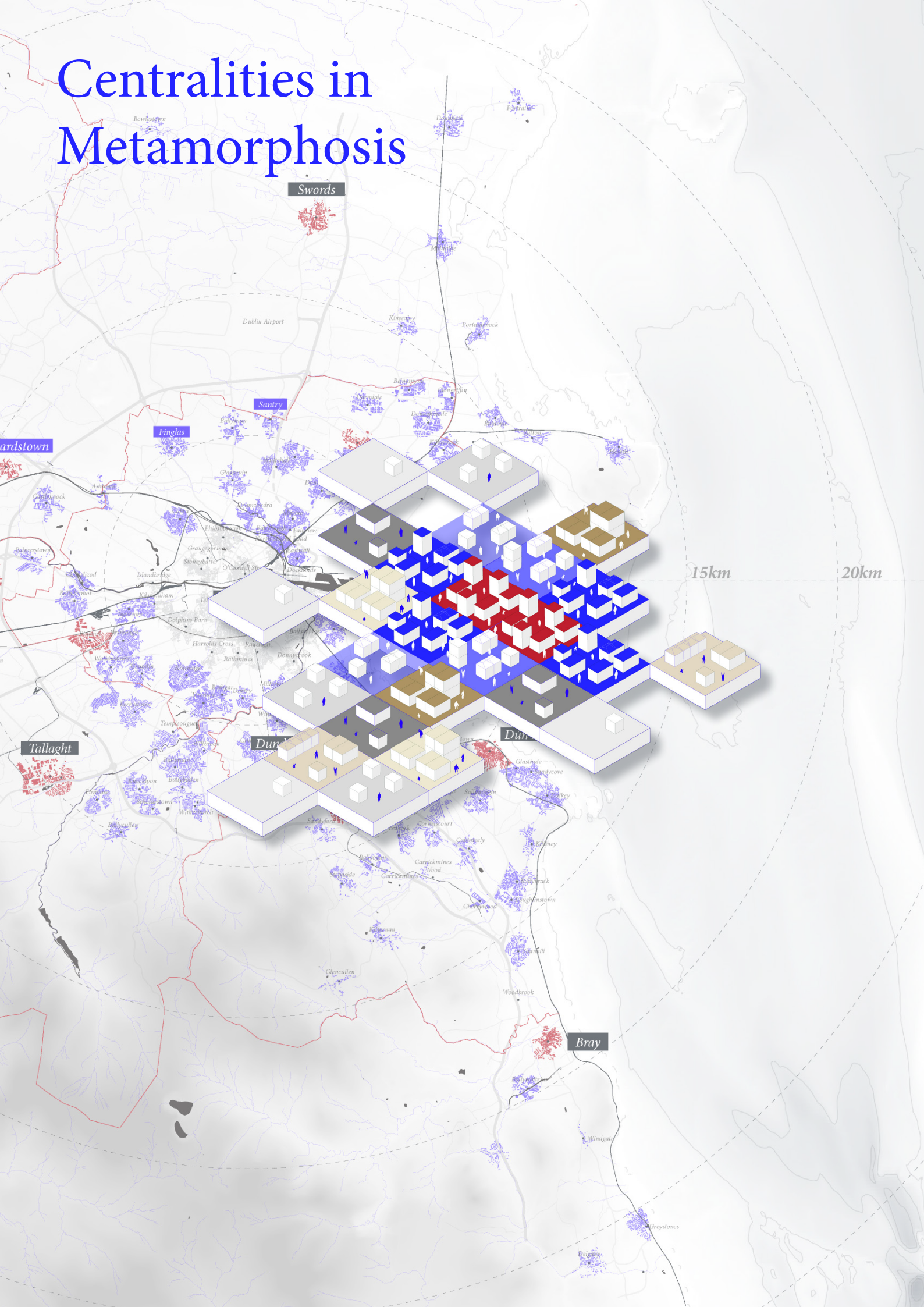


# Centralities in Metamorphosis



# Colophon

## CENTRALITIES IN METAMORPHOSIS

*Emerging Urban Peripheral Centralities, Liveability, and Planning in Metropolitan Dublin*

### Key Words:

Peripheral Centralities, Liveability, Metropolitan Governance, Urban Morphology, Planning & Governance, Dublin, Ireland

Master Thesis A4 Report 17.06.2026.

MSc Architecture, Urbanism, and the Building Sciences  
Department of Urbanism  
Faculty of Architecture, Urbanism and the Built Environment  
Delft University of Technology (TU Delft)

### Author:

Rian James McGrattan  
6252850

### Cluster:

Data Informed Strategies for Sustainable Urban Futures (DIS-SUF)

### First Mentor:

Birgit Hausleitner

### Second Mentor:

Marcin Dabrowski

### Acknowledgements:

I wish to thank my supervisors, Birgit and Marcin for all of the help and guidance provided to me throughout the process of this thesis. I greatly appreciate all of the knowledge that they have shared with me and it will stay with me for years to come, their commitment, dedication, and support shown towards me has been invaluable. I also wish to thank my friends, family, and partner, who have made my time at TU Delft a successful and enjoyable experience.

# Abstract

Dublin's urban development is increasingly challenged by uneven liveability, spatial inequality, and the persistent over-reliance on a dominant city centre. Despite sustained population growth and extensive suburban expansion, many areas beyond the historic core continue to lack well-functioning peripheral centralities capable of supporting everyday life through access to services, employment, public space, and civic infrastructure. Liveability, understood as the quality of the relationship between people and their living environment, has a strong spatial and social dimension and is closely tied to neighbourhood structure and urban performance (van Dorst, 2012). The underperformance of Dublin's peripheral centralities places growing pressure on the city centre and highlights structural weaknesses in the city's planning and governance framework.

While suburbanisation in Dublin began in the nineteenth century with the outward movement of affluent populations beyond Georgian Dublin, these early spatial patterns were later significantly reinforced and expanded through state-led housing provision, infrastructure investment, and planning policy. Through a diffusion-coalescence process, suburban growth spread outward before gradually consolidating into the metropolitan region, shaping the spatial structure of the city over time (Dietzel et al., 2005). However, this growth occurred largely without a coordinated strategy for the development of robust and liveable centralities. As a result, many peripheral centres exist in form but do not adequately function or perform in meeting high standards of liveability, reflecting broader conflicts between activity, regulation, and everyday life (Roberts & Turner, 2005).

Despite long-standing planning concepts that promote local centres, walkability, and mixed-use development, such as the urban village model, these ideas have often remained inconsistently applied or idealised, rather than embedded within a coherent metropolitan strategy (Biddulph et al., 2002). Literature on peripheral centralities has highlighted the historical and contemporary importance of suburban centres as key sites of urbanity, governance, and socio-spatial performance, challenging city-centric planning approaches and the representation of space (Phelps, Keil & Maginn, 2025) (Lefebvre, 1991). Nevertheless, the relationship between suburban expansion, fragmented governance, and liveability outcomes in to contemporary challenges of liveability and spatial equity. The aim of the project is to develop a strategic framework plan that integrates spatial and policy design to strengthen peripheral centralities and support a more liveable, coordinated, and polycentric Dublin metropolitan area. Dublin remains insufficiently examined as a strategic planning issue.

This thesis addresses this gap by examining the evolution of suburbanisation and planning governance in Dublin linking historical development patterns to contemporary challenges of liveability and spatial equity. The aim of the project is to develop a strategic framework plan that integrates spatial and policy design to strengthen peripheral centralities and support a more liveable, coordinated, and polycentric Dublin metropolitan area.



# Contents

## Introduction

Glossary 6-7  
Motivation 8-9

## The Problem

Problem Field & Context 12-29  
Problem Statement 30-31  
Relevance3 32-33

## Research Framework

Research Questions 36  
Conceptual Framework 37  
Methodology of the study 38-41  
Reviewing theories related to centrality and liveability 44-51

## Analysis

Components of liveability 54-55  
Evolving into a Metropolitan Region 56-62  
- spatial development 56-59  
- historical planning context 60-62  
Present Day Metropolitan Region 64-79  
Peripheral Centralities in Detail  
- regional  
- district and local  
Planing Peripheral Centralities 96-103  
Introducing the Case Areas 106-111  
Evaluating Case Areas 111-131

## Peripheral Centralities in Metamorphosis

A Multi-Scalar Metropolitan Region 134  
Metropolitan Scale Design Interventions 146  
Designing Peripheral Centralities146-159  
Public Space Design 160-167  
Planning Peripheral Centralities 168-183

## Conclusion & Discussion

Answering the Research Questions 184-189

## Reflections

Impacts on society, professional, and academic work 190-195  
Personal Progression 196  
Transferability 197

## Bibliography & Appendix

References 200-203  
- Text  
- Figures  
- Newspaper Quotes  
- AI Statement  
Appendix 206-215

# Glossary

## Clarifications

- \* *Peripheral Centrality - an area of high centrality and density of activities located outside of the city's urban core but within the built up urban fabric of the dominant core.*
- \* *Metropolitan Region - Depicting parts of Dublin, Kildare, Wicklow, and Meath Counties, the spatial cover of this study uses the metropolitan boundary as defined by the Department of Housing, Local Government and Heritage from the Government of Ireland. This is incorporated in the National Planning Framework Metropolitan Areas derived from Ordinance Survey Ireland Electoral Divisions and Small Area Boundaries.*
- \* *Small Areas - the smallest spatial level of census data measurement available.*
- \* *Local Authority / Council - these terms are used to refer to the single-tier system where Local Authorities act as the lowest independent level of local government.*
- \* *Urban Village - a term used to describe urban centralities that were once isolated from the continuous urban area fabric but retain spatial qualities of village like centralities.*
- \* *Development Plan - the statutory local authority policy and spatial planning document.*

## Abbreviations:

- GDA - Greater Dublin Area
- NACH -Normalised Angular Choice - Space Syntax analysis of the through-movement potential of each street segment in the street network.
- NAIN - Normalised Angular Integration - Space Syntax analysis of the to movement potential of each street segment in the street network.
- RSES - Regional Spatial Economic Strategy
- MASP - Dublin Metropolitan Strategic Plan
- NPF - National Planning Framework
- CPO - Compulsory Purchase Order
- LAP - Local Area Plan
- LPT - Local Property Tax
- UDZ - Urban Development Zone
- UAP - Urban Area Plan
- PAP - Priority Area Plan
- CAP - Co-ordinated Area Plan

## Authorities Abbreviations:

- DCC - Dublin City Council
- DLRCC - Dún Laoghaire-Rathdown County Council
- FCC - Fingal County Council
- SDCC - South Dublin County Council
- CSO - Central Statistics Office
- NTA - National Transport Authority



# Motivation

This project is motivated by a personal interest in how cities function as lived environments shaped by everyday practices, spatial structures, and policy decisions operating across multiple scales. Dublin, Ireland being my home country also provides an interesting context to place this type of research in. Growing up outside of the city in a village under a area of urban influence I felt the effect of not being from Dublin but feeling like I was aligning with the premise of the dissolving city of its lost or abandoned centralities. As Ireland continues to experience a sustained high level of population growth and accelerated urbanisation, pressures on the city's built environment, infrastructure, public space, and climate resilience are becoming increasingly visible. These dynamics raise urgent questions about how urban life is organised, where collective activities take place, and how the city can adapt to long-term environmental and social change.

A inspiration for the application of this project lies in James Joyce's Ulysses, a novel deeply embedded in the geography and rhythms of Dublin. The characters' paths intertwine throughout the day. Joyce wrote in the novel about ordinary movements, encounters, and places over the course of a single day, Ulysses reveals the city not as a singular centre, but as a constellation of interconnected locations where meaning, identity, and social life emerge. Although this is fiction literature, this perspective replicates with urban theory and practice, implying that centrality is not only a formal or planned condition, but also something produced through everyday use, proximity, and temporal overlap. This allowed me to apply a valuable lens through which to reconsider how urban centralities and 'hubs' operate beyond their conventional definitions.

From a planning perspective, Dublin's growth presents significant challenges. Ireland's population is projected to increase substantially in the coming decades, with a large share of this growth concentrated in the Greater Dublin Area (Metropolitan Area). This intensification places strain on housing supply, transport systems, social infrastructure, and environmental resources. At the same time, climate change introduces additional pressures, including the need for mitigation, adaptation, and more sustainable patterns of urban development. These combined forces demand new ways of thinking about how cities structure access to services, employment, social life, and environmental quality.

In response, this project questions the adequacy of existing planning frameworks that rely heavily on fixed, hierarchical centres and transport-oriented hubs. While such structures are important, they often fail to recognise emerging, peripheral, or under-acknowledged centralities embedded within Dublin's urban fabric. These places formed through clusters of everyday activities, social infrastructure, and spatial accessibility have the potential to support more resilient, low-carbon, and liveable urban environments if properly understood and integrated into policy and design thinking.

Although the concept of planetary urbanisation is explored more explicitly within the theoretical framework of the project, it underpins this motivation by situating Dublin within wider global processes. Urbanisation today extends beyond city boundaries, shaped by economic, ecological, and political systems operating at planetary scale. Recognising this condition reinforces the need for urban strategies that are flexible, multi-scalar, and attentive to both local lived experience and broader systemic change.

In conclusion, I believe that improving urban liveability requires a closer alignment between spatial form, governance structures, and everyday life. By rethinking urban centralities as dynamic, relational, and policy-relevant spaces, this research aims to contribute to a greater understanding of the make up of the city and how it functions to allow a more inclusive, adaptable, and climate-responsive urban future for the city.

*"Ineluctable modality of the visible: at least that, if no more, thought through my eyes."  
Ulysses, Proteus episode  
(Joyce, 1922)*

> Map (right) of Ireland showing the topology and built up urban areas with the main five cities highlighted

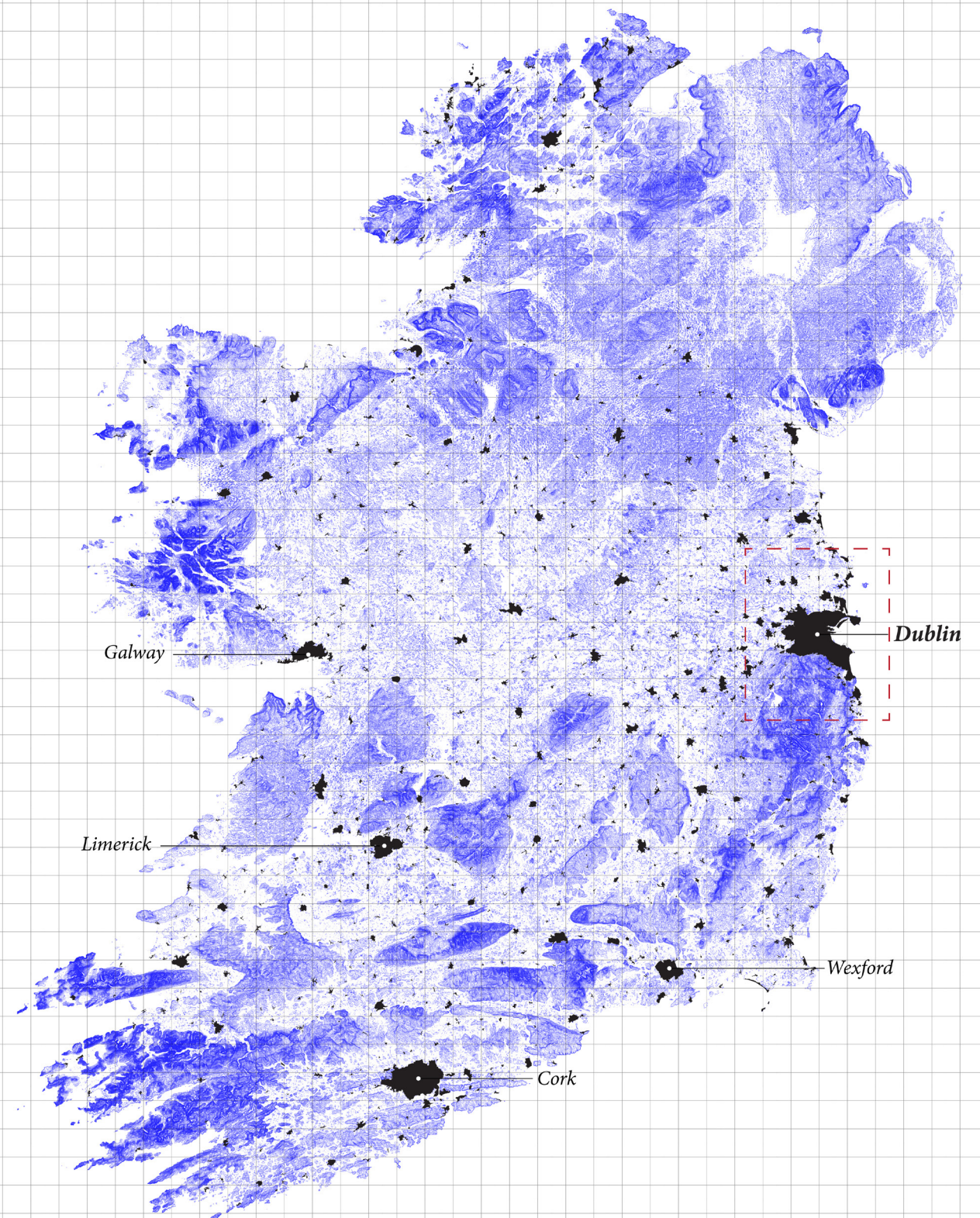
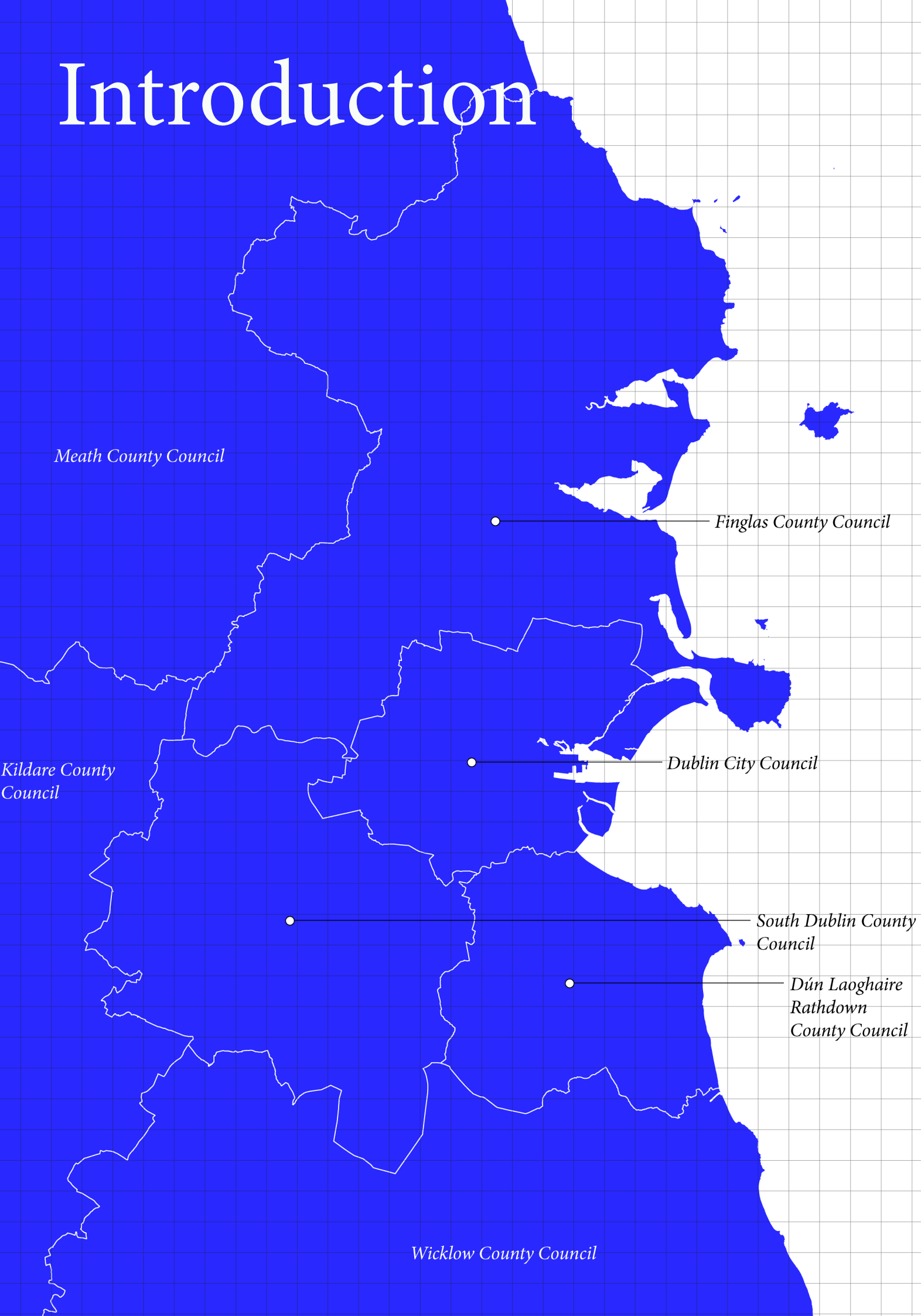


Fig 1. Built Up Areas Ireland, Author.

Built-Up Areas  
Topography Contour Lines



# Introduction



*Context*

*Problem Field*

*Problem Statement*

*Relevance*

# Context & Problem Field

## Urbanisation & Population Growth

### Centralities Under Pressure

Ireland is experiencing one of the fastest rates of population growth in the European Union, driven by a combination of natural increase and sustained inward migration. According to the Central Statistics Office (CSO), Ireland's population reached approximately 5.46 million in 2025, representing a significant increase over the past decade (CSO, 2025). This growth is unevenly distributed, with urban areas absorbing the majority of new residents. Dublin alone accounts for nearly 29% of the national population, reinforcing its role as the primary urban and economic centre of the country (CSO, 2025).

Urbanisation has intensified accordingly. More than 60% of Ireland's population now lives in urban areas, placing increasing pressure on housing, infrastructure, public services, and public space (Eurostat, 2024). National policy acknowledges this trajectory.

The National Planning Framework (NPF) positions compact urban growth as a strategic priority, emphasising the need to accommodate population increases while improving quality of life and spatial efficiency (Government of Ireland, 2018). However, the speed of demographic change has outpaced the delivery of housing and urban infrastructure, resulting in persistent shortages and spatial inequalities, particularly in the Dublin metropolitan area (OECD, 2023).

This rapid urban expansion forms a critical backdrop to the study, raising questions about how cities such as Dublin can spatially organise growth in a way that supports accessibility, everyday life, and long-term resilience.

Fig 2. Population Growth Chart Ireland, Author.

