Reimagining Dubai's Underused Public Spaces

for Climate and Social Responsiveness

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Abstract

This research explores how underused transport infrastructure in Dubai can be reimagined through climate-responsive and human-centered design to foster walkability and social inclusion, particularly for migrant and expatriate populations. As a city defined by rapid urbanization, vertical growth, and a car-centric planning model, Dubai's development strategies often prioritize global capital flows and profit-driven infrastructure, while marginalizing local needs and environmental considerations (Easterling, 2014; Menoret, 2014). These approaches have led to the proliferation of "lost spaces" (Trancik, 1986), underutilized and fragmented areas that disconnect communities and diminish urban livability.

Focusing on the area surrounding Sobha Realty Metro Station, this study proposes an inverted green deck which is an adaptive reuse strategy that transforms a space underneath a metro linkeay into shaded, green public spaces that encourage community interaction and reduce urban heat. While existing literature critiques Dubai's car-centric urbanism, few studies offer spatially and climatically adaptive design solutions that respond to its unique socio-environmental complexity. This research addresses that gap by developing design interventions that integrate environmental sustainability with social equity.

Employing a mixed-methods approach that combines spatial analysis, ethnographic fieldwork, precedent studies, and 3D modeling, the research investigates how repurposed infrastructure can mitigate extreme climatic conditions, enhance pedestrian experience, and accommodate diverse cultural practices. The study draws on global urban theories, including Henri Lefebvre's Right to the City and Keller Easterling's infrastructure politics to critically examine how design can mediate between economic imperatives and everyday urban life.

The research contributes to broader discussions on sustainable urban development by offering a context-specific, design-led response to the challenges of car dependency, social fragmentation, and environmental stress in rapidly urbanizing cities. The inverted green deck emerges as a scalable (modular) model for transforming neglected infrastructure into inclusive, climate-resilient public spaces.

Research Question

What role can repurposed green public spaces play in fostering social inclusion and improving walkability in Dubai, particularly for marginalized communities such as migrant workers and expats?

Hypothesis

If underutilized public space in Dubai is repurposed through climate-responsive and culturally sensitive design strategies, then walkability and social inclusion particularly for migrant and expatriate communities will improve through the creation of accessible, thermally comfortable, and socially engaging public spaces.

Contents

Introduction

Dubai's model of rapid urban development has emerged as a blueprint for cities in the Global South aiming to achieve swift economic growth and diversification (Menoret, 2014). By leveraging enclave economies through Special Economic Zones (SEZs) and prioritizing global capital, Dubai has influenced urban projects in regions such as China, Africa, and the Middle East (Easterling, 2014). However, this formulaic approach to urbanism often overlooks local governance structures and community needs, focusing instead on profit-driven infrastructure that reinforces global economic flows (Easterling, 2014). While Dubai exemplifies how infrastructure can shape a city's identity on the global stage, it also highlights the risks of unaccountable governance models that prioritize economic interests at the expense of civic and environmental well-being.

This development model has led to the proliferation of "lost spaces," a term coined by Roger Trancik to describe underutilized urban areas disconnected from pedestrian activity, such as the gaps between high-rise buildings, highway borders, and surface parking lots (Trancik, 1986). In Dubai, where vertical architecture and car-centric infrastructure dominate, these fragmented spaces erode the human scale of urban design, disrupting walkability, social interaction, and community life. Neighbourhoods like the area of Jumeirah Residences exemplify these challenges, with their underutilized streets and limited connectivity between residential and commercial zones. Despite recent improvements to Dubai's public transport system, suburban and car-dependent areas remain poorly integrated, perpetuating reliance on private vehicles (Abdelfattah, Bazzoni & Choubassi, 2021).

The Dubai 2040 Urban Master Plan signals a shift toward more pedestrian-friendly, sustainable environments. Yet, the city's unique climatic, cultural, and socioeconomic contexts pose significant challenges to this vision. Cultural norms around car ownership, extreme climatic conditions, and the fragmented nature of urban development constrain efforts to cultivate inclusive, walkable public realms (Alawadi, 2017). Moreover, site studies conclude that Dubai's diverse demographic, including migrant workers, expatriates, and local Emiratis calls for public space designs that accommodate a multiplicity of spatial behaviors and cultural practices.

While existing studies critique Dubai's urban form and environmental challenges, few propose spatially and climatically adaptive design strategies tailored to the city's socio-environmental complexity. There remains a gap in the literature for contextually grounded, human-centered design approaches that simultaneously address issues of environmental stress, walkability, and social inclusion, especially for marginalized groups like migrant workers and women.

Recent research and site analysis underscore the need for targeted interventions. Environmental conditions, such as extreme heat and aridity combined with a car-centric urban form, discourage pedestrian activity and limit social interactions. In response, this project

proposes spatial strategies that integrate passive, climate-responsive design elements such as operable facades, locally sourced materials like coral stone, water features for evaporative cooling, and green infrastructure to transform underutilized transport infrastructure into vibrant public spaces.

This research explores the intersection of spatial equity, climate adaptation, and design by asking: How can climate-responsive, human-centered design interventions that repurpose transport infrastructure improve walkability and foster social inclusion for Dubai's migrant and expatriate communities?

This research employed a mixed-methods approach combining spatial analysis, observational fieldwork, and precedent studies to develop and evaluate context-specific design strategies.

Methodology

This research adopts a mixed-method approach, combining both qualitative and quantitative methods to explore Dubai's urban context and underutilized infrastructure. The qualitative approach identifies factors influencing human behaviour on pathways, while quantitative data from traffic and government statistics inform the analysis. The qualitative phase then deepens the understanding of these numbers. By combining these methodologies, the research aims to create an informative and multi-faceted knowledge of Dubai's urban mobility challenges and opportunities for improvement. The methodology will include several components:

1. Literature Review: A thorough review of existing scholarship and research related to urban planning, mobility, and infrastructure in Dubai to establish a foundational understanding of the subject matter.
2. Archival Research: Plans and drawings of existing buildings and transport infrastructure on-site
3. Geospatial Analysis: Utilizing tools such as Google Earth and Geographic Information Systems (GIS) for imagery to visualize and analyze urban spaces and infrastructure.
4. Ethnographic Fieldwork: Conducting on-site observations to gather first-hand insights into how residents interact with public spaces and transportation systems, employing methods developed by Jan Gehl, a renowned Danish architect and urban designer known for his human-centred approach to urban planning.
5. 3D Modeling: Creating 3D representations of specific urban areas to better illustrate spatial dynamics and human interactions within the environment.
6. Design Experimentation: mixing traditional and modern aspects found through literature review, enabling the creation of climate-responsive spaces

Jan Gehl's Methodology

Gehl's detailed methods for site ethnographies of public spaces will be incorporated to examine pedestrian behaviour and the use of urban environments. The key methods will include:

1. Mapping Activities: Documenting various human activities (e.g., walking, sitting, playing, conversing) to understand how different segments of the street are utilized (Gehl, 2010).
2. Behavioural Observation and Timing: Timing how long individuals remain in specific locations (e.g., sitting on benches, standing) to gauge the comfort and attractiveness of those spaces (Gehl, 2010).
3. Path Mapping: Tracing the paths individuals take through spaces to determine natural pedestrian movement patterns (Gehl, 2010).
4. Photographic Documentation: Capturing images at different times of day to visually track changes in usage patterns, crowd density, and interactions within public spaces (Gehl, 2010).
5. Environmental Conditions Analysis: Assessing factors such as sunlight, wind, noise, and temperature that influence the comfort and usability of public spaces (Gehl, 2010).

While Gehl's methodology focuses primarily on human activity in streets and open areas, it has limitations regarding the usability of roads and traffic networks. Therefore, additional methods will be employed for a holistic analysis of mobility.

Traffic Data Analysis

ArcGIS and Open Street Map will be utilized to gather and analyze traffic data, enabling tasks such as traffic congestion mapping, shortest path analysis, accessibility assessments, and vehicle routing optimization (Flacke, Martinez & van Maarseveen, 2018). The ArcGIS tool is extensively used by urban planners and researchers to evaluate the accessibility and efficiency of urban road networks, integrating land-use and demographic data (Flacke, Martinez & van Maarseveen, 2018). These findings will be visually presented through maps, 3D models, and diagrams, allowing for a clear understanding of the current infrastructure landscape.

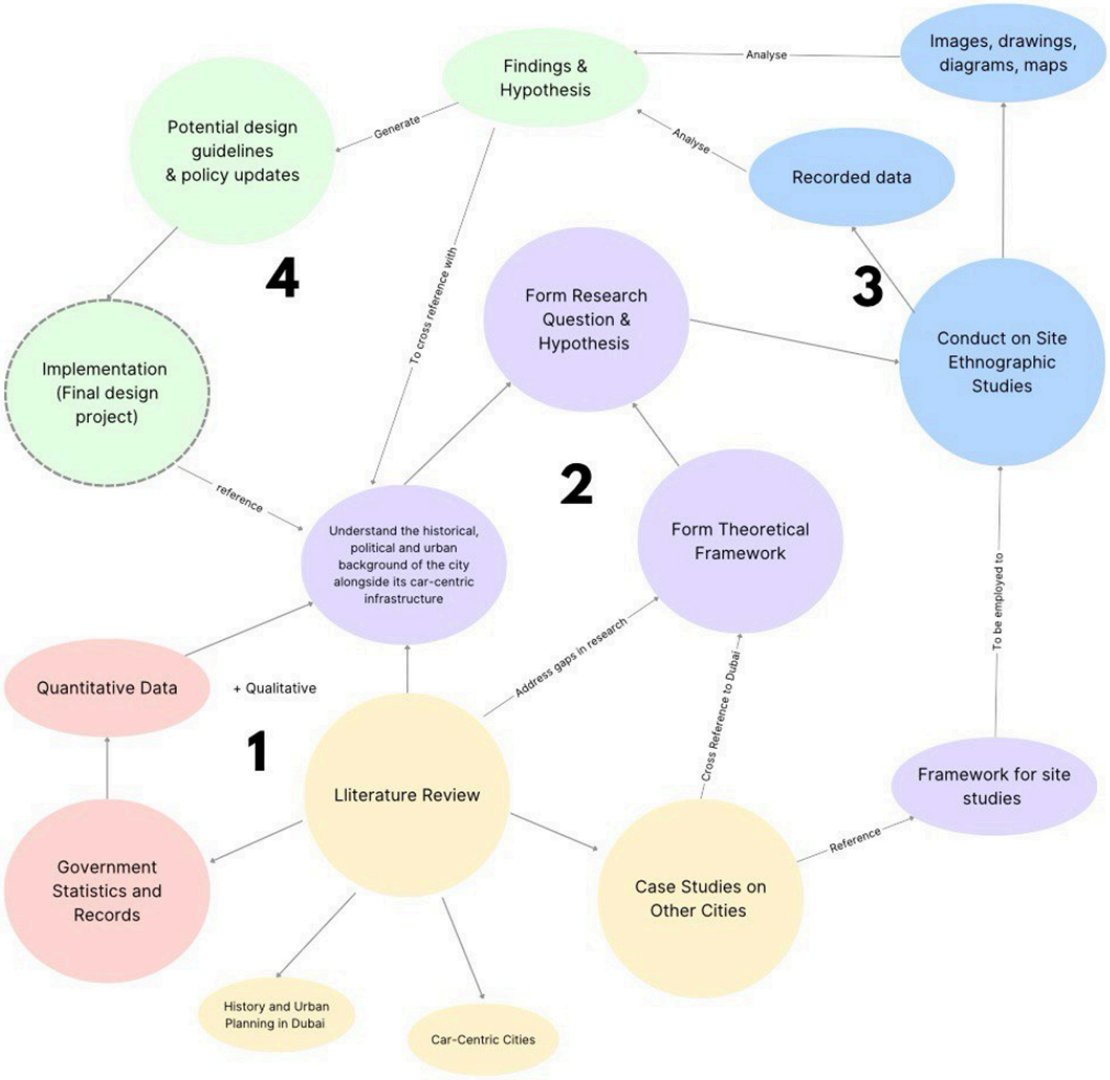


Fig. 1. Research Methodology (Source: Author)

Research Trajectory

The trajectory of this research diverges from conventional design research approaches due to the significant influence of site analysis in shaping the design outcome. While the initial phase involved a broad literature review to establish a general understanding of sustainable design strategies and urban interventions, it was through the site analysis that critical insights emerged that were not evident during the preliminary stages. Utilizing tools such as Google Earth and OpenStreetMap, the research began with a spatial and contextual examination of the site, which revealed pedestrian movement and underutilization of existing transport infrastructure. This spatial understanding was essential in formulating a targeted intervention aimed at enhancing connectivity and

liveability. Based on preliminary assumptions, experiential knowledge, and early literature findings, it was hypothesized that a successful intervention would require a hybrid approach, integrating modern bioclimatic strategies with traditional architectural methods. Social sustainability was identified as a key factor, emphasizing community engagement, pedestrian-oriented design, and ecological responsiveness within a car-dominated urban fabric. Initially, the literature review was intentionally broad, lacking a focus on specific methodologies or systems. This exploratory phase, however, was instrumental in developing a foundational design concept. The site analysis refined this concept significantly. Observations of public space usage, particularly human behavioural patterns around seating arrangements and walkability of the streets, informed a shift in focus toward designing a social node that fosters communal gathering. Hence, a second round of literature review was conducted prior to this alongside design experimentation to better understand human behaviour. The final refined proposal now incorporates more specific systems such as passive cooling techniques like water-based thermal comfort strategies to address the climatic conditions of the site and enhance overall user experience.

The next chapter is the theoretical framework consisting of a diagram that graphically shows the current understanding of the research problem through a network of influencing factors and the relationships between them.

Theoretical Framework

This theoretical framework provides a holistic perspective for analyzing how Dubai's infrastructure can be explored to tackle pressing environmental issues while simultaneously addressing long-standing systemic and historical social inequalities.

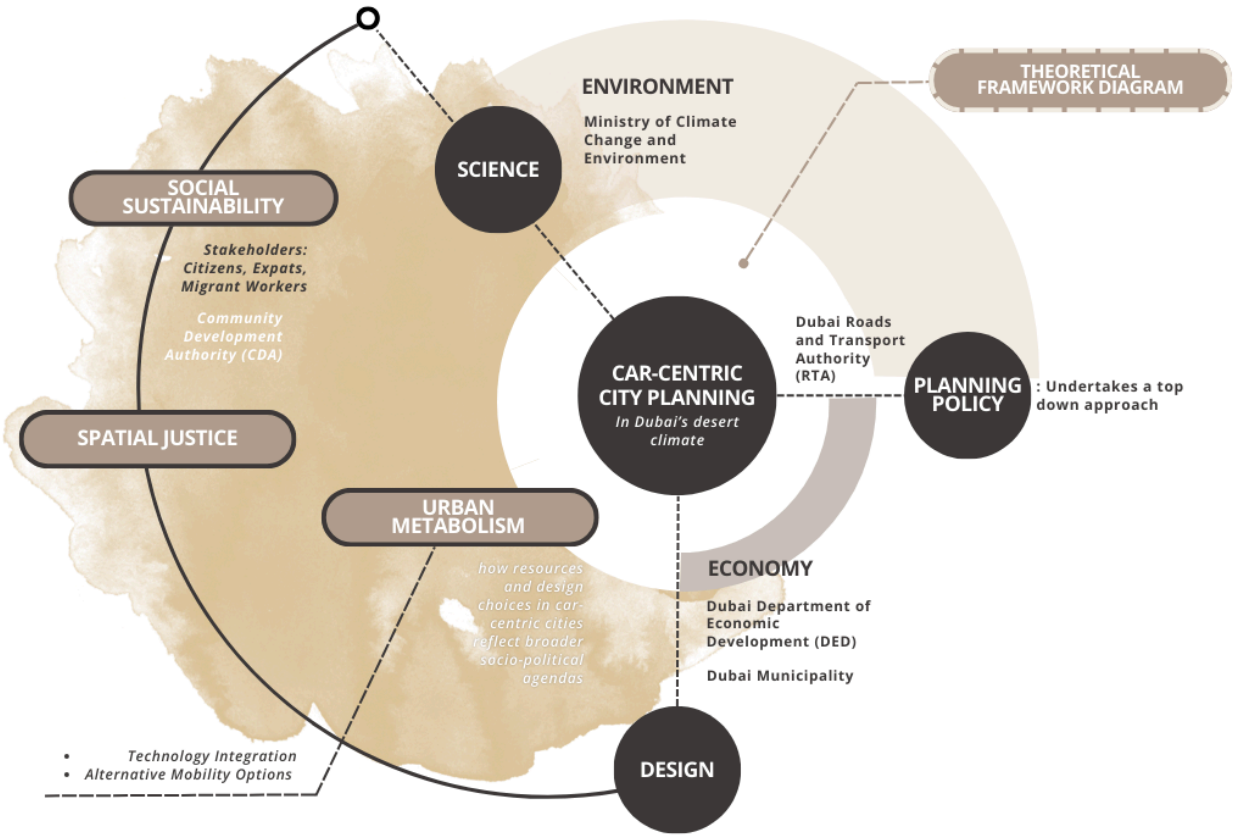


Fig. 2. Research Diagram with Theoretical Framework (Author)

Social Sustainability

Social sustainability focuses on creating equitable, inclusive urban environments that promote social cohesion, equal access to resources, and the well-being of all residents. In Dubai, the top-down, corporate-driven development model prioritizes economic objectives over social concerns, resulting in significant divides (Kanna, 2011). Having been shaped by private-public partnerships with minimal public input (Easterling, 2014), this approach to planning undermines social sustainability.

Spatial Justice

Henri Lefebvre's concept of The Right to the City asserts that all urban inhabitants, including marginalised groups such as Dubai's vulnerable working class, should have the right to participate in and shape the urban environment (Butler, 2012). This theory challenges the exclusion of certain populations from urbanisation's benefits and advocates for repurposing infrastructure to foster inclusion and equity (Butler, 2012).

Urban Metabolism

It looks at how a city's infrastructure, resources, and energy flow interact to support its functions and growth. In Dubai's case, its infrastructure shapes the physical city and influences global perceptions. This framework suggests rethinking urban systems like streets and transport, focusing not just on economic growth, but also on improving social and environmental outcomes.

Literature Review

A literature review is carried out in three main sections, the first is an introduction to walkability, followed by Dubai's car dependency and car-centric planning, and finally, it ends with climatic considerations in arid places. This research on walkability and car dependence in Dubai is deeply informed by literature from the 1970s to the 1990s, a period during which urban design theories were shaped by rapid global urbanization and post-modern thinking. Foundational works, such as those by Jane Jacobs, Jan Gehl, and Henri Lefebvre, emphasized the importance of human-scale cities and the social and environmental impacts of car-centric planning. However, as urban design literature has evolved, much of the focus has shifted to more specialized areas such as sustainability, and technological advancements in city planning. This shift, while important, has led to a gap in comprehensive discussions on how traditional car-centric models (often derived from temperate climates) fail to address the unique challenges of arid climates of rapidly developing cities like Dubai. Through examining this gap, the research builds on both historical urban theories and more recent, specialized studies to offer a nuanced understanding of how Dubai's car-dependent infrastructure intersects with its extreme climate conditions. By critically engaging with existing scholarship, this research aims to explore the gaps in current urban design theory, particularly how cities in arid climates can balance the need for walkability with the realities of their extreme environments.

