

Connecting Hatfield  
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DPD 801

# Abstract

Access to basic goods and services and social interaction is a vital foundation for a cohesive urban environment (Miciukiewicz & Vigar 2012). Urban mobility enables access to resources and also shapes the daily encounters and societal experience within the city (Miciukiewicz & Vigar 2012). Urban mobility can then be seen as transport and access to goods and services but also as an important component of connectedness to different human networks and spaces of social integration (Miciukiewicz & Vigar 2012). Places such as transport interchanges, bus stops, underground trains, and buses are public spaces where individuals and groups can establish and negotiate meanings, cultures, and identities (Miciukiewicz & Vigar 2012).

The country's public transport system has many problems, and some of these issues can be traced back to the spatial planning policies that were put in place prior to South Africa becoming a democratic country. This has resulted in people residing far away from cities, where the majority of job opportunities are available. This project looks at how we can we spatially integrate public transport systems in Hatfield in a way that can foster social capital. Social capital is defined as the networks, norms, shared beliefs, relationships that facilitate cooperation and collaborative action for mutual benefits (Bhandari and Yasunobu 2009). This can be achieved through implementing an interchange hub. An interchange hub is an area where people and cargo can be moved between different transportation modes. They usually consist of different types of transportation facilities such as train stations, bus stations, bus stops, trams and airports (SMMR 2023). But how can we design an interchange hub that meets the needs of the people of Hatfield. This project focuses on middle-income case study of Hatfield, City of Tshwane, South Africa.



Figure 1 : Map of Hatfield (Masu 2023)

# Project Brief

Hatfield is a suburb in Tshwane and is considered a vital institutional and business district. It has developed and become one of Tshwane's important metropolitan nodes, it has retail, commercial offices, education components and mixed use developments. Over the last few decades Hatfield has undergone a tremendous transformation in regards to the road networks, transport systems, population, business and economic profile (DHK et al 2020). It is made up predominantly of students (DHK et al 2020).

Hatfield has multiple public transport systems that operate within its boundaries but there is a need to have them more integrated. An interchange hub will be able to combine all these systems into one, which will make it simpler

for commuters to access a variety of sustainable public transportation options within walking distance and improve circulation efficiency across the precinct (DHK et al 2020). Each mode of travel takes the commuter to different routes and places, but through synchronising the system it would be to the benefit of the commuters as it would be possible to travel smoothly.

Human interactions occur in space. For this reason, many understood that human behavior and action have a relationship to the environment in which they are positioned (Descalu 2013) and the public spaces we create can have a long-lasting effect on how connected individuals are to their communities. An interchange hub can be considered a public space or gathering point as



Figure 2 : Sketch of daily life (Masu 2023)

public transport involves travelling with others and therefore provides opportunities for social interaction. Therefore the design of the built environment can affect how social capital is formed in public areas (Sloan 2020).

The vision is to create an interchange hub in Tshwane that does more than just commute people from one place to another. The purpose of the interchange hub is to allow commuters to seamlessly connect between different transportation modes to facilitate multi-activity patterns but to also allow for strong social connections to be formed, contributing to the social fabric of Hatfield. The intention is to promote public transport as a preferred mode of transportation, even for those that own a vehicle.

“How can we spatially integrate public transport systems in Hatfield in a way that can foster social capital?”

Urban mobility is more than just moving goods and people, it encompasses different human networks and social spaces. Public interchanges serve as public spaces where human connections can take place. Architecture can't force people to connect; it can create the spaces for people to interact. Architecture holds the potential to set the stage for these encounters and social interactions, thus nurturing community building and influencing the fabric of our social culture. When public spaces are well-designed and managed, they can encourage people to interact with each other, form connections, and build trust (Sloan 2020). This, in turn, can contribute to the development of social capital and strengthen the social fabric of a community.

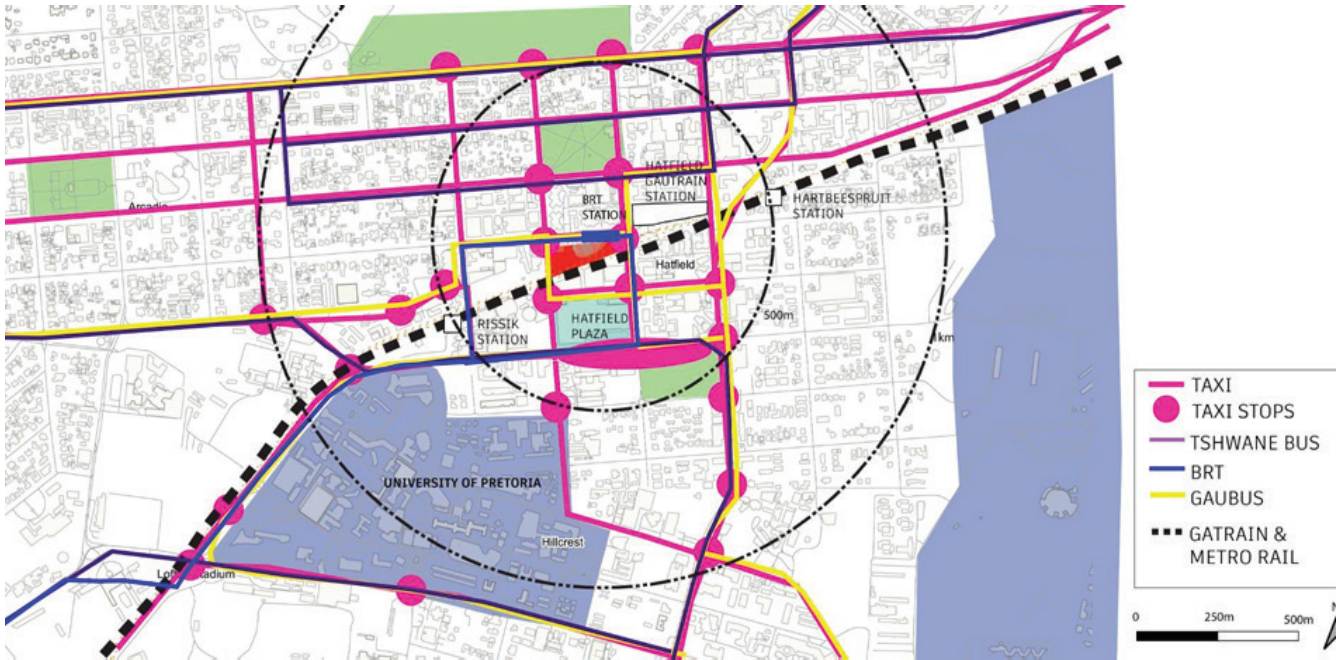


Figure 3: Public transport map (Masu 2023)

The site is the existing Gaibus station and the railway tracks. The site is well connected with multiple different public transport systems, such as the Gautrain rail, the Prasa rail, the BRT, the Re Yeng bus service, Tshwane bus service, taxis, rental cabs and e-hailing services that overlap each other around that point (figure 3). This then became the ideal site to create an interchange hub.