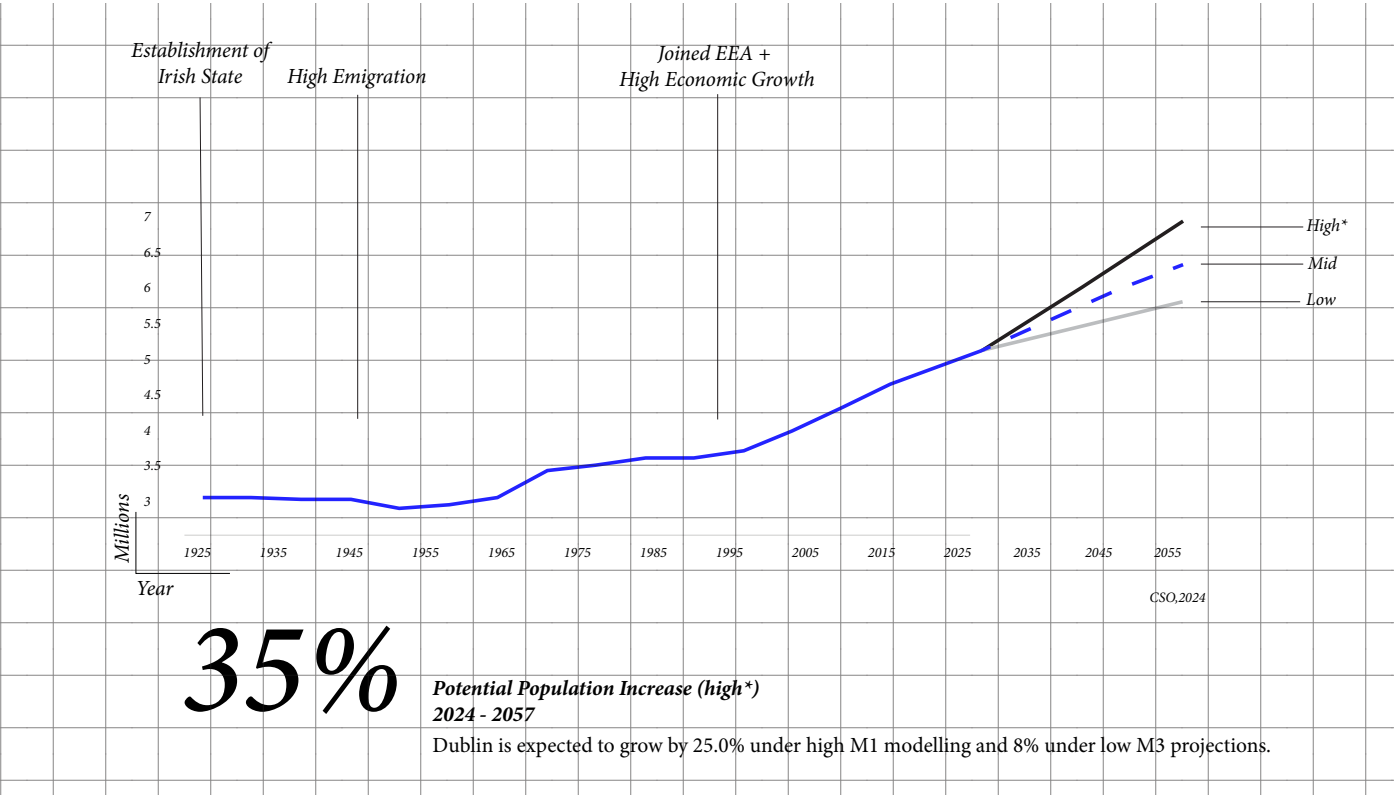
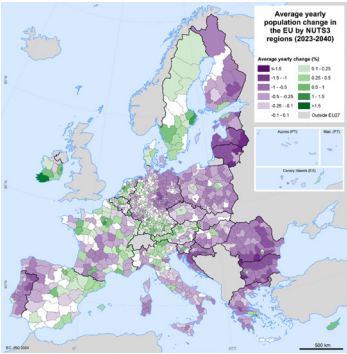


Fig 1. Average Yearly Population Change in EU, (European Commission, 2025)



Greater Dublin Area Population:

2.1 Million or 40.5% of the total population of Ireland live in the GDA

Dublin County (inclusive of the four municipalities) Population: c. 1.5 Million CSO, 2022

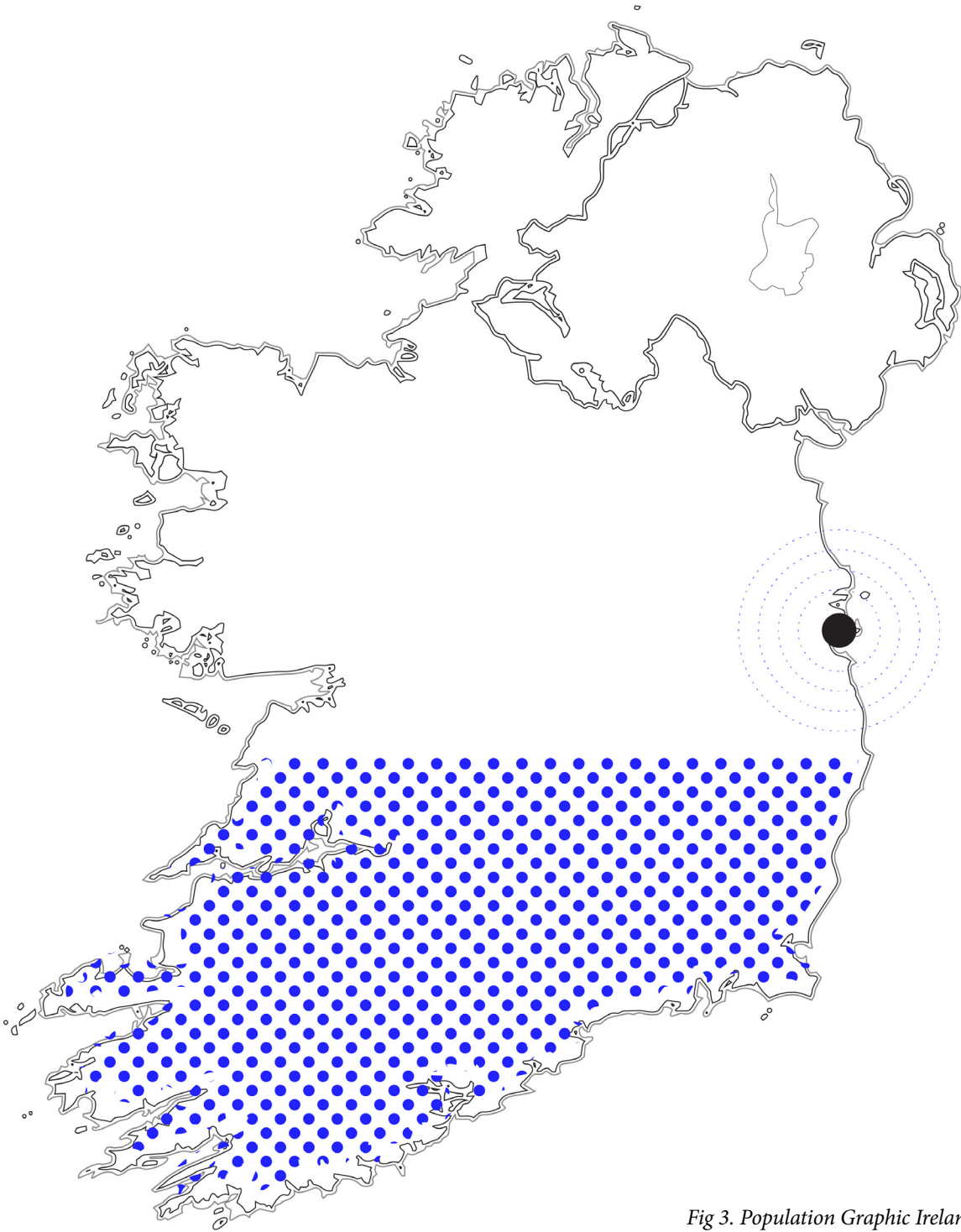


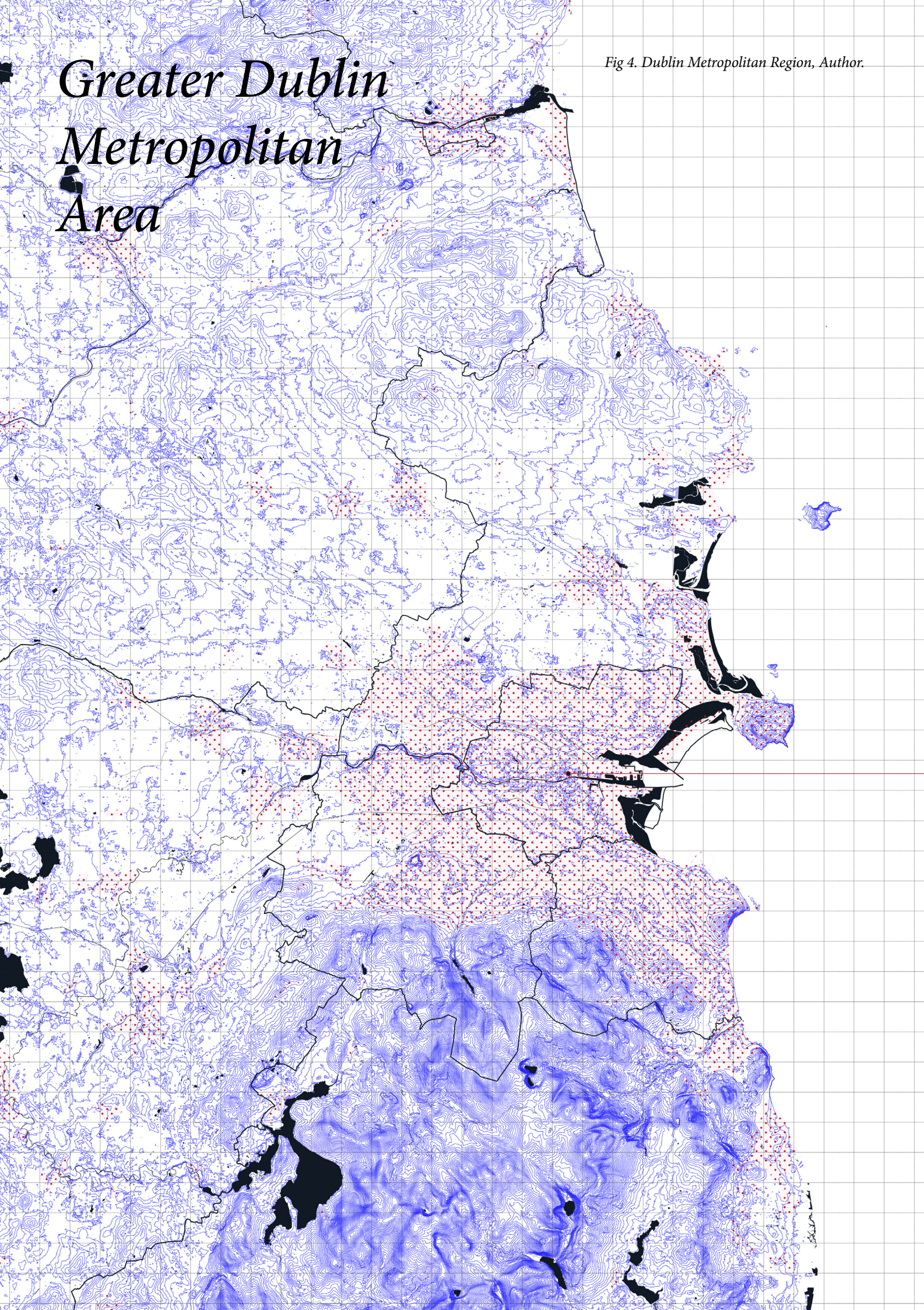
Fig 3. Population Graphic Ireland, Author.





# Greater Dublin Metropolitan Area

Fig 4. Dublin Metropolitan Region, Author.



- Boundaries Municipalities
- Waterways & Canals
- Contour Lines
- Built Up Areas
- Wetlands

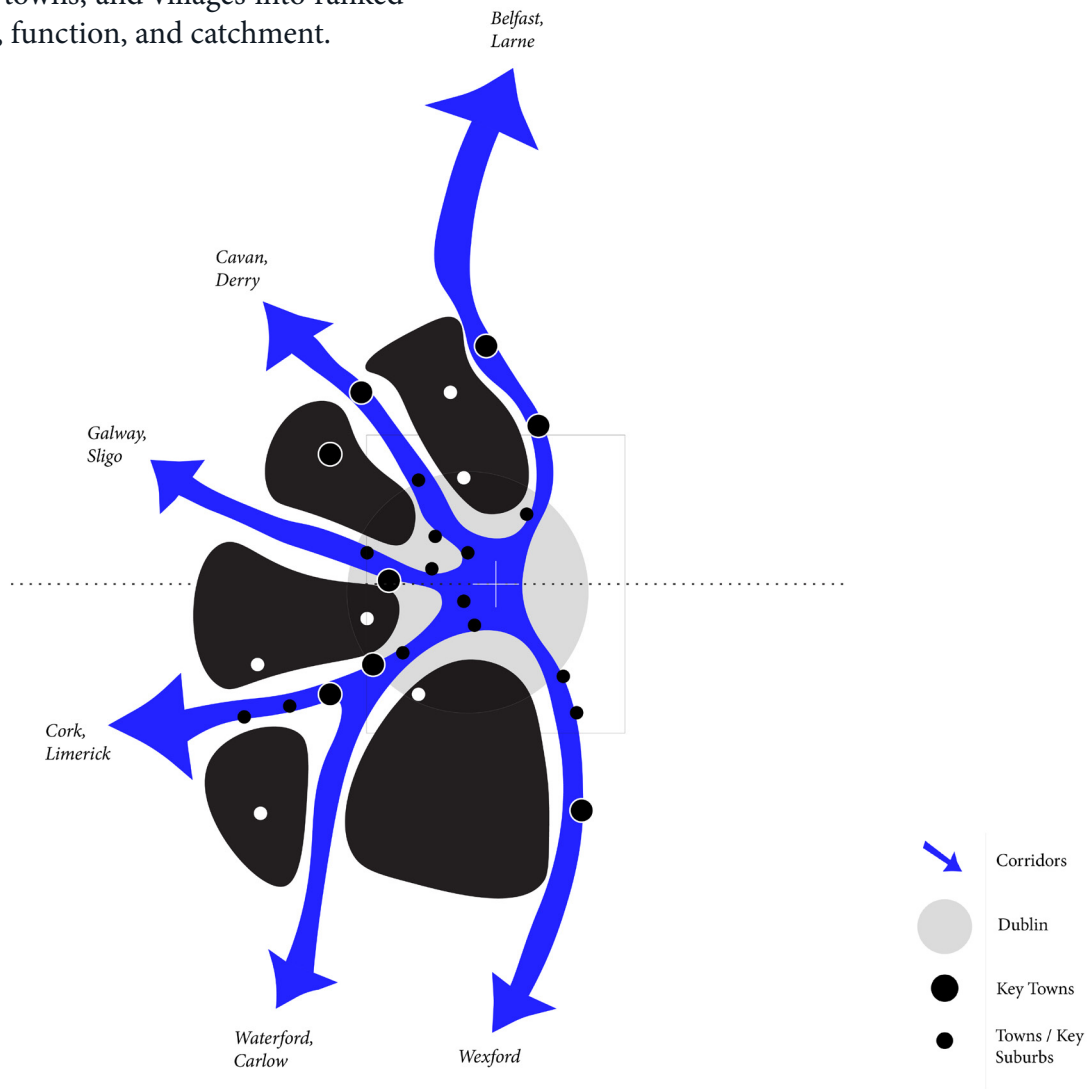


Fig. 5. Core City Centre, O'Connell Street, a boulevard created by the Wide Streets Commission 1777 to 1784  
Photograph June 1933: The O'Connell Monument in O'Connell Street, Dublin, from Nelson's Column.  
(French & Lawrence, 1865)



**Urbanisation & Population Growth**  
*Where People Gather: Patterns of Urban Growth*

Urban growth in the Dublin metropolitan region has traditionally been structured through hierarchical models of settlement and service provision. National and regional planning frameworks have implicitly drawn on principles associated with central place theory, organising cities, towns, and villages into ranked systems based on size, function, and catchment.



This logic remains visible in strategic representations of the metropolitan region, where Dublin is positioned as the dominant centre, supported by a clearly defined hierarchy of secondary centres and commuter settlements.

The city and its surrounding settlements have grown predominately along five corridors or fingers linking Dublin to other key cities and towns in the country

Fig 6. Settlement Hierarchy & Key Corridors  
 Dublin Metropolitan Region, Author

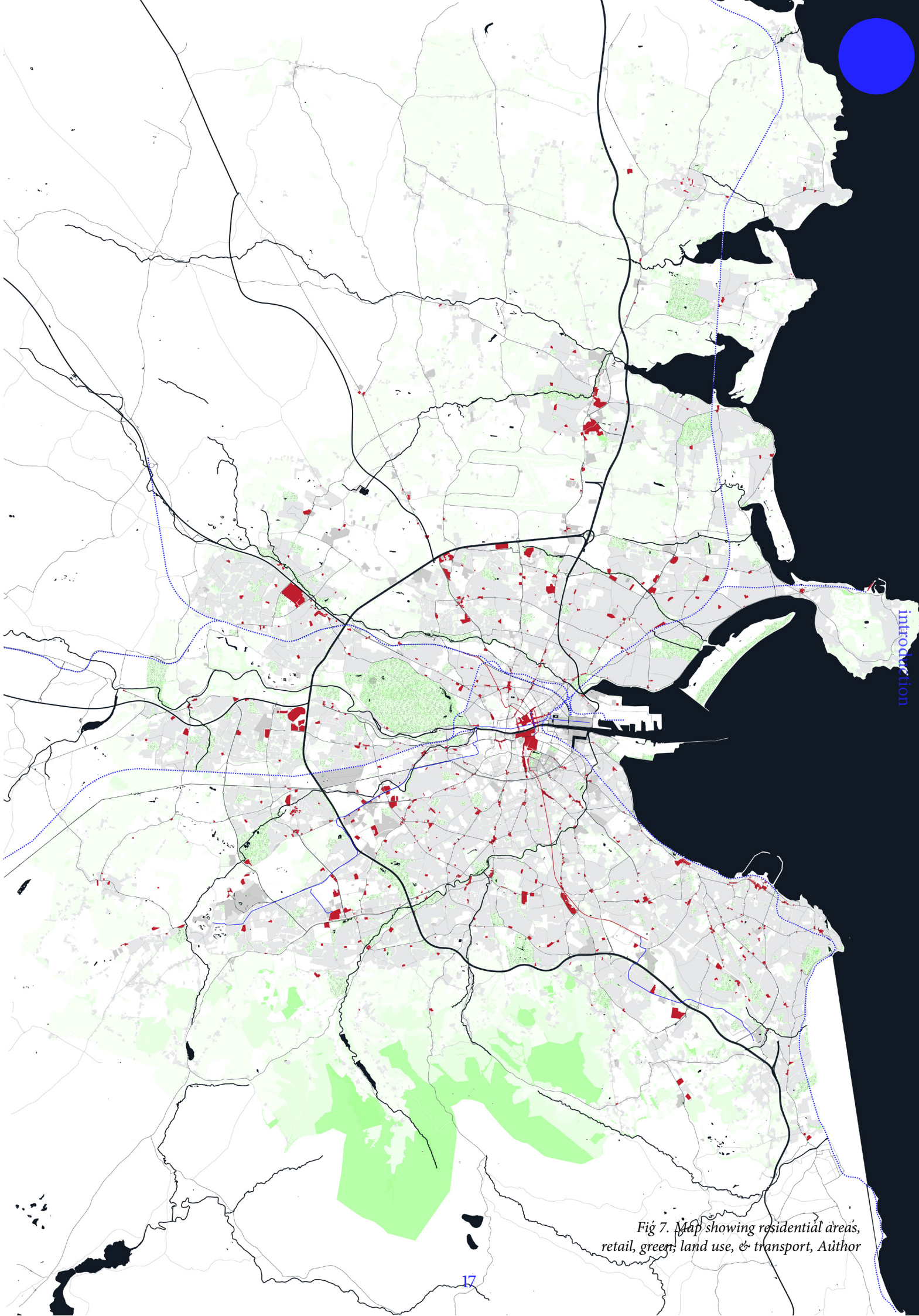


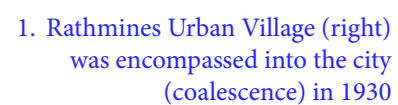
Fig 7. Map showing residential areas, retail, green, land use, & transport, Author



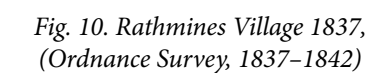
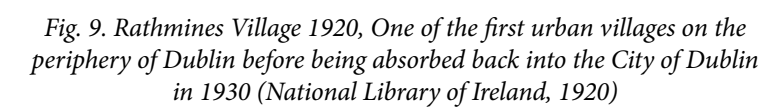


This pattern has resulted in a city where everyday activities can concentrate in places that lie outside formally designated centres and urban villages. Along transport corridors, main streets, retail clusters, and infrastructural intersections, new focal points of daily life have emerged, functioning as local hubs despite lacking formal recognition within planning frameworks. These places often serve surrounding neighbourhoods but remain spatially and functionally ambiguous within the wider metropolitan structure.

Since 2023 Ireland has a new National Land Cover Map is a major upgrade for Ireland, which provides offering much more detail than the older European system, Corine. Helpful for more new detailed studies of land use of up to 0.1 hectares, providing more accurate representation of how land is used. (EPA, 2024).



18





## Governance & Irish Planning System

### A Changing City

The start of this diffusion coalescence model began when the wealthy started to move out of the centre of the city in the Victorian and Edwardian periods (1837-1910) beyond the perimeters of Georgian Dublin. Leading to the establishment of new peripheral villages around the old boundary of the city centre which was mostly just outside the city's canal 'ring' (Royal and Grand Canals). (Dublin City Council, 2022).

Areas such as Rathmines, mapped and illustrated on the previous page, were viewed as being far removed from the city at the time, a perception that persisted well into the mid-20th century (RTÉ Archives, 1988). As affluent populations relocated to these emerging suburbs, former Georgian mansions within the city core were increasingly subdivided into tenements, contributing to severe overcrowding and urban decline (Ó Maitiú, 2003).

A second wave of suburbanisation occurred from the 1915s to 1930s meant that the recently independent Irish government and local authorities started to plan the city more and invest in public housing to improve living conditions. They built new suburbs on the edge of the city, mostly influenced by the garden city model. These areas were Marino, Cabra, Kimmage, reflecting a shift from the previous market-led to publicly-driven urban expansion.

While Dublin continued to expand radially through the mid and late 20th century, the main morphological structures of these earlier suburbs largely persisted. Later developments such as Tallaght and Blanchardstown represent further diffusion, eventually coalescing into the metropolitan area. Expanding to the west making them part of the urban conglomeration. Experiments with high-rise social housing in the 1960s, most notably in Ballymun, were largely unsuccessful due to social issues and inadequate services.

Earlier affluent suburbs such as Rathmines continue to perform strongly in terms of liveability, while later-planned suburban peripheral centralities exhibit more varied forms and functions reflecting the planning ideologies of their time e.g. Dublin's northern suburbs feature more shopping centres to provide services while the southern suburbs are more 'village' and street typology based.

As a result, a band of under performing or weakly defined centralities has emerged between the historic inner-city core and the later peripheral centres areas that were neither endowed with the fine-grained urban structure of early suburbs nor the scale and service provision of metropolitan-era developments.

B. Caulfield, A. Ahern/Case Studies on Transport Policy 2 (2014) 20-27

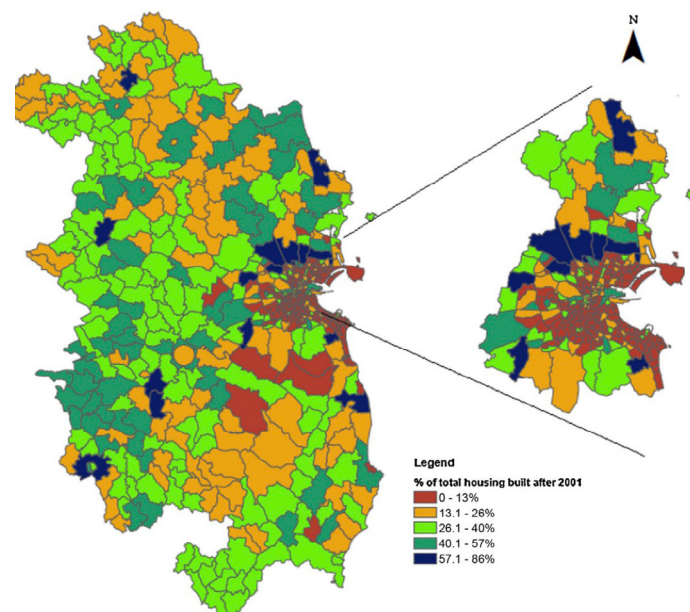


Fig 11. Percentage of new housing built after 2001 (to 2011), (Caulfield, 2014)

Fig. 12. Extract from Abercrombie's town plan (right) for Dublin 1922 depicted a changing city in a newly established independent state

The image contrasts two realities of early 20th-century Dublin: burning civic landmarks damaged and the crumbling Georgian tenements. Looming over both is a figure representing a dying Dublin, which signals toward the slums suggests either the promised eradication of poor living conditions under the new town plan or perhaps it represents a warning about the consequences of poor planning and neglect of the city's people.



The last hour of the Night.

Fig. 12. The Last Hour of the Night, from Dublin of the Future: The New Town Plan Harry Clark (University Press of Liverpool and Hodder & Stoughton,



## Governance & Irish Planning System

### Centralised Rules, Local Consequences



Fig 13. Dublin Poolbeg glass bottle site new development, Lion-core, LinkedIn, 2025

*‘Donal O’Donovan: ‘Rural Ireland will survive, but our biggest city is now eating itself’*  
Irish Independent, 2018

*‘After 30 years of relative success, is Dublin city going backwards again?’*  
Irish Times, 2024

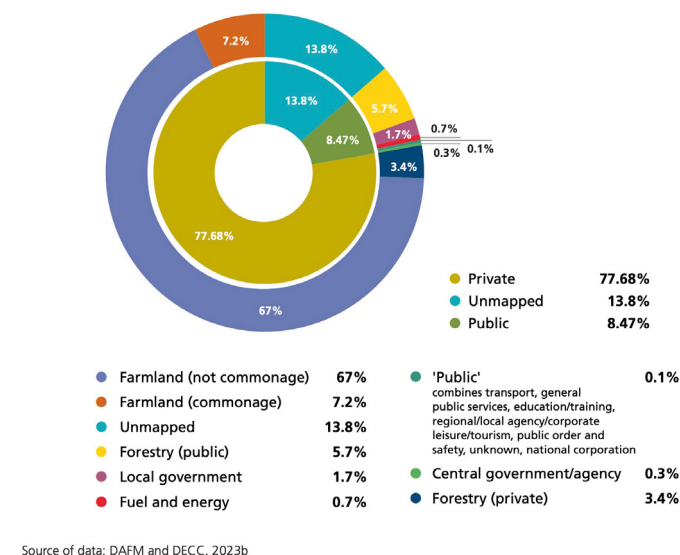
Ireland’s ability to respond effectively to urbanisation, climate processes, and liveability pressures is strongly shaped by the structure of its planning and governance system. Despite recent reforms, the Irish planning system remains highly centralised, fragmented across multiple institutions, and vulnerable to delays and uncertainty in implementation. These characteristics pose significant challenges for delivering spatially coherent, place-based urban strategies, particularly in metropolitan regions such as Dublin.

International comparisons consistently identify Ireland as one of the most centralised systems of governance in Europe. Local authorities have limited fiscal autonomy and constrained decision-making powers, operating largely within nationally prescribed policy frameworks (Council of Europe, 2018) (OECD, 2023). Ireland also ranks among the lowest-performing countries on the Local Autonomy Index, particularly in relation to fiscal and policy autonomy (Ladner et al., 2019). Unlike more decentralised systems, Ireland lacks an elected regional tier of government, leaving strategic spatial coordination largely directed from the national level.

