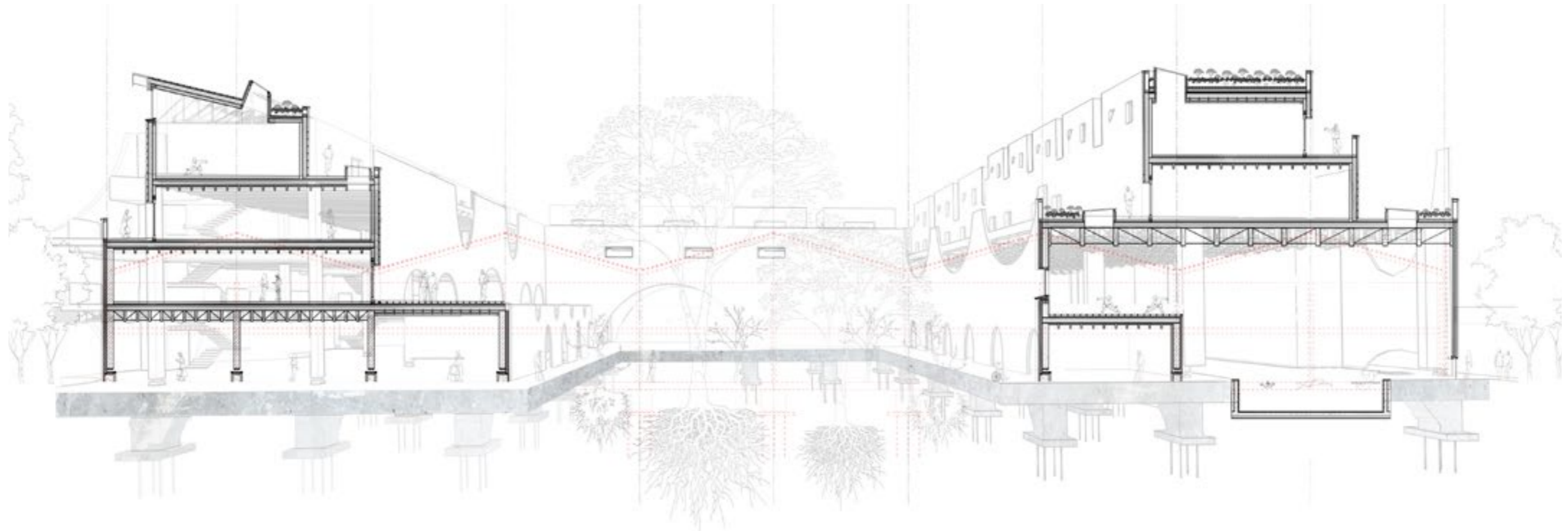


## Fragmentation in an era of Climate Emergency: Finding an appropriate approach to density

 Protection & Re-use of Existing Assets, Sprawl Repair, De-Zoning Land



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I would like to thank my best friend, life companion and future husband, Victor, for the unlimited support and unconditional love, I am here today because of you. Thank you for teaching me that I must believe in myself, stop procrastination and just be who I am. I cannot thank you enough.

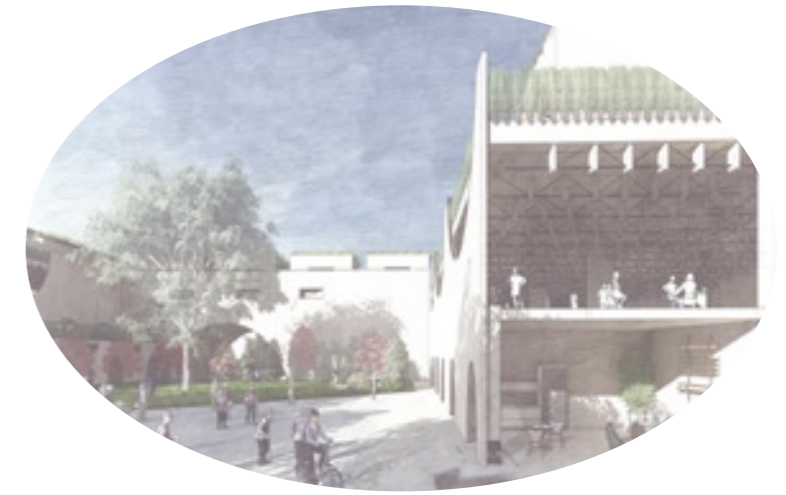
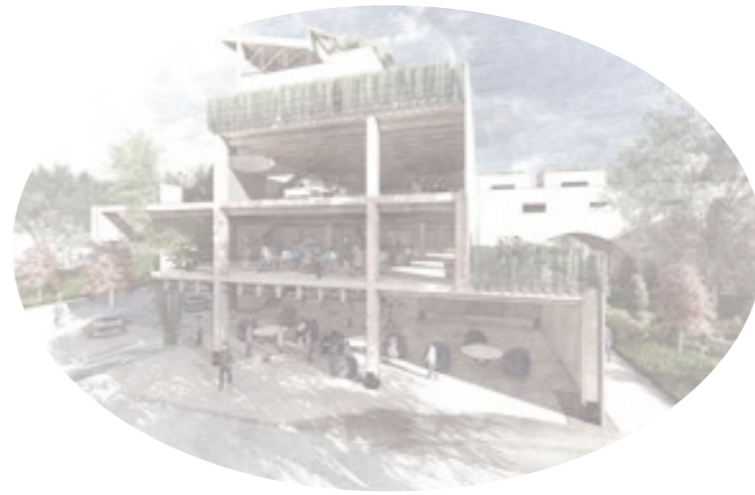
I would like to thank my family from Romania, for the support into taking the decision of moving here, and for all the support throughout the years, both emotionally and financially. I very much appreciate your efforts. And lastly, I would like to thank my dog, Lip, the border collie, for changing the atmosphere over the past year and a half, I won a best friend for a lifetime, thanks for all the joy and happiness during tough times. And finally, Red Hot Chilli Peppers, thanks for the amazing new albums that kept me going through this final year of thesis.

This thesis book focuses on the housing typologies in Ireland and the Land-Use Zoning systems, going then into the demographics and infographics, taking the Tolka Valley Area as a testing ground.

The investigation concerns with underutilized and vacant spaces, uses and functions of particular areas, transportation issues and the well-being of citizens. The purpose of this research is to better understand the existing context, the history of sprawl, the existing housing and building stock, as well as travel times and infrastructure in relation to much needed services.

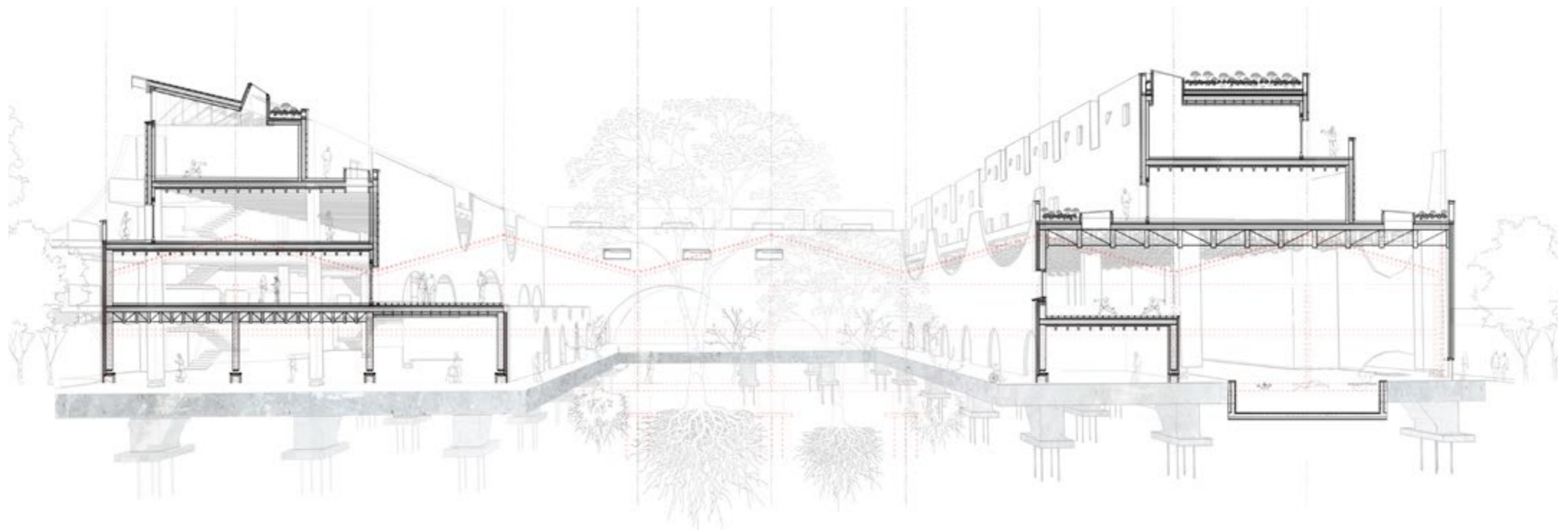
Taking principles from successful cities across Europe, starting to re-think the urban realm, a layered analysis and proposal are taking place just in between all housing settlements at the Tolka Valley, at Dublin Industrial Estate. Research revealed that this area is underutilized, as well as all housing settlements nearby and there is a need for amenities, services and infrastructure.

A mixed-use estate is proposed on site, keeping all employment active, while providing amenities, recreation and leisure facilities, as well as medical and educational facilities within a walking distance from Cabra, Finglas and Ashtown. This new built will have 4 stories in height at maximum, as in this way, it can be built on top of existing ground floor slabs and foundations. The top floors can include accommodation, especially for elderly people, homeless or other people in need for urgent accommodation.



## Fragmentation in an era of Climate Emergency: Finding an appropriate approach to density

 Protection & Re-use of Existing Assets, Sprawl Repair, De-Zoning Land



## Introduction

The growth of population requires more and more resources for a better quality of life and unfortunately, at present, has a negative impact on the environment which increases the risk of natural disasters. Carbon emissions from construction and car dependency are contributing significantly to climate change, increasing pollution, as well as having a detrimental effect on mental health. Ireland is facing a terrifying housing crisis and yet it is expanding out and not up, away from the cities and amenities, still adopting a low-density approach when designing new communities.

Developers' control over large land areas contributes to this imbalance because their primary goal is to meet the Council's minimum required standards in order to profit. This results in a lack of thoughtful mix of different types for older people, single professionals, or larger families, as well as small housing sizes. How might approaches to housing design and policy respond to this imbalance? Why does it have to be housing estates? Could they become apartment complexes instead?

Changes in planning are required to achieve sustainable compact communities, to move away from a dispersed car-centred approach which has costs for the economy of the country, the well-being of its citizens, and last but not least, climate change. The main concern of this study focuses on identifying what would be an appropriate approach to density in Ireland questioning how to repair the current legacy of sprawl (Kavanagh, 2021). Would Ireland need more density in the core or more sprawl in the suburbs, or both? Design thinking must be flexible to address the reality and particularly of each area based on its history, skyline and needs of each community.

*“The history and topography of a site are important, not only because they help explain the nature of its past, but because they can inform the shape of its future.”* (Limited, 2021)

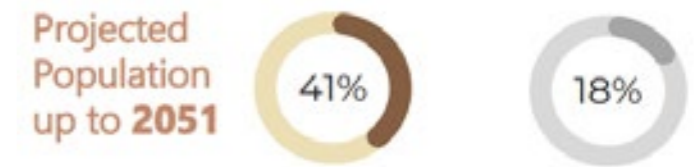
How could higher densities schemes be applied in a way that not only addresses the housing shortage numerically but creates long term sustainable communities? How much could Ireland expand upwards without affecting the privacy of people, safety, and climate? Is there an ‘optimum’ density for living? The specific objective of this dissertation is to explore these questions through a series of steps and then apply the answers in context.

This paper will start with in-depth raw research of the demographics in Ireland and continue by exploring the background to Ireland's low-density approach to housing as well as the impacts of the restrictive zoning regulations. It will then examine the benefits and drawbacks to higher density and how it must be thought of in conjunction with other factors such as scale, proximity to amenities and transport hubs.

A series of high-density, mixed-use residential lead projects will be analysed and displayed to understand the factors that makes them successful, together with an in-depth analysis and research of successful cities on urban regeneration, and finally, taking Tolka Valley as a testing ground, this research will explore how this concept might be applied in the context of Dublin.

**Infographics**  
Population Data in Ireland

Population in Ireland has increased from 2.9 million in the 1950s to 5 million up to date according to Census Data (CSO, 2016).

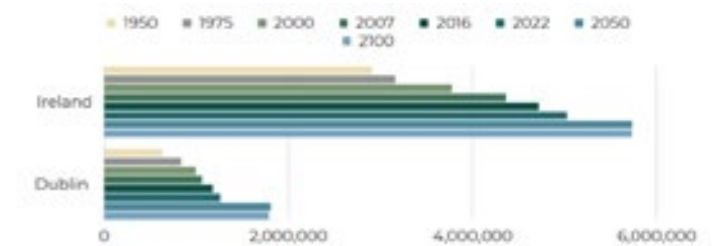


(Fig. 1)

- 2026 = **5.1-5.3** Million
- 2036 = **5.3-5.9** Million
- 2051 = **5.6-6.7** Million

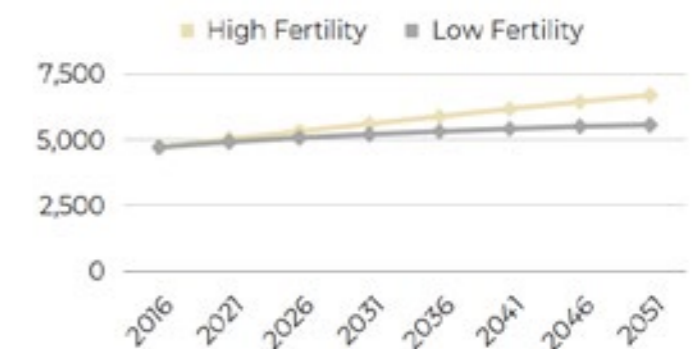
(Fig. 2)

UN projections show that there will be an increase in population of 18% up to 2051, up to 5.6 million people in the worst-case scenario considering the lowest possible migration and fertility rates (Population, 2022).



(Fig. 3)

On the other hand, with the best conditions, population will reach a maximum of 6.7 million, which is an increase of 41% (CSO, 2016).



(Fig. 4)



(Fig. 5)

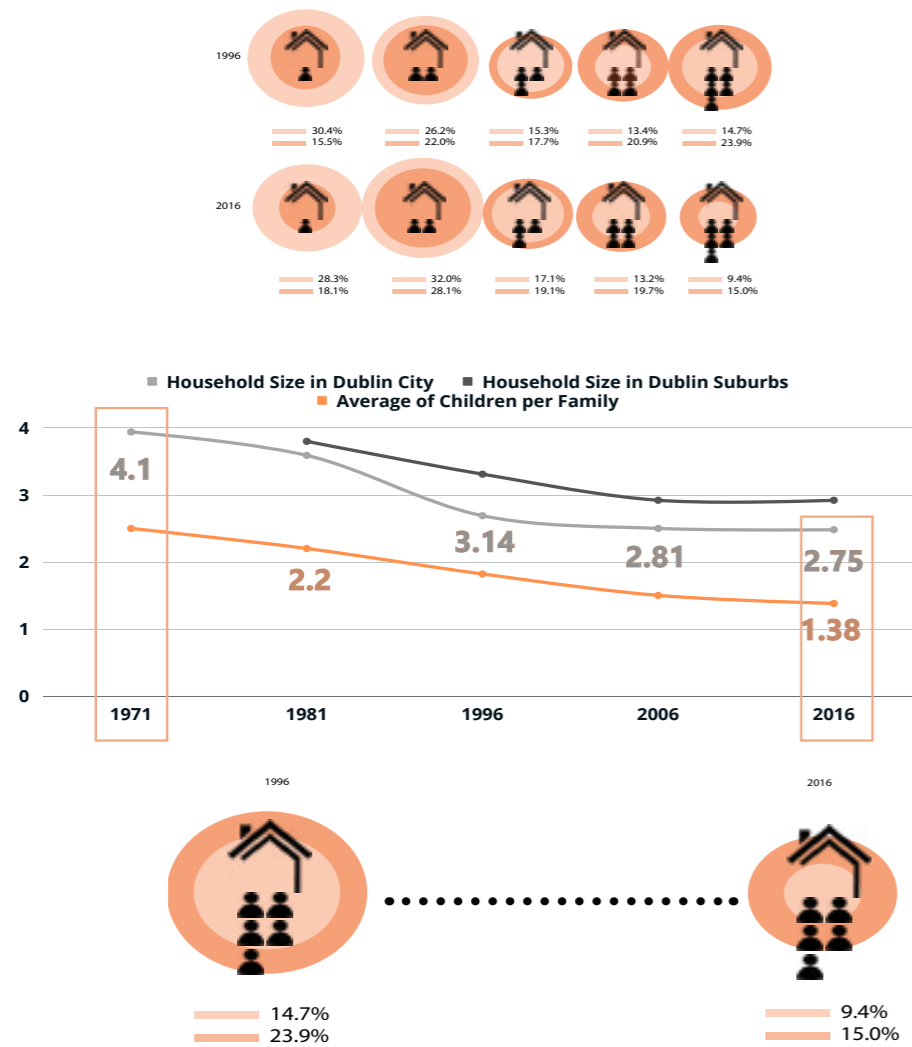


## Infographics Household/ Family Sizes

Meanwhile, family average sizes have gone down from 4.1 persons per household in 1971 to 2.75 persons per household in 2016.

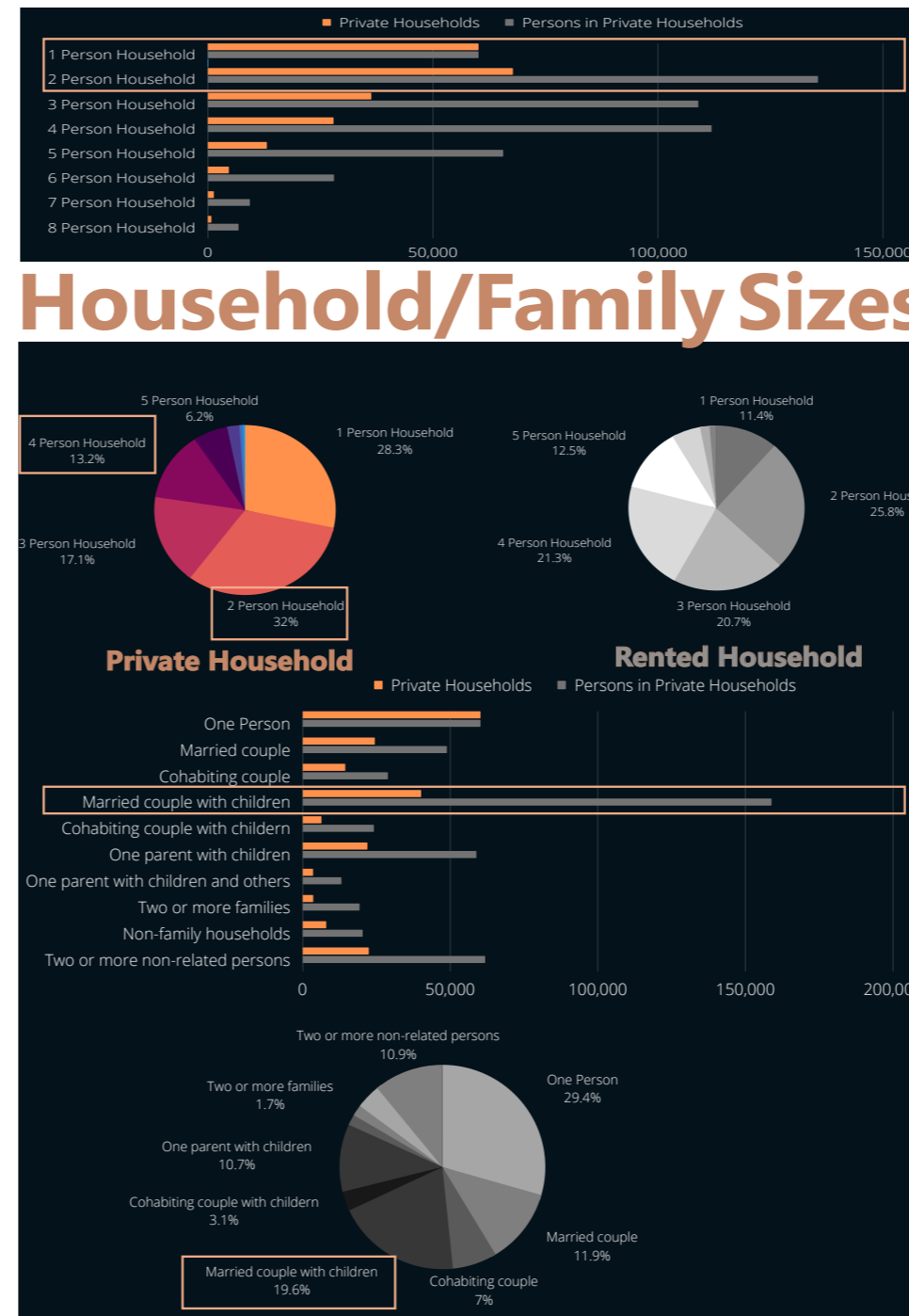
The average of children per family have also decreased from 2.2 in 1981 to 1.38 in 2016, according to Census Data. Studies also show comparison between 2002 and 1981, where 35% of children were living with one or two children in same household in 1981, where in 2002, 60% were living as such.

Looking at larger family households, 38% of children were living with four to six children in same household in 1981 compared to only 15% living as such in 2002.

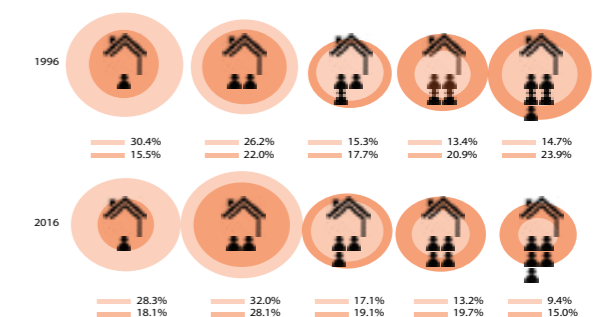


**“By 2002, 60% of children were living in households with one or two children, compared with 35% in 1981, and 15% of children were living in households with four, five or six or more children, compared with 38% in 1981.”**

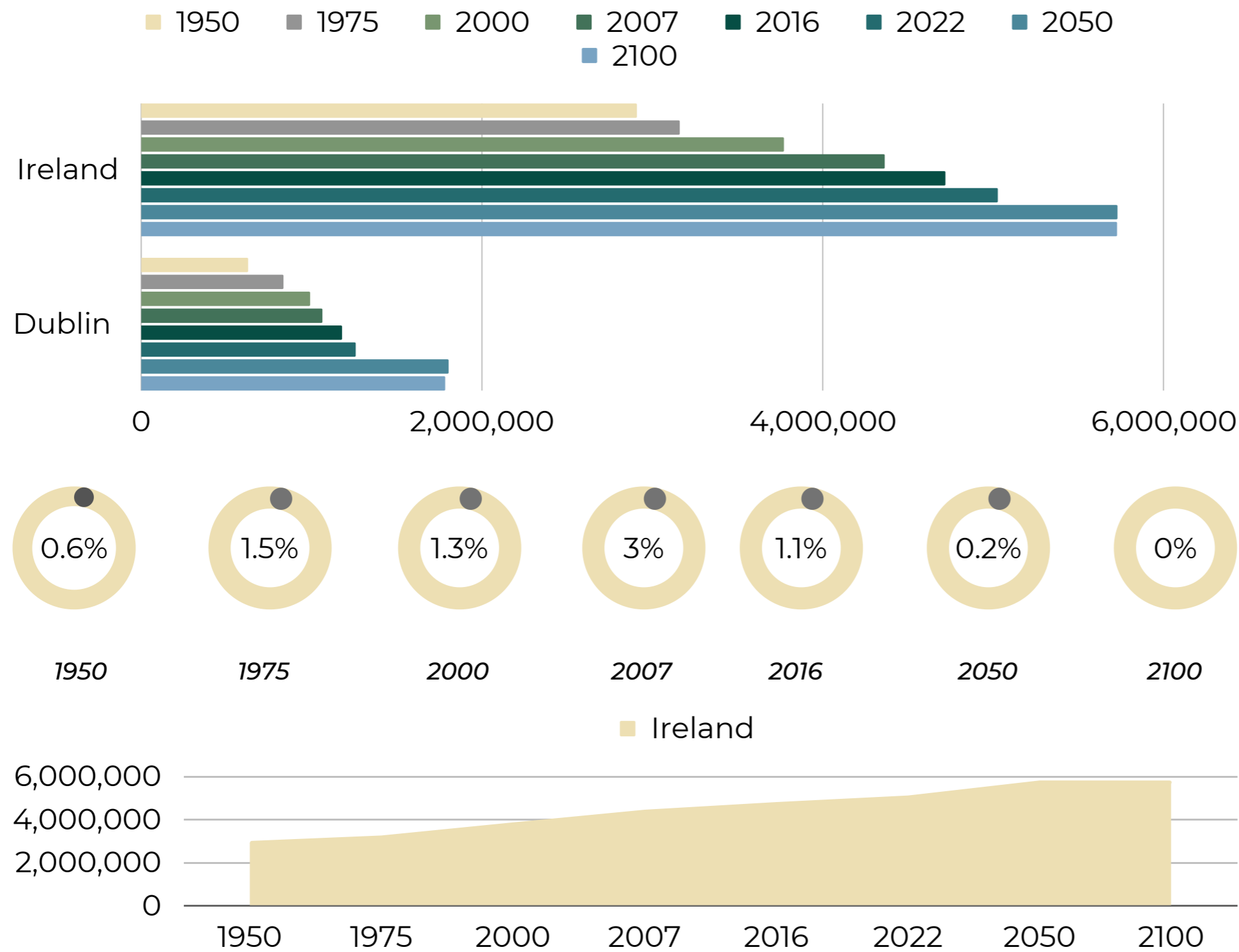
(Fig. 6)



(Fig. 7)

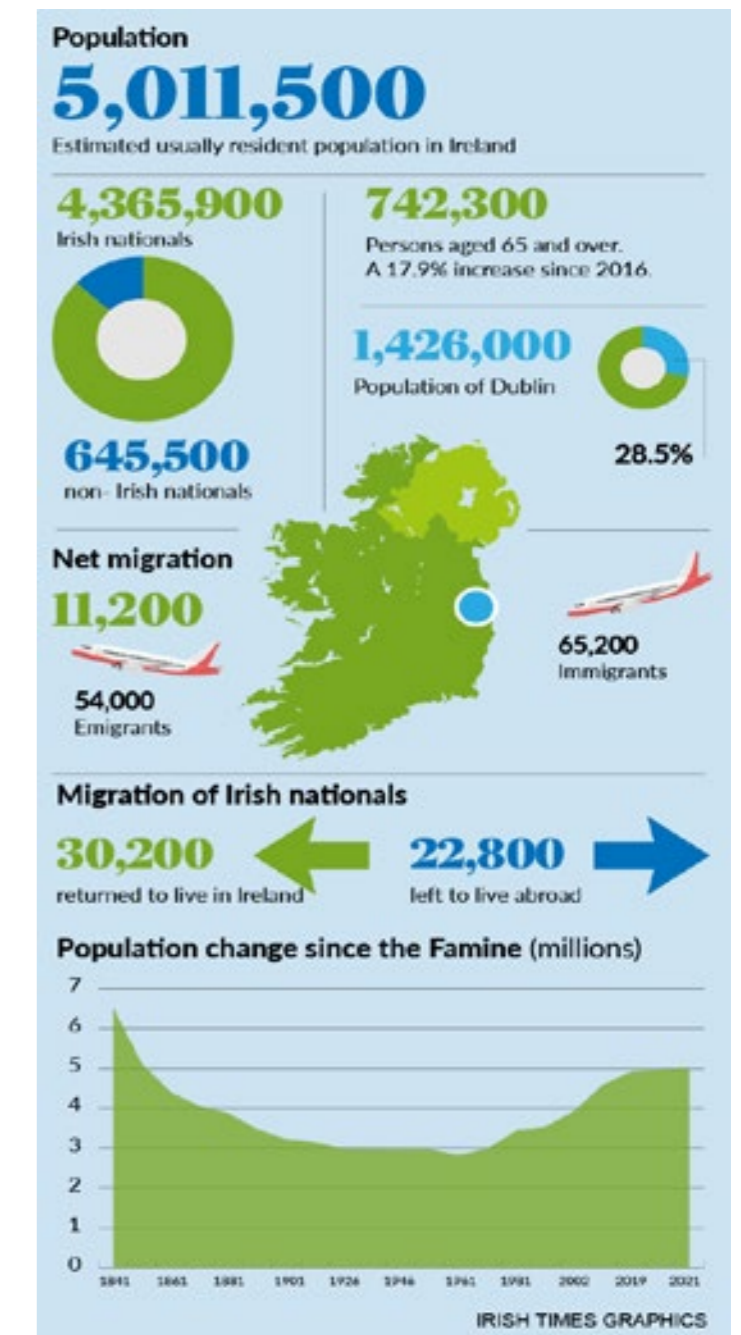


(Fig. 8)



(Fig. 9)

In other words, the population is increasing dramatically, with a remarkable growth in the number of households needed, while the housing stock is also increasing, it cannot keep up with the demands.



(Fig. 10)

## Sprawl Low Density Housing & Zoning Restrictions



(Fig. 11)



(Fig. 12)



(Fig. 13)



(Fig. 14)



(Fig. 15)



(Fig. 16)

Compact sustainable communities cannot be established in Ireland due to restrictions imposed by the planning departments, especially on zoning. The government controls land uses, allowing developers to invest and keep increasing their profits at the expense of all other citizens by forcing people to live further and further out away from jobs, schools, and amenities.

*“A city is more than its buildings. Buildings, in turn, are more than just housing” ... “What kind of environments are we creating?” ... “Will the structures we are adding to the existing urban space contribute to a good built environment and provide pleasant living environments?”* (The Swedish National Board of Housing, 2017)

Zoning breakdown on large areas with specifics for residential units has a significant impact on the environment as carbon emissions are inevitably high due to car dependency. Car-centred communities are also a threat to human health as it increases stress levels due to congestions and travel times, it also increases the risk of obesity (Hynes, 2006), therefore adding up as an extra cost for both well-being and economy of the country.

## **Sprawl** Ireland's approach to low density

In the twentieth century, Ireland experienced a radical change as most people shifted from rural to urban environments. This movement had a huge impact on the built environment resulting in an urban sprawl (Kelly, 2019).

The need for privacy and space has left an important mark on the Irish landscape, as the home of the rural inhabitants only changed scenery and location, still taking the shape of individual housing units. The family household sizes have gone down from 4.48 people per household in 1926 to 2.95 in 2002, but the style of construction remains the same.

This indicates that although the homes were three to four bedrooms and two stories tall, their inhabitants have gradually decreased over time. It wasn't until the 1990s that the dominance of these types began to be questioned by the emergence of apartment blocks. At this point, most homes were found on the edge of town, forcing residents to rely on cars.

A few significant dates and events from the 20th century will be looked at and explained to better understand the history of sprawl, demonstrating how both individuals and the government played a part in the development of these typologies. See Appendix 1 – History of Housing Typologies & Zoning Restrictions.

## Benefits and Drawbacks of Higher Density

The need for privacy is very important to the Irish community as it has been a way of living for centuries. Private patios and entrances to homes bring comfort and safety but increase the need for using private transport for all needs as these developments do not have a centre. Climate change has thought us to think and act collectively, and let go of personal wishes, but rather create a safer place to live for all, where social equality is of most importance.

The first sociological studies associated urban life with aggression and frustration, due to overcrowding (Baker, 1984). High density can affect people's behaviours negatively, but if it is well planned, it can also strengthen a sense of community.

*“Architects and urban designers can manipulate architectural and urban design features as a means to alter the environmental stimuli; this can help either to reduce the actual amount of information flow or to arrange the incoming information in a way which enables more efficient organization in our perceptual system” (Vicky, 2010)*

### Drawbacks of High Density

High rise developments of dwellings can be very expensive and inefficient in terms of services required to go up, materials, structure, and heating or / and cooling of the property. Maximization of natural light and ventilation is very important in the inhabitable spaces to cut down on unnecessary costs. The layout of the floor plan, number of corridors or staircases serving several apartments must be carefully considered to avoid overcrowding and mitigate possible negative human behaviours.

Green spaces can easily be lost or over shaded in between the apartment blocks, leading to negative experiences. Traffic Congestion and associated lower air quality could also be a negative impact of higher density if not considered carefully at initial design stages. The provision of car-parking becomes very important, as well as the road infrastructure and public transport are also crucial to avoid unwanted behaviours, noise, and pollution.

### Benefits of High Density

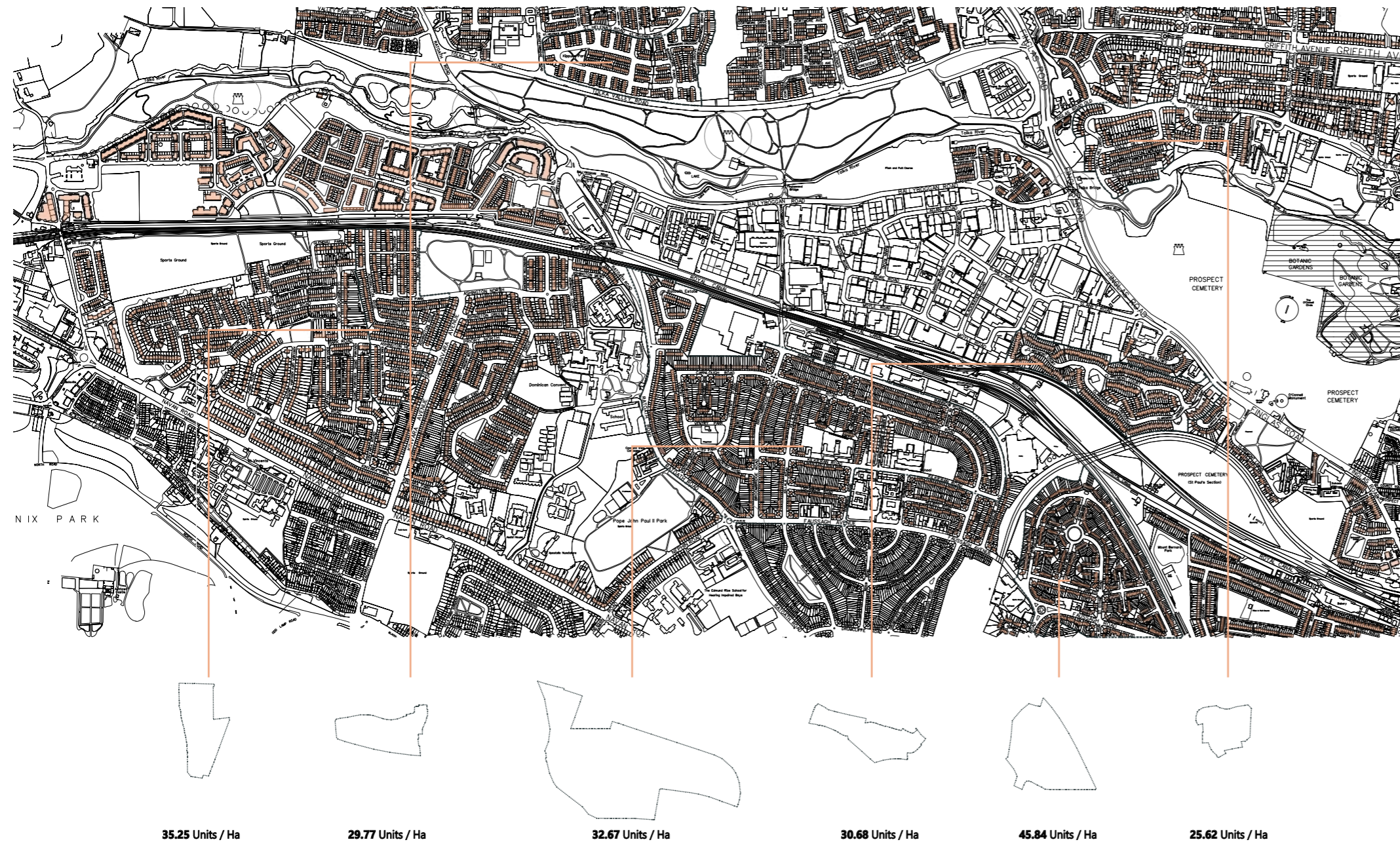
Higher density developments provide easier access to amenities and services, such as schools, shops, and medical services usually within a walking distance or served by a good quality public transport. This leads to a reduction on the dependency of owning a private motor and encourages the movement by foot or bike. As amenities are closer by, new employment opportunities arise for locals to further engage within their community.

Large apartment schemes often have a good mix of unit types which give people the opportunity to choose a property that fits their needs and give a sense of belonging by having the community engaging together in communal areas, green spaces, and shared facilities. The infrastructure costs are becoming lower, and they are easier to manage because they do not sprawl out on long distances. The impact on the land taken is also lower, and larger green areas can be provided in between for sports, recreation, and nature.

Higher density complex communities are also increasing property prices and value as they are nearby facilities and therefore attract new employers in the area, while reinforcing the sense of community for multi-generational living. With all resources and facilities becoming more cost-effective, the traffic being cut down leading to a cleaner air and people not having to waste time in traffic, higher density, if designed properly can have way more benefits than drawbacks. High density does not mean high rise.

### High-Density Projects

The chosen case studies show an appropriate approach to density through design thinking, layout and organisation of spaces and they work well in relation to their context and surroundings. These will be analysed through the same method as the existing developments at the Tolka Valley, method which was extracted from the Translating Housing: Berlin-Belfast (Sheridan, 2014). In addition, residential density as well as net density have been added to better explain the context and draw conclusions. See Appendix 2 – High Density Residential Successful Projects



### Tolka Valley Demographics & Housing Stock

Up to 2013 there were 9758 bed-spaces in the area. With new developments up to date, a total of 12460 Bed spaces exists in the area. According to Ashtown-Pellestown Local Area Plan 2013 (Council, 2014), there would be a couple of sites within the east side of Tolka Valley sites that could host between 1222 beds to 1641 bed.

An average would be 1429 Beds in Apartment blocks, on sites 1, 2 and 9 of the Local Area Plan which have not been developed yet. Site 2 is under construction now and it will bring a total of 13889 beds in the area.