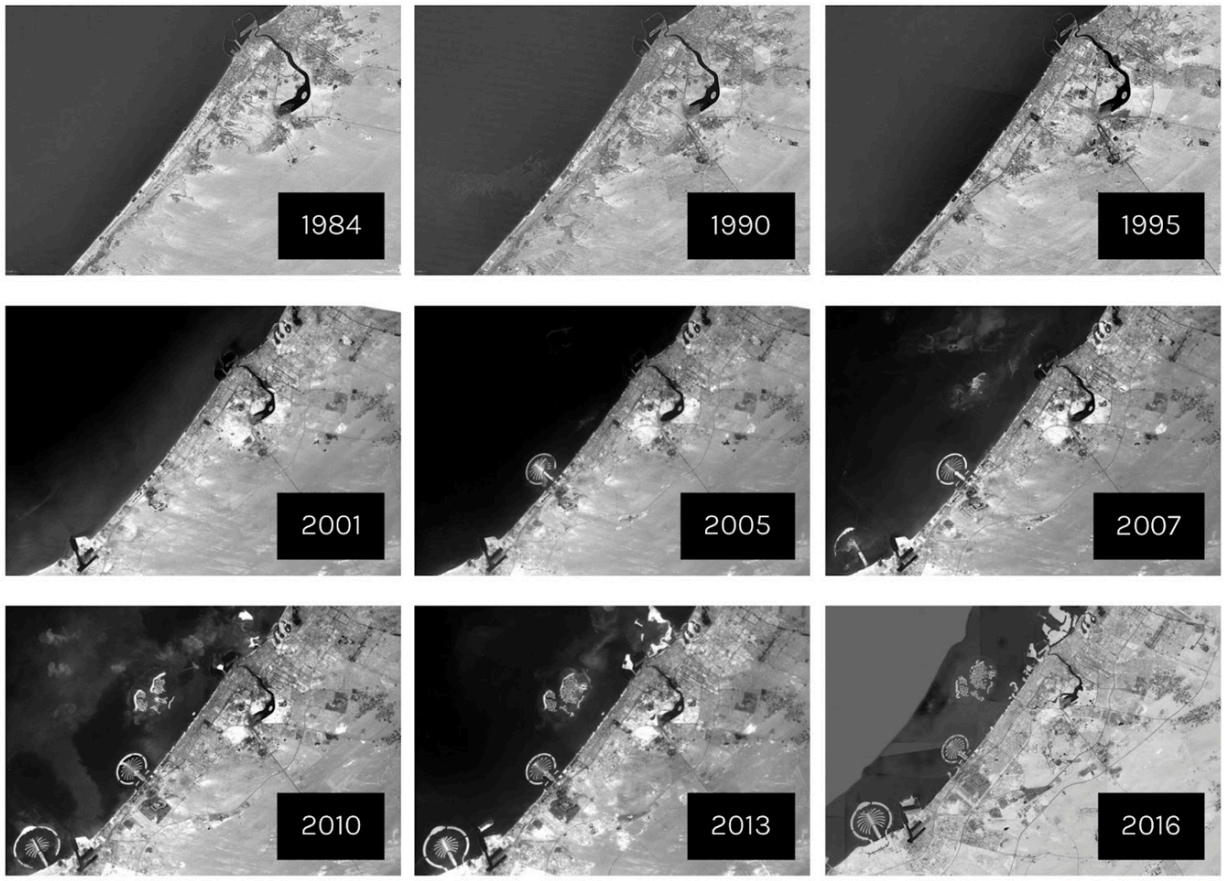


Fig. 3. Sequence of Dubai's Urban Growth (Source: Google Earth, NASA)

Dubai's urban growth from 1960 to the present has been marked by rapid transformation driven primarily by the discovery of oil and subsequent economic diversification. In the 1960s, Dubai was a small trading port with a limited economy based on fishing, pearl diving, and regional trade. The discovery of oil in 1966 catalyzed substantial infrastructure development in the 1970s, including the expansion of transportation networks and the establishment of key urban amenities. By the 1980s, Dubai's economy had diversified beyond oil, with significant investments in trade, tourism, and real estate, contributing to the rapid expansion of its urban fabric. The 1990s and 2000s saw the construction of iconic architectural landmarks such as the Burj Al Arab and the Palm Jumeirah, reinforcing Dubai's global position as a business and tourism hub. As Dubai rapidly urbanized, it adopted elements from the American model, leading to a similar focus on automobile infrastructure and urban design.

Relevance of American Urban Planning Literature

While the urban, climatic, and socio-political conditions of the United States and Dubai differ considerably, American urbanism literature provides a critical lens for interpreting and responding to the spatial dynamics of Dubai's urban landscape. Much of Dubai's urban

development has been shaped by Western paradigms, particularly American models that emphasize automobile dependency, mono-functional zoning, and the commodification of public space (Elsheshtawy, 2010). These models, which have produced socio-spatial segregation and exclusion in many U.S. cities, are echoed in Dubai's privatized infrastructure, gated enclaves, and underutilized public transit linkages. The critique of neoliberal urbanism, advanced in U.S. scholarship (Harvey, 2008; Mitchell, 2003), is especially relevant in a city where urban planning is often driven by global capital and elite interests, leaving limited space for the needs and comfort of the working-class majority, especially migrant laborers. Henri Lefebvre's (1996) notion of the "Right to the City" emphasizes the right of all urban inhabitants to participate in shaping the urban environment. While in American cities this has been used to critique gentrification, displacement, and exclusion from public space (Purcell, 2002; Mitchell, 2003), in Dubai, it can be mobilized to question who has access to dignified and comfortable urban life in a hyper-planned city shaped from above.

Walkability and walkable spaces in Dubai

Defining Walkability

Walking has historically been a vital mode of human mobility, with individuals walking for various reasons such as leisure, enjoying nature, exploring their environment, maintaining health, seeking solitude, reflecting, or simply accessing key destinations (Forsyth, 2015). Being a sustainable and healthy mode of transportation, walking offers numerous benefits, including affordability, environmental friendliness, and well-being (Speck, 2012). Regardless of the motivation, cities, including those in car-dependent environments like Dubai, must ensure that the necessary infrastructure is in place to support safe and comfortable walking experiences, as outlined in both The International Charter for Walking and The European Charter of Pedestrian Rights (Speck, 2012). The definition of a pedestrian should be expanded to include people using wheelchairs or other mobility aids, emphasizing the need for inclusive spaces that accommodate all forms of walking (Speck, 2012). Everyone should have the right to walk in urban spaces and actively participate in the creation of walkable environments, even in cities where car-centric planning has historically dominated (Speck, 2012).

The definitions of walkability can be grouped into two main categories: the means of creating walkable environments and the perceived outcomes of walking (Forsyth, 2015). The first group emphasizes physical conditions that make an environment traversable, such as smooth, uninterrupted paths and compact urban design, which shortens distances to key destinations (Forsyth, 2015). Additionally, safety is a critical dimension as both actual and perceived relate to levels of crime and traffic hazards (Forsyth, 2015). Physically enticing environments, which feature pedestrian-friendly elements like sidewalks, crosswalks, proper lighting, and street trees, encourage walking and offer comfort to those who might have other transportation options (Forsyth, 2015). These environments also tend to have engaging features, like interesting architecture and diverse services, appealing to individuals seeking exercise or enjoyment from walking.

The second category of definitions focuses on the outcomes of walkability. A walkable environment is often described as vibrant and sociable, offering pleasant experiences, cleanliness, and a mix of people, particularly in shopping areas and mixed-use neighbourhoods (Forsyth, 2015). Walkability also aligns with sustainability goals, offering transportation options that save energy and improve social equity by providing mobility for people who are unable to use cars due to factors like age, income, or disability (Forsyth, 2015). Furthermore, walkable environments are linked to health benefits, encouraging exercise and higher levels of walking. In some definitions, walkability serves as a broader factor for better urban design, where improved walkability symbolizes healthier, slower-paced, and more human-scaled urban spaces (Speck, 2012).

These definitions highlight the multidimensional nature of walkability, offering measurable indicators for urban development, similar to those used to define livability or sustainability (Speck, 2012). Ultimately, walkability represents a holistic approach to improving urban environments, making them not only more pedestrian-friendly but also more sustainable, equitable, and livable.

Walkable Spaces in Dubai

Despite the UAE's goal to reduce car dependency, Dubai remains one of the most car-oriented cities, with 550 vehicles for every 1,000 residents (Saleh, 2024). According to existing studies, the city is not walkable due to several factors, including urban sprawl, inadequate public transportation, road designs that prioritize cars, a lack of shade, extreme weather conditions, the absence of sidewalks in many areas, and socio-economic influences (Marzbani, Awad, & Rezaei, 2020). Through Google Earth imagery and ethnographic studies of Dubai by researchers, it is noted that the city's initial impression is the fragmented structure, where cars dominate as the main mode of transportation (Elsheshtawy, 2013). Dubai is made up of various disconnected centres, divided by extensive multi-lane highways and this fragmentation has not gone without notice from the government and policymakers.

Due to this, there have been efforts to make Dubai more walkable, with several well-designed projects such as "Jumeirah Beach Residence", "The Sustainable City", "City Walk", "BoxPark", and "La Mer" providing more pedestrian-friendly spaces (Marzbani, Awad, & Rezaei, 2020). Historically, Dubai's urban fabric was developed with consideration for human scale, local culture, and climate, but late 2000s developments have been rushed to address rapid population growth and car dependency (Marzbani, Awad, & Rezaei, 2020). Interestingly enough, a research paper states that Jumeirah Beach Residence stands as the first example of a truly *walkable* area in Dubai's newer developments (Marzbani, Awad, & Rezaei, 2020). Yet another paper critically examines the extent of this "walkability". It is important to recognize that several scholars critique its true walkability based on other factors such as its connectivity to the rest of the city, the quality of pedestrian infrastructure, thermal discomfort and the car-centric nature of the overall urban fabric. In a study conducted by UAE University, the researchers argue that some developments in Dubai support walkability only within certain defined development

boundaries, which is done to achieve economic and environmental objectives (Zabanoot, Marwan & Bleibleh, 2019).

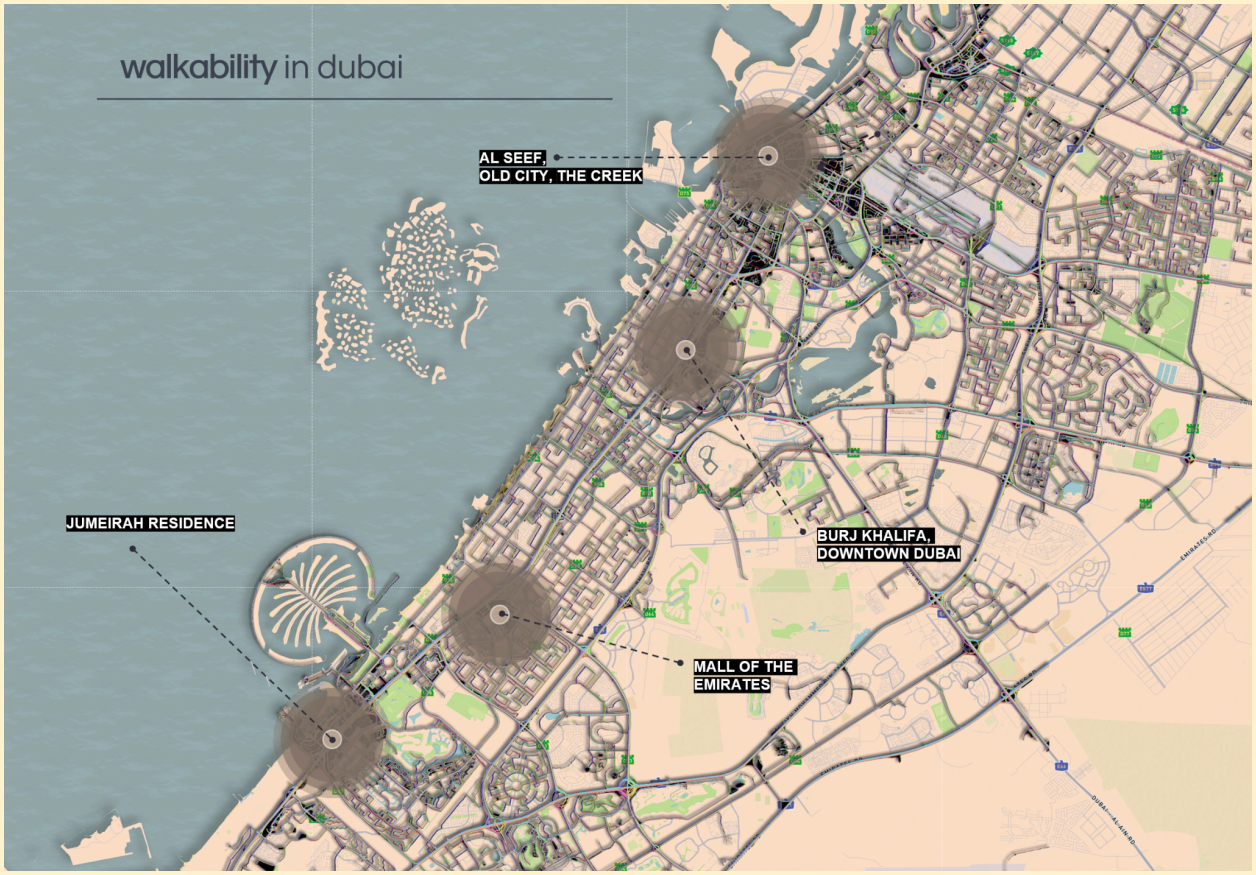


Fig. 4. Map of Pedestrian Activity in Dubai (Source: Open Street Map, diagram by author)

Through Open Street Map, it is seen that heavy pedestrian flows are seen in popular areas such as the Jumeirah Residence, Mall of the Emirates, Burj Khalifa (Downtown Dubai) and the old creek but there is very little footprint showing their connectivity to transport nodes nor other public zones. Seeing as walkable streets are not only defined by their accessibility, compactness, and safety but also by their pedestrian-friendly infrastructure. This includes features like wide, well-maintained sidewalks, active street fronts, traffic-calming measures, street trees, vegetated buffers, marked pedestrian crossings, benches, wayfinding signs, and pedestrian-scale lighting (Al-Hagla, 2012).

In the downtown streets of Dubai, there is visible street furniture lining the walking paths, this feature however does not fully encourage walkability. The usability of street furniture is affected by other important elements, such as shadows or sidewalks, which directly increase or decrease the number of people walking (Marzbani, Awad, & Rezaei, 2020). Moreover, indirect impacts arise when changes in one aspect affect other factors, which then influence walkability. For example, a sense of belonging, which falls under the perceptual category, encourages more social activities (a behavioural factor), ultimately enhancing walkability (Marzbani, Awad, &

Rezaei, 2020). This same study argues that while the physical characteristics of a place are essential for walkability, they are not sufficient on their own. The social and perceptual aspects must also be taken into account when planning walkable neighbourhoods. This is because walkability is a dynamic quality that significantly influences both the tangible and intangible elements of a place (Marzbani, Awad, & Rezaei, 2020).

In conclusion, Dubai's street analysis shows that it should have been designed organically to integrate clean public transportation into its planning, with a focus on achieving transit-oriented developments(Zabanoot, Marwan & Bleibleh, 2019). This would be the approach that prioritizes walkability and cyclability, ultimately reducing reliance on single-vehicle use. By reclaiming streets for pedestrians and cyclists, downtown Dubai can promote more sustainable and livable environments (Zabanoot, Marwan & Bleibleh, 2019). As highlighted, "non-motorized transportation is central to people's daily activities, such as shopping, walking, or enjoying a meal," underscoring the importance of walking in urban life (Zabanoot, Marwan & Bleibleh, 2019).

Car Dependency and Car-centric Planning in Dubai

Transportation is key to a city's growth, providing access to land and enabling mobility. However, cities must evolve with plans that prioritize community needs to improve urban life quality (Okeke, Okosun, Akabuilo, & Okekeogbu, 2020). Despite the potential for a high quality of life, cars have dominated urban spaces, making them less accessible to people of all income levels (Wiersma, 2020). Cars are integral to daily activities such as commuting, shopping, and recreation, and have reshaped cities to accommodate their needs (Okeke, Okosun, Akabuilo, & Okekeogbu, 2020). While the automobile is a significant technological advancement, it also contributes heavily to pollution and is linked to urban sprawl, which diminishes the vitality of city centres (Wiersma, 2020). An auto-dependent city is one where most people cannot easily access amenities without a car, making the city reliant on automobile use (Okeke, Okosun, Akabuilo, & Okekeogbu, 2020).

Dubai in this case is highly car-dependent, with statistics highlighting its reliance on automobiles. According to the Dubai Roads and Transport Authority (RTA), the number of vehicles in Dubai has reached over 1.8 million, and the city's vehicle-to-population ratio is approximately 550 vehicles per 1,000 residents, one of the highest in the world (Saleh, 2024). This extensive car ownership is reflected in daily traffic congestion, particularly during peak hours. In 2019, reports indicated that the average daily traffic volume in Dubai was around 1.8 million vehicles, contributing to significant traffic bottlenecks. Studies show that daily activities greatly influence transportation choices (Chaudhry, 2024). Work commutes often lead to higher use of public transport and shared mobility with employees prioritizing reliability, punctuality, and cost. In contrast, leisure activities tend to result in more diverse transport patterns, including private car use (Chaudhry, 2024). Public transportation, while growing, still accounts for a

relatively small portion of travel, with estimates from the RTA suggesting that less than 20% of daily trips are made using public transit (Saleh, 2024). This data underscores the significant car dependency in Dubai, despite efforts to improve public transportation options.

Car dependency in Dubai is deeply rooted in the city's historical and ongoing urban planning decisions. In the early years of Dubai's rapid expansion, particularly after the discovery of oil, urban development followed a car-centric model (Kanna, 2011). The city's infrastructure was designed to accommodate the increasing use of automobiles, with wide roads, multi-lane highways, and sprawling suburban developments, often at the expense of pedestrian and public transport infrastructure (Kanna, 2011). The lack of a comprehensive public transportation network during the city's initial growth phases encouraged reliance on private vehicles, further reinforcing the car-dependent urban landscape.