This centralisation is compounded by institutional fragmentation. Planning responsibilities are distributed across national departments, four Dublin local authorities, regional assemblies, sectoral agencies, the Office of the Planning Regulator, and An Bord Pleanála (Government of Ireland, 2018). Although the National Planning Framework and Regional Spatial and Economic Strategies aim to improve alignment across scales, regional bodies possess limited enforcement capacity and offer limited scope for metropolitan-scale differentiation (OECD, 2023).

At the metropolitan level, governance fragmentation is especially pronounced. Dublin functions as a single labour market and urban system, yet it is governed by four separate local authorities, each with its own development plan, political priorities, and implementation time lines. While coordination mechanisms exist (MASP), there is no statutory metropolitan authority with decision-making power over housing delivery, transport integration, or strategic placemaking (Moore-Cherry & Tomaney, 2018). This institutional separation limits the city’s capacity to plan and deliver integrated urban hubs or centralities that cut across administrative boundaries.

Dublin City Council’s 400 year old motto is still:  
“*Obedientia Civium Urbis Felicitas,*”  
“the obedience of citizens produces a happy city”



## Land Ownership

Land ownership patterns play a decisive role in the Irish planning system. Fragmented private ownership, combined with strong constitutional protections of property rights, restricts land assembly, strategic acquisition, and long-term public intervention (Fox-Rogers et al., 2011; Byrne, 2020). Public debate reinforces this diagnosis, noting that the State owns very little land and has limited scope to assemble sites or plan at scale, leaving development governed by a framework designed for a different model of land control and contributing to delay and conflict in housing and planning outcomes (Gubbins, 2025).

Fig 14. Estimated Percentage Area of Land Ownership Ireland 78% Private, (EPA, 2023)

Recent reforms under the Planning and Development Act 2024 introduce new spatial instruments, including Urban Development Zones (UDZs) and Urban Area Plans (UAPs), intended to improve coordination and delivery. However, their effectiveness is constrained by land ownership patterns. Fragmented private ownership and strong constitutional protections of property rights limit land assembly, strategic intervention, and long-term public investment, particularly in smaller-scale and peripheral centralities (Fox-Rogers et al., 2011) (Byrne, 2020).

Together, these governance and land-related constraints contribute to a persistent gap between planning ambition and spatial delivery. While national and regional frameworks increasingly emphasise compact growth, resilience, and liveability, the institutional capacity to actively support emerging and everyday centralities remains limited.

*“In Cyprus, Ireland, Malta and Turkey, municipalities have **very little influence** when it comes to deciding on the services they are responsible for. They merely **execute what has been decided on higher levels.**”*  
Ladner, A., Keuffer, N., & Bastianen, A. (2021)



**Governance & Irish Planning System**  
*How it Works*

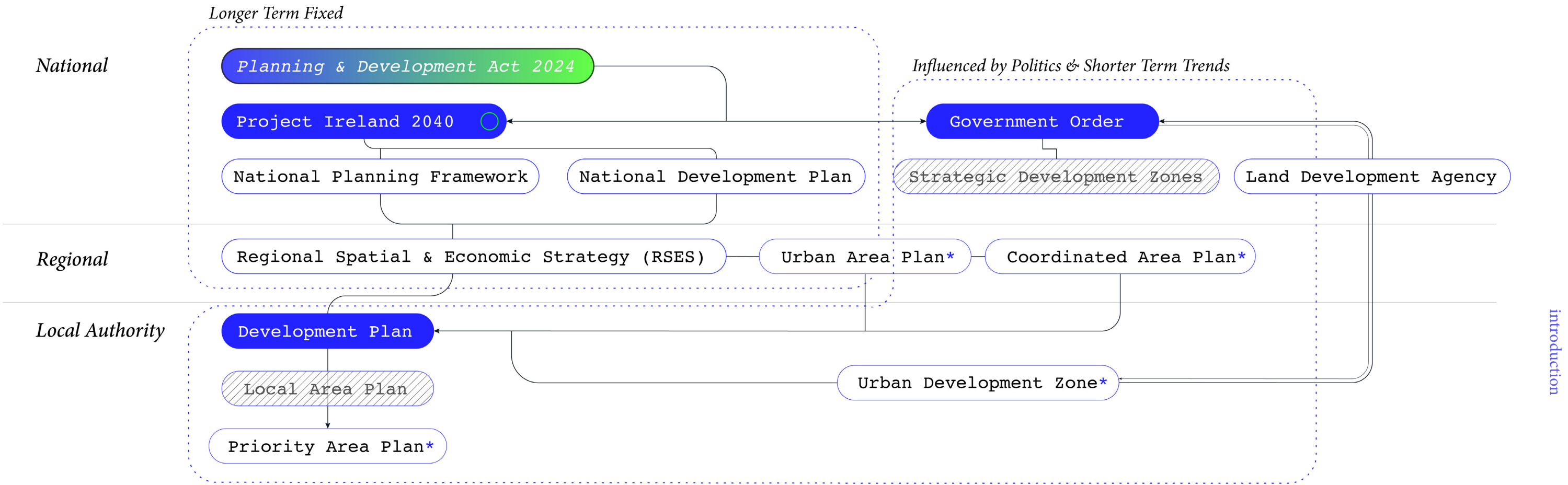


Fig 15. Planning System Framework Current 2026,  
Author

**Recently Replaced:**  
Strategic Development Plans with  
Urban Development Zones  
Local Area Plans with Priority  
Area Plans

| Plan Type*                   | Intended Scale      | Primary Focus                                                            |
|------------------------------|---------------------|--------------------------------------------------------------------------|
| Urban Area Plan (UAP)        | Entire Town/City    | Integrated Planning for Regional Growth Centres / Key Towns              |
| Urban Development Zone (UDZ) | Strategic Area      | Fast Tracking High Density / Large Scale Residential / Economic Projects |
| Coordinated Area Plans (CAP) | Cross Boundary      | Planning for Areas That Cross Two or More Municipalities                 |
| Priority Area Plan (PAP)     | Local Neighbourhood | Regeneration / Targeted Change / Housing Delivery                        |

A PAP can exist within a UAP



## Everyday Urban Experience

As Dublin's population continues to grow and broader environmental and social pressures intensify, ensuring urban liveability has become a central concern for planning and governance and how this will translate into centralities in terms of the way people live in the city. Liveability is often approached through measurable indicators such as housing density, access to amenities, green space provision, safety, and mobility. While these indicators are important for comparative assessment and policy benchmarking, however they only partly capture how urban environments are actually lived and experienced. Van Dorst does not conceptualise liveability as a fixed or singular condition, but as a composite and context-dependent quality emerging from the interaction of multiple spatial and social dimensions, including density, spatial quality, access to nature, noise, safety, diversity of lifestyles, and proximity of services (van Dorst, 2012).

From this perspective, liveability emerges through everyday spatial practices: how people move through the city, appropriate public space, negotiate proximity to others, and balance competing uses of the urban environment. Roberts and Turner (2006), in their study of London's Soho, demonstrate how areas often celebrated for their vitality and mixed-use character can simultaneously generate conflicts that undermine residential liveability. High concentrations of activity, extended hours of use, and overlapping functions may enhance economic vibrancy, yet they can also produce noise, congestion, waste, and a sense of exclusion for certain groups. Their work highlights that liveability is not simply a matter of "more activity" or "more density," but of how different uses are spatially organised, regulated, and managed over time.

Finglas



## Lucan



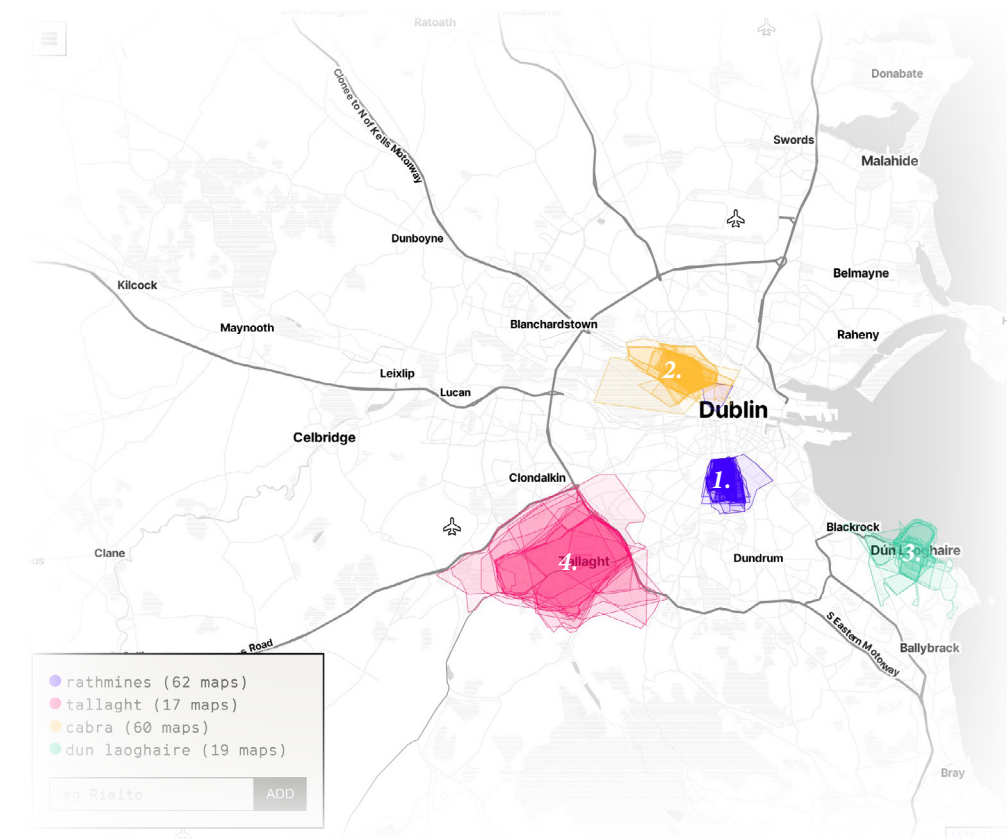
## Artane



Fig 16. Zoom in lived urban peripheral centralities differing examples, Dublin.  
Google Earth, n.d.

## Will You Draw Your Dublin Neighbourhood for Us?

*Fig 17. Perception of Neighbourhoods,  
(Dublin Inquirer, n.d.)*



Example of four different types of neighbourhoods developed in different periods.

1. Rathmines
2. Crumlin
3. Dún Laoghaire
4. Tallaght

For example, most peripheral neighbourhood here is Tallaght (4. / pink) and is the 'newest' and largest neighbourhood in this selection. Above shows the perceived boundaries of the neighbourhood. How does this affect the centralities in this location on a city scale, what do they look like now, and what should they look like? (Alexander, 1965).

This relational understanding of liveability is particularly relevant when considering urban centralities. Central places, such as neighbourhood hubs, high streets, or informal centres of activity, often function as focal points of social life and service provision. However, their contribution to liveability depends on the balance between intensity and accessibility, stability and change, and inclusion and exclusion. Van Dorst (2012) emphasises that liveability is shaped by tensions between different user groups, temporal patterns, and value systems, suggesting that what is liveable for one group may be experienced as disruptive or alienating by another.

Therefore, liveability is understood not as a static outcome of planning standards, but as a produced condition, continuously shaped by spatial design, governance decisions, and everyday use. This approach allows liveability to be analysed alongside urban centrality: not only in terms of where services and amenities are located, but in how centralities function as lived spaces that support or undermine daily life across different social and spatial contexts.



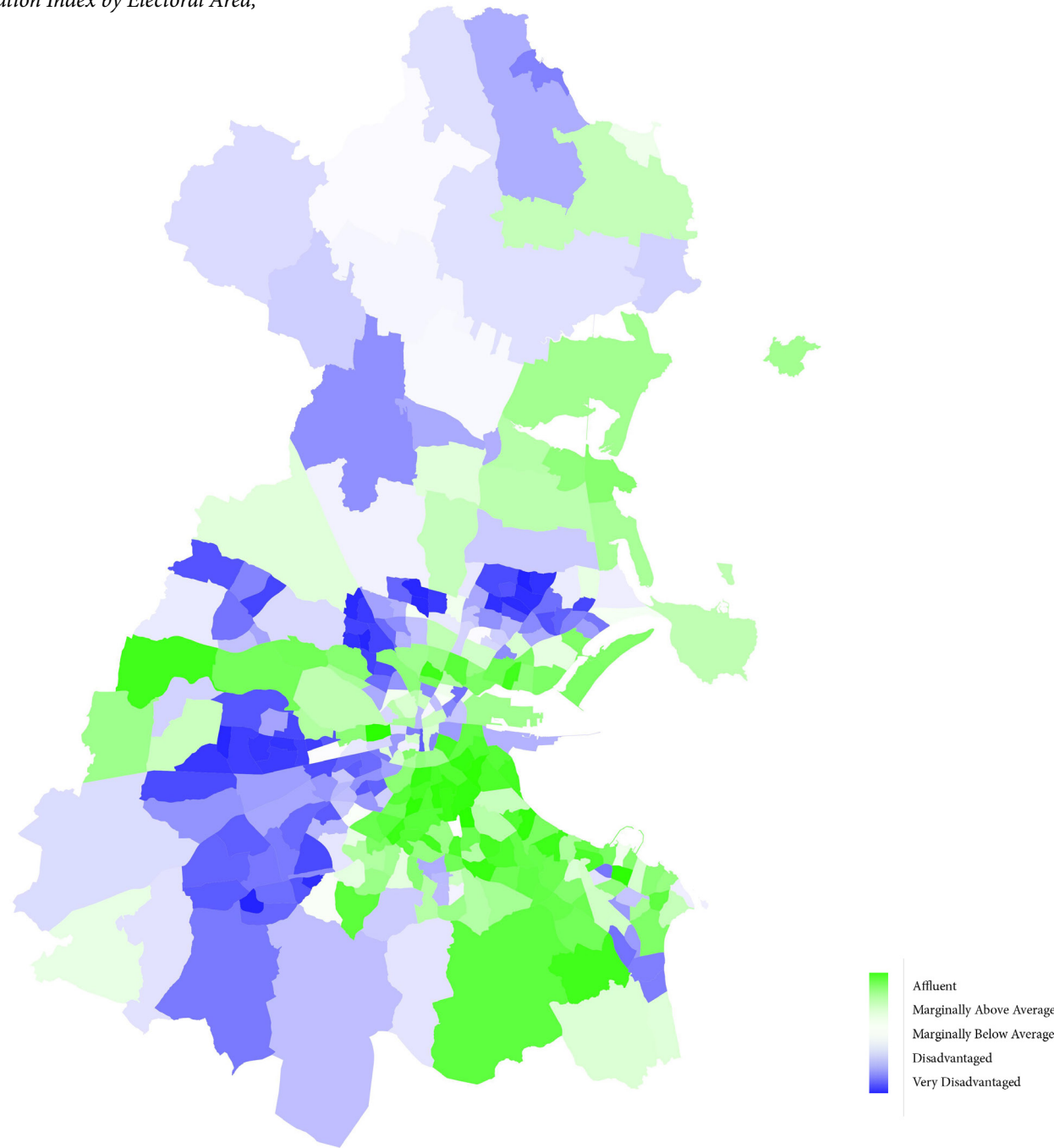
**Climate Change & Social Equity**  
**From Global Targets to Local Centralities**

Climate change is ongoing planetary process that increasingly conditions how cities function, adapt, and are lived. Urban areas are central to this process, they concentrate emissions, infrastructure, and population, while also being the primary places susceptible to climate impacts such as heat stress, flooding, and infrastructural failure are experienced most directly.

At the European level, climate neutrality targets for 2050 and interim emissions reductions by 2030 have reshaped national and local policy frameworks, placing cities under growing pressure to embed mitigation and adaptation into everyday urban environments (European Commission, 2021).

In Dublin, these pressures are spatially uneven and can be tied to the city’s pattern of centralities. While Ireland has adopted legally binding climate targets, including a 51% reduction in greenhouse gas emissions by 2030 (Government of Ireland, 2021), recent assessments indicate that progress remains insufficient, particularly in relation to transport, buildings, and land-use patterns (European Environment Agency, 2024). The spatial form of the city plays a critical role here with neighbourhoods and local centres differ significantly in terms of access to green space, surface permeability, building typologies, and mobility factors that shape both emissions and exposure to climate impacts.

Fig 18. Deprivation Index by Electoral Area, (Pobal, 2022)



These differences are visible across Dublin’s everyday centralities. Disadvantaged areas such as Crumlin are characterised by higher proportions of hard surfaces, limited tree cover, and constrained public space, intensifying exposure to heat stress and surface-water flooding. By contrast, wealthier areas such as Rathgar benefit from larger plots, mature greenery, and lower levels of environmental stress. Research consistently shows that socio-economically disadvantaged urban areas tend to experience higher climate risk and lower adaptive capacity, reinforcing existing inequalities through spatial form (EEA, 2024) (OECD, 2023) (Brennan et. al., 2017).

Climate processes therefore do not affect Dublin uniformly, they are filtered through the city’s morphology, infrastructure, and governance, becoming particularly visible at the scale of neighbourhood hubs and local centres. These everyday centralities concentrate social life, services, and movement, yet many lack the spatial qualities a climate-responsive public space required to support adaptation and suitable neighbourhood centre and hub formation. As a result, climate pressures exacerbate existing disparities between centralities, shaping not only environmental outcomes but also liveability and access to resilient urban space.

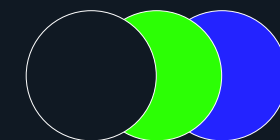
In this context, the challenge is not simply to reduce emissions or adapt infrastructure at a city-wide level, but to understand how climate processes are spatially produced and experienced through Dublin’s network of centralities. Without recognising and addressing these uneven conditions, climate policy risks reinforcing existing inequalities rather than transforming everyday urban environments into more resilient and liveable places.

*“Irish society is becoming more unequal,  
new deprivation index suggests”,*  
*The Journal, 2023*



Fig 19. Climate Change Protest Dublin November 2025, RTÉ (2025)





# Problem Statement

Dublin's urban development is increasingly challenged by uneven liveability, spatial inequality, and the persistent over-reliance on a dominant city centre. Despite sustained population growth and extensive suburban expansion, many areas beyond the historic core continue to lack well-functioning peripheral centralities capable of supporting everyday life through access to services, employment, public space, and civic infrastructure. Liveability, understood as the quality of the relationship between people and their living environment, has a strong spatial and social dimension and is closely tied to neighbourhood structure and urban performance (van Dorst, 2012). The underperformance of Dublin's peripheral centralities places growing pressure on the city centre and highlights structural weaknesses in the city's planning and governance framework.

While suburbanisation in Dublin began in the nineteenth century with the outward movement of affluent populations beyond Georgian Dublin, these early spatial patterns were later significantly reinforced and expanded through state-led housing provision, infrastructure investment, and planning policy. Through a diffusion-coalescence process, suburban growth spread outward before gradually consolidating into the metropolitan region, shaping the spatial structure of the city over time (Dietzel et al., 2005). However, this growth occurred largely without a coordinated strategy for the development of robust and liveable centralities. As a result, many peripheral centres exist in form but do not adequately function or perform in meeting high standards of liveability, reflecting broader conflicts between activity, regulation, and everyday life (Roberts & Turner, 2005).

Despite long-standing planning concepts that promote local centres, walkability, and mixed-use development, such as the urban village model, these ideas have often remained inconsistently applied or idealised, rather than embedded within a coherent metropolitan strategy (Biddulph et al., 2002). Literature on peripheral centralities has highlighted the historical and contemporary importance of suburban centres as key sites of urbanity, governance, and socio-spatial performance, challenging city-centric planning approaches and the representation of space (Phelps, Keil & Maginn, 2025) (Lefebvre, 1991). Nevertheless, the relationship between suburban expansion, fragmented governance, and liveability outcomes in Dublin remains insufficiently examined as a strategic planning issue.

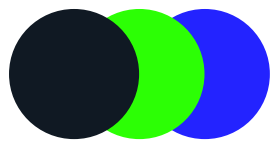
This thesis aims to address this gap by examining the evolution of suburbanisation and planning governance in Dublin linking historical development patterns to contemporary challenges of liveability and spatial equity. The aim of the project is to develop a strategic framework plan that integrates spatial and policy design to strengthen peripheral centralities and support a more liveable, coordinated, and poly-centric Dublin metropolitan area.

The research questions and methodology follow in the next section, subsequent to the relevance statements.

problematisation

Fig 20. Dublin Buildings & Transport Graphic, Author.





## Societal Relevance

Dublin’s continued suburban growth, combined with an over-reliance on the historic city centre, has contributed to uneven liveability and increasing spatial inequality across the metropolitan area. Many peripheral and intermediate areas lack well-functioning centralities that support everyday life through access to services, employment, public space, and social infrastructure. As a result, residents are often dependent on long-distance travel to meet basic needs, placing pressure on transport systems, public services, and household well-being.

By addressing the underperformance of peripheral centralities, this project engages directly with everyday societal concerns such as quality of life, accessibility, social interaction, and environmental sustainability. Strengthening local centres has the potential to reduce commuting burdens, improve access to amenities, and foster more cohesive and resilient neighbourhoods. The project also responds to broader societal debates around liveability by recognising that well-functioning urban environments are not solely defined by density or activity, but by how effectively space supports social life and individual well-being. In this sense, the thesis contributes to discussions on social equity and the right to liveable urban environments across the entire metropolitan region, rather than concentrating urban quality within a limited central core.

We can at the very least aim within our profession to improve the liveability of our cities to create better and healthier cities for current and future generations.

## Professional Relevance

From a planning and urban design perspective, the thesis addresses a critical gap between strategic ambitions for polycentric development and their translation into coordinated spatial outcomes in Dublin. While Irish planning policy increasingly promotes compact growth, local centres, and sustainable mobility, these objectives are often implemented in a fragmented manner across administrative boundaries and sectoral responsibilities. This has limited the ability of peripheral centralities to evolve into robust, multi-functional centres.

The project’s development of a strategic framework plan that integrates spatial and policy design offers a practical tool for planners, designers, and decision-makers. By combining historical analysis with contemporary spatial challenges, the framework provides guidance on how peripheral centralities can be strengthened through coordinated land-use planning, governance alignment, and targeted public investment. The project also contributes professionally by reframing centrality as a performance-based concept, linked to liveability outcomes, rather than a purely morphological or policy-designated status. This approach supports more informed decision-making and offers transferable insights for other metropolitan regions facing similar challenges of suburban growth and fragmented governance.

## Scientific Relevance

Scientifically, this thesis contributes to urban studies and planning theory by linking historical processes of suburbanisation with contemporary challenges of liveability and metropolitan governance. By applying a diffusion–coalescence framework to Dublin’s urban development, the research advances understanding of how early spatial patterns and state-led expansion have shaped the long-term performance of peripheral centralities. This historical grounding helps move beyond present-focused explanations of urban imbalance and situated current conditions within longer trajectories of urban growth.

The thesis also contributes to the growing body of literature on peripheral centralities by empirically examining how such centres function, or fail to function, in a contemporary European capital. By integrating liveability theory with spatial and governance analysis, the research bridges gaps between social, morphological, and institutional approaches to urban performance. Finally, the project’s combination of analytical research and strategic design contributes methodologically by demonstrating how spatial and policy frameworks can be used as research instruments, offering a model for interdisciplinary approaches in planning research. tion of climate and circular-economy agendas.



# Research Framework

*Research Questions*

*Conceptual Framework*

*Methodology*

*Research Timeline*

*Theory*



# Research Questions



## Main Research Question:

How can Dublin reconceptualise and operationalise urban centrality to identify, support, and govern emerging and peripheral hubs that shape everyday liveability across the metropolitan region?

Expose

### Sub-Research Question 1

What does Dublin’s urban form, street networks, and socio-economic conditions look like in shaping the emergence and functioning of everyday urban hubs across the metropolitan region?

Analyse

### Sub-Research Question 2

Why do emerging and peripheral hubs that contribute to everyday liveability remain under-recognised or unsupported within Dublin’s current planning and governance frameworks?

Propose

### Sub-Research Question 3

How do definitions of urban centrality in understanding everyday liveability in Dublin, and how do they challenge existing hierarchical models of centres and urban villages?