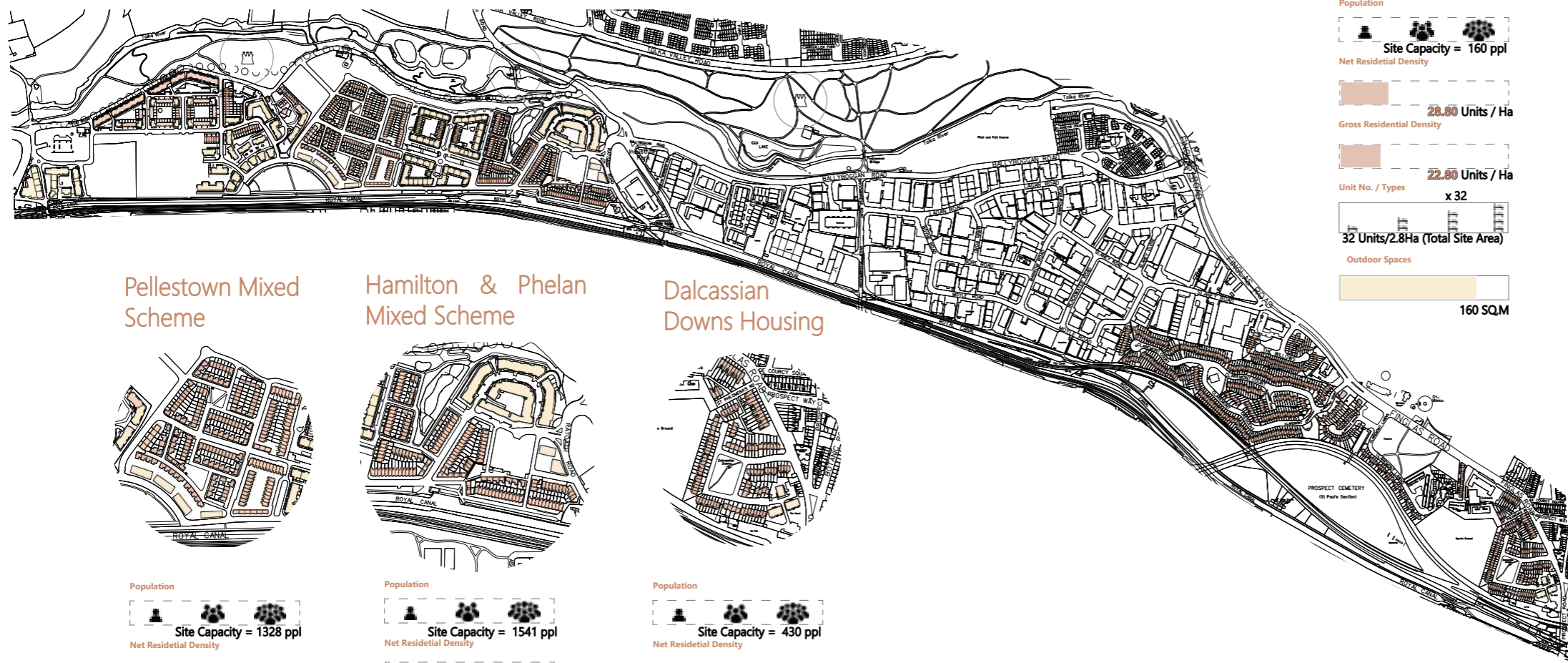
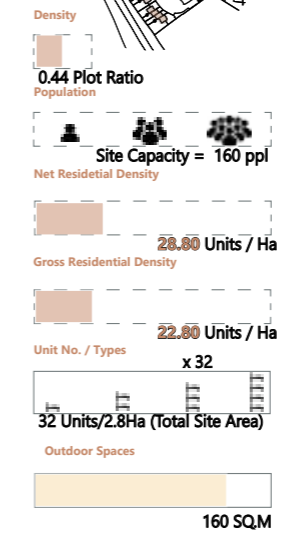
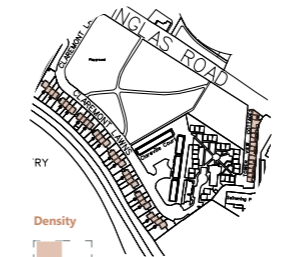
The population in the area according to Census 2016 is approx. 6027 people, with only 3822 people live in the Easter:



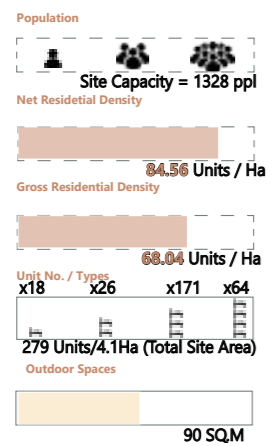
# Density Housing Per Hectare

Analysis have revealed that the site is currently underutilized; new construction offers few, if any, one-bedroom homes or apartments, which causes people to purchase or rent larger properties than they need.

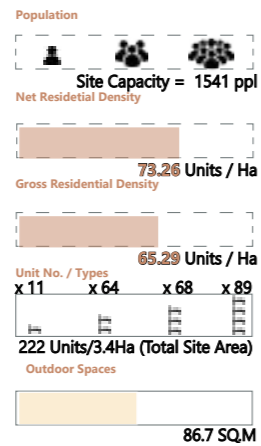
## Claremont Lawns



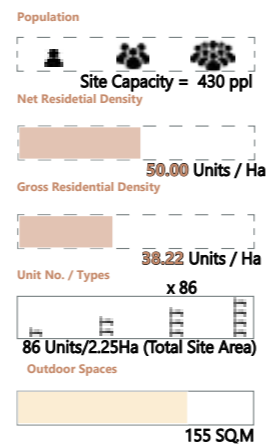
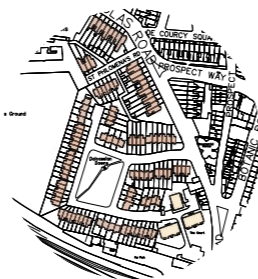
## Pellestown Mixed Scheme



## Hamilton & Phelan Mixed Scheme



## Dalcassian Downs Housing



Data, Diagrams & Map

## Density Housing per Hectare

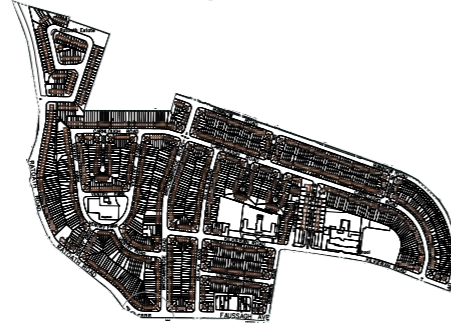
Ashington Units



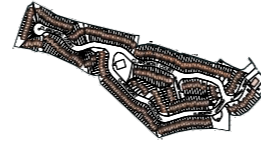
Barnamore Units



Carnlough Units



Ashington Units



Claremont Units

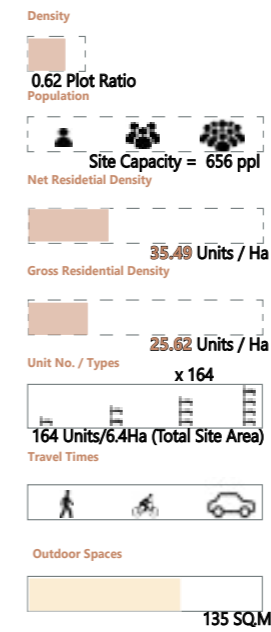
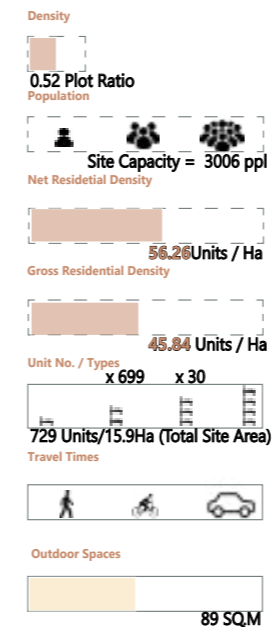
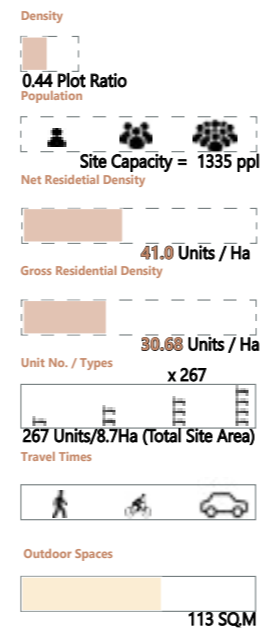
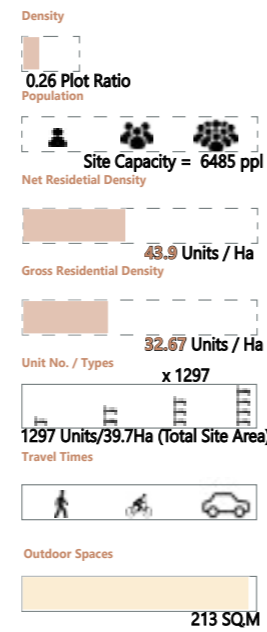
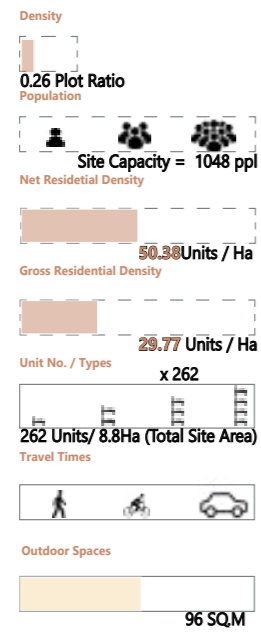
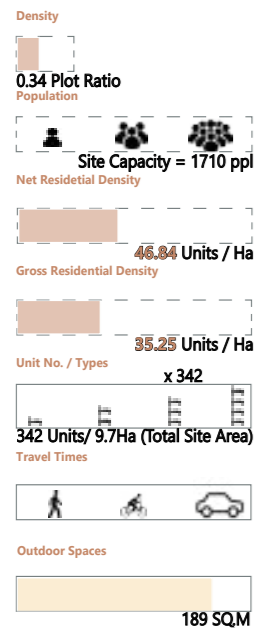


Violet Hill Units



On the other hand, the western side of the site consists of three-to-four-bedroom houses, built, and bought by larger families in the 1960.

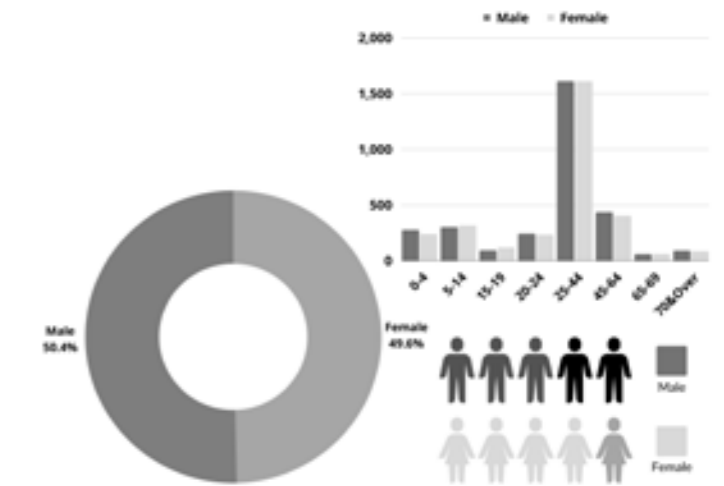
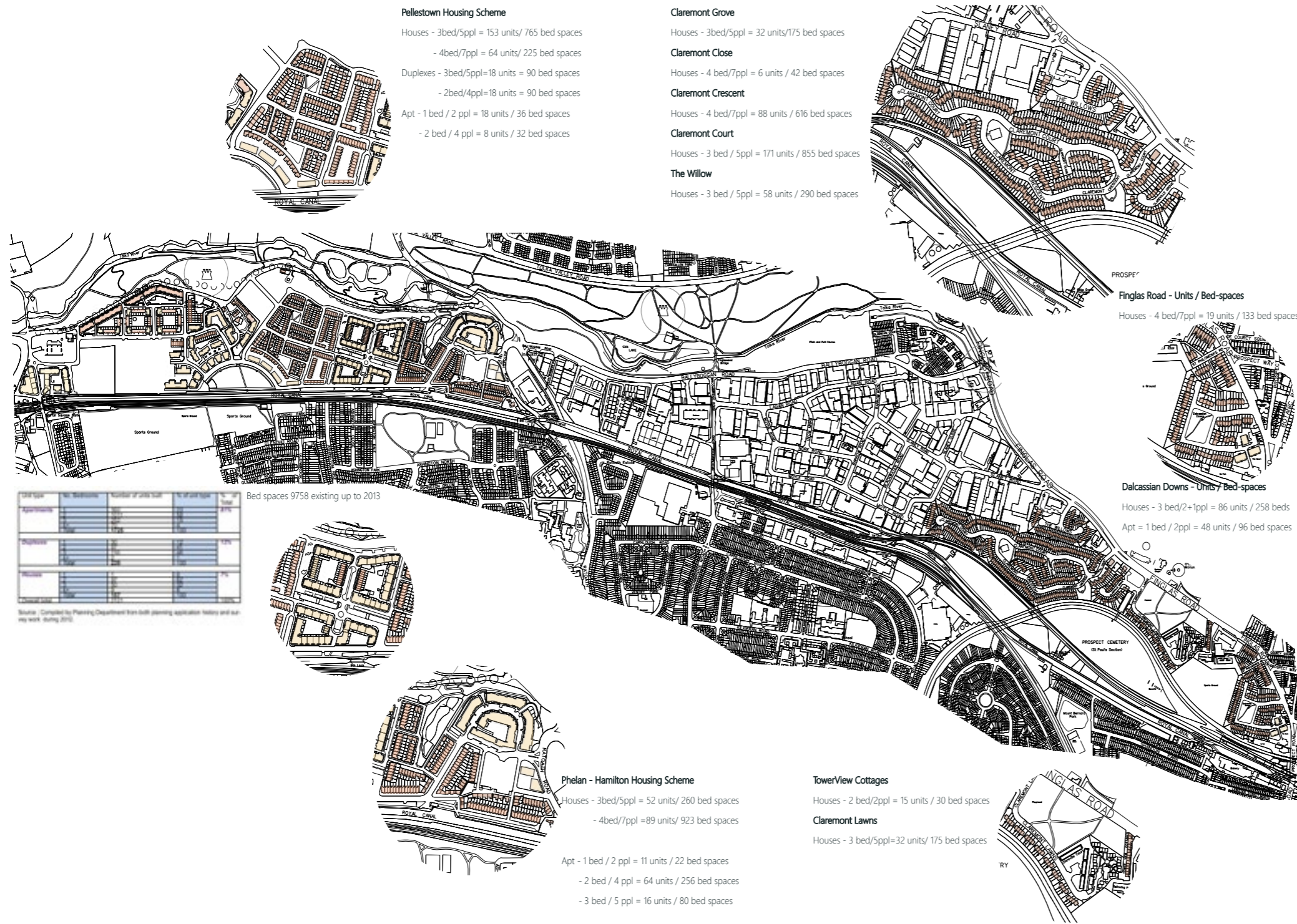
Research shows that these are also underutilised as population is aging, children have moved out and elderly people still live in them as they do not have other choice for a flat or small property within their well-known communities.





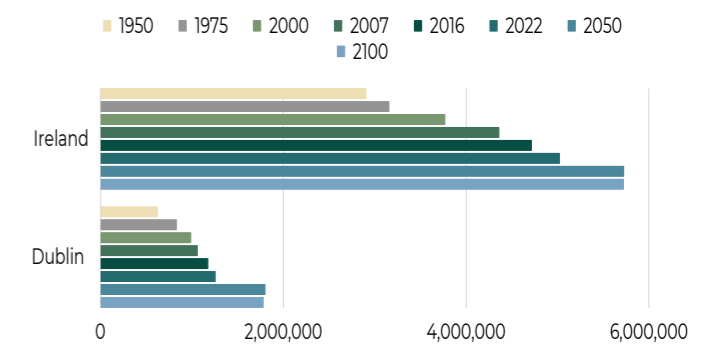
## Density Population & Housing Data

Additionally, studies show that most people at Tolka Valley are between the ages of 25 and 44 and are either having few, no, or late-life children.



(Fig. 17)

According to projected population studies, the population will grow quickly by 2075, then begin to decline (CSO, 2016).



(Fig. 18)


### Data Calculations & Map



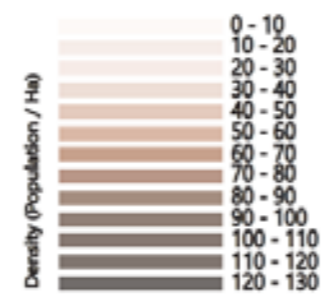
 Data Map

65+ Percentages by Area  
The Darkest Zones contain  
the highest numbers

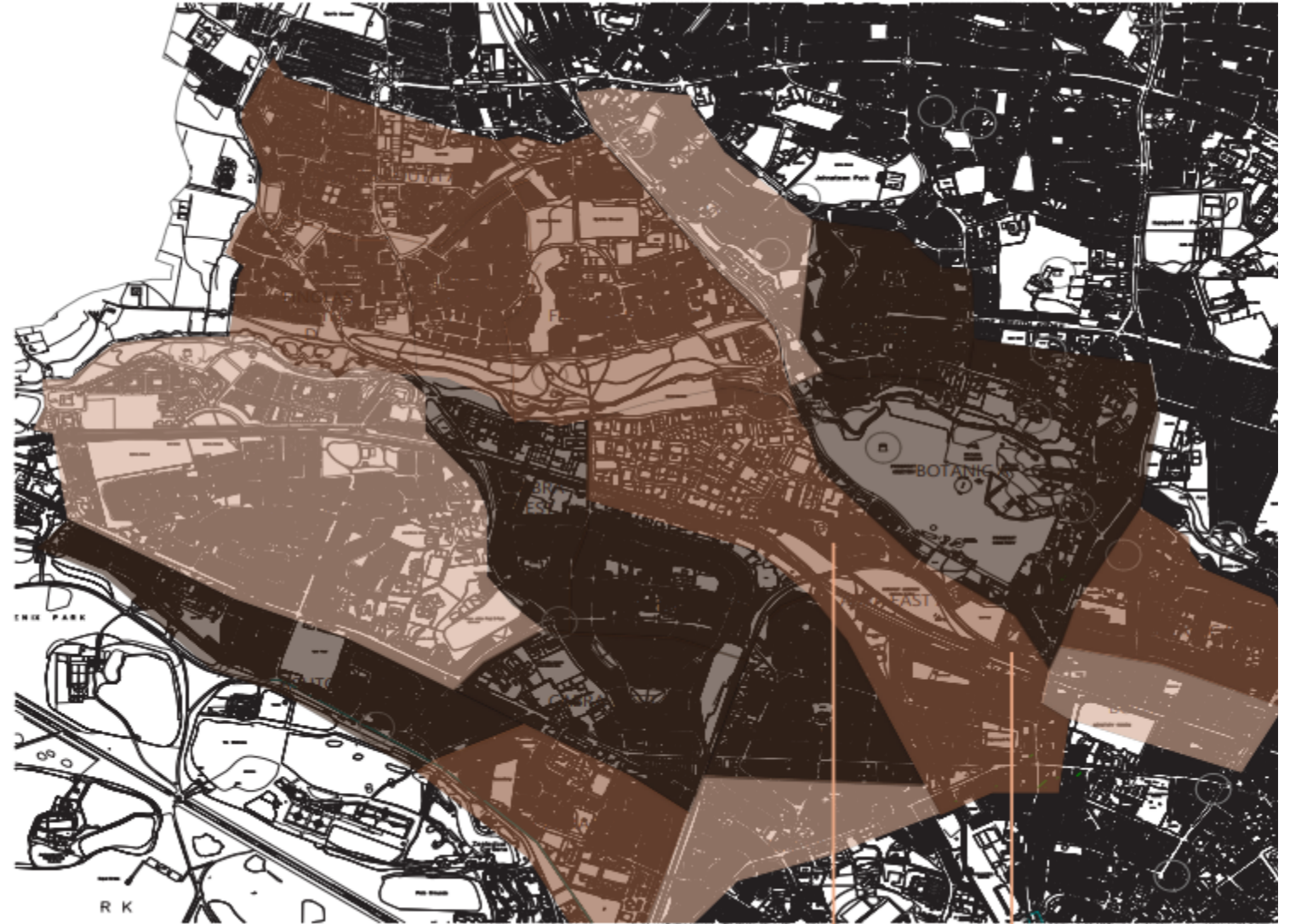
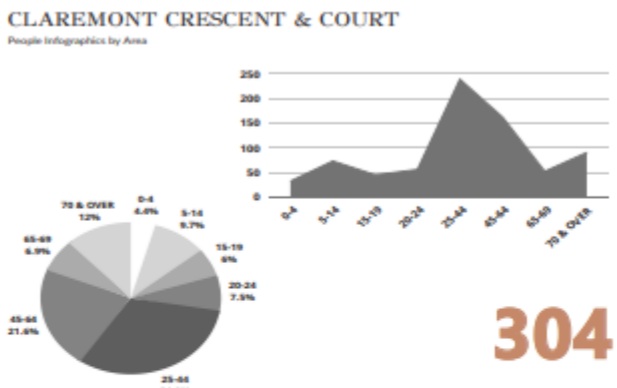
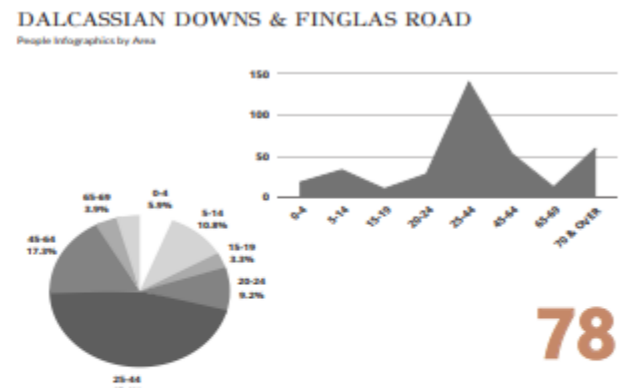
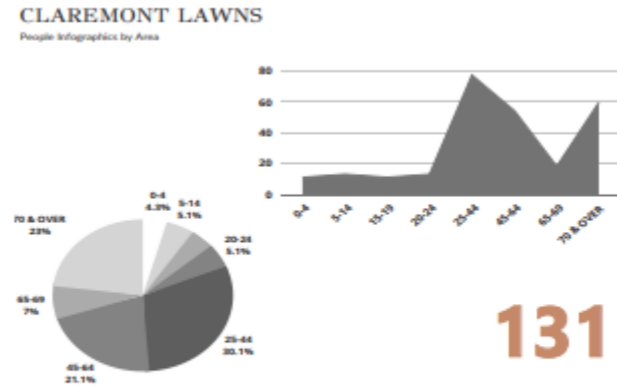
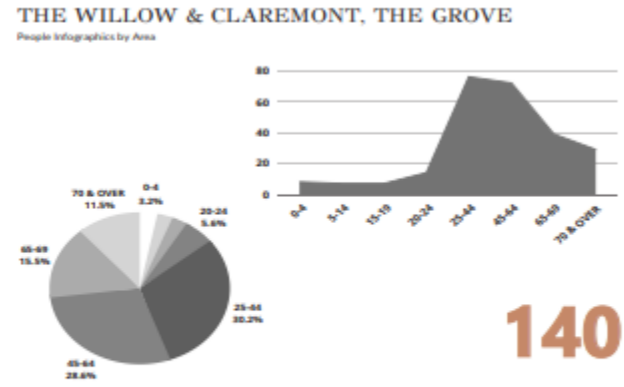


 Data Map

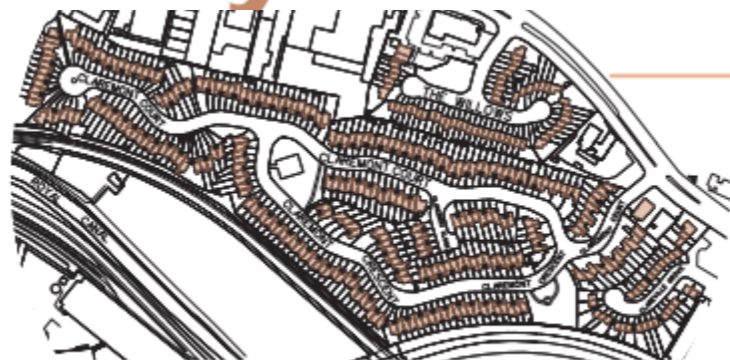
Elderly Density by Area  
The Darkest Zones contain  
the highest numbers



# 65+ Analytical Data

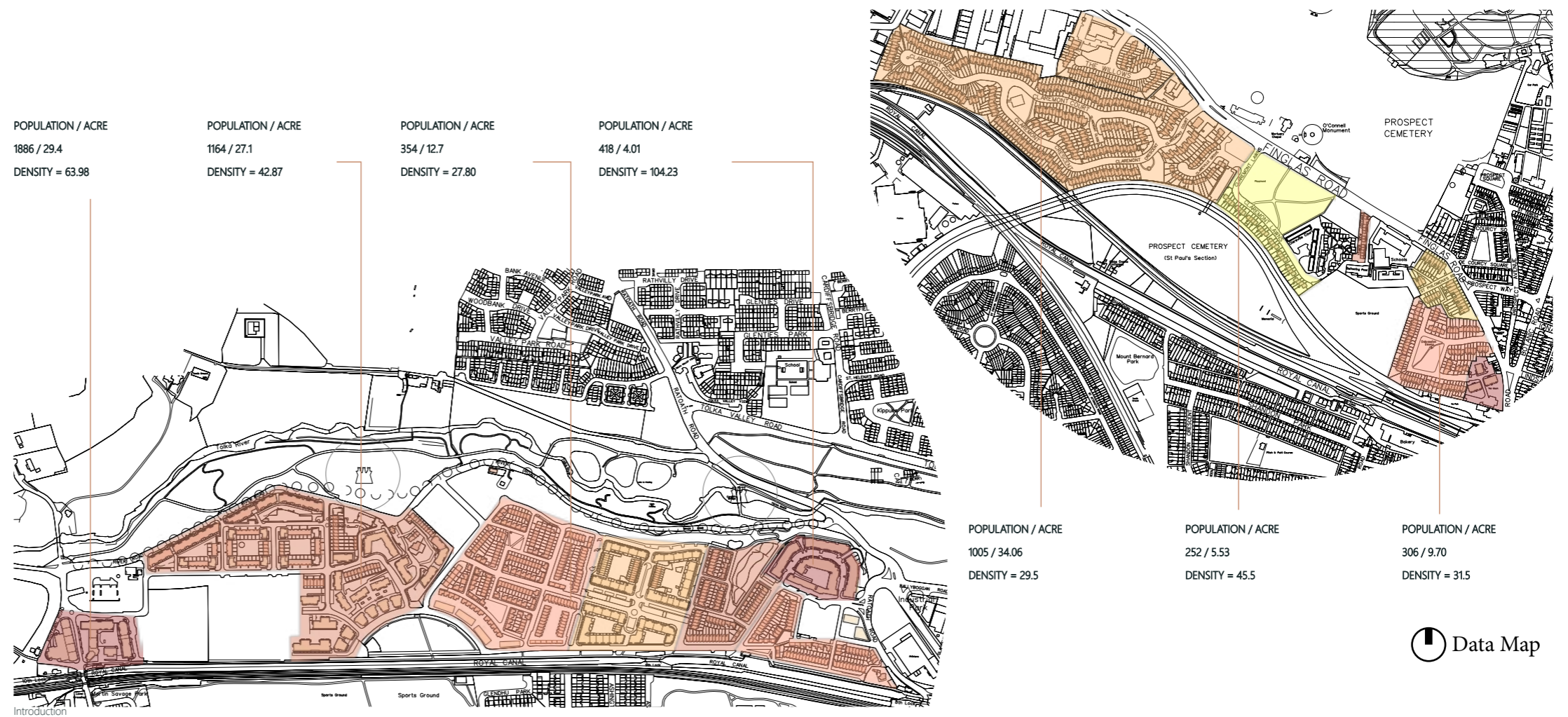


# 45+ Analytical Data



Data Map

65+ & 45+(Age Groups)  
by Area  
The Darkest Zones contain  
the highest numbers

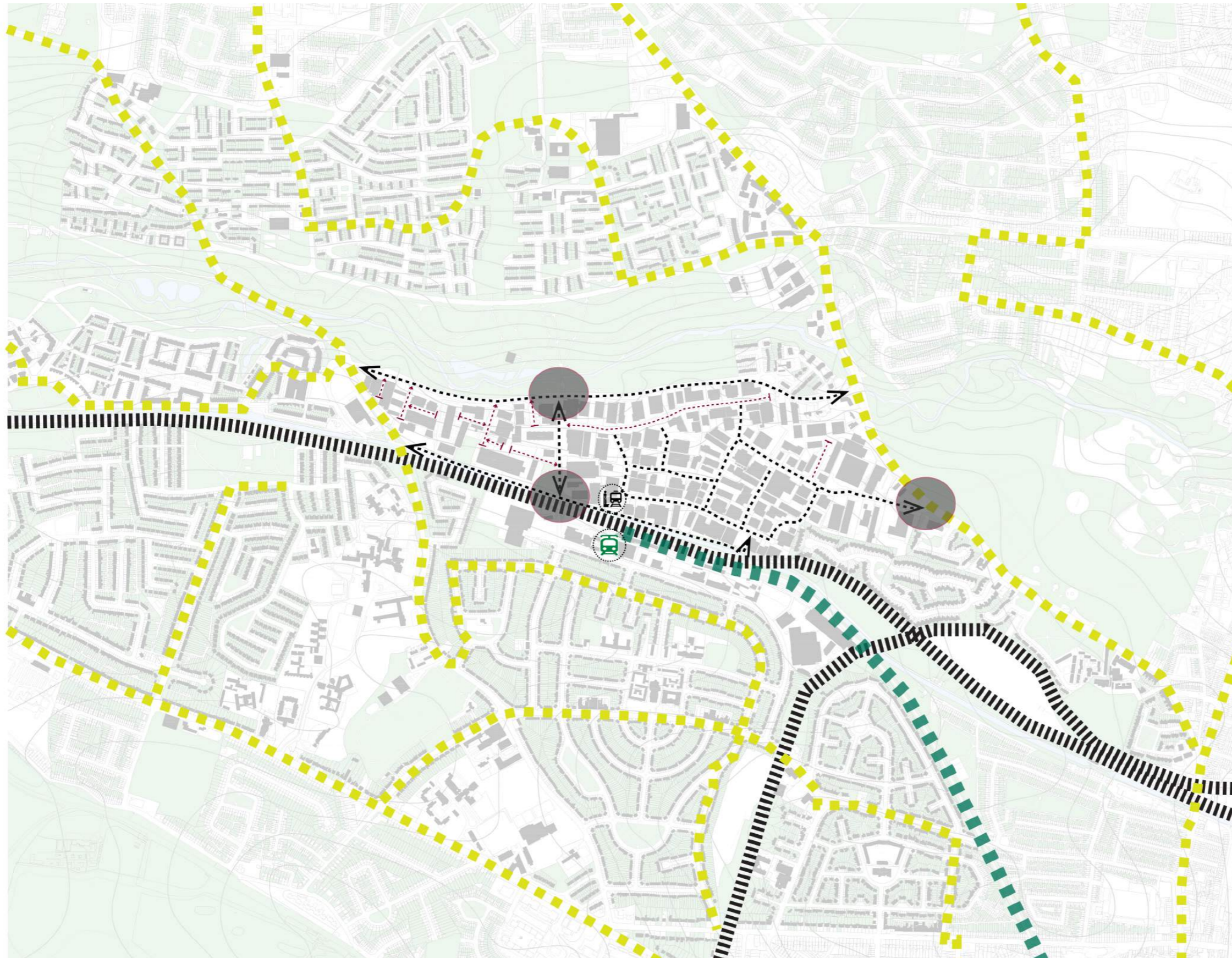











 Data Map

**Site Analysis & Characteristics**  
Tolka Valley Movement Patters

In this section, both amenities in the area as well as transportation patters will be analysed through a series of maps to explain the existing uses as well as the needs for further development.

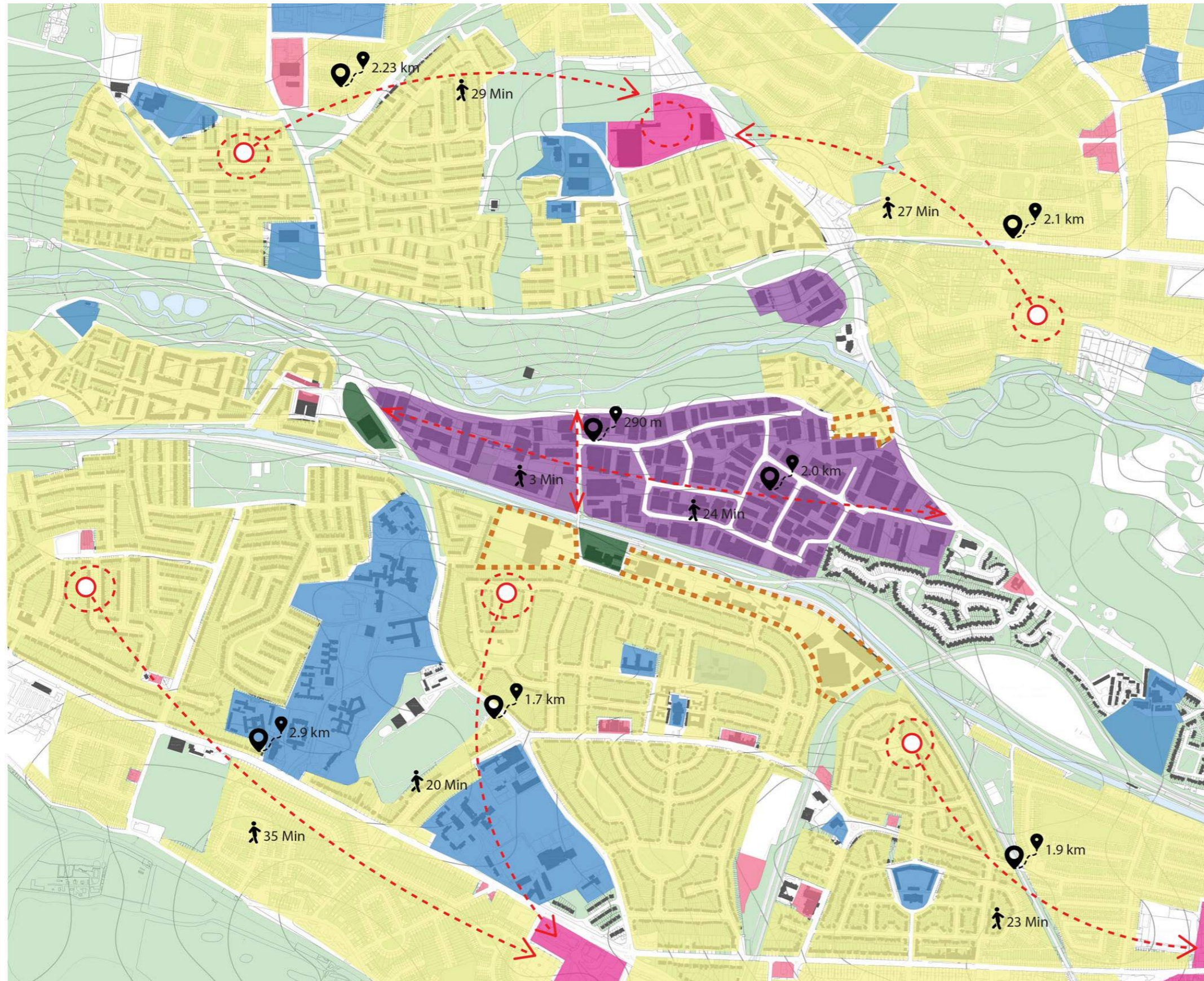
**Tolka Valley Transportation Patterns**














-  Existing Transportation Patters Map
-  Main Roads
-  Dead End Roads
-  Train Trucks
-  Luas Trucks
-  Bus Routes
-  Nodes & Intersections
-  Train Stop (Broombridge)
-  Luas Stop (Broombridge terminal)

 Existing Transportation Patters Map

**Site Analysis & Characteristics**  
Tolka Valley Zoning & Travel Times

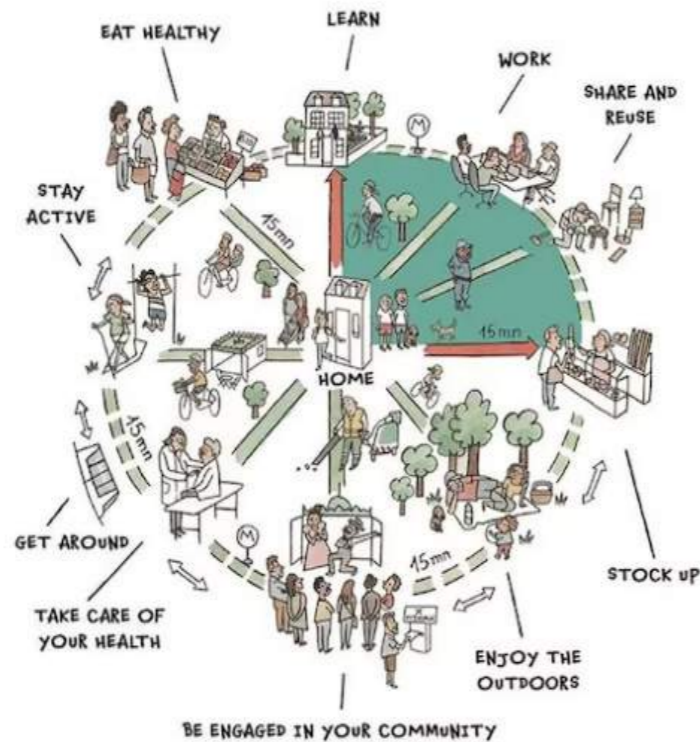


**Tolka Valley Zoning & Travel Times**

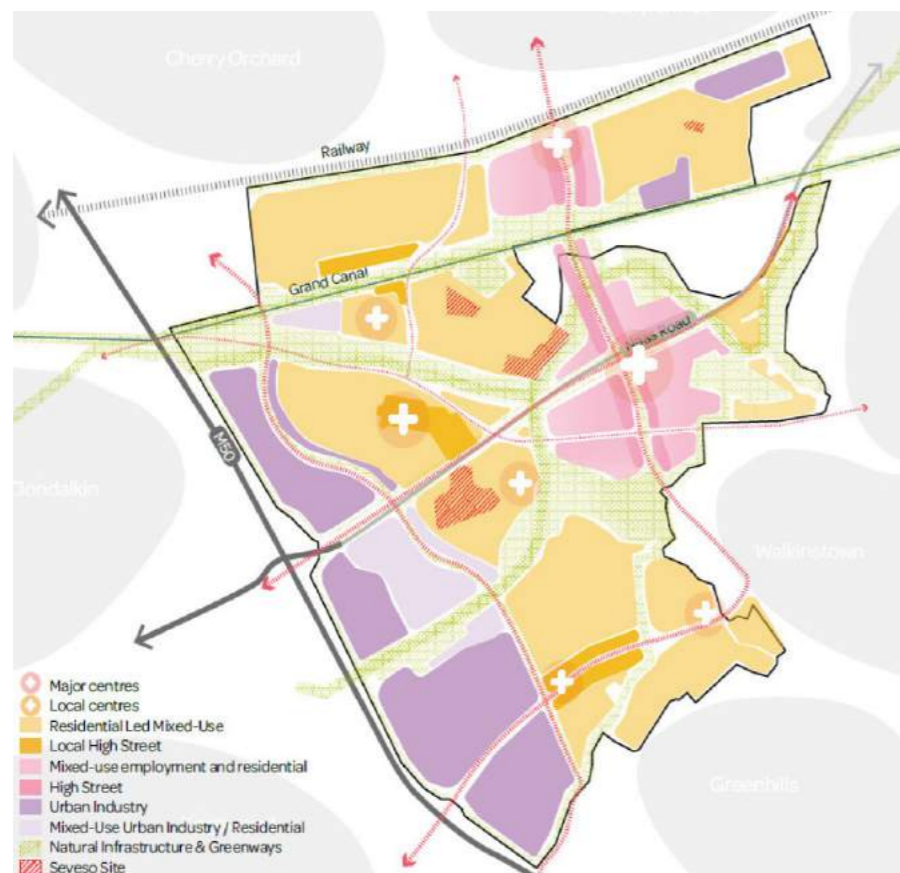
-  Existing Zoning & Travel Times Map
-  Measuring Distances
-  Travel Distances
-  Zone Z1  
Sustainable Residential  
Neighbourhoods
-  Zone Z6  
Employment /  
Enterprise
-  Zone Z3  
Neighbourhood Centre
-  Zone Z4  
Urban Villages
-  Z15  
Community & Social  
Infrastructure
-  Areas just zones to  
'Sustainable Residential' in  
the Dev. Plan 2022-28
-  Distance (meters / km)
-  Travel Distances  
(Minutes / Walking)

 Existing Zoning & Travel Times Map

## Design Principles for Compact Sustainable Communities



(Fig. 19)



(Fig. 20)

### ‘The 15 Minutes City’

The case studies chosen for this research paper have good quality design features that can be applied to any context when designing for higher density. It is important that the architect is designing for people, with respect for privacy as well as the needs for interaction with the wider community, reinforcing the sense of community by reducing unwanted social behaviours and interactions. To achieve this, the layout of the residential complex is very important as its scale and capacity dictate the outcome, therefore is very important to maintain appropriate group sizes. All the selected case studies have a good mixture of units for all ages, occupations and needs that one might have. It is also noted that none of the apartments were too small or too large.