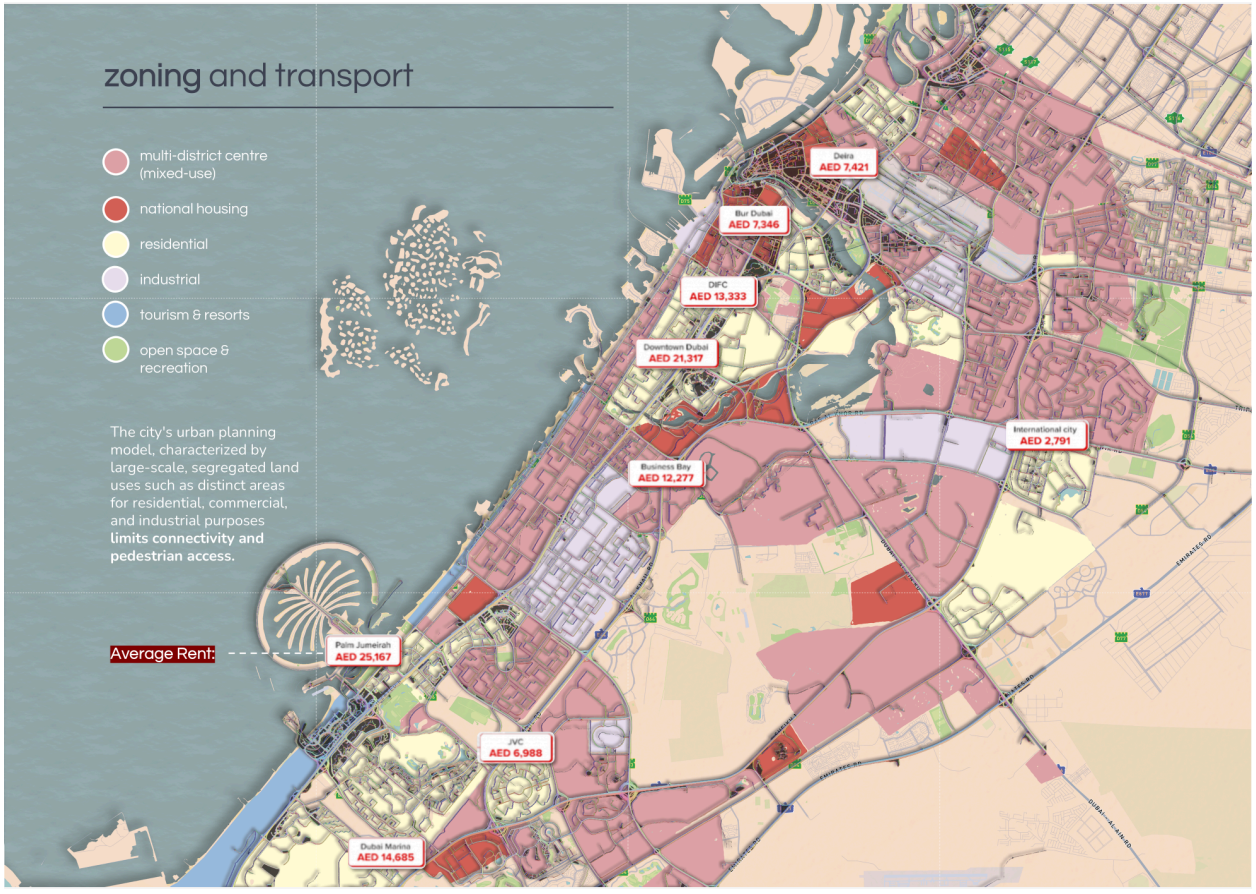


Fig. 5. Map of Zones in Dubai (Source: Author)

Dubai's urban planning has largely been shaped by the vision of high-end, luxury developments that cater to a wealthier demographic, with roads and transportation systems designed to meet the needs of private car owners (Sunakh, & Bleibleh, 2019). This approach is evident in the sprawling nature of the city, where residential areas, commercial centres, and leisure developments are often scattered and isolated from one another, creating long distances

between destinations (Kanna, 2011). As a result, driving became the most convenient and preferred mode of transport, particularly for residents living in the peripheries, far from the city centre (Sunakh, & Bleibleh, 2019). While the introduction of the Dubai Metro in 2009 was a significant step toward diversifying the city's transport options, it remains insufficient to meet the demand, with a system still underutilized relative to its potential (see Appendix A for full dataset). In addition, many areas of the city are still poorly served by public transit, leading to increased reliance on private vehicles (Sunakh, & Bleibleh, 2019).

This historical trend of car-centric urban planning has led to environmental and social challenges (Alawadi, 2017). The high reliance on automobiles contributes to air pollution, traffic congestion, and the urban heat island effect, while also reinforcing social inequalities by making it difficult for lower-income groups and migrant workers, who are often reliant on public transport, to access the city's amenities and opportunities (Alawadi, 2017). Consequently, Dubai faces the complex task of rethinking its urban planning framework, balancing the needs of private vehicle owners with sustainable, pedestrian-friendly alternatives to create a more inclusive and environmentally conscious city (Sunakh, & Bleibleh, 2019).

Underutilised Transport Infrastructure in Dubai

Roger Trancik's concept of "lost spaces" refers to areas within urban environments that, despite being physically present, fail to serve their intended purpose or remain underused due to poor design, disconnection, or lack of engagement (Trancik, 1986). These spaces may be overlooked, uninviting, or inaccessible, resulting in a missed opportunity for community interaction and urban vitality (Trancik, 1986). These *lost spaces* can be seen in the underutilized public spaces in Dubai, where fragmented urban planning and a car-centric development model often leave large portions of the city's public realm underused or disconnected.

In many areas of the city, public spaces were not designed with high attention to pedestrian needs or community engagement, leading to large, unused spaces or areas that feel isolated and unwelcoming. For example, wide streets, vast parking lots, and expansive developments with limited pedestrian access can create "lost spaces" that are difficult to navigate and fail to foster social interaction. Moreover, the city's fragmented urban planning, with disconnected zones for residential, commercial, and recreational activities, further exacerbates the problem. These spatial divisions make it challenging to create cohesive, integrated public spaces that serve the needs of diverse populations, particularly those who rely on public transport or walking. The result is a city with significant portions of public space that remain unused or underutilized.

Climate and Physiological Comfort in Arid Climates

The climate is characterized by various elements that directly influence architecture and urban planning. Key climate elements affecting architectural design include solar radiation, air temperature, humidity, precipitation, and wind. These factors determine how buildings and spaces are designed to optimize comfort, energy efficiency, and resilience to environmental conditions. Arid climates are defined by a natural lack of freshwater and limited precipitation. Currently, over 30% of the world's land surface is classified as arid, a proportion that is expected to grow due to the effects of climate change and global warming (Arup, 2018). The size and structure of cities in arid regions have traditionally been shaped by environmental limitations, particularly the need to manage freshwater resources for agriculture and public health. However, in the past 60 to 70 years, advancements in water management, logistics, transportation, and especially air conditioning, have enabled these cities to experience rapid and significant growth (Arup, 2018).

While technological innovations have driven growth and improved quality of life, they have also led to unsustainable practices and new environmental challenges, such as climate change, desertification, water scarcity, and air pollution (Tavassoli, 2018). These issues highlight the urgent need to rethink the planning and design of cities in arid environments. Dubai in this case has an arid desert climate characterized by extremely hot summers and mild winters. Temperatures often exceed 40°C (104°F) during the summer months, with high humidity levels near the coast, making the heat even more intense (Arup, 2018). Rainfall is scarce, averaging only about 3-5 days a year, and the city experiences limited precipitation (Arup, 2018). This climate, with its extreme heat and minimal rainfall, presents challenges for urban planning, particularly when it comes to outdoor comfort, water conservation, and creating sustainable green spaces (Arup, 2018).

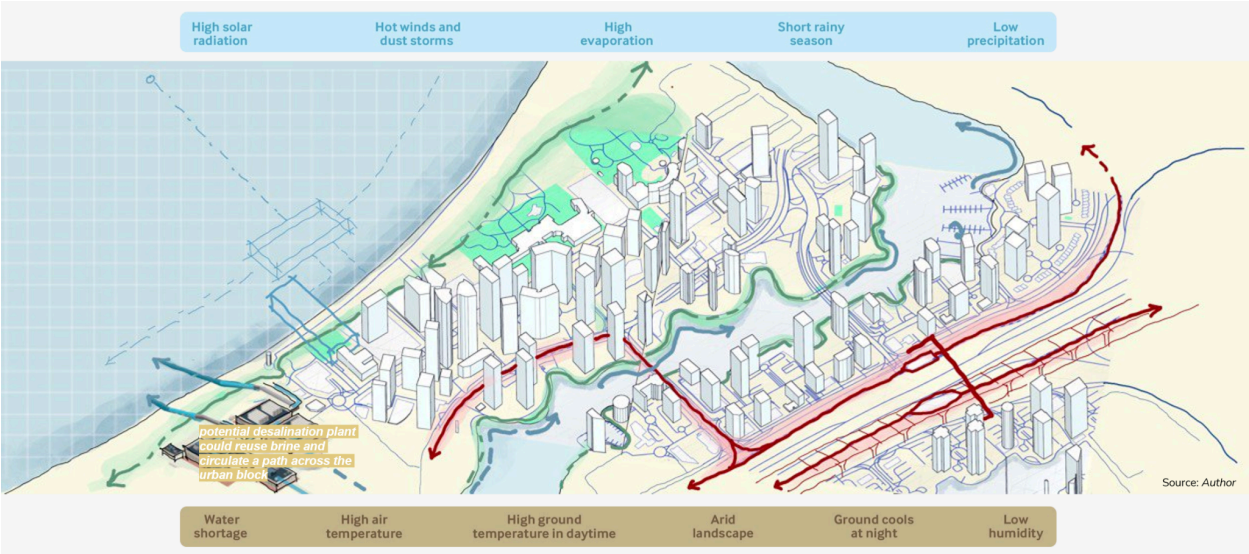


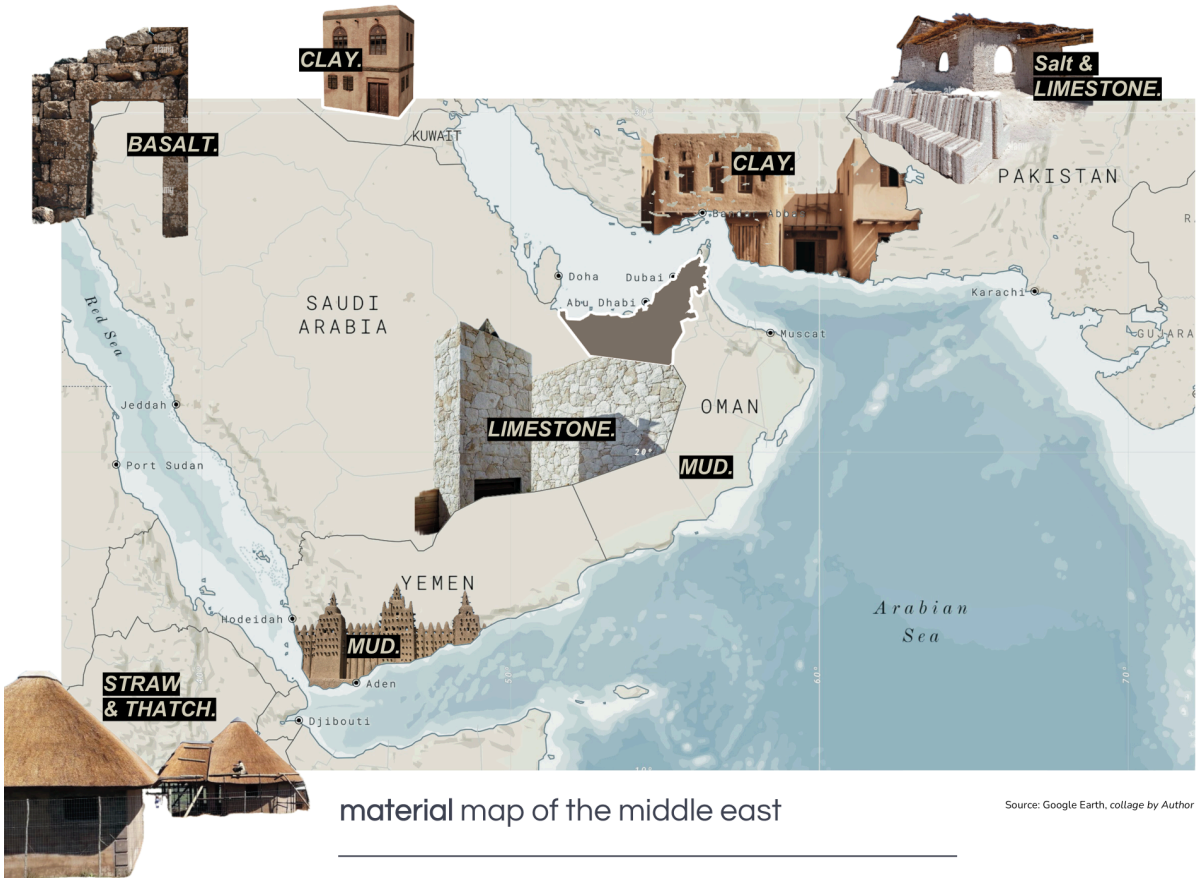
Fig. 6. Climate Challenges on Site (Source: Author)

Defining Green Spaces

Public space is often tied to green spaces which can be defined are areas within urban environments designed or designated for public use that integrate natural elements into the built environment. They serve as key components of urban planning aimed at improving the quality of life, providing recreational opportunities, and fostering community well-being (Arup, 2018). It is noted that the definition and physical qualities of green spaces vary from region to region. In Dubai's case, green spaces should be tailored to withstand extreme heat, limited water resources, and harsh desert conditions (Arup, 2018).

General Design Strategies for Dubai's Underused Spaces

While the discussion around climate-responsive design is broad, this paper focuses specifically on the climate-sensitive strategies that can transform Dubai's underutilised spaces. One approach is through green infrastructure, such as pocket parks with native plants, green roofs, and vertical gardens, which enhance the microclimate and conserve water (Arup, 2018). Adaptive reuse of vacant buildings for community purposes, like markets or exhibitions, can revitalize these areas and encourage community involvement (Tavassoli, 2018). Shaded public spaces with pergolas, solar canopies, and modular shading can make outdoor spaces more usable and enjoyable. Introducing pedestrian and cycling pathways in unused corridors supports sustainable mobility, while micro-mobility hubs promote low-carbon transport (Speck, 2012). Water-sensitive design solutions, like stormwater harvesting and water features, can enhance cooling while managing resources effectively (Arup, 2018). Underused spaces can also host solar energy generation systems, contributing to renewable energy efforts. Additionally, traditional Middle Eastern architecture plays a crucial role in shaping climate-sensitive strategies for underused spaces in Dubai, offering time-tested design principles that address the challenges of its arid climate while reinforcing cultural identity (Elmasry, 2018).



Regionally Sourced Materials

Incorporating regionally sourced materials into sustainable building practices in Dubai offers both environmental and cultural advantages, particularly by reducing carbon emissions associated with long-distance transport and enhancing climate adaptability. Coral stone, historically used in traditional Gulf architecture, is especially valuable for its natural thermal insulation and breathable properties, which help regulate indoor temperatures in Dubai's extreme heat. Its porous structure allows for passive cooling, making it an ideal material for façades and cladding in climate-responsive design. In addition to coral stone, gypsum, abundantly found in the UAE is a versatile material commonly used for interior finishes due to its low environmental footprint. Others such as palm wood and date palm leaves, byproducts of the region's agricultural systems, can be reused for shading screens, partitions, or ceiling treatments, evoking vernacular aesthetics while supporting circular material practices. These materials support a sustainable and contextually grounded architectural language, aligning modern design interventions with local heritage and environmental conditions.

Existing Incorporation of Traditional Architecture

During the 1960s, newfound oil wealth and visionary plans spurred rapid urban development characterized by modern designs (Elmasry, 2018). The era was marked by extensive construction dominated by Westernized architectural typologies. These trends, shaped by post-colonial politics, led to an inevitable loss of its Islamic identity (Elmasry, 2018). The Sheikh Rashid Tower, designed by John R. Harris, serves as an early example of globalized architecture in the city, reflecting modernist principles (Kanna, 2011). However, it incorporates subtle Islamic references, with repetitive patterns and geometric motifs on its façade that interplay with light and shadow (Elmasry, 2018).

Cooling through Wind and Water

Traditional Middle Eastern architecture, by contrast, was deeply rooted in responses to the harsh climate and cultural norms of the region (Arup, 2018). Design features such as thick walls and small windows minimized heat gain, providing natural insulation and maintaining cooler interior temperatures. Wind catchers, a hallmark of traditional architecture, effectively harnessed natural ventilation to cool living spaces (Elmasry, 2018). Central courtyards often included water features for pools, not only serving as aesthetic focal points but also helping to regulate temperature and humidity (Elmasry, 2018). These design elements were integral to creating sustainable, climate-responsive environments that respected local cultural values.

Drawbacks of Modern Architecture Features

The trajectory of modernization continued into the 1990s with the emergence of “spectacle architecture,” driven by a desire to create ever “bigger, taller, larger, grander, faster, and more spectacular” structures (Elmasry, 2018). By the late 20th century, iconic high-rise, high-tech buildings featuring curtain wall facades came to dominate the skyline. While these designs gained international media attention and fueled architectural discourse, they neglected environmental considerations and distanced the city from its heritage (Elmasry, 2018). At the same time, the old city’s urban fabric remained largely unchanged. Though no longer a significant influence on the architectural narrative, it continued to function as a bustling trade hub, frequented by merchants, labourers, and those seeking affordable goods (Elmasry, 2018). Overall, modernization in its current form undermines the balance between progress and preservation, prioritizing visual spectacle over environmental, cultural, and social harmony.

Hybridisation

A more integrated approach, such as a hybrid consisting of modern bioclimatic techniques and traditional methods, could better address these downsides (Lotfabadi, & Hançer, 2019). In Dubai, there has been an emergence of this hybridisation as a form of pseudo-traditionalism, where Islamic imagery was evoked through superficial decorative motifs, hence devoid of any functional or performance-based integration (Lotfabadi, & Hançer, 2019). Only after the 2008 financial crisis, did more developers start paying attention to the climatic and functional considerations.

In the past decade, local developers like Meraas have successfully introduced alternatives to the market with a series of low-rise, lifestyle-oriented architectural developments. From a functional perspective, shaded pedestrian walkways (both outdoor and indoor) have made a significant comeback in these projects. Advanced construction techniques have enabled the use of modular, manufactured materials in place of traditional local ones, allowing shading elements to incorporate cultural, artistic, or political messages through interactive displays. A modern take on traditional air-pulling double walls has emerged, using lightweight modular second skins to shade exterior walls and reduce interior heat gain (Lotfabadi, & Hançer, 2019). These skins also provide opportunities to showcase colour, texture, and art. In some cases, these layered systems have created buffer zones that promote outdoor walkability, a concept that had largely been forgotten. Although not all traditional environmental regulators have returned in functional form, their symbolic presence is evident (Elmasry, 2018). For example, the cubic structures of wind towers are frequently reimagined as housings for mechanical systems, such as service ladders (Elmasry, 2018). Despite these measures, most interior spaces remain fully air-conditioned.

