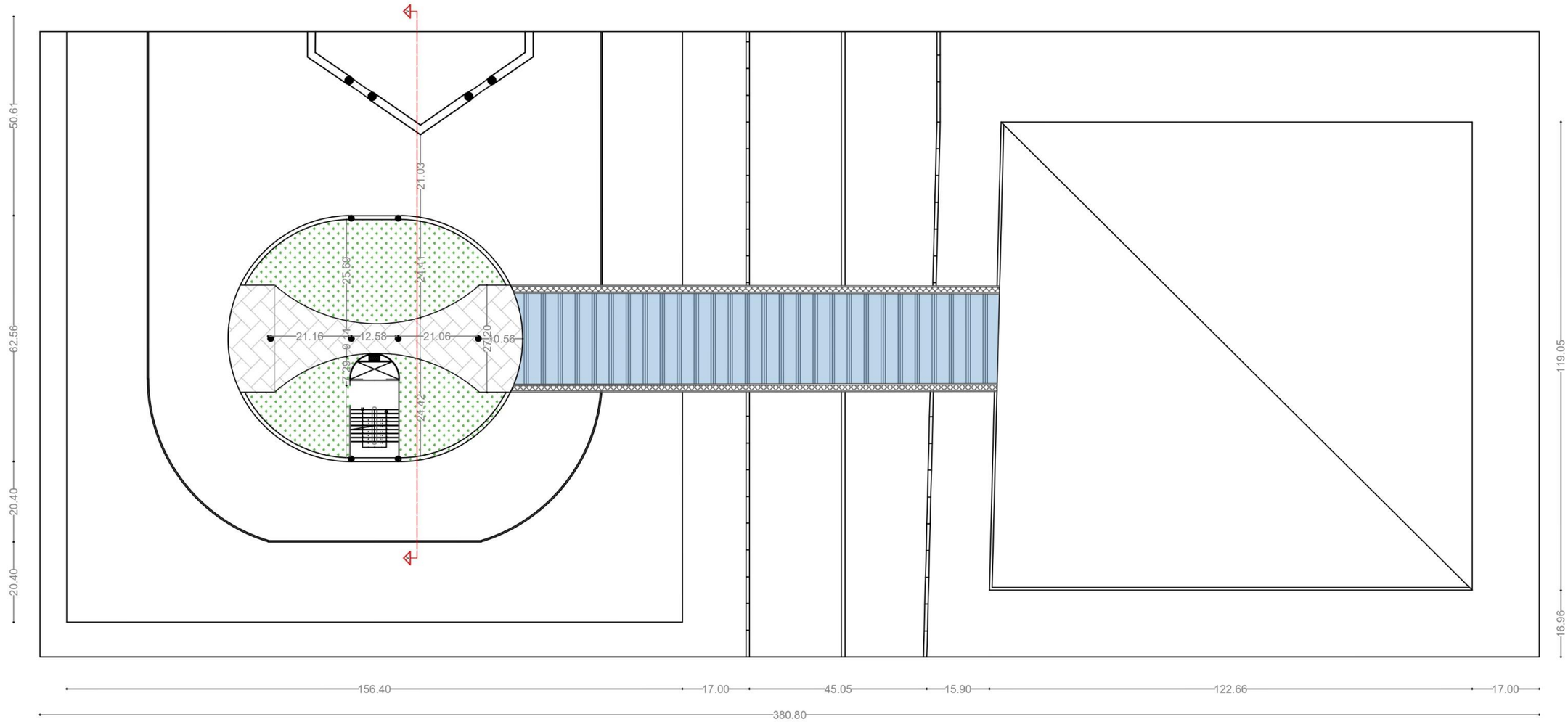
Institute of Architecture and Urban Planning - BLIDA 01		
Urban architecture 2023-2024	HADJ-AHMED Meriem	
Group 01	First floor plan	Scale: 1/250