The one bedroom often includes a study room, and all the three to four beds include twin rooms and single rooms, rather than three double bedrooms, which only lead to overcrowding, hosting multiple families, due to rent costs. Sizes of the one bed are between 48 and 56 square meters, which is a decent size compared to the minimum in Ireland which is 39 to 45 square meters in certain areas.

All this case precedents also follow the concept of ‘The 15 Minutes City,’ also known as walkable neighbourhoods or complete communities, which supports the idea of having all amenities and services needed within a 15 minutes’ walk from the front door of the house (Keogh, 2022). Following approach taken by Melbourne, Barcelona and Paris, Dublin Chamber launched same vision for Dublin, calling for the “15-Minute City” to enhance quality of life and sustainability, see fig. 19.

Having amenities within a walking distance and good transport is reducing costs, carbon emissions and less time wasted in traffic. The public spaces configuration should provide safety and discourage unwanted behaviours from the early stages of design this will emerge from the arrangement of blocks around opened areas.

### ‘The City Edge Project’

The City Edge Project, a project that is distinct in Ireland, is a transformational initiative that re-imagines Dublin’s Naas Road, Ballymount, and Park West neighbourhoods.

One of the largest redevelopment projects in Europe, it might result in 40,000 new residences and 75,000 new employments, according to (County Hall Tallaght, South Dublin County Council, 2022), while forming a new urban district.

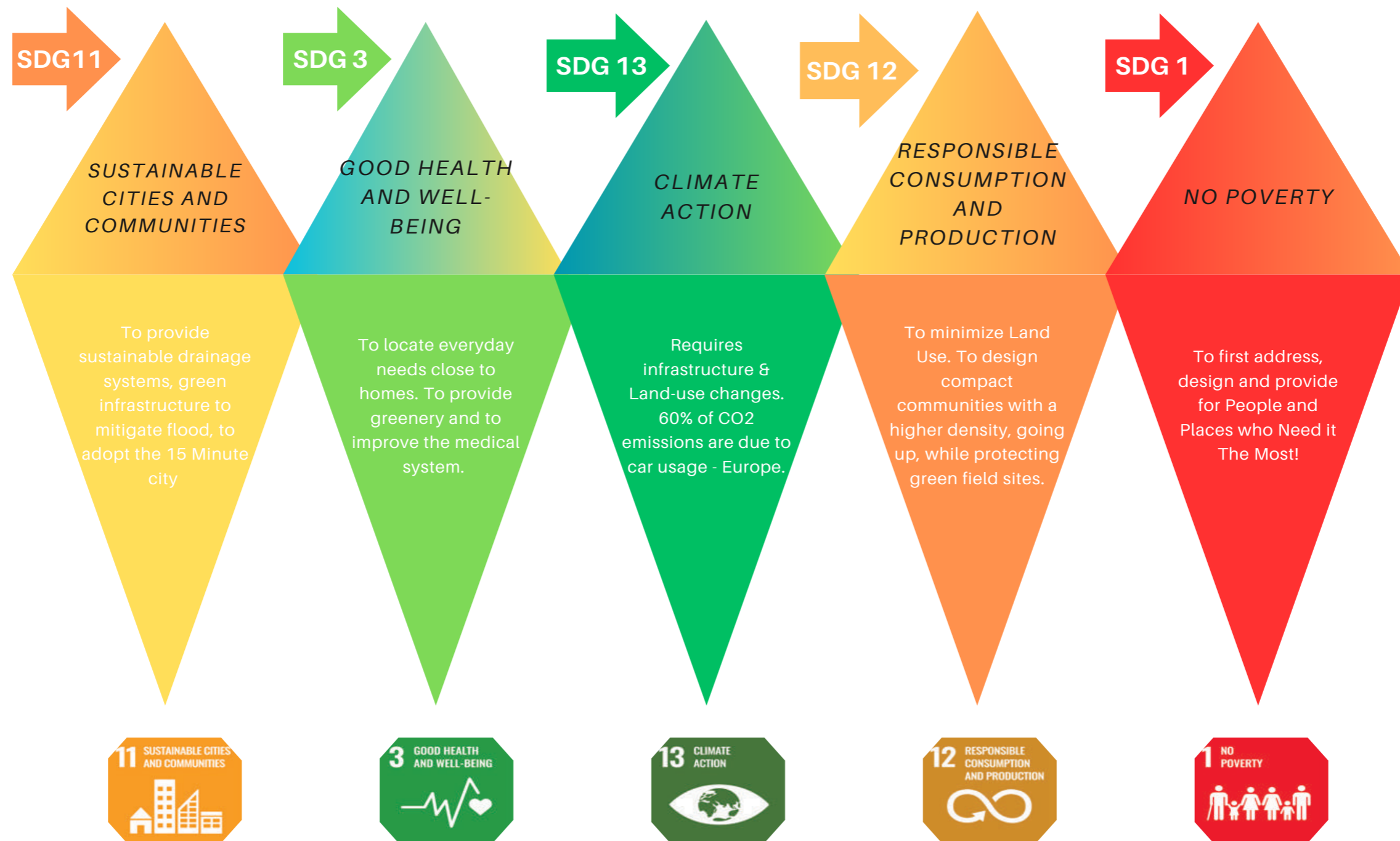
Beyond that, the main ideas are focused on the townscape, tall building clustering based on height analysis, and transportation-oriented aims. They advocated

Mixed Use Urbanism, which includes multifunctional buildings, active ground floors, and street engagement, as well as establishing identities for distinct neighbourhoods and incorporating heritage and culture.

One of the key goals is to provide infrastructure before densifying, to increase resilience within each region with defined edges through building design and placement, and to analyse distances from streets while enhancing public spaces. This is a ‘Street Based Urbanism Project’ that focuses on creating a favourable micro-climate by using direct sunlight and orientation as primary design driver to prevent overshadowing and windy conditions.

## SUSTAINABLE DEVELOPMENT GOALS

Includes Master-plan Objectives, City Objectives & Building Design Objectives



(Fig. 21)



*“Neighbourhoods built up all at once change little physically over the years as a rule... [Residents] regret that the neighbourhood has changed. Yet the fact is, physically it has changed remarkably little. People’s feelings about it, rather, have changed. The neighbourhood shows a strange inability to update itself, enliven itself, repair itself, or to be sought after, out of choice, by a new generation. It is dead. Actually it was dead from birth, but nobody noticed this much until the corpse began to smell.” (Jacobs, 2016)*

## MasterPlan Thesis in Context

In the context of Tolka Valley, there is a need for re-development of the underutilised Dublin Industrial Estate, to provide amenities to all existing residential settlements nearby. This will serve thousands of people, increasing employment and shortening travel times to work, amenities, education, medical and recreational facilities.

This thesis paper interrogates the existing zoning system and provides options on how we might start repairing sprawl. Researching and investigating projects on a local and global scale, on urban patterns and grid systems for urban places, through 3D volumetric studies and 2D maps, as well as the characteristics and particularities of this area, to come up with a site-specific approach in this area of globalization, always taking successful principles from sustainable cities, but keeping in mind what this area needs the most and how a new proposal can emerge in this existing rich context.



(Fig. 22)

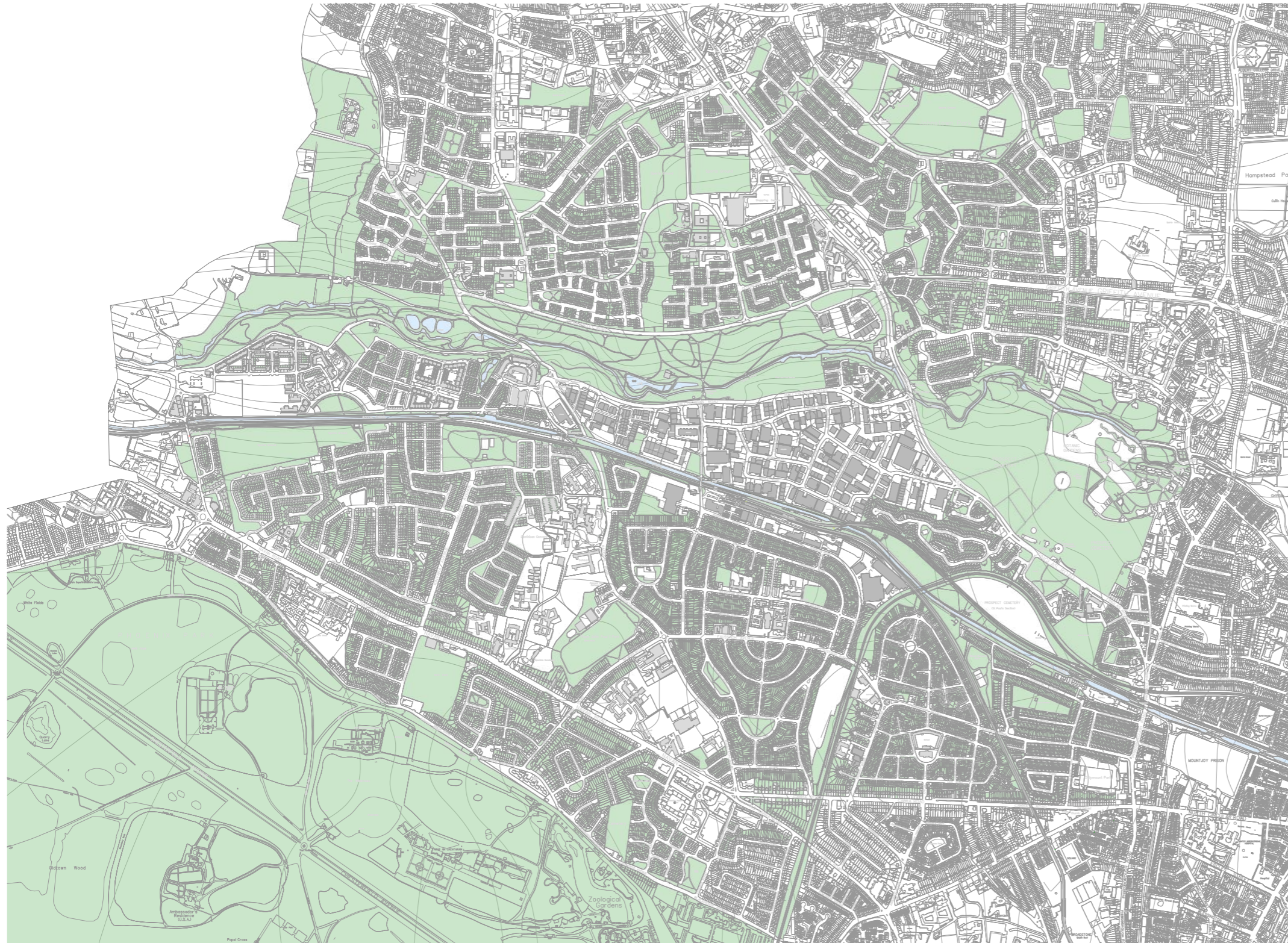


(Fig. 23)



Existing Site Location Map / Industrial Area Map

## MasterPlan The Brief & Site Location



Dublin Industrial Estate is positioned between the royal canal and the Tolka Valley river, the canal is running parallel the whole length on the south side and the river and park on the north. The Tolka Valley Park and Dublin Industrial Estate are situated between Ashtown, Cabra and Finglas. This area, as many others outside Dublin, is on a mono functioning zone, it is car-dependent due to the crowded public transport, and the lack of alternative public transport.

The train are not scheduled very often, and the buses are going through a lot of estates to get to their destination, increasing travel times by hours, compared to 15/25 minutes by car on short distances.

There is a lack of amenities in the area as it is primary residential. There are no libraries, swimming pools or other recreational facilities.

Dublin Industrial Estate in the middle of the site, and it is all surrounded by housing. It is acting as a barrier between these residential zones, as its perimeter is enclosed by a wall, and only provides three main vehicular access routes. The industrial estate has a couple of large shops as Woodies and Lidl and many warehouses for packing, mechanics, shops and gyms, but little manufacturing.

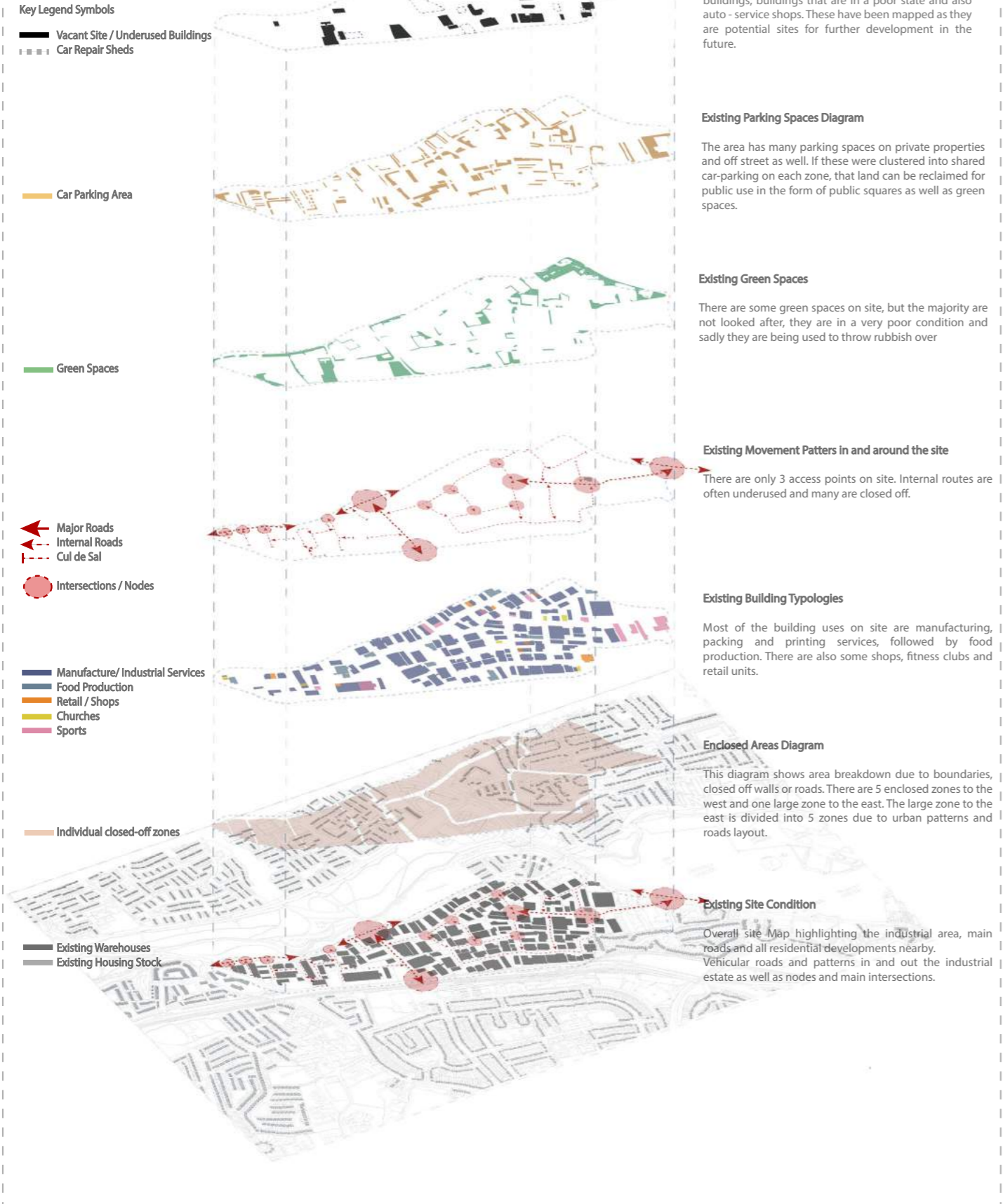
The public transport is keep developing, there is a relatively new train station in the area, and a total of three surrounding the site, including Broombridge Station, Pellestown and Ashtown Stations. There are some bus linkages as well and a Luas linkage at the Broombridge train station.

There are some bike lanes, and many pedestrian footpaths and canal walks, together with a large park on the north. The park does not have many access routes as well as the area in general, there is a lack of proper planning in terms of movement flow and proximity to amenities by foot, as there is no permeability.

Existing Site Location Map / Overall Map

# Site Condition

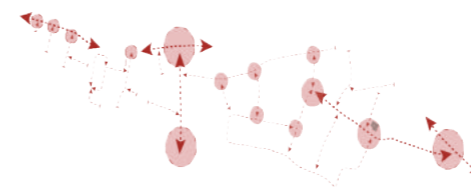
## Dublin Industrial Estate



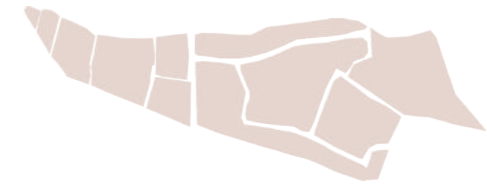
Dublin Industrial Estate has many underutilized buildings, buildings that are in use only at specific times, buildings of disrepair, many auto repair shops and some brownfield sites.

These spaces can be retrofitted, re-imagined and / or modified to provide for the needs of the existing and future community.

The industrial underutilised sheds are mainly made of concrete portal frames, and they have a story or two in height, usually double height to allow for goods in and out from trucks.



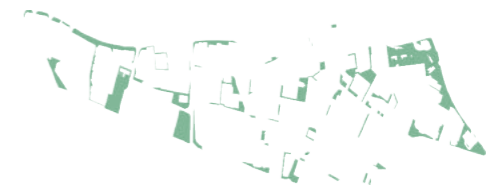
(Fig. 24)



(Fig. 28)



(Fig. 25)



(Fig. 29)



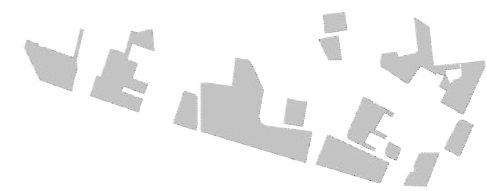
(Fig. 26)



(Fig. 30)



(Fig. 27)



(Fig. 31)



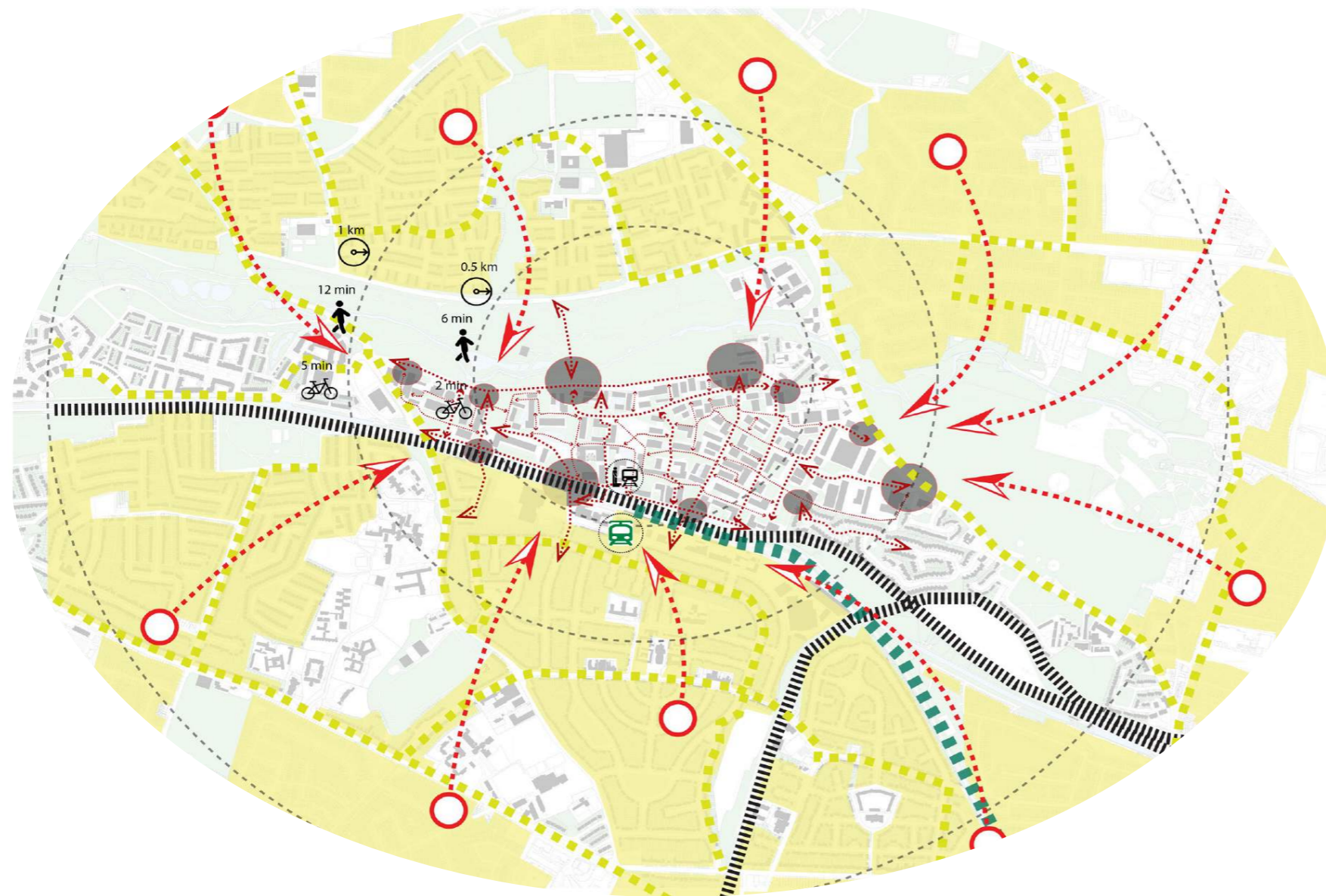
At the Tolka Valley, due to the lack of unit types, there are many elderly people living in a three-to-four-bedroom, two story house, (CSO, 2016), and have no option to move within their community in a space that they could fully use and access throughout.

On the other hand, the new high-rise developments do not provide as many different types either and they do not have large communal spaces.

Starting now to re-think the housing typologies as a new system would have many positive impacts on people, land and architecture.

Data Map

*“...frequent streets and short blocks are valuable because of the fabric of intricate cross-use that they permit among the users of a city neighbourhood.” (Jacobs, 2016)*



(Fig. 32)

Changes in land use are essential to allow for vibrant communities and to create the proposed 15 minutes cities as stated in the Dublin City Development Plan 2022-28, Section 5.5.3 ‘Healthy Place Making’, where QHSN10 addresses same, stating: “*To promote the concept of 15 Minutes City which provides for liveable, sustainable urban neighbourhoods and villages throughout the city*” ...” served by local services, amenities and sustainable modes of transport.” (Dublin City Council, 2022-2028). See Appendix 4(Personal DCC Observation on Chapter 5, Quality Housing and Sustainable Neighbourhoods of the Draft Development Plan 2022-2028)

Allowing for mix use could potentially repair sprawl by providing infrastructure first, access to services and good quality transport, then also increasing density in each area.

This provides for existing residential developments, reducing demand on private transport and / or the long hours commutes.

At Tolka Valley this can be achieved by re-utilizing existing fabric of underutilized and / or vacant spaces. There is an opportunity for this site to be taken as a whole, analysed and a new housing typology can emerge on it, with services and amenities to serve all residential units around and act as a 15 Minute City in itself.

The Industrial Estate could potentially be a town centre, stitching Cabra, Finglas, Glasnevin and Ashtown together.

*“Automobiles are often conveniently tagged as the villains responsible for the ills of cities and the disappointments and futilities of city planning. But the destructive effect of automobiles are much less a cause than a symptom of our incompetence at city building.” (Jacobs, 2016)*





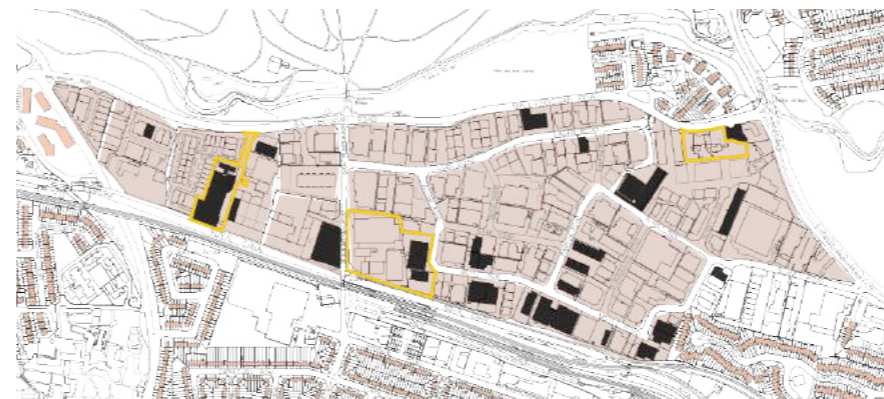
(Fig. 33)

Based on research and investigation on housing types, numbers and type of amenities, employment rates and locations, as well as infographics, the regeneration of this area would be done in phases, with main master planning components and objectives focusing on keeping and increasing amenities and employment in the area; to cluster the industry across strategy roadways, to provide green infrastructure, to target current and projected trends based on demographics to provide sustainable residential units, while introducing a rule of 'No Surface Car-park', where all the cars would be placed in stacked car-parking and providing Go Car Stations to allow people to move away slowly from the idea that they need to own their own private motor.

**MasterPlan**  
Early Stages Thoughts



(Fig. 34)



(Fig. 35)



(Fig. 36)

**Masterplan: Initial thoughts**

**Proposed Connectivity and Movement:** Same movement patterns and access routes are kept ensuring privacy and security. Working industrial zones are clustered carefully to limit the vehicular access throughout the site and to maximise pedestrian movement instead.



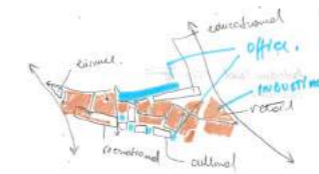
(Fig. 37)



(Fig. 38)

**Proposed Areas of further Investigation:**

These areas were chosen based on research on site conditions, buildings conditions which were either vacant or underutilised, and some sites with submitted planning applications for mixed large developments.



(Fig. 39)



(Fig. 40)

**Proposed New Zones:**

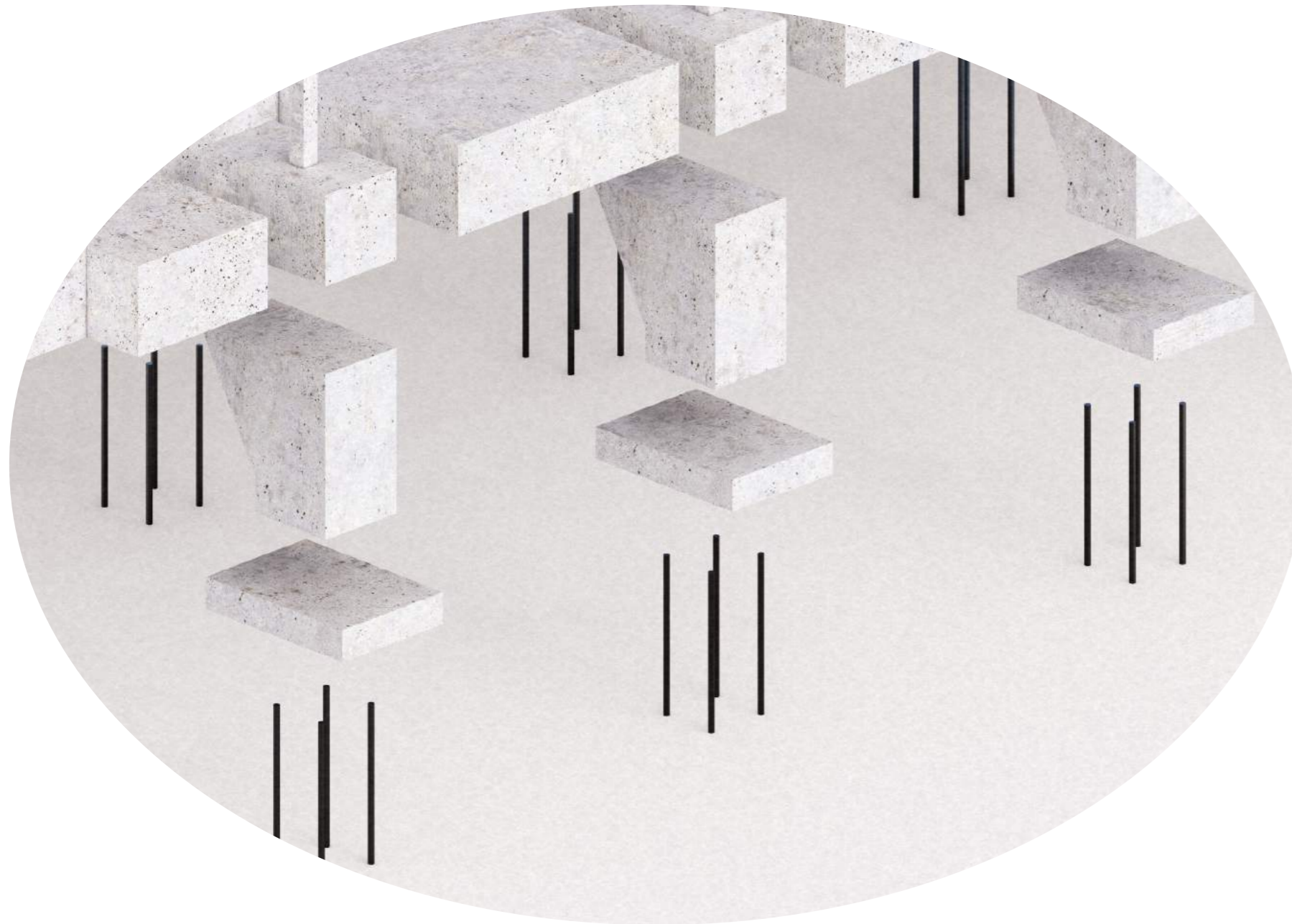
The area will benefit of a couple of shared stacked car parking, as well as a mixture of businesses existing and new, new commercial spaces, recreational and leisure to make full use existing underutilised building fabric for all residential developments surrounding the site, while also placing new residential accommodation on top, to provide for desperate people in need.



(Fig. 41)



(Fig. 42)



(Fig. 43)

Identifying the most precious existing assets on site, the concrete floor slabs of all existing structures are being protected and reused for the new developments, as they can hold up to four stories of CLT and Glulam construction. All other elements from the ground up are being disassembled and sent for recycling.

All existing roads are stripped away, and these concrete slabs are remaining and essentially forming these little islands where new construction can take place.

The existing boundaries, roads and 'green' spaces are being removed, but all the trees are being kept. The proposed densification takes place at different levels from macro to micro scale, introducing new street layouts and grids, new public squares and large green spaces, together with more trees, while bodies of water from the canal to come in at times.

Essentially this development becomes 'A Forest within the city', creating a utopian view for living and working, with good quality urban-scape and streets for people, designed in 3D, thinking about perspective and the experience at eye level.

## Masterplan Case Studies

*“Mat-building can be said to epitomise the anonymous collective; where the functions come to enrich the fabric, and the individual gains new freedoms of action through a new and shuffled order; based on interconnection, close-knit patterns of association, and possibilities for growth, diminution, and change.” (Al-Ragam, Asseel, 1970)*

### Case study 1 – MATT Building

A mat building is a system that can be repeated as many times as needed across a site and it is based on following principles: plot ratio, site coverage, sizes of modular units, sizes of streets, heights and orientation, lengths and sizes of blocks to allow for walkable neighbourhoods.

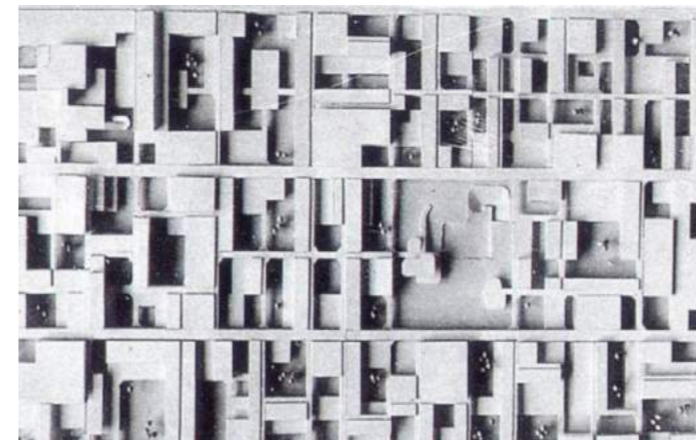
Applied principles in context: Access between blocks is made at maximum 350m which is the equivalent of 5 minutes’ walk.

Heights vs buildings distances proportions are carefully considered to allow for maximum solar gain.

Optimum density calculations are made to avoid overcrowding.



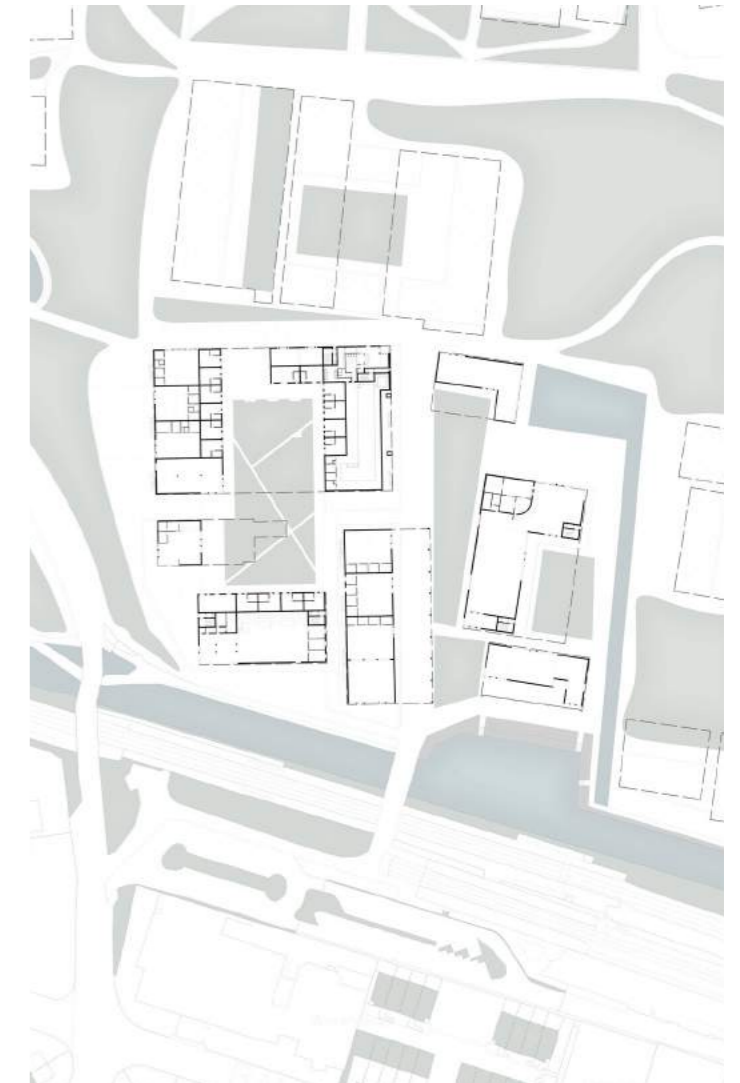
(Fig. 44)



(Fig. 45)



(Fig. 46)



(Fig. 47)

## Masterplan Case Studies

### Case study 2 – Paris, 1853, June 23rd, Haussmann on the formation of Paris



(Fig. 48)

On June 23rd, 1853, Georges-Eugene Haussmann, commonly known as Baron Haussmann, presented his plans for the transformation of Paris to the Emperor Napoleon III. Haussmann served as the Prefect of the Seine department and was appointed by Napoleon III to carry out an ambitious project of reshaping the city, (Wikipedia, , 2023).

Haussmann plan aimed to address the numerous issues that plagued Paris at the time, including overcrowding, unsanitary conditions, and a lack of proper infrastructure. Under his direction, vast areas of Paris were demolished to make way for the wide boulevards, parks, and public squares we now associate with the city.

The intent was to improve traffic flow, provide better ventilation, and enhance the aesthetic appeal of Paris. His plans also involved the construction of new buildings, including apartment blocks, government offices and cultural institutions.

He introduced regulations for building façades, promoting architectural unity and a consistent style across the city. The new boulevards facilitated movement throughout the city, the installation of sewer systems improved sanitation and the creation of public parks provided the much-needed greenery.

Haussmann's renovation of Paris became a model for urban planning around the world and played a significant role in shaping the city's identity as a global cultural and architectural capital. Today, Haussmann's legacy can still be seen in the wide boulevards, iconic buildings and the distinctive city scape of Paris.



(Fig. 49)

Applied principles in context: Proposing Mixed Use developments with the ground floor as public space, large streets for people, green corridors and good quality outdoor spaces.

Designing in perspective, thinking in 3D both as an organisational block order in relations to streets and squares, as well as perspectival eye level experience of these spaces and places.



(Fig. 50)



(Fig. 51)

## Masterplan Case Studies

### Case Study 2 – Amsterdam, The formation of Amsterdam Canals

The formation of Amsterdam canals dates back to the 17th Century, during the Dutch Golden Age.

Amsterdam was rapidly growing as a prosperous trading city, and the construction of canals played a crucial role in its urban development and economic success.

The city's expansion and canal construction were driven by a combination of factors, including the need for transportation, defence and water management.

The planning and construction of the canals were carried out in a systematic manner, Amsterdam's city planners designed a concentric ring structure, with a series of semi-circular canals radiating outwards from the historic centre.

These canals were interconnected by smaller canal, creating a network of waterways throughout the city.

The canals served multiple purposes. They provided transportation routes for goods and people, facilitating trades and commerce, and enabled the city's economic growth.