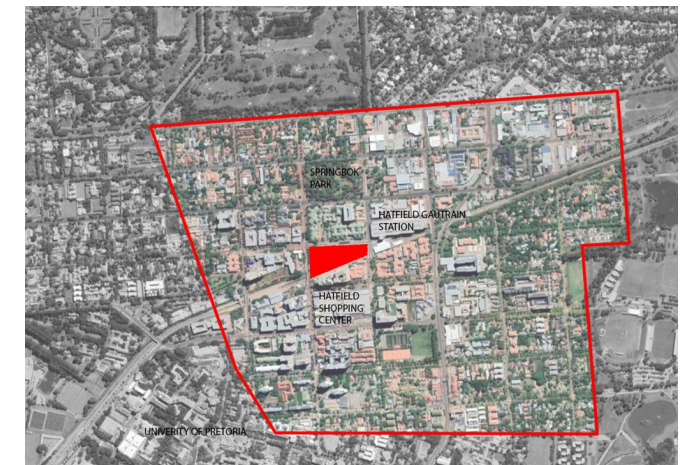


Figure 4: Location of site in the greater context (Masu 2023)



Figure 5: Site, Gautrain bus station (Masu 2023)

SITE: 20 410.40SQM  
ZONED: SPECIAL + RAILWAY

# Concept

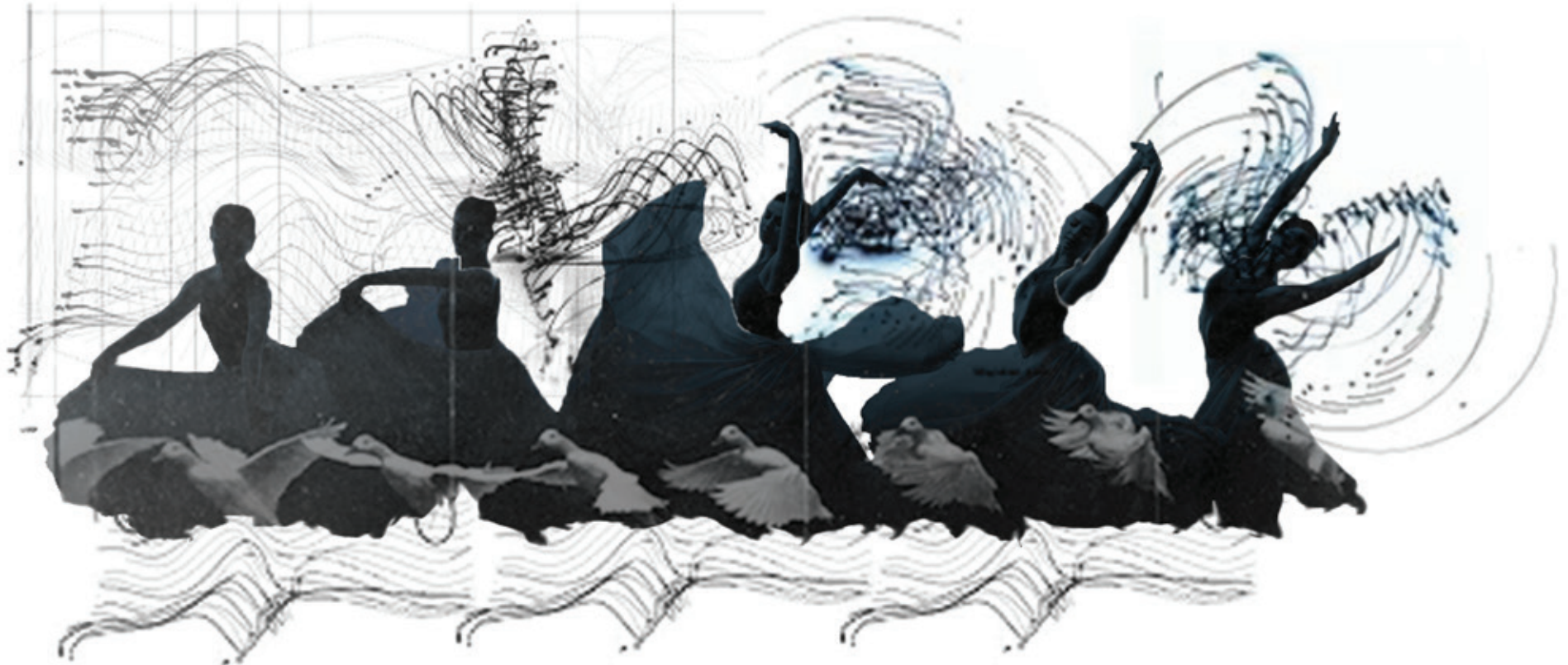


Figure 6: Image portraying movement (Masu 2023)

The idea is movement, architecture can express movement—or in other words imply, convey or embody movement— without actually moving, like when a form or space is sensed as dynamic. Movement refers to the use of motion in the design of buildings. It can either refer to the physical movement of people or the visual movement created by design elements in the building. The purpose is to create a feeling of flow and experience for the users of the space looking at both the physical and visual aspect of movement.

# Urban integration

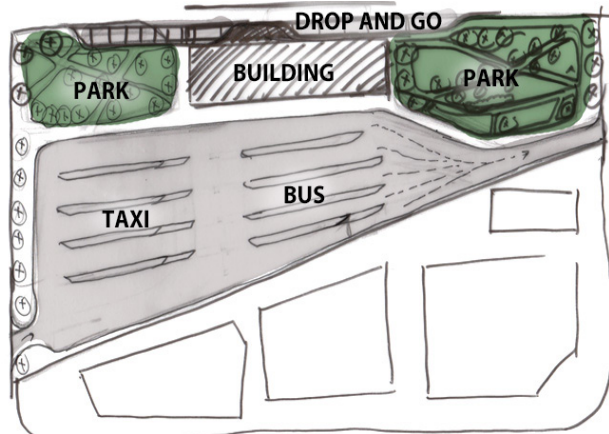


Figure 7: Urban design plan A (Masu 2023)