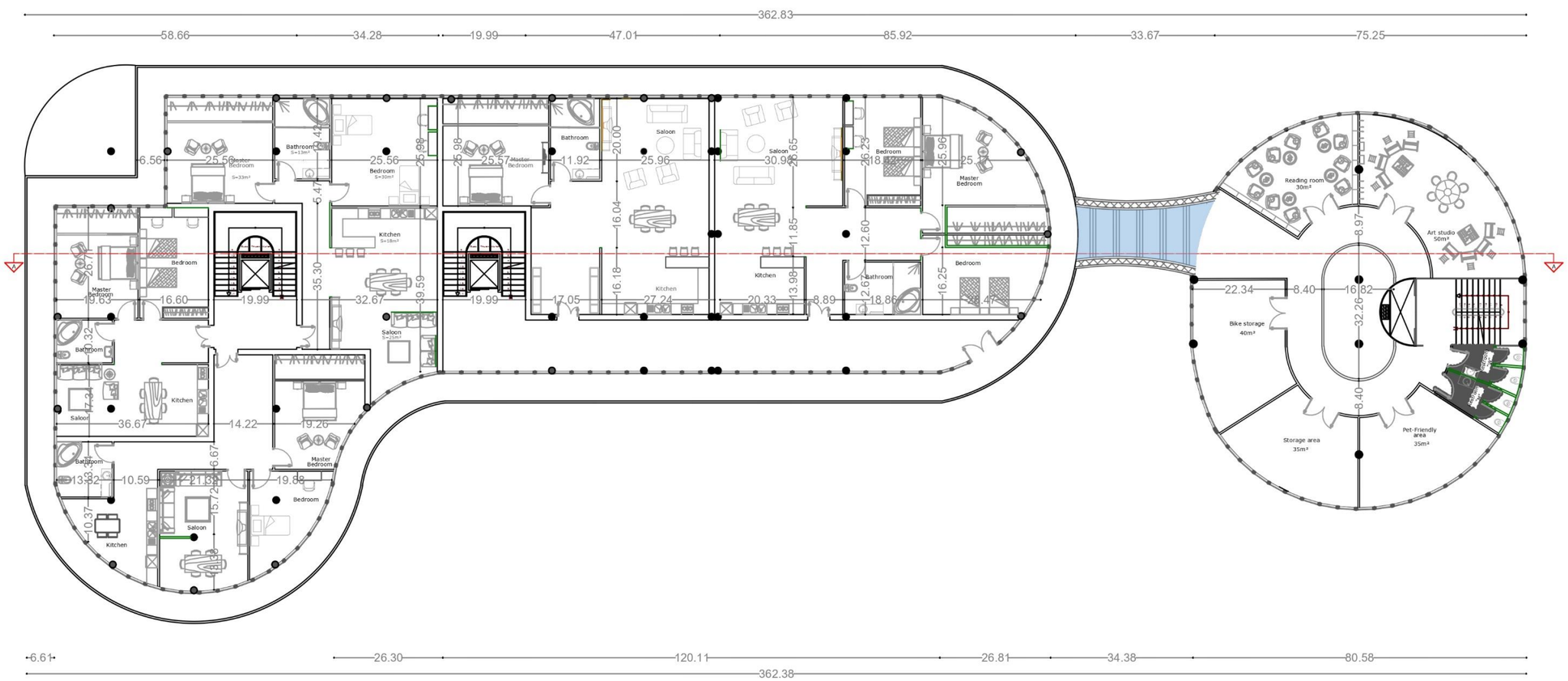
Institute of Architecture and Urban Planning - BLIDA 01		
Urban architecture 2023-2024		HADJ-AHMED Meriem
Group 01	3rd floor plan	Scale: 1/250