Compactness in Urban Planning

Urban compactness offers significant benefits to Dubai's urban planning. The city's sprawling developments have contributed to high energy consumption and extensive heat absorption from vast paved surfaces, exacerbating the urban heat island effect (Abdelfattah, Bazzoni, & Choubassi, 2021). Compact urban forms could mitigate this by promoting mutual shading between closely spaced buildings and narrow streets, creating cooler microclimates and reducing the need for constant air conditioning (Arup, 2018). Furthermore, traditional elements could be integrated into compact designs to enhance passive cooling strategies. Adopting urban compactness could optimize land use, reduce energy consumption, and enhance walkability (Arup, 2018). However, achieving this would require rethinking existing planning parameters to prioritize environmental performance.

Site Analysis:
Ethnographic Documentation

This chapter presents a situated analysis of urban space in Dubai through a series of narrative fragments, or what might be described as micro-ethnographic vignettes experienced by the author. Accompanied by diagrams and pictures, these observations are used to reveal the socio-spatial dynamics that more traditional urban analysis often overlooks (Till, 2005; Rendell, 2006). The site, centered around Sobha Realty Metro Station and the surrounding Marina district is examined not only through its physical form but through its informal uses, rhythms of occupation, and the nuanced behaviours of its diverse users. Rather than relying solely on masterplans, zoning documents, or architectural typologies, this analysis foregrounds lived experience as a way of accessing what Dovey (2010) terms the “unscripted” city. The method is observational, narrative-driven, and reflective. It treats space as both material and symbolic, a product of design decisions, but also of human negotiation, cultural codes, and invisible hierarchies. In this approach, moments of discomfort, anonymity, interaction, or even silence become diagnostic clues into the functioning (or dysfunction) of public life.

Dubai Stories

Experience A: The Metro

Fig. 7. Site Collage (Author)

One would expect travelling in Dubai’s new metro line, one that currently supports only 37% of the city’s daily commute to be a relatively calm and stress-free experience,

however it was met with major upheaval and rush hour crowds. The weekday started at 9 am, a little over the morning peak hour so overall pedestrian activity was slow. The month was February and the daytime temperature averages around 22°C, for Dubai this is the coolest it will get during the day. The wind is blowing and the streetscape was composed of waiting taxis and people on route to their place of work. Dressed in blazers and office wear, most people were either looking at their phones or talking into their earpieces. The day moved at a relatively slow pace until lunchtime where tourists start lining the main streets near the Burj Khalifa and the Mall of Dubai. The metros get liven up with the pedestrian flow increase as shops have finally begun to open. This mild activity would continue until late afternoon at around 5pm, which is when a surge of commuters start approaching to make their long journey home. The link-ways and stations start to experience a frenzy of synchronised movements for those who make this commute daily. However, that does not look like the case for tourists and new subjects. In the midst of this controlled messiness, there are the individuals that are clearly lost in this new order. The metro atrium is not a huge space, and it is mostly taken up by commuters. Some move at ease while some get stuck at the gantry. Metro staff station themselves in the crowd as a form of crowd control. Crowd control is activated via announcement, this protocol locks the gantries which prevents an overload of commuters onto the platforms. While effective to a certain extent in controlling the ingress, the crowd in the main atrium separated by gantry starts piling up. This is not new to many people who live in high-density cities. In many big cities in Western Europe, the US, and Asia, peak hour travel is usually draining for the average worker but it is routine. Dealing with crowds is a primary experience of living in cities, although personal space is something that is experienced and interpreted differently across various cultures and cities. In this case of Dubai's metro, the physical dimension of personal space gets pushed to a maximum as commuters squeeze into the metro cars in a rush to catch their way back home.

Experience B: The Link-ways

Fig. 8. Site Collage (Author)

The link-ways of Dubai's metro stations stretch across the city like silent arteries, functional, necessary, and overwhelmingly overlooked. They are long corridors suspended above roads and beneath the belly of metro lines, connecting towers to trains, commuters to routines. Though they are integral to the structure of daily life, they are rarely seen for what they are: spaces in their own right. In the vocabulary of the city, they do not qualify as "places." There are no pauses, no lingering moments, no trace of memory left behind. Instead, they are built for motion, not presence. During rush hour, these link-ways come to life, crowds surge forward in uniform direction. People walk quickly, headphones in, heads down, shoulders tight. Every movement is about arrival, not the journey.

In these moments, the linkway becomes an extension of the metro car: a vessel of passage rather than a spatial experience. And yet, every so often, something interrupts the choreography. Against the grain of the current, a few migrant workers are seen sitting quietly on the wide window ledges or squatting on the floor, waiting for friends. Their bodies create stillness in a place designed for flow—an anomaly within this otherwise hyper-regulated environment. Around them, commuters weave without acknowledgment, their presence both unnoticed and quietly disruptive. It's a moment that resists the system, not by defying it, but by simply pausing within it. Here, waiting becomes an act of quiet occupation, subtle, unspoken, and entirely human. In a city obsessed with spectacle, the linkway resists it. There are no Instagrammable corners here, no curated urban aesthetics, no reason to stop. The spatial experience is purely transitional. But in these overlooked corners of pause where workers wait and lean and rest, there is the faintest flicker of place-making. A reminder that even in motion, people seek presence. And perhaps, by noticing these moments, by acknowledging the linkway not just as a route but as a space, the journey might once again come into focus.

Experience C: The Taxi Ride

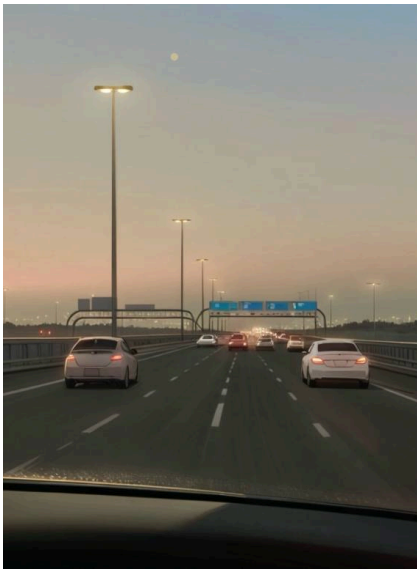


Fig. 9. Site Photo (Author)

It was midnight when I emerged from the cool, fluorescent expanse of Dubai Airport, the noise of the bustling taxi rank growing distant as I moved towards a quieter, more secluded pickup point. The air, light and breezy, pressed against my skin as I walked. I then approached a man in a blazer who, I assumed, was organising rides—a common service I had encountered in other airports, like in Doha. I told him my hotel's location, he took my luggage and we were off. The ride

was swift, the city's roads quiet, free of the usual traffic. It struck me that at this hour, Dubai, known for its constant business, seemed almost unrecognisable, a city that had momentarily exhaled. Upon arrival, the transaction began to take an unexpected turn. He insisted I call him during my stay, offering to drive me around, free of charge. There was something unnerving in the ease with which he made the offer, coupled with the overcharge for the initial ride, as though it were a veiled attempt to ensure I would call. I dismissed it as an isolated incident, a gesture I could overlook, but it was the final moments that unsettled me. As I stepped out of the car, he handed me my luggage and, to my surprise, leaned in and kissed me on both cheeks—a gesture of farewell that felt too intimate. In the context of Dubai, where public displays of affection are largely restrained, this was not only unexpected but strikingly out of place. Here, in a city where cultural norms emphasise modesty and personal boundaries, a gesture like that should have been considered over the line. The man was a Muslim in an Arab country, where such intimacy between a man and a non-Muslim woman is typically seen as inappropriate.

This interaction lingered in my thoughts long after. In a society where strict social codes often govern personal behaviour, why is it that some men feel comfortable crossing boundaries, particularly with women who fall outside their cultural or religious circles? And how does this behaviour reflect deeper, more complex psychological dynamics within the society? There is a tension between public decorum and private actions, a space where repression and desire can conflict, creating an environment that blurs the lines between what is culturally permissible and what is not. When these boundaries are pushed, what impact does it have on the broader social fabric? How do these unspoken tensions shape the way individuals interact with the world around them? For men in particular, who may feel the weight of social and cultural repression, moments like these, where a boundary is tested or crossed can become loaded with significance. The psychological effects are subtle but pervasive, leaving an indelible mark on one's perception of the city and its people. The awkwardness, the discomfort, the crossing of lines: all of it speaks to the deeper undercurrents that pulse through a city like Dubai, where culture, religion, and personal interaction often exist in delicate, sometimes fraught balance.

Fig. 10. Site Photo (Author)

Experience D: The Street Walk

It was late afternoon, the time of day when Dubai's sky begins to settle into a golden haze. At Sobha Realty Metro Station, the architectural logic is familiar, orderly, glazed facades, air-conditioned corridors channeling people through a functional choreography of daily movement. It's not a space

that encourages lingering. One is meant to pass through, not pause. But that day, the routine of observation was interrupted. At the foot of an escalator, a man turned around. He asked where Jumeirah Beach was. A simple question with a simple answer. A few seconds later, another: where are the Marina Residences? I pointed again. It didn't make sense because these were destinations any pedestrian with a smartphone or passing familiarity with Dubai's signage would know. But this wasn't about directions. As I moved off in the opposite direction, heading toward the quieter side of the station to observe, he followed. His tone was casual, his pace matched mine, his words unmemorable. There was no question of being lost anymore. What lingered instead was an unsettling awareness of being watched, of being followed, and of how difficult it is, as a woman, to interrupt that choreography without becoming the problem oneself.

The issue was not fear, at no point did I feel in direct danger. But I did feel anger. Not just at him, but at the system of assumptions that made his behaviour seem acceptable in the first place. The assumption that a woman walking alone is open to engagement. The assumption that public space is his to navigate freely, while mine must always be negotiated, policed by unspoken calculations: how loud to speak, how stern to look, how many exits are in sight. I eventually told him to leave, and he did. The encounter lasted no more than ten minutes. But in those ten minutes, I was no longer a researcher, or an observer of infrastructure—I was a woman navigating the emotional weight of spatial vulnerability in broad daylight. It left me wondering: if this happens at 3pm, what does 9pm look like? The metro station may be staffed, the streets may be clean, but they are not neutral. Their safety is conditional. In Dubai, where streets are wide and pedestrian activity is often secondary to vehicular movement, women's presence in public space can feel anomalous. Light levels drop as one exits the metro's glow, shadows grow longer, and yet it's not darkness that unsettles, it's the knowledge that someone might follow simply because you're there.

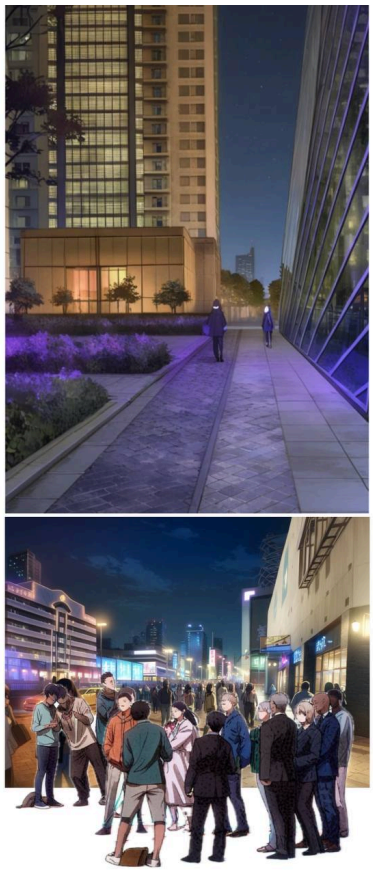


Fig. 11. Site Collage (Author)

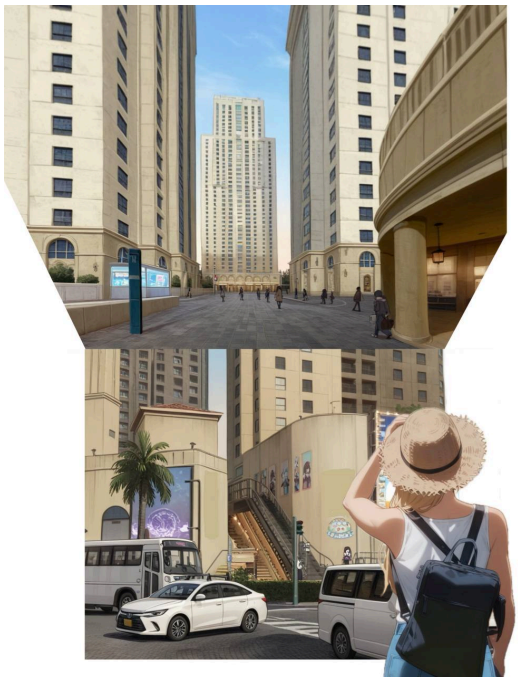
Experience E: Jumeirah Beach Front

Approaching the Jumeirah Beach Residences, one is struck by a moment of architectural déjà vu. Towering by the shoreline, framed by the brilliant Gulf sky, stands a familiar structure, Caesars Palace. But this isn't the Las Vegas original, nor the Roman forum it imitates. It's a replica of a replica, twice removed from its historical source. The Roman columns, triumphal arches, and shimmering gold signage transport the visitor, not into antiquity, but into a mediated memory of Las Vegas, now transplanted onto the Dubai coast. Its presence is striking not for its beauty, but for the layered dislocation it embodies. This layering invites a closer examination of how architecture travels, not just as form, but as performance. The Caesars Palace façade in Dubai thus becomes emblematic of a broader tendency in contemporary urban development, where design is mobilised as a global commodity rather than a local dialogue. It prompts questions about authenticity, belonging, and the purpose of public space. Who inhabits these spaces, and who are they truly designed for? The more urban design becomes about image, the more it risks alienating its users, creating spaces that are impressive from afar, but disengaging up close (citation to be added).

In this sense, the fallacy of architectural replicas is not just in their inauthenticity, but in their refusal to respond. They speak loudly of aspiration, but remain silent on context, climate, or community. And in doing so, they offer a lesson for future urban interventions: that meaningful design must emerge from place, not from projection (citation to be added).

Experience F: Jumeirah Marina Apartments

Just a short walk from the lively edge of Jumeirah Beach lies a quieter, elevated space atop the Marina apartment podiums. These platforms, meant to serve as communal spaces beneath residential towers, offer shaded seating, planted edges, and even retail units facing a pedestrian walkway. On paper, they offer the logic of elevated, sheltered environments like the proposed inverted green deck, spaces that are close to high-traffic areas but protected from the intensity of the street or sun. Yet in reality, the podium tells a different story. Despite its proximity to one of Dubai's most frequented beach destinations, the space remains underused. Stores sit mostly empty, benches sit unoccupied, even when the weather is bearable. The atmosphere is not hostile, but hollow. It doesn't invite pausing, lingering, or gathering. There's no draw, no rhythm of activity, no indication of who this space is for. The issue isn't just visibility, it is about orientation, programming, and social temperature. The podium feels peripheral rather than central to urban life. Movement here is not instinctual and way-finding is ambiguous. Its architectural logic may actually be working against the public nature it intends to foster.



For the design of the inverted green deck, this becomes a moment of reconsideration. It reveals the delicate balance between spatial shelter and social engagement. Protection from climate does not automatically equal usability. Microclimate alone cannot generate community unless the space also facilitates encounters, offers programmatic flexibility, and feels embedded in a larger circulation pattern. This reflection however doesn't invalidate the concept of the inverted green deck, it helps sharpen it. It suggests that visibility, porosity, and continuity of movement must be integral to its design. If not, the intervention risks becoming an elegant but empty platform.

Fig. 12. Site Collage (Author)

Experience G: Delivery Riders

Behind the gleaming towers of the tower residences, away from the high-speed rush of Sheikh Zayed Road, a quieter set of roads unfolds. These are the back roads, functional arteries meant primarily for residents' ingress and egress. On the maps, they serve as calm access points to the condominiums, buffered from the noise and intensity of Dubai's main expressways. But walking through them tells another story, one that is far less about exclusivity and more about the informal systems that make the city work. Here, under the shade of the residential towers, the street edge is lined not by ornamental landscaping or leisurely street furniture, but by the steady presence of delivery riders. Some sit astride their motorcycles, others lean against the low walls or squat near the mini-marts tucked into the podium level of the apartments. They scroll through their phones, chat among themselves, or check incoming orders. It's a space in limbo, a holding area not officially designated, yet clearly claimed. The surrounding shops are small but crucial: pizza outlets, convenience stores, local grocers. These ground-floor businesses are lifelines for the building's affluent tenants and the delivery riders are their invisible extension. Orders are picked up, meals packed in insulated boxes, and riders dart off again into the neighbourhood's grid. But in between, they wait. And wait. This stretch of street becomes a kind of impromptu ground, not for leisure, but for labour. There are no benches, no shade structures, no facilities for the people who use the space most. Yet the riders have formed their own rhythm as bikes pulled into

orderly rows, and brief conversations exchanged between trips. It's a scene of quiet resilience, and a subtle commentary on urban omission.

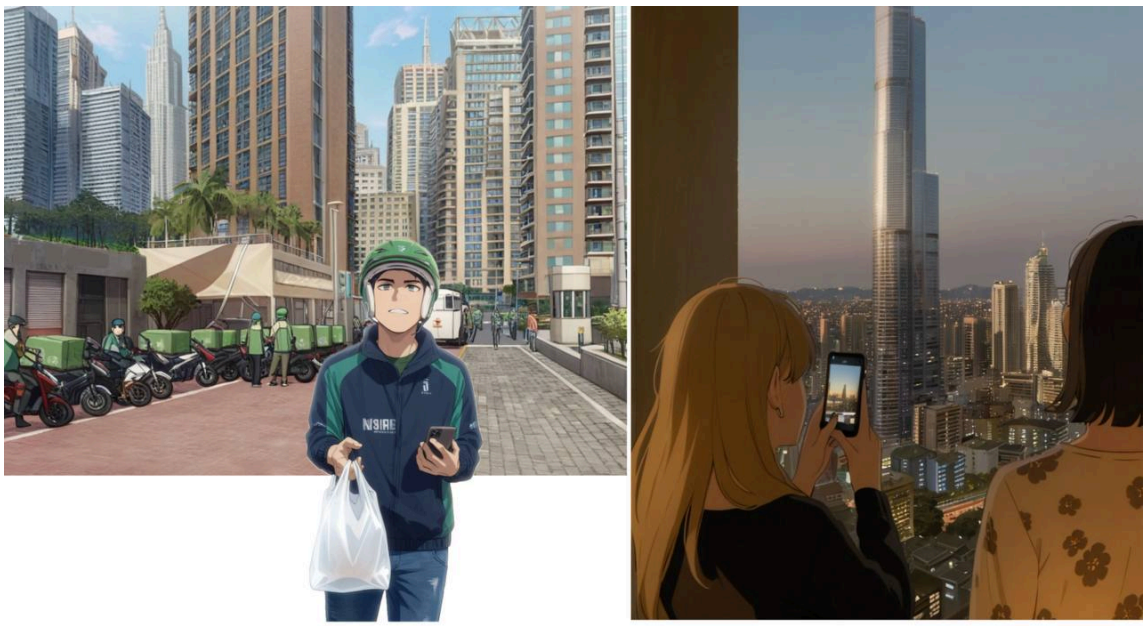


Fig. 13. Site Collage (Author)

The irony is striking. In a district that markets itself on luxury and seamless convenience, this roadside scene reveals the machinery behind that promise, one made possible by the very people for whom the space provides nothing. The riders' presence is tolerated but unacknowledged, their needs invisible in the broader planning logic. And yet, they reshape the space through use, carving out a social zone in a setting that was never meant to accommodate them.

