

1. Relation between graduation project topic and the Master of Science in Architecture programme

The graduation project aligns with the core aims of the Master of Science in Architecture programme, which emphasises research-driven design, critical engagement with contemporary urban challenges, and the integration of sustainability, technology, and social responsibility in architectural practice. By addressing the underutilisation of transport infrastructure in Dubai’s public spaces and proposing a design that merges spatial justice, climate responsiveness, and urban livability, the project embodies the interdisciplinary ethos of the programme. It is an attempt to combine architectural theory, urban analysis, and human-centered design into a cohesive intervention that is both context-specific and conceptually driven based on people’s behavioural patterns on site.

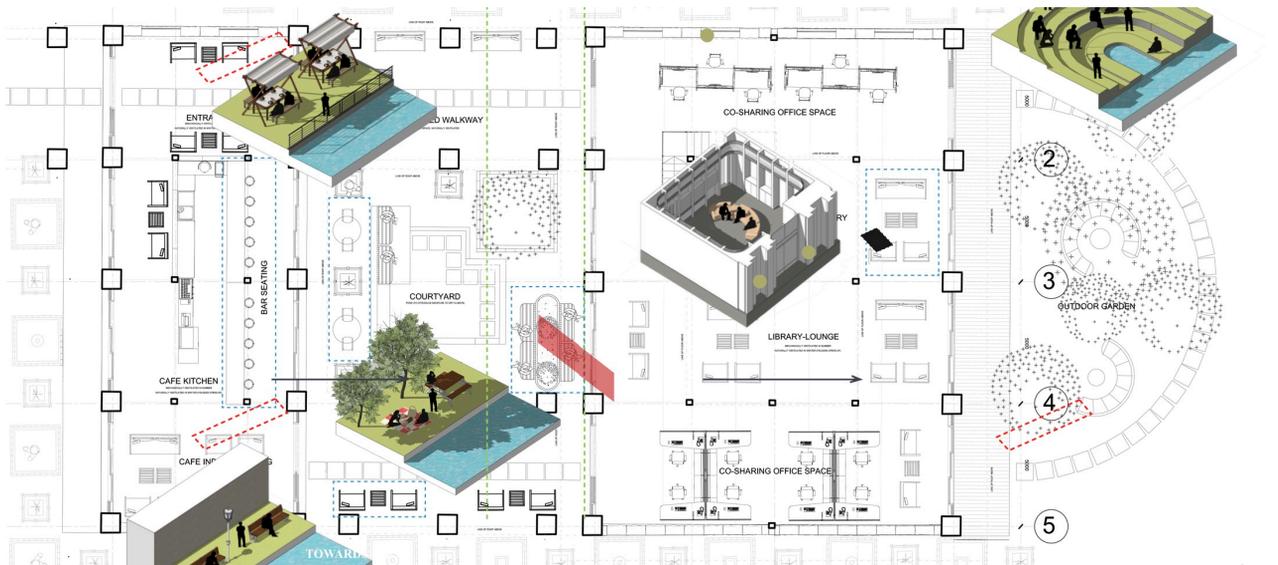


Fig. 1. Partial Ground Floor Plan of Final Proposed Project with Key Seating Spaces

The proposed design aims to transform underutilised 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 and sheltering the cars, this proposed intervention capitalises on sheltered areas such as linkway bridges, spaces underneath metro tracks, and indoor building zones to create indoor pathways optimised for thermal comfort and greenery. This adaptive reuse focuses on fostering communal engagement, supporting walkability, and enhancing environmental sustainability in a car-centric urban context.



Fig. 2. Traditional Green Decks (Author)

This research has been both an analytical and introspective journey into the complexities of urban development and social structures in Dubai, especially in relation to infrastructure, sustainability, and spatial justice. In the very beginning, my focus was drawn to the city’s high-profile, top-down development model and its car-centric planning. However, as the research progressed, I delved deeper into theoretical frameworks such as Henri Lefebvre’s Right to the City and Keller Easterling’s Extrastatecraft, I began to uncover Dubai beyond a city of spectacle, but see it as a layered space where infrastructure acts as both a physical and political agent. Although the project downscaled in the design stage as it became more focused on a specific plot of land on the metro area, it is still seen as a gesture to manipulate the existing public sphere and introduce a new approach to comfortable and sustainable gathering spaces in the busy transport networks of the city.

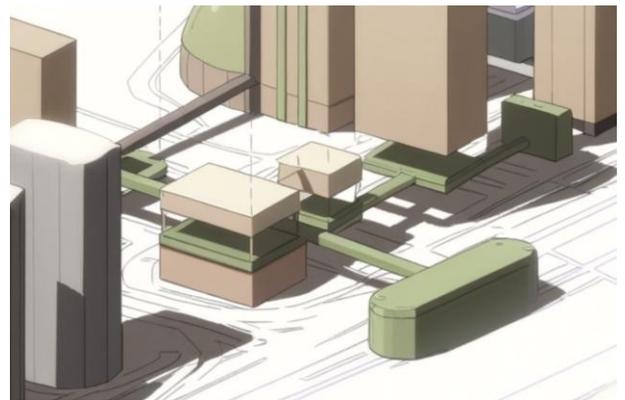


Fig. 3. Concept Sketch of “Inverted Green Deck” (Author)

2. How research influenced the design/recommendations, how the design/recommendations influenced the research

The research significantly influenced the design by highlighting key environmental sustainability challenges and opportunities within Dubai's urban context. Investigating the city's reliance on car-centric infrastructure, harsh environmental conditions, and the impacts of rapid urbanization led to the proposal of a design that incorporates passive climate-responsive strategies such as operable facades, the use of locally-sourced materials like limestone, low carbon footprint material such as timber, and water elements like small ponds to mitigate the extreme heat. These interventions were directly informed by the research findings on Dubai's high temperatures, arid conditions, and the need for cooling strategies in the public realm.

Furthermore, the design's focus on green infrastructure, namely the way the inverted green deck addresses the dual challenge of climate resilience and social inclusivity by transforming otherwise neglected, underused spaces into environments that reduce the urban heat island effect and enhance air quality. This design choice was reinforced by research into the social benefits of green spaces, particularly in relation to mental health, community engagement, and environmental awareness.

Studying the area around Sobha Realty Metro Station revealed the disconnect between public transport infrastructure and its surrounding urban fabric. Despite the presence of metro connectivity, the area remains dominated by vehicular infrastructure, fragmented public space, and limited pedestrian engagement. This led me to reconsider what walkability and accessibility really mean, not just in terms of movement, but in terms of social inclusion and environmental interaction.