The canals also played a crucial role in the water management, helping to control flooding and maintain the city's water levels. (Amsterdam Info, 2003-2023)



(Fig. 52)



(Fig. 53)

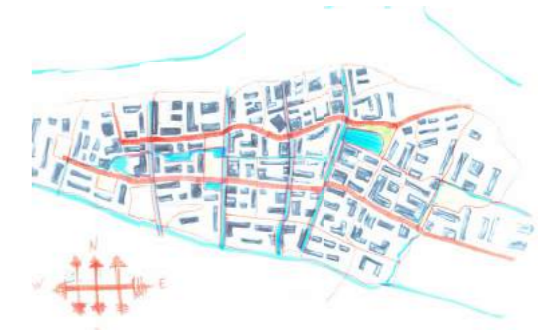
Applied principles in context: Proposing a new harbour on site and allowing the water to come in at times, along the New Broombridge Harbour Development, allowing residents and visitors to enjoy the walk along these new water bodies.

Also integrating ponds along key flooding plains, which have the capacity to hold the excess water on site when needed.

The new streets have permeable surfaces and sustainable materials to address same issue.



(Fig. 54)



(Fig. 55)

## Masterplan Case Studies



(Fig. 56)



(Fig. 57)

### Case Study 3 – The Wide Street Commission, 1757

The Wide Street Commission was established in 1757 by an Act of the Irish Parliament.

It was created to address the need for urban planning and development of Dublin, which faced overcrowding, unsanitary conditions, and inadequate infrastructure.

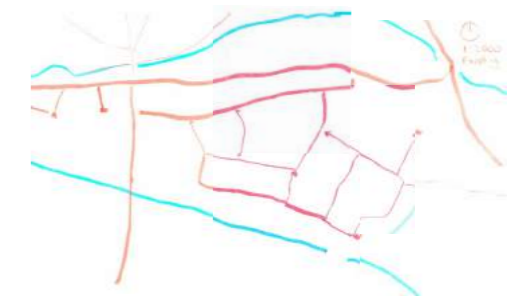
Under the authority of the Wide Streets Commission, large scale reconstruction and modernization projects were undertaken in Dublin. The commission was responsible for widening and improving existing streets as well as creating new ones.

Their goal was to create a more organized and aesthetically pleasing city, modelled after the architectural principles at the time.

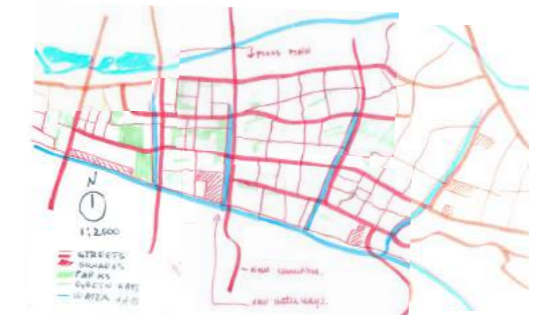
Some of the notable projects undertaken included the creation of Sackville Street, known today as O'Connell Street, which was designed as a grand thoroughfare leading to the city centre; the commission also oversaw the development of D'Olier Street, Westmoreland Street, and College Green.

They also implemented regulations regarding the building façade, heights and architectural style to ensure a cohesive and harmonious urban environment. (Dublin City Council, 1758-1851)

Applied principles in context: Bring back the 'Living on top of the Shops' strategy as a driving tool in the design process and 'making' of these new places, together with streets for people and public squares.



(Fig. 58)



(Fig. 59)

## Masterplan Case Studies

### Case Study 4 – Ildefons Cedra, The development of Barcelona, mid-19th Century



(Fig. 60)

Ildefons Cedra's plan was commissioned by the city council in response to the rapid growth and overcrowding that Barcelona experienced during the Industrial Revolution.

The plan was designed to address the various urban issues, including poor sanitation, lack of green space, and inadequate transportation infrastructure (History of Barcelona, 2014). Key features of Cedra's plan included:

1. **Grid System:** Cedra proposed a gridiron street layout, consisting of a series of wide, straight streets intersecting at right angles; this design allowed for better circulation of traffic and facilitated the movement of people and goods throughout the city.
2. **Expansive City Blocks:** Cedra's plan included the concept of the "island blocks" or "super-blocks", these blocks were significantly larger than traditional city blocks and featured inner courtyards, providing space for communal facilities and green areas.
3. **Green Spaces:** The plan emphasized the importance of greenery within the city. Cedra included numerous public parks and gardens throughout Barcelona to provide residents with recreational areas and improved the city overall quality of life.
4. **Transportation Infrastructure:** Cedra recognised the need for efficient transportation systems, and he proposed various modes of transportation, including trams and horse drawn carriages.
5. **Social Equality:** Cedra's plan aimed to create a more egalitarian society. He sought to ensure that all residents had access to essential services and amenities, regardless of their social or economic status.

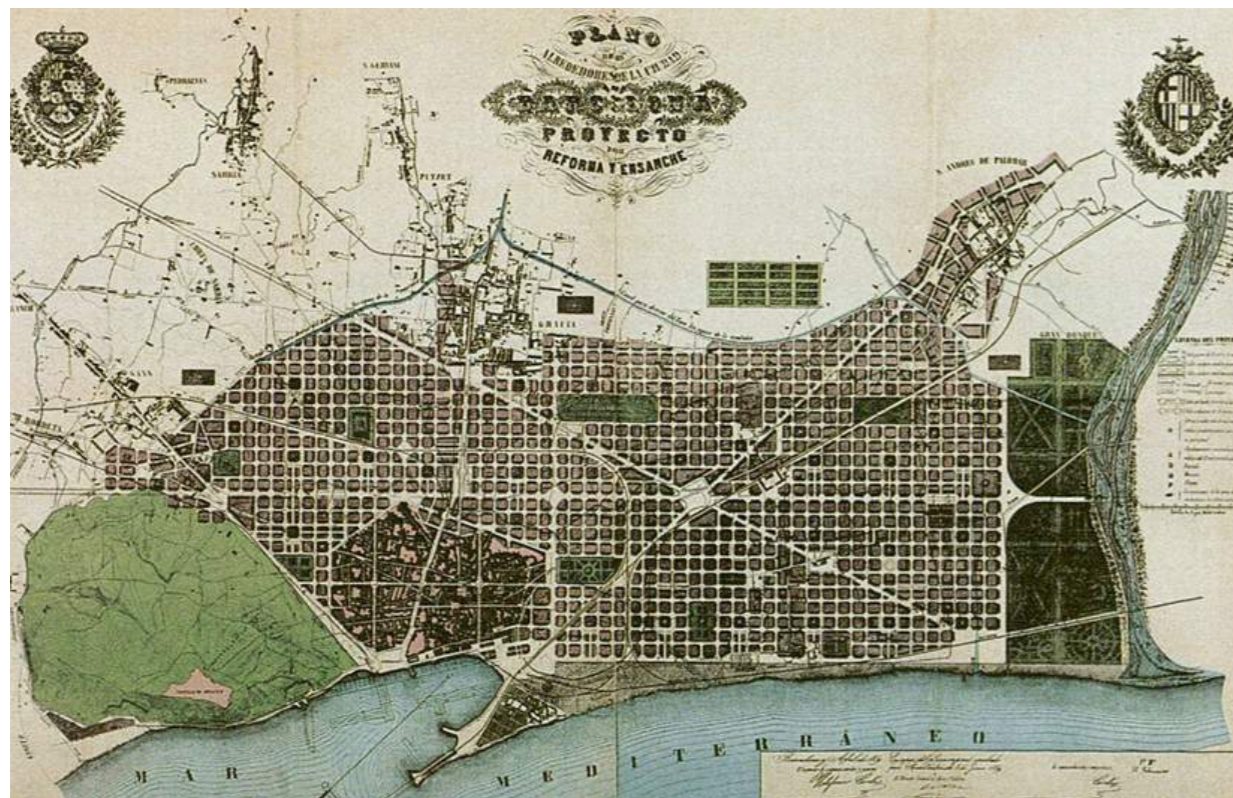
Applied principles in context: Taking these good principles and re-using them throughout the development.

This includes the proportions of blocks, the distances between them and the depth of each block to allow for good cross ventilation, dual aspect, proper orientation, as well as large outdoor spaces for people.

This development also provides for people in need of housing. The proposed development will offer studios, one bedroom and two-bedroom apartments to people that need it the most.

The idea is that the state would facilitate the construction of these amenities, parks and squares as well as housing for homeless people, or people on social welfare.

Instead of payment colossal amounts on social welfare, especially for people associated with depression, or drinking issues, which will more likely be spending these money to feed these unhealthy needs, the government could rather offer them a job and a house, and integrate them into the community, offering a chance for a better quality of life, where they are feeling needed and useful, and they feel like they contribute to this whole, as everything is interconnected.



(Fig. 61)



(Fig. 62)



## Masterplan Case Studies

### Case Study 5 – The Barbican Estate, London

The Barbican Estate is a prominent residential complex located in the city of London, England. It is one of the most significant examples of post-war brutalist architecture in the country.

The estate was development as a part of a larger plan to regenerate the area after it was heavily bombed during World War II.

The construction began in 1960s and was completed in the 1970s and it aimed to create a self-contained residential community within the heart of the city. The estate is known for its distinctive architectural style characterized by concrete structures, angular forms, and a focus on functionalism.

The design incorporated a variety of residential units, including flats, maisonettes, and a penthouse, as well as amenities such as a school, library, arts centre, shops and public spaces.

One of the key features is the extensive use of communal spaces, providing residents with relaxation, socialization and recreation.

The estate includes a lake and an elevated walkway which offers scenic views to the surrounding area, and it has been acclaimed for its architectural significance and its successful integration of residential, cultural and commercial elements.

While cars are not entirely prohibited in the Estate, the design of the complex emphasizes pedestrian-friendly spaces and limits vehicular access and parking.

The estate was planned with the intention of prioritizing pedestrian movement and creating a more tranquil living environment with reduced noise. (Keskeys, 2016)

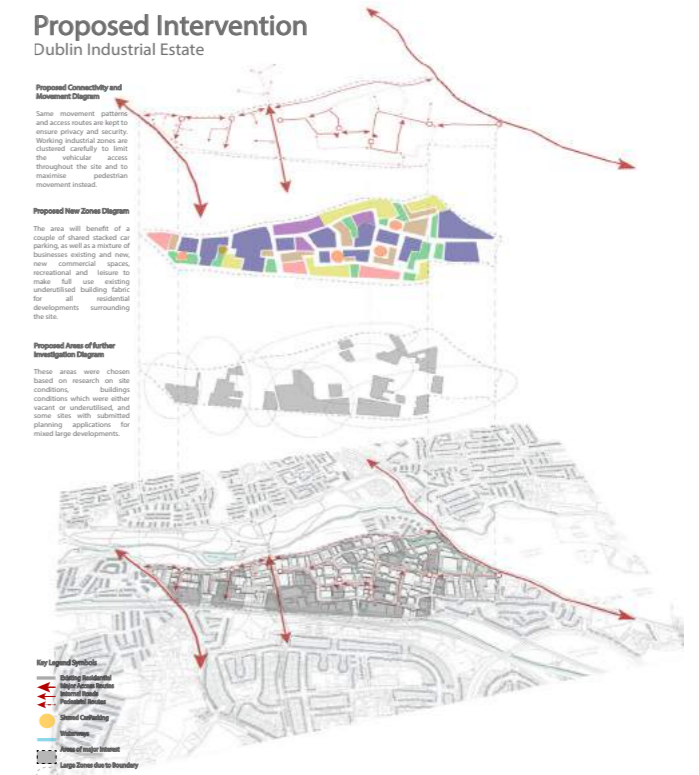


(Fig. 63)



(Fig. 64)

Applied principles in context: Proposing mixed use places for people to live, adopting a No-Car Strategy, thinking about carbon emissions and noise, with the focus on natural elements, as water, greenery and simple interactions.



(Fig. 65)



(Fig. 66)



(Fig. 67)

Based on research and investigation on housing types, numbers and type of amenities, employment rates and locations, as well as infographics, the regeneration of this area would be done in phases, with main master planning components and objectives focusing on keeping and increasing amenities and employment in the area; to cluster the industry across strategy roadways, to provide green infrastructure, to target current and projected trends based on demographics to provide sustainable residential units, while introducing a rule of 'No Surface Carpark', where all the cars would be placed in stacked carparking and providing Go Car Stations to allow people to move away slowly from the idea that they need to own their own private motor.



(Fig. 42)



(Fig. 62)











(Fig. 59)

**MasterPlan**  
Proposed Movement & Circulation  
Patterns

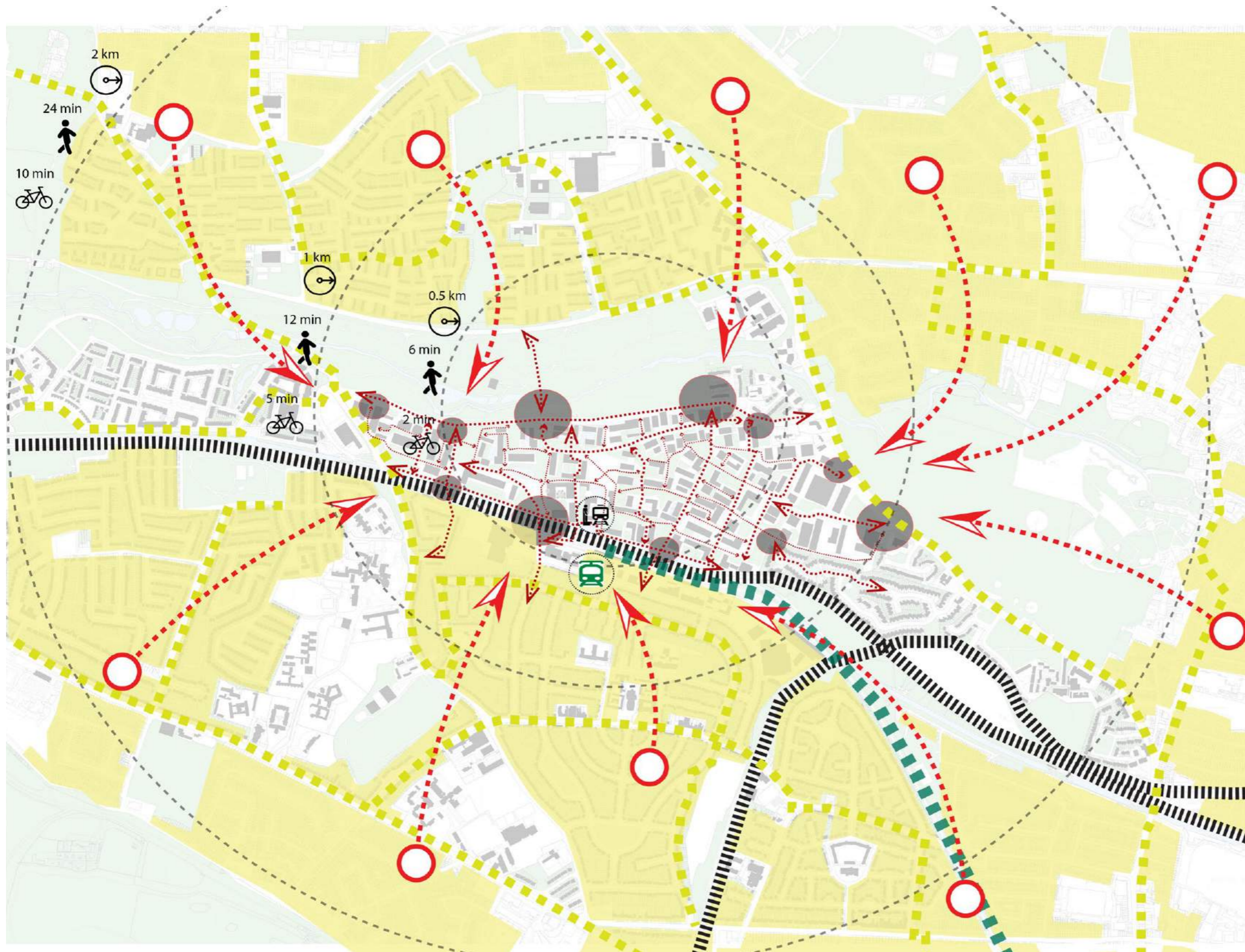
















Proposed Movement & Circulation Patterns Map

-  Main Streets
-  Secondary Routes
-  Train Trucks
-  Luas Trucks
-  Bus Routes
-  Nodes & Intersections
-  Train Stop  
(Broombridge)
-  Luas Stop  
(Broombridge terminal)

Proposed Movement & Circulation Patterns Map

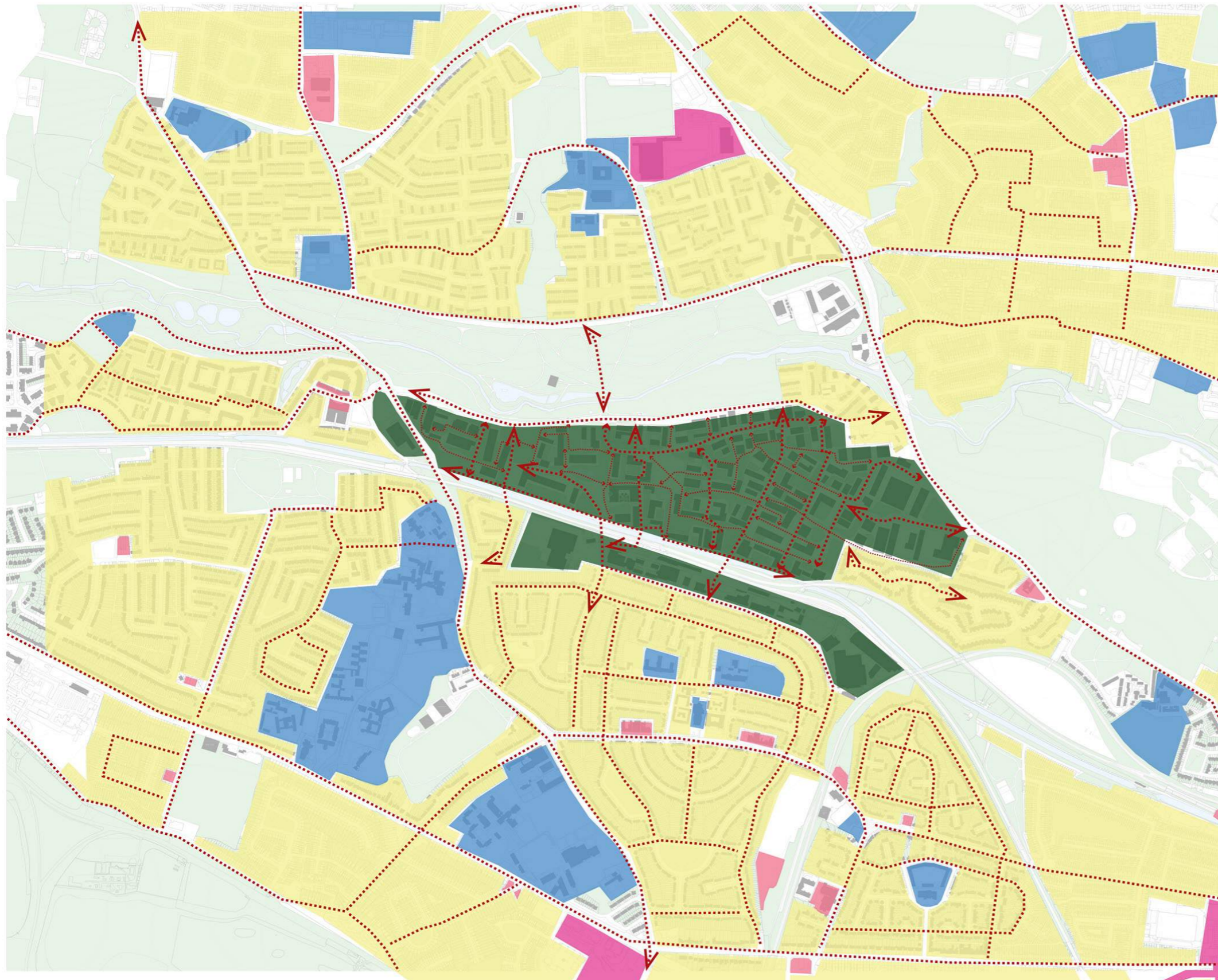
**MasterPlan**  
Proposed 15-Minute City













-  Existing Zoning & Travel Times Map
-  Main Streets
-  Secondary Routes
-  Travel Distances
-  Zone Z1  
Sustainable Residential  
Neighbourhoods
-  Travel Distances  
(Minutes / Walking)
-  Travel Distances  
(Cycling)
-  Radius
-  Train Tracks
-  Luas Tracks
-  Bus Routes
-  Nodes & Intersections
-  Train Stop  
(Broombridge)
-  Luas Stop  
(Broombridge terminal)

 Existing Zoning & Travel Times Map

**MasterPlan**  
Proposed Zoning



Proposed Zoning Map

-  Main Streets
-  Secondary Routes
-  Zone Z1  
Sustainable Residential  
Neighbourhoods
-  Zone Z10  
Inner Suburban and  
Inner Sustainable  
Mixed-Uses
-  Zone Z3  
Neighbourhood Centre
-  Zone Z4  
Urban Villages
-  Z15  
Community & Social  
Infrastructure
-  Areas just zones to  
'Sustainable Residential' in  
the Dev. Plan 2022-28
-  Distance (meters / km)
-  Travel Distances  
(Minutes / Walking)

Proposed Zoning Map

## Masterplan In-Depth Analysis of New Proposed Layers







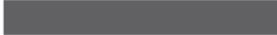

Dublin Industrial Estate has many underutilized buildings, buildings that are in use only at specific times, buildings of disrepair, many auto repair shops and some brownfield sites.

These spaces can be retrofitted, re-imagined and / or modified to provide for the needs of the existing and future community.

The industrial underutilised sheds are mainly made of concrete portal frames, and they have a story or two in height, usually double height to allow for goods in and out from trucks.

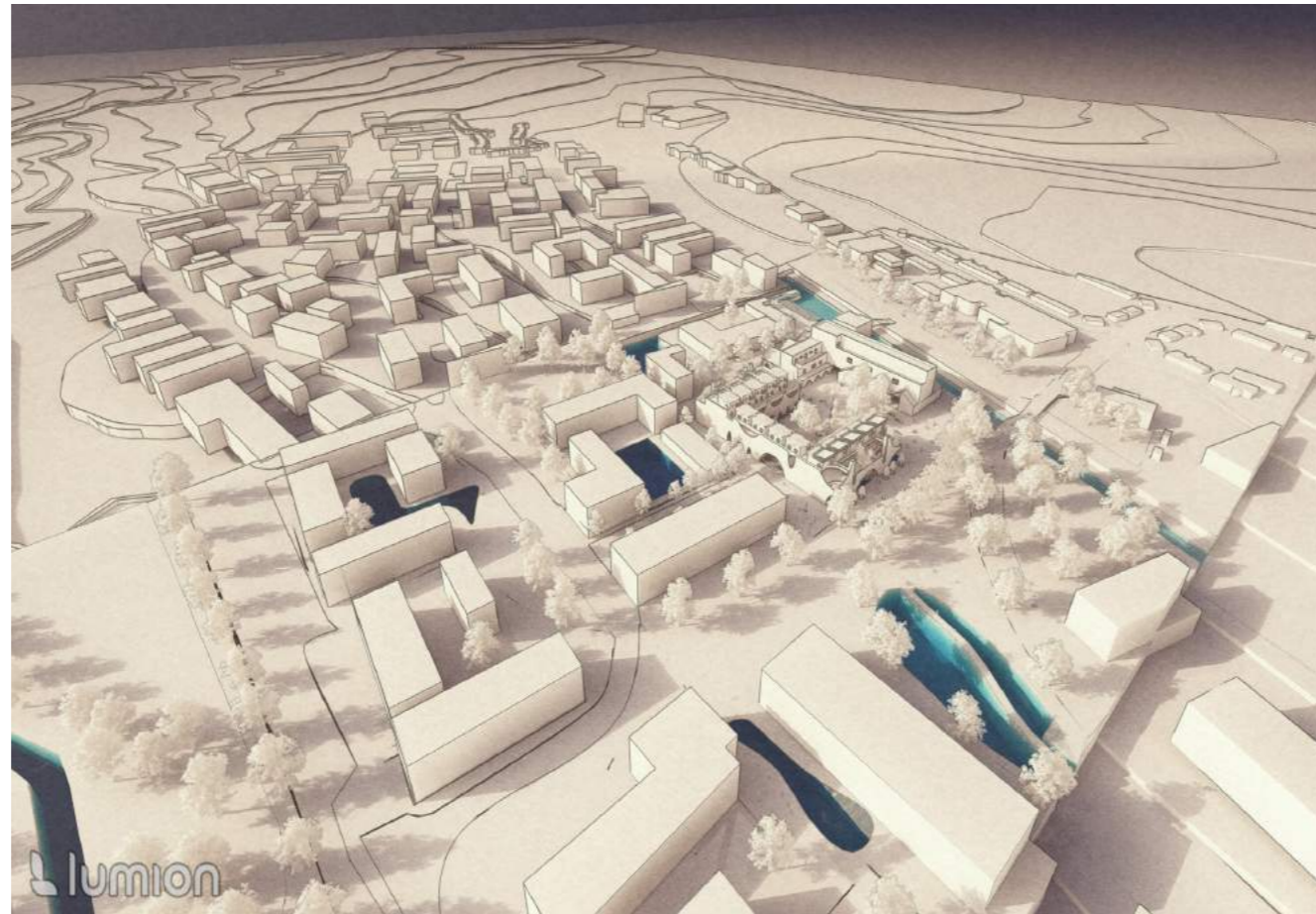


### Legend

-  Main Streets
-  Secondary Routes
-  New Zones due to Boundary
-  Nodes & Intersections
-  New Green Spaces
-  Civic Space
-  Public Squares
-  Proposed Buildings

 Proposed Exploded Map Layers

**MasterPlan**  
'Life Between Buildings'



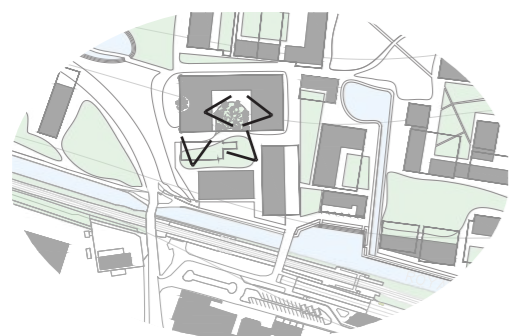
Proposed 3D Massing on Site



Public Square Perspective View



Public Square Perspective View



Key Plan



Public Square Perspective View

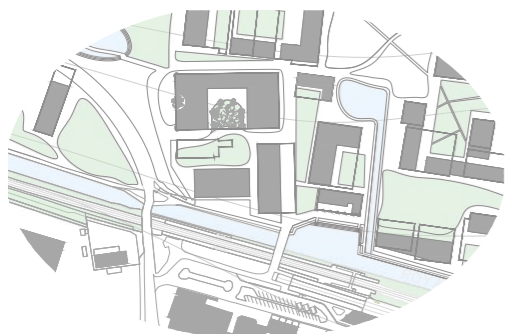


Public Square Perspective View

 **Masterplan**  
Proposed Form



 Key Plan



✓

Aerial Site View



**Chosen Site**  
A Detailed Investigation



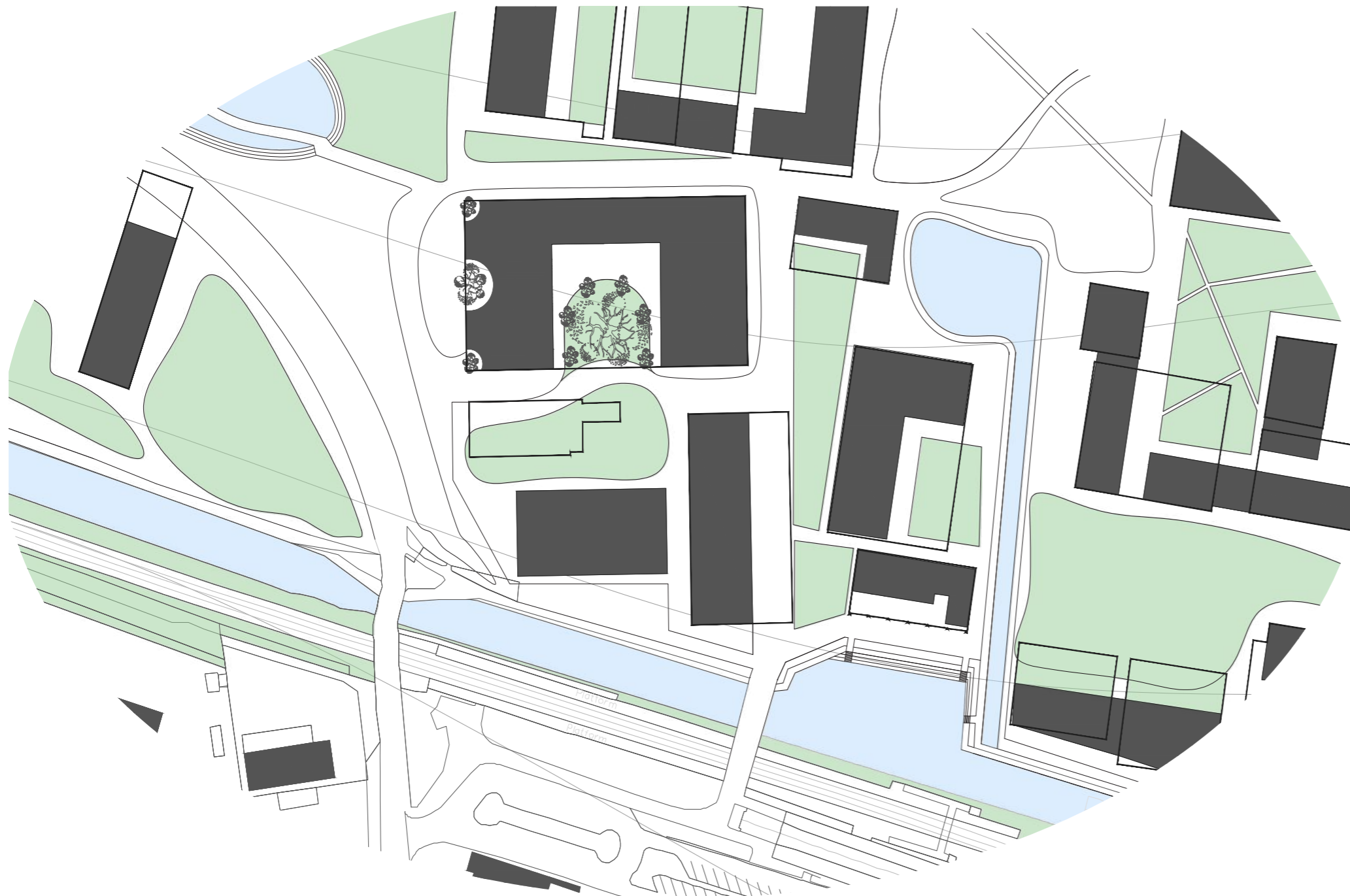
 Existing Site Layout Plan

The chosen site for detailed development is located north of the Luas and Broombridge Stations, across the royal canal, having the Broombridge Road running parallel the length of the site, on the west side. This site accommodates seven sheds, double height with 7.7 meter in height. They have portal concrete frames and block work on the exterior, no insulation and metal claddings, and metal roofs. The site is located at a strategic location, due to the transportation hubs, and it can host a large flow of people throughout the day, to encourage movement and activity throughout.



(Fig. 68)

## Chosen Site A Detailed Investigation



Proposed Site Layout Plan

Concept Design / The proposed site for development will accommodate active uses at ground floor to allow for a flow of people throughout the day, supporting movement and humans' interaction from morning to late evenings.

The uses include elderly accommodation and facilities, recreational and leisure facilities with opening times from 6am to 10pm; Sustainable commercial uses from 8am to 6pm; restaurants, bakery, and cafés with opening times from 6am to late night and a library and other educational facilities which stay open late as well.

The buildings and site layout intervention allows for flexibility overtime as there is a structural grid in place based on existing foundation pads.

Modular units will be used to allow for some flexibility on the upper floors, where if, in the future this building can become, office space, hotel, other accommodation types, this could be easily achieved due to the grid, and the prefabricated elements.

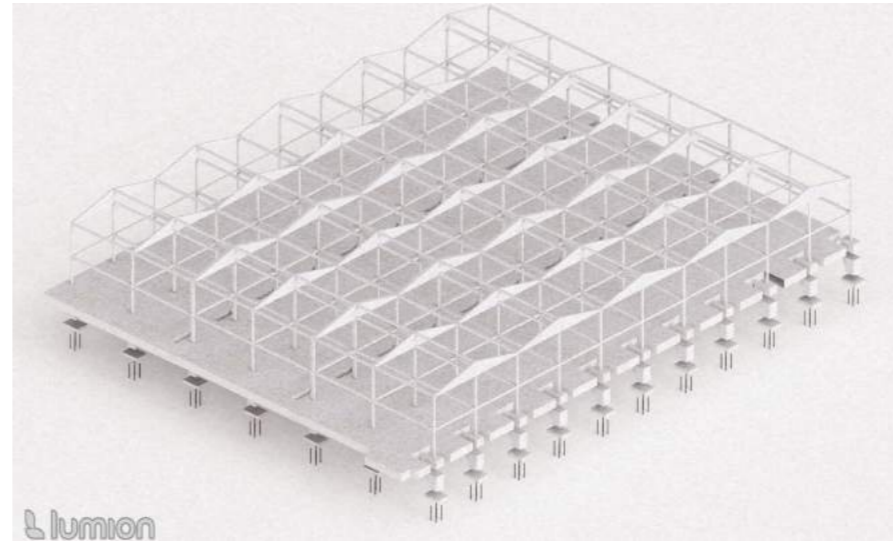
## Reuse of Existing Assets

### The concrete Slab

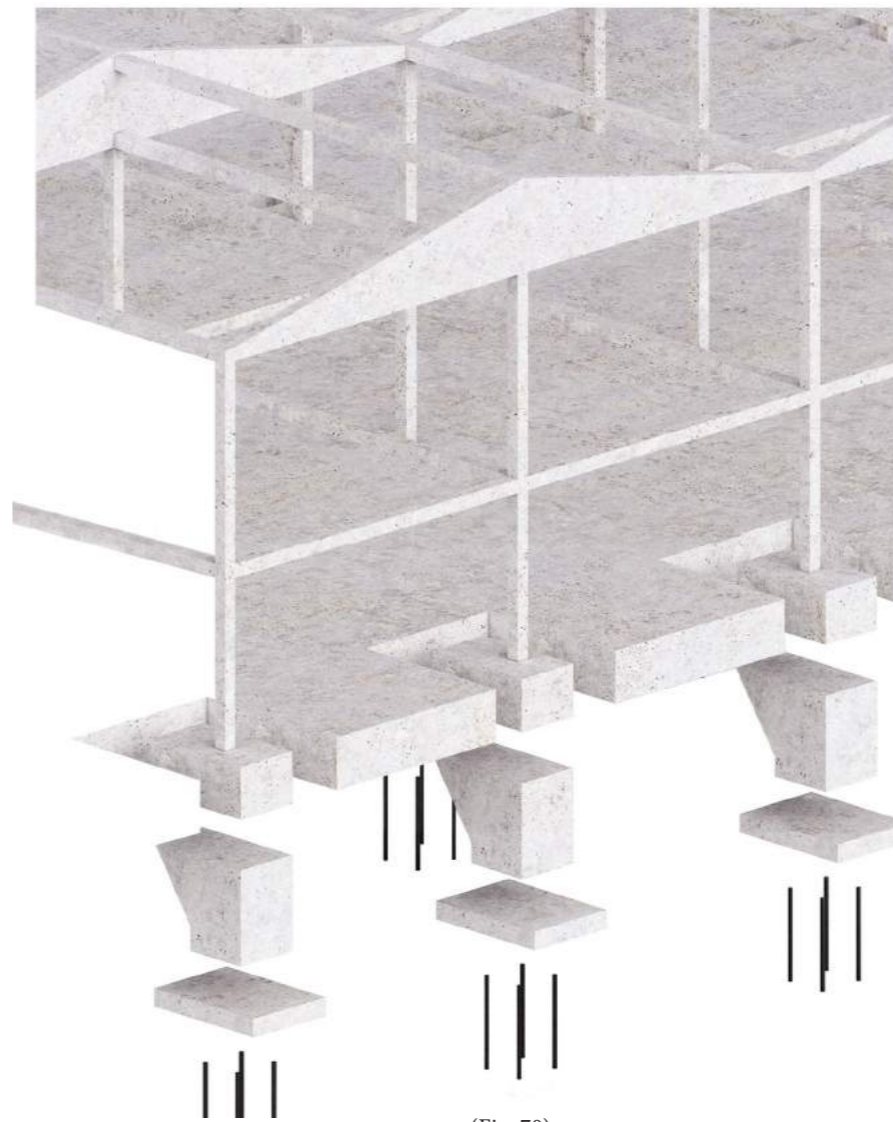
The shed plans are very deep, and they have strong foundations, having the strength to hold up to four stories of CLT and Glulam construction on top. This is ideal because it is an excellent opportunity for retail, medical, education, recreational and leisure at ground floor, together with new sustainable new streets, parks, and public squares.

The existing ground floor slab is cut at times to allow for nature to be a part of the developments with active green spaces and active uses throughout the day.

Different services are required to always keep the streets active.



(Fig. 69)



(Fig. 70)



(Fig. 71)

## Building Design Case Studies

### Case Study 1 – Peter Barber Architects



(Fig. 72)

Peter Barber Architects focuses on creating sustainable, inclusive and well-designed spaces that respond to the needs of local communities.

Their projects often involve the regeneration of existing sites, the creation of affordable housing and the revitalization of urban areas. Their design often incorporated elements to promote social interaction, public spaces and environmentally friendly features.