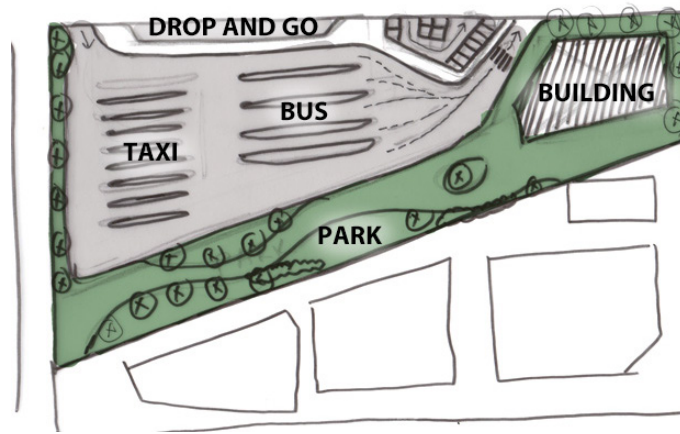


Figure 8: Urban design plan B (Masu 2023)

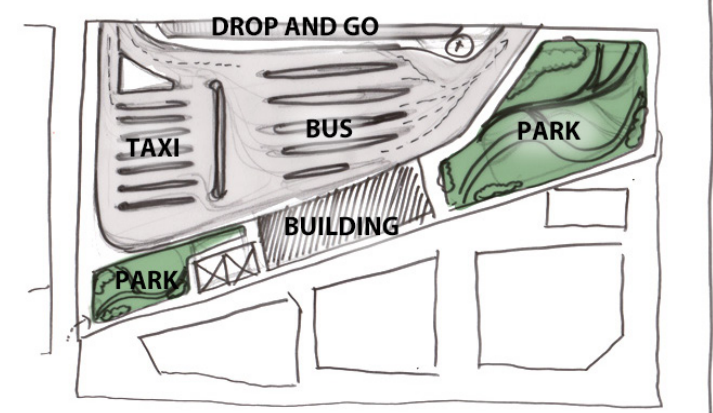


Figure 9: Urban design plan C (Masu 2023)

Interchange hubs are not just places where travellers arrive or leave anymore. The surrounding facilities and amenities of the hub can attract visitors, stimulate economic growth in the area, create new sources of income, and improve overall prosperity.

The site of the interchange hub spans over the railway tracks and connects the north and south side of the site, removing the barrier between them. In the first iterations (figure 7,8 & 9) of the design of the interchange hub, locating the building on the site was the focus of the design. Balancing the location of the park and the interchange hub. What was noticed in these iterations is that each layout started creating islands on the site, creating a large separation from each side of the site. The focus in these iterations was on the vehicle and not on the human experience, and what was meant to be a public space for all turned into a parkade for vehicles.

Seeing this happen, it required a different approach to how to design the interchange hub and not how we currently experience them in our everyday lives. Therefore the last iteration (figure 10) was to design the interchange as a public park, and hide the interchange. Focusing more on the individual and less on the vehicle. The focus was on removing obstacles and creating a natural public space rather than just developing an architectural object to address infrastructural needs. A park that connects two previously divided sides has replaced a physical barrier and created a unique and attractive public space.

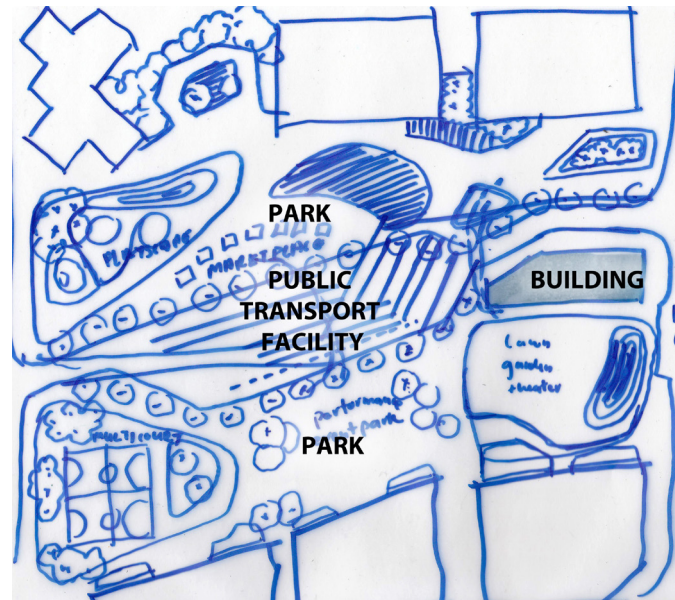


Figure 10: Urban design plan D (Masu 2023)



Figure 11: Aerial view of the Logrono station (Archdaily 2023)



Figure 12: Aerial view of the Logrono station (Archdaily 2023)

This project took inspiration from the Logroño Intermodal Station project (figure 11). The proposal was to bury the train as it passed through the city and stitch together a spatially segregated urban fabric through a park and going beyond the program of a train and bus station. It is an urban park that sits over railway tracks and has the bus and train station underneath it (figure 12).

What the design became then is a large public park that has an amphitheater, children's park, informal market space, retail court and the interchange hub buried under the park (figure 13). Integrating the public environment with a vehicle orientated infrastructure .

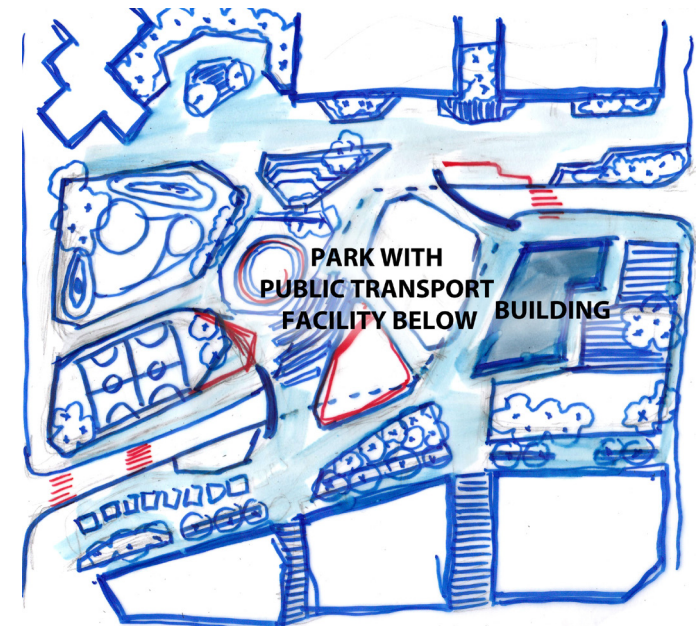


Figure 13: Urban design plan E (Masu 2023)





Figure 14: Final Urban design plan (Masu 2023)

The final urban design of the interchange hub and public park (figure 14). The interchange hub separates the shops from the building creating a retail plaza. Breaking down the idea of creating a mall type building and incorporating a series of spaces.