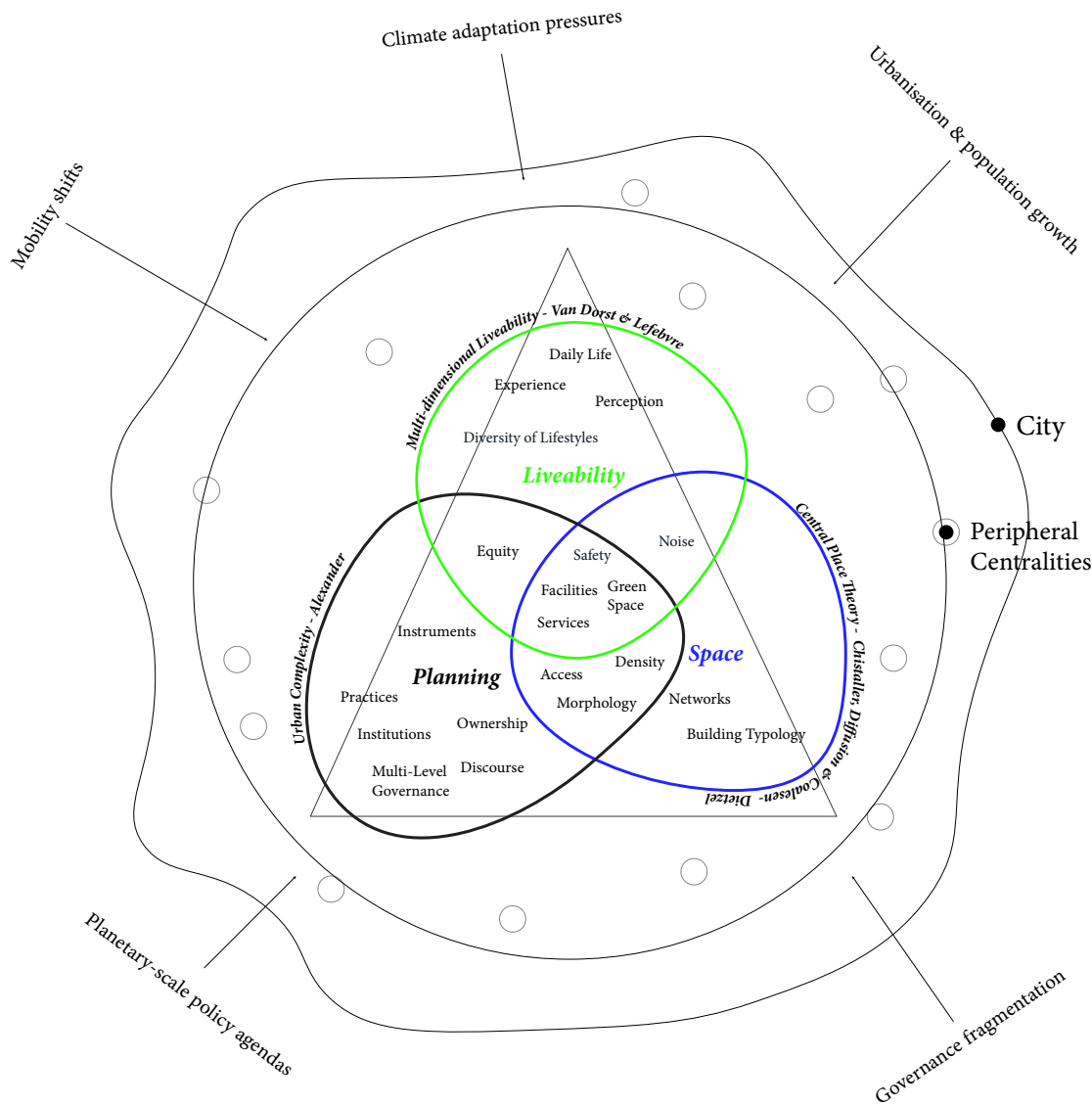
Politicise

### Sub-Research Question 4

How can a revised centrality framework better identify, classify, and support urban hubs as places of everyday life and liveability across administrative boundaries?

# Conceptual Framework

Fig 20. Conceptual Framework, Author



methodology

This conceptual framework positions liveability as the outcome of the interaction between space (urban form, density, networks, typologies) and planning (governance, institutions, policies, and practices). These three domains overlap most clearly in peripheral centralities, where everyday services, access, safety, green space, and equity shape daily life. The framework situated these local dynamics within wider metropolitan and global pressures, such as urbanisation, mobility shifts, climate adaptation, and fragmented

Governance, highlighting how misalignment between spatial design and planning limits the liveability performance of peripheral centralities in Dublin. This conceptual framework allows the basis for further research in this study.

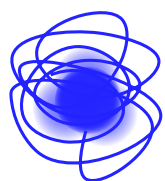




How can Dublin reconceptualise and operationalise urban centrality to identify, support, and govern emerging and peripheral hubs that shape everyday liveability across the metropolitan region?

|                   | Sub-Research Question                                                                                                                                                                   | Input                                                                                                                                                                                                                                                                                                              | Method                                                                                                                                                                                     | Output                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Outcome                                                                                                                                                                                                                                                                                        |
|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Analyse</b>    |                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                |
| 1.                | What does Dublin's urban form, street networks, and socio-economic conditions look like in shaping the emergence and functioning of everyday urban hubs across the metropolitan region? | Policy documents<br>Maps<br>Criteria sets for hub classification                                                                                                                                                                                                                                                   | Literature review<br>Historical Analysis<br>Policy Review<br>Spatial / Morphological Analysis<br>SM<br>LT<br>PG                                                                            | Text, graphics, & maps<br>Comparative diagrams<br>Conceptual diagrams                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Historical context<br>Development of City & centralities<br>Problem Field<br>Socio-economic aspects                                                                                                                                                                                            |
| <b>Expose</b>     |                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                |
| 2.                | Why do emerging and peripheral hubs that contribute to everyday liveability remain under-recognised or unsupported within Dublin's current planning and governance frameworks?          | Spatial datasets<br>Morphological references<br>Movement and accessibility indicators<br><br>Urban theory literature<br>Planning policy documents<br>Comparative conceptual frameworks<br><br>Governance frameworks<br>Institutional documents<br>Comparative governance models<br>Colloquial Input & Observations | Governance mapping<br>Policy alignment / misalignment analysis<br>Comparative analysis<br>Morphological analysis<br>GIS mapping<br>Space syntax / network analysis<br>SM<br>LT<br>PG<br>SO | Diagrams mapping: governance actors, policy flows (EU, national, regional, local)<br>Text & diagrams identifying: policy translation gaps<br>governance fragmentation mismatches between strategic intent & spatial outcomes<br>Maps & drawings showing: centralities, street network, accessibility, movement patterns, density and functional clustering<br>Identification of latent peripheral under recognised centralities<br>Comparative overlays: designated centres vs emergent centralities linked to liveability | Theoretical & conceptual understanding of centralities and liveability in Irish context<br><br>Diagnosis of structural, spatial, & governance mismatches that explain why existing hubs and centres fail to fully support liveability and policy delivery in Dublin / and in Ireland generally |
| <b>Propose</b>    |                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                |
| 3.                | How do definitions of urban centrality in understanding everyday liveability in Dublin, and how do they challenge existing hierarchical models of centres and urban villages?           | Synthesised findings from previous stages<br>Urban theory literature<br>Planning policy documents<br>Comparative conceptual frameworks                                                                                                                                                                             | Framework design<br>Strategic mapping<br>Case Studies<br>PG<br>CS<br>RD                                                                                                                    | A metropolitan-scale hub/cluster framework<br>Strategic maps<br>Diagrams translating policies into spatial requirements<br>Scenario testing of alternative hub configurations                                                                                                                                                                                                                                                                                                                                              | A new strategic framework for identifying, classifying, and supporting urban centralities & liveability in Dublin                                                                                                                                                                              |
| <b>Politicise</b> |                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                |
| 4.                | How can a revised centrality framework better identify, classify, and support urban hubs as places of everyday life and liveability across administrative boundaries?                   | Selected hub case studies<br>Design precedents<br>Policy requirements translated into spatial terms<br>Stakeholder logic                                                                                                                                                                                           | Site Observations<br>Research by design<br>SO<br>RD                                                                                                                                        | Design explorations at selected hubs<br>Maps<br>Policy<br>Phasing strategies<br>Visual narratives                                                                                                                                                                                                                                                                                                                                                                                                                          | Demonstration of hubs/clusters as political and spatial devices<br>Guidelines                                                                                                                                                                                                                  |

# Methodology



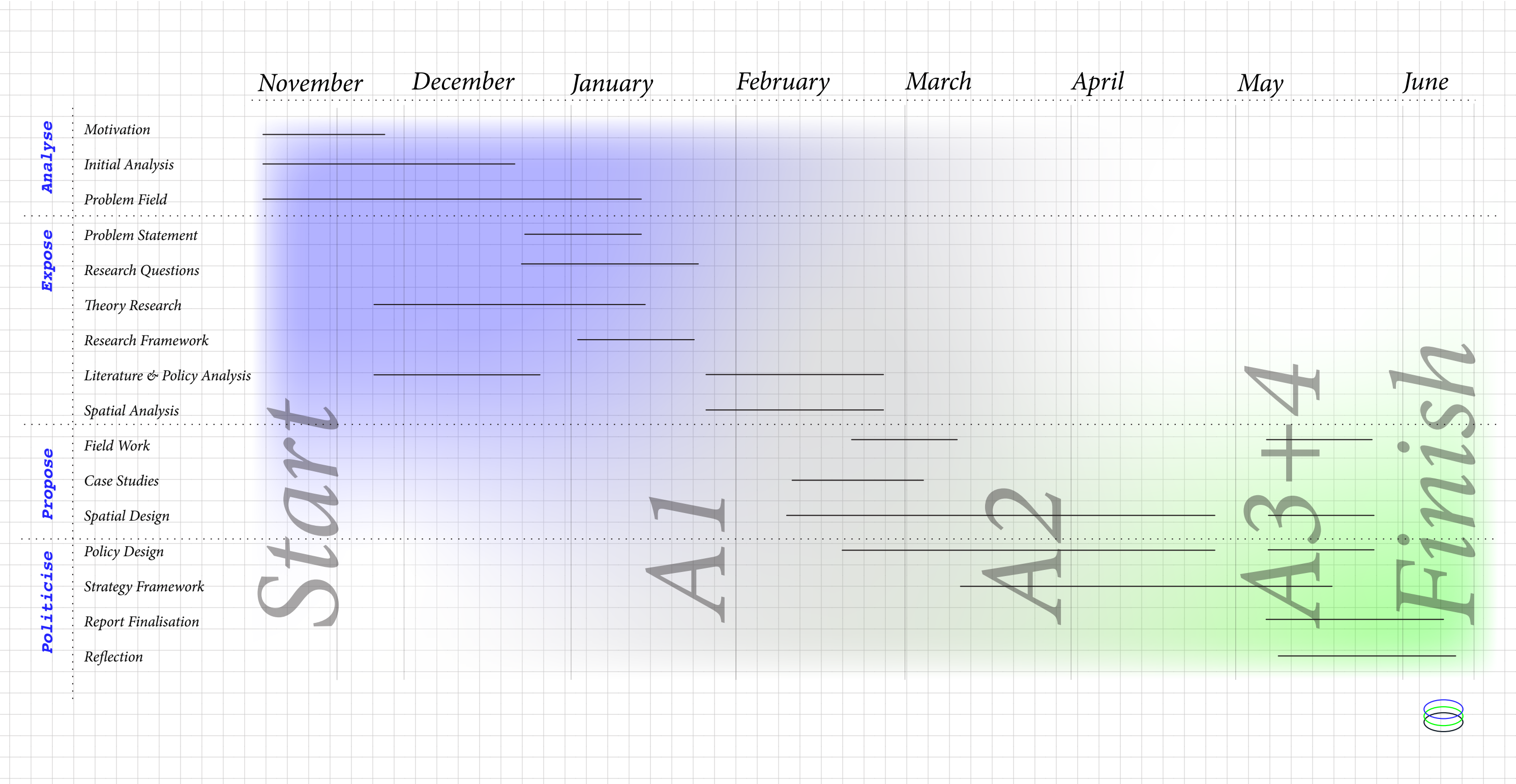
| Methods Explained  |                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-----------------------------------------------------------------------------------------------------|----------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SM                                                                                                  | <b>Spatial &amp; Morphological Analysis</b>  | <p>To understand how Dublin's urban form, street networks, and spatial configurations shape the emergence and functioning of everyday urban centralities.</p> <ul style="list-style-type: none"><li>• Mapping street networks, accessibility, density, and land-use mix</li><li>• Analysing movement patterns and spatial continuity</li><li>• Identifying spatial conditions associated with latent and peripheral hubs</li><li>• Comparing lived spatial patterns with formally designated centres</li></ul> |
| LT                                                                                                  | <b>Literature &amp; Theory Review</b>        | <p>To establish a theoretical foundation for understanding urban centrality, liveability, and the production of space.</p> <ul style="list-style-type: none"><li>• Review of urban centrality, diffusion and coalescence, and critical urban theory</li><li>• Review of liveability concepts and critiques of hierarchical centre models</li><li>• Conceptual synthesis informing spatial and governance analysis</li></ul>                                                                                    |
| PG                                                                                                  | <b>Policy &amp; Governance Analysis</b>      | <p>To examine how planning and governance frameworks enable or constrain the recognition and support of urban centralities.</p> <ul style="list-style-type: none"><li>• Review of national, regional, and local planning documents</li><li>• Mapping governance structures across administrative scales</li><li>• Identifying misalignments between policy intent and spatial outcomes</li></ul>                                                                                                               |
| SO                                                                                                  | <b>Site Observation &amp; Urban Analysis</b> | <p>To ground analytical findings in lived experience and everyday use of urban hubs.</p> <ul style="list-style-type: none"><li>• Targeted site visits to selected centralities</li><li>• Observation of access, use patterns, and temporal rhythms</li><li>• Visual documentation, interpretive and literal mapping</li></ul>                                                                                                                                                                                  |
| CS                                                                                                  | <b>Comparative Case Studies</b>              | <p>To situate Dublin's approach to urban centrality &amp; the emerging preferred centrality within a broader European planning context.</p> <ul style="list-style-type: none"><li>• Review of selected international frameworks and precedents</li><li>• Comparison of how centralities are identified, governed, and implemented</li><li>• Extraction of transferable principles rather than direct models</li></ul>                                                                                          |
| RD                                                                                                  | <b>Research by Design</b>                    | <p>To test how a revised understanding of urban centrality can enhance everyday liveability through spatial and strategic interventions.</p> <ul style="list-style-type: none"><li>• Selection of representative hub case studies</li><li>• Development of exploratory design scenarios</li><li>• Evaluation of how interventions support liveability and policy translation</li></ul>                                                                                                                         |

**Conclusion**

Overall, the methods described (left) will provide the analytical and conceptual grounding required to address the main research question of how Dublin can re-conceptualise and operationalise urban centrality in support of everyday liveability. By combining spatial and morphological analysis By combining policy and governance review, theoretical synthesis, and research by design, the methodology enables the identification and improvement of emerging and peripheral hubs, the diagnosis of how they can contribute better to liveability by proposed an alternative centrality framework and guidelines which crosses scales. This integrated approach ensures that urban centrality is examined not only as a formal planning designation, but as a lived, spatial, and governable condition, allowing the research question to be addressed in a holistic manner.



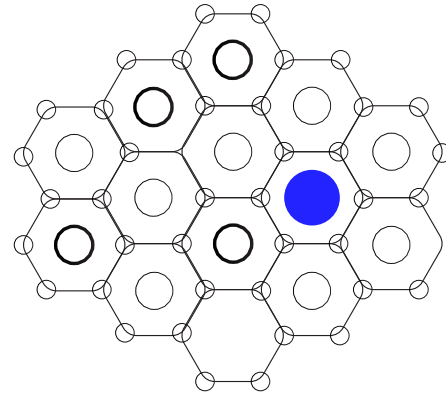
# Research Timeline



# Theory Overview Summary

## Central Place Hierarchy

Traditional planning models organise cities into hierarchical systems of centres and catchments. While useful for strategic clarity, such models struggle to capture dispersed, overlapping, and lived forms of centrality in contemporary metropolitan regions (Christaller, 1933).



## Urban Centrality

Urban centrality is not a fixed location but a relational condition produced through concentrations of activity, accessibility, and everyday use. Centralities can emerge, shift, and decline over time, often beyond formal planning designations (Gaspar, 1985; Pereira et al., 2013).

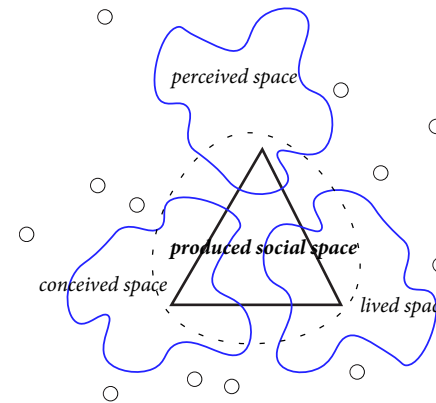
## Diffusion & Coalescence (Urban Morphogenesis)

Urban growth spreads unevenly through diffusion and consolidates selectively through coalescence. These processes explain how latent and peripheral hubs emerge over time and, under certain conditions, stabilise into recognised centres (Dietzel et al., 2004).



## Planetary / Critical Urban Theory

Urban centralities must be understood within the context of planetary urbanisation and political economy. Centralities operate as interfaces where global processes intersect with local governance and everyday urban life (Lefebvre, 1989; Brenner, 2014).



## Production of Space

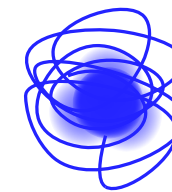
Urban space is socially produced through the interaction of planning representations, spatial practices, and lived experience. Centralities are therefore produced and contested, rather than simply discovered or designated (Lefebvre, 1991).

## Liveability & Urban Village Critique

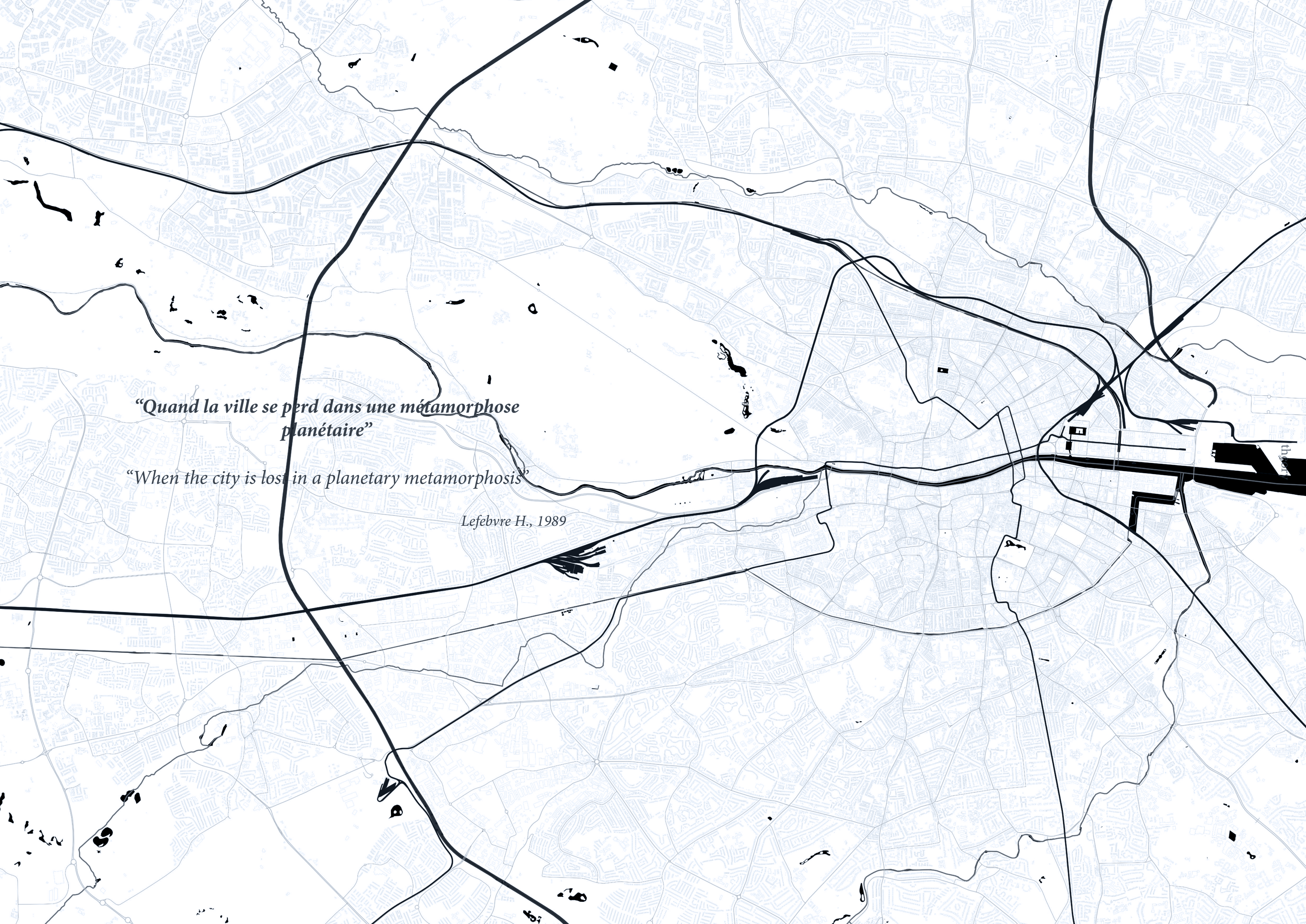
Liveability encompasses both measurable conditions (amenities, access) and lived experience (appropriation, comfort, agency). The urban-village model can obscure informal hubs and socio-spatial inequalities when applied as a fixed planning template (Biddulph, 2007; Hillier, 1999).

## Urban Complexity

Cities function as complex, overlapping systems rather than neatly separated hierarchies. Social life and urban vitality emerge where multiple networks intersect, producing informal and relational centralities that cannot be fully captured by tree-like planning structures (Alexander, 1965).







*“Quand la ville se perd dans une métamorphose  
planétaire”*

*“When the city is lost in a planetary metamorphosis”*

*Lefebvre H., 1989*



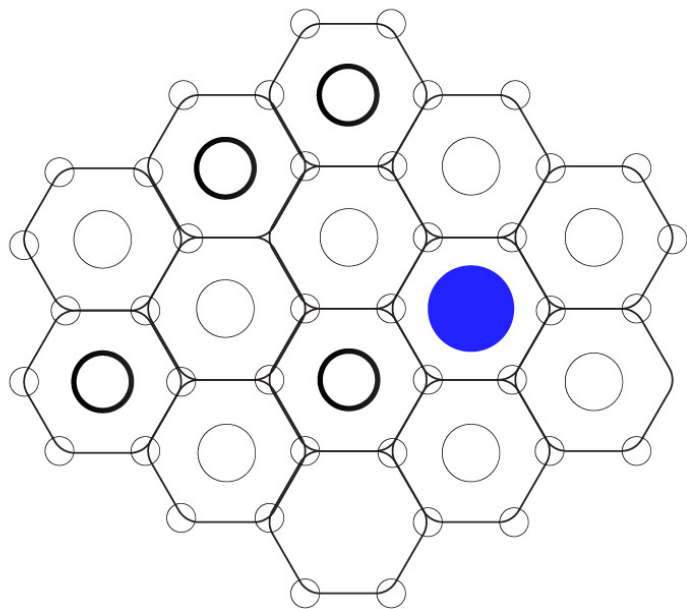


Fig 21. Central Place Theory, adapted from Beavon K.S.O. (1977), & Christaller W. (1933),

Central Place Theory provides a foundational framework for understanding the spatial organisation of urban centres and their hierarchical relationships. Originating from Christaller (1993), the theory explains how settlements function as centres for the provision of goods and services, each with a defined catchment area based on thresholds and ranges of activities. Larger centres support higher-order services with wider catchments, while smaller centres cater to everyday needs at a more local scale. In contemporary urban theory, central place concepts have been extended beyond rigid hierarchies to consider relational and functional forms of centrality, rather than purely geometric ones. This allows centrality to be understood as a performance-based condition, shaped by accessibility, service provision, and connectivity within wider urban systems (Pereira et al., 2013). In metropolitan regions, central place theory remains useful for diagnosing imbalances between designated centres and their actual capacity to serve surrounding populations.

While this framework has provided clarity for directing growth and infrastructure, it assumes that centrality is stable, bounded, and primarily tied to formally designated locations. In practice, everyday patterns of movement, consumption, and social interaction increasingly diverge from this hierarchy. People gather not only in designated centres, but also in smaller, dispersed clusters that sit between or outside established categories, particularly within suburban and peripheral areas of the metropolitan region. (Lefebvre, 1970). As a result, the prevailing hierarchical model struggles to account for the growing number of places that function as central in daily life without being recognised as such within planning frameworks. This misalignment raises questions about how centrality is defined, identified, and supported in a metropolitan context that is no longer organised solely around a fixed settlement hierarchy.

*'locus celeberrimus'*  
*'the 'busiest place''*

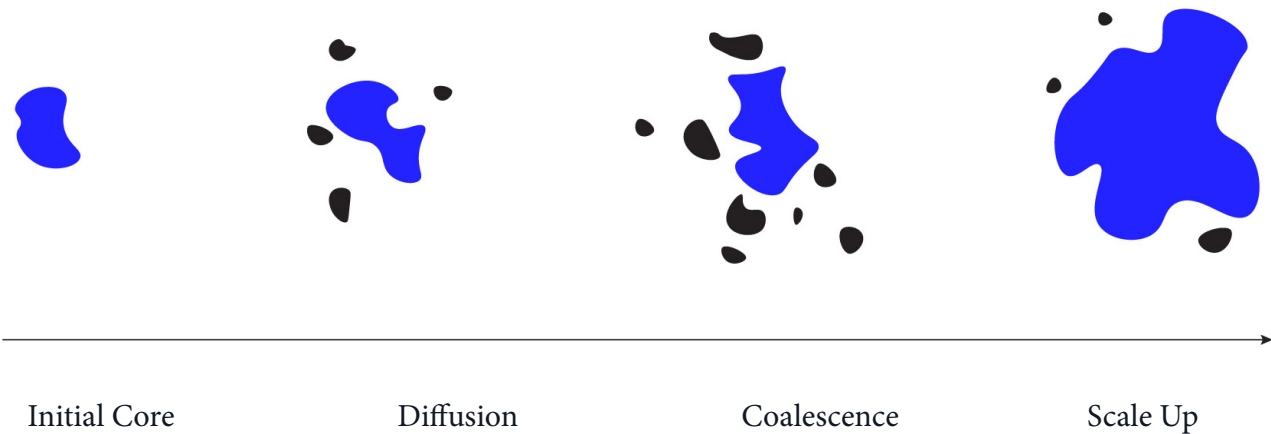
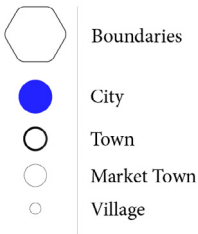


Fig 22. Diffusion & Coalescence, Adapted from Dietzel et al. 2005, Author

Diffusion and coalescence describe the dynamic spatial processes through which urban areas expand and restructure over time. Diffusion refers to the outward spread of population, activities, and built form from an urban core, often producing dispersed and fragmented development patterns. Coalescence follows when these dispersed areas gradually merge through infrastructure investment, densification, and functional integration, forming a more continuous urban fabric. Dietzel et al. (2005) demonstrate how these processes operate cyclically, shaping the emergence of new centres, altering catchment relationships, and redefining metropolitan structure. Importantly, diffusion does not automatically result in well-functioning centralities; without coordinated planning, coalescence may occur physically while functional integration remains weak. This framework is particularly relevant for understanding suburban and peripheral development, where growth often precedes governance capacity or strategic spatial coordination.

theory



# Planning

## Urban Complexity

Alexander's critique in *A City Is Not a Tree* challenges conventional planning models that organise cities as rigid, hierarchical systems with clearly separated functions and no overlapping with defined distances. He argues that living cities function instead as semi-lattices, characterised by overlapping networks of activities, uses, and relationships, and that we should be aiming for a more distributed structure rather than a centralised (monocentric) and decentralised (polycentric) city. Tree-like planning structures, where zones, functions, and catchments are strictly separated, reduce complexity and undermine urban vitality. Alexander's argument is particularly relevant to suburban and peripheral areas, where zoning practices and infrastructure planning often limit overlap between residential, commercial, and social functions. Applying this critique shifts attention from formal designation to relational performance, highlighting the importance of overlapping networks, mixed-use environments, and multiple centres of activity within everyday life contributing to liveability.