Experience H: The Old Dubai

Fig. 14. Site Collage (Author)

It is a little over 10 in the morning in what is called the “Old Dubai”. The air here is lighter than in the concrete corridors of Downtown, and the streets, shaded by canvas canopies and hemmed in by ochre-toned buildings, exhale a cool stillness not often felt elsewhere in the city. The narrow pathways move in angular turns, following a puzzling geometry, neither radial nor gridded but instead a quiet zigzag that evokes the logic of wind, not blueprint. The architectural language here is soft-spoken yet intentional. Sand-coloured walls, what is known as coral stones rise in textured layers, and traditional wind towers sit like relics atop roofs. They signal heritage but are rendered shut by the false ceilings and sealed interiors below, where air conditioning is now placed. The towers no longer breathe. They perform presence but not purpose, a preservation of form and not function. The occasional water feature, still pools of water recessed into low basins is ornamental, not participatory. Vendors emerge slowly, their voices cutting through the morning quiet with assertiveness that grows as the sun rises and the crowd grows. The moment a tourist’s pace falters toward a display of shawls or perfumes, they are ushered closer, sometimes physically.

There is charm here, but it competes with commerce. Every step is choreographed by transaction. Every view is a potential sale. Despite its pedestrian scale and intimacy, the space feels strangely suspended, like a set designed to suggest what once was. There is movement, but it is mostly of visitors: European families with sun hats and cameras, South Asian travellers taking selfies beneath the canopies, and small groups led by tour

guides. What's absent is more telling than what's present. Local residents are nowhere to be seen. The social life of the neighbourhood is ghosted out, replaced by a consumable heritage experience that has been scripted into existence. Yet for all its simulation, there is something undeniably tender about the space. The shadows cast by wooden beams across the narrow streets, the sudden quiet between alley turns, the patterned light reflecting off cream-coloured walls lingers. It gestures toward a different Dubai, one that once operated at the scale of the street and not the skyline, but what remains now is more of a memory, its cultural density hollowed out and filled instead with spectacle.

In documenting these episodes, ranging from tourist pathways and gendered encounters to informal labour geographies the aim is to construct a layered understanding of the site. The stories are neither linear nor comprehensive, but together they begin to map the city as it is felt, moved through, and quietly appropriated. This method aligns with critical spatial practices that seek to expose hidden systems of exclusion, marginalisation, and spatial injustice embedded in the design and governance of contemporary cities (Soja, 2010; Franck & Stevens, 2007). By privileging these fragments of lived space, the chapter attempts to shift the lens of site analysis from the abstract to the embodied, from what the city looks like to how it is actually inhabited.

Site Analysis: Results and Further Analysis

Personal Encounters and Social Tensions in Dubai's Urban Landscape

The incidents involving unsolicited gestures of intimacy from a taxi driver in Dubai and light harassment in a metro station offer a compelling lens through which to examine the complex interplay of cultural norms, personal behaviour, and urban social dynamics in rapidly globalising cities. What initially appears as a personal encounter reveals broader questions concerning gender, cultural negotiation, and psychological expression within a socially regulated environment. Dubai's status as a global city invites a multiplicity of social norms, often leading to ambiguous boundaries of behaviour. As a hub of international migration, it accommodates a diverse demographic with differing understandings of propriety, intimacy, and personal space.

The driver's forwardness, offering unsolicited rides and initiating physical contact suggests a tension between the public persona required by cultural and religious expectations and the private impulses that are, in some cases, repressed by those very expectations. This dichotomy is not uncommon in cities where modernity coexists with traditionalism. The cultural codes that discourage informal interaction between unrelated men and women, particularly in public, are often challenged in spaces where anonymity, transience, and the diversity of visitors afford a

perceived relaxation of social norms (AlMutawa, 2024). Moreover, the gendered nature of the interaction reflects an unspoken power asymmetry that is often present in encounters between local or regional service workers and foreign female visitors. In many such contexts, there exists a paradox: while the city's infrastructure is built to welcome international mobility, some local or regional social attitudes may still harbour fixed expectations about gender roles and interactions. The behaviour of the taxi driver might thus be interpreted as a result of a broader phenomenon: the selective transgression of cultural norms when interacting with those perceived to be outside the dominant social framework (Gneezy et al., 2015). This moment of boundary-crossing gestures toward a more significant phenomenon, the psychological effects of repression in hyper-regulated urban environments. When strict codes of behaviour govern gendered interactions, personal expression may find irregular or inappropriate outlets. Acts that seem isolated or spontaneous may, in fact, be symptomatic of deeper psychosocial undercurrents. Ultimately, this episode contributes to a more nuanced understanding of the informal, often unrecorded social exchanges that take place within Dubai's built environment. These moments, although small in scale, disrupt the illusion of seamless order often attributed to highly designed urban systems. It reveals the tensions within the urban choreography of Dubai.

Public spaces like airports, metro stations, and malls are curated for seamless movement, commercial activity, and cosmopolitan image-building (Kanna, 2011). But beneath this surface, there exist frictions born out of unequal power relations, cultural difference, and emotional dissonance. Public space, rather than being neutral or universal, becomes a contested terrain, especially for women navigating the city, and for men whose cultural conditioning may not align with the behaviours expected in a globalised, tourist-facing metropolis (AlMutawa, 2024). Dubai's public spaces are not merely physical environments but are deeply embedded with social codes, exclusions, and contradictions. These spaces may appear orderly, but beneath the polished aesthetics reveal the city's more fragmented and intimate human geographies.

Informal Governance of Public Spaces in Dubai

While much of Dubai's urban development emphasises order, efficiency, and spectacle, what occurs in its public spaces can challenge the formal scripts intended for those environments (Elsheshtawy, 2010). Public space, particularly those that are functionally transit-oriented becomes a stage for unanticipated personal negotiation. The spatial organization suggests a controlled, regulated setting; yet within it, informal hierarchies and interpersonal dynamics emerge. The fact that the subject (author) moved away from the official taxi area to a quieter zone (seeking reprieve from noise and crowds) illustrates how even within highly designed infrastructure, spatial choices are socially and psychologically driven (Koolhaas, 2007). It is in this marginal space, outside the visible order, where unexpected social encounters occur.

Public spaces in Dubai have dualities: formally structured, yet socially complex. While governments, planners, and developers often design and regulate public space with specific intentions like mobility, surveillance, economic activity, aesthetics, the actual governance of

public space is far more diffuse and contested. In theory, urban authorities govern through zoning laws, design codes, policing, and maintenance regimes. But in practice, public space is co-governed through the everyday behaviours, negotiations, resistances, and appropriations enacted by its users (Low, 2006; Mitchell, 1995). These users, commuters, migrants, tourists, vendors, passersby reshape space in real-time, often subverting its intended use. In cities like Dubai, this tension is particularly stark. There is a strong top-down control over how space looks and functions, like to be clean, efficient, hyper-modern. Yet what emerges is a parallel system of soft governance, where informal hierarchies, social scripts, and cultural codes govern behaviour just as powerfully. Migrant workers resting on ledges, a taxi driver taking liberties, or a woman navigating unspoken risks, these are all subtle acts that redefine public space, sometimes reinforcing, sometimes disrupting its intended order.

As Setha Low (2006) argues, public space is never neutral, it's shaped by power, access, and cultural meaning. And Don Mitchell (1995) reminds us that truly public space must allow for the right to be present, to act, and to challenge norms, not just to consume or pass through. So while planners may draw the lines and the state may enforce rules, social behaviour ultimately governs how public space is lived. The inverted green deck, then, is not just an urban design intervention, it is a proposal to acknowledge and legitimise these informal, often invisible modes of governance.

Designing Public Space for Women in Dubai

In contemporary urbanism, the design and perception of public space are not neutral but deeply gendered. The experience of safety, or the lack thereof, significantly shapes how women navigate, occupy, and perceive the city. In Dubai, a rapidly urbanizing metropolis characterized by hyper modern infrastructure, transnational mobility, and layered cultural codes, this dynamic becomes especially complex. The visibility of women in public spaces, particularly those moving unaccompanied, is often met with a gaze that renders them vulnerable to unwanted attention, harassment, or discomfort. Research shows that women experience public spaces differently from men due to both perceived and real threats of harassment or violence (Koskela, 1999; Pain, 2001). The built environment can either exacerbate or mitigate these threats. For instance, poorly lit streets, ambiguous sightlines, and isolated urban corners can induce fear and dissuade women from occupying public space after dark (Day, 2001). In Dubai's urban landscape, where modern architecture often prioritizes spectacle and efficiency over lived experience, this is particularly pronounced. The spatial disconnect between infrastructure and social engagement leads to streets that are technically accessible but socially exclusionary. The narrative of a woman being followed at Sobha Realty Metro Station, even in broad daylight, highlights how spatial design alone is insufficient without an understanding of social dynamics. The metro station provides limited provisions for social support in such moments. Despite the presence of staff and surveillance, the social discomfort endured by women in these spaces often goes unnoticed, as public infrastructure tends to prioritize regulation over empathy (Phadke, Khan & Ranade, 2011).

Designing for women's safety requires an interdisciplinary and intersectional approach. Urban planners, designers, and policymakers must consider strategies that include but are not limited to:

- Visibility and Lighting: Ensuring all public pathways, particularly those around transit hubs, are well-lit and visually open. Lighting is not merely functional but symbolic of care and presence (Loukaitou-Sideris, 2006).
- Active Edges and Eyes on the Street: Jane Jacobs (1961) argued for the importance of street life and natural surveillance through "eyes on the street." Mixed-use developments that activate street-level facades with shops, cafes, and community spaces can help normalize pedestrian presence and reduce isolation.
- Gender-Inclusive Planning: Participatory design models, where women are consulted about their experiences, have proven effective in identifying subtle but impactful safety interventions (Whitzman, 2007).
- Training and Regulation in Transit Areas: Transit hubs are often where harassment occurs due to high anonymity and flow. Station staff can be trained not just in logistics but also in handling social distress. Normalizing women's presence in all spaces help recalibrate social perceptions.

Ultimately, safety is not merely the absence of danger but the presence of comfort, freedom, and dignity. For women in Dubai, and global cities this means creating environments where they are not merely permitted to exist but are welcomed, acknowledged, and protected. It is also understood that a feminist urban lens does not only serve women but enhances the quality of public life for all.

Informal Urban Back-spaces in Dubai

The informal occupation of the back roads behind the Jumeirah Marina residences by delivery riders exemplifies a quiet but significant spatial injustice within Dubai's urban fabric. These workers, essential to the convenience and lifestyles of affluent residents, are granted no formal infrastructure to support their presence. They gather in transitional spaces (streets meant for vehicular ingress and egress) because there are no designated zones for rest, shelter, or social interaction within the formal design of the city. This omission highlights a broader pattern of spatial exclusion, where the needs of those who sustain the city's everyday operations are systematically overlooked in favour of aesthetics and exclusivity (Soja, 2010). Public and semi-public spaces in high-end developments often prioritise curated retail, polished facades, and image-based urbanism over functional inclusivity.

In relation to the project of the inverted green deck, this reveals a critical opportunity: to reimagine underused, in-between, or neglected spaces as zones of support and dignity for the labour force that sustains urban life. Rather than replicating the polished but exclusionary podiums above which these interactions currently go unnoticed, the design could intentionally include shaded rest zones, public seating, and accessible amenities that invite informal

occupation and foster a sense of belonging. By acknowledging and accommodating the city's invisible networks of labour, the green deck becomes more than an environmental intervention, it could evolve into a socially responsive, justice-oriented space that bridges the divide between elite consumption and everyday urban labour (Harvey, 2008).

Seating Patterns in Public Spaces of Dubai

Public seating plays a crucial role in shaping the inclusivity and social vitality of urban environments. As Madden, Kent, and Peinhardt (2023) argue, the presence and design of seating in public spaces is a reflection of a city's priorities, whether it values people's ability to rest, gather, and interact. Thoughtful seating design encourages people to linger and engage with their surroundings, particularly when seats are movable, face areas of interest, and are arranged in clusters to support social interaction. The authors emphasise that flexibility, variety, and comfort in seating not only enhance usability but also signal that public space is meant for everyone. In contrast, hostile architecture, such as anti-homeless measures or seating that deters rest, sends a message of exclusion and undermines a space's social potential. Ultimately, involving communities in the design and placement of seating, and observing how people actually use space, are essential strategies for creating welcoming and vibrant public realms (Madden et al., 2023).

During the site study, it is seen that the urban sprawl and harsh climatic conditions discourages pedestrian activity. This is particularly evident in neighborhoods that are more dependent on vehicle traffic, where sidewalks are narrow or even absent in some areas. The challenge of creating pedestrian-friendly spaces is further stressed by extreme temperatures, especially in the summer months, where the limited street infrastructure offers little to no shade or shelter, discouraging foot traffic.

In parallel, Dubai's multi-racial and multi-cultural environment presents unique challenges and opportunities for the design of public spaces. As a global city, Dubai hosts a large migrant population from various parts of Asia, the Middle East, and beyond. These diverse cultural backgrounds influence how public spaces are utilized. For example, Westerners and Europeans tend to seek open-air spaces like beaches or sun-facing terraces, enjoying outdoor dining with panoramic views of the skyline. Conversely, migrant workers, who often have limited access to private spaces, tend to gravitate toward roadside areas and street benches, where they can socialize or rest. These spaces are typically more informal and provide necessary respite during long working hours.

These spatial preferences of different groups reflect a deep connection to both environmental factors and cultural practices. People from warmer climates or rural backgrounds might feel more at home in open, informal spaces, while those from colder regions may find comfort in more structured and enclosed environments. The need for social interaction or solitude can also influence seating preferences. The varying preferences for seating in public spaces also connect to psychological comfort and cultural norms. The contrast between open, sun-facing

spaces and more enclosed seating arrangements speaks to how different users perceive privacy, social interaction, and comfort.

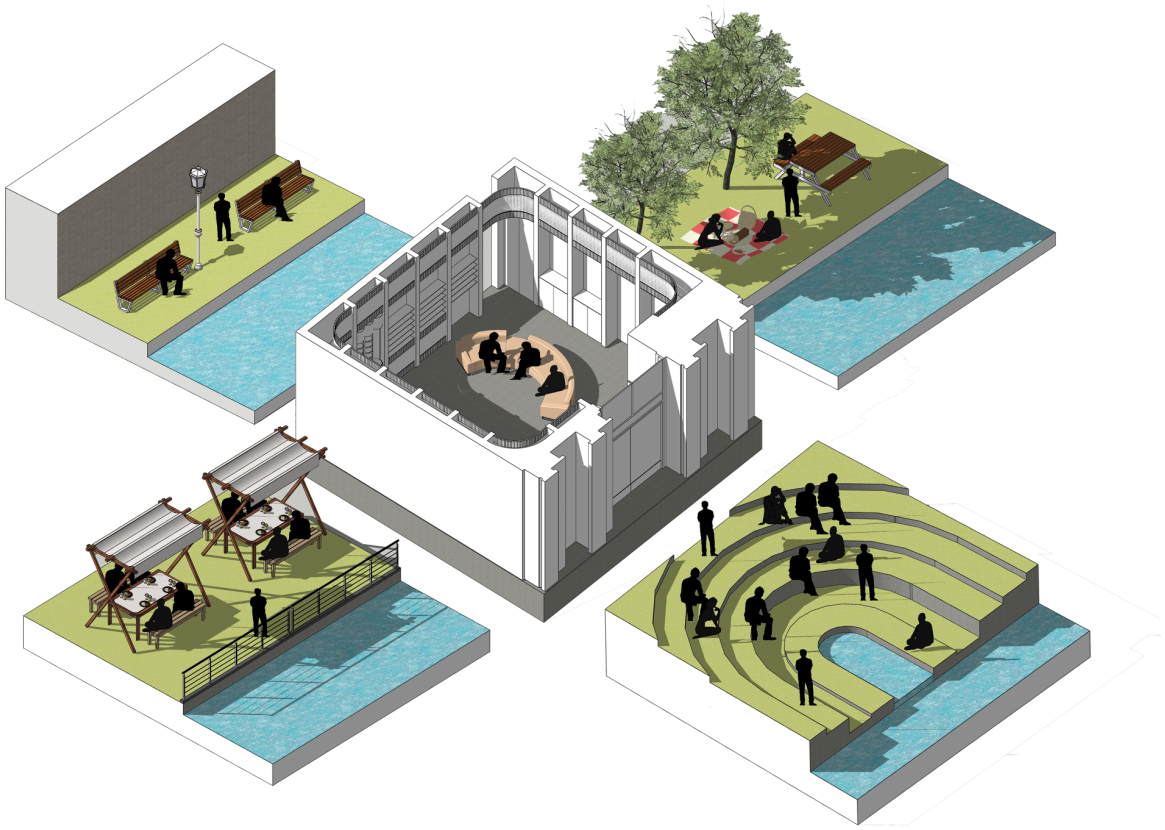


Fig. 15. Types of Seating Patterns Observed in Dubai's Public Spaces (Source: Author)

Open, sun-facing spaces:

Often preferred by those seeking connection with nature or a place for relaxation (such as Western tourists or locals), these spaces promote physical and psychological well-being. Exposure to sunlight has been shown to improve mood and mental health, particularly in colder regions, where sunlight is scarce. In Dubai, the appeal of sun-facing spaces may also be tied to the luxurious lifestyle associated with outdoor cafés or beachfront areas.

Roadside seating:

Migrant workers, who often spend long hours outdoors may seek public seating for rest and socializing. These informal spaces provide opportunities for social bonding but can also reflect a lack of private space or amenities.

Enclosed seating:

This preference is more common in those from colder climates or urban areas, where privacy, comfort, and a sense of safety are prioritized. Enclosed areas can also create a more controlled, intimate environment, offering refuge from the harsh sun and the crowded, chaotic street environment.

Outdoor dining with a view:

Dubai's identity as a global city draws people to spaces that offer a connection to both nature and the city's modernity. Restaurants or cafes with views of the waterfront or skyline are seen as luxurious and a status symbol, catering to both expatriates and tourists.

To design for this diversity, it's essential to understand the interplay between social behavior, cultural preferences, and environmental factors. The challenge lies in accommodating different spatial needs while fostering interaction between the diverse groups who share the city while keeping a consistent architectural language.