Figure 15: 3D of urban design plan (Masu 2023)



# Design

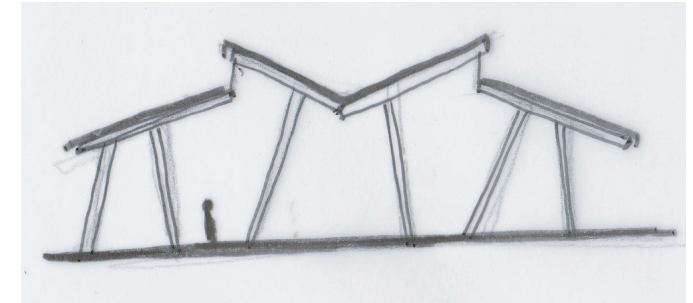
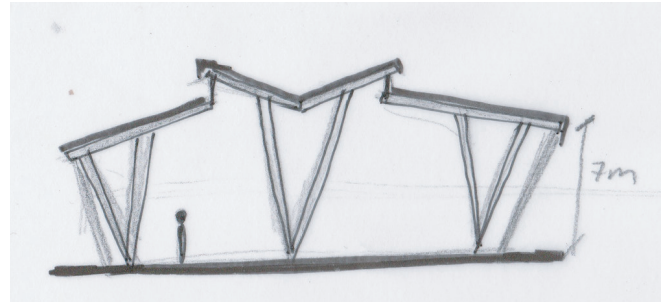
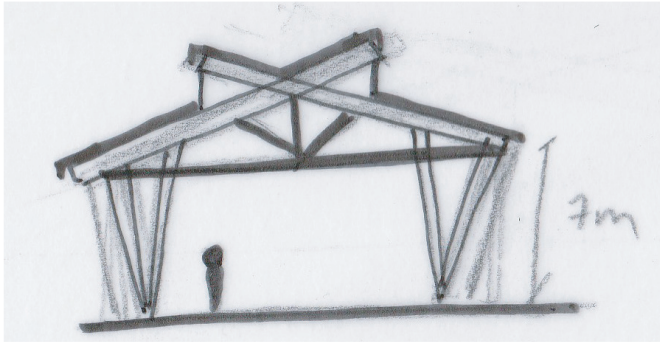


Figure 16: Hand drawn sketches possible design of the interchange hub (Masu 2023)

The intention of the interchange hub is to serve as a transportation node but also foster social interaction. Existing interchange hubs tend to be warehouse in structure and lack the softness needed to create spaces for people to interact. Therefore this interchange hub differs from what is the norm and is designed not to look like infrastructure and rather encourages social cohesion and also incorporates additional social functions

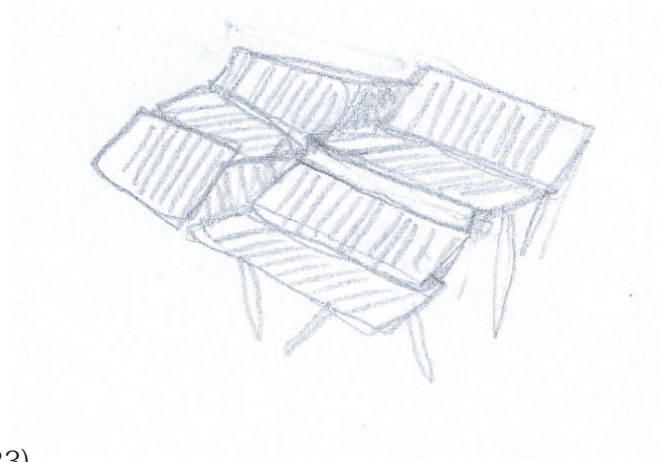
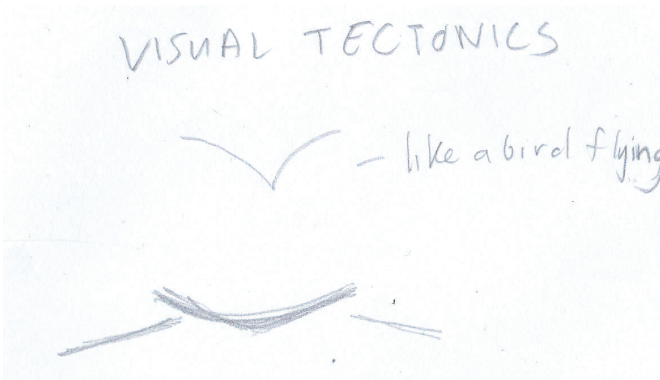


Figure 17: Hand drawn sketches concept (Masu 2023)

The design of the building is for it to be distinctive and to be easily read as an important node as it is the public transport gateway into Hatfield. The visual tectonics of the design is for it to mimic a bird flying which allows the roof to undulate and is a similar typology found with other interchanges hubs around the world (figure 17).

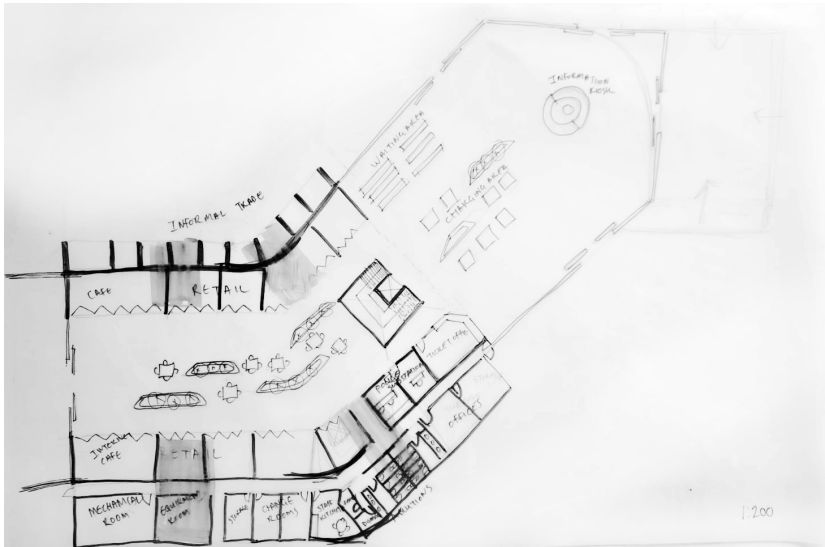


Figure 18 :Initial floor plan (Masu 2023)

The initial design layout (figure 18 & 19) was a building that incorporated all amenities within and is angled to the interchange hub, this design layout was connected to the initial urban design layout.