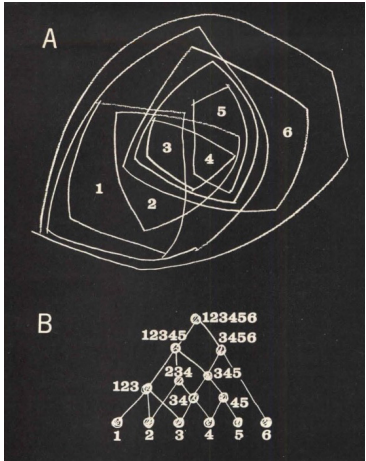


Fig 23. *A City is not a tree*, C. Alexander, 1965

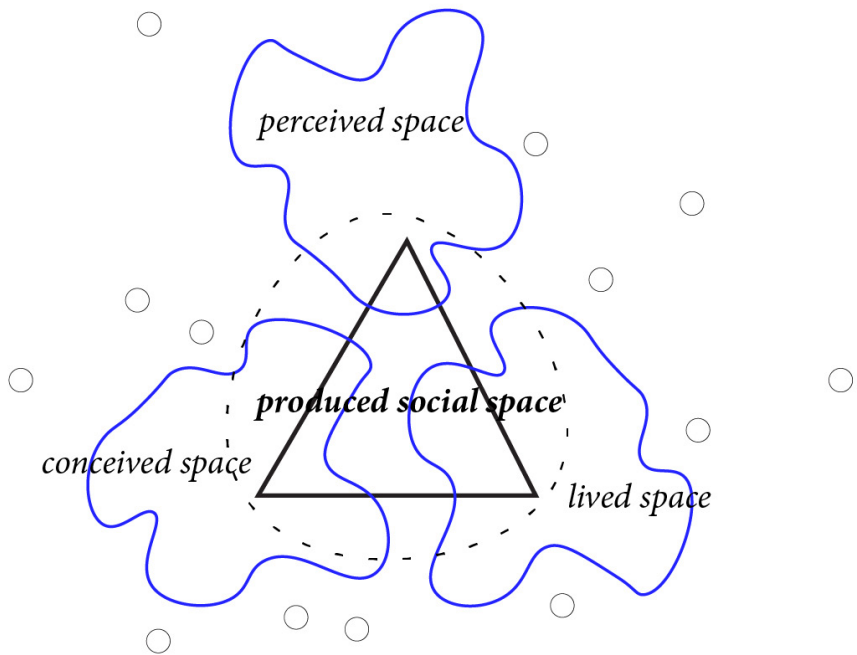
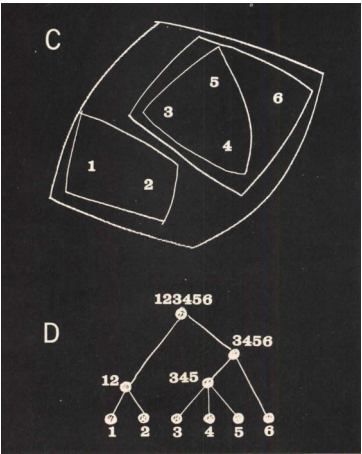


Fig 24. *Production of Space*, adapted from Lefebvre, 1991, Author

# Liveability

Fig 25. *Presumed liveability is emphasising the presumed conditions for liveability*, (van Dorst, 2012)

Liveability is a multidimensional concept that captures the quality of the relationship between people and their living environment. Van Dorst (2012) frames liveability as both objective and subjective, encompassing measurable spatial conditions, such as access to services, green space, safety, and environmental quality, as well as lived experience, perception, and social interaction which is harder to measure. All these elements form part of the conceptual framework for this research.

Liveability is therefore not guaranteed by density or centrality alone, but depends on how spatial form, governance, and social practices interact at the neighbourhood, city, and metropolitan scale. In urban centres, liveability is closely tied to everyday functionality: the ability to meet daily needs locally, feel safe and included, and experience a sense of place and belonging. This makes liveability a critical lens through which to evaluate and measure the 'performance' of peripheral centralities.

These experiential dimensions are inherently dynamic and can shift rapidly in response to broader planetary, economic, and social conditions, such as climate impacts, economic uncertainty, safety, or changing local perceptions which planning frameworks are not always able to predict. (Lefebvre, 1991).

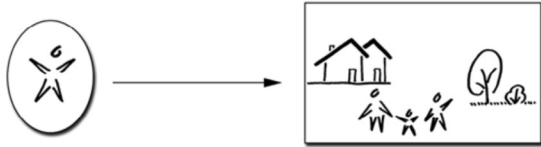


Fig. 8.2 Perceived liveability – the appraisal of the individual for his or her habitat

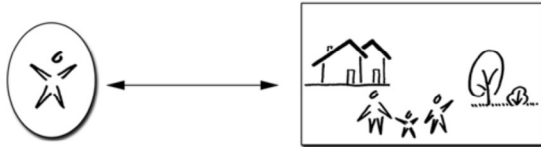


Fig. 8.3 Apparent liveability – the perfect match between species and habitat

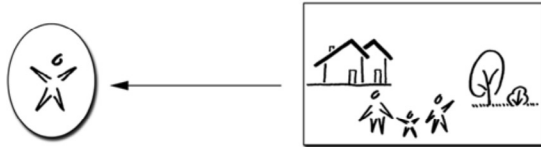


Fig. 8.4 Presumed liveability is emphasising the presumed conditions for liveability

Together, these theories provide a framework for understanding why many of Dublin's peripheral centralities exist in form but underperform in practice. Central Place Theory and diffusion-coalescence explain how suburban expansion produced dispersed centres without functional integration, while Alexander's critique highlights how rigid planning structures limit overlap and everyday urban life. The right to the city foregrounds issues of equity and governance, and liveability offers a performance-based lens through which spatial, social, and institutional conditions can be assessed together. Applied to Dublin, this framework supports the development of a strategic approach that integrates spatial and policy design to strengthen peripheral centralities and improve liveability across the metropolitan area and will be used for the basis of the remained of the research.

# Analysis

*Components of Liveability*

*Evolving into a Metropolitan Region*

*Present Day Metropolitan Region*

*Peripheral Centralities in Detail*

*- Regional*

*- District and local*

*Planning Peripheral Centralities*

*Introducing the Case Areas*

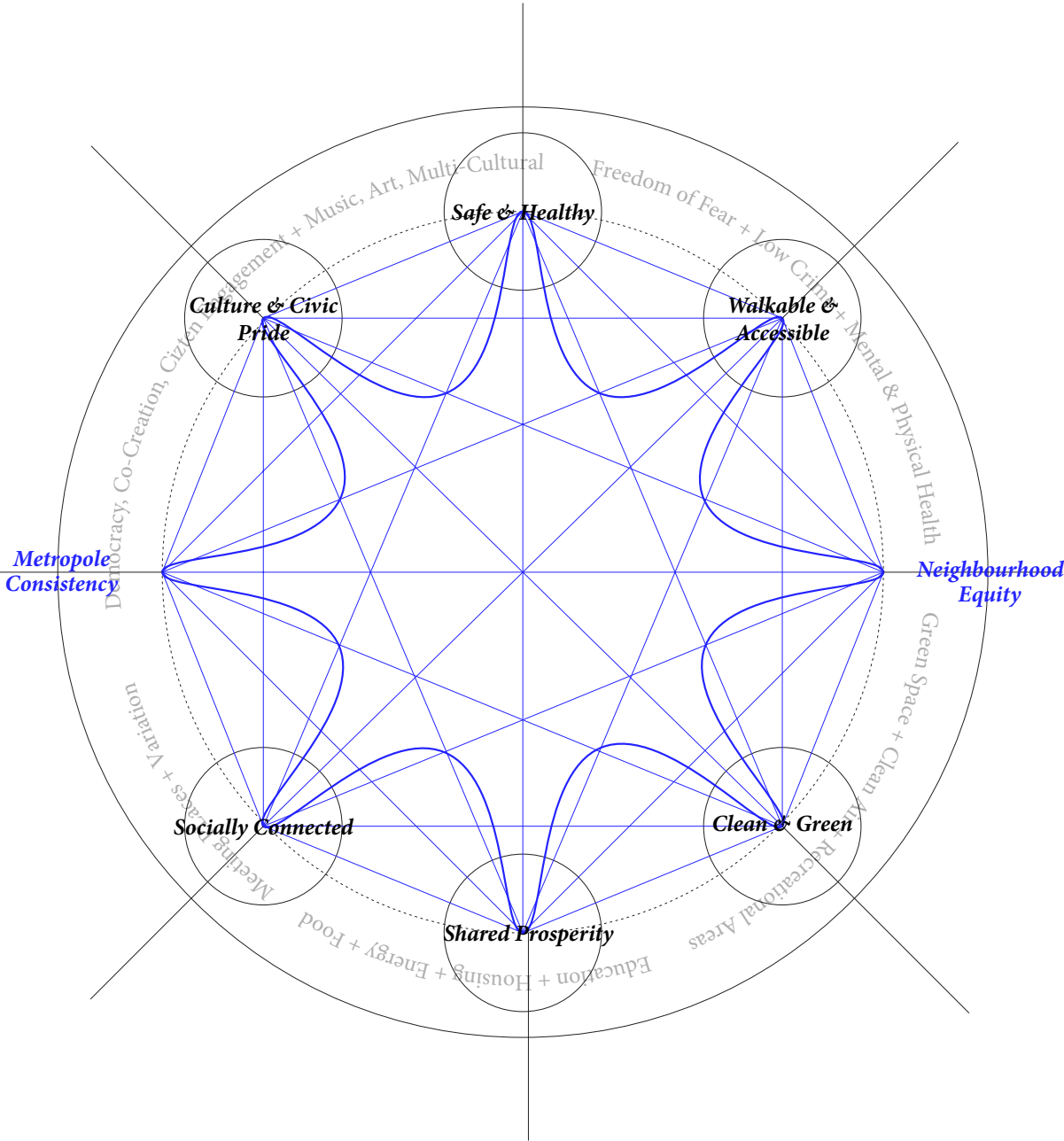
*Evaluating Case Areas*

*A Multi-Scalar Metropolitan Region*



# Components of Peripheral Centralities

Star of Liveability  
Key Elements



It is important to establish these components as shown in the star of liveability above, as in the core these are expected and considered to be taken for granted in the most central place, especially in a monocentric city like Dublin. When peripheral areas are more heterogeneous, this requires a framework of liveability metrics that adequately corresponds to the morphologies contained within the metropolitan region so that the centralities can be evaluated.

The periphery is more heterogeneous and subject to intense spatio-temporal rhythms in the metropolitan area. The core ponders to international, national, regional, and metropolitan scale with activities only being viable at such scales. While in the peripheries there is a focus on everyday needs and values where the implications of larger scale influences are felt for example, working from home trends and fuel concerns part of the wider economic systems.

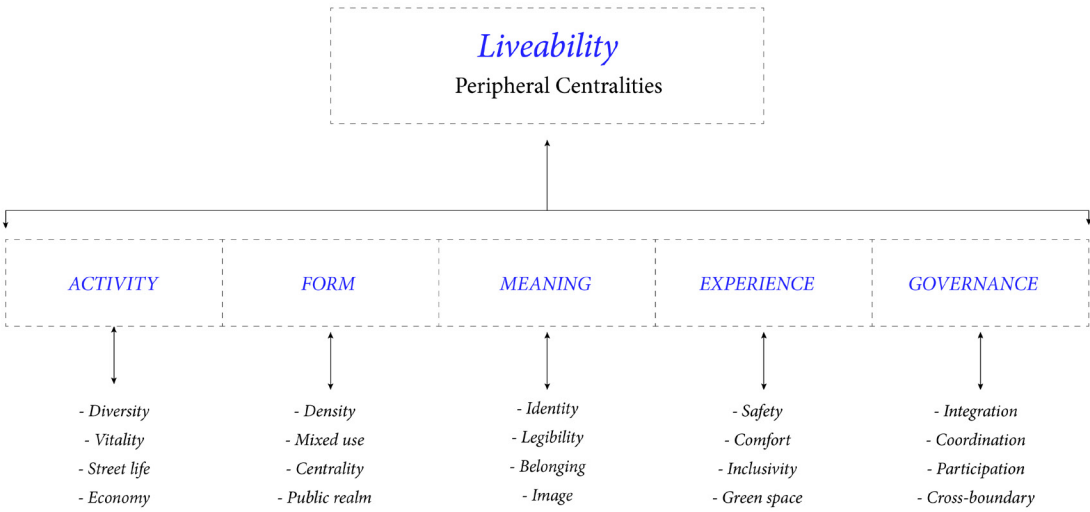


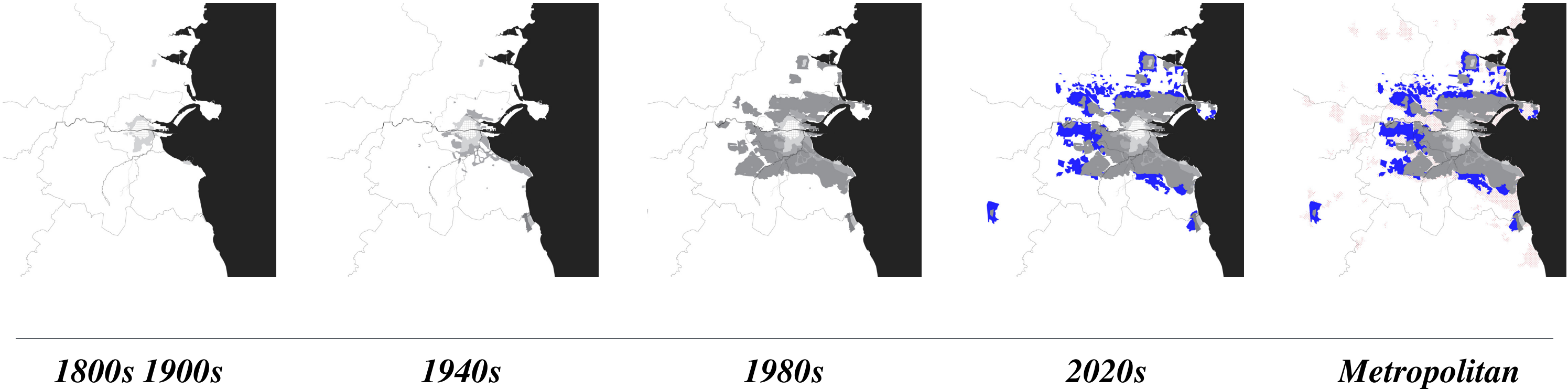
Figure 3. Policy directions to foster an urban sense of place (or place making), Source: Montgomery J., 1998

The components in the star of liveability are derived from the literature and theory review, and spatial analysis thus far. A large influence on the metrics comes from Montgomery's (1998) policy directions to foster an urban sense of place. These are outlined above in the adapted graphic, figure 26.

# Evolving into a Metropolitan Region

## Development of the Region Overtime

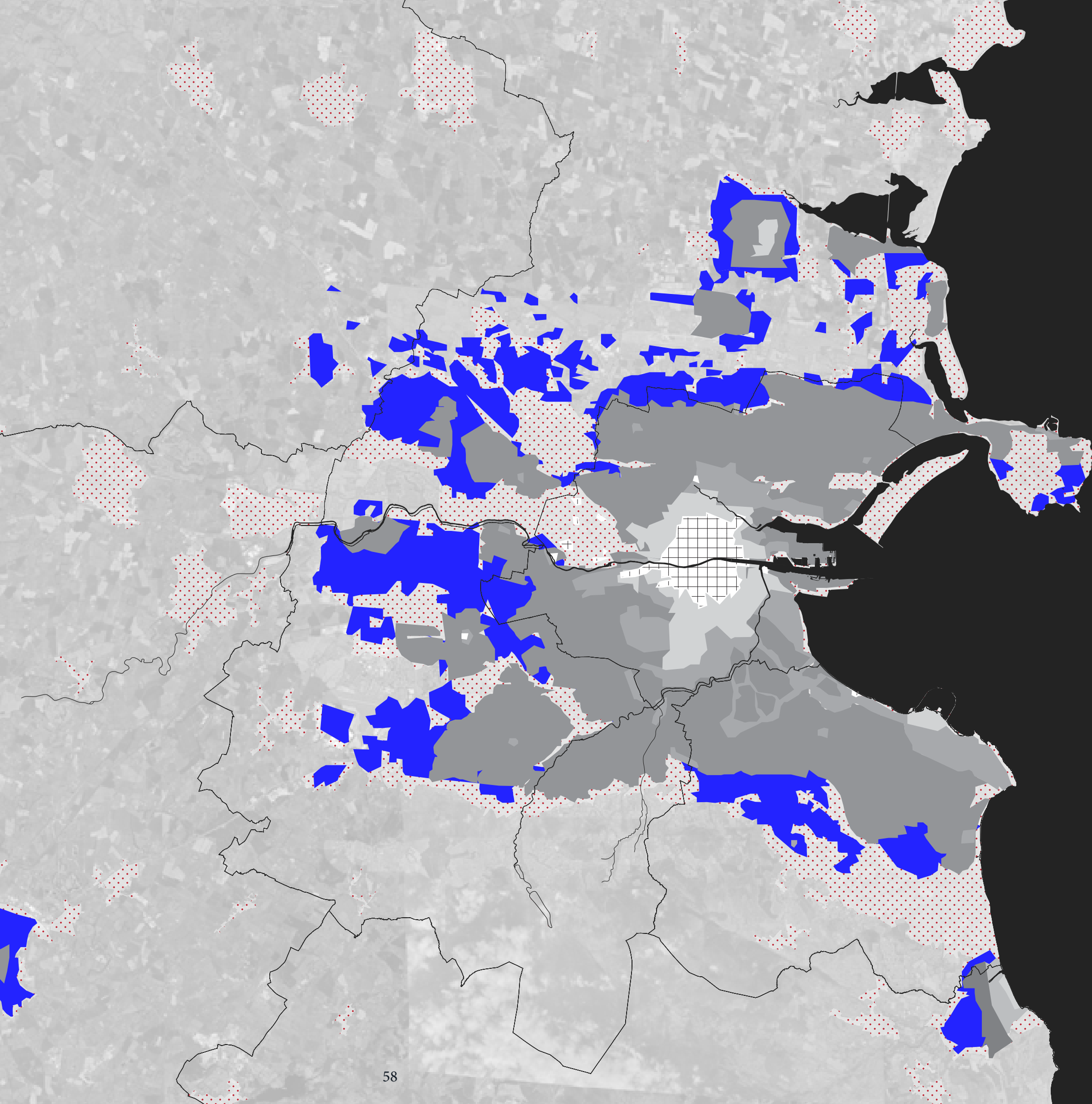
Fig 27. Development of Region,  
Source: Author



- Boundaries Municipalities
- Rivers & Water
- 1800s
- 1910s
- 1940s
- 1980s
- 2020s
- Built Up Area 2022

analysis



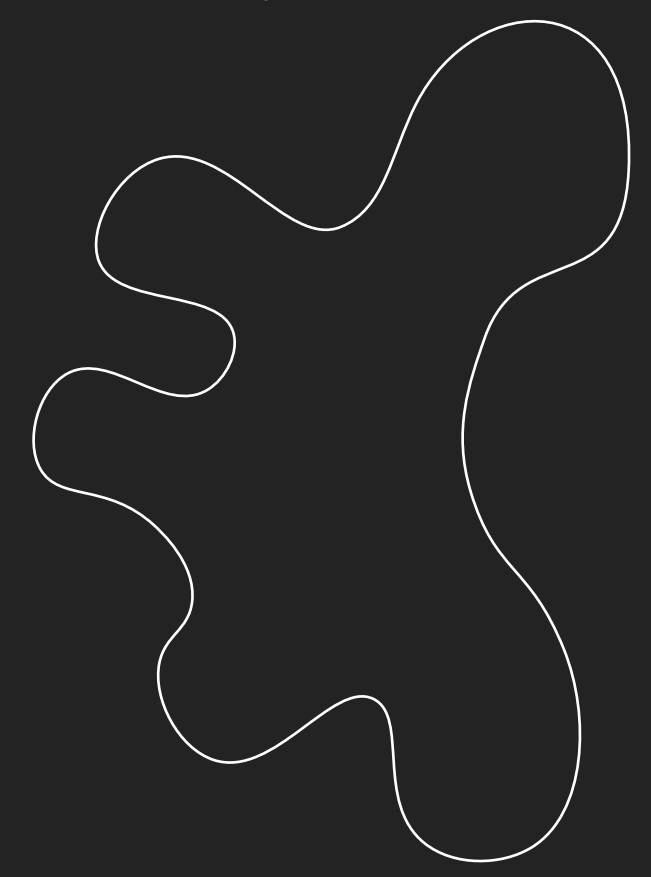


The City has continued a pattern of development in a radial and expansions via a finger like pattern due to the geography of the city rather than specific urban planning agendas. This has led to peripheral urban areas that are disconnected with each other and have a reliance on the mono-centric city where most urban activity happens. The city has developed in what can be called a hub and spoke model rather than a polycentric point to point model city.

These time-periods of forty years are chosen to represent here it provides the most visible change over the course of the development of the city. The spatio-temporal growth of the city which is clearly outlined here in this synthesis map, is characterised by the theory of oscillating phases of diffusion and coalescence (Dietzal, et al., 2005).

The City's Metropolitan area, once constrained to Dublin City Council, now spans over seven municipalities, these are: Fingal, South Dublin, Dún Laoghaire Rathdown, Kildare, Wicklow, and Meath Councils.

An abstraction of the city's general growth pattern is shown in the diagram below.

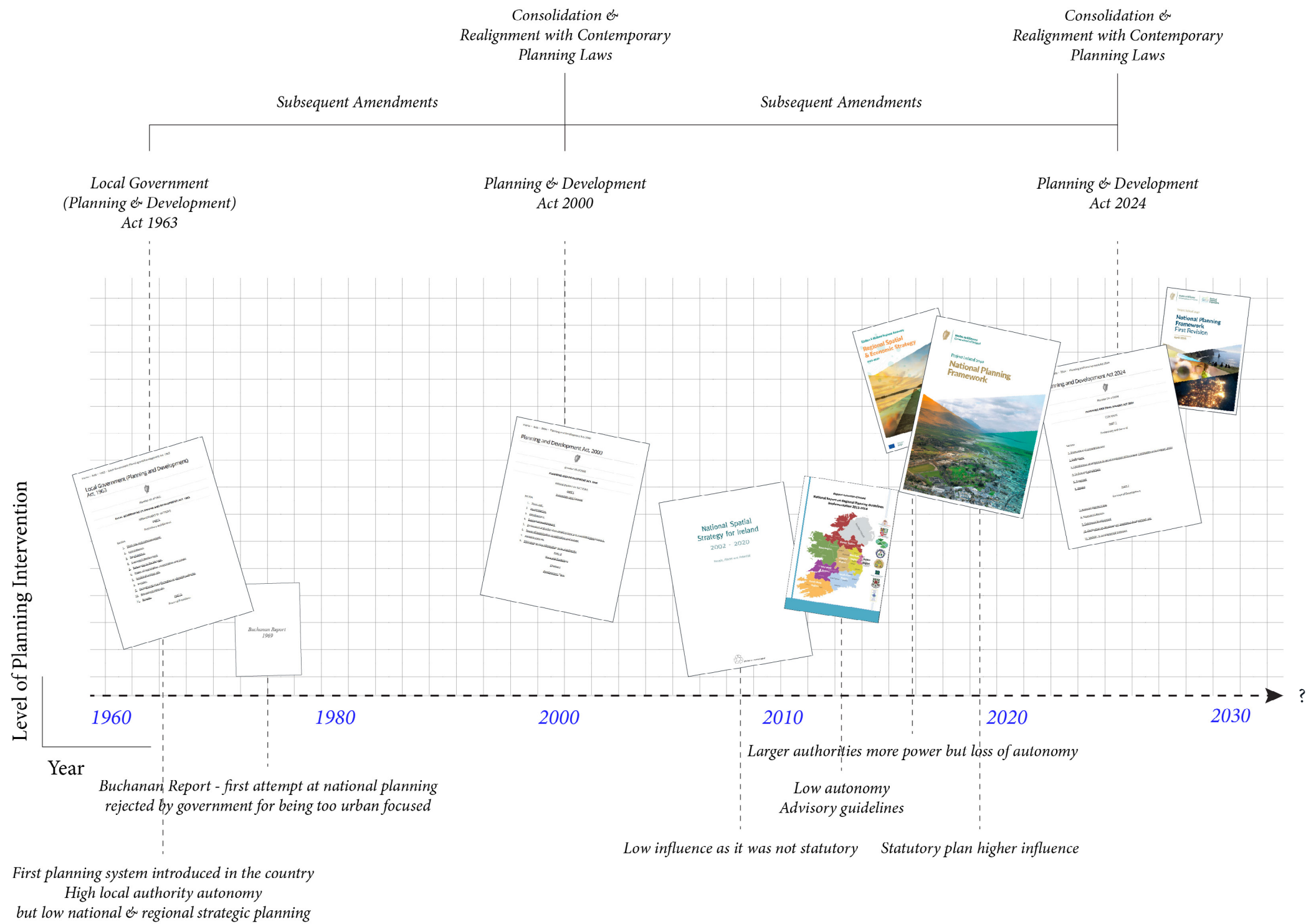


# Planning Peripheral Centralities

## Planning System Review

To understand why the periphery has come to be the way it is today, this part of the analysis outlines the Irish planning system overtime and the topical ongoing planning reform.