(Fig. 73)

### Case Study 2 – Alison Brooks Architects



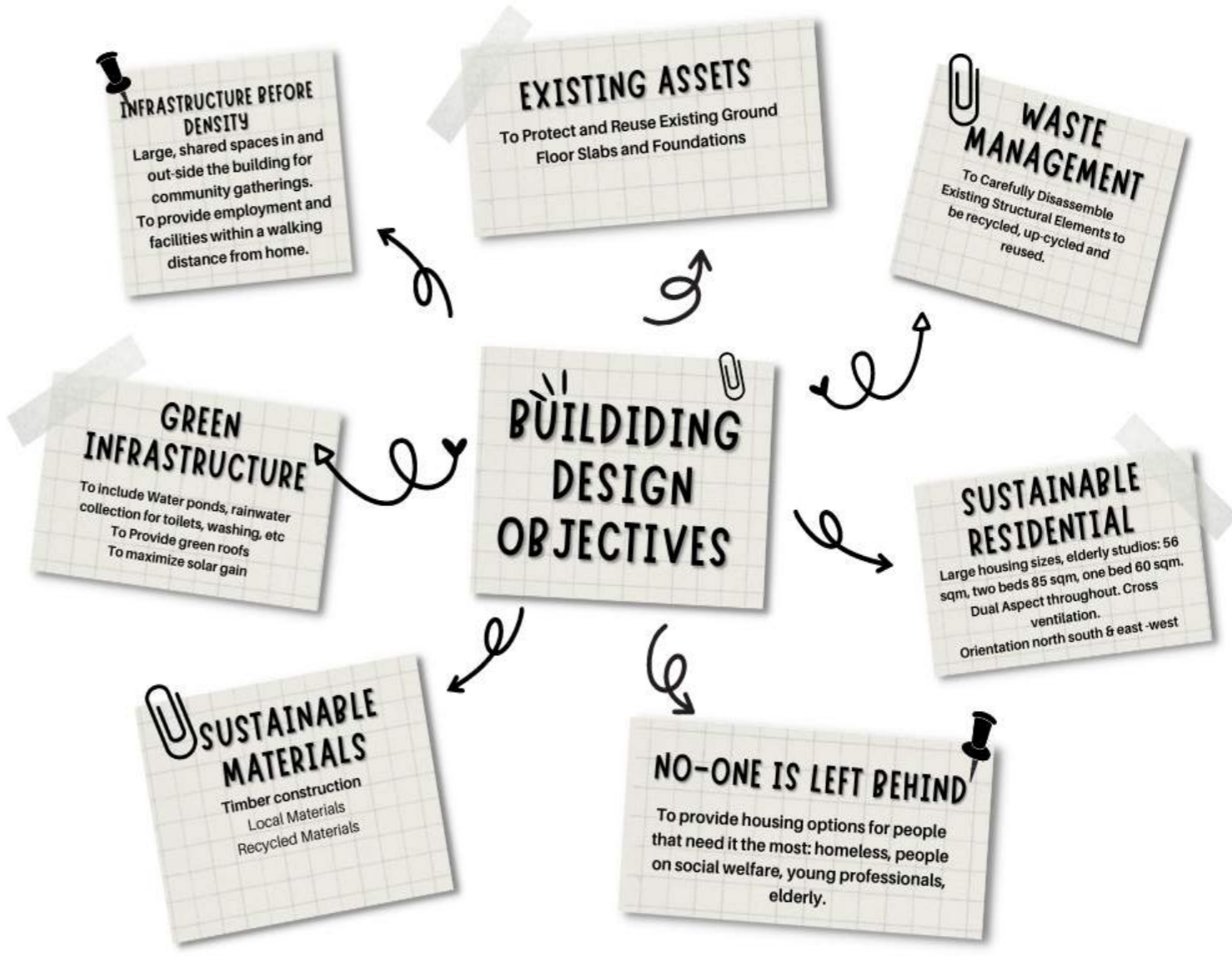
(Fig. 74)

Alison Brooks architects focuses on creating sustainable and contextually responsive designs that address the social, cultural and environmental needs of their clients and communities.

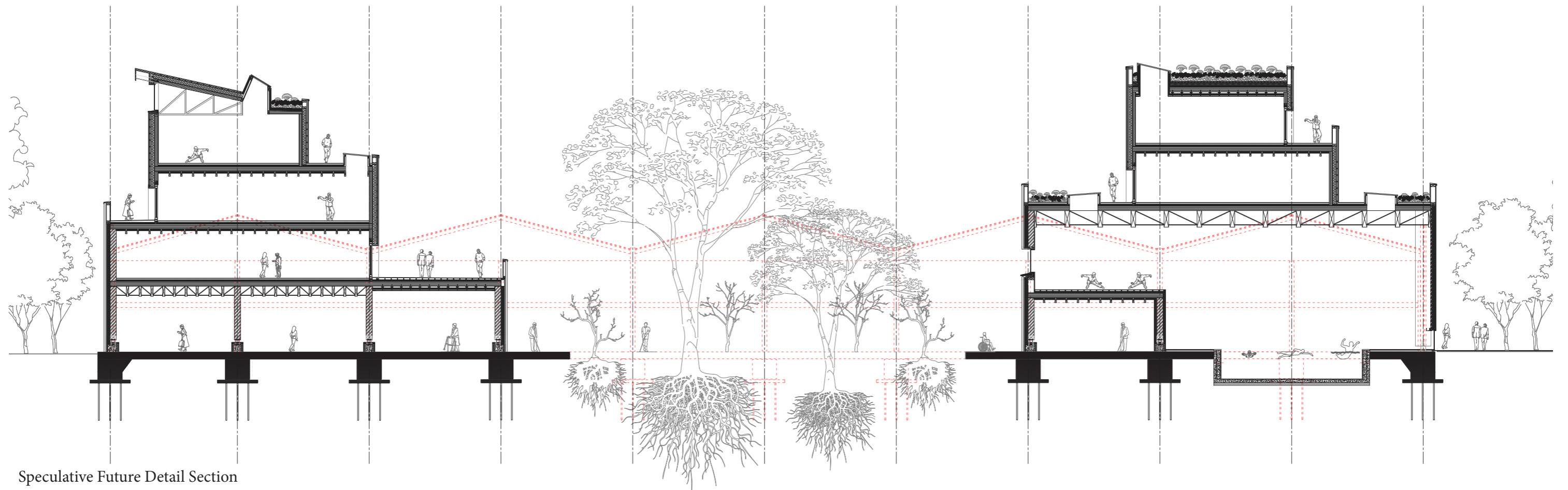
The firm has been involved in a diverse range of projects, including residential, cultural, educational, and mixed-use developments, and they are known for responding to the unique characteristics of each site, with the emphasis on innovation, materiality and special experiences.



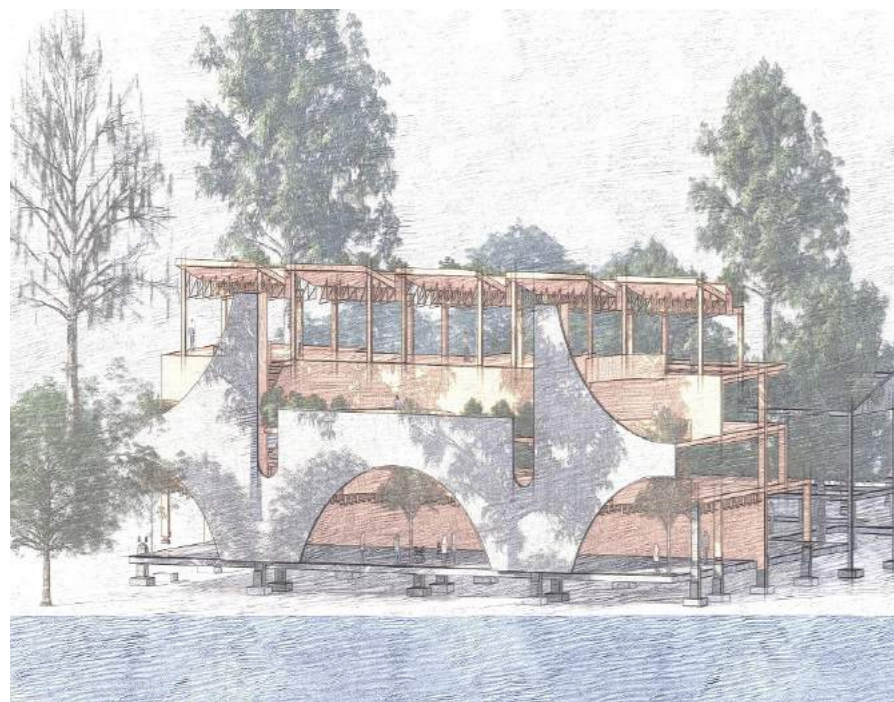
(Fig. 75)



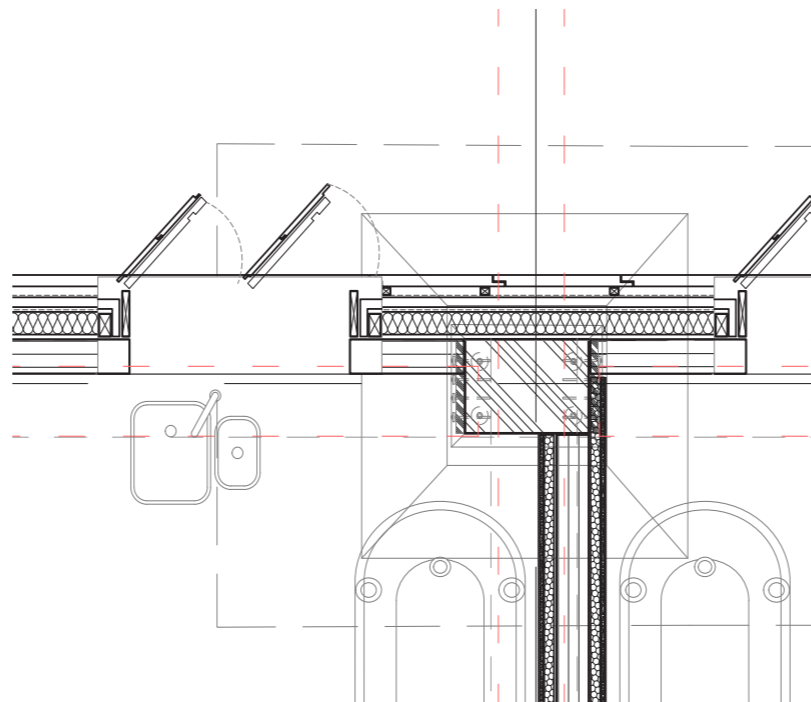
(Fig. 76)



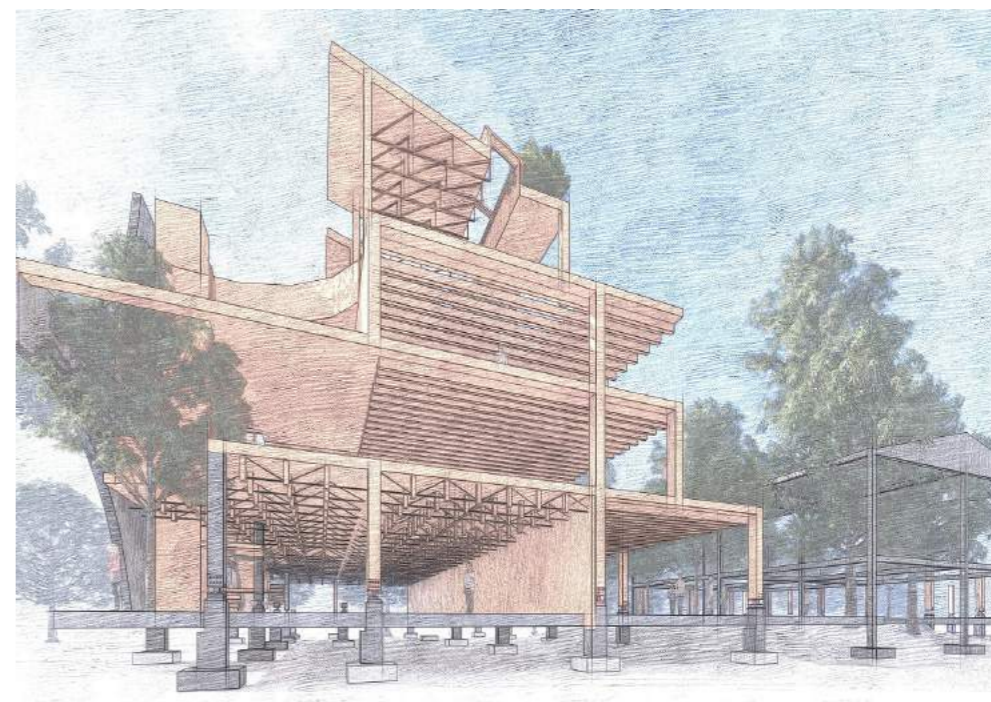
Speculative Future Detail Section



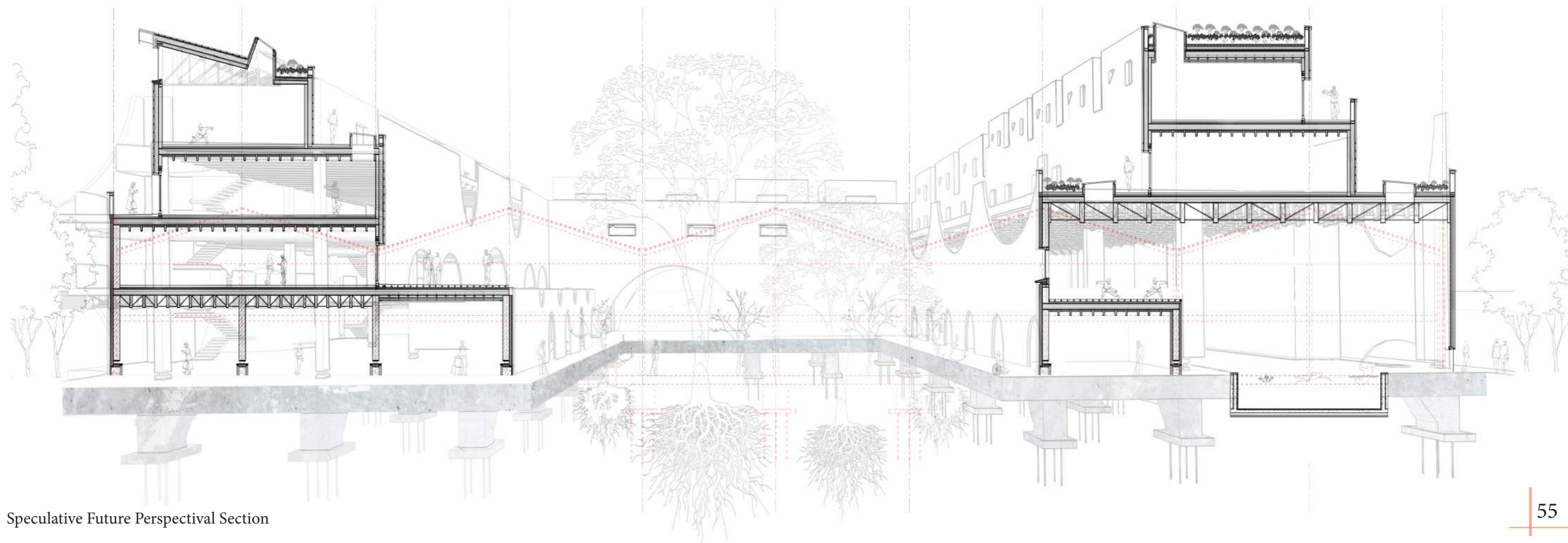
Speculative Future Facade & Skeleton Render



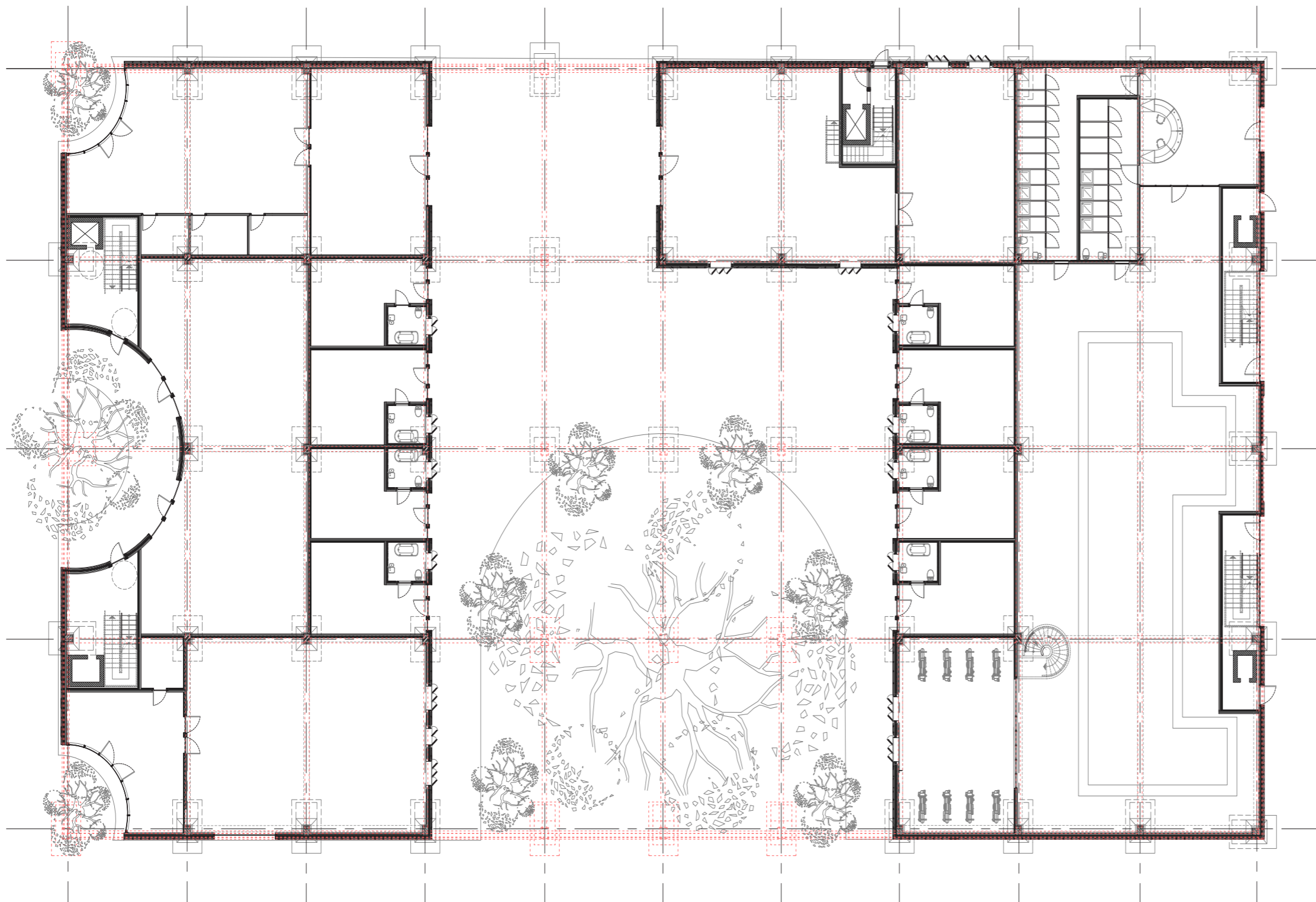
Speculative Future Part Plan / Glulam Detail



Speculative Future Skeleton Render



Speculative Future Perspectival Section



Proposed Ground Floor Plan

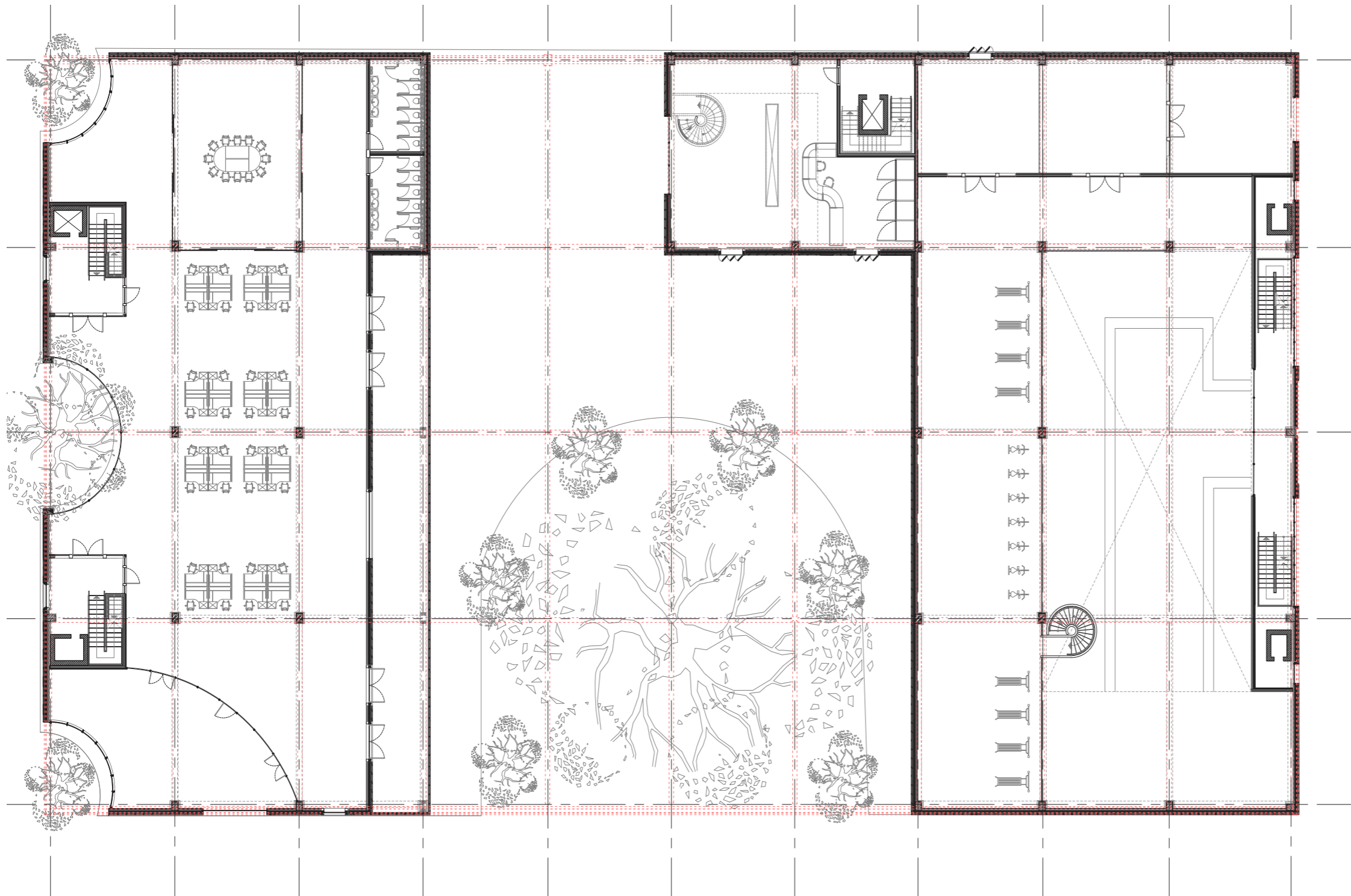
Legend

- Vertical Semi Private Access  
(Access to Residents Above & The Office Space)
- Commercial  
(Sustainable Commercial Spaces Selling Local Foods)
- Community  
(Shared Community Rooms & Facilities)
- Leisure  
(Swimming Pool, Yoga & Pilates Classes & Gym)
- Residential Units  
(Elderly Studios at Ground Floor, x8 in total, Area: 50 Sq.M)



Key Plan (Functions & Uses)

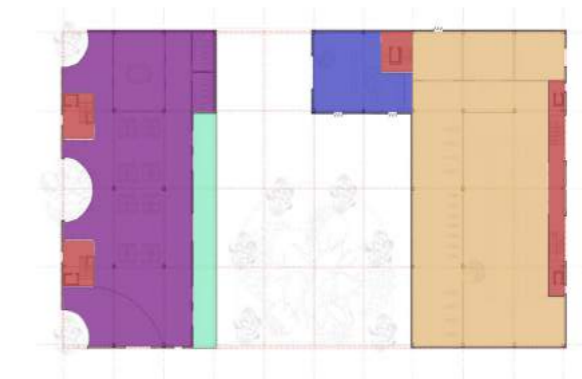




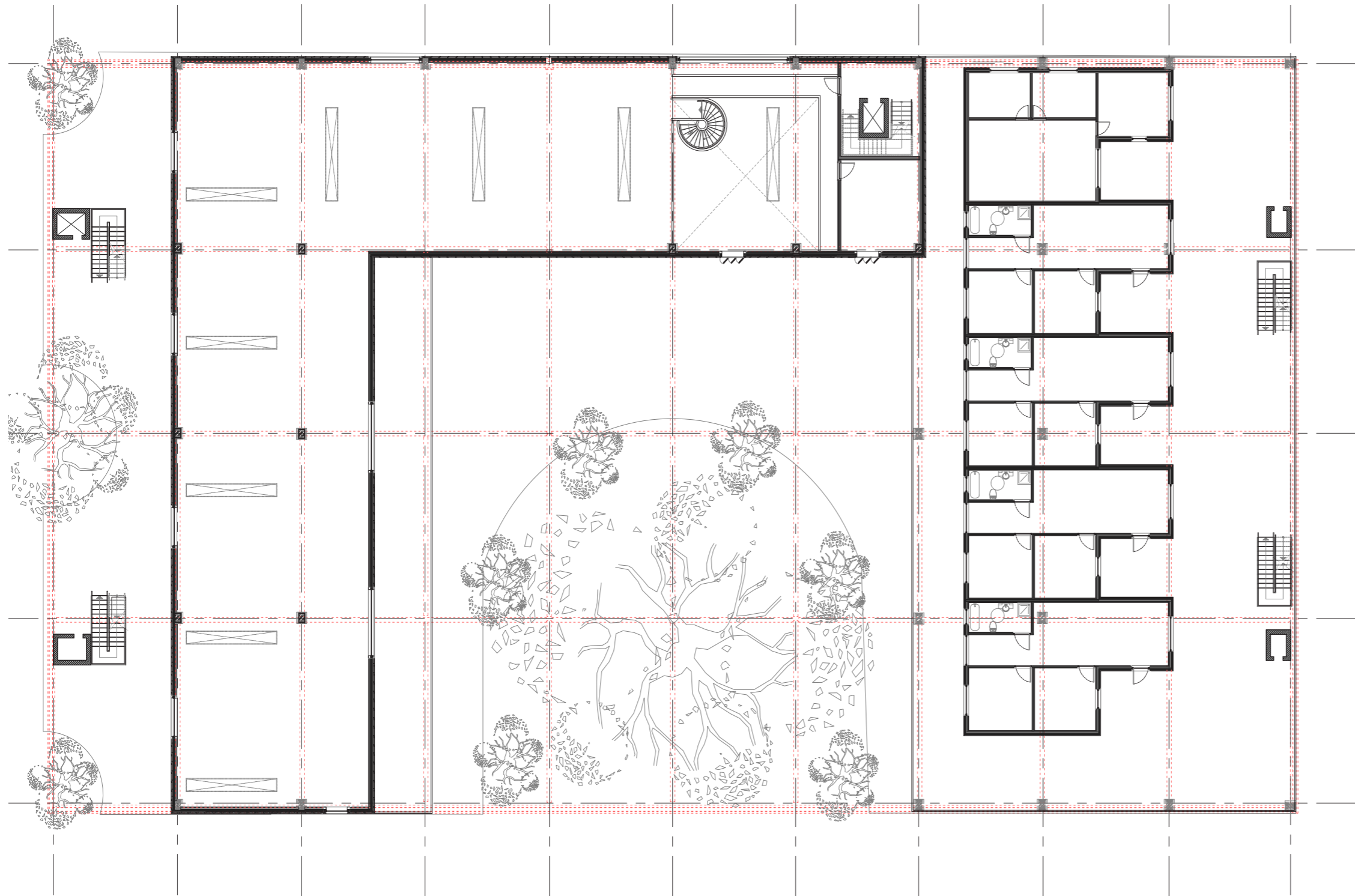
Proposed First Floor Plan

Legend

- Vertical Semi Private Access  
(Access to Residents Above & The Office Space)
- Office Space  
(Shared Large Office Spaces)
- Medical Centre  
(GP Facilities & Small Injuries Clinic)
- Leisure  
(Yoga & Pilates Classes & Gym)
- Roof Terrace  
(Shared Outdoor Large Balconies)



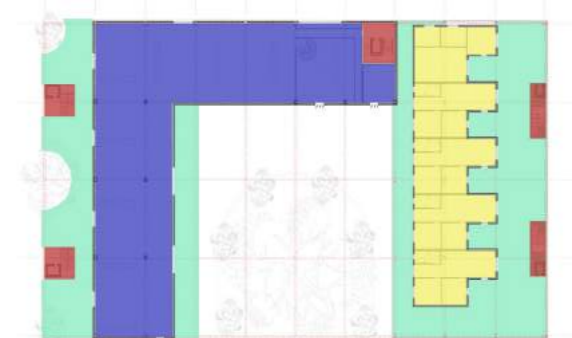
Key Plan (Functions & Uses)



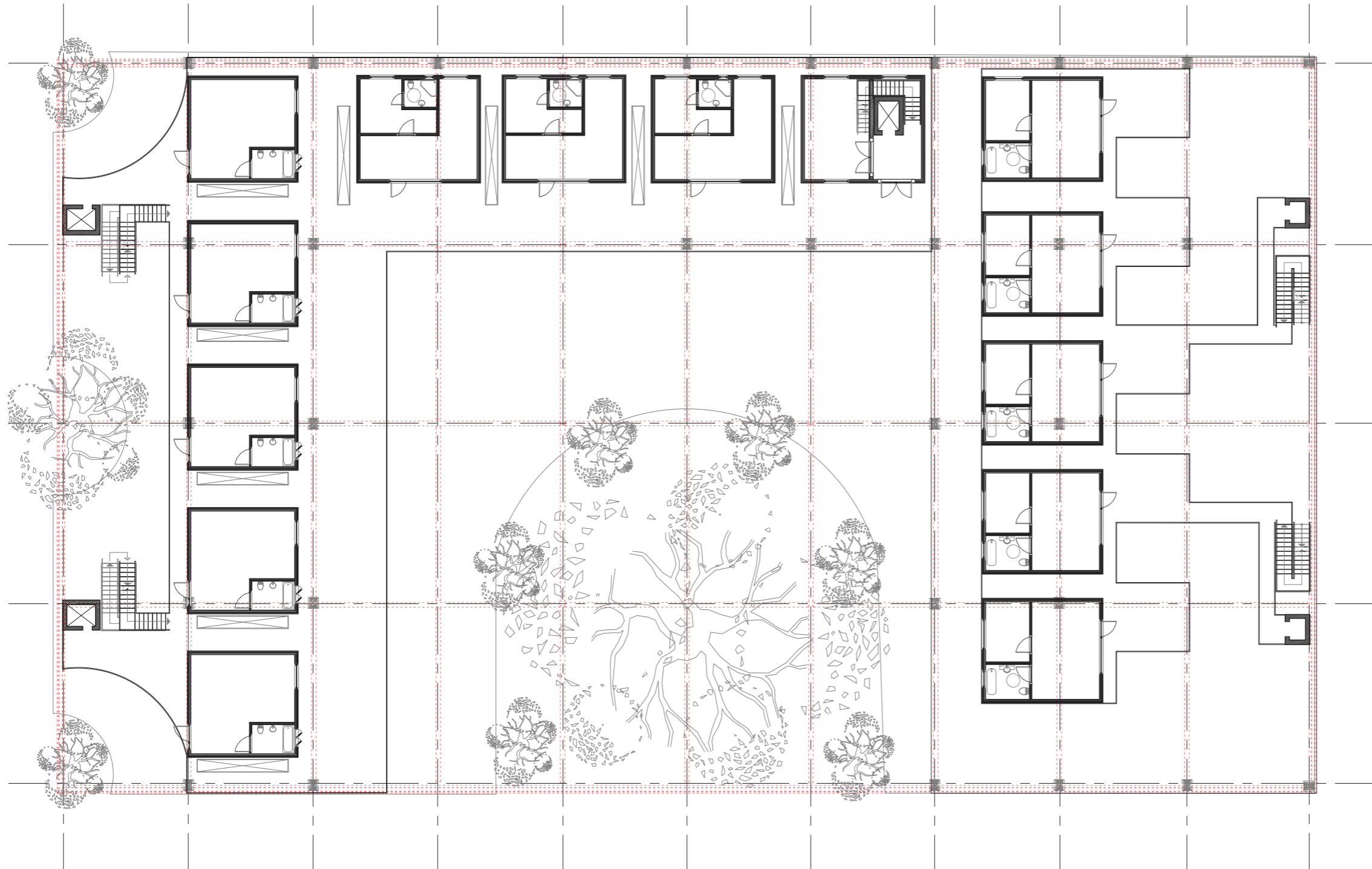
Proposed Second Floor Plan

Legend

- Vertical Semi Private Access  
(Access to Residents Above & The Office Space)
- Medical Centre  
(GP Facilities & Small Injuries Clinic)
- Residential Units  
(Two-Bedroom Apartments)
- Roof Terrace  
(Shared Outdoor Large Balconies)



Key Plan (Functions & Uses)



Proposed Third Floor Plan

Legend

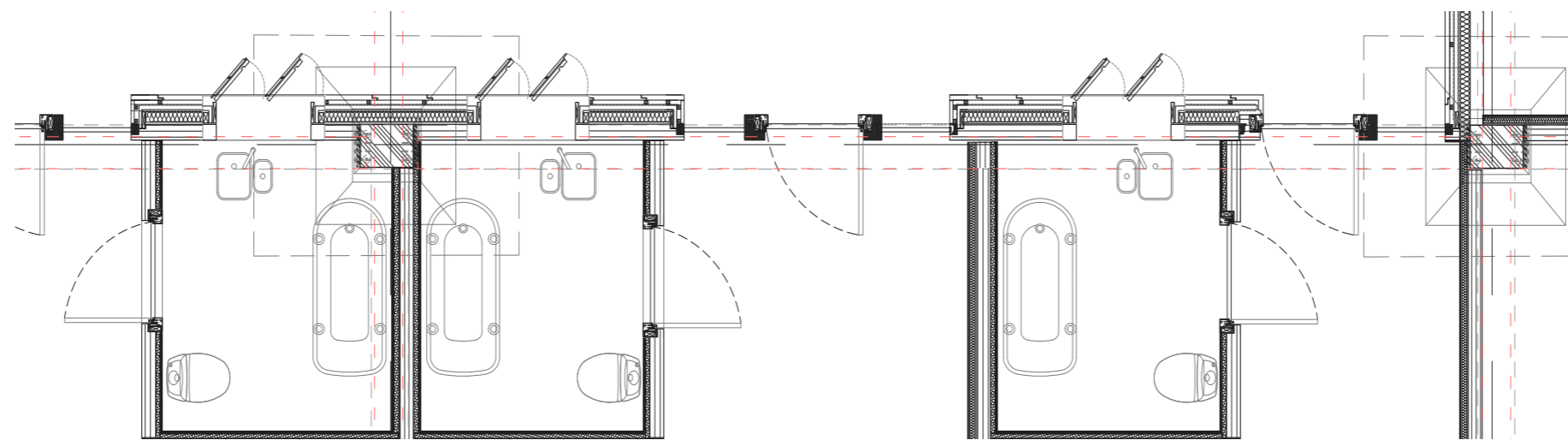
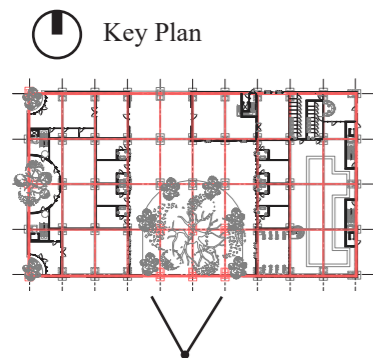
- Vertical Semi Private Access  
(Access to Residents Above & The Office Space)
- Community  
(Shared Community Rooms & Facilities)
- Residential Units  
(One-Bedroom Apartments & Studios for Emergency Accommodation)
- Roof Terrace  
(Shared Outdoor Large Balconies)



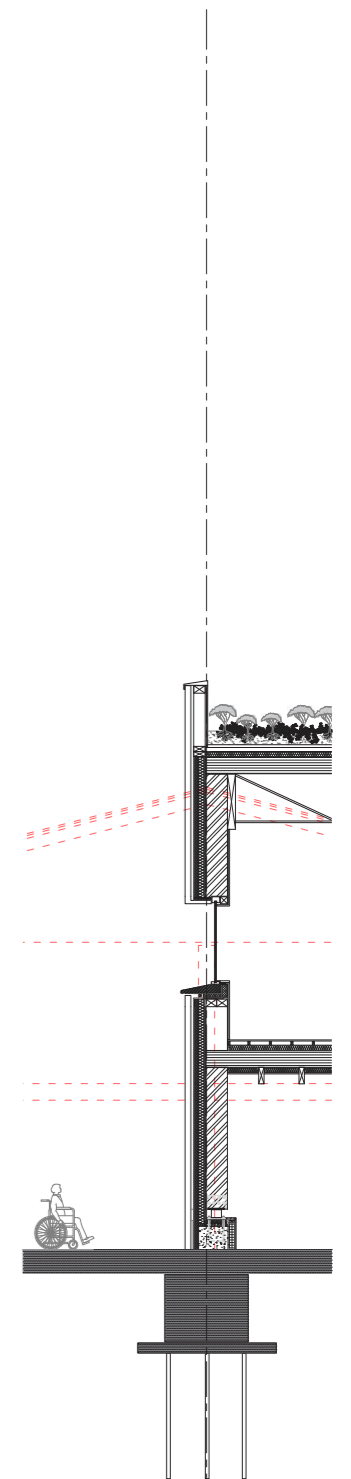
Key Plan (Functions & Uses)