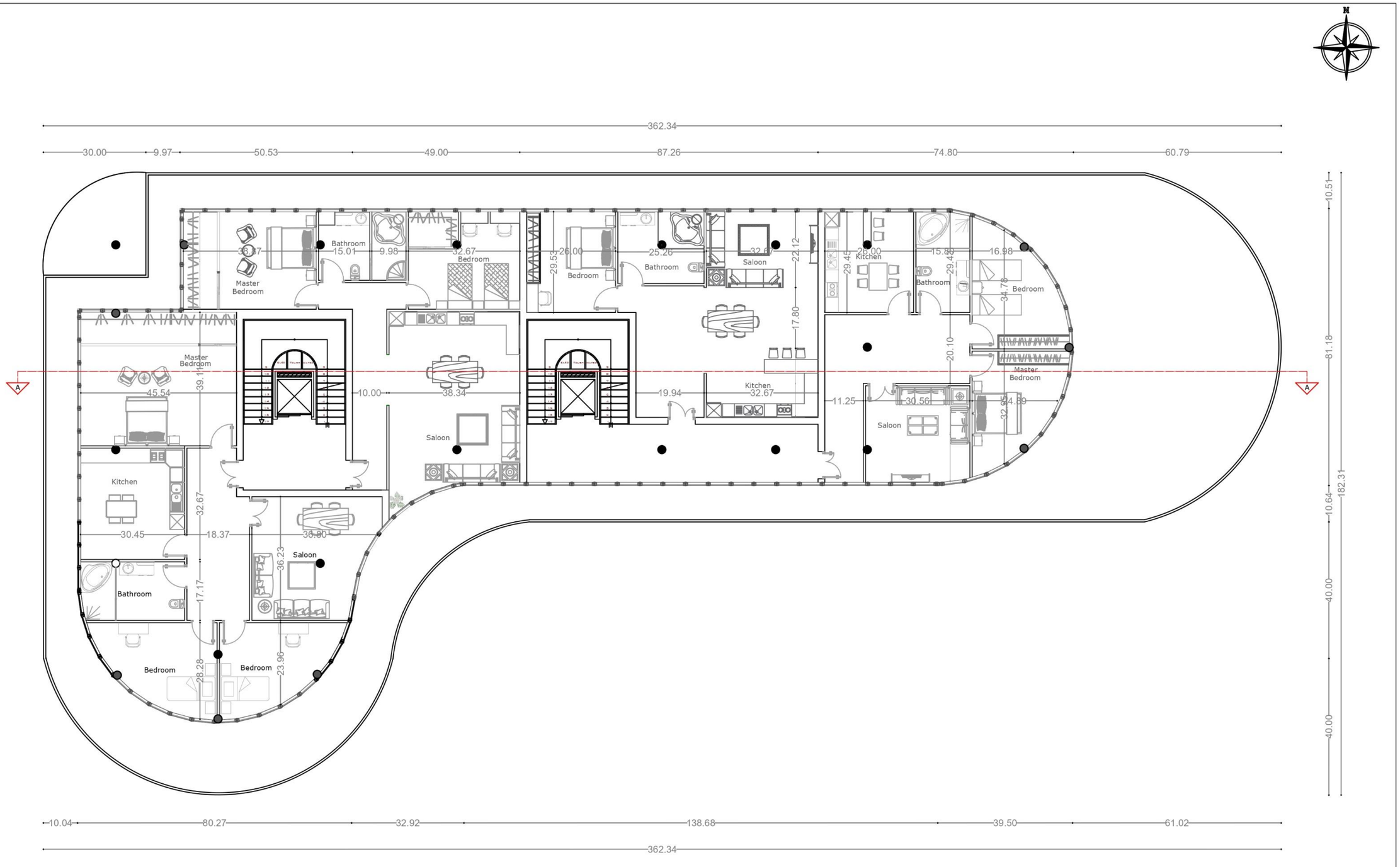
Institute of Architecture and Urban Planning - BLIDA 01		
Urban architecture 2023-2024		HADJ-AHMED Meriem
Group 01	4th floor plan	Scale: 1/250