Fig 29, Irish Planning System Historical Developemnt  
Source: Author



The Irish State's planning system was predominantly adopted from the anglosphere planning via the introduction of the Local Government (Planning & Development) Act in 1963. This was modelled largely on the post war planning system of the U.K. A key element that differed of the Irish system was the land ownership rights, which being a post-colonial state were strengthened. For the first time, local authorities were required to create development plans which outlined a set of development principles and policies for the administrative area.

Shortly after, the government commissioned the Buchanan Report (1968), which was supposed to be the first spatial strategy plan for the country. This report highlighted that Dublin was growing too fast, and the rest of the country was suffering a braindrain. It was recommended concentrating investment into a few major "growth poles" (primarily Cork and Limerick-Shannon) to create genuine economic counterweights to the capital, similar to today's NPF strategy to reduce reliance on Dublin.

The government at the time, did not officially adopt this report for being too urban-focused. This was and still is today very politically contentious, the urban-rural divide.

By 2000, The Planning and Development Act 2000 consolidated Irish planning law, at a time when the country's population and economy and was growing significantly and rapidly after joining the European Union in 1973. This was the first time the Irish independent government experienced population growth. This is reflected in planning legislation with land ownership rights strengthened after independence in 1916.

In 2002, the government launched the National Spatial Strategy (NSS). While this had good intentions of balancing development in the country, the result was non-binding policies leading to local authorities satisfying local requirements for land use zoning, thus a long period with little spatial strategy being enforced. This led to significant amounts of rural ribbon and sprawl development.

The National Planning Framework (NPF), is the long-term, 20-year strategy for strategic planning and sustainable development for urban and rural areas until 2040, it contains key planing objectives for securing balanced regional development and a sustainable 'compact growth' approach to the form and pattern of future development. It was last updated in 2025 to reflect the update to the 2040 time period. The national document informs what type of development in general that should occur. It is up to the regional assemblies and at the lowest planning level, the local authorities to implement the policies on the ground. (Government of Ireland, 2025).



Despite legislative reform, the fundamental characteristics of the Irish planning system, particularly its discretionary nature and localised decision-making remained largely unchanged between 1963 and 2000, mixed with a non-binding national spatial framework for nearly another two decades instilled this rural mindset, while urban Ireland was allowed to sprawl in a non-strategic pattern with centralities in the in-between areas being left behind.

1984



2022



Fig 30. Remote sensing imagery, 1984 & 2022 respectively. (NASA, 2024)

*Where are peripheral centralities and what do they look like in the Metropolitan Region?*

analysis

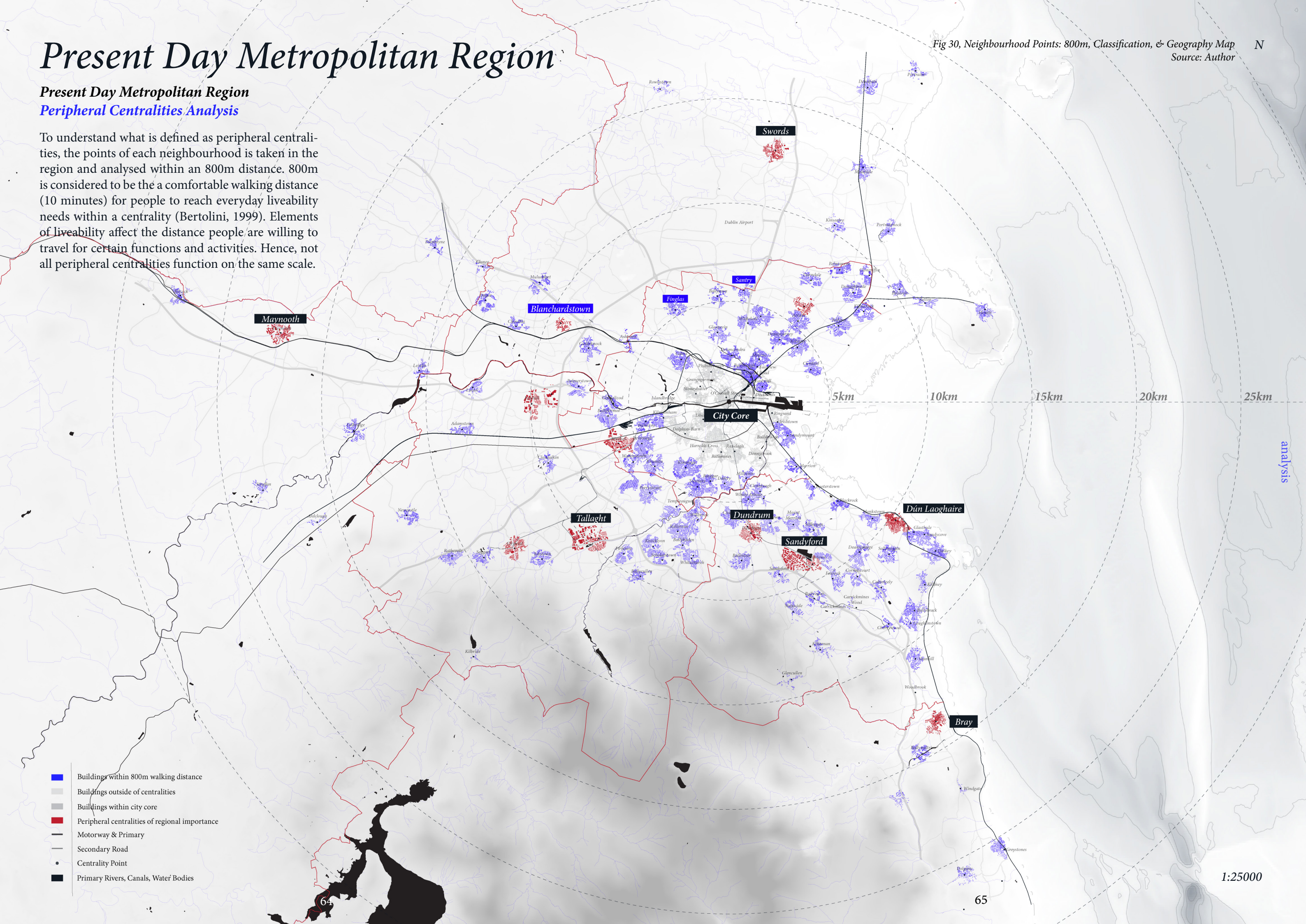


# Present Day Metropolitan Region

## Present Day Metropolitan Region Peripheral Centralities Analysis

To understand what is defined as peripheral centralities, the points of each neighbourhood is taken in the region and analysed within an 800m distance. 800m is considered to be the a comfortable walking distance (10 minutes) for people to reach everyday liveability needs within a centrality (Bertolini, 1999). Elements of liveability affect the distance people are willing to travel for certain functions and activities. Hence, not all peripheral centralities function on the same scale.

Fig 30, Neighbourhood Points: 800m, Classification, & Geography Map  
Source: Author



- Buildings within 800m walking distance
- Buildings outside of centralities
- Buildings within city core
- Peripheral centralities of regional importance
- Motorway & Primary
- Secondary Road
- Centrality Point
- Primary Rivers, Canals, Water Bodies



**Dublin Metropolitan Region**  
**Regional Peripheral Centralities Analysis**

Peripheral centralities operate at varying scales throughout the region, here it is outlined those that are on the regional scale. The remaining centralities as shown previously can be generally understood as operating at local, neighbourhood and district levels.

The metropolitan region has a number of key peripheral centralities that operate on a regional scale, these are shown in the map (left) and the satellite images above. They have strategic functions such as hospitals, universities, commercial, industries that are core nodes of activity in the periphery.

They vary in scale and typology with some being contained as urban centres of mixed use or arising from urban villages and towns (e.g. Maynooth, Swords) while the others are mono-use suburban centres (e.g. Liffey Valley, Sandyford). Notably, the north side of the city lacks a number of cores at this scale in comparison to the south.

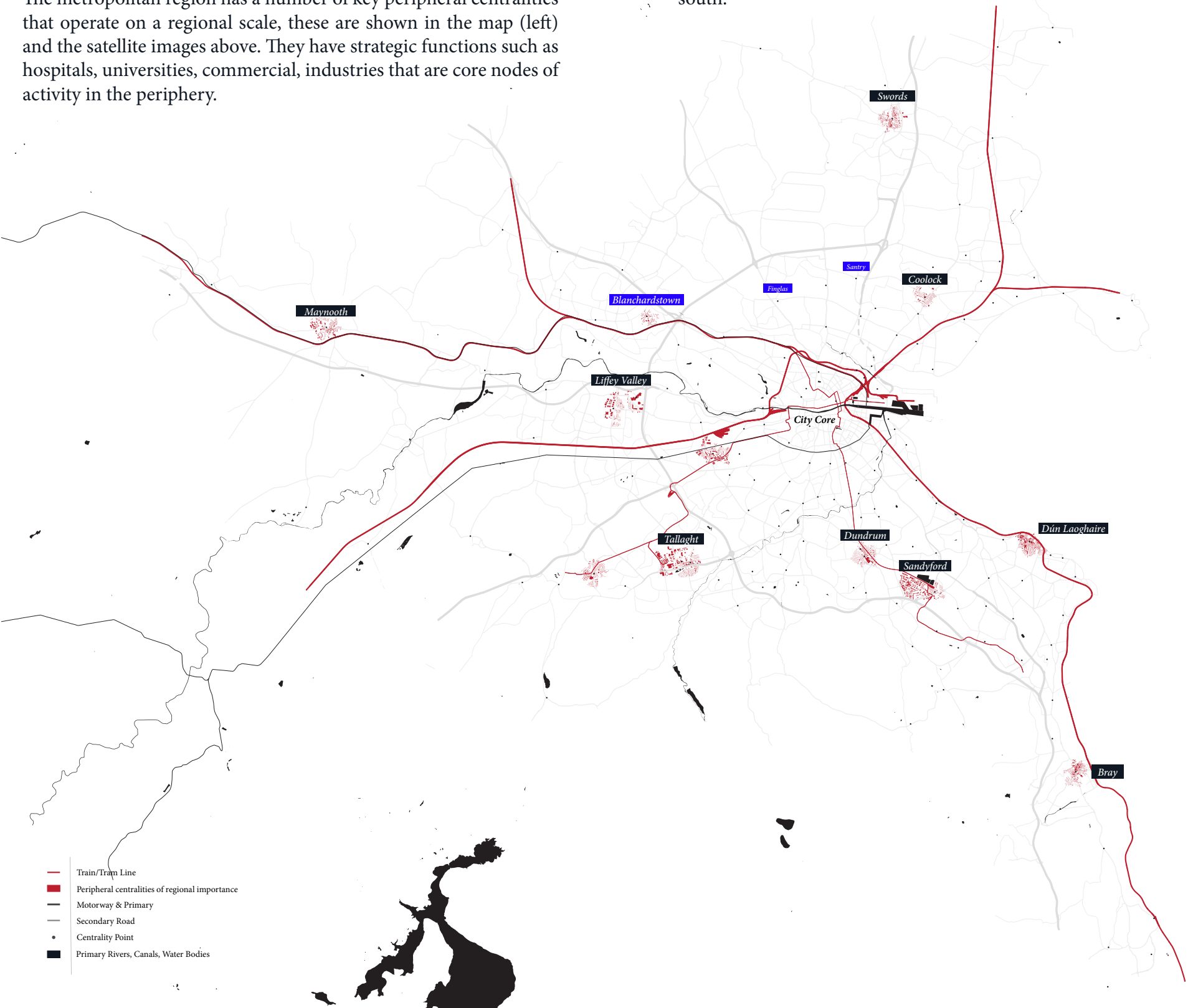
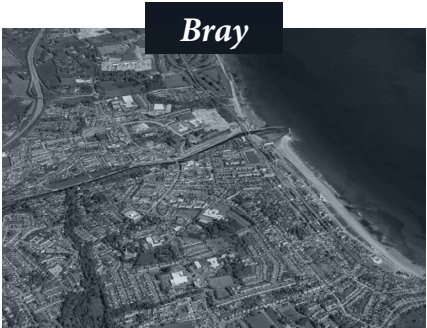
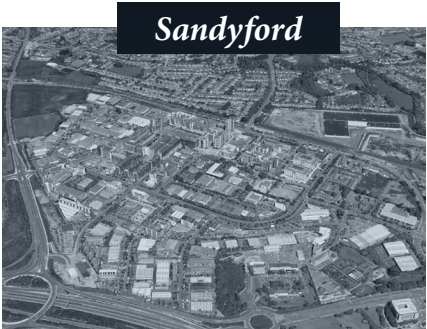
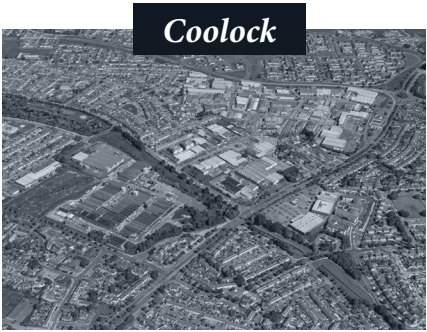
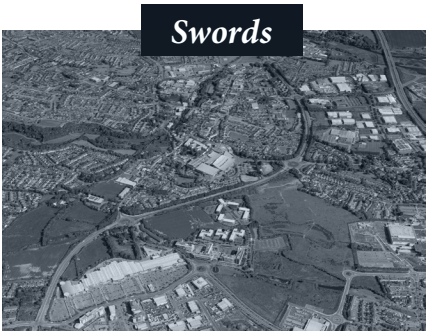
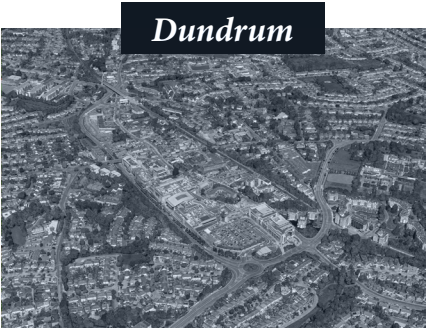
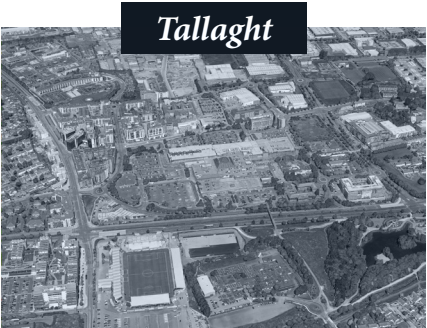
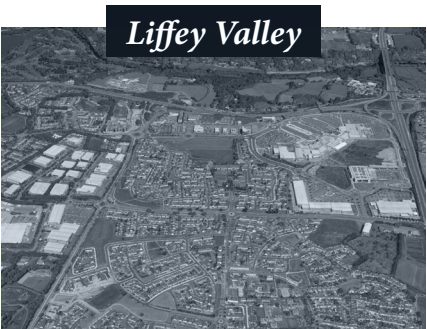
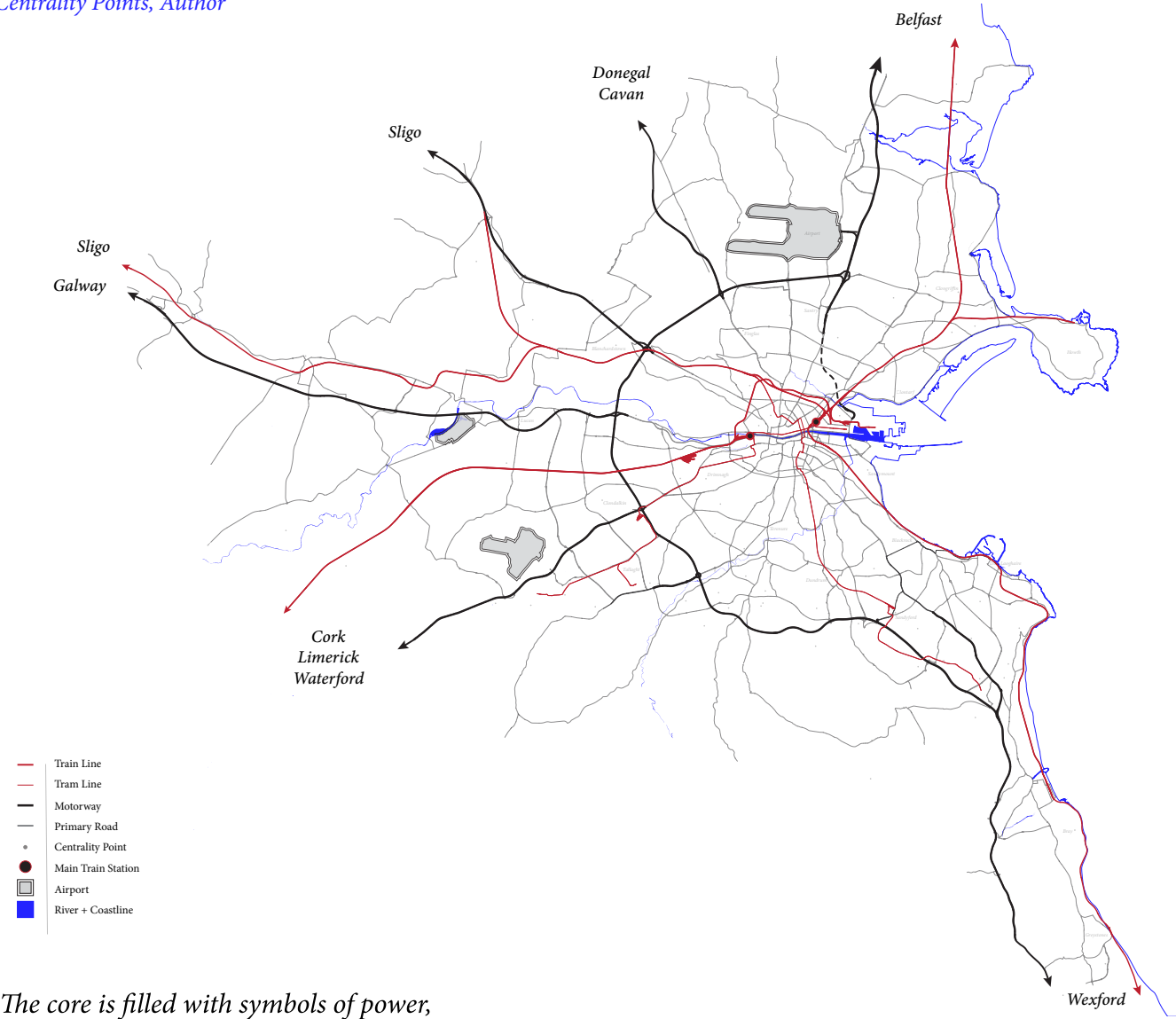




Fig 32. Metropolitan Transport Network with Centrality Points, Author



The core is filled with symbols of power, nationalism, capitalism, and mobility

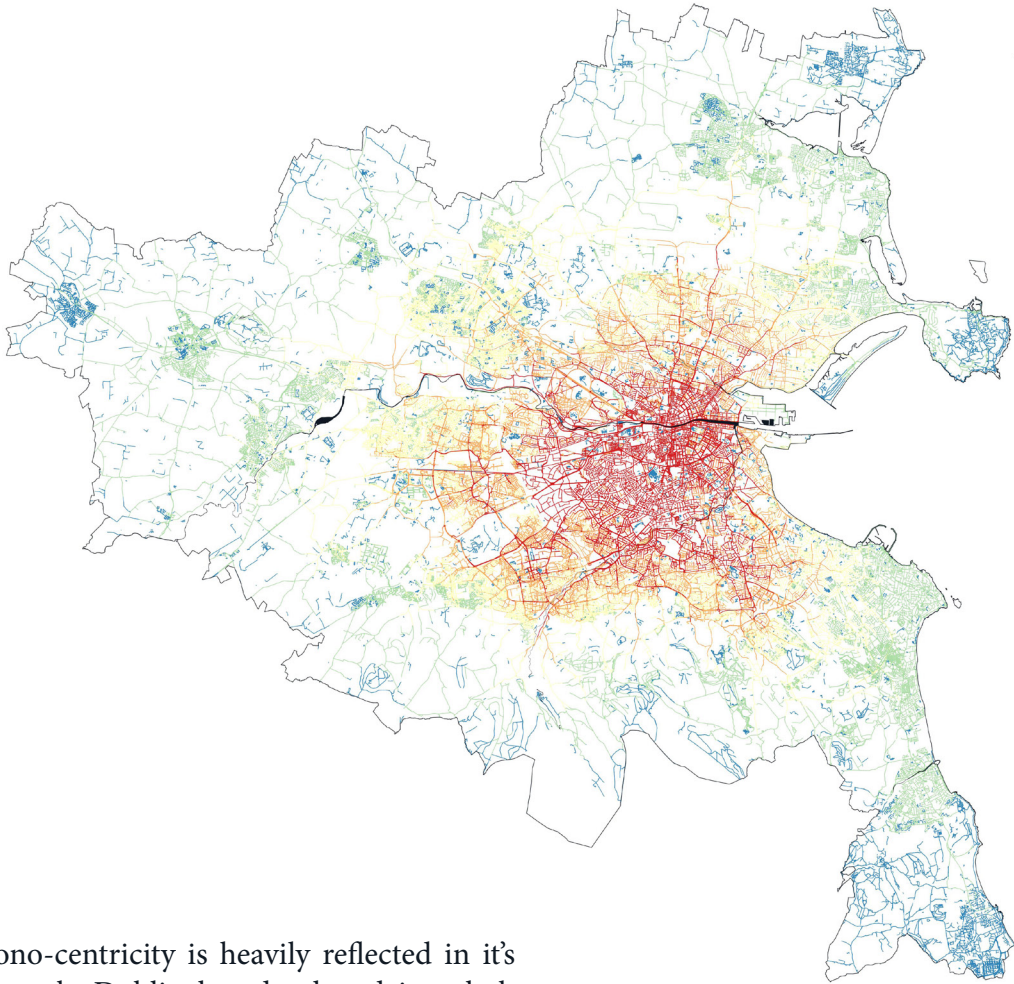


Fig 2X. Bottom - Historic Photo, O'Connell Street c.1970, Source: Mondadori, 1966.

Dublin Metropolitan Region  
Transport Network & Centralities

analysis

Fig 33. Space Syntax Centrality Analysis - 10KM Non-Motorised Network, Source: Author.



The city's mono-centricity is heavily reflected in its transport network. Dublin has developed in a hub and spoke model and via diffusion and coalescence but with little strategic thought on how the peripheral centralities should develop. The orbital motorway that surrounding the periphery of the city was opened fully in 1990. The port tunnel (dashed line motorway above) was opened in 2007 (TII, n.d.).

For a city this size the public transport network is lacking while the priority has evidently been given to growing the road network, the city heavily relies on buses for public transport.

The role of the core city (predominantly pictured red above) is ever changing and consequently the peripheral centralities will evolve with this. While the focus has historically been on the city's core, how can it be ensured that the city's peripheral centralities are strengthened to provide a function in the metropolitan area. The question is also posed, how can a standard be set to evaluate and develop these areas in the future for a equal standard of liveability.