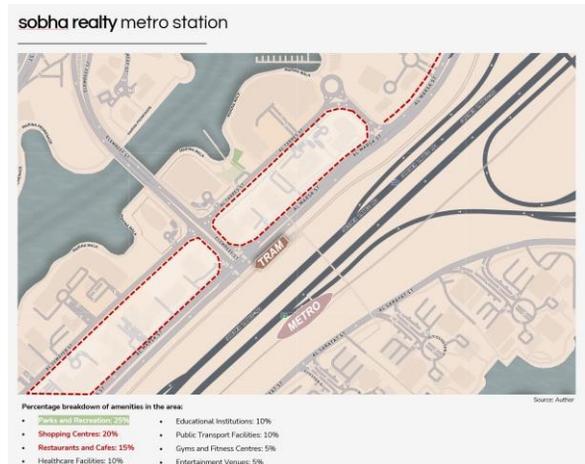


Fig. 4. Basic Site Map (Author)

Engaging deeply with the site has profoundly shaped both my personal outlook and my evolving understanding of public spaces. Having lived and studied in Singapore, I was accustomed to a dense, highly coordinated urban system where infrastructure was carefully integrated with public space and environmental planning. In contrast, researching Dubai's infrastructural landscape exposed me to a model where urban systems are grand in scale but often disconnected from the human experience. This comparative lens, alongside the scholarly literature, has helped me recognise that urban success is not merely about scale or speed, but about relational depth, the way people, systems, and spaces interact meaningfully.

It's also important to acknowledge that my architectural education in Singapore and now in the Netherlands has been shaped largely by Eurocentric design principles and planning ideologies. From the human-centric urbanism of Copenhagen to the sustainability frameworks of Dutch water cities, not excluding the verticality of American cities, the models I've been trained to value often originate in contexts vastly different from Dubai's socio-political and climatic realities. While these frameworks have equipped me with critical tools, they also carry assumptions about walkability, public participation, or the role of the state that may not fully translate into the Gulf region's unique governance structures or cultural norms.

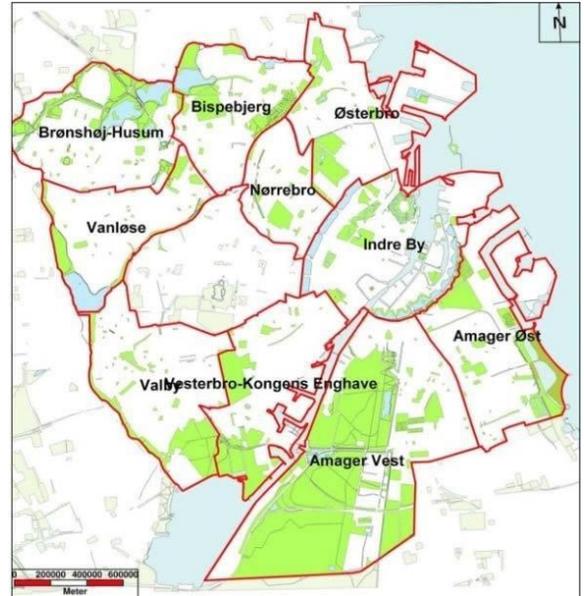


Fig. 5. Green spaces in Copenhagen (Cömertler, 2017)

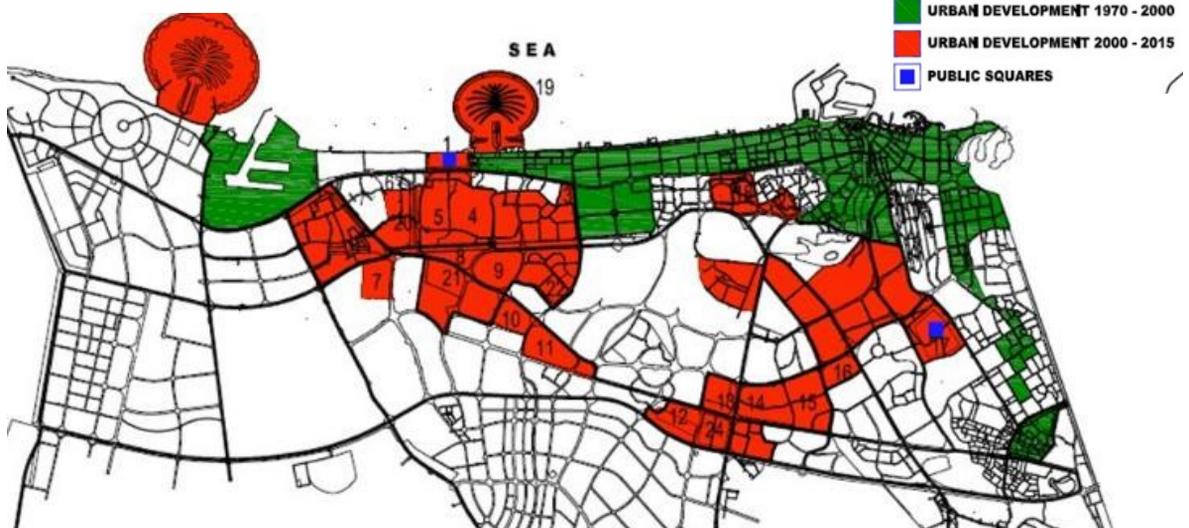


Fig. 6. Lack of public squares in Dubai (Ezzeddine and Kashwani, 2019)

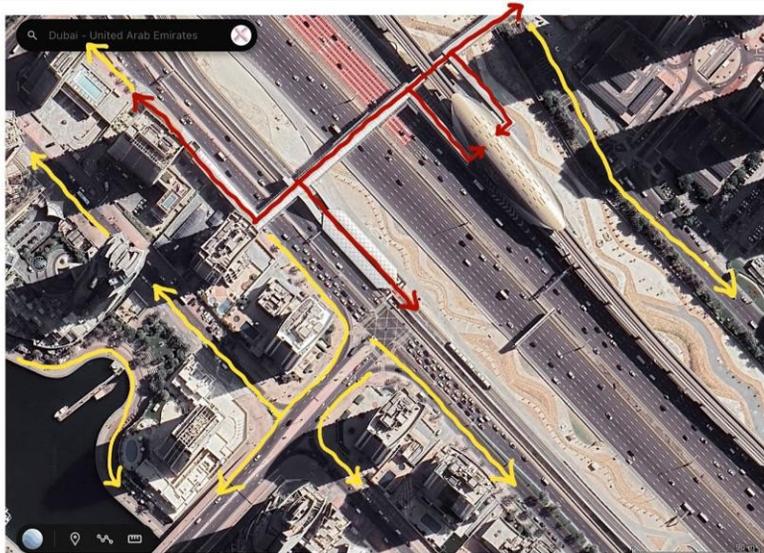
As an outsider, my reading of “under-utilised” or “lost” spaces around Sobha Realty Metro Station may differ profoundly from that of someone native to the UAE or familiar with the local logics of space, privacy, and mobility. Recognising this positionality has become central to how I approach the design, not as a universal solution, but as a context-sensitive negotiation that must remain open to multiple ways of inhabiting and valuing urban space.

site coverage (shelter)



Limited Green Spaces:

While Jumeirah is a beautiful area, a limited amount of green space is available. This can be a challenge for those who enjoy spending time outdoors. The lack of green space can also contribute to air pollution, which can concern those with respiratory issues.