Public transport Facility

Figure 20 :Sketch of final design floor plan (Masu 2023)

Once the urban design layouts changed the building design also changed. The new building was now incorporated into the interchange hub, as the interchange hub was buried under the park (figure 20 & 21).

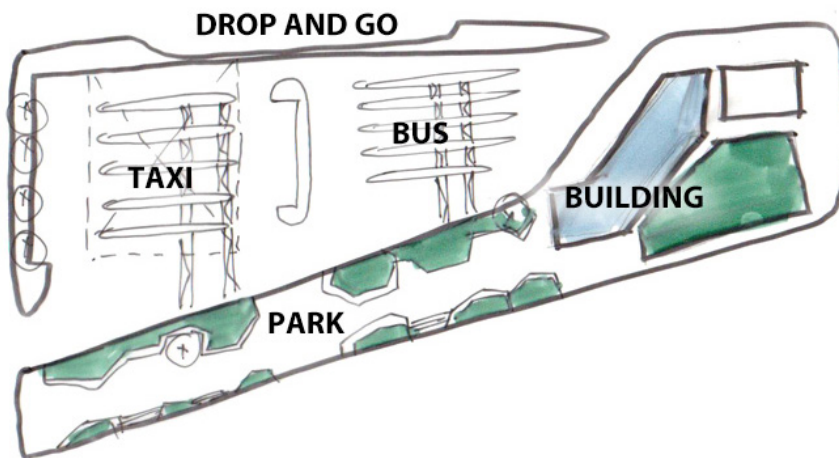
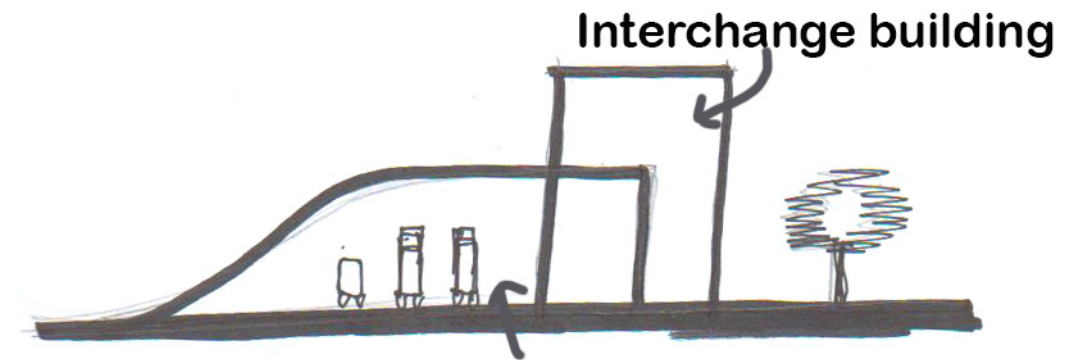


Figure 19 : Initial Site plan (Masu 2023)



Public transport facility

Figure 21 : Conceptual section through interchange hub (Masu 2023)

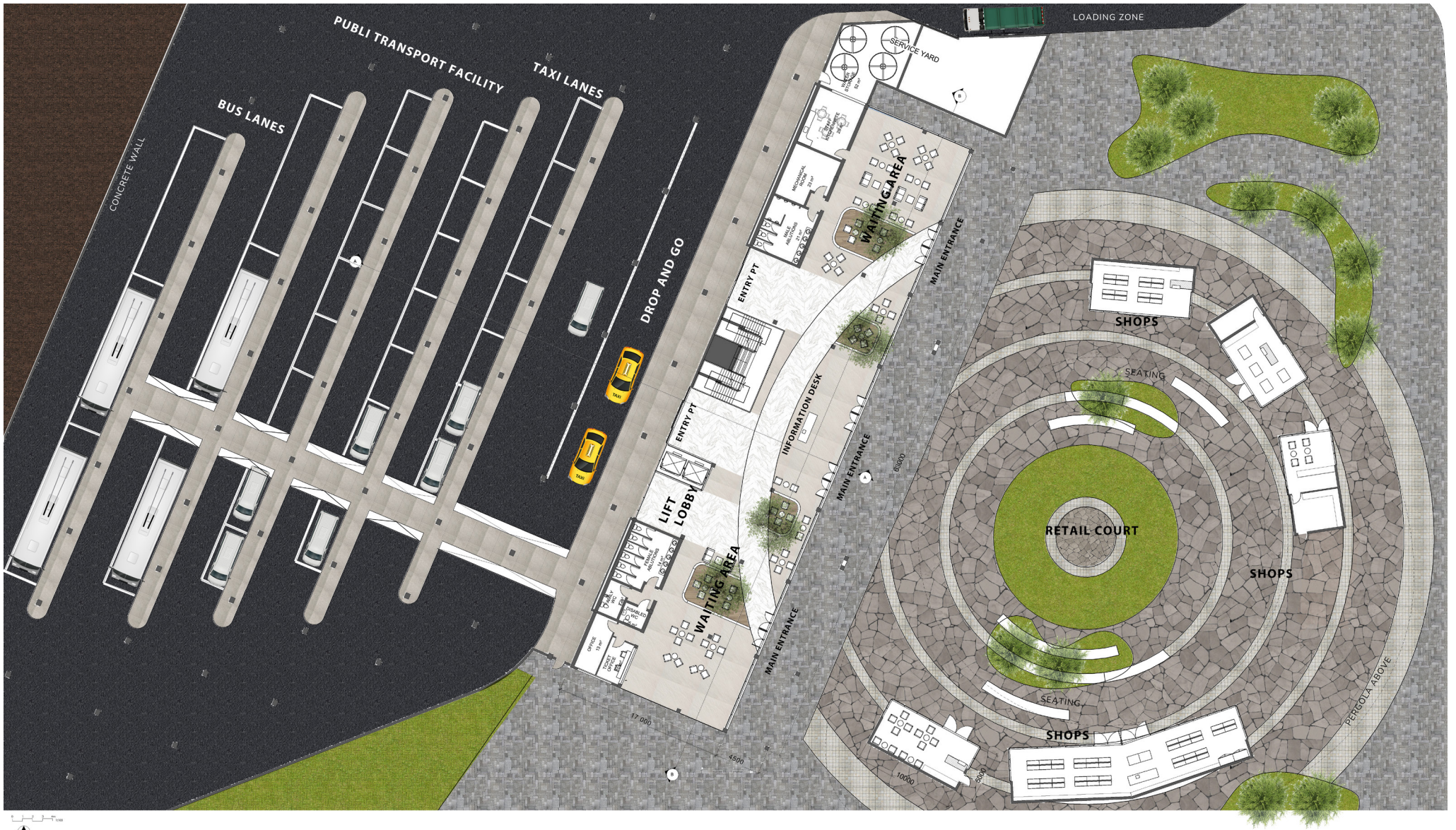


Figure 22 : Ground floor plan of final design (Masu 2023)