Elderly Accommodation Courtyard View

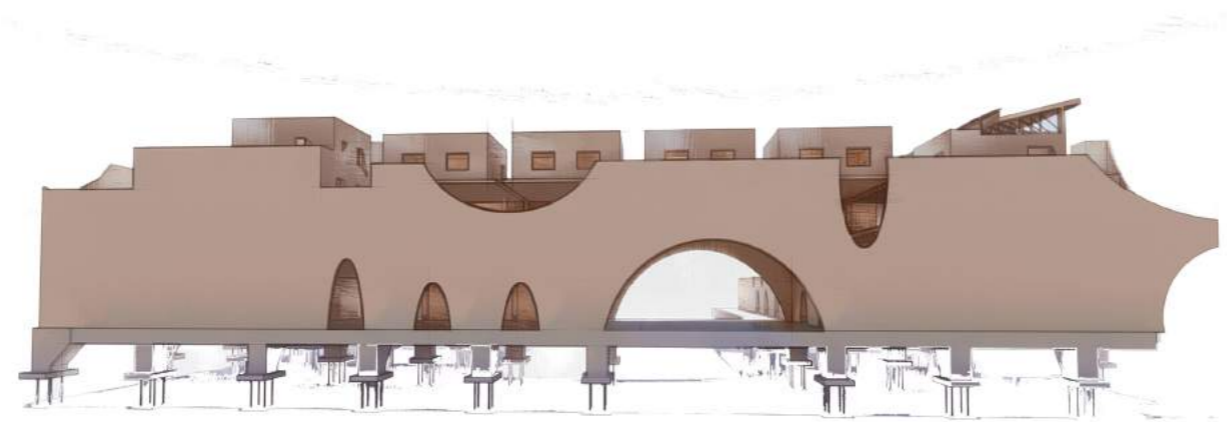


Elderly Accommodation Part Plan / Detailed

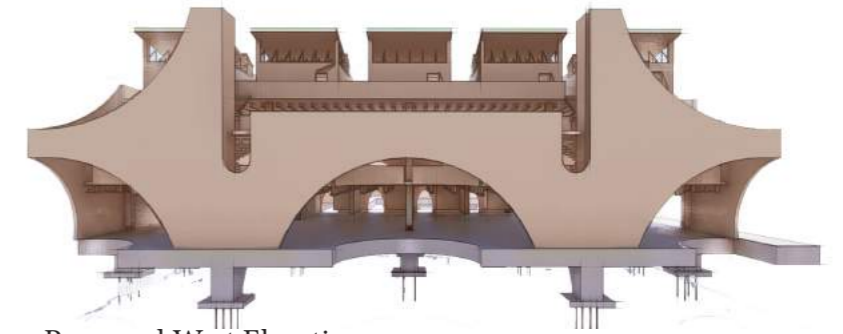


Part Section / Detailed

**Building Design**  
Place, Space & People



Proposed South Elevation

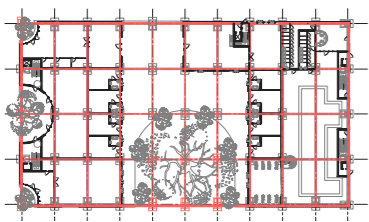


Proposed West Elevation



Proposed North West View / Morning Time Render

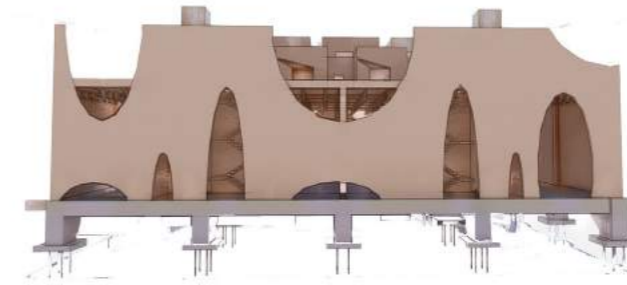
Key Plan



**Building Design**  
Place, Space & People



Proposed South Elevation

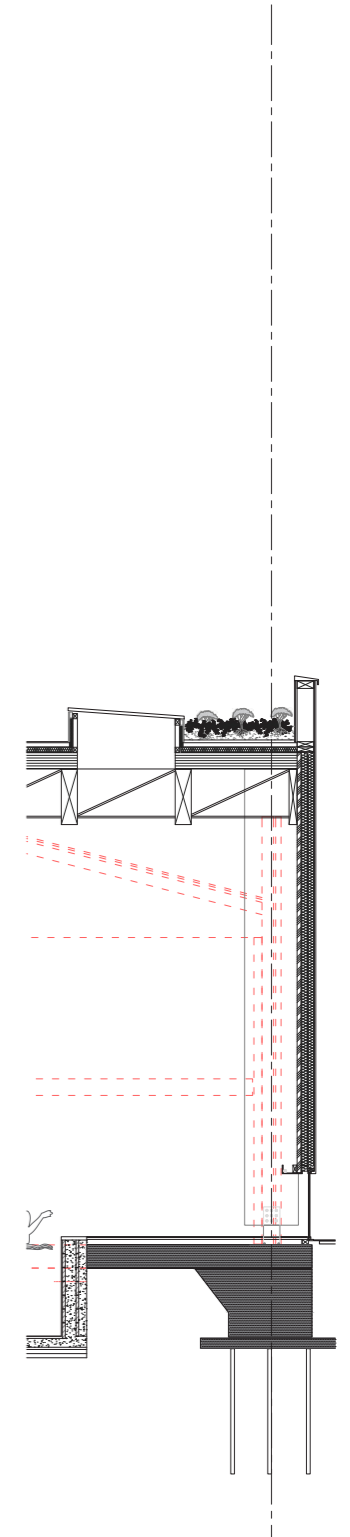
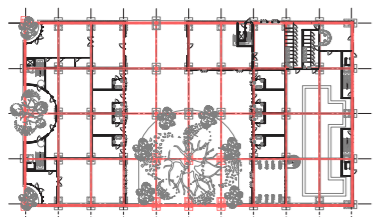


Proposed East Elevation



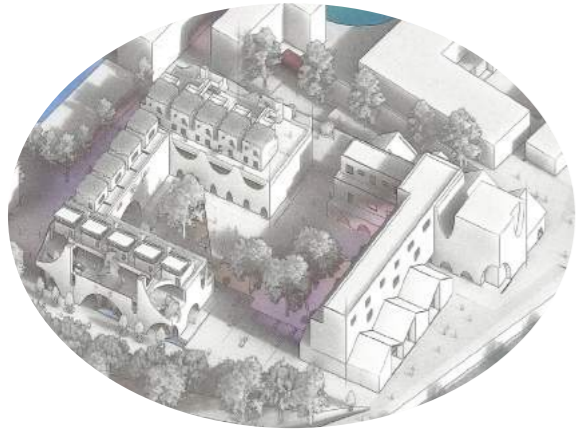
Proposed East Facing Render

Key Plan



Detail / Swimming Pool

 **Building Design**  
Place, Space & People



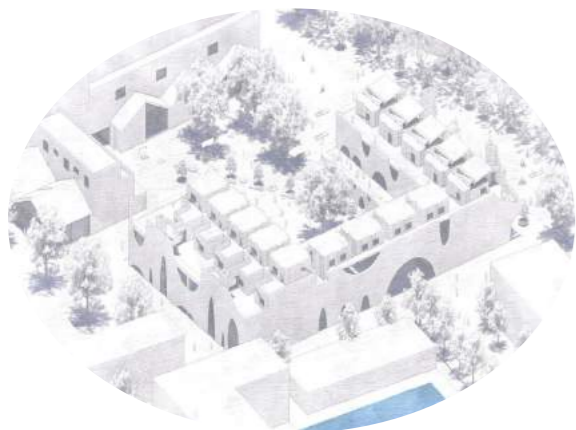
South - West Axonometric



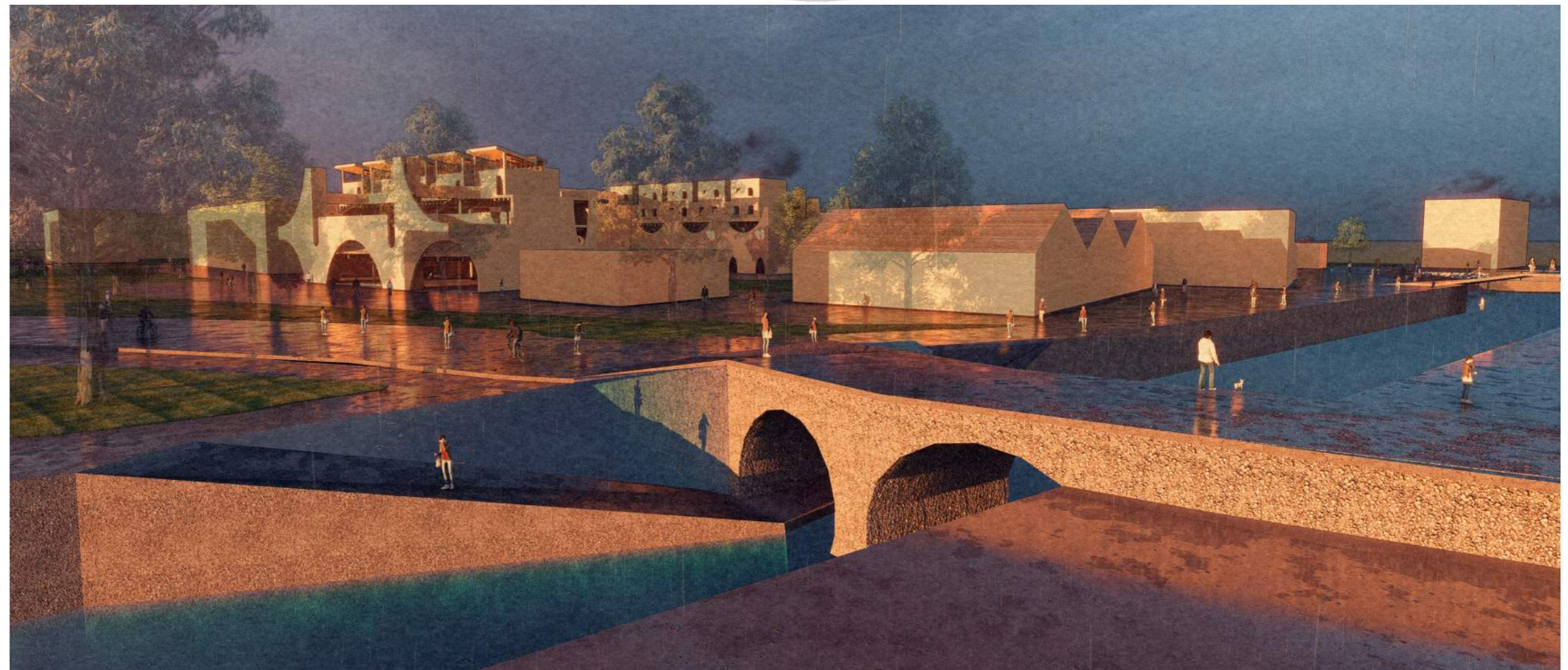
Old & New Construction / Collage



South - East Axonometric



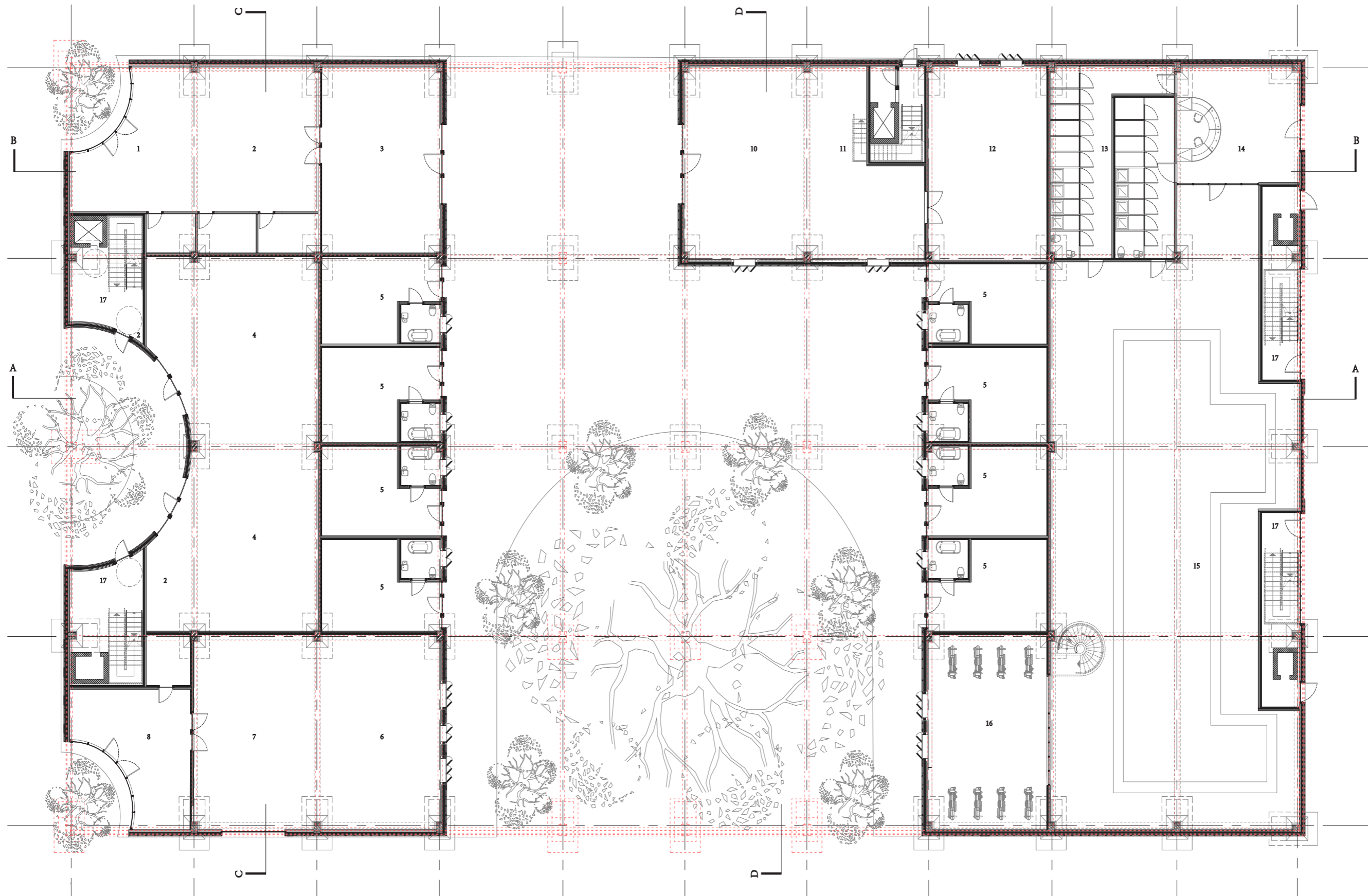
North - East Axonometric



Building in context / Render

# Building Design

## Ground Floor As Public Space



**LEGEND**

REMOVAL WORKS - - - - -

NEW BUILT

EXISTING

FOUNDATIONS

Proposed Mixed-Use Development built on existing foundations. Portal frames are disassembled and sent for recycling. All removal and disassembly works are highlighted in red. The scheme provides commercial spaces at ground floor, elderly accommodation overlooking the internal courtyard, as well as more shops, a community room and a swimming pool and gym. The Floors Above provide accommodation of 2-bed and 1-bed apartments for elderly and / or young professionals at second and third floor. First Floor contains a medical centre above the commercial spaces, small gallery space, and more rooms for training above the pool.

- Ground Floor Building Programme:**
- 1 Public Entrance Atrium Space
  - 2 Commercial Space
  - 3 Commercial Space
  - 4 Shop
  - 5 Elderly Accommodation
  - 6 Community Gathering Room
  - 7 Shared Communal Space
  - 8 Private Entrance Atrium Space
  - 10 Cafe
  - 11 Restaurant
  - 12 Storage, Kitchen and Staff Rooms
  - 13 Leisure Centre Changing Rooms
  - 14 Leisure Centre Reception
  - 15 Swimming Pool
  - 16 Classes Room
  - 17 Stair Cores for Vertical Access

Proposed Ground Floor Plan



**Building Design**  
Built Form in Context

**Density**



**Population**



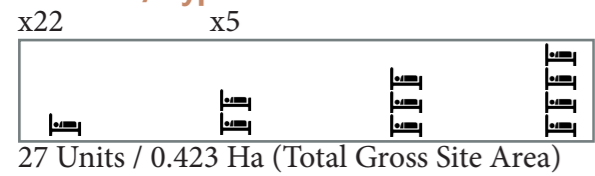
**Net Residential Density**



**Gross Residential Density**



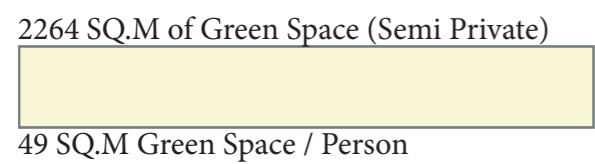
**Unit No. / Types**



**Travel Times**



**Shared Outdoor Spaces**



Site Model / Building in context

## Building Design Built Form in Context

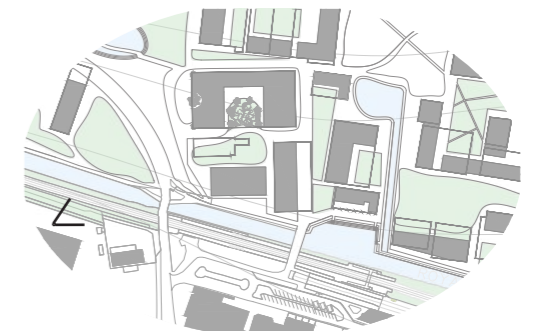


Daytime Render / Materiality, Form & Scale In context

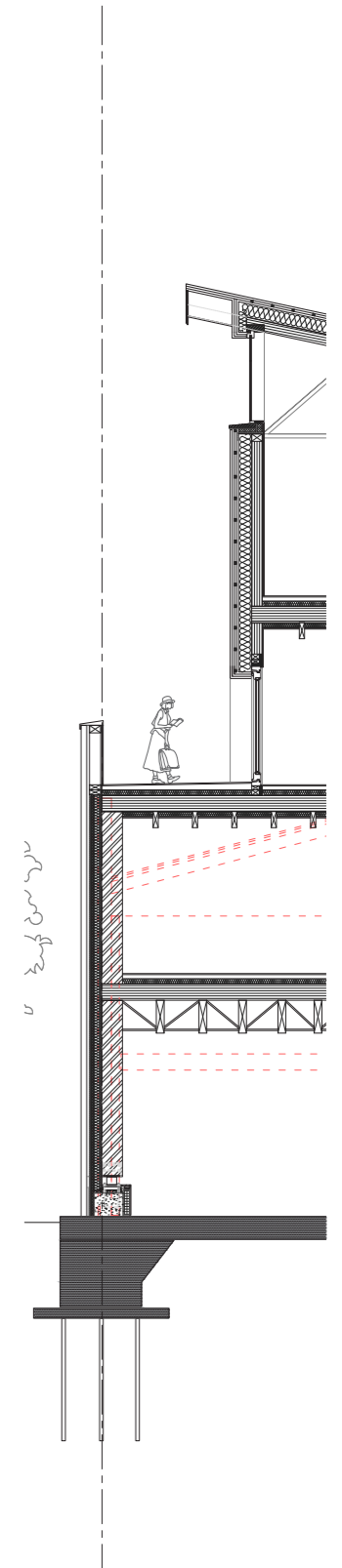
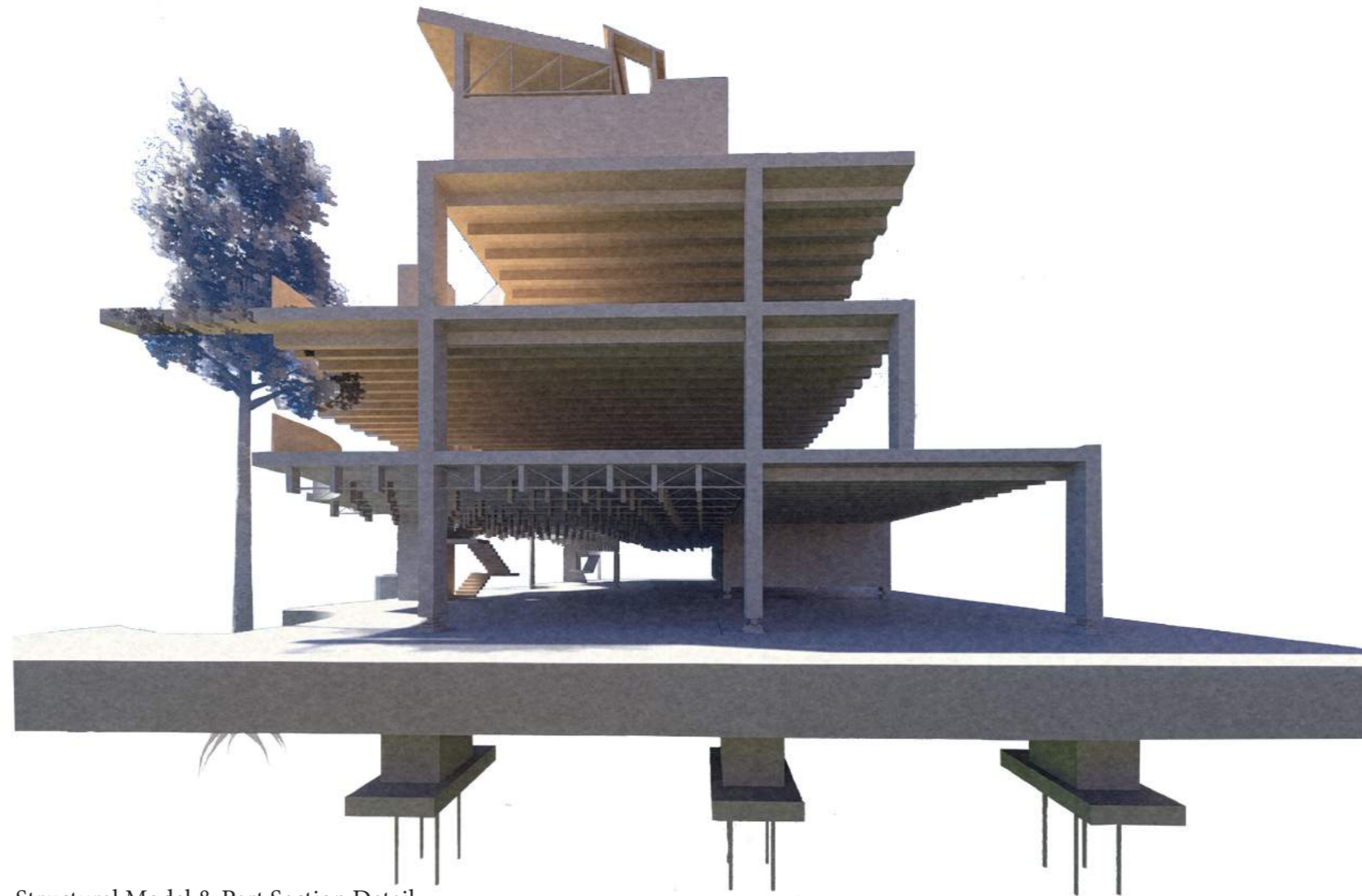
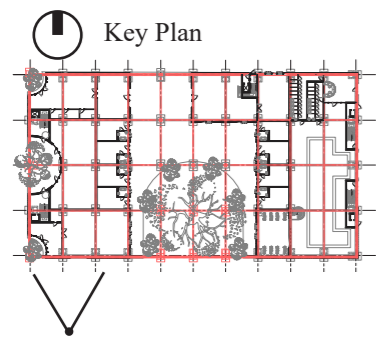
The proposed building will be fully naturally ventilated, including all bathrooms, and all residential rooms will have cross ventilation, dual aspect, and south roof light where possible. The proposed development will be placed only on existing foundations and the space in between will be used for nature and communities-oriented activities.

The site area is 4236 Sq. M, and it hosts 27 residential units across two floors achieving a density 92.7 units / ha net density, that gives an approx. number of 158 people per hectare. The development focuses on providing an active life and services for everyone outside their homes, but also good quality living spaces with amenities, work, and services within a walking distance. This development seeks to achieve a NET 0 Carbon.

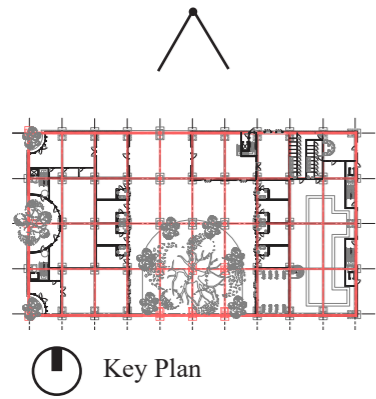
Key Plan



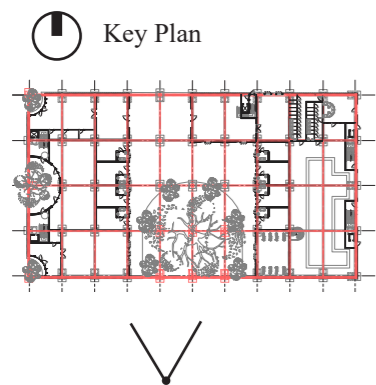
 **Building Design**  
Skeleton & Materiality



**Building Design**  
Skeleton & Materiality

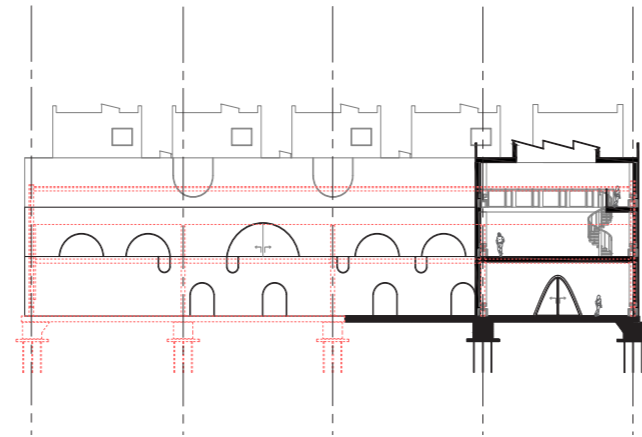
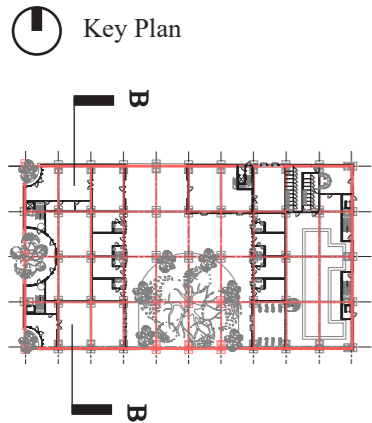


Materiality Perspectival Collage / North View



Materiality Perspectival Collage / South View

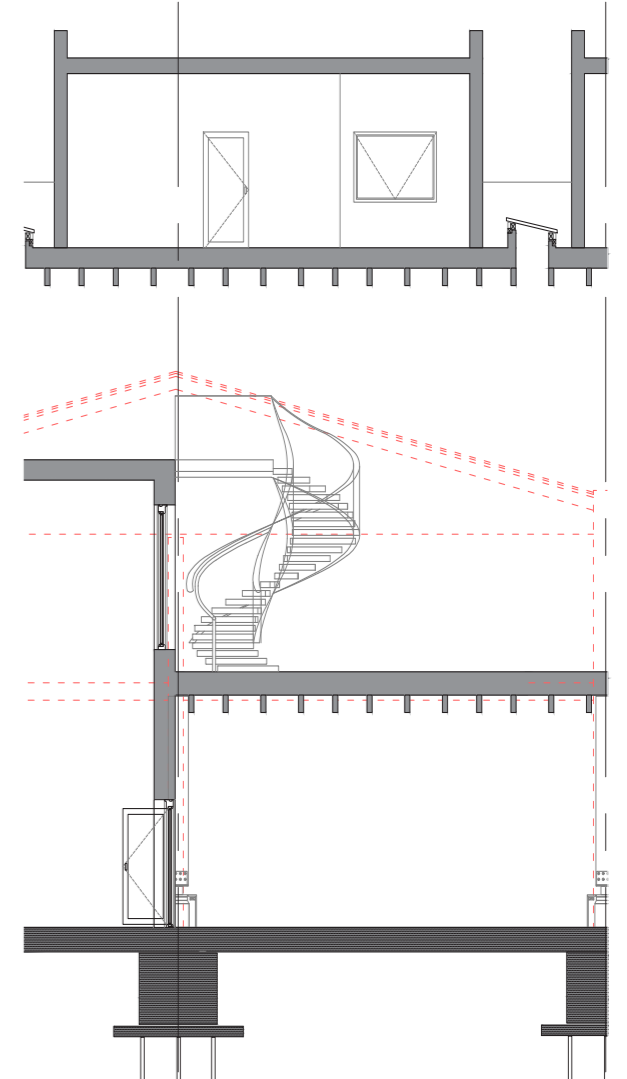
**Building Design: Inside-Out**  
 Characteristics



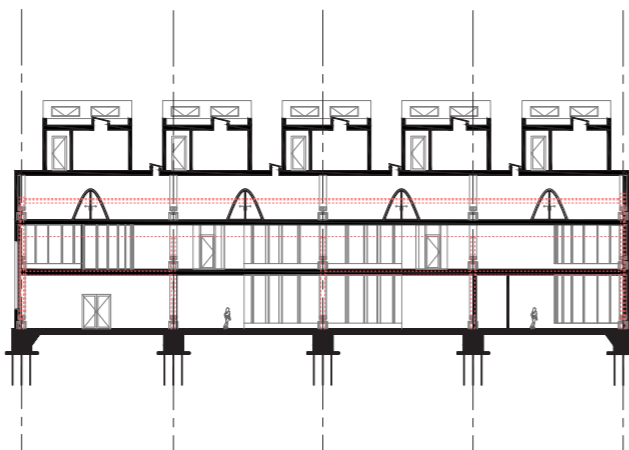
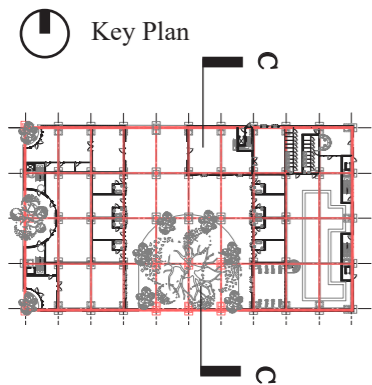
Section B - B'



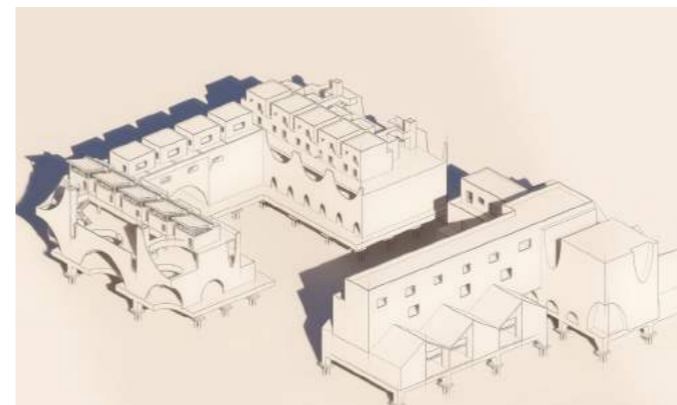
West Facing View / Model



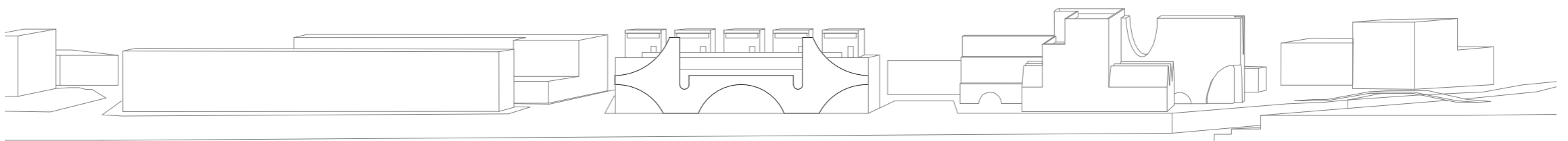
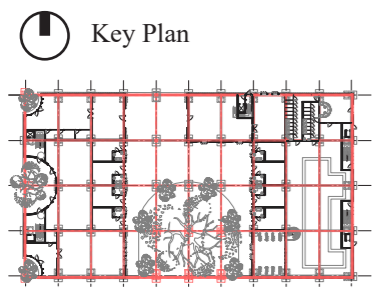
Part Section / Detail Section



Section C - C'

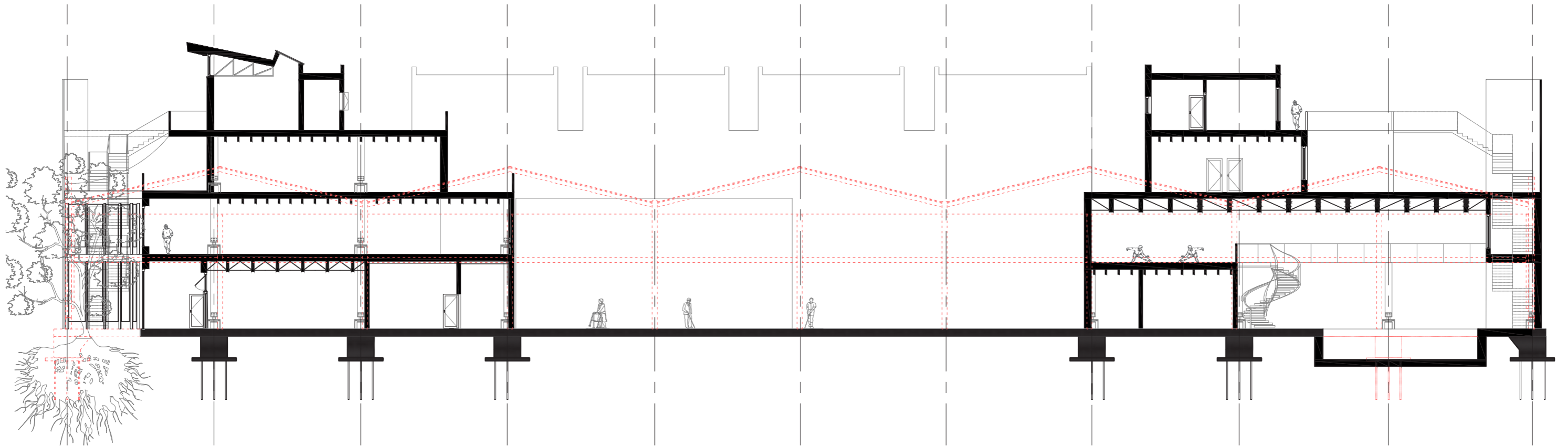


East Facing View / Model



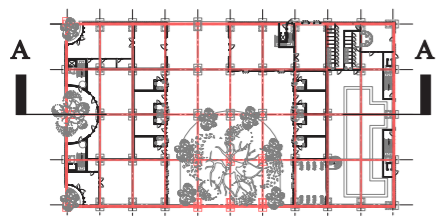
Contextual Elevation F - F' / West Elevation

F F

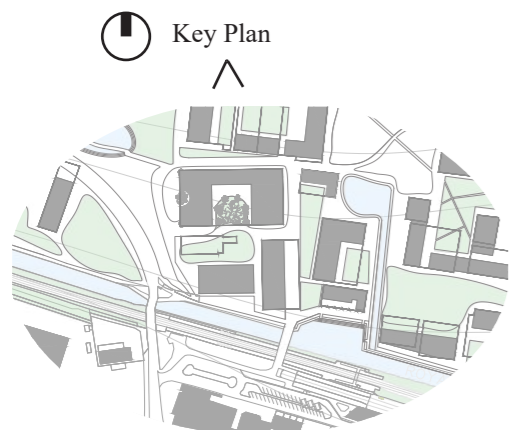


Proposed Building Long Section A-A'

 Key Plan



 **Building Design**  
Inside-Out Characteristics

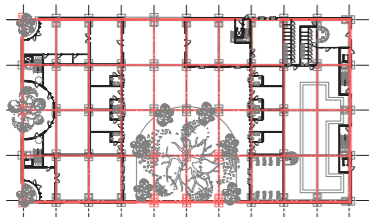


Objects at the end of a street, Render

 **Building Design**  
Inside-Out Characteristics



 Key Plan

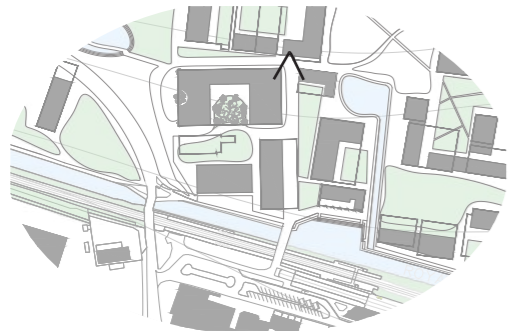


Streets at public spaces, Render

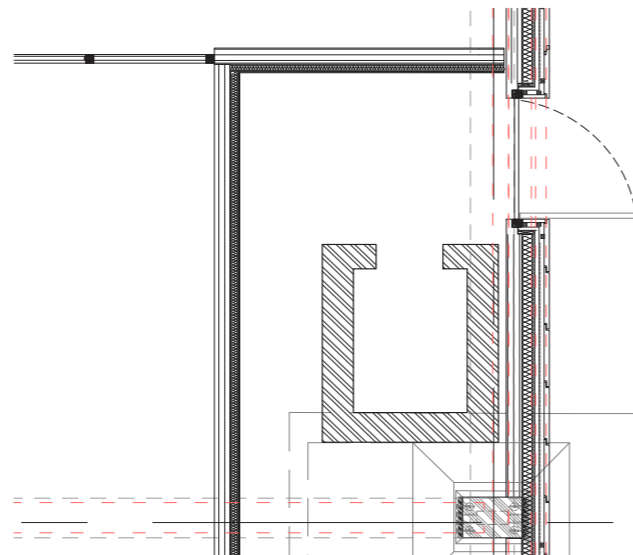


**Building Design**  
Inside-Out Characteristics

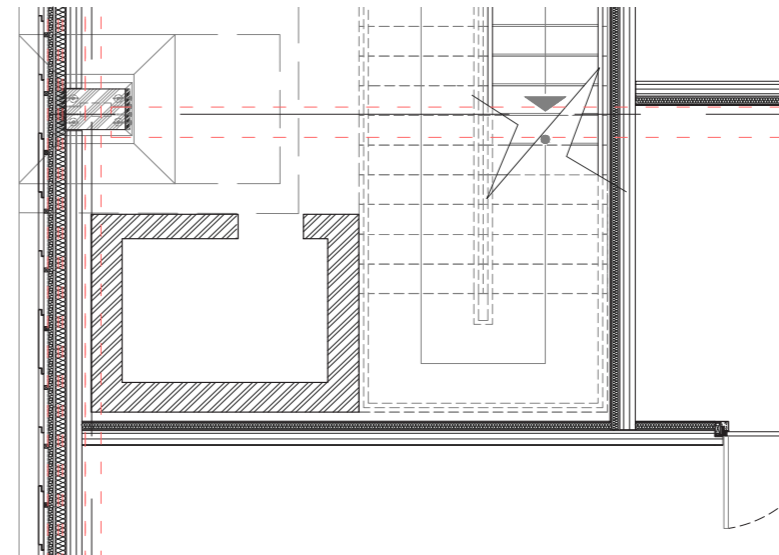
Key Plan



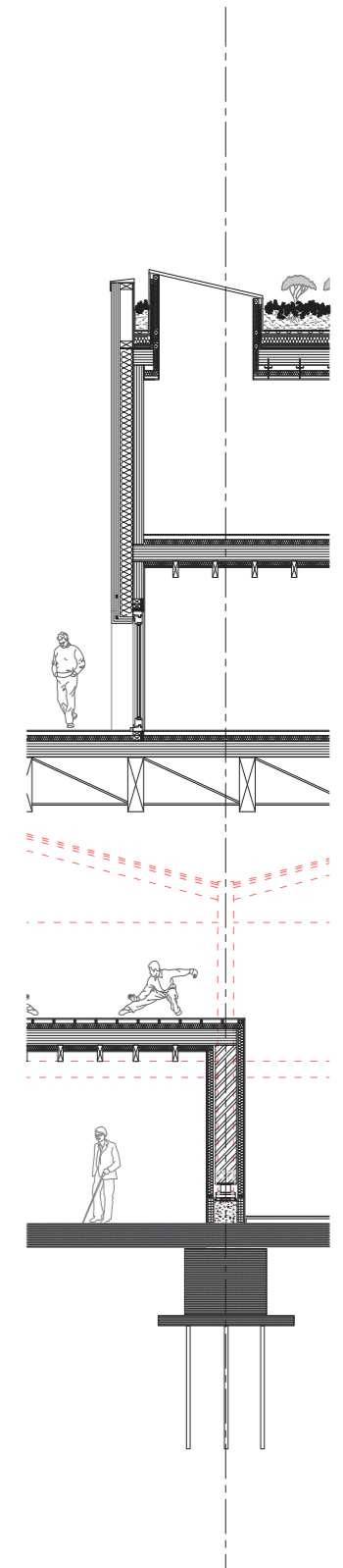
Streets as Public Spaces / Render



Part Plan / Private Entrances Detail



Part Plan / Private Entrances Detail



Part Section / Detail

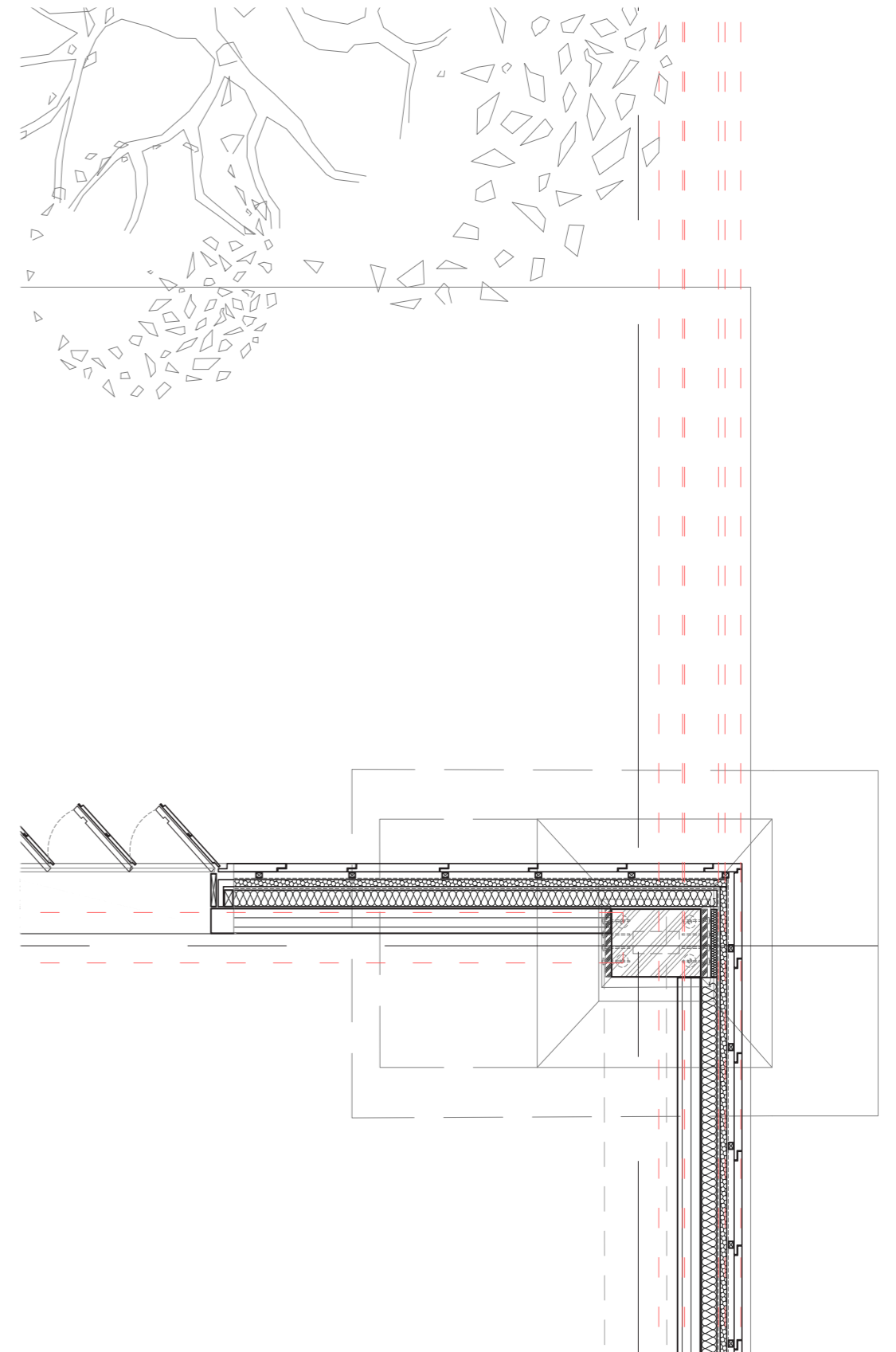
 **Building Design**  
Inside-Out Characteristics