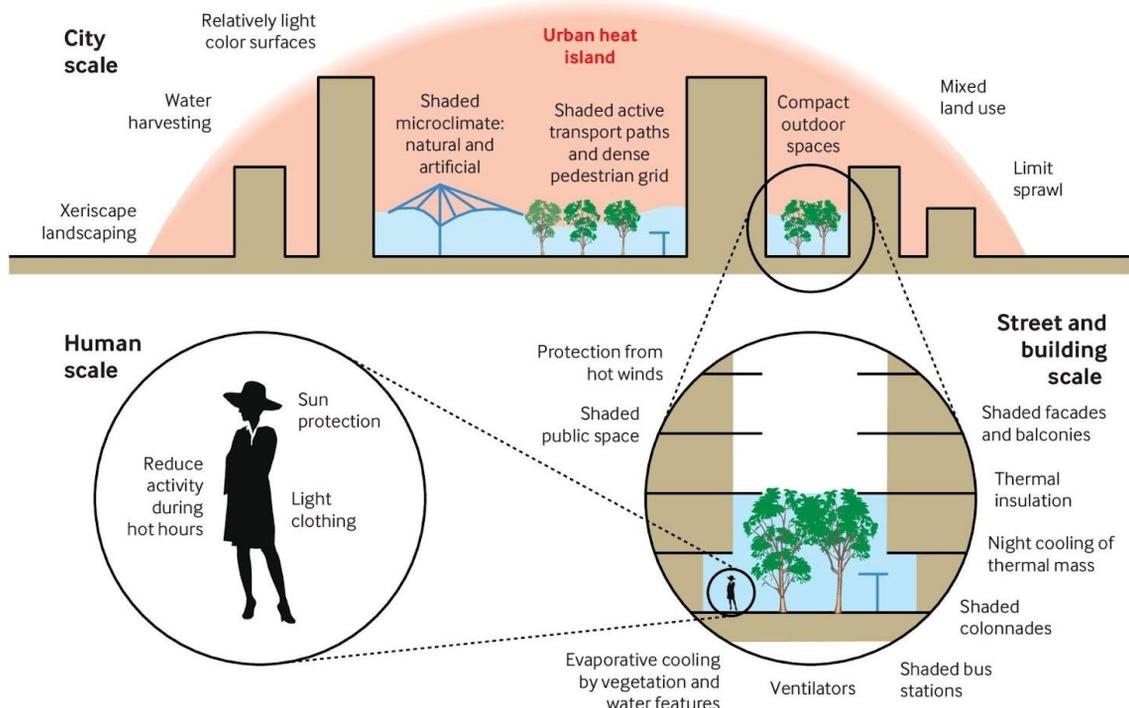
Source: Google Earth, edited by Author

- Sheltered
- Unsheltered

Limited Public Transport: Jumeirah needs to be better served by public transport. While some buses and taxis are available, they can be unreliable and expensive. This can make it difficult for those who do not own a car to get around.

Limited healthcare facilities

During the site study, it is seen that the urban sprawl and harsh climatic conditions discourages pedestrian activity. This is particularly evident in neighbourhoods 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.



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 utilised. 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 socialise 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. Public spaces in Dubai must, therefore, cater to a diverse set of behaviours and desires, ensuring inclusivity and comfort for all user groups.



Fig. 7. Site Collage (Author)



Fig. 8. Site Photos Collage (Author)

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.

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 behaviour, 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.

Another aspect of Dubai's urban experience is the social dynamics that influence the use of public space. During site studies, it was observed that some streets are not particularly safe, especially for women. The dominance of men in public spaces, particularly at night, can create an intimidating or unwelcoming atmosphere for women.



Fig. 9. Roadside Pavement at Sobha Realty Metro Station (Author)

The lack of proper lighting on some pavements and poorly designed public spaces can make them feel unsafe, particularly in less-visited areas. These factors may limit the full participation of women in public life, particularly in evening hours.

Additionally, during peak hours, the metro system can become overcrowded, adding to the stress and discomfort of commuters. This situation further underscores the importance of designing spaces that allow for both physical and psychological comfort. Public spaces should be both accessible and welcoming, and incorporate design elements that promote safety, social equity, and inclusivity.

Overall, the site analysis helped derive several design strategies:

Improved Walkability:

To enhance pedestrian infrastructure with shaded sidewalks, safe crossings, and green buffers to promote walking and cycling.

Culturally Responsive Spaces:

To create flexible seating areas, offering both open and enclosed options to accommodate diverse cultural preferences and encourage interaction.

Enhanced Safety:

Improve lighting in poorly lit areas and incorporate visible security measures to ensure safety, particularly for women.

Inclusive Urban Planning:

Design informal spaces for migrant communities to gather, ensuring cultural sensitivity and promoting social integration.

The on-site analysis offers the research a deeper layer by giving a different experience than from the knowledge gained through reading research or looking at the curated pictures online. Being physically in a space, gave a much deeper understanding of how the metro, public spaces and streets actually function in real life. One can feel the environment, how the weather, light, and noise impact the space and see how these elements affect its usage. Through Google Earth visual imagery, the underutilised spaces were identified.



Fig. 11. Picture of linkway (Author)

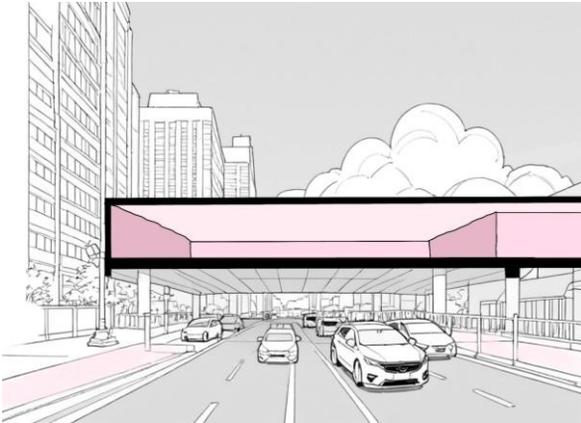


Fig. 10. Drawing of linkway at Sobha Realty metro station (Author)

Picking up on the local culture and social dynamics, the way different groups use the space in their own ways, whether it's locals, tourists, or migrant workers are nuances that are difficult to refer from limited online sources.