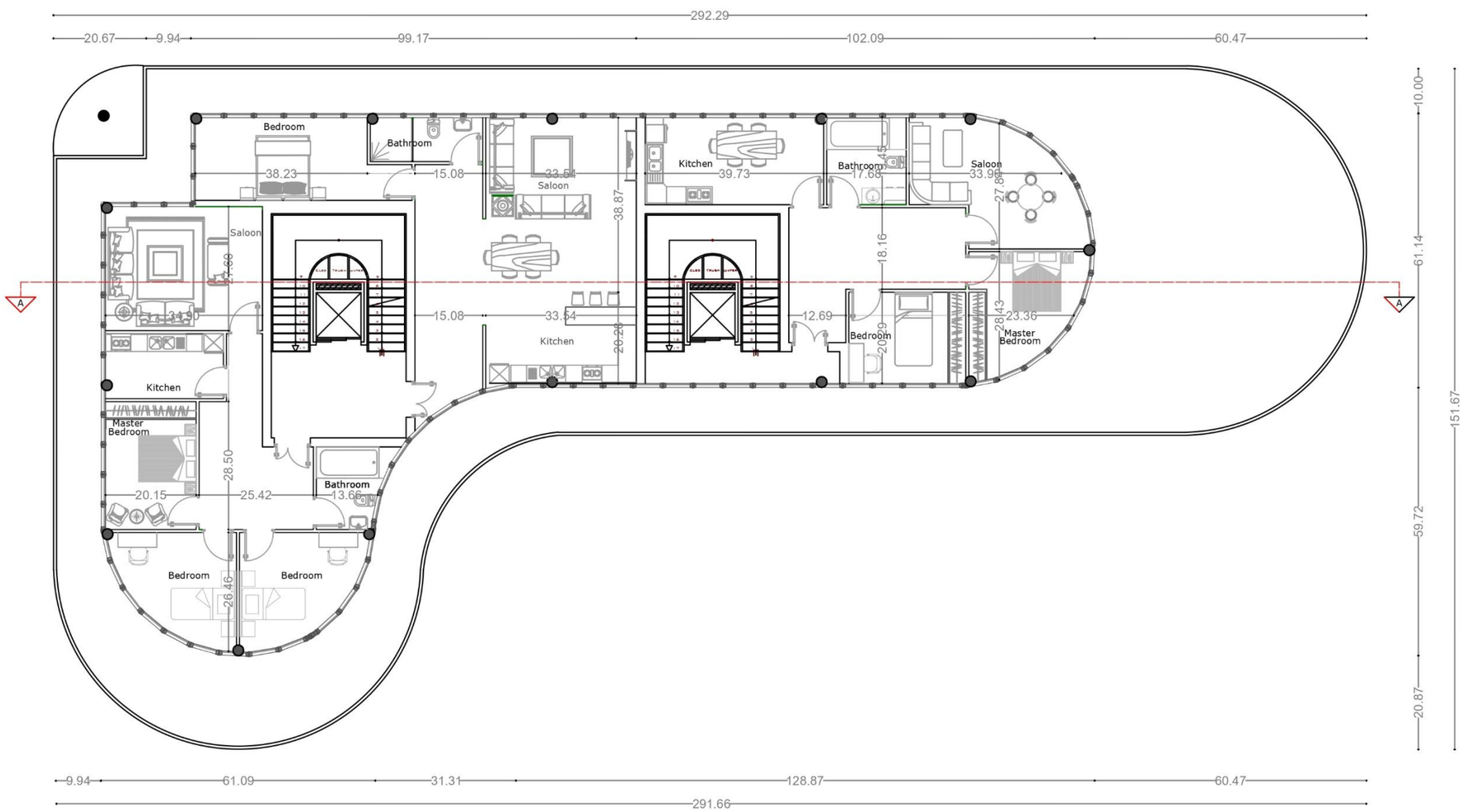
Institute of Architecture and Urban Planning - BLIDA 01		
Urban architecture 2023-2024		HADJ-AHMED Meriem
Group 01	5th floor plan	Scale: 1/250