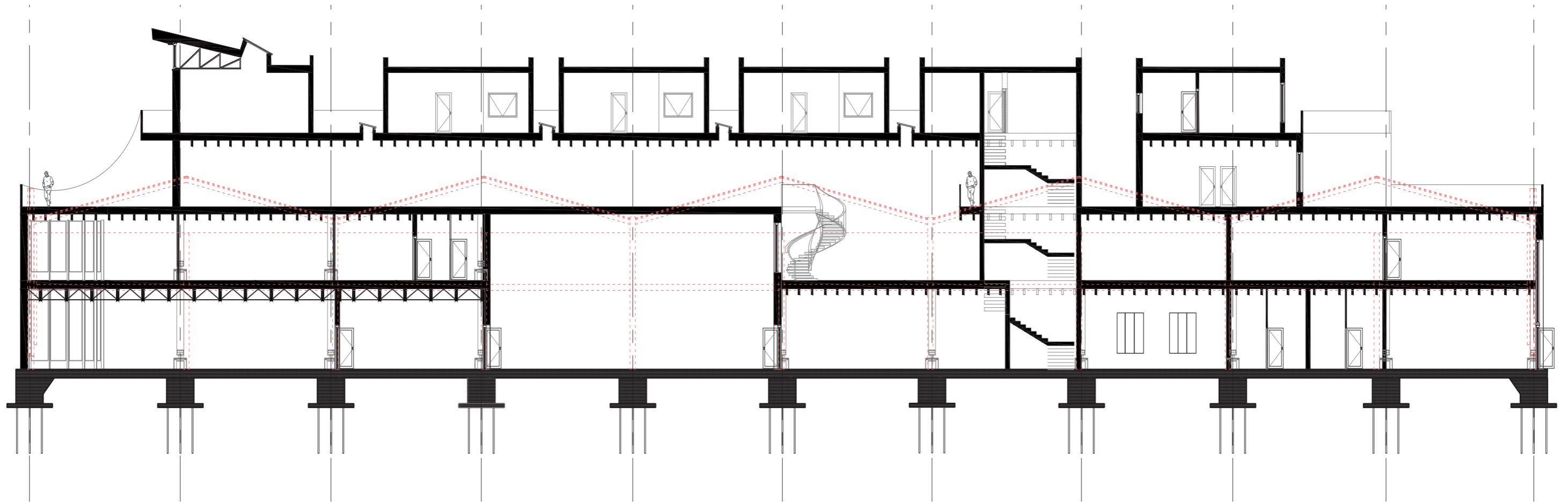
Commercial Spaces / Materiality Render



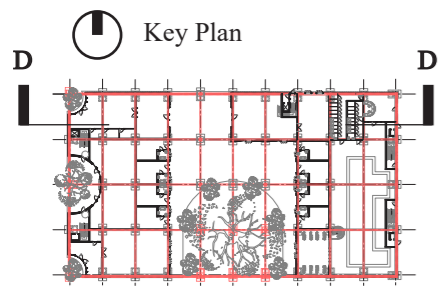
Office Spaces / Materiality Render



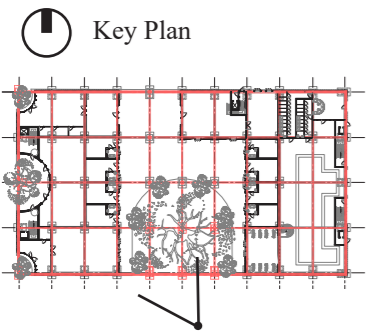
Part Plan Detail



Proposed Long Section D - D'



 **Building Design**  
Inside-Out Characteristics

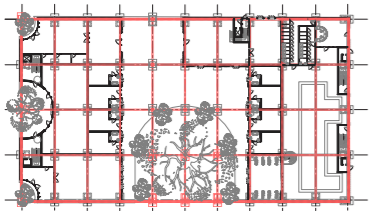


Life between Buildings, Render

 **Building Design**  
Inside-Out Characteristics



 Key Plan



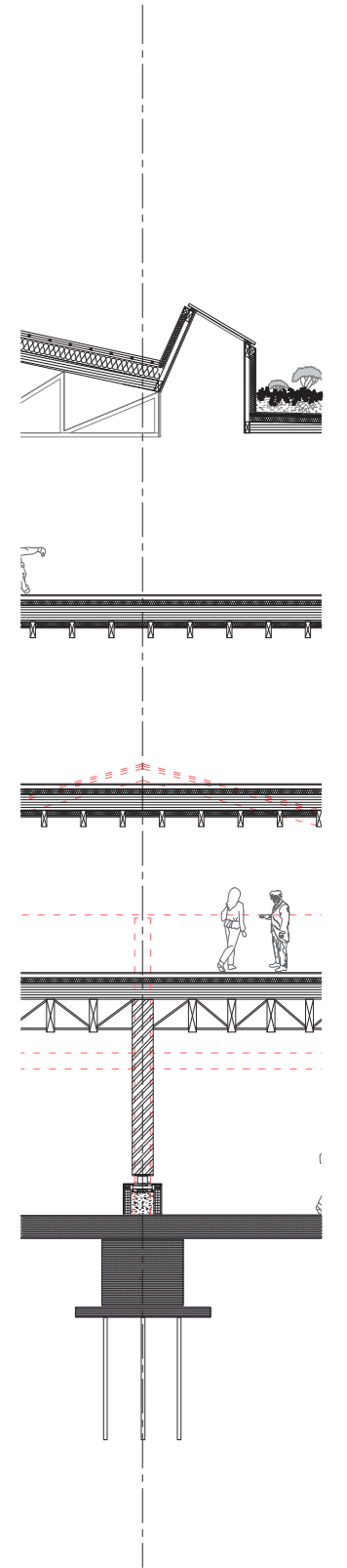
South West View, Render



Speculative Future Perspectival Section



Structural Cutaway Drawing & Associated Part Sectional Detail

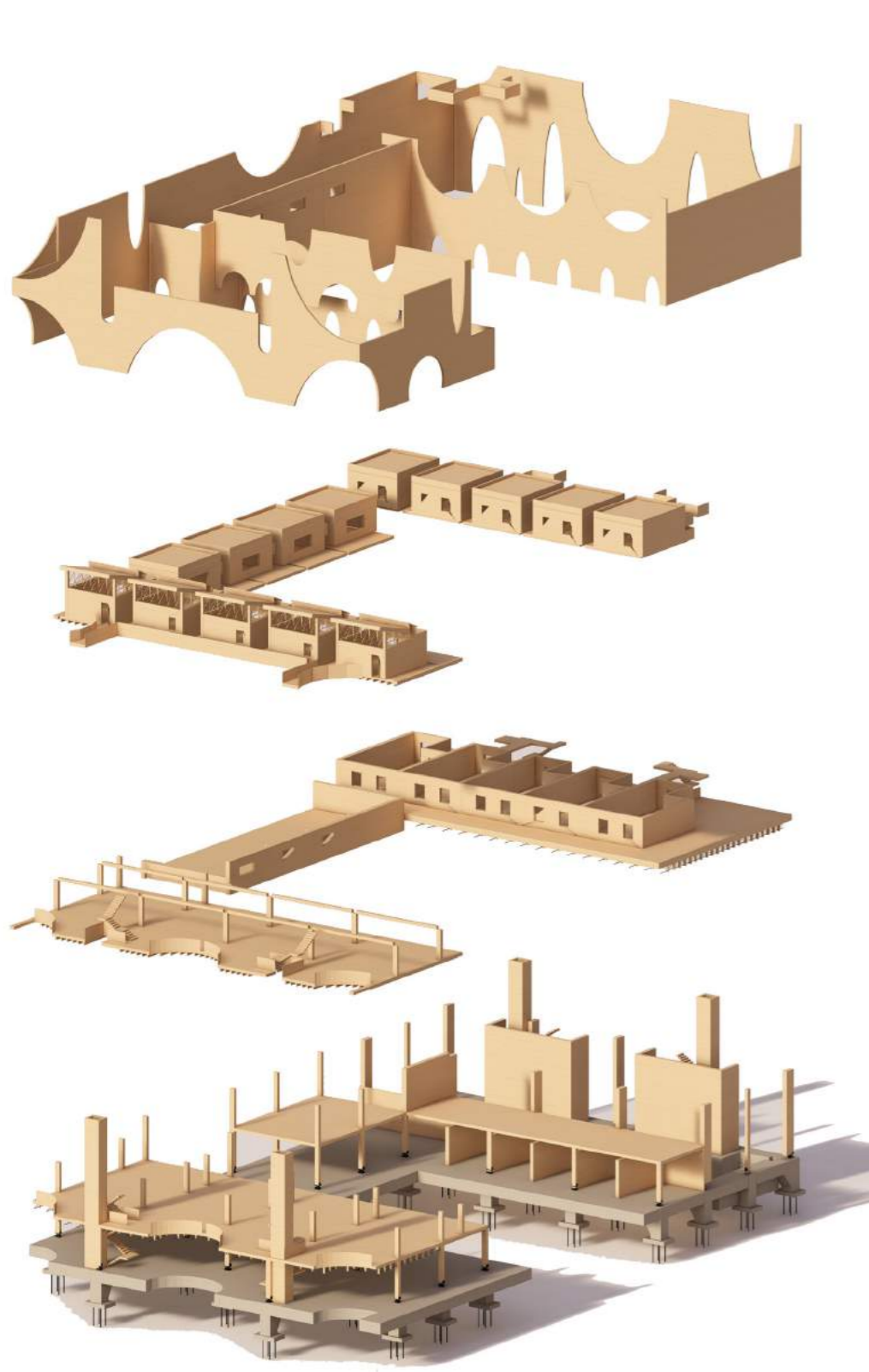


### Environment & Tectonics

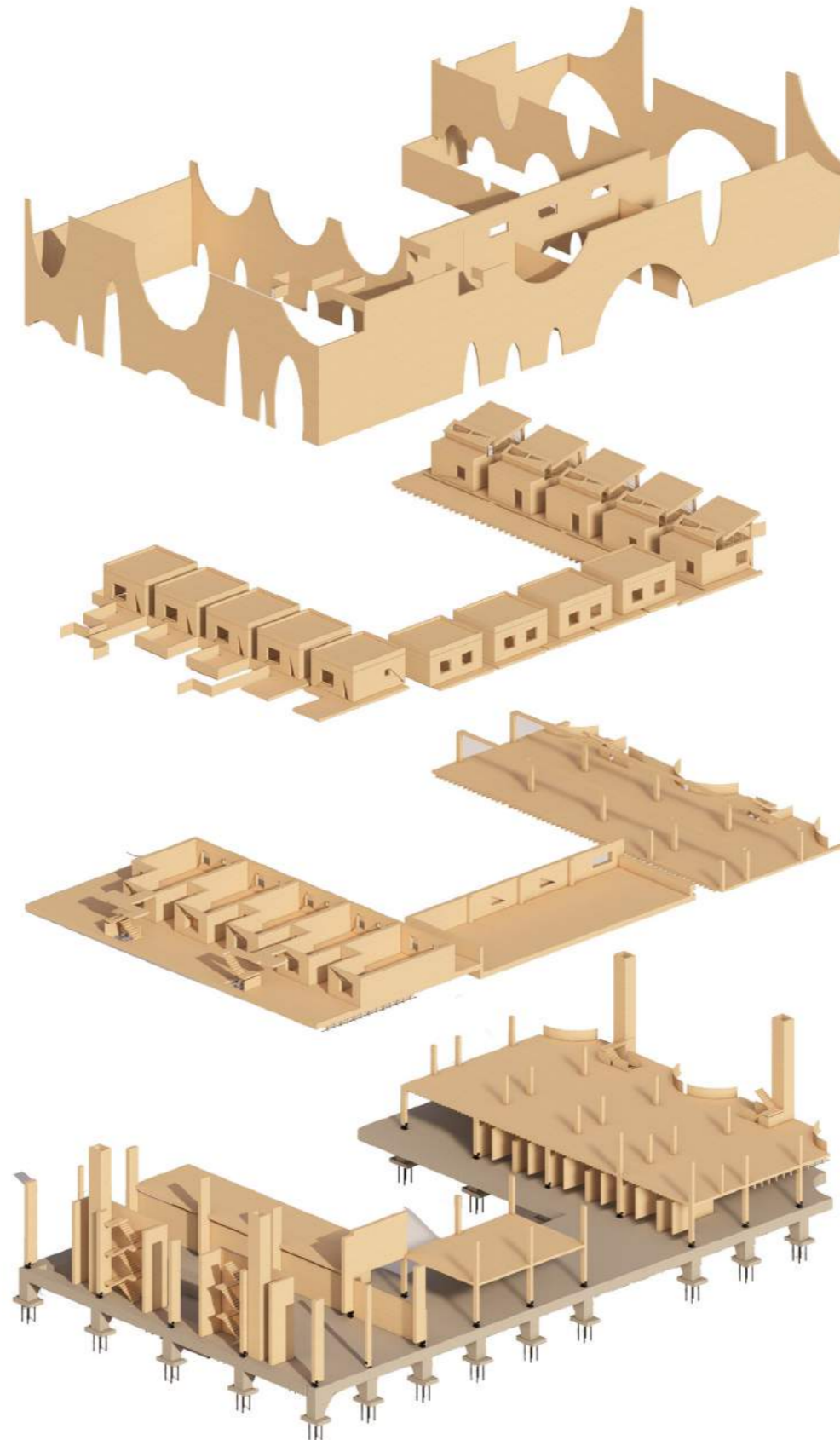
The whole development is made of timber, Glulam Columns and CLT walls, the arched façade language blends in – between the trees, and curved cuts are made into it to allow lighten the spaces.

Instead of placing windows, and attached balconies, this works together as a whole, as each whole allows for a window and each roof plane allows for a shared space.

All spaces are utilising at maximum, throughout the development there are superior quality spaces, double height atriums with planted trees to allow nature to come in, as well as green roofs for water collection which also support biodiversity.



Exploded Structural Model



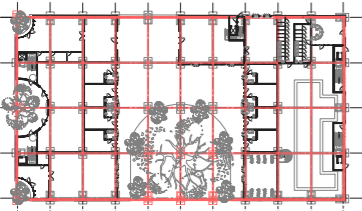
Exploded Structural Model



 **Building Design**  
Character of Built Form



 Key Plan

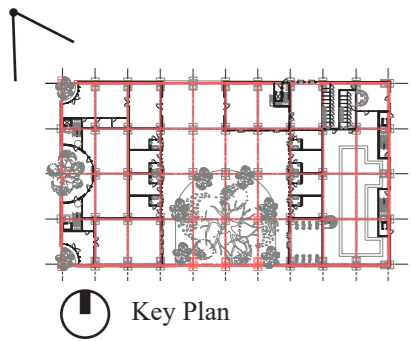


Daytime Render, West View

 **Building Design**  
Character of Built Form

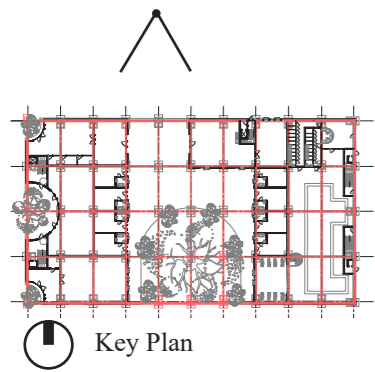
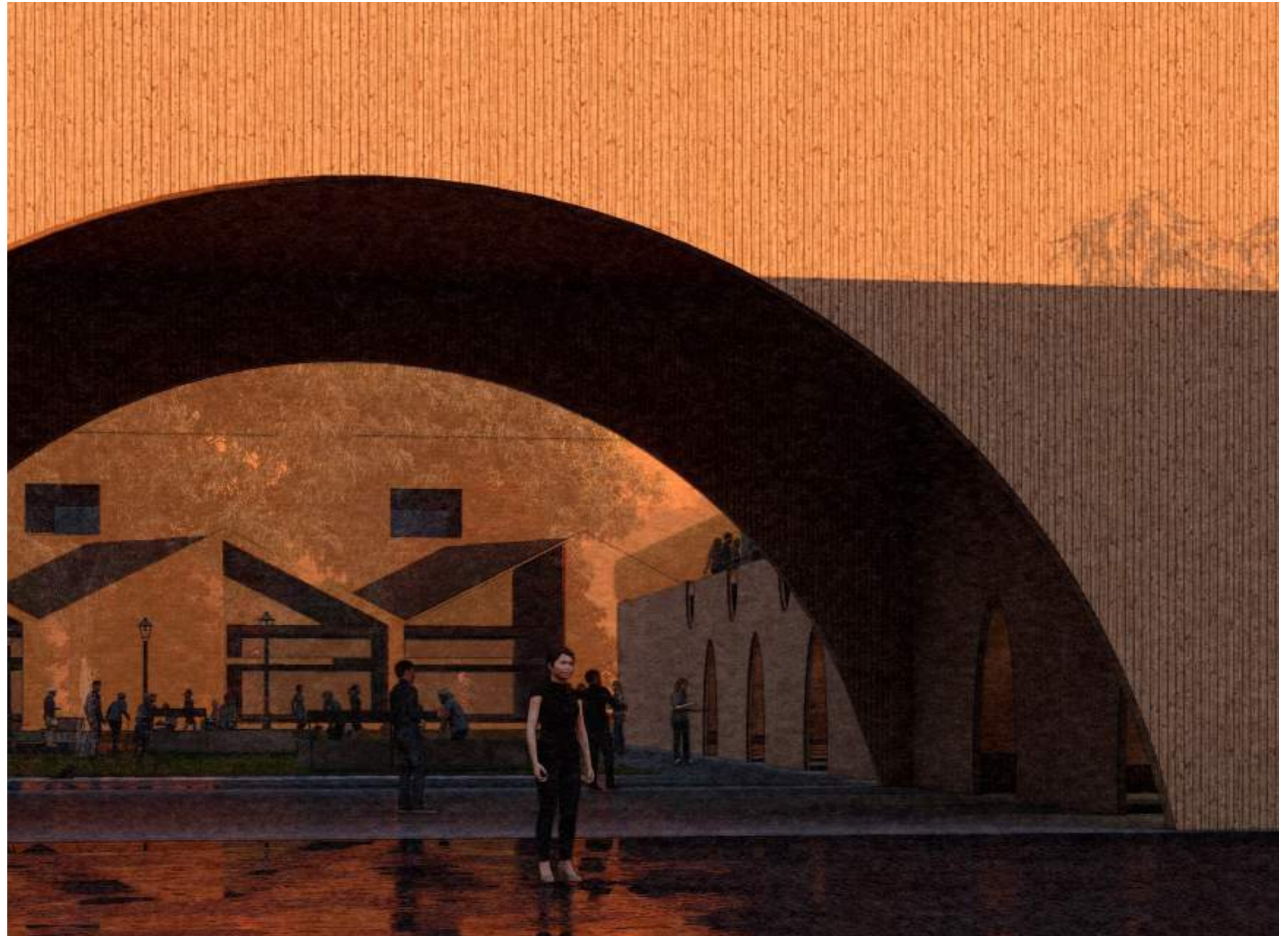


Daytime Render, West View



 Key Plan

 **Building Design**  
Character of Built Form



Evening Time Render, North View



Athmosphere / Community Centre Render



Athmosphere / Office Spaces Render



Athmosphere / Small Injury Clinic Render



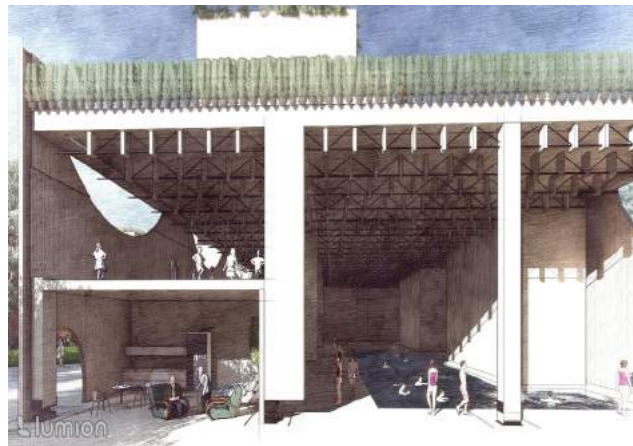
Athmosphere / Inhabitation & Use Render



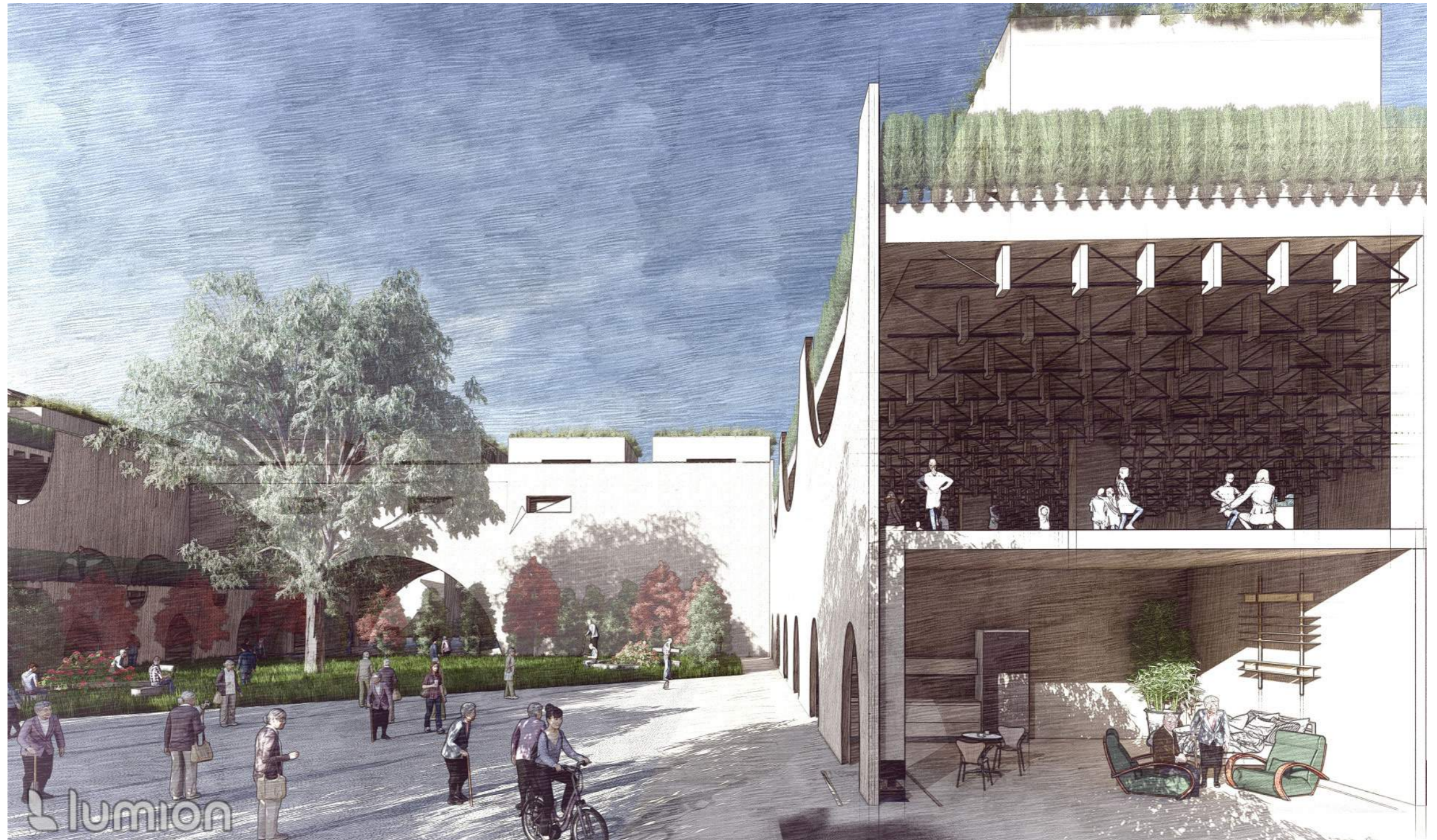
Athmosphere / Elderly Accommodation Render



Athmosphere / Shared Balconies Render



Athmosphere / Elderly & Pool Render



Athmosphere / Inhabitation & Use Render



Atmosphere / Building in Context Sectional Model



Athmosphere / Building in Context Model

Dublin Industrial Estate is in disrepair. This area must be redeveloped, retrofitted, or removed and rebuilt. Because it is zoned for Light Industry / Employment and Enterprise, all present uses can be maintained while new jobs are generated. Because the surrounding area is residential, this estate has the potential to become a new town centre for all these settlements, generating employment, stimulating interaction, and providing amenities and services for Cabra, Ashtown, and Finglas.

As this new Mixed-Use Estate is proposed on site, it has the potential to provide additional houses for employees and homeless people, as well as the elderly and young professionals in need of a place to live and/or a job. This proposed layout is only one example of what this could become and how the entire neighbourhood, as well as thousands of individuals, will benefit.

## Conclusion

When there is a large imbalance between housing demand and available supply, a housing crisis occurs. This frequently results in increased property values, rental rates, and homelessness. Rapid population increase, limited housing supply, insufficient affordable housing options, income disparity, and speculative real estate practices all lead to housing crises. To solve these difficulties, governments and local governments often utilize techniques such as expanding housing production, establishing rent control measures, providing subsidies for affordable housing, and supporting inclusive housing policies.

Population increase, especially in cities, puts a strain on housing options, infrastructure, and resources. Population growth necessitates suitable housing, transportation networks, healthcare facilities, and public services. Rapid population growth, without adequate planning and infrastructure development, can strain existing systems, causing urban sprawl, increased traffic congestion, and environmental deterioration. To manage population increase, adequate urban planning is required, which includes efficient land use, sustainable development methods, and the provision of necessary social and physical infrastructure.

Mixed-use developments are urban planning concepts that include many land-uses into a single area or structure. They seek to encourage more pedestrian activity, better access to amenities and services, and better social interactions. These developments can help address housing shortages and build more sustainable, liveable neighbourhoods by fostering a varied range of land uses.

Their success, however, is dependent on proper design, zoning regulations, and community interaction to ensure that they fit the requirements of people and businesses while preserving the area's distinctive characteristics. Mixed-use developments can play an important role in addressing the difficulties faced by housing crises and population increase. Mixed-use buildings can give more affordable housing options and minimize reliance on private transportation by integrating housing options with commercial spaces, public facilities, and green areas, fostering sustainable and inclusive urban environments.



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## Appendix 1 - Ireland's approach to low density

According to Census 1901, there were approximately 1385000 people living in urban and suburban houses at the very beginning of the 20th century, while the remaining three quarters of the population of living in rural areas.

The ownership of land or private housing was very little at the time as records show that many people were renting homes or rooms. The properties were built by small scale speculative builders with no regulations or rules to follow from the state, therefore they were small, standard design, usually terraced homes, which started to sprawl towards the suburbs often built-in small clusters and sold to investors rather than homeowners.

As a result, the urban areas started to decay, there were slum conditions in all towns and people started to move outwards. Dublin City has recognised the conditions and launched the first housing legislation for the working class and built the first flats at a higher density. This was not successful as it was very expensive to maintain, became hard to manage as people had shared facilities and quickly became overcrowded due to bad design.

In 1905, Dublin Corporation built the first cottage estate in Clontarf for workers to provide a better quality of life. Unfortunately, the cottages also became overcrowded as the flats, leading people to rent private rooms in large city homes.

Due to the social and urban decay, new ideas emerged during the 1920s regarding construction methods, technique and functionality of spaces provided as well as human health, as the government came up with a new housing typology where there were 40 houses per hectare, back gardens, and shared green spaces, as well a new trend which launched with the grants and funds from the state to encourage people to buy their own home. By 1946, the suburbs started to sprawl out with good quality large homes, pushing the ownership percentages up to 70% in rural areas, but only one quarter of houses in central areas, due to high costs.

By 1971, 52.2% of homes were owner occupied in rural areas and went up to approximately 63% within a decade.

In 1930, the local authorities realised that there is an issue with the way these housing typologies that spread out impact on lifestyle and started to provide sites for amenities, schools and shops and other sites for factories and work, therefore small-town centres started to emerge.

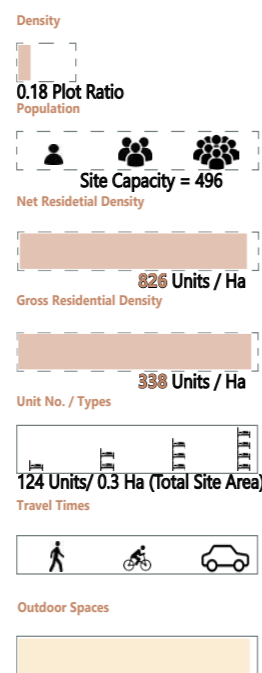
At the end of the 20th century, 85% of properties were houses in urban areas and only 9% were flats. This was the outcome of the negative perceptions on high density, due to the conditions people were forced to live in, which were highly associated with overcrowding due to the lack of thoughtful design considerations for these taller units, their sizes and types.

Lion Feuchtwanger, Berlin



(Fig. 77)

LION 61, Berlin



LION 61 in Berlin is a large residential development which comprises two five-story blocks and a courtyard in between. The blocks are facing north and south to maximise solar gain and the living spaces are arranged accordingly.

There are 124 No. of units and a mixed of 20 types and an estimated population of 496 people living here. The floor areas range from 48 to 118 square meters, and it comprises from 1-bed to 4-bed apartments.

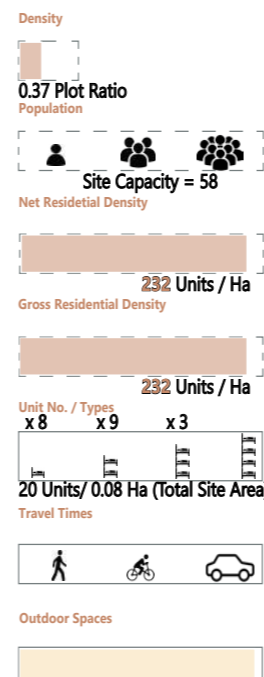
The shared courtyard has an area of 2000 square meters all necessary amenities are within a walking distance of 15 minutes.

La Balma Cooperative Housing, Barcelona



(Fig. 78)

La Balma



La Balma Cooperative Housing in Barcelona has a high density of 232 people per hectare. The project has 20 units across five floors, out of which, one unit is used by everyone in the building as a spot for the community to gather. The site has a capacity of 58 people and a mixture of one-, two- and three-bedroom apartments with office spaces and associated shared areas.

There are 8 No. 1-bed units and three different types, 9 No. 2-bed units with another three different types and 3 No. 3-bed units. All apartments have an office space and / or they have twin rooms or single rooms. The mixture is very good for small families, larger families, elderly or young professionals.

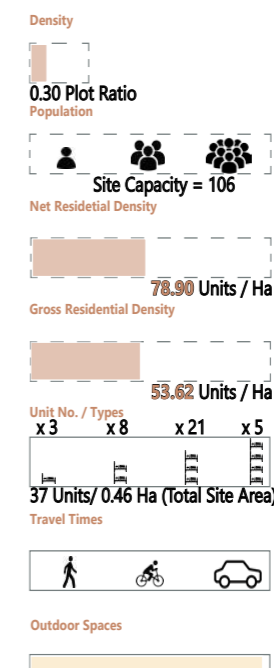
The outdoor shared spaces have an area of 4806 square meters, a double height ground floor as an indoor shared space and a shared roof garden of 860 square meters.

Social Dwellings, Madrid



(Fig. 79)

Social Housing Vallecias, Madrid



The Social Housing in Madrid is an apartment block that has 37 units, with 13 different types for a variety of people. The project consists of 3 No. 1-bed apartments, 8 No. 2-bed apartments for three to four people, 21 No. 3-bed apartments for four to five people and 5 No. 4-bed apartments with two double and two single rooms.

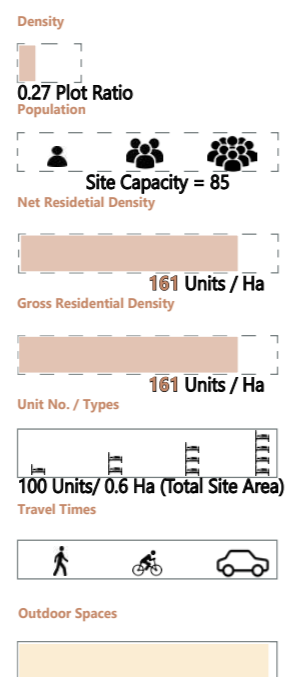
The apartments are large, some have a home office as well as an addition and they are within a short walking distance of amenities and services. The capacity is for a maximum of 106 people, and it has a quite gentle density, communal and outdoor spaces reach a maximum of 2300 square meters out of 4689 square meters which is the total site area.

KraftWerk1 Housing Complex, Zurich, Switzerland



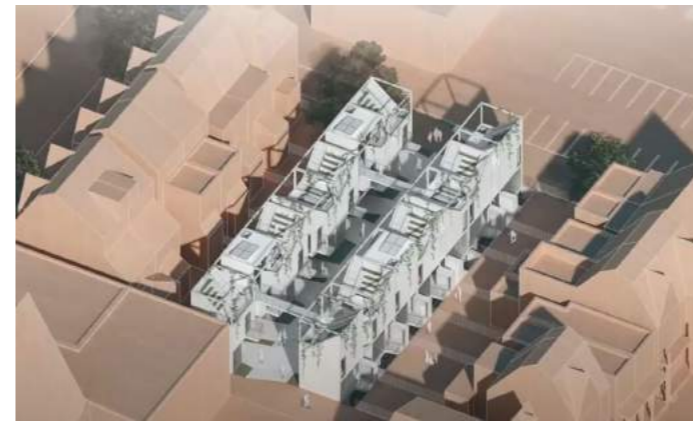
(Fig. 80)

Kraftwerk1, Zurich



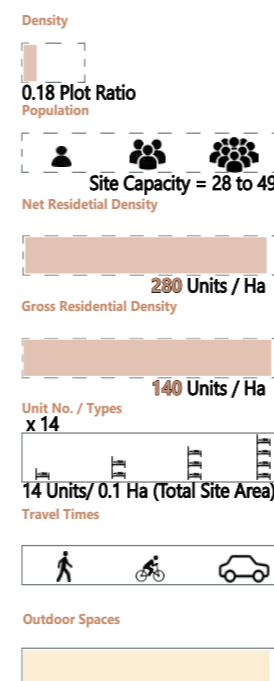
The Kraftwerk1 is a multi-generational house located in Zurich. The apartment scheme is formed out of four apartment blocks, some are mixed with offices and retail, and some are residential only. There are 100 no. of units across four blocks on a total site area of 0.6 Ha. In the ‘residential only’ block, there are 85 residents across five floors. The scheme includes more unit types, including the ‘Le Corbusier’ style duplex apartments out of a total of 26 units. There are 210 square meters of commercial use and 120 communal spaces. Each person has 36 square meters of private open space as per regulations.

Laneways of Living, Toronto



(Fig. 81)

LaneWays of Living, Toronto



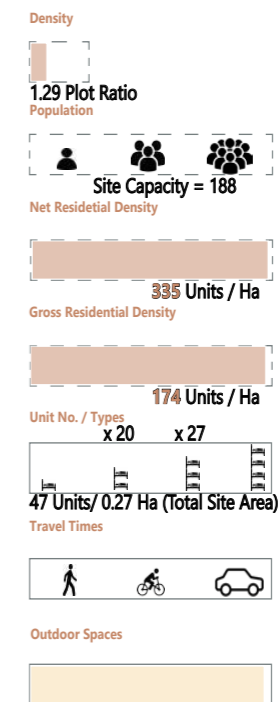
The urban infill project Laneways of Living functions as a mini village within the urban fabric of the heart of Toronto. The project encourages high density by establishing a new residential hub between buildings. The ground floor is treated as a natural feature of the context. It is a shared outdoor area that is covered, like a public square. The project emphasizes the value of pedestrian-friendly hard edges and walled streets. Another place where the community can interact is on the roof. It is a place where vegetables are grown, and it has bridges that link the two residential blocks. The site capacity can host 28 people as designed, but there is an opportunity for development upwards or outwards with each unit for the addition of an extra bedroom. All the units are one bedroom, and each has a total area of 58 squared meter, and they can all be extended up to 78 square meters based on individual needs.