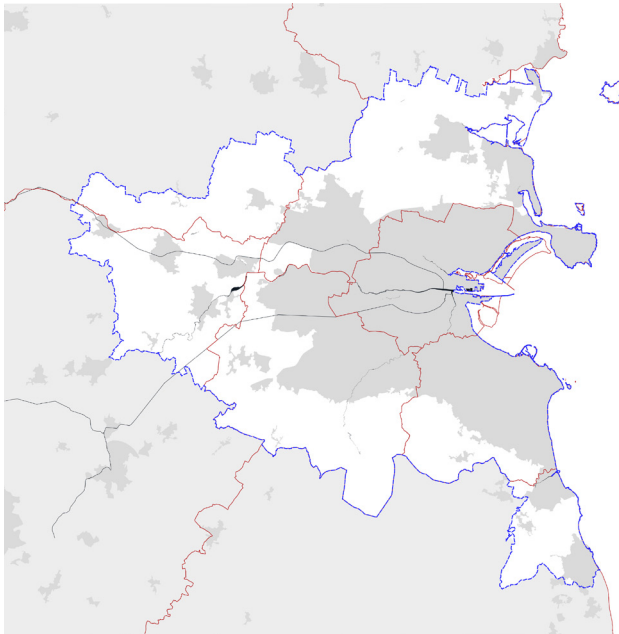
Fig 34. Peripheral Centralities & Central Core linked via a traditional Hub & Spoke Model, Author



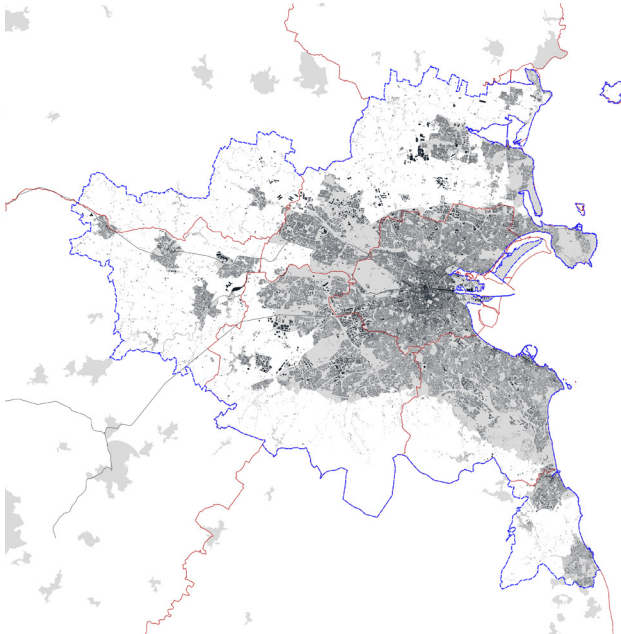
Fig 35. Built Up Area & Buildings with Administrative Boundaries,  
Source: Author.

**Dublin Metropolitan Region**  
*Land Use Review*

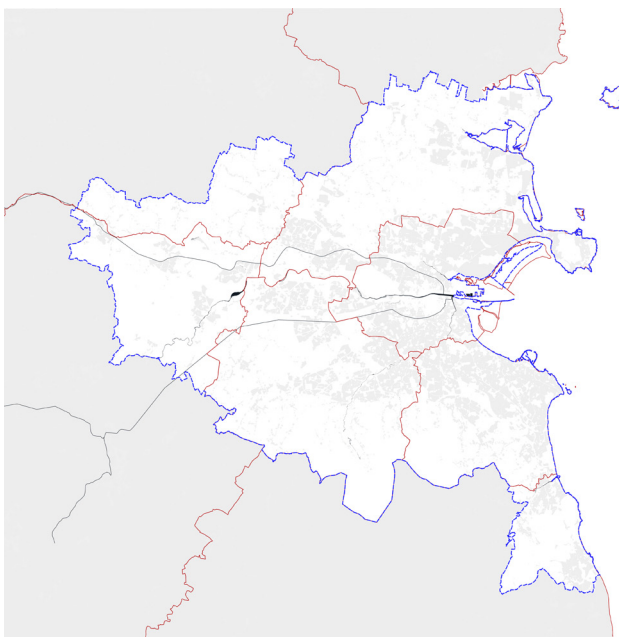
Where are the current built up areas within the metropolitan region?



Where are the buildings and what kind of building footprints exist?



Where do people live?



What does the outer periphery look like?

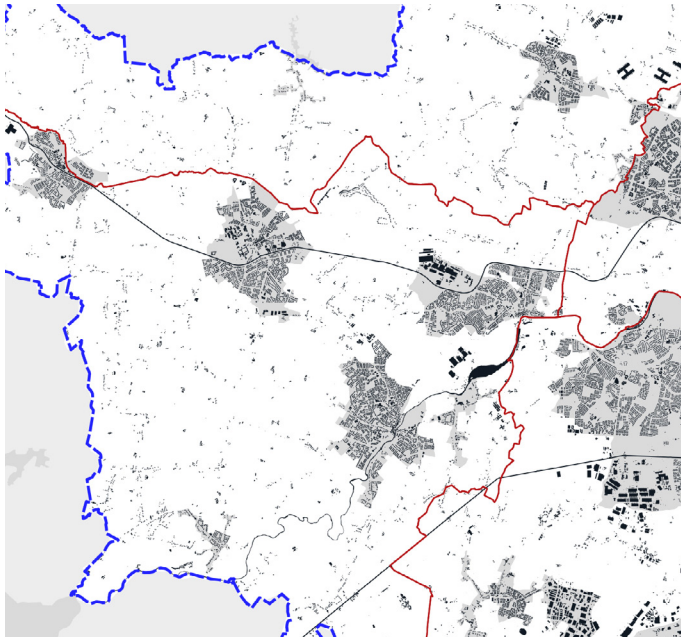
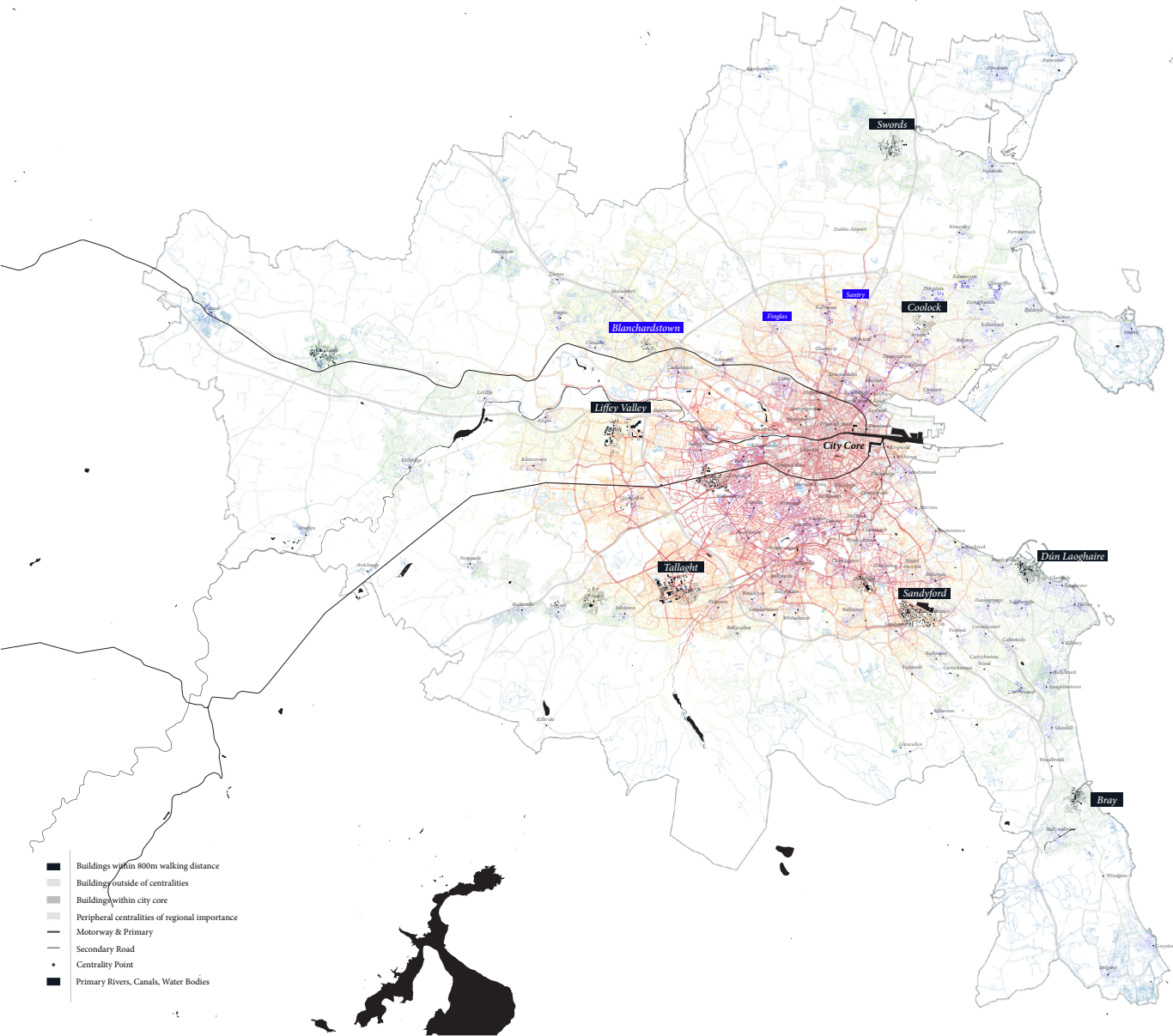


Fig 36. NAIN Road Network Map with Centralities  
Source: Author.

**Dublin Metropolitan Region**  
*Morphological Peripheral Centrality Analysis*

When the NAIN is overlayed with the centralities it becomes apparent the streets in the network that are the most accessible destination to congregate or find a service i.e. the highest level of activity.



Naturally, as expected the city core is the most accessible place. The remaining accessible places in the periphery are places that are highly suited for higher density mixed use, retail, and civic uses. However, above it is shown in the peri-urban areas the core radial and orbital streets which are not limited to the city core and inner city.

This allows the narrowing down of key peripheral centralities to determine their functions and potentials for transformation. When this is correlated with land uses, it is found that there are areas that are underutilised in terms of their level of accessibility. There are more centralities of regional importance on the southside of the city which can be correlated to the level of accessibility in the network.



Regional Peripheral Centralities Analysis

The regional centralities were primarily a result of the process of diffusion and coalescence as majority started as a small village core at one point, and evolved into large regionally important urban areas as the city has grown. Some of these areas retain their town or urban village like feel while others have had strategic master-planned interventions to vastly increase the scale and strategic function of the area, but typically the original village and newer developed areas coexist side by side.

For example Tallaght was planned in 1960s. While it is shown on the metropolitan scale network that the area successfully channels destination movement to Tallaght's core, the internal local street network layout was originally designed too coarsely, potentially impacting liveability metrics in the urban area.

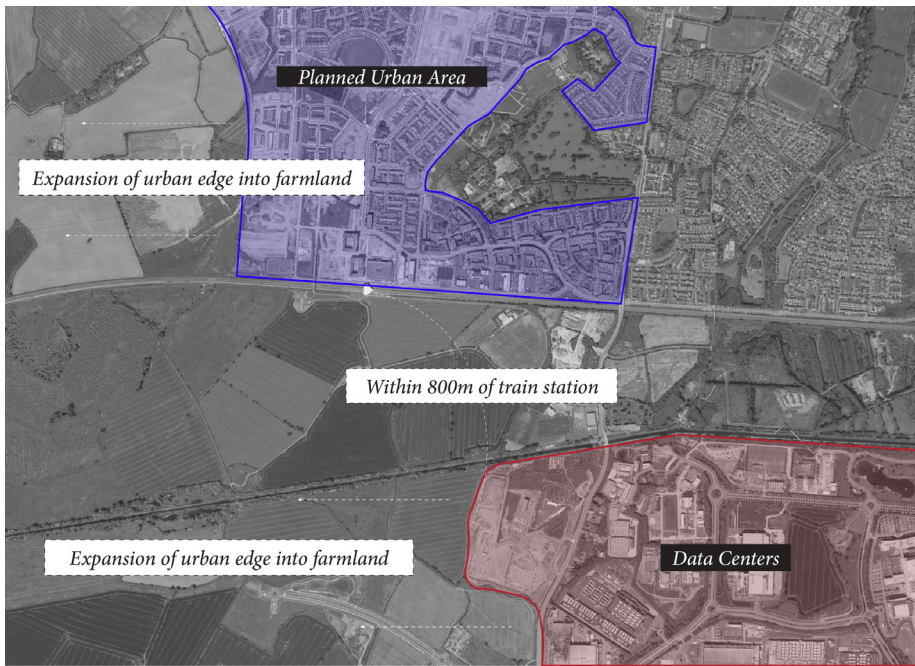


Fig 37 Urban Edge Dublin showing lack of strategic land use planning (Author & Apple Maps, 2026)

Simultaneously, the city's local authorities have allowed expansion of the city for residential development on the edges of the city into the farmland than surrounds the city. This can also be related to lack of co-ordination and planning between private land owner, developers, and local authorities. Local authorities and the national government have chosen less complex greenfield sites on the edges of the city to be redeveloped (this is explored further in the following sections as part of the green blue analysis) while more central existing locations exists prime for intensification and to address the liveability metrics being equally spread throughout the region's centralities which are often assumed or taken for granted the city core.

Planning the Metropolitan Region

A study showing scenario-based modelling of urban growth in Dublin demonstrates how different planning approaches could lead to varying spatial patterns, ranging from dispersed sprawl to more consolidated and structured development. Scenario one (S1 on figure 2X,to the right) is characterised by highly fragmented, diffusive growth, with new development occurring in dispersed and isolated patches, reinforcing low-density and car-dependent urban forms as the city has developed typically.

In contrast, alternative scenarios, such as consolidation, managed dispersal, and corridor-based expansion, promote more aggregated and coordinated urban growth, concentrating development within existing centres or along strategic growth corridors.

The scenarios support the argument to reducing fragmentation and increase spatial cohesion by encouraging consolidated urban growth.

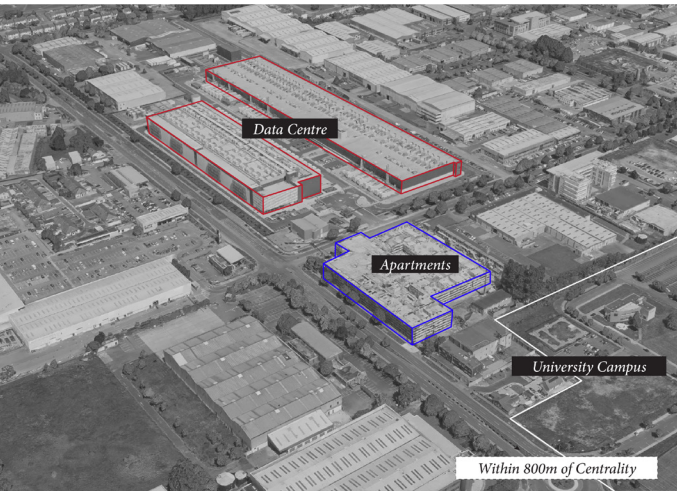
In relation to peripheral centralities, they will play a key role in potential structuring elements within regional growth patterns: under weak planning conditions, they risk remaining isolated, mono-functional nodes embedded in sprawl, whereas under more strategic scenarios, they can evolve into integrated centres that anchor development under a liveability framework, intensify activity, and contribute to a more coherent urban structure.

In conclusion, the peripheral centralities are not fixed outcomes, but are shaped by the broader metropolitan spatial logic of growth scenarios, determining whether they function as fragmented suburban nodes or as consolidated, urban places which is heavily reliant on spatial planning strategies or a lack there of.

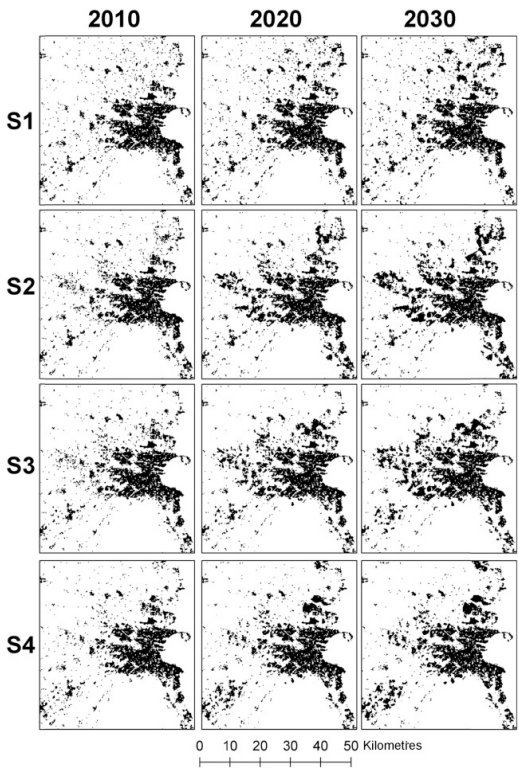
Fig 39. (right) Extract from fig. 4. Simulated urban masks of Dublin for the four scenarios. S1 = "Continued Trends", S2 = "Finger Expansion", S3 = "Consolidation of Key Towns and Metropolitan Extent", S4 = "Managed Dispersal".

Source: Van De Voorde C, , et. al., (2016) Projecting alternative urban growth patterns: the development and application of a remote sensing assisted calibration framework for the greater Dublin area.

Fig 38. Conflicting land use within peripheral centrality (Author & Apple Maps, 2026)



In recent years, planning policy has allowed land uses such as data centres to be built within 800m of the centrality of Tallaght, while residential areas sprawl into farmland, this is reviewed further in the following pages. This issue is potentially due to a lack of centrality plan for the area and co-ordinated metropolitan level planning across local authorities to strategically plan for these uses and protect urban centralities for places of activity and liveability. While local authority land use zoning exists within the development plans, they lack coordination cross boundary





Regional Peripheral Centralities Analysis

Blanchardstown

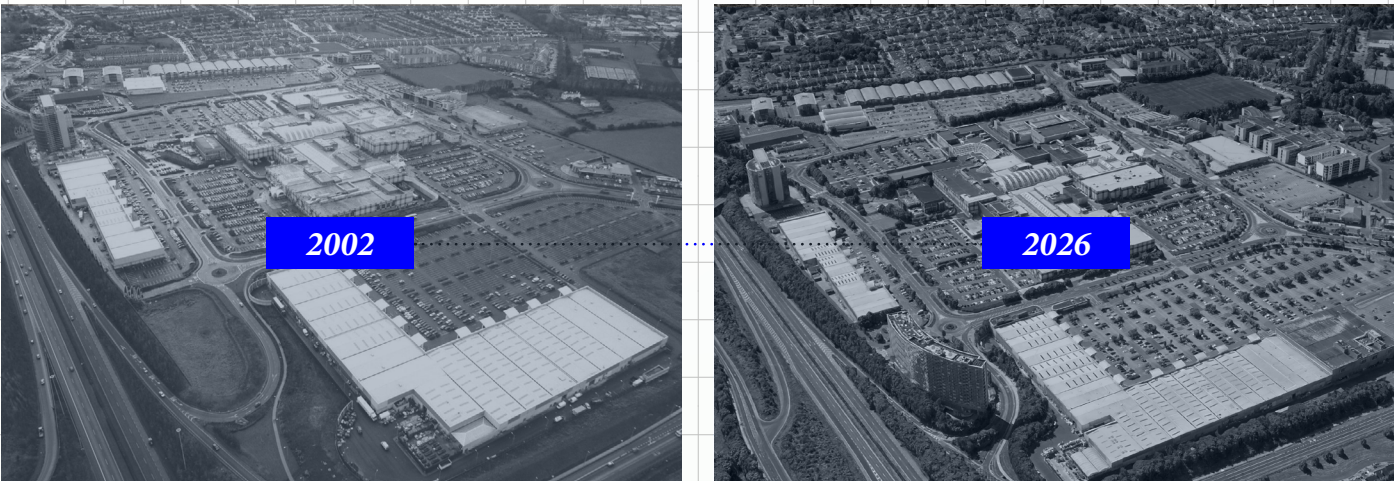


Fig 40. Little development has occurred in the span of over 20 years relative to the urban edge expansion that has simultaneously developed (Author & Apple Maps, 2026)

The expansion of the periphery appears to be the result of imbalances between demand of land and infrastructure and supply orientated by profit making for example commercial and light industrial lands at Blanchardstown, Santry, Liffey Valley, and Coolock, which have remained largely under developed for 20 plus years, rather than strategic urban planning for the peripheral centralities and the creation of sustained long term liveable places. This had led to spatial conditions that mix central places with retail, commercial, industrial, civic, while missing the components of what makes a centrality in terms of liveability.

How has this affected other elements of the region that are crucial for liveability?

Metropolitan Scale Land Uses



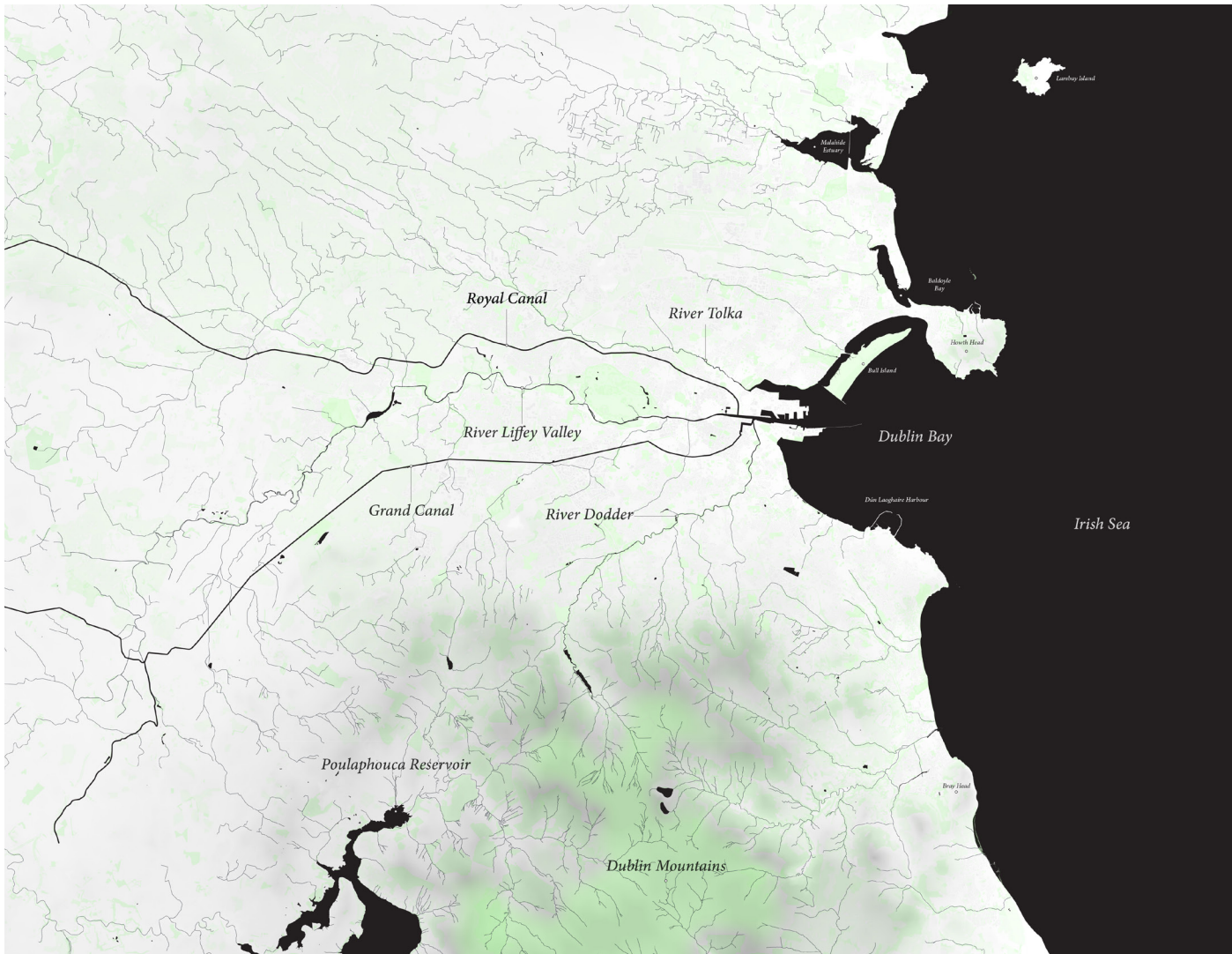
Fig 40. Land Use Maps Metropolitan Region  
Source: Author.



# Dublin Metropolitan Region

## Green & Blue Analysis

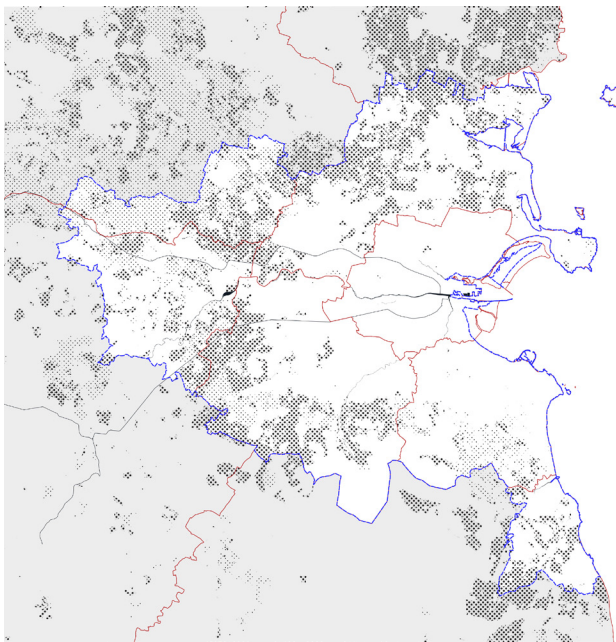
To further understand the development of these centralities, it is important to gain an understanding of the geography and physical constraints of the region such as the rivers, canals, elevation, green, parks, beaches, sea, bays, islands, forest, grass, meadow, scrub, heath, and farmland (OSM) aspects of the region's environment.



The geography of the city reveals a layer for the logic of the city's development, with it naturally being constrained to the east by the Irish Sea, the south the Dublin and Wicklow Mountains, and by the main rivers that flow through the region, these are the river Liffey that crosses through the immediate centre of the city, while the periphery sees the main rivers of Dodder and Tolka. There are also canals that flow though the edges of the city core and the periphery.