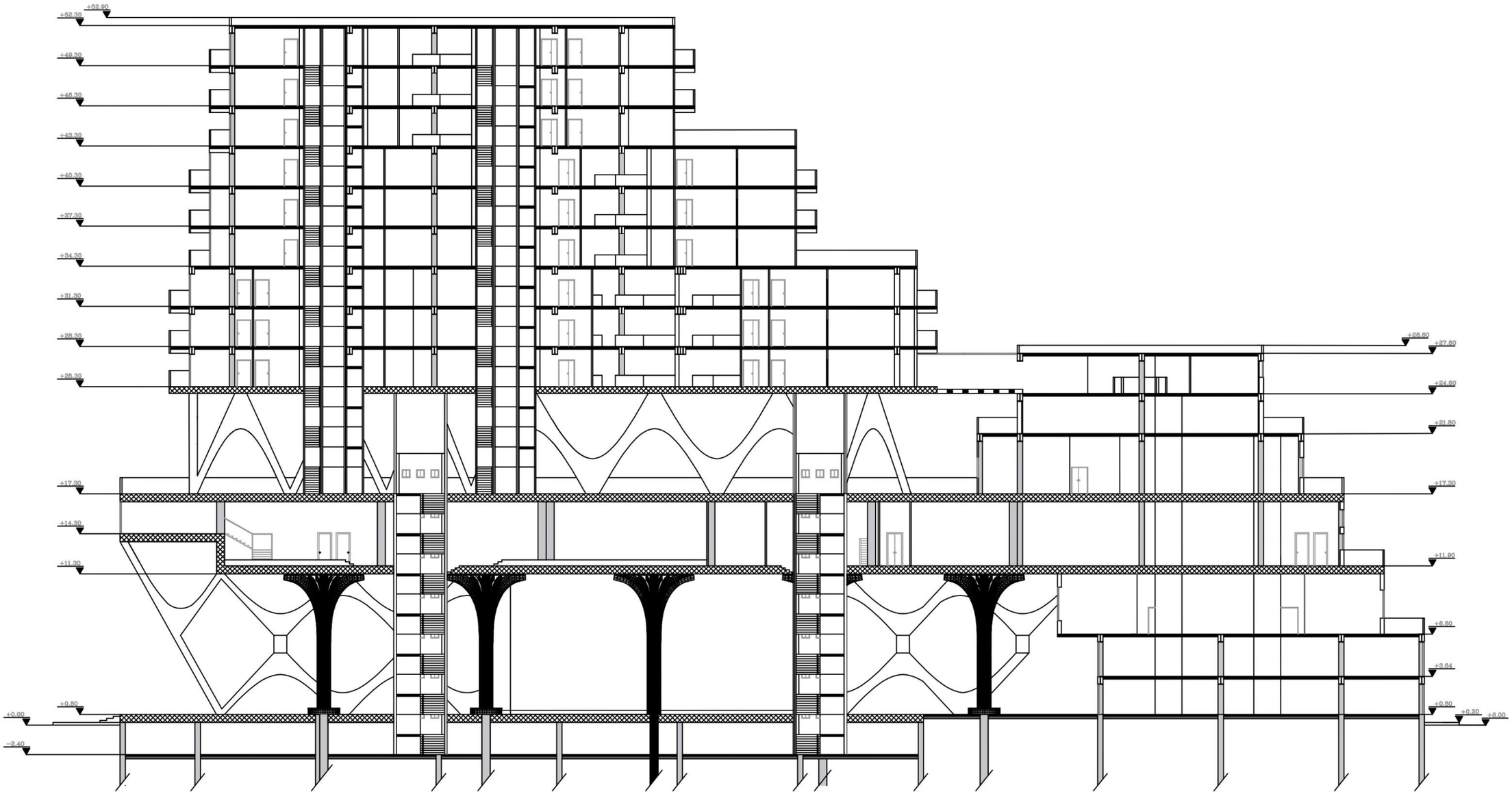
Institute of Architecture and Urban Planning - BLIDA 01		
Urban architecture 2023-2024		HADJ-AHMED Meriem
Group 01	6th to 8th Residential floor plan	Scale: 1/150



Institute of Architecture and Urban Planning - BLIDA 01		
Urban architecture 2023-2024		HADJ-AHMED Meriem
Group 01	9th to 11th Residential floor plan	Scale: 1/100