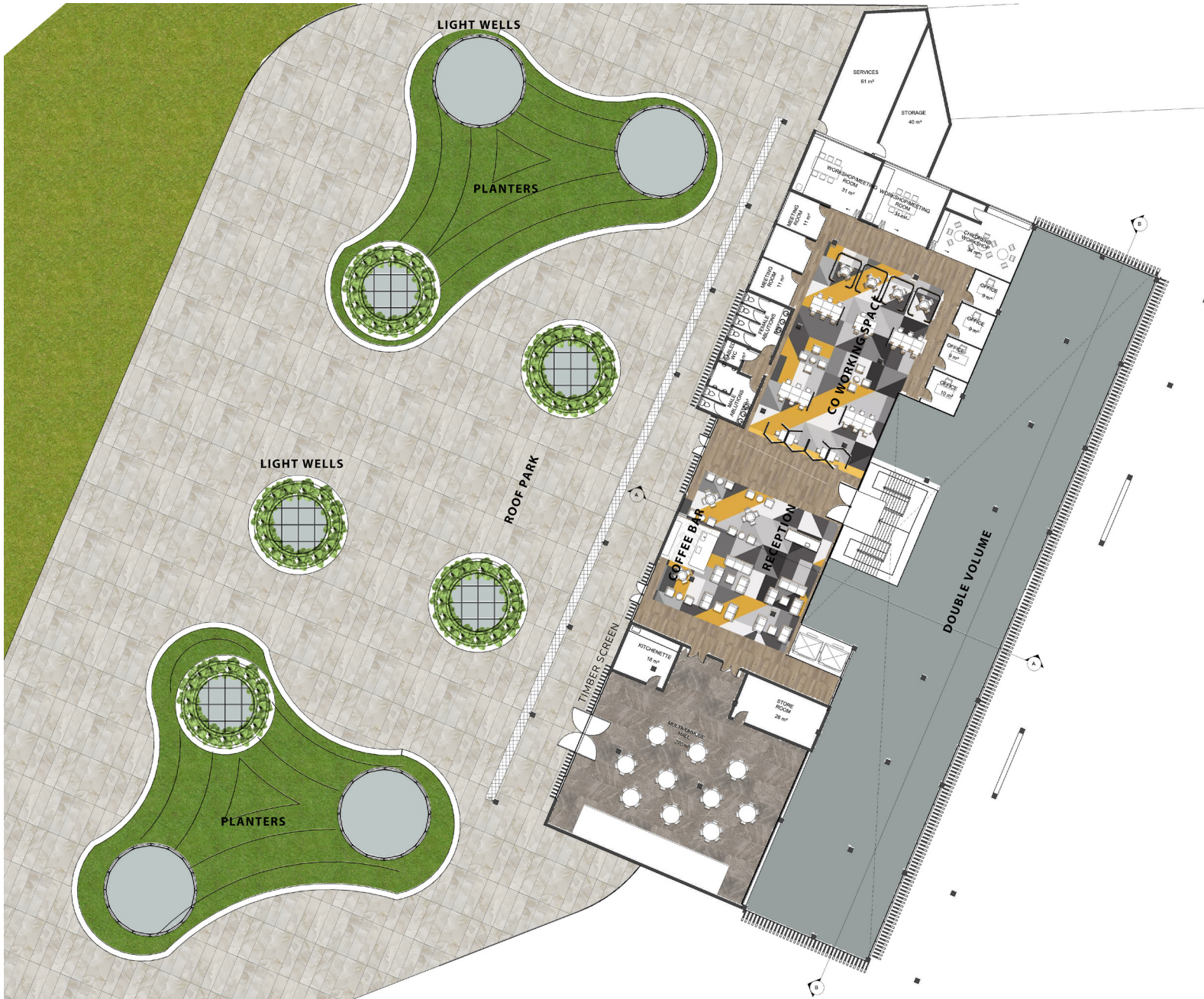


Figure 23 : First floor plan of final design (Masu 2023)

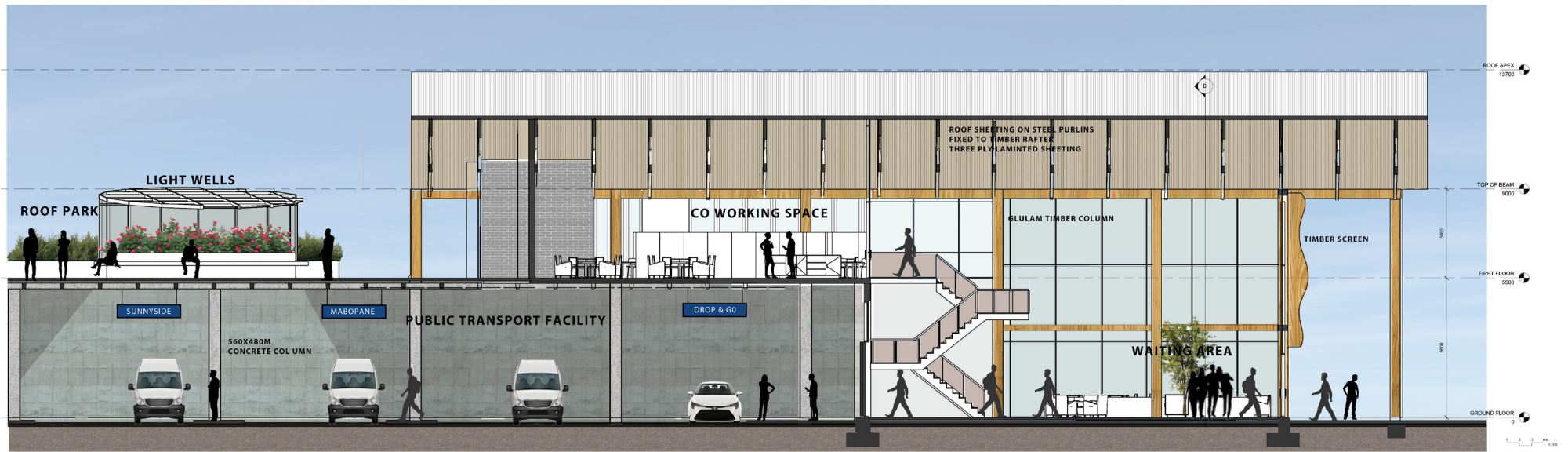


Figure 24 : Cross section A-A through interchange of final design (Masu 2023)



Figure 25 : View of the building from the retail plaza area (Masu 2023)

In order to create a series of spaces and avoid creating a monolithic building, the retail shops were removed from the building and placed in front of the interchange in the retail plaza, an area where anyone can easily access the shops. This contributes to different pockets of spaces where social interaction can take place (figure 25).