Visiting these areas gave a better understanding on why certain spaces remain underused while some push the limit of its maximum capacity. Research and images that were studied beforehand provided a more theoretical view, but being there painted a clearer picture. On-site, the real-time behaviours such as the way people interact with the space, where they choose to sit or gather, and how they move through it revealed more hidden issues, like safety concerns, overcrowding, or things that just don't feel right, which easily goes unnoticed in secondary data.

3. How the value of the way of working (approach, used methods, used methodology) is being assessed

The strength of this research’s approach lies in its interdisciplinary methodology, which combines qualitative and quantitative techniques to build a holistic understanding of the urban condition. The integration of literature review, ethnographic fieldwork, GIS-based geospatial analysis, and 3D modeling provided a robust framework for both critical insight and design experimentation. Earliest stages of finding a potential site involved mapping and walking the site on Google Earth to identify nodes and key transportation hubs (see figure 7).

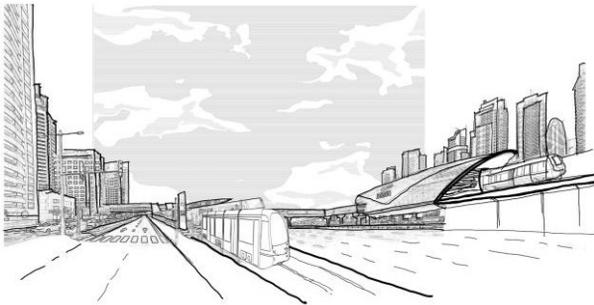


Fig. 12. Site Sketch and Traffic Analysis (Author)

Afterwards, during site analysis, the use of Jan Gehl’s observational methods added depth to the human-centric aspects of the project, while passive environmental strategies grounded the work in practical, sustainable design thinking. This layered approach allowed for a nuanced proposal that is socially adjusted, technically grounded, and spatially adaptable.

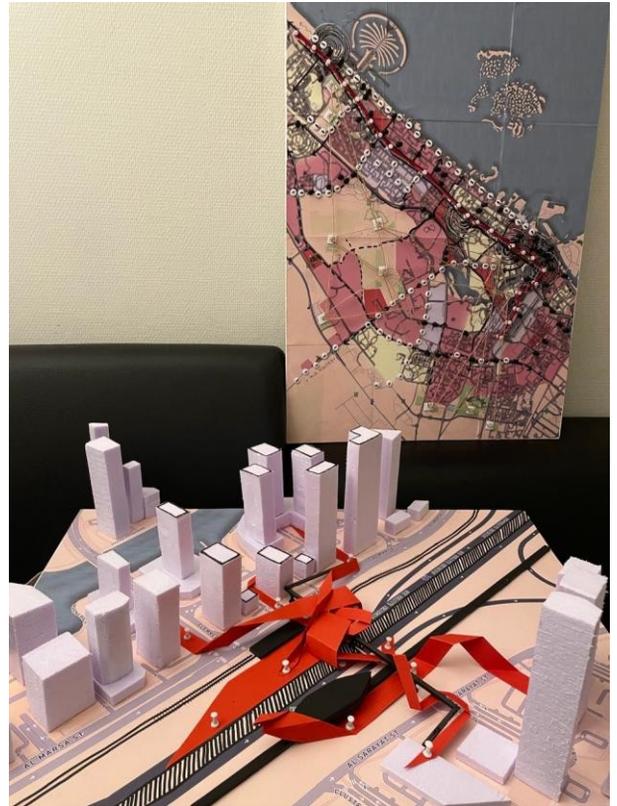


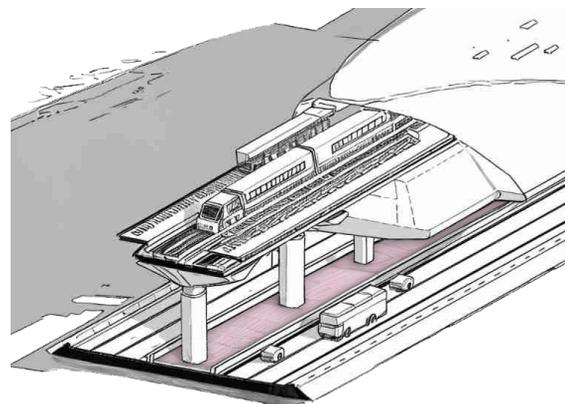
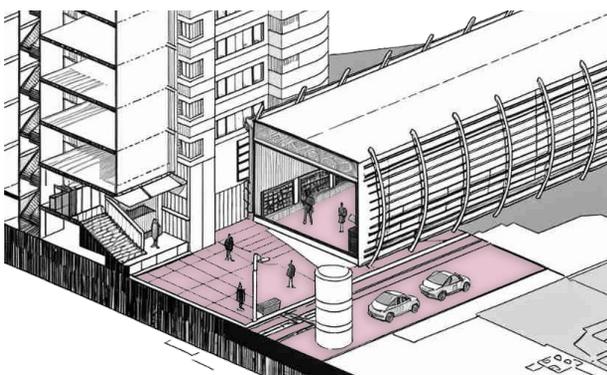
Fig. 13. Initial Massing (Author)

The final stage of the research is at the design experimental stage where form exploration comes together with climatic considerations. During the early stages, digital modelling proved to be helpful as the site was massive and the information available on maps were essential in providing a visual of the urban fabric. However, it is easy to lose the sense of scale as the work was fully done sat in front of a monitor screen. A physical model of the site in contrast offers a much clearer sense of scale and how small a human is against the backdrop of the towers and wide expressways. This clarity was obviously not fully understood until one walks the actual site in order to absorb its vastness in full scale.



Fig. 14. Concept diagram of possible linkway connection at Sobha Realty metro station (Author)

The idea of developing the inverted green deck design proposal was a turning point in the research as this was a move from critique to intervention. Rather than adding more external infrastructure, I was interested in working with what already existed such as the linkway bridges, underpasses, shaded corridors and reprogramming them into communal, green, thermally comfortable spaces. This approach challenges urban reuse as a design method and rethinks the current public spaces in transportation nodes that often ignore the present realities of vulnerable urban populations.