The insights presented by Madden, Kent, and Peinhardt (2023) align closely with these spatial observations, where seating preferences reflect not only environmental conditions but also deep-seated cultural practices. Their argument that seating is a social instrument capable of shaping how people interact with urban environments resonates with findings at Sobha Realty Metro Station, where diverse user groups exhibit varying spatial behaviours. Individuals from warmer climates or rural backgrounds often gravitate toward open, informal settings that support social interaction, while those from colder regions appear to prefer structured, enclosed seating arrangements that offer a sense of order and privacy. This range of preferences underscores the need for adaptable and inclusive public seating. In this context, seating becomes a tool not just for rest, but for cultural expression and environmental responsiveness, making it a critical component of inclusive urban design in a multicultural city like Dubai (Madden et al., 2023). Public spaces and seating arrangements in Dubai should, therefore, cater to a diverse set of behaviors and desires, ensuring inclusivity and comfort for all user groups.

Proposed Design Intervention

Initial Proposed Design Intervention: *Inverted Green Deck*

The proposed design aims to transform under-utilised public spaces at Sobha Realty Metro Station into an interconnected, climate-sensitive “inverted green deck.” Unlike traditional green decks that are fully exposed to the sun, this intervention capitalises on sheltered areas such as linkway bridges, the spaces underneath them, and indoor building zones to create pathways optimised for thermal comfort and walkability. This adaptive reuse method aims to focus on building communal engagement, supporting walkability, and enhancing environmental sustainability in this car-centric urban context.

Fig. 16. Traditional Green Deck (Source: Author)

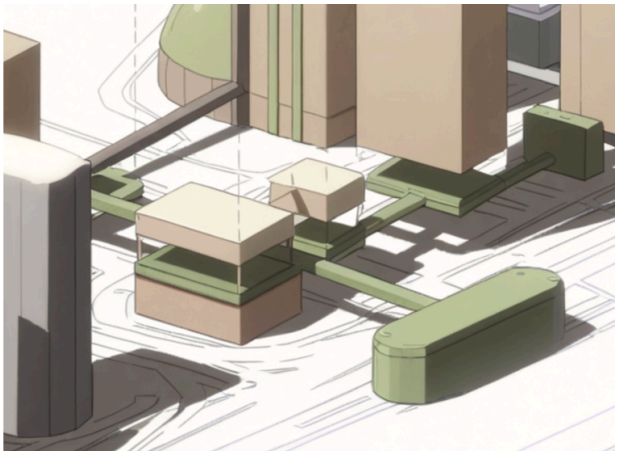


Fig. 17. Proposed Inverted Green Deck (Source: Author)

Site Analysis: Sobha Realty Metro Station and Surrounding Area in Dubai

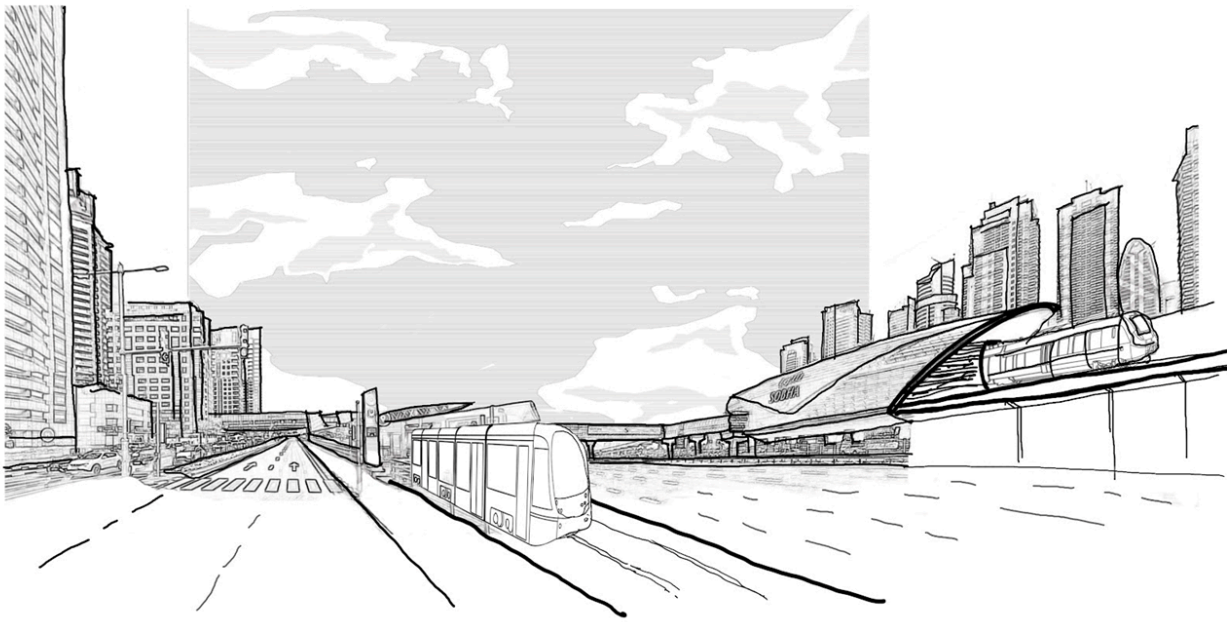


Fig. 18. Sectional Sketch of Sobha Realty Metro Station (Source: Author)

Urban Fabric and Connectivity

The Sobha Realty Metro Station is situated within a heavily urbanized environment, surrounded by high-density developments, including upscale residential complexes and retail outlets. The surrounding area is highly car-dependent, with wide arterial roads and highways that facilitate the flow of vehicles, yet pedestrians and cyclists are often sidelined. The station connects to significant roads such as Sheikh Zayed Road, making it a key point for commuters and travellers moving through this major corridor. However, while the metro station itself offers an alternative to car use, the area lacks a comprehensive pedestrian network, and public transport accessibility beyond the metro is limited, particularly in peripheral districts.

The surrounding neighbourhood exhibits a typical Dubai urban design approach, with large commercial and residential towers separated by wide roads, parking lots, and expansive spaces dedicated to car-centric infrastructure. This design leaves minimal space for communal or pedestrian activities, leading to the creation of “lost spaces,” underutilized areas that lack meaningful interaction between residents and urban life (Trancik, 1986). The area, though well-connected by transport, lacks the human-scale public spaces that encourage street-level engagement and social cohesion.

Land Use and Public Spaces

The area around Sobha Realty Metro Station is dominated by a mix of luxury residential developments, commercial spaces, and leisure destinations, such as shopping malls and cafes, that cater predominantly to affluent expatriates and tourists. The designs of these developments often prioritize private car use, parking facilities, and expansive commercial zones that limit pedestrian flow and access to public spaces (Abdelfattah, Bazzoni, & Choubassi, 2021). While these areas serve the economic and residential needs of the population, they have created stark contrasts between wealthy and marginalized communities, particularly the working-class migrant population (see Appendix A for the full dataset).

Public spaces in the vicinity of the station are minimal and often poorly designed for social interaction. Open areas around high-rise buildings are underutilized due to their lack of connectivity, shade, and accessibility. This disconnection from the street and the isolation of public spaces are a direct consequence of Dubai's urban design prioritizing verticality and vehicular movement over human-centred urbanism. Green spaces, if present, are often contained within private developments and rarely serve the public, highlighting a significant gap in urban design that limits the social and environmental potential of the area (Abdelfattah, Bazzoni, & Choubassi, 2021).

Opportunities for Design Intervention

Given the site's proximity to a metro station and the surrounding mixed-use developments, Sobha Realty Metro Station presents a unique opportunity for the implementation of sustainable, pedestrian-oriented urban solutions. The introduction of an inverted green deck, an intervention that repurposes existing infrastructure such as linkway bridges and areas beneath elevated metro tracks, could transform these underutilized spaces into green corridors that connect residential and commercial zones. The proposal aims to provide sheltered, communal spaces for people to engage with nature and each other while promoting a shift away from car dependency by encouraging walking and cycling.

Additionally, the inverted green deck would act as a catalyst for improving the quality of public spaces around the metro station, making them more accessible, pedestrian-friendly, and conducive to social interaction. Providing green spaces in otherwise barren urban areas would enhance the area's livability, contribute to environmental sustainability, and foster a more inclusive urban experience for residents and commuters.

Existing Infrastructre

Linkway Bridges:

- Current State (highlighted in green): Linkways connecting the station to nearby buildings are underutilized and primarily function as transitional spaces with little social or environmental value.

- Proposed Use (not depicted): The linkway bridges are repurposed into indoor, shaded pathways featuring vegetation and seating areas. This creates a community space that promotes interaction, relaxation, and pedestrian mobility.

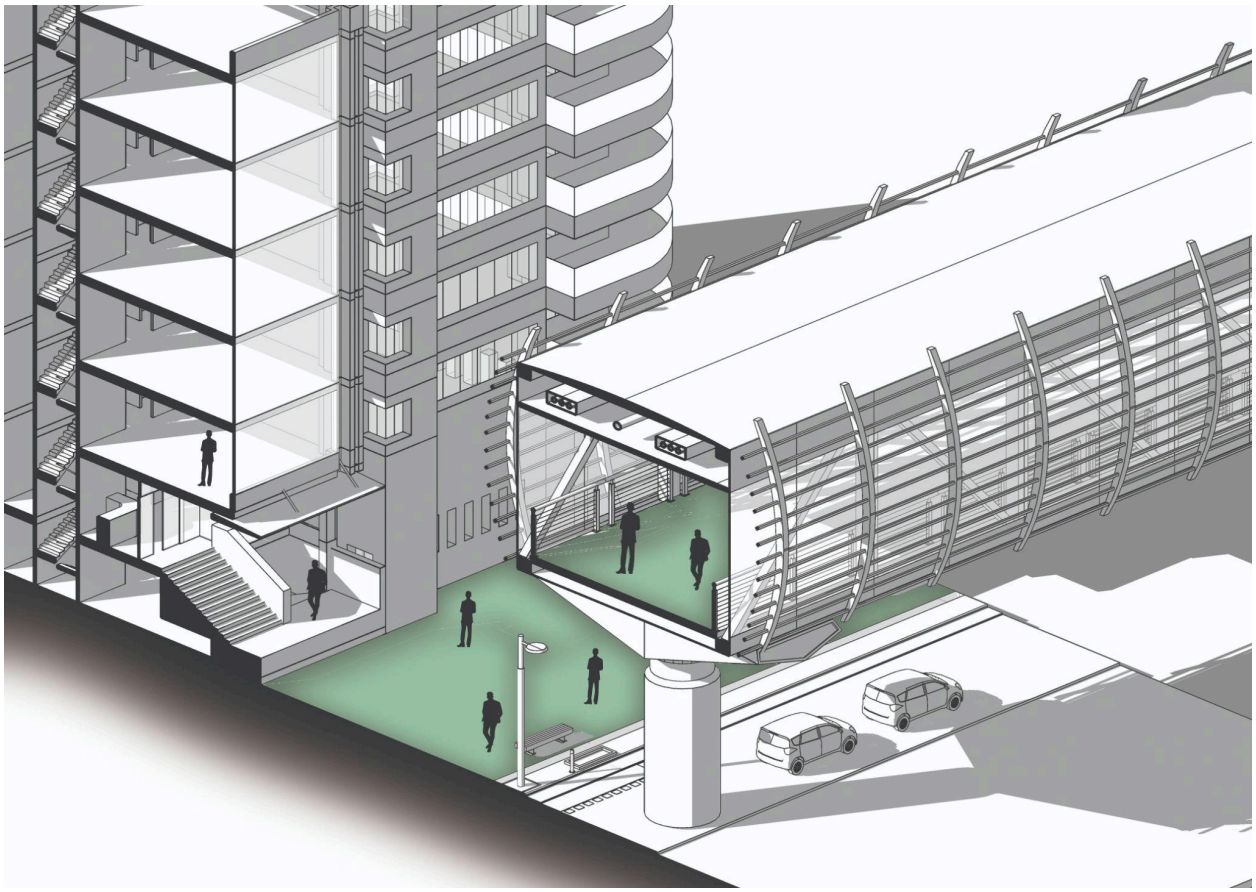


Fig. 19. Axonometric Section of Linkway at Sobha Realty Metro Station (Source: Author)

The site, Sobha Realty Metro Station is located on the Red Line of the Dubai Metro system near Interchange 5 on Sheikh Zayed Road and it primarily serves the bustling districts of Dubai Marina and Jumeirah Lakes Towers (JLT). The station provides connections to key destinations like the Jumeirah Marina Beach via the metro, tram, and bus services, with elevated pedestrian walkways and bridges. Opened in 2010, the stations have air-conditioned waiting areas, ticketing services, retail outlets, and pedestrian linkways that connects the metro and tram to both sides of the Sheikh Zayed Road. Its proximity to Dubai Marina Mall, luxury hotels, offices

and residential communities enhances its significance as a transit, workplace and lifestyle hub. The station reflects the city's integration of public-private partnerships in urban infrastructure, that while it is reasonable on a macro scale, its shortcomings are made visible upon a visit on site.

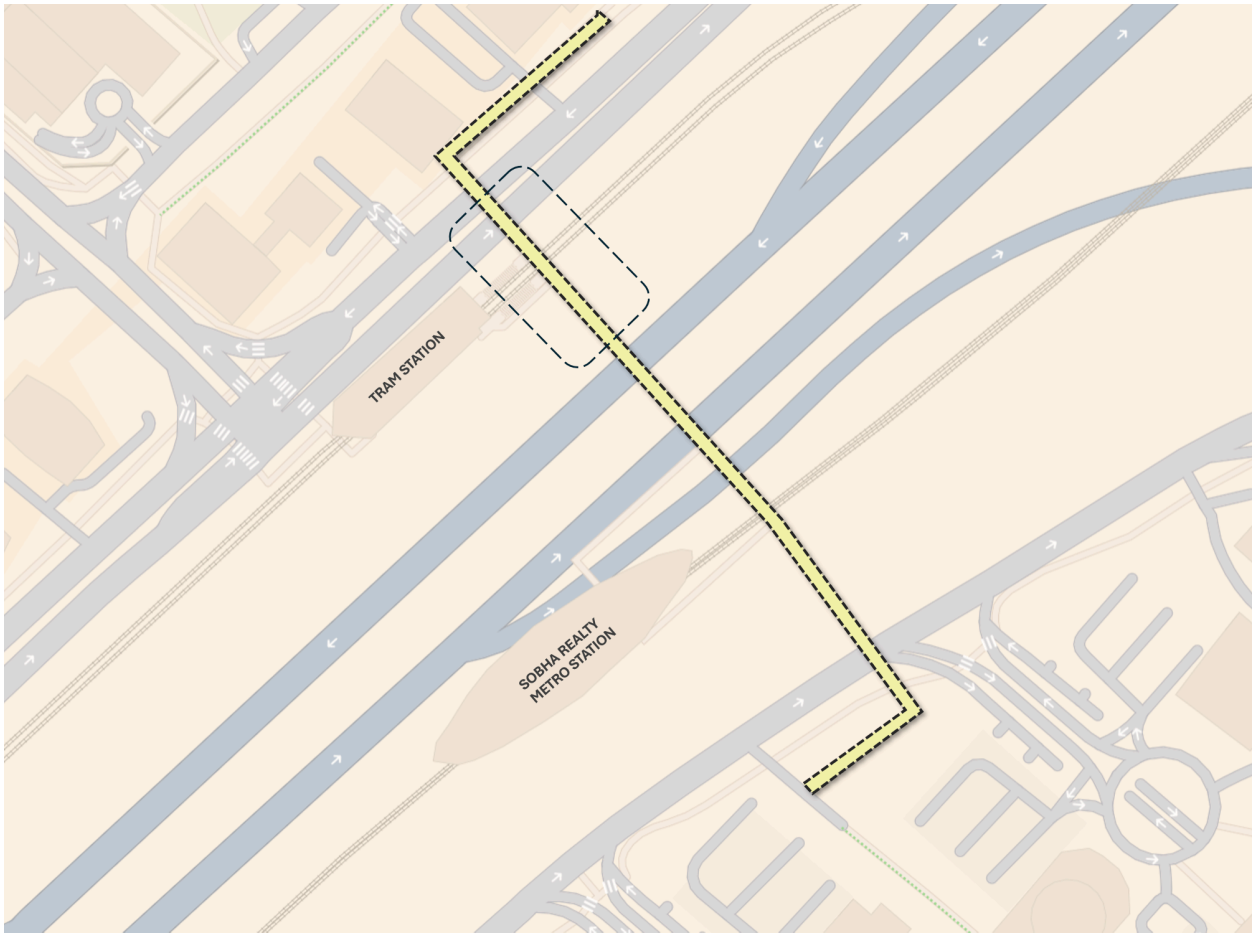


Fig. 20. Outline of Existing Linkway on Site (Source: Author)

Following the findings from the site analysis, key activities like informal gatherings, outdoor dining, recreational sports and cultural appreciation were the most common and hence the programmatic outline of the project follows accordingly. It is envisioned to be a transport node and gathering hub for leisure, culture and sustainable research. Tapping on the potential of the empty highway planting strips seen in the map that separates the tram station from the expressway, the main hub is set to take over the space as shown.

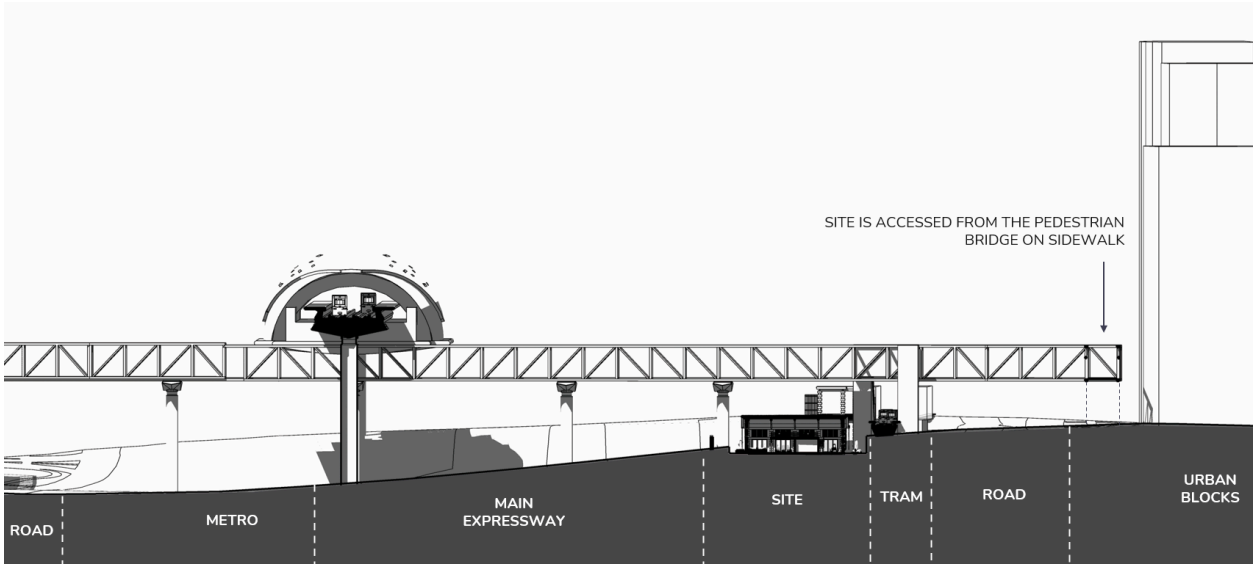


Fig. 21. Cross Section of Site (Source: Author)

The design began from making a connected detour from the metro link-way space, in which it was expanded below into the empty plot of land (seen as “site” above). This is an attempt to accommodate to the group of people who commutes through the linkways and it aims to serve as an area of rest and escape from the busy metro station. It is meant to act as a small break between commute and serve as proper gathering spaces.