# Technical integration

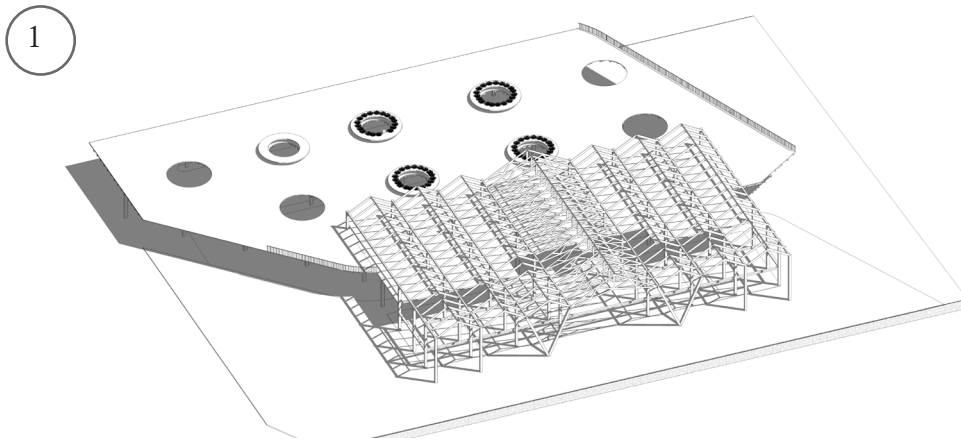


Figure 26: Glue-laminated columns and beams structure (Masu 2023)  
The primary structure of the building is made up of glue-laminated timber columns and beams and underneath by the public transport facility is concrete columns and a waffle slab. Timber being more sustainable and environmentally friendly as compared to steel.

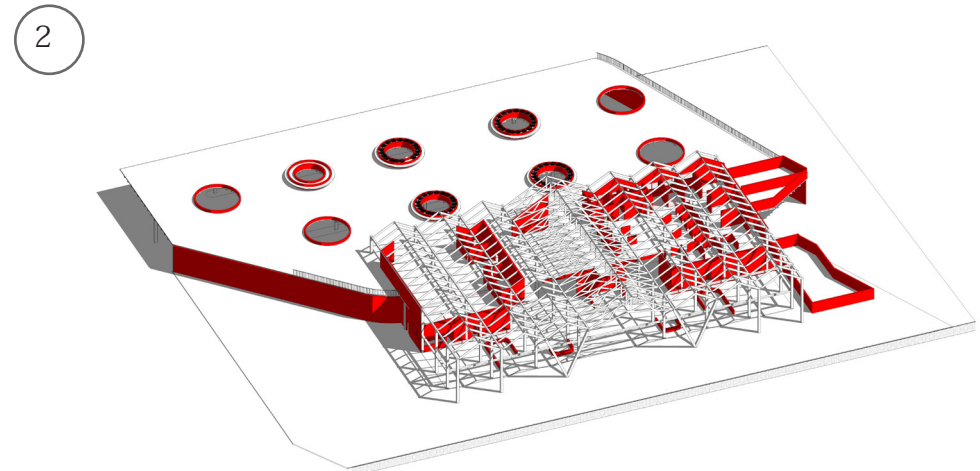


Figure 27 : Secondary brick work structure (Masu 2023)  
Next is the brickwork that acts as the secondary structure, supporting the slab.

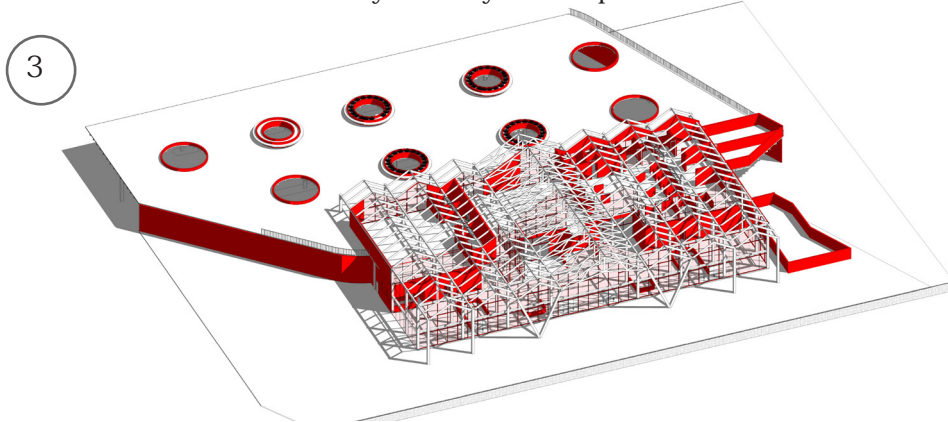


Figure 28 : Curtain wall and dry wall infill (Masu 2023)  
The infill being the curtain wall and drywall.

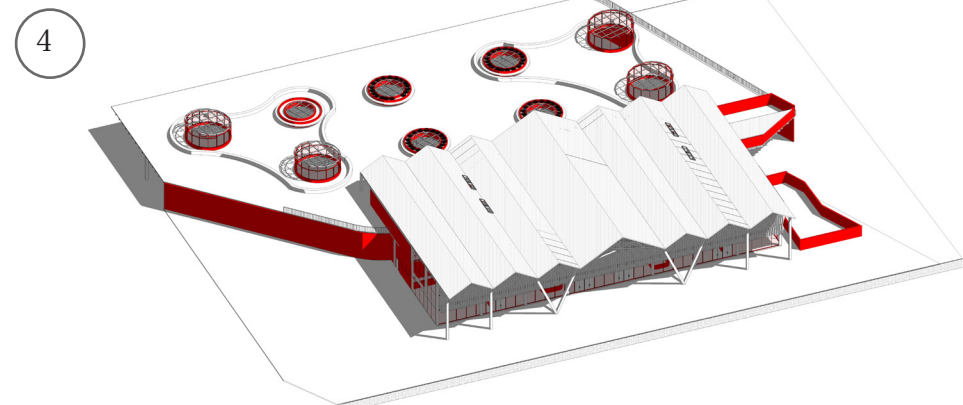


Figure 29 : Complete structure (Masu 2023)  
And lastly the steel roof structure.