Modular systems and the utilisation of spaces underneath expressways offer a fascinating opportunity to transform overlooked areas into vibrant public spaces that connect leisure activities to the broader urban fabric. In a city where space is at a premium, these underutilised zones beneath highways were reimagined (see figure 9), realistically it could turn wasted real estate into valuable, multifunctional areas. Modular systems (possibly made with regionally sourced materials), with their flexibility and adaptability, allow these spaces to be tailored to various needs, whether for outdoor seating, recreational activities, or social gatherings, all while being responsive to Dubai's unique climate and urban scale challenges.

However, despite the bold move to shift large masses of expressway structures up, the climatic adaptation strategies need further refinement to make the lower space truly livable in Dubai's extreme heat.

While the area beneath the expressways benefits from shade, poor ventilation could lead to significant heat buildup, turning it into a heat trap. Additionally, the concrete infrastructure of highways absorbs and radiates heat, exacerbating the urban heat island effect. This is a big concern in most new developments across the city.

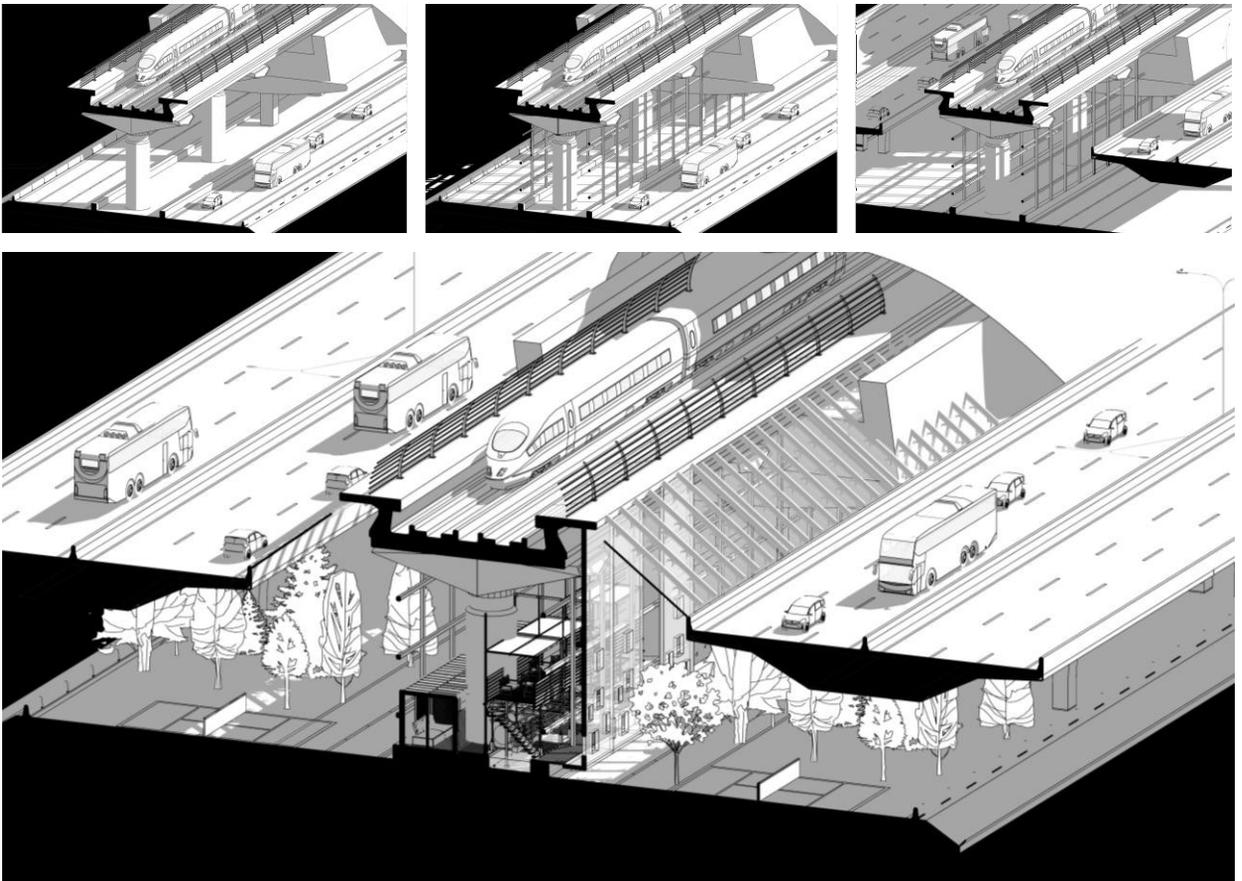


Fig. 14. An attempt at weaving into existing road infrastructure

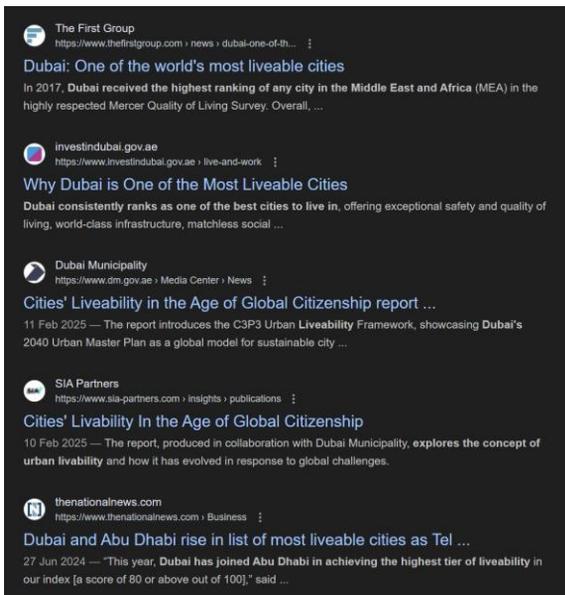


Fig. 15. Screenshots of Google search on Dubai's liveability

One limitation I continually encountered was the absence of open civic discourse in the planning processes of Dubai. Unlike other cities where participatory planning plays a role, Dubai's governance structure leaves little room for bottom-up input which made it difficult to gather public opinion. This made it necessary during the design stage to rethink what kinds of design interventions could exist within, or adjacent to, existing power structures without being entirely co-opted by them.

Hence, the main aim of the intervention was aligned with preserving current programmed and activities seen in the city and reshaping the existing infrastructure and building elements to continue support these leisure activities. This closer look into the key activities made me experience a significant shift in my understanding of scale.