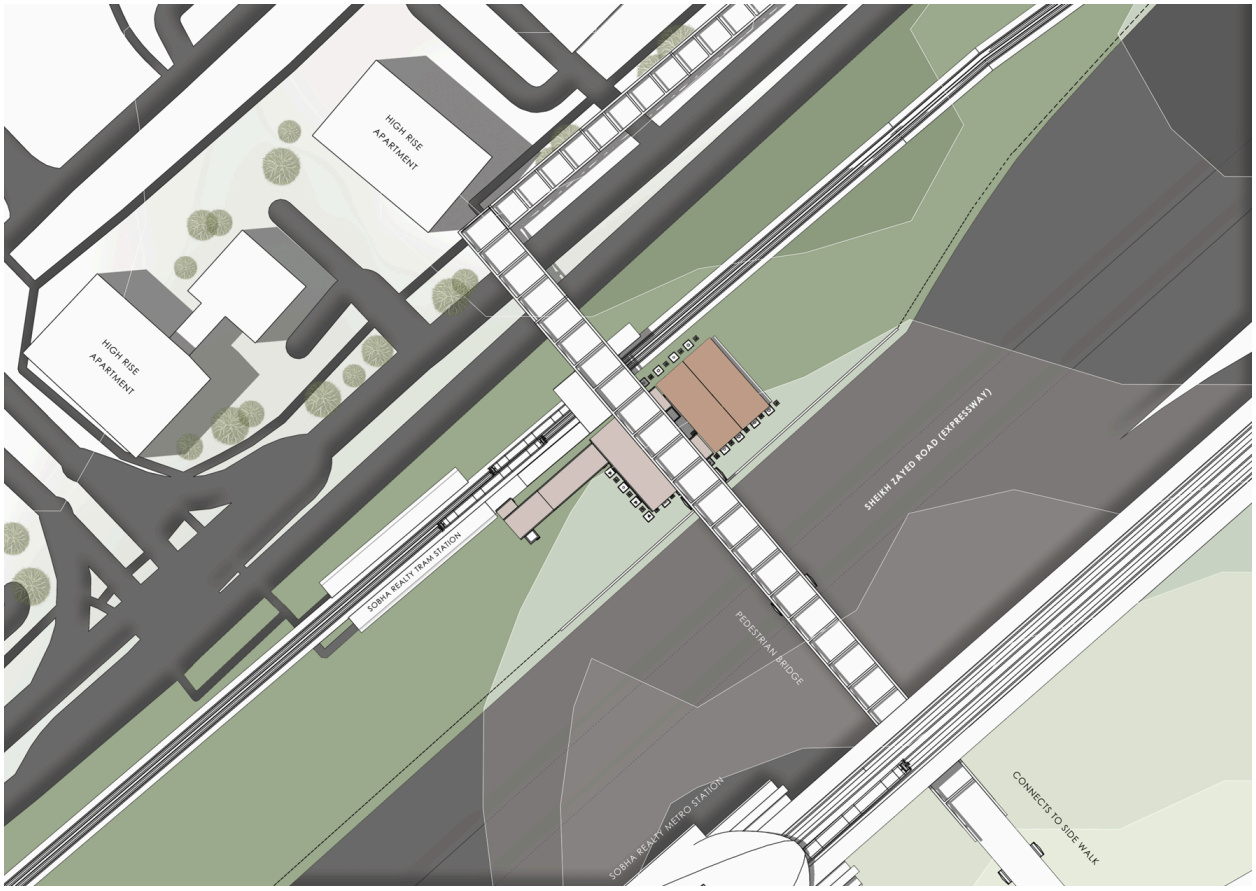


Fig. 22. Site Plan (Source: Author)

The massing development of the project emerged as a direct response to the infrastructural constraints and spatial opportunities created by the elevated metro lines and surrounding highways at Sobha Realty Station. The introduction of two primary volumes—the café (beige block) and the co-working space (brown block) on either side of the metro linkway establishes a balanced composition that anchors both programs to the pedestrian flow of the station. Their placement capitalizes on the existing circulation lines, transforming what was previously a residual, overlooked space into an active urban pocket. The alignment of these two volumes generates an enclosed courtyard beneath the bridge, where the intersection of structural and movement axes naturally forms a shaded, climatically comfortable micro-environment. This courtyard becomes the social heart of the project, mediating between the fast-paced metro traffic above and the more intimate activities of the café and co-working space below. The architectural process, therefore, is not additive but adaptive, using infrastructural byproducts as generative design tools to create permeability, shade, and social interaction in a site otherwise dominated by movement and barriers.

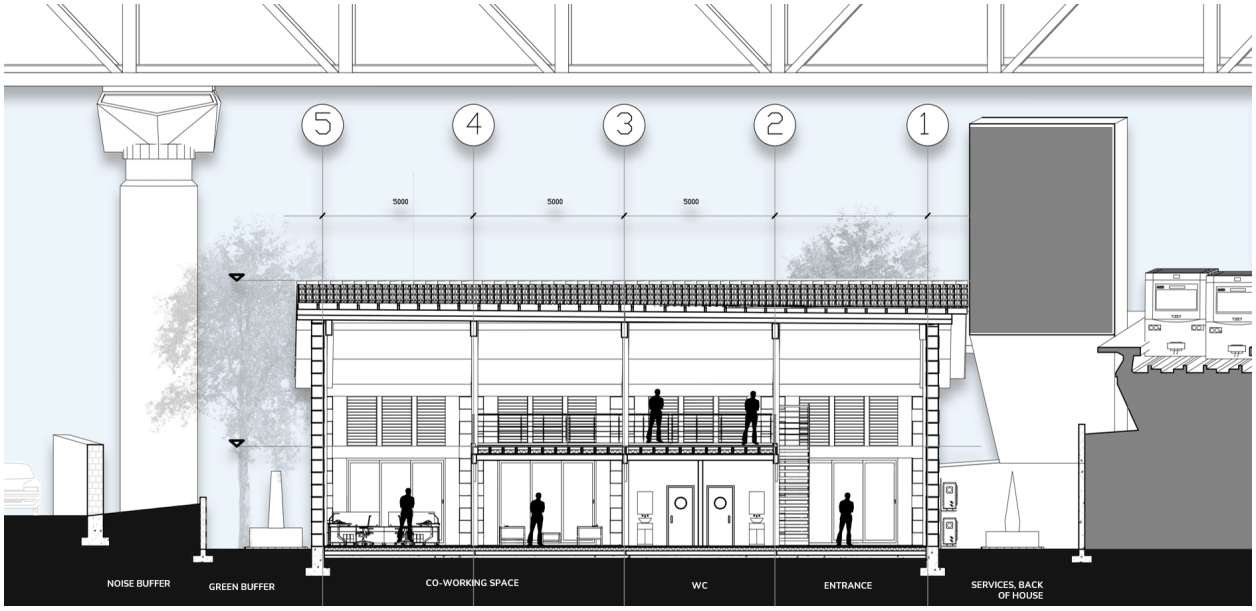


Fig. 23. Cross Section of Building (Source: Author)

In a quest to use local materials to reduce carbon footprint and promote the use of sustainable materials given the climatic context, limestone served as the main material of choice for vertical structures and ground floor building parts. It is noted that the weight of stone is not as favourable in comparison to concrete and timber but it was crucial to be able to implement the careful use of coral stone. Additionally, these large frame like limestone load bearing columns were tweaked to cater to the roof systems and daylight requirements. The modification and distancing of these structures resulted in large shading fins that act as a tertiary barrier from the sun that shields part of the direct sunlight before it hits the facades being the timber louvres and glazed sliding doors.

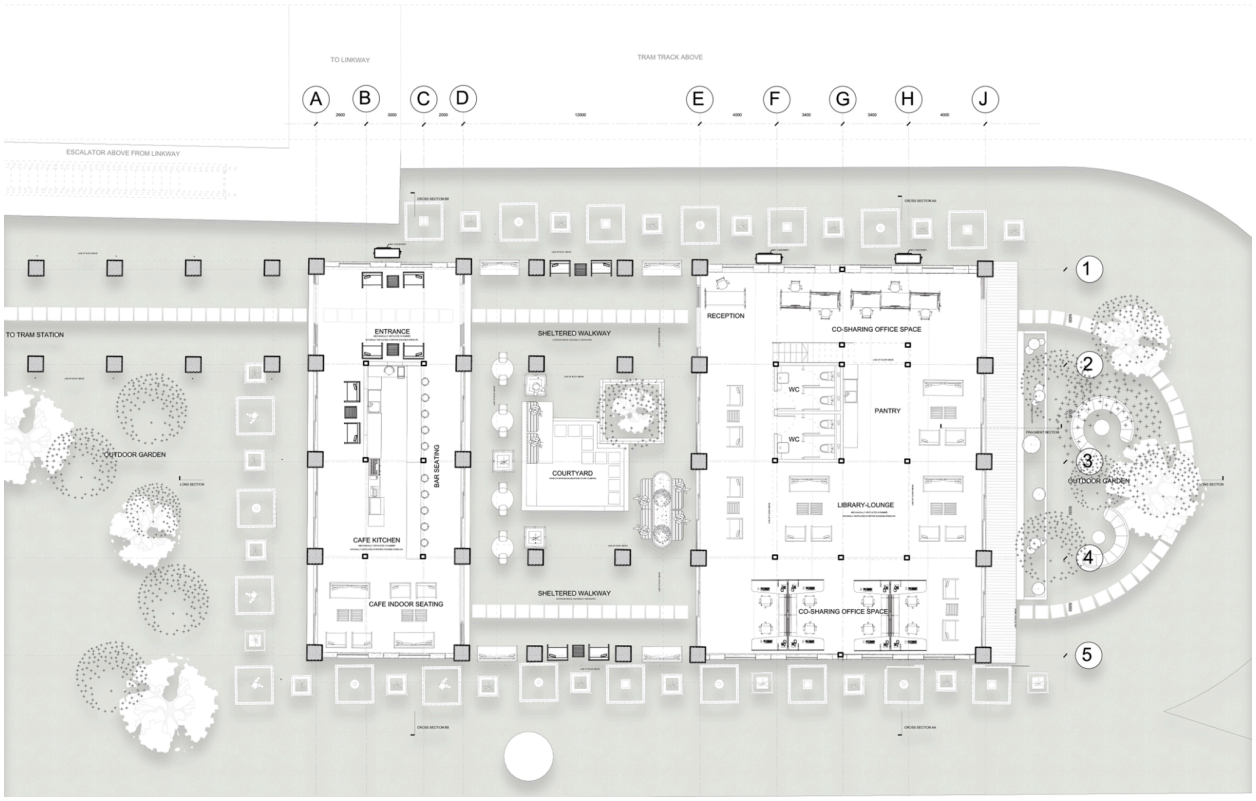


Fig. 24. Ground Floor Plan (Source: Author)

The project strategically integrates a co-working space and a café within the high-traffic context of Sobha Realty Metro Station, it is a mediation between social classes to redefine how public and semi-public spaces coexist in Dubai. From an analytical perspective, the café functions as an open and approachable threshold, an intermediary layer that invites metro users, particularly lower-income migrant workers, into the space without the intimidation often associated with co-working environments. This gradual spatial transition encourages a sense of belonging and redefines work culture as an inclusive, communal act. Architecturally, both programs are designed for expandability: the café's open plan and flexible furniture layouts allow it to spill into the co-working zone during off-peak hours, while the co-working area can reciprocally extend toward the café during periods of higher demand or for collaborative events. This adaptive overlap not only maximizes the efficient use of limited transit-adjacent real estate but also fosters a dynamic relationship between leisure and productivity. Over time, the flexibility of these spaces allows for organic growth, perhaps pop-up retail, workshops, or cultural programming, transforming the project into a living urban organism that responds to its users' rhythms. While acknowledging that full inclusivity remains bounded by Dubai's socio-economic realities, the design focuses on the middle spectrum of society, aiming to create a permeable social interface where everyday activities such as drinking coffee or working become shared rituals that subtly bridge class divides. The facades are an interplay of various methods, traditional and modern in a bid to reduce energy consumption yet pay homage to the region's natural strategies. The

project reads as a reinterpretation of existing activities and spaces in a more culturally and environmentally conscious manner.

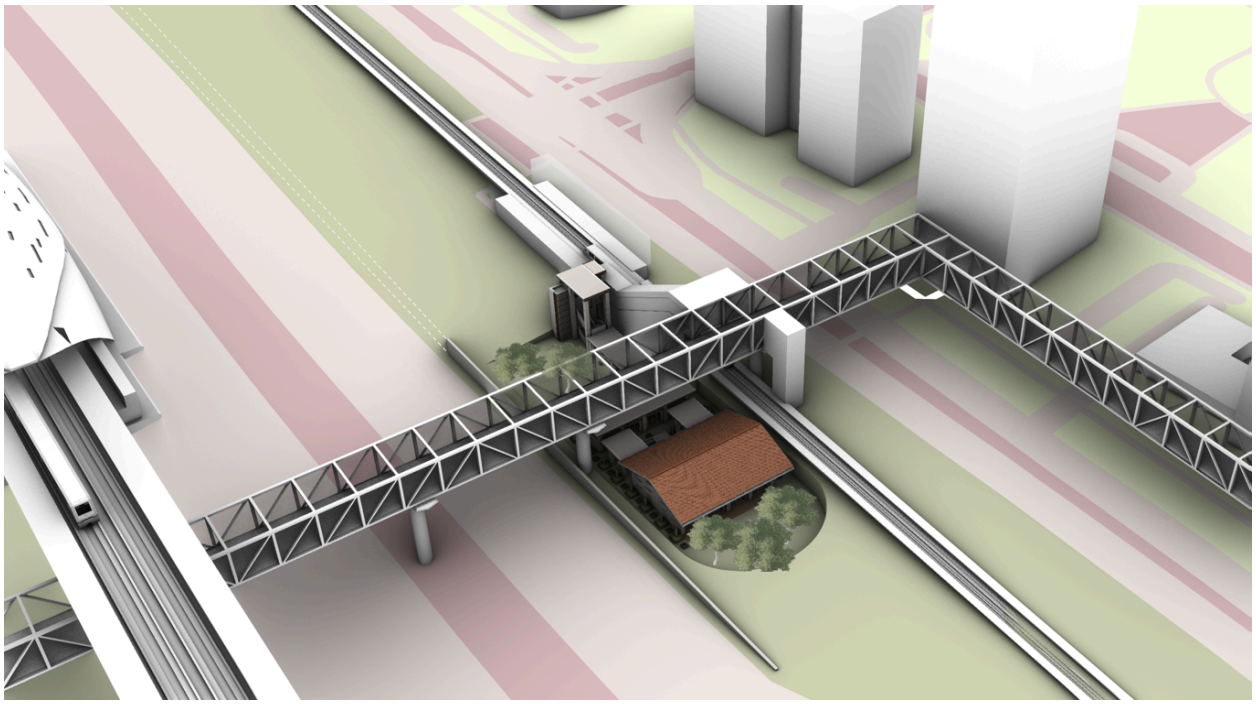


Fig. 25. Perspective Section (Source: Author)

The corridor extension becomes a multifaceted cultural nexus that connects two distinct functions together in a linearity. Its distinctive design is wrapped around the main travel artery that seeks to be a connector that brings cultural epicentres, work spaces, and leisure corners of the expat and migrant communities together. Considering the learning points extracted from site, the expanded space was then segmented to create voids in between to create narrower spaces that serve as a tool for way-finding between the injected programmes being the enclosed restaurant seatings, research centre and co-working spaces.

Building upon earlier research findings yet diverging from the initial proposal, the final design intervention adopts a more compact and site-specific approach. Rather than addressing a broad urban fabric, the intervention concentrates primarily on link-way spaces, the often-overlooked connective infrastructure surrounding the transport node. These transitional zones, typically characterized by underutilization and spatial fragmentation, are reimagined as accessible, inclusive public corridors.

The central concept involves transforming the main artery of the transport interchange into a dynamic public pathway that doubles as a cultural and leisure spine. By integrating elements of art, greenery, and passive cooling strategies, the design aims to establish a multi-sensory urban experience that encourages visual and physical engagement among diverse user groups. The

proposal envisions this space not just as a transit route, but as a social conduit, linking pedestrian flows with opportunities for gathering, rest, and cultural expression.

Fig. 26. Building Courtyard Rendering (Source: Author)

Migrant workers, who constitute the majority of the population, are frequently excluded from central urban amenities and relegated to peripheral housing, despite being essential to the city's operation and construction (Kanna, 2011). These conditions call for alternative urban strategies that not only respond to climatic extremes but also assert a spatial form of justice by improving everyday accessibility, comfort, and communal belonging. In this context, the proposed inverted green deck at Sobha Realty Metro Station, providing accessible spaces of leisure, refuge, relaxation, collaboration and artistic expression functions as a spatial intervention aligned with the ethos of the "Right to the City."