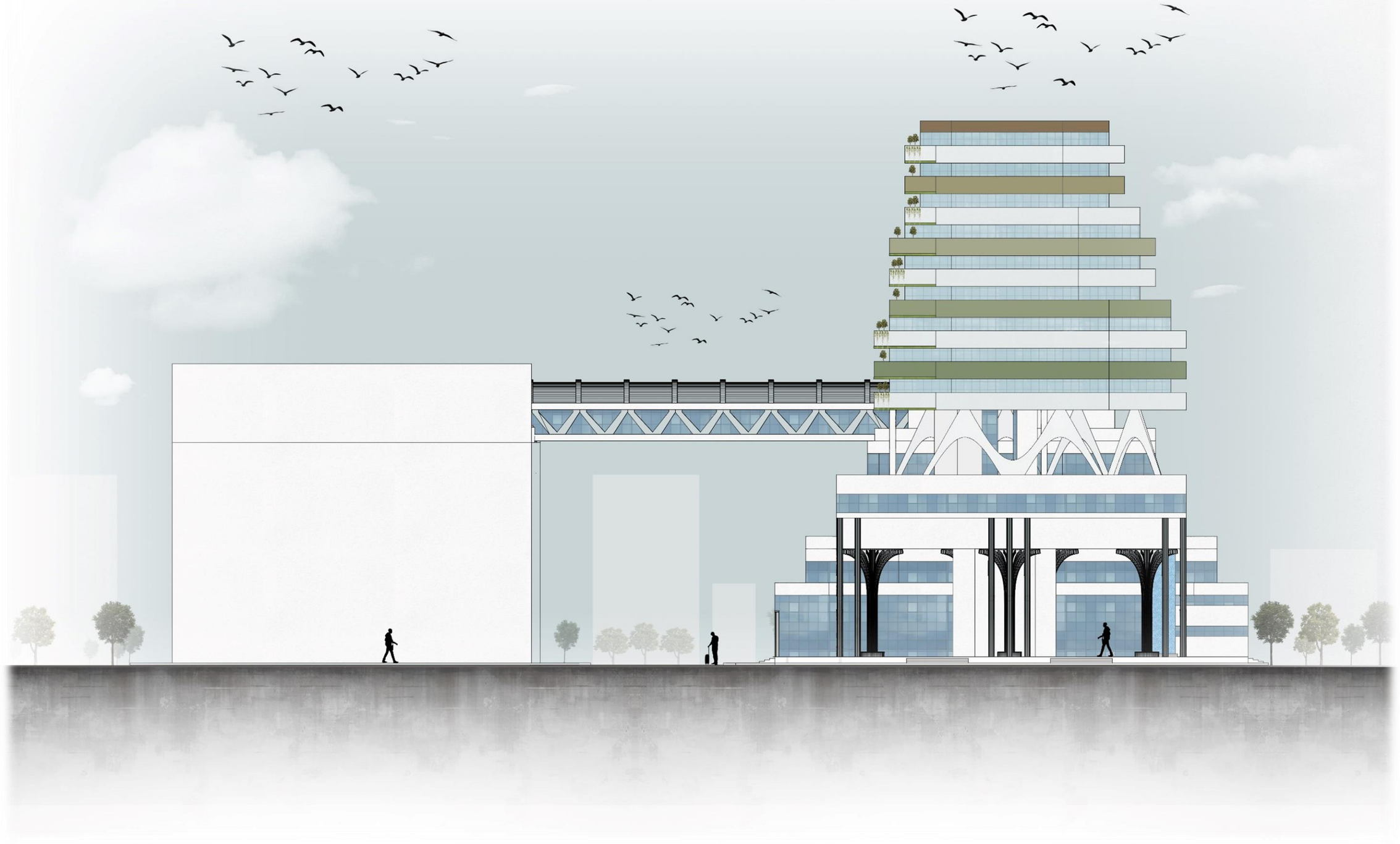
Institute of Architecture and Urban Planning - BLIDA 01		
Urban architecture 2023-2024		HADJ-AHMED Meriem
Group 01	12th to 14th Residential floor plan	Scale: 1/150