Timberyard Social Housing, Dublin



(Fig. 82)

Timberyard, Dublin



The Timber Yard Social Housing has a site capacity of 188 people across 47 units. The project has a high density, but tackles very well the fine line between high density and overcrowding due to its urban form. It steps up and down on different sides of the building to allow for natural sun light and ventilation. It has two types of units, two bedrooms and three bedrooms apartments which are well designed and spacious. The project is an urban infill and has all necessary amenities and services within a walking distance and good public transport linkages.



## Appendix 3 – Industrial Areas Research / Precedents

### Precedent 1 - Frontier Industrial Park - Malaysia

The Frontier Industrial Park is a secure business campus for businesses with passive benefits for owners and employees.

Due to its nature, it provides a serene work environment for better collaboration and productivity of employees. It has many open shared spaces, retail areas, running trails and water lakes with bridges crossing over for recreation and leisure during breaks.

It also has indoor social spaces to promote human interaction. Industry sectors include machinery, precision engineering, metal fabrications, food processing, trading IT services and many more.



(Fig. 83)



(Fig. 84)

### Precedent 2 - Gopalpur Industrial Park – India

Gopalpur Industrial Park consists of Multi-Product Special Economic zone, Domestic Tariff Area and Social Infrastructure across 270 acres.

The features of the site include well planned wide roads network, flexible design for warehouses to accommodate goods, large multinational businesses, as well as lakes and ponds for water storage.

It promotes employee's interaction and mental health oriented through facilities such as recreational spaces to connect with nature, exercise and running trails and areas, sports facilities as well as fully private employee accommodation.



(Fig. 85)



(Fig. 86)

### Precedent 3 - Old Town Road Development, London

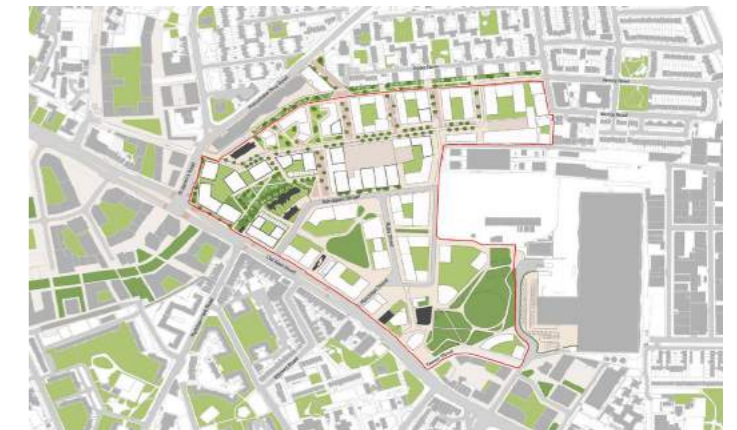
SUB AREA 1 - January 2021 / Southwark Council. Council proposal to intensify industrial area with mixed developments with new retail, community and residential uses. Large industries are clustered into larger areas and small businesses are spread across in between new community zones.



(Fig. 87)



(Fig. 88)



(Fig. 89)

**I**n response to Chapter 5 of Draft Dublin City Development Plan 2022–2028, Quality Housing and Sustainable Neighbourhoods, the following observations were made. These observations are based on research carried out as core component of Technological University Dublin's Bachelor of Architecture program. The study examined the demographics, housing stock and typologies, dwelling sizes, as well as nearby amenities and transportation, in the Tolka Valley area, including Ashtown-Pellestown, Cabra, Finglas, and Glasnevin.



(Fig. 1) Existing Condition of Sprawl in the Suburbs - Site Location Map highlighting the single units spreading across the land - All hatched units represent residential condition in the area.

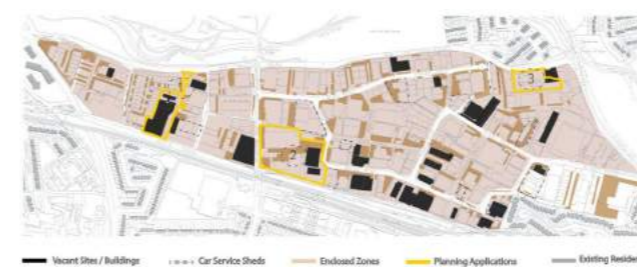
It is stated by the committee that “It is acknowledged that quality neighbourhoods are responsive to the needs of local communities, play an important role in quality of life factors and foster a wider sense of community and active citizenship.” In the 5.1 Section of this chapter, which provides a detailed overview of this vision for the future in which new residential developments are a part of a sustainable community with good transport links and close proximity to daily needs. **However, because there are to this day zoning restrictions in place for large areas of land, where residential is divided from employment, separated from services, and so on, it is not only impossible to form these compact communities but also completely conflicting with the suggestions.**

Section 5.2 Achievements, states that: *The Council has been successful in planning for new neighbourhoods and creating new communities at Ashtown-Pelletstown*”. What accounts for their success? Are the needs of the current community being met? What steps have been taken to address the needs of the local elderly population as outlined in Section 5.3.3 of QHSN11? *To provide the necessary inclusive community facilities and design features to promote independence for older people and to maximize quality of life;*”

The research carried out shows that up to 2013 there were 9758 bed spaces in the area and including new developments up to date, a total of 12460 Bed spaces exists in the area. According to Ashtown-Pellestown Local Area Plan 2013 (DCC, 2014), there would be a couple of sites within the east side of Tolka Valley sites that could host between 1222 beds to 1641 bed. An average would be 1429 Beds in Apartment blocks, on sites 1, 2 and 9 of the Local Area Plan, LAP 2013, which have not been developed yet. Site 2 is under construction now and it will bring a total of 13889 beds in the area. Meanwhile, the population in the area according to Census 2016 (CSO, 2016) is 6027 people, with only 3822 people live in the Eastern side of the site. **In other words, despite a population decline in the region, more residential buildings are being constructed far from services and places of employment, which continues to support a car-centred lifestyle** and stands in contrast to section 5.4 Strategic Approach. *“Promote and facilitate the provision of the 15-minute city which provides for sustainable urban neighbourhoods and villages through healthy placemaking and the delivery of high quality housing served by local services.”*

Section 5.3 concerns with issues regarding population increase and the importance of sustainable planning for communities with increased diversity to support everyone, *“as well as aging population”*. Data shows that most people at Tolka Valley are between the ages of 25 and 44 and are either having few, none, or late-life children (CSO, 2016). Population studies predict that by 2075, the population will increase quickly before starting to decline (CSO, 2016). **As the population ages, children have left the area, and elderly have no other options for a smaller property within their well-known communities. Young professionals or couples are also affected by this problem because they are compelled to buy or rent a larger home than they need.** How is this current problem being handled?

On another hand, in Section 5.5.2, QHSN7 *“Reduction of Vacancy To promote measures to reduce vacancy and underuse of existing building stock and to support the refurbishment and retrofitting of existing buildings, including Dublin City Council’s Estate Renewal Programme.”* could be applied to Dublin Industrial Estate. Objectives QHSN11 and QHSN10 are applicable because **there are multiple underutilized sites and buildings, as well as buildings with scheduled use and deteriorating buildings.** In terms of movement, it would take 25 Minutes by foot to walk from one end to the other, East to West on the whole length of the industrial estate, which is zoned for Employment/ Enterprise in Chapter 14: Land-Use Zoning, Zone Z6, Mapset A. Could these vacant units be retrofitted and re-used? Can they be re-zoned to address local needs as per QHSN45 *“T A. o encourage and facilitate the timely and planned provision of a range of high-quality neighbourhood and community facilities which are multifunctional in terms of their use, adaptable in terms of their design and located to ensure they are accessible and inclusive to all.”* **Could these parts of the industrial estate be reimaged and given back to the community?**



(Fig. 2) Mapping the existing condition of Dublin Industrial Estate surrounded by residential developments. The black hatch represents the vacant units and / or brownfield sites, dark brown shows the amount of spaces used for carparking and the light brown shows delimitation in between areas and how much space is closed off and poorly designed, therefore not functional at maximum capacity.

Lastly, Section 5.5.3 ‘healthy place making’ focuses on delivering 15 Minutes Communities, where QHSN10 addresses same, stating: *“To promote the concept of 15 Minutes City which provides for liveable, sustainable urban neighbourhoods and villages throughout the city” ... “served by local services, amenities and sustainable modes of transport.”* How is this possible in the current sprawling environment (Kavanagh, 2021), where it takes over 15 minutes to travel through a residential neighbourhood, to provide the above? How is it still possible that planning applications for housing estates on sizable parcels of land outside of towns are still being approved without the requirement for all necessary services to be provided within the mentions walking distance? According to QHSN11, Neighbourhood Development, they will support projects that supports *“encourages sustainable and low carbon transport modes through the promotion of alternative modes and ‘walkable communities’ whereby a range of facilities and services will be accessible within short walking or cycling distance;”* **nevertheless, this is a far-off utopia that will never materialize in a world where the current regulations give developers control over large parcels of land and enable them to exacerbate this imbalance** because their top priority is to adhere to the Council's minimal sizes requirements—which are already incredibly low—in order to make a profit. **As a result, there isn't a thoughtful mix of housing types for older people, single professionals, or larger families, again, far away from amenities.**

To build sustainable communities, changes in planning are required, particularly with regard to land-use zoning constraints, but also with regard to dwelling typologies and their minimum required sizes, in order to allow for flexible future usage while still meeting current trends and people's needs. **How can we move away from this fragmented car-centric strategy if we are not currently fixing sprawl?** (Housing, 2017) How can we achieve Net Zero by 2050 or a car-free future for daily needs if we don't act now?



(Fig. 3) Sprawl Consequences - existing condition travelling from Dublin to Enfield on weekdays from 4pm to 7pm – 21.02.2023 – distance 44.5 km / time wasted: 1:00h – 1:30h.

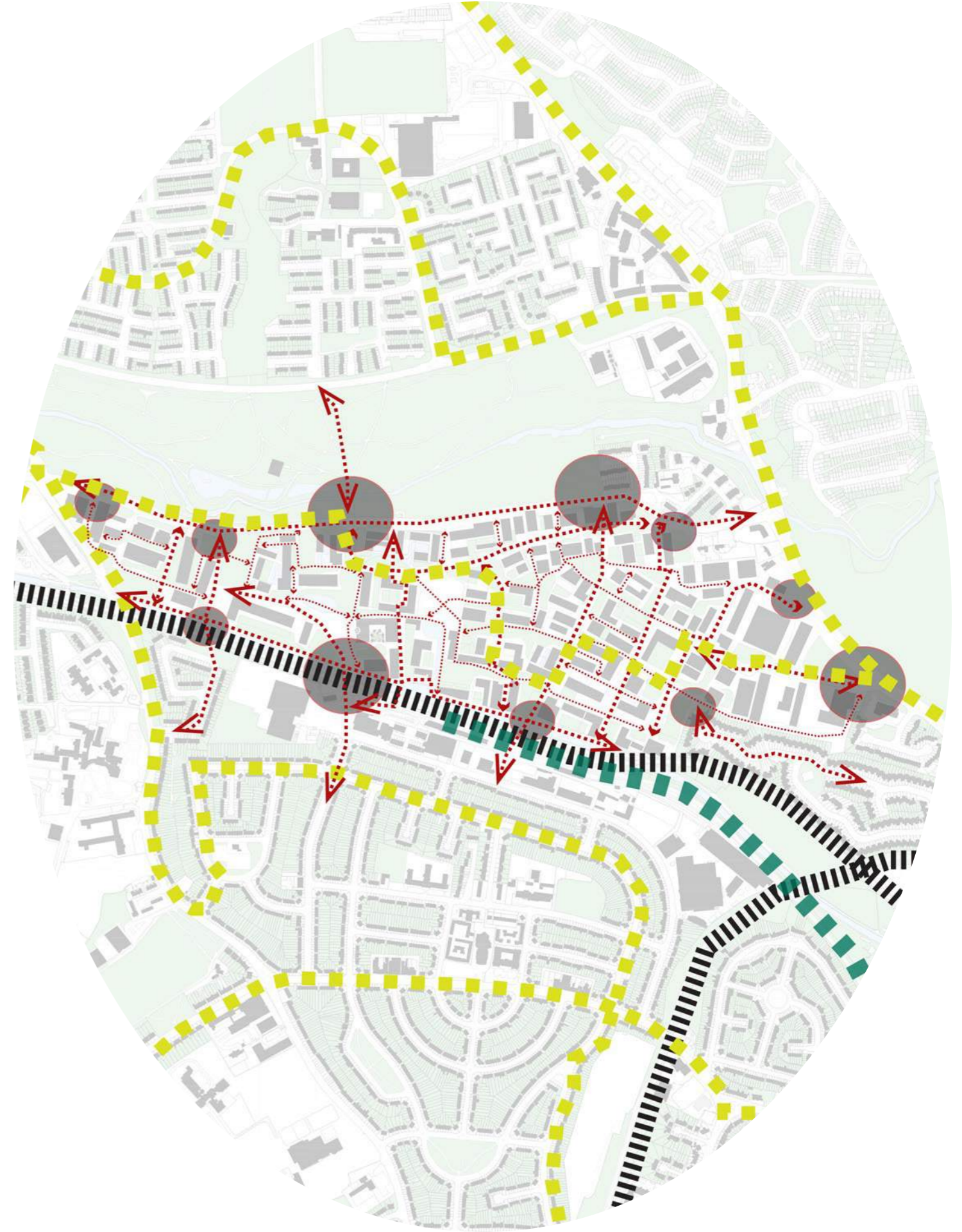
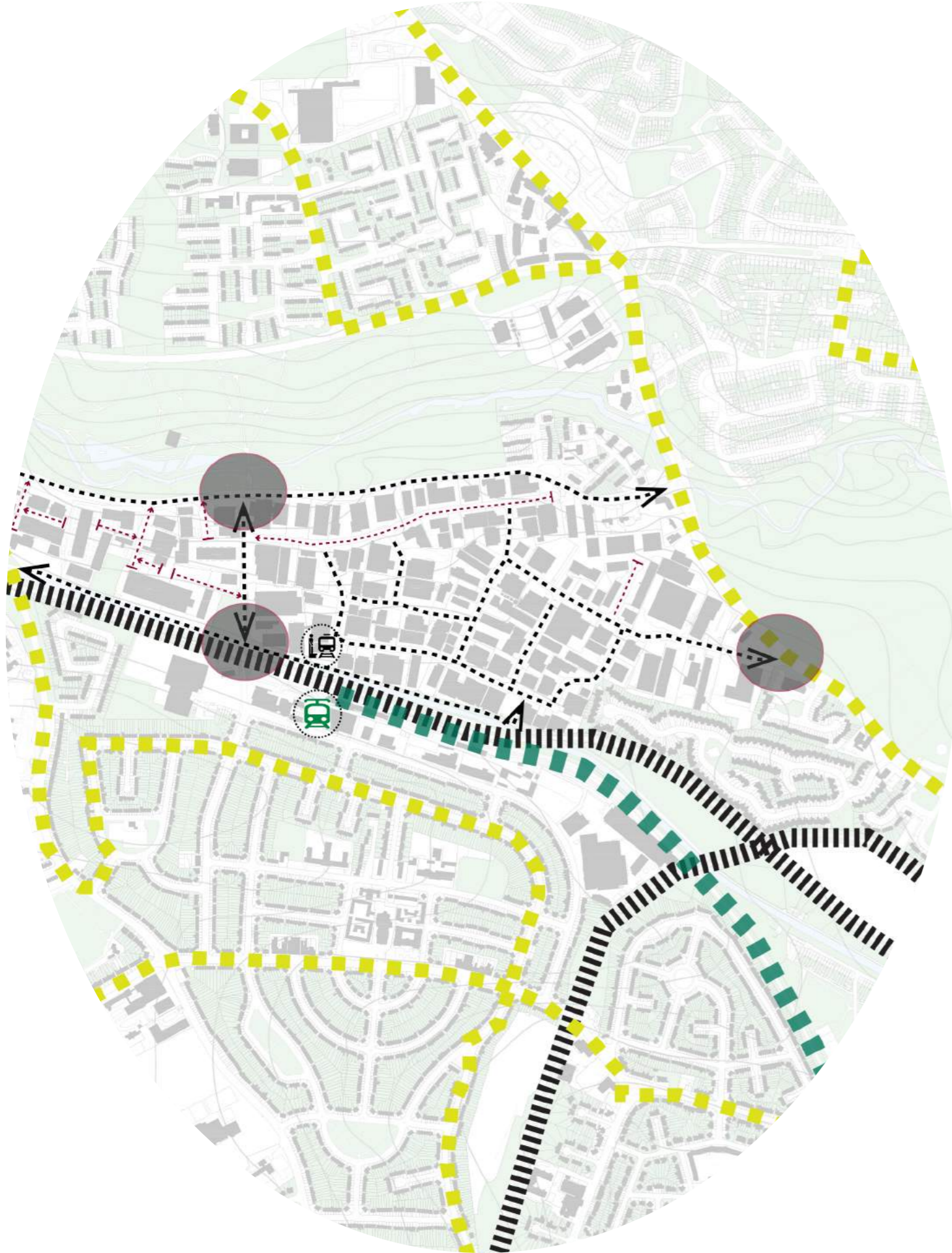
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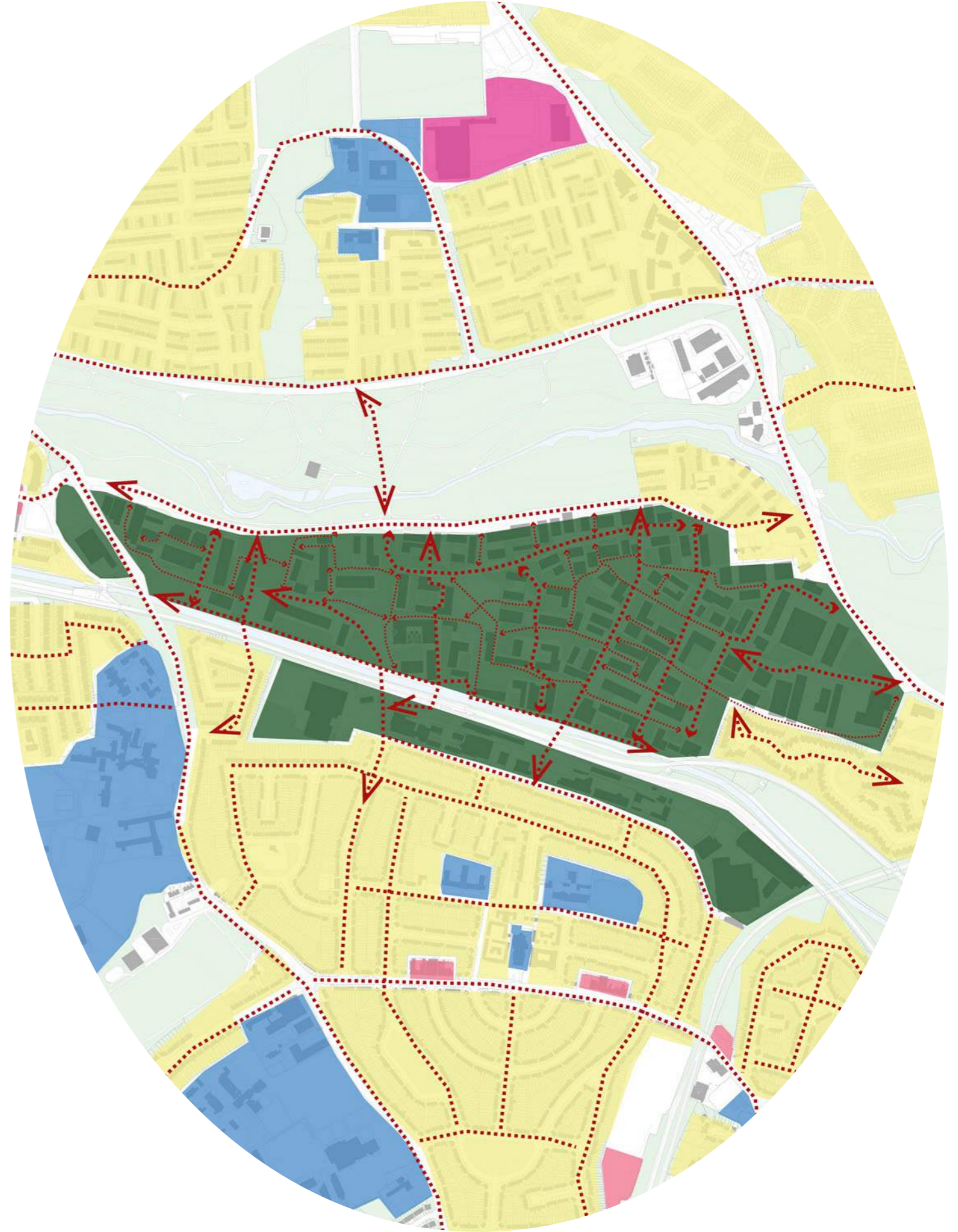
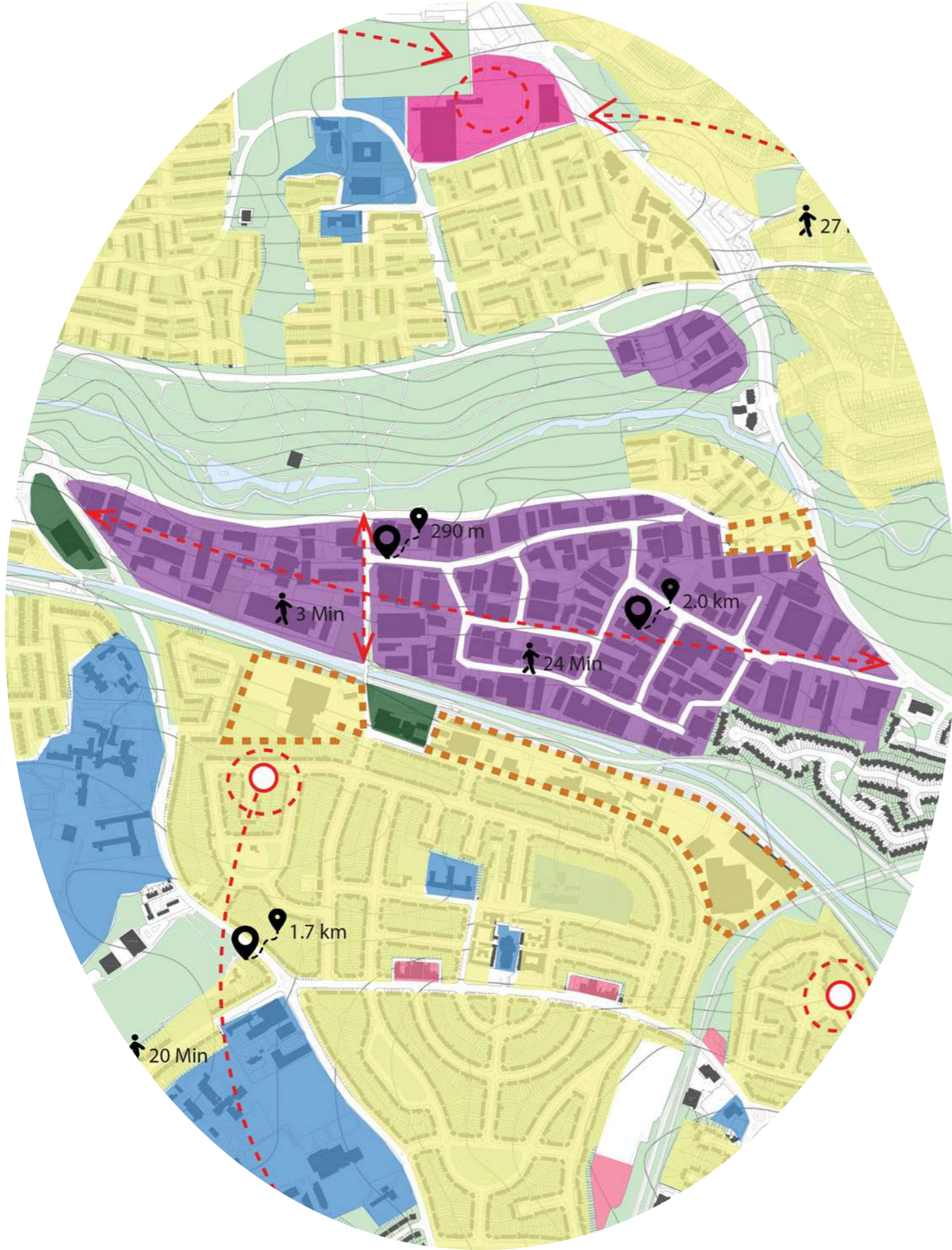
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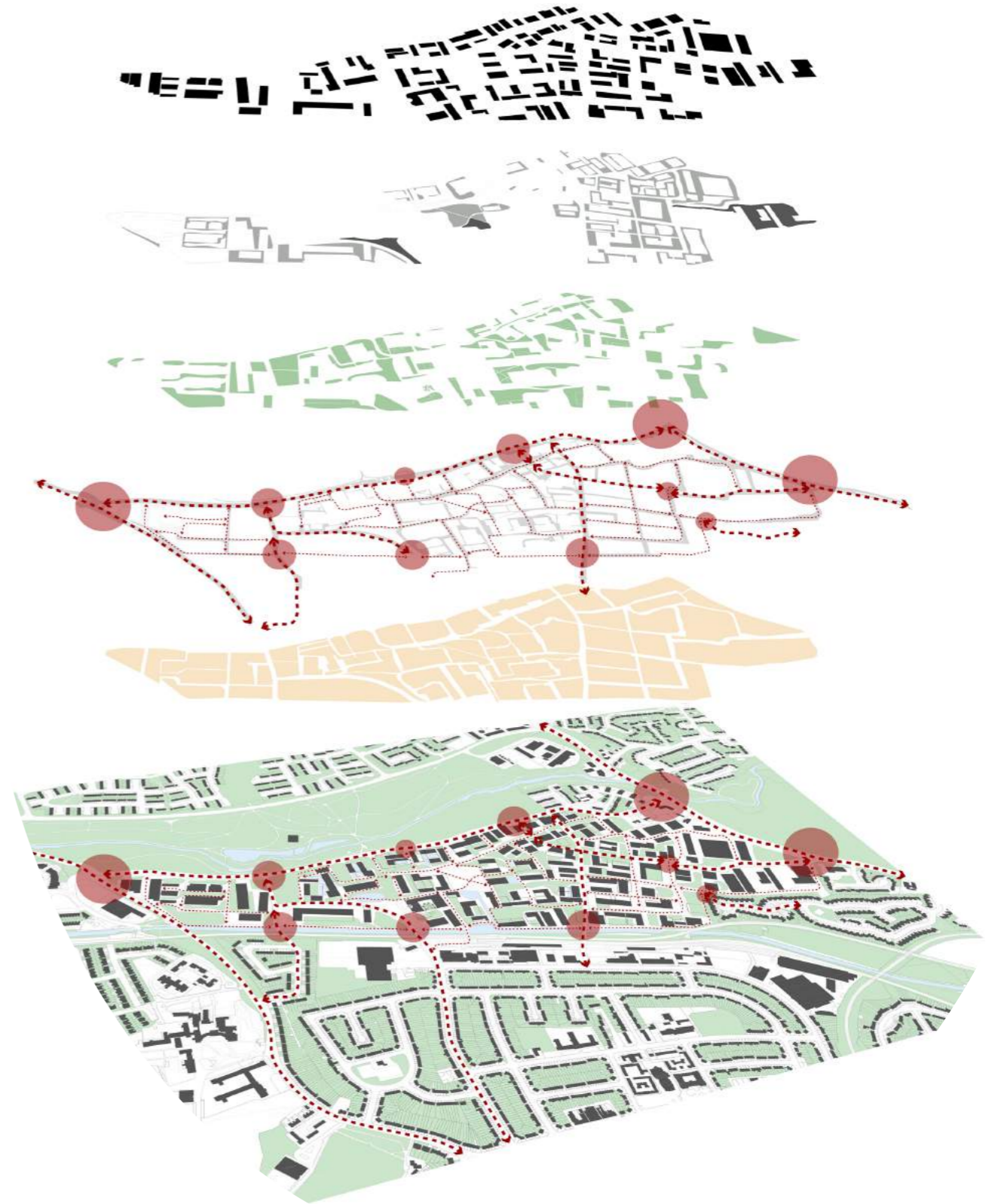
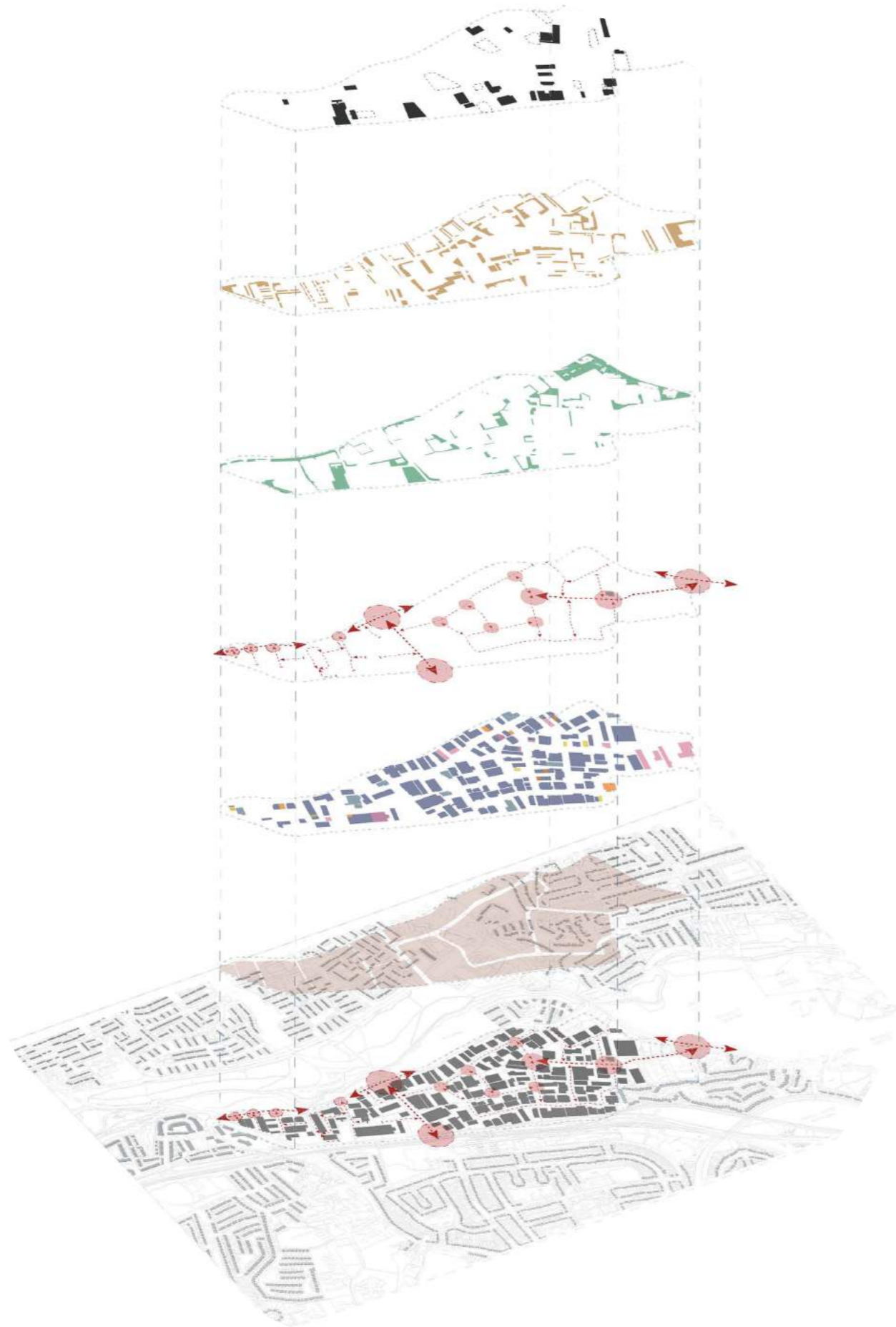
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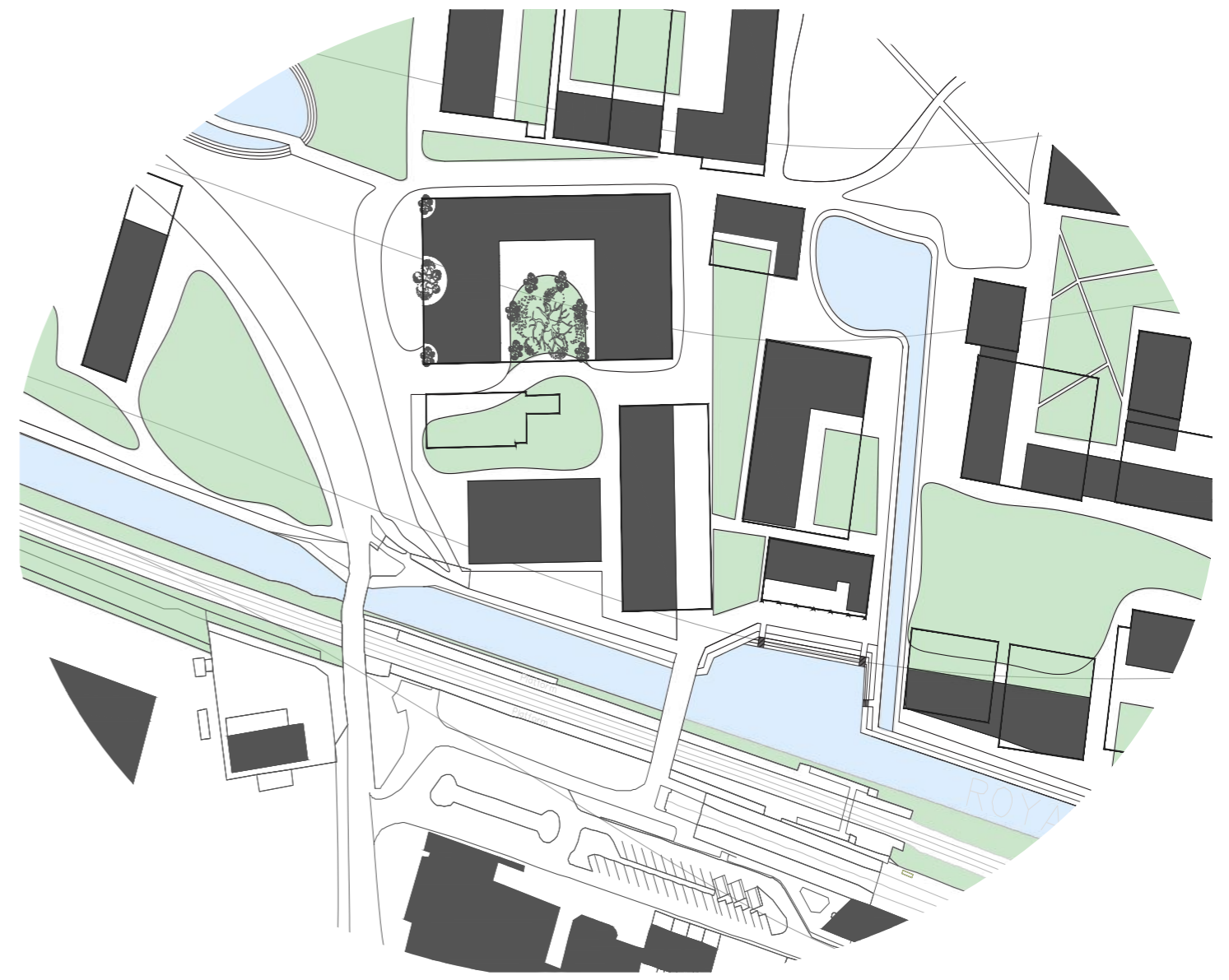
Kavanagh, A. S. & J., 2021. Is it time to halt Urban sprawl and start to build upwards or should we preserve the.



Appendix 6 – Before & After Zoning & Travel Times Maps







## Appendix 9 – Exhibition Sheet & QR Code To Stage 5\_Final Review\_Presentation

Name: Nistorescu, Adriana  
 Student Number: C16770839  
 Thesis Title: **Fragmentation in an era of Climate Emergency: Finding an appropriate approach to density**  
 Protection & Re-use of Existing Assets, Sprawl Repair, De-Zoning Land  
 Building Typology: Mixed Use Development

### Description:

As Dublin Industrial Estate is proposed for disassembly, all lightweight elements are taken apart and reused where appropriate. The site remains empty in-between all existing ground floor slabs and foundations, forming these islands of concrete which are being protected and reused at their maximum capacity. The idea is that this area becomes vibrant, and it densifies to provide for existing residents with all amenities that one might need throughout the day within a short walking or cycling distance. The proposed site for development will accommodate active uses at ground floor to allow for a flow of people throughout the day, supporting movement and humans' interaction from morning to late evenings. The uses include elderly accommodation and facilities, recreational and leisure facilities with opening times from 6am to 10pm; sustainable commercial uses from 8am to 6pm; restaurants, bakery, and cafes with opening times from 6am to late night and a library and other educational facilities which stay open late as well. The buildings and site layout intervention allows for flexibility overtime as there is a structural grid in place based on existing foundation pads. Modular units will be used to allow for same flexibility, where in the future this building can become, office space, hotel, other accommodation types etc. The ground floor slabs will be cut at times to allow for nature and the existing concrete will be exposed where it existing as this is the only concrete left on site. This project is a response to a detailed site analysis and investigation of the existing condition, seeking to support and provide for present and future needs.



Density	Population	Net Residential Density	Gross Residential Density	Unit Types / No.	Shared Amenity Space
0.68 Site Coverage 1.82 Plot Ratio	Site Capacity: 46 Population Density: 158 ppl / Ha (NET) 108 ppl / Ha (Gross)	92.7 Units / Ha Total Site Area: 2910 SQ. M	63 Units / Ha Total Site Area: 4236 SQ. M	x22 x5 27 Units / 0.423 Ha (Total Gross Site Area)	2264 SQ. M 49 SQ.M Space / Person

## Appendix 10 – Graphic Key

### Density



### Population



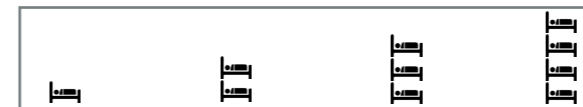
### Net Residential Density



### Gross Residential Density



### Unit No. / Types



### Travel Times



### Shared Outdoor Spaces



## Graphic Key

The graphic key for analysis case studies and the given site are similar to the 'Translating Housing: Berlin-Belfast' Book Graphic Key. It shows the project title, the density / plot ratio, the population occupying the building in question or the maximum capacity based on number of beds. It also shows the net density, which is the floor area of the building excluding footpaths and green spaces, while the gross residential density shows the overall. The graphic also shows the unit types, beds and people per bedroom and the amount of units per development, as well as travel times to close amenities and the square meters of the shared communal spaces.



**Thank you!**

# Fragmentation in an era of Climate Emergency: Finding an appropriate approach to density

 Protection & Re-use of Existing Assets, Sprawl Repair, De-Zoning Land