What began as a more expansive and ambitious proposal gradually became more focused and compact, as I came to recognise the importance of working precisely within the urban grain. Small spatial gestures such as shaded thresholds, well-placed seating, or narrow passages that encourage pause can have a disproportionately positive impact on daily life in a dense, transitional urban environment. This shift did not represent a compromise, but rather a deeper understanding that precision matters: that impactful urban nodes are often the result of well-considered, modest interventions rather than grand, sweeping gestures. Designing spaces of gathering required careful attention to scale, context, and movement, and I became more attuned to how people navigate heat, time, and proximity in their daily routines. During then the main question was about how a space can adapt, welcome, and sustain human presence at the right scale.



Fig. 16. Initial Massing (Author)

In the initial massing, the extensive use of steel raised issues due to its high embodied carbon and heat absorption properties, making it less suitable for Dubai's climate.

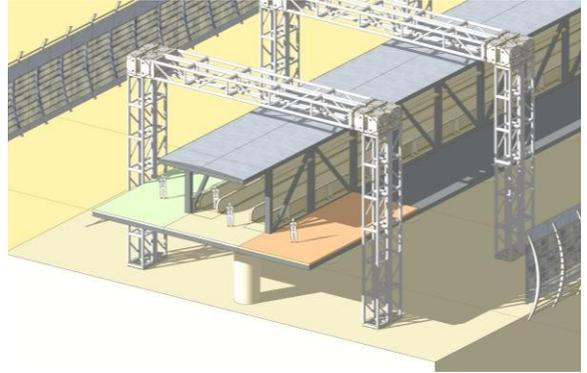


Fig. 17. Initial Expansion (Author)

Additionally, it was overpowering the existing linkway in terms of size and visuals. There was also a question of scale in relation to the programmes as to what exactly were the dimensions needed for these communal activities.

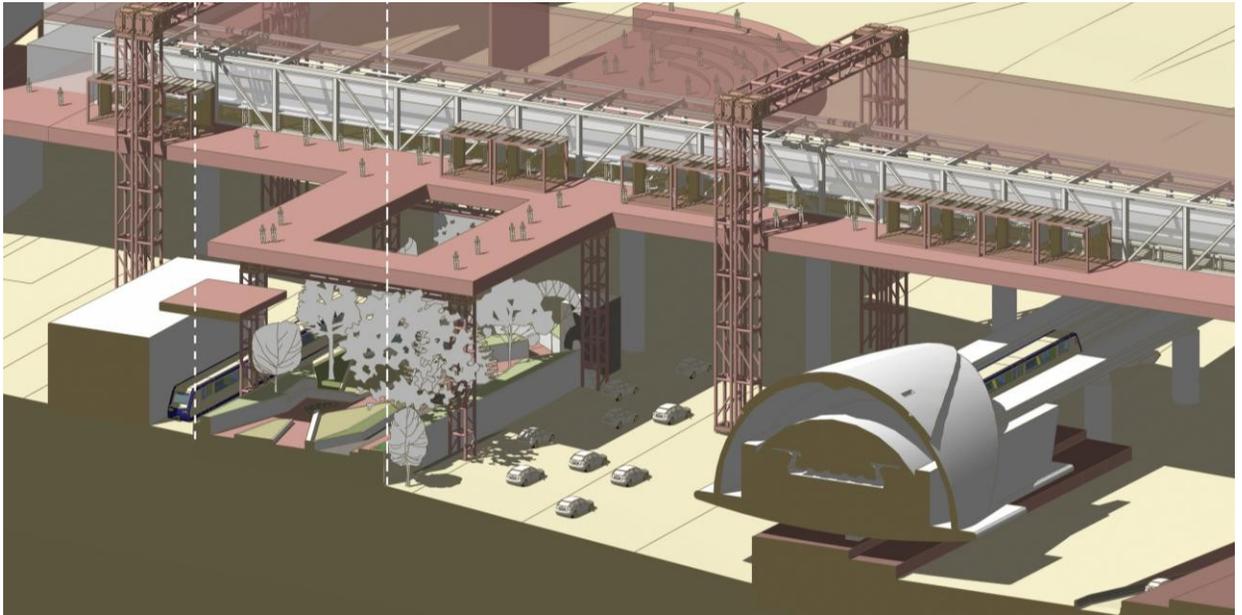


Fig. 18. Conceptual Section of Initial Proposal (Author)

The deck is envisioned to be mostly open and porous to allow for ventilation, the roof at the top is intended for basic shading from the sun. The ground floor extends outwards to the planting strip on the highway and serves as a shaded urban garden that is positioned in between the tram and highway. Although the scheme looks feasible, a closer look into spatial qualities, especially while keeping climatic conditions in account reveals various concerns over its actual usability.

Following this, other alternatives like lightweight composites or regionally sourced stone could be the environmentally responsible solution. Additionally, the exposed truss structure, while functional, gave the design an industrial and bulky appearance. A more refined approach incorporating parametric design or architectural elements inspired by traditional Middle Eastern aesthetics could create a sleeker and more elegant form. The design also appears disproportionately large for the level of public activity it is intended to accommodate, which may result in inefficient use of space. Prioritising more human-scaled elements such as shaded seating, green terraces, and flexible event areas could optimise its usability. Furthermore, the scheme remains heavily car-centric, with its layout emphasising vehicular infrastructure rather than fully supporting pedestrian movement. It is understood that the design would benefit from a stronger integration of regional context and climate adaptation strategies. The use of local materials such as limestone, rammed earth, or traditional stone could help ground the project within its cultural and environmental setting.

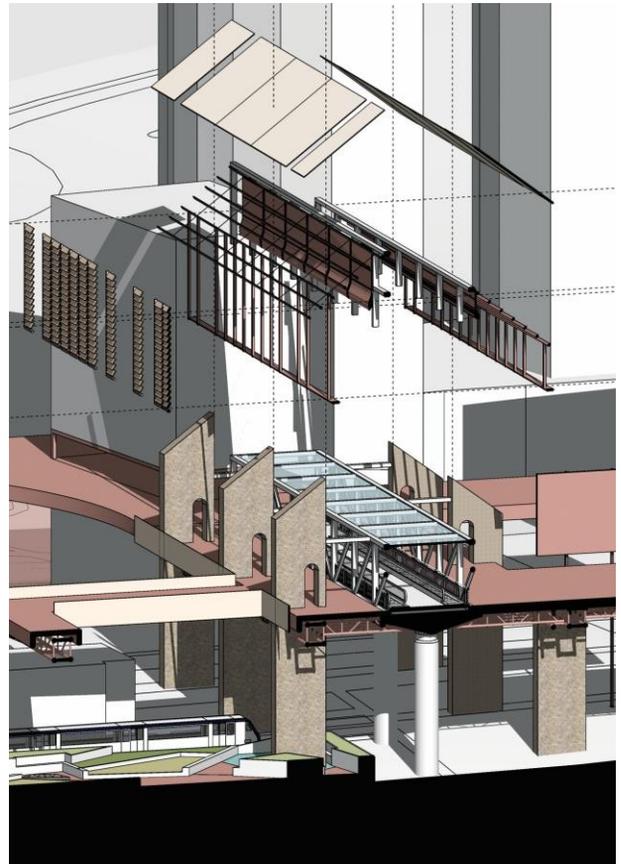


Fig. 19. Material and Facade Exploration (Author)

As the design evolved, it raised new research questions, such as the long-term sustainability of using limestone in construction or the impact of water features on the microclimate. These questions drove further investigation into the environmental performance of materials, water use efficiency, and the life cycle impacts of various design elements.