# Reflection mini project

The intuitive nature of the mini project had an impact on the rest of the main project. I did not have any preconceived ideas of what the project should be and this can be seen through the multiple iterations and differing design outcomes. The intuitive style of coming to a design allowed for a more organic process to take over, something that I'm not used to. Allowing the mind to wander.

The focus of the mini project art installation was to design for experience, as architecture is an experience (figure 28). The intention is to focus on human centric design. Architecture has multiple factors that play a role in shaping that experience, and this sentiment carried through into the major project.

A social and more human centric approach was taken in defining the project, specifically designing for social capital. In order to create an environment that can foster social interaction, it requires a focus on design being human centric, looking at the differing elements that can shape experience which was the focus of the mini project. By offering places and opportunities for people to come together, architectural design adds to the social fabric of a community and helps to strengthen social links and connections. We should be designing in a way that considers that everything is within a ecosystem and to find a balance that can lead to harmony.

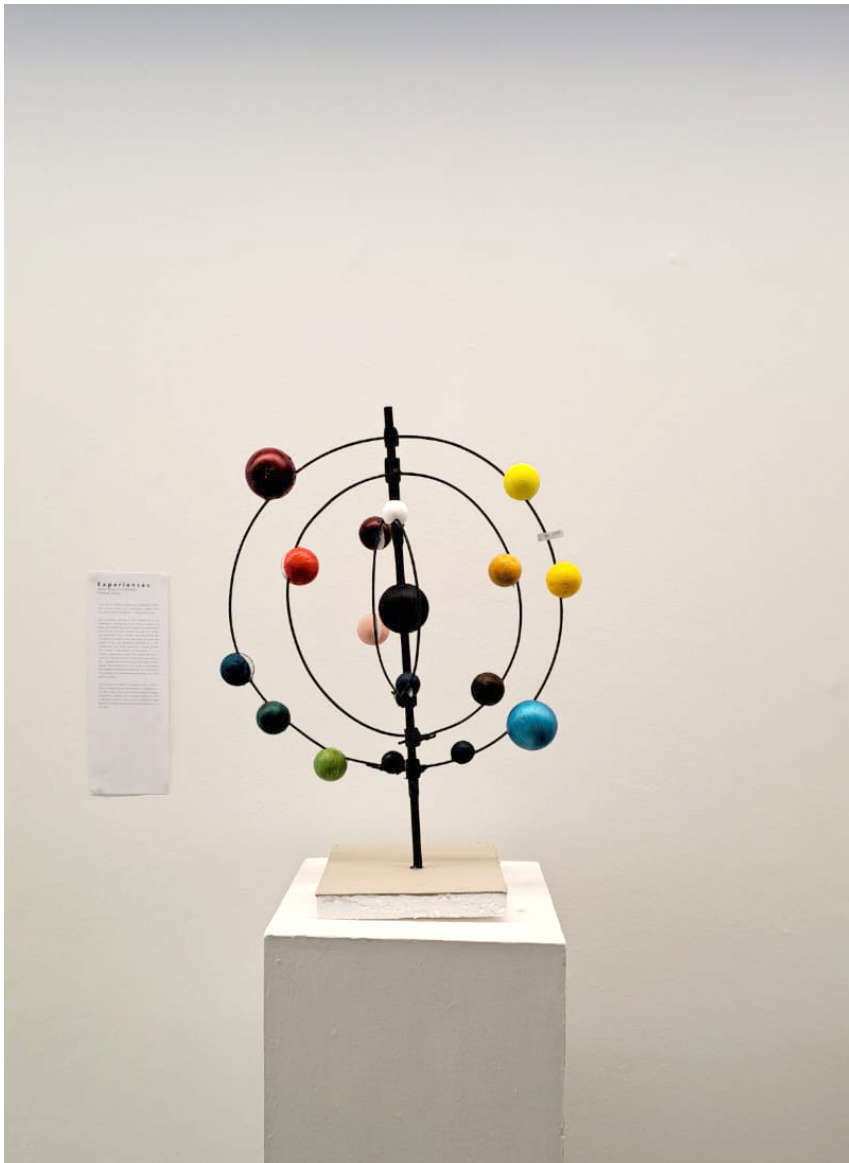


Figure 30 : Mini project installation (Masu 2023)

# Reflection Major project



When I first started the project I wanted to look at transportation or social design. Initially I wanted to design a train station and realised that there wasn't a need for that in Hatfield. This led me to look at the current transportation networks in Hatfield and I realised there is a disconnect between the different transportation systems that a large part of the population use to navigate their lives. This brought me to the idea of designing an interchange hub, a necessary modern transportation system that promotes connectivity, efficiency, sustainability and improved quality of life for individuals and communities.



There were many challenges to address to try to marry the concept of mobility and social capital together. Architecturally I was hoping to have a series of smaller buildings as the outcome but I think the current scale and use was more appropriate for the context. The focus of the project required me to rethink the way we currently experience interchange hubs as warehouses with parkades, but rather as an opportunity to build social cohesion. Currently buildings and the urban environment in Hatfield do not respond to social capital and its seen through the lack of public social spaces. It is a highly privatized community. This project set out to design a spaces that contribute to the social fabric of Hatfield. Architecture has the power to shape social capital by influencing the way people interact with their built environment.

I learnt a lot from this experience, it challenged my understanding of designing social spaces. Addressing the social capital aspect changed the design outcome of the project, and this came as a surprise. Going forward I'll be challenging the status quo more and try design in a more holistic way.

Figure 31 : Interior view of interchange hub  
(Masu 2023)

# Conclusion

How can we spatially integrate public transport systems in Hatfield in a way that can foster social capital?

The intention of the project was to design an interchange hub that allows for social interaction and contributes to the social fabric of Hatfield. This requires a change in perspective on how we currently design interchange hubs. This project has challenged how interchange hubs are currently experienced and designed in the South African context by putting more emphasis on the user experience and not the vehicle. Social capital became the driving force of the design that led to an urban framework that became a public park and softened the rawness of an interchange hub. A well-informed approach to an interchange hub can reshape the public's image of public transportation and through design create spaces that are inclusive and allow for social interaction between varying user groups in the public transport sector. Therefore providing safe, convenient and affordable public transportation is essential for the socioeconomic development of the people of South Africa. By bridging barriers across various communities and socioeconomic groups, interchange hubs can provide accessibility to jobs, educational opportunities, and basic services. They contribute to social inclusion and mobility for all.

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## Images

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