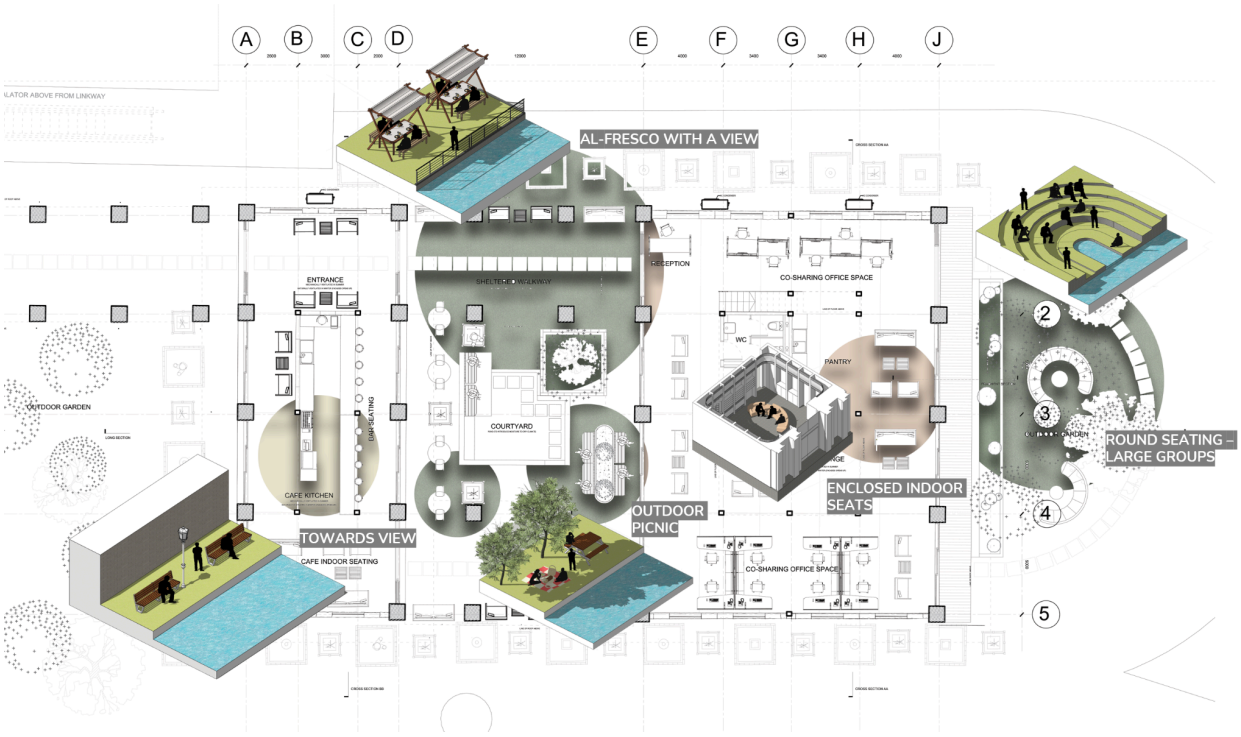


Fig. 27. Various types of seatings (Source: Author)

Unlike conventional green decks that are fully exposed to harsh outdoor climates, this intervention occupies underutilized indoor and semi-sheltered infrastructures such as linkway bridges and spaces beneath metro tracks and transforms them into thermally moderated, vegetated communal corridors. By repurposing existing structures into accessible and inclusive public pathways, the inverted green deck counters the exclusionary tendencies of privatized development and car-oriented infrastructure. It creates microclimates and informal social nodes within otherwise transient or inhospitable environments, particularly benefiting low-income commuters and laborers who lack access to private cooling or recreational amenities. Thus, the design is not only a response to environmental constraints but also a spatial articulation of urban rights, reclaiming neglected urban infrastructure for collective use and comfort. In doing so, it operationalizes Lefebvre's theory through a localized, climate conscious, and socially responsive design that promotes spatial justice within Dubai's neoliberal urban landscape.

General Design Targets

- Optimized Temperature Control:

  Indoor and shaded pathways maintain comfortable temperatures through passive cooling strategies and vegetation, encouraging year-round usability.

- Green Infrastructure:

  Vegetation is integrated into linkway bridges, pathways under the tracks, and building interiors to improve air quality, reduce urban heat, and enhance visual aesthetics.

- Hybrid Mobility Support:

  The deck connects to the metro station, encouraging pedestrian mobility and providing a climate-optimized alternative to driving for last-mile connectivity.

- Community Engagement:

  The repurposed spaces are designed to foster community interaction through flexible zones for socializing, exercising, and cultural activities.

Traditional Cooling Methods Found in Desert Climate

- Wind Catchers (“Barjeel”):

  Utilising vertical wind catchers on key parts of the linkway bridges and spaces under metro tracks. These structures funnel cooler air from above into the sheltered green spaces below. Modern adaptations can include adjustable louvres and integration with natural ventilation systems to maximize cooling efficiency. Wind catchers create airflow in indoor pathways, reducing reliance on air conditioning while maintaining a comfortable temperature.

- Shaded Courtyards and “Mashrabiya” Elements:

  Mashrabiya (decorative screens) can be added to vertical facades along the pathways and linkways to filter sunlight while allowing airflow. These elements diffuse sunlight, prevent heat buildup, and create visually appealing spaces for relaxation or small gatherings.

- Thermal Mass Design:

  Integrating cooling water features or shaded green surfaces adjacent to these materials enhances their heat absorption and dissipation properties. Thermal mass absorbs heat during the day and releases it during cooler nighttime hours, stabilizing indoor temperatures.

- Qantas-Inspired Cooling with Evaporative Techniques:

  Incorporate shallow water channels, misting systems, or shaded water features in communal areas to create evaporative cooling effects.

- Vegetative and Soil Cooling:

  Additional green roofs in surrounding buildings provide additional cooling to the pathways below as plants provide shade and cooling through evapotranspiration, improving air quality and mitigating the urban heat island effect.

Landscape and Plants

Historically, desert communities have employed techniques such as the use of native drought-tolerant plants, natural shading, and passive cooling to adapt to harsh conditions. Similarly, Nordic plants can be incorporated into contemporary desert planning to mimic these traditional methods while offering new ecological benefits. For instance, traditional desert architecture often uses materials like adobe or mud to regulate temperature, while plants like the Norway Spruce or Silver Birch, when grown in controlled environments, can help regulate indoor climates through natural cooling and humidity control, akin to the traditional use of vegetation for shading and air filtration.

Benefits of Growing Nordic Plants in Desert Climates (in enclosed and controlled spaces):

- Humidity Regulation:

  Many Nordic plants have high transpiration rates, helping to increase humidity and improve air quality in dry desert environments.

- Natural Cooling:

  Certain plants like conifers and shrubs can create microclimates within controlled environments, reducing the need for air conditioning by providing natural cooling.

- Biodiversity:

  Introducing native plant species can increase biodiversity, attract pollinators, and create a healthier ecosystem, even in arid climates.

- Aesthetic Value:

  Nordic plants, such as mosses and heathers, bring unique textures and colours, contributing to the beauty of enclosed spaces.

- Soil Improvement:

Many of these plants, like red clover, improve soil quality by fixing nitrogen or stabilizing soil, which can be useful in desert environments where soil may need assistance.

- Thermal Insulation:

  Certain plants act as natural insulation, regulating temperature fluctuations inside greenhouses or plant rooms.

Traditional desert agriculture often relies on crops that are well-adapted to dry conditions, such as date palms or succulents. By introducing hardy Nordic plants, the modern approach could diversify plant species in desert landscapes, broadening the ecological toolkit for desert environments. In urban contexts, these plants can support sustainability by providing green spaces that help reduce the urban heat island effect which is an issue traditionally addressed through techniques like wind towers, courtyards, and water features as mentioned in the previous section.

In essence, the use of Nordic plants in desert climates complements traditional methods by offering innovative ways to enhance biodiversity, reduce environmental stress, and create more livable urban spaces. By combining both approaches, cities like Dubai can benefit from a fusion of cultural heritage and modern sustainable practices.

Usage of Sea Water for Cooling (citation to be added)

Seawater, especially in coastal regions, remains cooler than the outside air during warmer months. This makes it an ideal source for cooling. By extracting the cooler temperature of the seawater, it can then be used to absorb heat from indoor spaces that need cooling. This innovative cooling system relies on the temperature difference between seawater and air to provide an efficient and eco-friendly alternative to traditional air conditioning systems.

The system works by circulating seawater through the pump. Marine geothermal cooling systems are highly energy-efficient. For every 1 kWh of electricity used to run the system, the heat pump can provide up to 4 kWh of thermal cooling. This means the system produces 4 times more cooling energy than the electrical energy it consumes, making it significantly more efficient than traditional air conditioning systems that rely on energy-intensive compressors. By using natural seawater, marine geothermal cooling systems can reduce energy consumption dramatically compared to conventional methods. In addition, because the system operates on a renewable, sustainable source (seawater) rather than electricity or fuel oil, it leads to a significant reduction in greenhouse gas emissions, up to 80% less when compared to systems powered by fossil fuels. This makes it a more environmentally friendly alternative.

Limestone as Building Material

Limestone, a sedimentary rock composed primarily of calcium carbonate, forms through the gradual accumulation and compression of marine sediments, shells, and skeletal fragments of organisms. Known for its subtle texture and pale coloration, limestone has been a traditional building material across the Arabian Peninsula and the Gulf region for centuries, valued for both its aesthetic warmth and climatic performance. Its moderate porosity and low thermal conductivity make it an effective thermal buffer, reducing heat gain during the day while releasing stored coolness at night, an essential characteristic for passive cooling in Dubai's hot, arid climate. Studies have shown that limestone façades can significantly lower indoor heat gain and improve thermal comfort in desert environments (Al-Sallal, 2016).

However, while limestone provides significant thermal and environmental advantages, its compressive strength and durability vary depending on mineral composition and quarrying methods. To enhance structural performance, limestone can be paired with reinforced concrete or steel frameworks, allowing it to serve as an insulating cladding or infill system rather than a load-bearing element. This hybrid approach preserves the stone's breathable, thermally stable qualities while ensuring the necessary strength to withstand vertical loads and lateral forces. Beyond its functional benefits, its use reaffirms a connection to vernacular Gulf architecture, promoting material continuity, passive performance, and contextual sustainability within Dubai's rapidly modernizing urban fabric.

Building Technology Features

Fig. 28. Building Technology Diagram (Source: Author)

The project's environmental strategy integrates passive principles with selective mechanical intervention to achieve thermal comfort in Dubai's extreme desert climate. Taking advantage of its position beneath the elevated walkway, the architecture transforms an infrastructural constraint into a climatic feature, the bridge structure shades the central courtyard and surrounding roofs, significantly reducing direct solar exposure. The building envelope is designed as a responsive skin, adapting its openness and thermal behavior to the changing seasons.

1. Cool Roof + Light Gravels on Roof Surface

Both café and co-working volumes use light-colored roofing materials topped with reflective gravel to minimize solar absorption. The co-working space incorporates a ventilated roof cavity that promotes heat stacking, expelling accumulated warm air through concealed vents.

2. Limestone Wall Cladding for Additional Insulation

Locally sourced limestone forms a thermally massive envelope that acts as both insulation and heat regulator, absorbing radiant heat during the day and releasing it at night. The material's high albedo also helps reflect solar radiation, supporting overall cooling efficiency.

3. High Ceiling + Operable Louvres

Tall internal volumes allow hot air to rise and create a sense of spaciousness. The operable louvres play a dual role allowing cross-ventilation during mild seasons, but fully closing in summer to prevent the intake of hot desert air. This adaptability makes the building a dynamic environmental system rather than a static enclosure.

4. Cooling Pipes within CLT Floor Slabs

Radiant cooling is achieved through embedded water pipes within the CLT floor slabs. This low-energy system maintains a comfortable interior temperature, reducing the reliance on high-power air conditioning systems while providing stable cooling beneath occupants' activity zones.

Additional Features

- Courtyard Microclimate: The shaded courtyard acts as a thermal buffer. In summer, it remains semi-enclosed and shaded, while in winter, it opens up to encourage social interaction.

- Vegetation Buffers: Gardens with native plants flank both sides of the building, mitigating heat reflection from surrounding pavements and acting as visual and thermal barriers from the adjacent highways.

- Pitched Roof: Terra cotta roof tiles are set at a 19° pitch, optimizing rainwater drainage and airflow beneath the roof plane.

Summer Scheme (Hot-Dry Conditions: 36 to 42 degree celsius)

During the extreme summer months, the building shifts into a defensive cooling mode. Louvres and openings are closed to prevent the intake of hot external air, and air conditioning systems

maintain comfortable interior conditions supported by the radiant cooling floor system. The courtyard and outdoor decks function as thermal buffers, absorbing and dissipating heat before it reaches indoor spaces. The shaded courtyard remains visually active but thermally insulated, preserving comfort for short transitional use. Reflective roofs, limestone insulation, and minimal direct solar exposure reduce cooling loads and energy consumption.

Winter Scheme (Mild Conditions: 18 to 25 degree celsius):

In winter, the architecture becomes more open and porous. Louvres and openings are fully operable, allowing natural ventilation and daylight to permeate the interior. The courtyard transforms into a social and climatic zone, benefiting from gentle solar radiation and cooler ambient temperatures. Limestone walls retain daytime heat, releasing it at night to maintain warmth. The radiant floor system operates passively or in low-energy mode, complementing the mild external environment.

Limitations

Dubai's transport infrastructure, particularly its metro and roads, remains underused relative to the city's expansive urban development. A significant limitation of this study is the discrepancy between the availability of public transport options and their actual usage, especially when compared to the city's high car ownership rate. Despite substantial investments in metro and road networks, many residents, particularly those in suburban or labour-intensive areas, continue to rely heavily on private vehicles. This issue is exacerbated by the spatial segregation of Dubai's migrant workforce, who live in labour camps located on the urban periphery, far from key transit hubs (Kanna, 2011). While the inverted green deck seeks to create sheltered, inclusive pathways and communal spaces, its impact on migrant workers' daily experiences may be limited without addressing systemic barriers like restricted mobility, spatial segregation, and the prioritization of private over public infrastructure.

Moreover, Dubai's governance model, characterized by a top-down, centralized approach to urban planning, poses challenges in aligning the city's transport infrastructure with broader goals of walkability. While significant efforts have been made to develop transit-oriented projects, the persistent emphasis on car-centric infrastructure and rapid real estate development often takes precedence over pedestrian and public transit solutions (Easterling, 2014). As such, the success of interventions aimed at improving walkability depends heavily on policy shifts that not only integrate public transport systems but also promote alternatives to car dependency and create more inclusive public spaces.

Additionally, the limited accessibility of public transport for low-income and marginalized groups further complicates efforts to enhance walkability. These populations, particularly migrant workers, face not only physical distance from transport infrastructure but also systemic barriers to mobility, such as legal and socio-economic restrictions (Kanna, 2011). Unless these barriers are addressed, any improvements to transport infrastructure will have a limited impact on the broader population's ability to engage in sustainable, walkable lifestyles.

The underutilization of public spaces and infrastructure in Dubai highlights the need for a comprehensive strategy that not only improves the physical transport networks but also addresses deeper socio-economic, political, and cultural factors. Enhancing walkability in Dubai requires a holistic approach that reduces car dependency, prioritizes integrated public transport, and ensures equitable access for all residents, especially marginalized groups. Overcoming these challenges will be crucial for shaping a more sustainable and inclusive urban future.

Conclusion

This research alongside the design component examined how Dubai's underutilized infrastructure, specifically around Sobha Realty Metro Station can be repurposed to support more inclusive, sustainable, and contextually responsive urban experiences. The proposed intervention, an inverted green deck, emerged from a need to challenge conventional top-down, car-centric planning models and reimagine residual infrastructural spaces as shaded, accessible, and socially vibrant communal corridors. Informed by theories of urban sustainability, spatial justice, and infrastructure theory, the project investigated how existing transport infrastructure could be hybridized to better serve not only economic goals but also environmental performance and social equity. The proposal recognizes that meaningful urban change in Dubai is constrained by governance structures, climate challenges, and socio-economic hierarchies, particularly the systemic marginalization of migrant workers and the spatial exclusions faced by women. These realities highlight that design alone cannot solve structural problems, but it can act as a powerful mediator in creating conditions for more equitable urban life.

At the design level, the process revealed the difficulty of moving from critique to implementation. Ideas such as passive cooling through water roofs or cooling pipes proved far more complex when subjected to architectural detailing, spatial integration, and material realities. Similarly, addressing gender safety through spatial design raised critical questions about the limits of architecture in reshaping deeply embedded cultural and social dynamics. This research also served as a site of personal and professional reflection. Having studied in Singapore and the Netherlands (contexts shaped by Eurocentric and western design principles), this investigation brought into focus the importance of cultural positionality in architectural research. The reading of Dubai's public spaces, aesthetics, and planning logics may inevitably differ from that of a regional native, a reminder that all design is embedded within a cultural lens. Acknowledging these biases is essential in producing work that is both critical and respectful of local contexts.

Ultimately, this project asserts that meaningful urban critique must be accompanied by design humility. Large-scale systemic issues are easy to theorize but difficult to resolve. Yet, even small-scale interventions, like the inverted green deck demonstrate the potential of precise, context-sensitive design to reframe how infrastructure, climate, and social life intersect. While not a universal solution, the project contributes to an emerging discourse on how cities like Dubai might evolve toward futures that are not only economically ambitious but also socially inclusive, ecologically responsive, and spatially just.

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Appendix A: Statistics and Demographics of Sobha Realty Metro Station Area

Average real estate price

- Commercial Real Estate Average Price: 3,973,636 AED
- Residential Real Estate Average Price: 3,524,408 AED

These figures reflect the current market conditions in Sector 3, Dubai, United Arab Emirates.

Busiest hours of the day at the Jumeirah Residences and Sobha Realty Metro area:

- Morning Peak: 7:00 AM - 9:00 AM
- Evening Peak: 5:00 PM - 7:00 PM

During these times, there is a high volume of commuters, both residents and visitors, utilizing the metro and surrounding facilities.

Public Transport Ridership 2024

Marine Transport

	Q1	Q2	Q3
Number of Marine Ridership	5,337,781	4,458,697	3,256,959

Public Transportation

	Q1	Q2	Q3
Number of Operating Public Buses	1,116	1,075	1,098
Number of Public Buses Routes	184	177	178
Number of Public Buses Ridership	45,790,008	43,400,198	45,751,067

Dubai Metro

	Q1	Q2	Q3
Number of Metro Ridership - Red Line	49,044,735	39,627,483	42,754,771
Number of Metro Ridership - Green Line	23,548,165	20,886,765	21,777,911

Dubai Tram

	Q1	Q2	Q3
Number of Tram Ridership	2,449,699	2,032,239	2,091,085

(Source: Government of Dubai, DSC, Dubai Statistics Centre)

Summary of Traffic Scores

- Restaurants have the highest average traffic score and a significant number of highly visited locations.
- Grocery Stores have a moderate traffic score with a notable number of above-average visits.
- Gas Stations have the lowest average traffic score with fewer highly visited locations.

Overall, restaurants experience the highest traffic, followed by grocery stores, and then gas stations.

Demographics of Residents

- Total Population: 23,420
- Female Population: 6,838
- Male Population: 16,769
- Mean Age:
    - Overall: 31 years
    - Females: 27 years

    - Males: 32 years
- Population Density: 6,111.84 people per square kilometer

Age Groups

- 0-14 years: 18%
- 15-24 years: 12%
- 25-44 years: 30%
- 45-64 years: 25%
- 65+ years: 15%

Employment Sectors

- Technology: 20%
- Healthcare: 15%
- Education: 10%
- Retail: 12%
- Manufacturing: 8%
- Finance: 10%
- Other: 25%

Income Levels (in USD)

- Below $30,000: 20%
- $30,000 - $50,000: 25%
- $50,000 - $75,000: 30%
- $75,000 - $100,000: 15%
- Above $100,000: 10%

Percentage breakdown of amenities in the area:

- Parks and Recreation: 25%
- Shopping Centers: 20%
- Restaurants and Cafes: 15%
- Healthcare Facilities: 10%
- Educational Institutions: 10%
- Public Transport Facilities: 10%
- Gyms and Fitness Centers: 5%
- Entertainment Venues: 5%