Additionally, the proposal emphasised rainwater harvesting and thermal massing (instead of traditional passive cooling methods like cross ventilation) to minimise energy consumption, further influencing the research on low-energy architecture and resource-efficient systems.



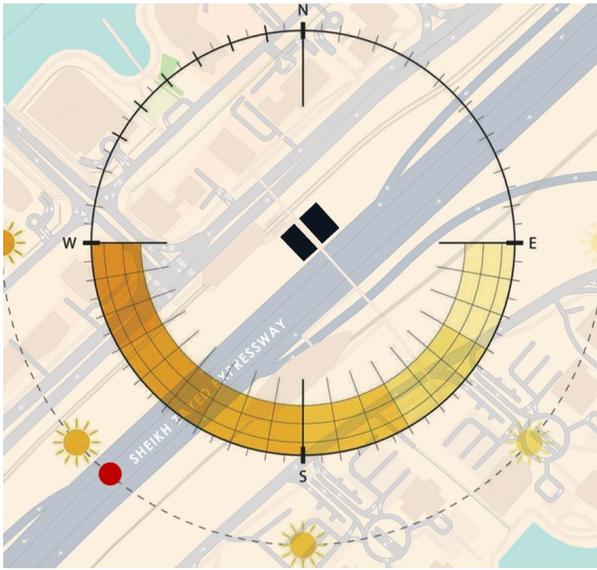


Fig. 21. Sun Path on Site (Author)

Eventually the size of the plot was focussed towards the space directly below the link way as it provided the best access and shade. Two variables which were crucial in the feasibility of a newly injected gathering space in the heart of the metro station's messiness. The sun path above alongside more shadow and form studies helped to orientate and place masses and openings.

More environmental factors were used based on the site studies and readings of similar conditions in gulf cities. The goals and design responses are drawn out accordingly.

In comparison to Dubai's default material palette (steel, glass, reinforced concrete) which leads to high embodied carbon and waste-heavy demolition. The final proposed design demonstrates an alternative paradigm, a mix of biogenic materials like timber alongside locally sourced natural stone (limestone). Through this, the normally extensive use of concrete and steel is minimised. Additionally, construction is made simplified for efficient construction while keeping the idea of "design for disassembly", this ensures that the building is not a complete waste at its end-of-life, but rather a material bank. Timber is easily reusable after deconstruction and due to the size of the limestone blocks, they are able to be broken into smaller pieces for other purposes

Factor	Goal	Design Response
Sun (undesirable)	Reduce heat gain	Orientation, shading devices , reflective surfaces
Wind (desirable)	Enable passive cooling	Indirect capture , filtering, wind towers
Sandstorms (problem)	Minimize dust infiltration	Filtered air paths, angled openings, screens
Thermal mass	Delay and reduce heat transfer	Heavy materials , insulated envelopes
Behavioural Patterns	Create habitable resting areas	Oriented to views, secure, peaceful, thermally comfortable
Form efficiency	Reduce solar exposure	Compact, courtyard , stepped massing