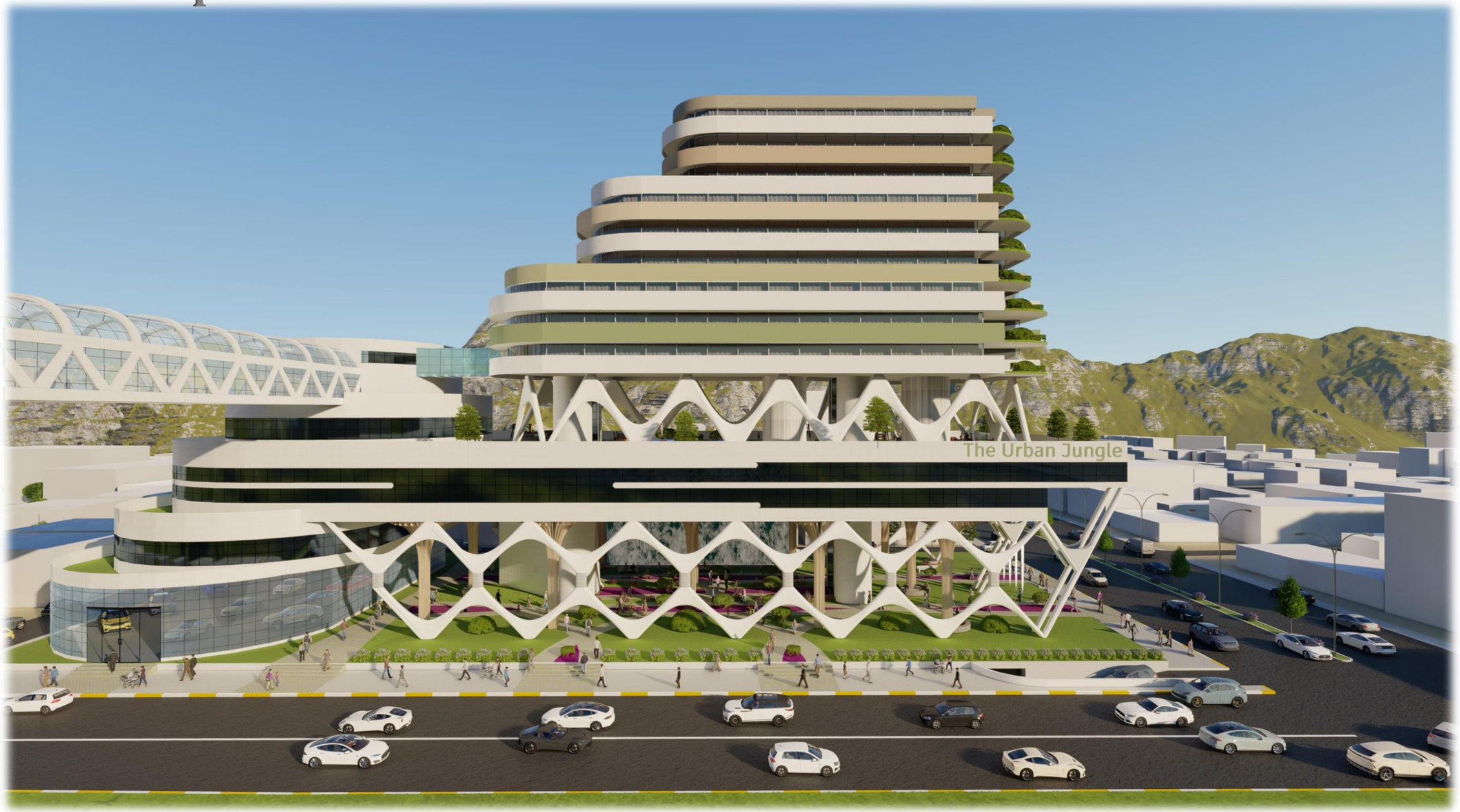
Institute of Architecture and Urban Planning - BLIDA 01		
Urban architecture 2023-2024	HADJ-AHMED Meriem	
Group 01	Section AA	Scale: 1/250

North facade

West facade



3D Perspective



3D Perspective

3D Perspective

3D Perspective

3D Perspective