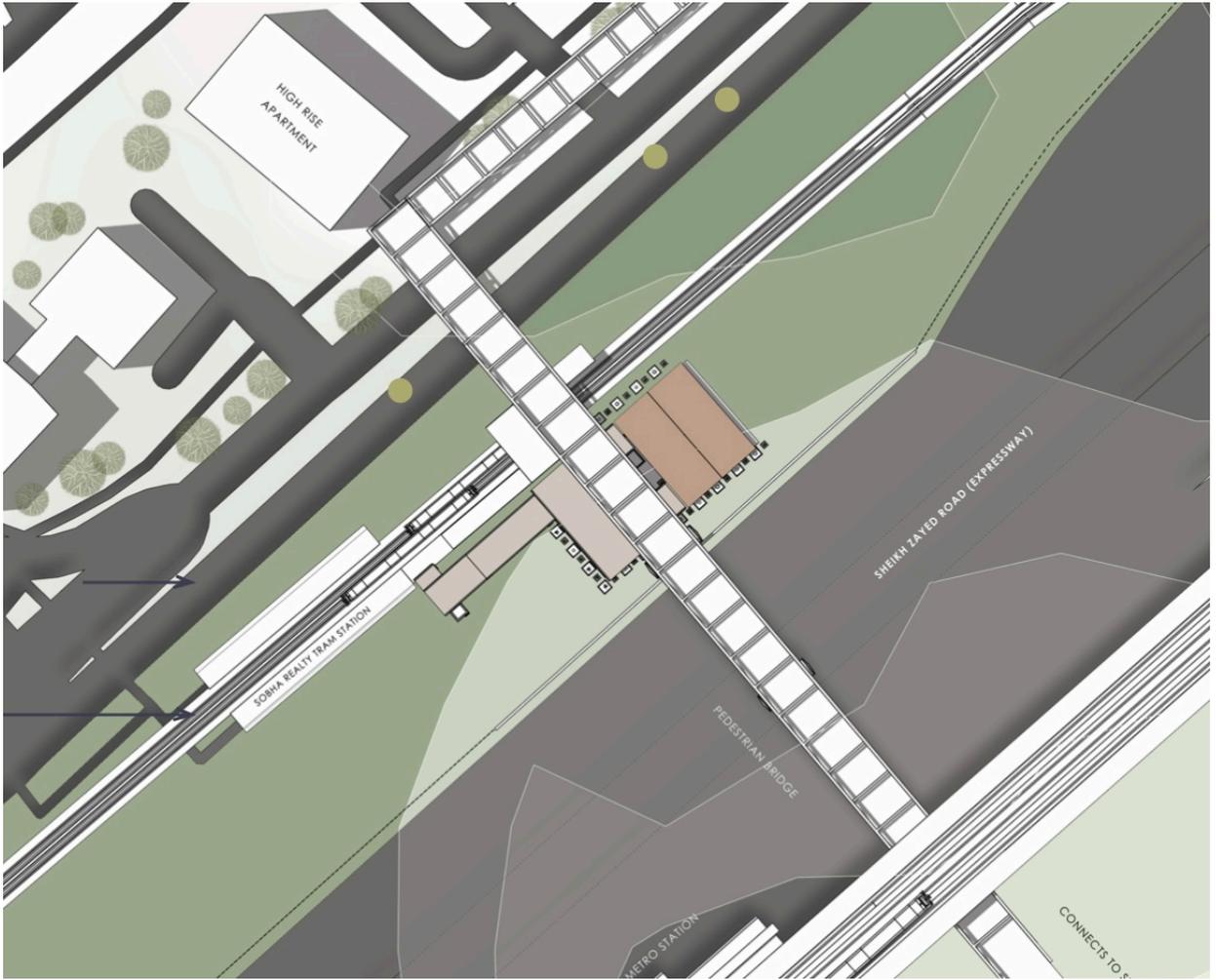


Fig. 22. Final Proposal Site Plan (Author)



Fig. 23. Final Proposal Section with Annotated Climate Strategies (Author)

Throughout the design phase, I've also come to recognise a fundamental tension in architectural discourse: while it is often far easier to critique urban planning failures in theory, it is significantly more difficult to propose grounded, implementable interventions that genuinely address those failures I've stated. Theoretical frameworks and research alone do not necessarily provide clear pathways for design action. As designers and students, we must be conscious of this distinction and remain humble in our proposals, understanding that speculative or idealistic visions must also contend with logistical, cultural, and political complexities if they are to move beyond the drawing board. During the critical stages of design development stage, I faced several technical and ethical challenges that further complicated my initial assumptions. Concepts like cooling pipes, water roofs, and thermally responsive materials appeared promising in theory, but translating them into a feasible, maintainable, and context-appropriate system proved far more difficult. It became clear that achieving thermal comfort in Dubai's extreme climate requires not just technological intervention, but a careful integration of material behaviour, energy infrastructure, and long-term maintenance capacity, factors often overlooked in conceptual proposals.

Similarly, addressing socially embedded issues, such as the creation of safe and inclusive spaces for women, exposed the limits of what architecture can control. While spatial design can foster conditions for safety, through visibility, lighting, enclosure, and access, it cannot independently dismantle deep-rooted socio-cultural hierarchies or ensure behavioural change. These realisations have underscored a crucial lesson, that architecture must not only aspire toward transformation, but also remain honest about its limitations. Rather than seeking total solutions, I've come to see the value in incremental, carefully situated interventions that work in tandem with policy, community engagement, and cultural understanding.

4. How the academic and societal value, scope, and implication of the graduation project (including ethical aspects) is being assessed

Academically, the project offers valuable contributions to both sustainability in architecture and social justice in urban design. The integration of passive cooling strategies, eco-friendly (regionally-sourced) materials, and green infrastructure into the design framework could provide newer examples of how regional architecture can be part of climate adaptation in cities with extreme climates, in Dubai's case a hot arid climate. This addresses the omnipresent environmental sustainability gap in urban planning by emphasising resource conservation, energy efficiency, and climate-responsive design in public spaces. Although it is not a new topic, there has not been much research on this front as arid climates are not commonly found in most global cities.

On a societal level, the project contributes to the growing recognition of how environmental sustainability and social inclusion are deeply intertwined. The design intervention is intended to be more than an aesthetic response but also a socially responsible one, that is to create walkable, climate-comfortable spaces that foster community well-being, regardless of social class. The proposal is rooted in the belief that urban environments should serve all residents equitably, with particular attention paid to the marginalised migrant workforce and expats, who often face challenges in accessing quality public spaces. The sustainable design solutions not only respond to Dubai's environmental conditions but also enhance public health, particularly by reducing heat stress and offering spaces for relaxation and social interaction.

From an ethical standpoint, the project aims to counterbalance the socio-economic divide in Dubai's urbanisation model by ensuring that marginalised populations have access to public spaces that are not only safe but also climate-resilient. The ethical implications are closely tied to the design's commitment to inclusive urban spaces that consider environmental justice alongside social justice. By fostering spaces that prioritise green infrastructure and energy-efficient design, the project tackles both the climate crisis and the spatial inequality seen in Dubai's profit-driven development model.

5. How the value of the transferability of the project results is being assessed

The project holds potential for transferability, particularly in rapidly developing, car-oriented cities facing similar climatic and social challenges in the Middle-East. The concept of repurposing transport infrastructure and using it as a gateway to community-oriented, climate-adapted public space is adaptable to other urban contexts with underutilised transit corridors or single functional infrastructure. While the design is tailored to Dubai's socio-political and environmental conditions, the methodological framework in this case which is combining human-centric analysis with sustainable design can be applied elsewhere. Furthermore, the passive cooling strategies and modular green deck typology are scalable and replicable, offering a versatile toolkit for inclusive urban transformation in arid and semi-arid regions.

In a summary, the project advocates for the idea that urban spaces should not only meet human needs but also respect the environment, making this approach a model for future urban developments in similarly hot and resource-scarce regions.

Current Research Questions:

- How can passive climate-responsive design strategies, such as operable facades and the use of locally sourced materials (limestone), be effectively integrated into Dubai's urban public spaces to mitigate the impacts of extreme heat and enhance the climatized spaces?
- What role can new infrastructure and green public spaces play in fostering social inclusion and improving walkability in Dubai, particularly for marginalised communities such as migrant workers and expats?

In conclusion

Ultimately, this research helped me realise that meaningful urban transformation in cities like Dubai may not begin with large-scale policy shifts or mega-projects but instead with small, spatial negotiations that challenge how infrastructure is used, who it serves, and how it can be repurposed to support environmental and social justice. The inverted green deck became more than just a design solution, it became a lens through which to reimagine neglected spaces as agents of change. The point of which to reimagine what already exists in the city and introduce a thoughtful way of giving the migrants and expats the space to support their social and emotional wellbeing.

The process of design has also taught me how to position design not just as a visual or formal act, but as a spatial negotiation, especially in environments shaped by exclusionary policies or opaque governance. It has deepened my appreciation for subtle, adaptive reuse strategies that are not outwardly extravagant form-wise and this grounded my belief that infrastructure can be both utilitarian and symbolic, a tool for connection and equity.

More personally, it challenged me to confront the ethical dimensions of architecture. In a city like Dubai, where economic performance often overshadows environmental and social priorities, there is a growing need for projects as such to reaffirm the importance of critical design, one that values inclusion, environmental impact, and everyday urban experience over spectacle.