From these analytical layers it is further understood, the historic development of the city, the infrastructural, and environmental conditions that explain the patterns of development and future development that can occur. It is understood the city is spatially constrained to the east, (by the sea) south (by the mountains), and north (by the airport), in addition there are non-visible boundaries of the local authorities and planning policies that have led to differing spatial outcomes across the region.

Fig 41. Green & Blue map regional analysis, Author



In the first map on the above, it is revealed how there is a ring of a productive agricultural landscape that wraps around the city while being within the metropolitan area. Where there are major gaps in this productive ring this can be understood to be filled by the natural elements such as the Dublin Mountains to the south, forested areas, river valleys, and nature reserves shown on figure 42 to the left.



Fig 42 Land Use Maps Metropolitan Region Agriculture  
Source: Author.

When the agricultural areas is overlaid with the built up urban area and buildings, development has been allowed to take place outside of the built up urban areas in the form of one off houses forming part of the metropolitan area's discontinuous urban fabric, shown here (figure x).

This is a result of the lack of consistent strategic metropolitan planning across local authority borders has led to fragmented urban expansion and lack of vision to protect a cohesive productive and natural landscape in the long term. This has resulted in this patchwork of farmland and urban fabric that is apparent today. This leads to challenges in urban planning with sprawling ribbon development and farmland in-between urban areas.



The region has a number of nature reserves which are primarily located outside of the built up urban area, with the exception of the Dublin Bay UNESCO Biosphere. The proportion of space given to forested areas is limited to the Dublin Mountains and Liffey Valley, beyond these the city has limited forested areas. A study found that the percentage of tree canopy cover in Dublin City Council is 10%, which is lower than average in comparison to other European cities.

This is also linked to spatial social equity in the city with more affluent neighbourhoods being known as the leafy suburbs while the remaining neighbourhoods in the city are deprived of sufficient green space that works for both the humans and the environment.

Please also refer to the deprivation index by Pobal on pages 28 and 29 which show clearly the divide in the city of affluent and areas of deprivation. This overlaid with the tree canopy cover, the correlation is made between areas in city of affluent having more tree cover than areas that are considered deprived. This is most stark in neighbouring municipalities of Dún Laoghaire Rathdown and South Dublin County councils.

The connection is also made how the influence of land ownership affects this, Dún Laoghaire Rathdown, a local authority with the lowest proportion of public land, has the highest level of urban tree canopy cover in the city (Source). This highlights the role that municipalities must provide more incentives and have more effective policies for greening the city within public land ownership.

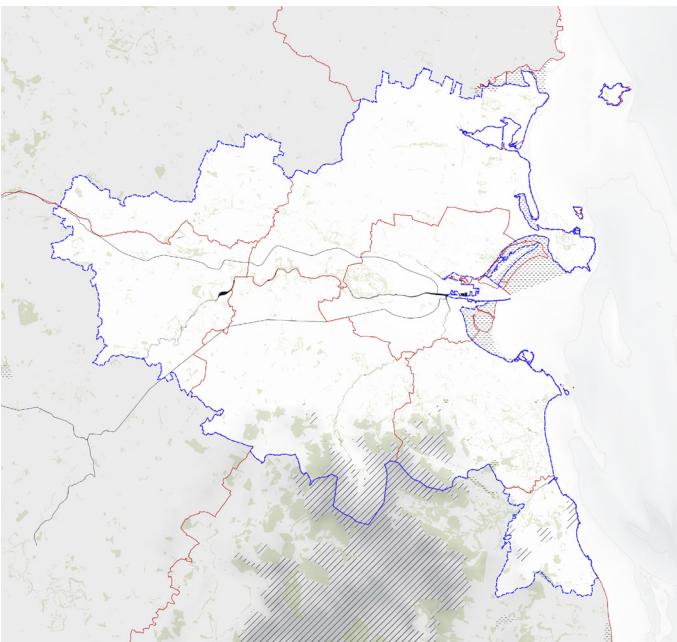


Fig 43, Land Use Maps Metropolitan Region Forest & Nature Reserves  
Source: Author.

analysis

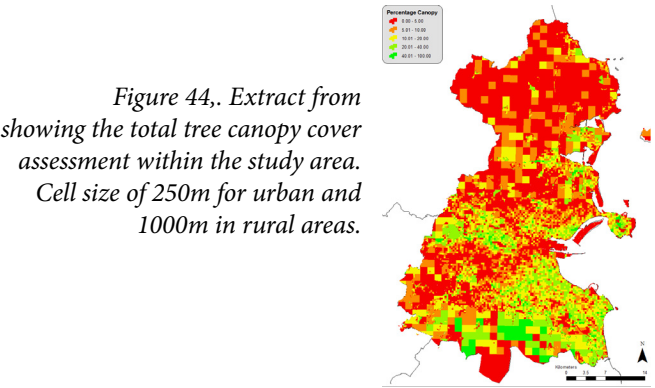
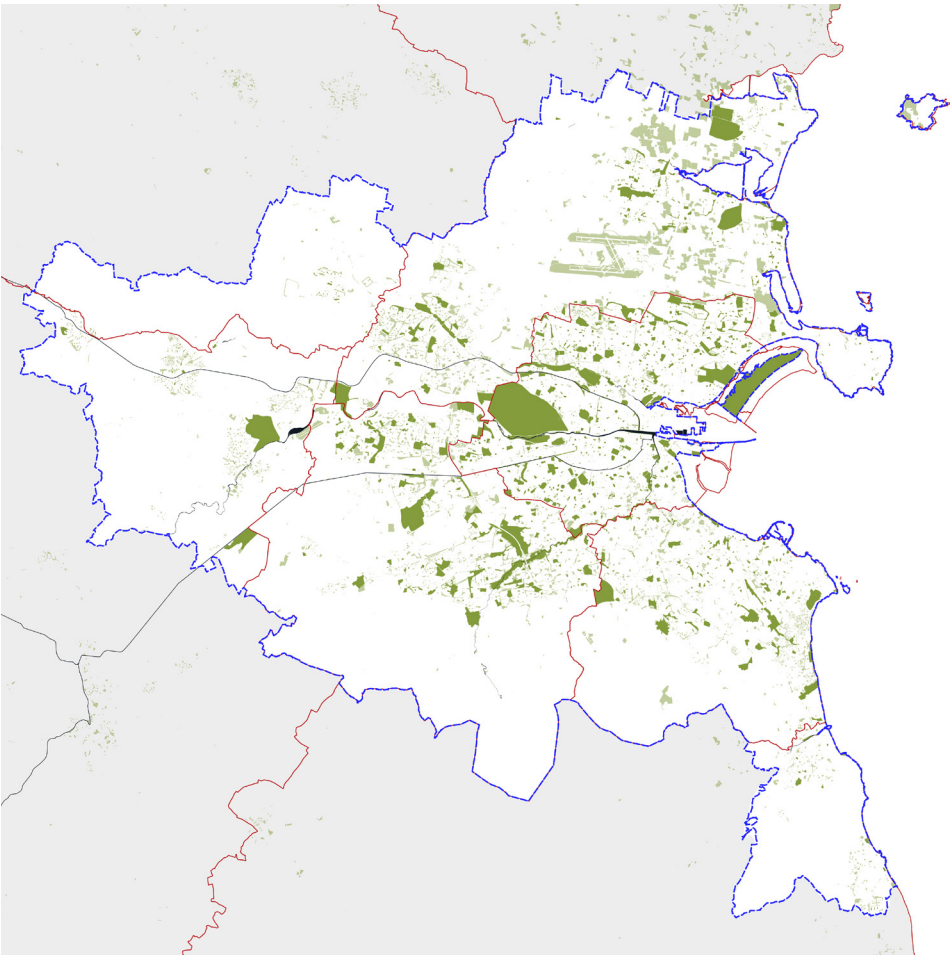


Figure 44,. Extract from showing the total tree canopy cover assessment within the study area.  
Cell size of 250m for urban and 1000m in rural areas.

Fig 44, Land Use Maps Metropolitan Region Green Spaces, Parks, Beaches, Grass.  
Source: Author.



analysis

Upon initial review of the city's green spaces it could be assumed that the city is quite green, however, looking into this further reveals that the ecological value of these areas is low, with majority of this green space being grass for human recreational use. This is particularly prevalent in the peripheral areas where, in places, beyond the key large flagship urban parks (Dublin City Council, 2022) e.g. Phoenix Park, St. Annes, green space appears vast but is not necessarily of high ecological value. Green spaces are an important component of urban areas for liveability for recreation and quality of life (Jabbar et al., 2021). One study finds that green spaces within a 300 metre radius are essential for people to keep them physically and mentally healthy (Houlden et al., 2019).

In addition, equally related are low noise and air pollution. The current state of these spaces in the city does not significantly contribute to reducing these factors. Acoustic waves have been found to travel more easily across flat green grassy spaces (Nunho dos Reis et al., 2022), with non-linear, more complex and dense green spaces having higher noise reduction (Feng et al., 2024), correlating to the ecological value of the space, and thus also liveability. The functional tree canopy cover is heavily fragmented and insufficient in many built-up neighbourhoods to allow for noise reduction or PM 2.5 filtering (Clavin et al., 2021).

# Peripheral Centralities

*Present Day District & Local Centralities*

*Peripheral Centralities Analysis*

This part of the chapter reviews the local scale peripheral centralities, within the context of the wider metropolitan scale and regional centralities previously analysed.

*What do the peripheral centralities comprise of on the local and district scales?*

analysis



# Peripheral Centralities in Detail

## Constructing the Metropolitan Region's Typologies Typologies of the Metro Region

The map below outlines the coagulation of urbanity for the metropolitan region.

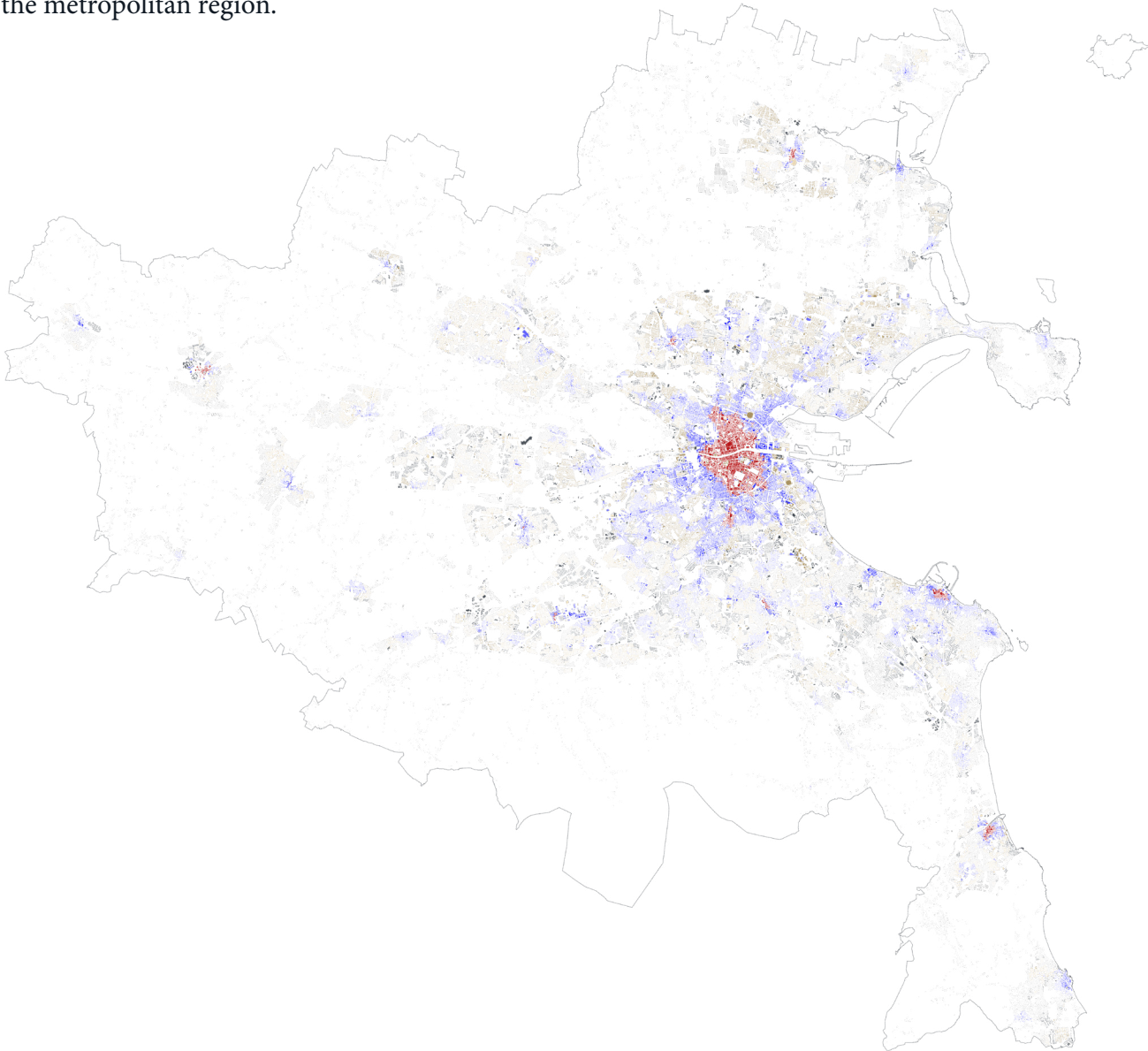


Fig 45, Typology Clusters (10) of Centrality Degrees. Source: Author

A construction of the city's typologies is essential to understand in relation to the quantitative criteria where and what the functions of peripheral centralities are.

The choice to apply to the data on the building layer provides richer data set for analysis of the cluster types. The elements used in this analysis to identify cluster typologies for the degree of centrality are outlined in the coming sections.

K-medians clustering analysis was executed in the attribute space ( $k = 10$ ). By omitting spatial contiguity constraints, the model groups geographically distant features into the same urban typology based on statistical similarity. K-medians objective function ensures that the resulting profiles represent true median characteristics, preventing extreme spatial outliers from distorting the typologies.

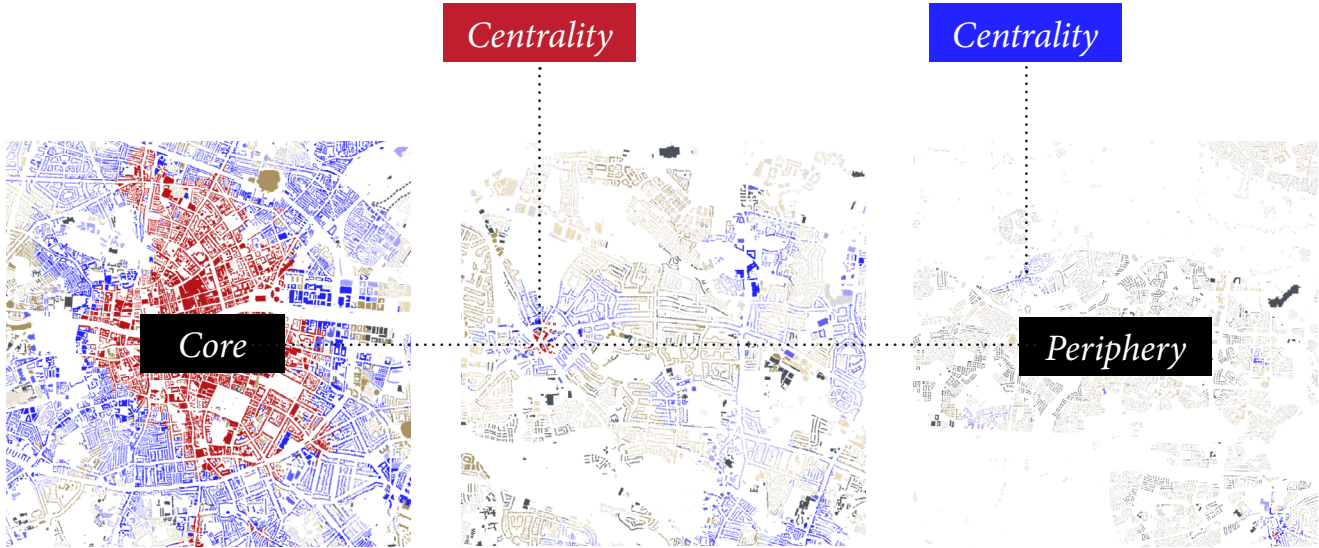


Fig 46. Defining the Peripheral Centralities, Source Author.

### The Metropolitan Core: High Centrality & Functional Cohesion:

The centre of the metropolitan region is characterised by the highest concentration of multi-scalar centrality. Spatially, this zone shows a dense, continuous urban fabric with a high degree of functional mixed use. Components such as retail areas, transport infrastructure, employment centres, and civic services are co-located within a more dense compact network. In this core, physical proximity and high network connectivity ensure that diverse urban functions are integrated within the immediate built environment. The core here operates beyond the metropolitan region scale.

### The Intermediate Ring: Functional Deconcentration & Typological Variation:

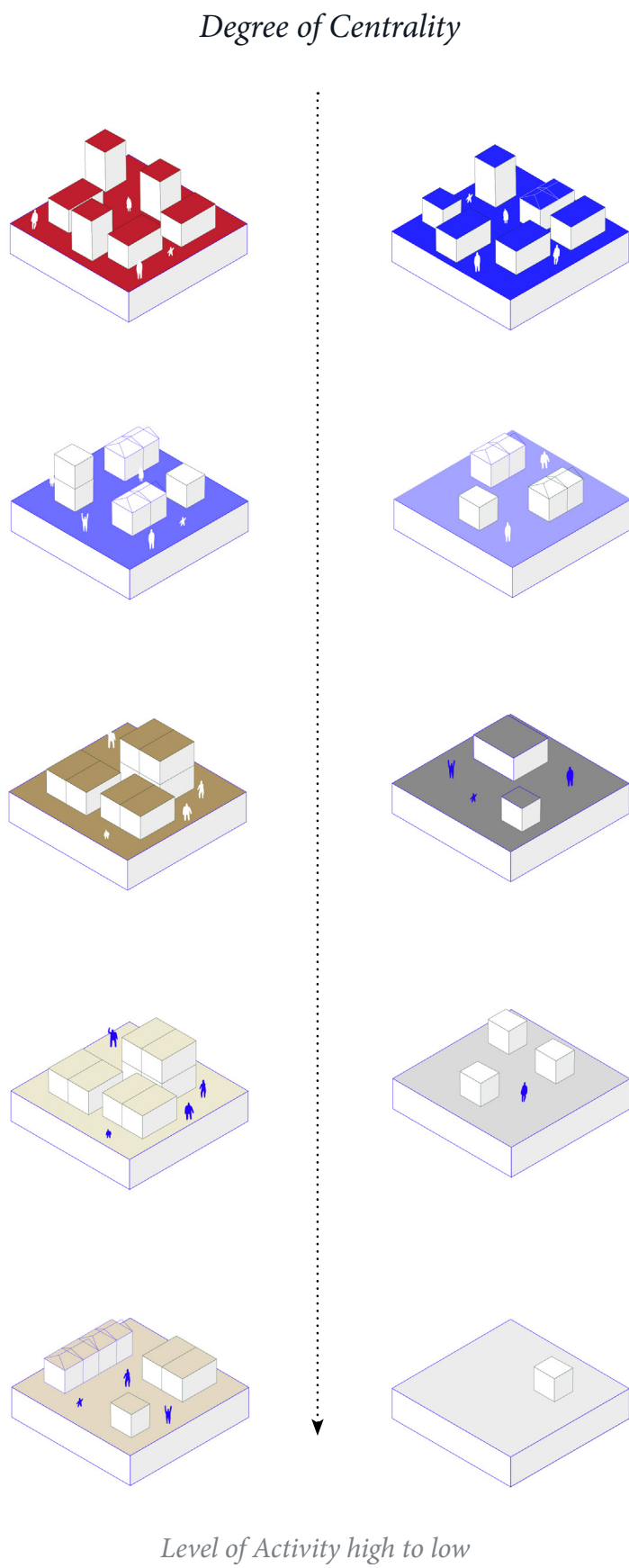
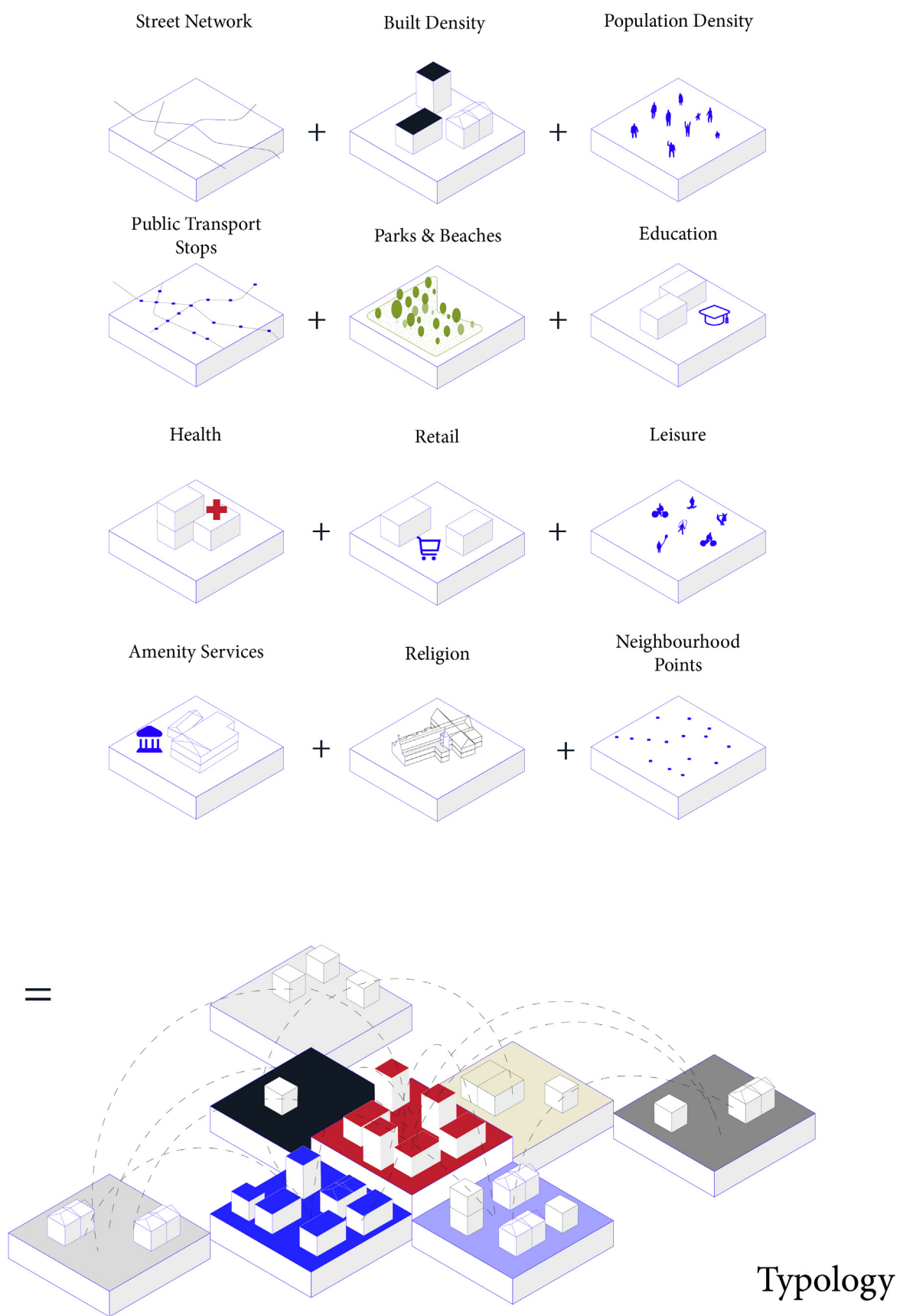
Moving outward from the metropolitan centre, the continuous urban fabric begins to deconcentrate into distinct functional typologies. Here it is found, that the intermediate tier, the spatial qualities varies between two main patterns:

- \* Organic Local Centers: Historic village cores and traditional main streets that have been absorbed by suburban expansion (diffusion and coalescence) but retain their distinct local centrality, walkable retail, and localised community identity.
- \* 'Planned' Functional Centres: Modern, larger-scale institutional and commercial developments, such as larger hospitals or shopping centres, which provide high amenity access but are spatially more geared towards regional transport rather than a highly integrated, fine-grained urban fabric.

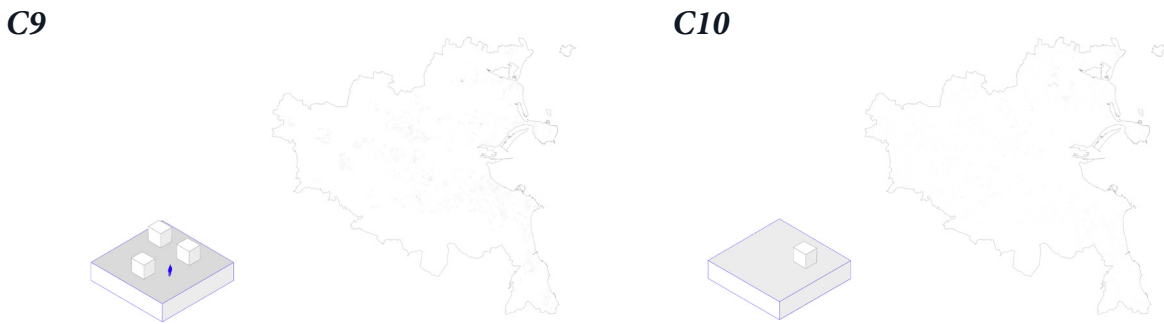
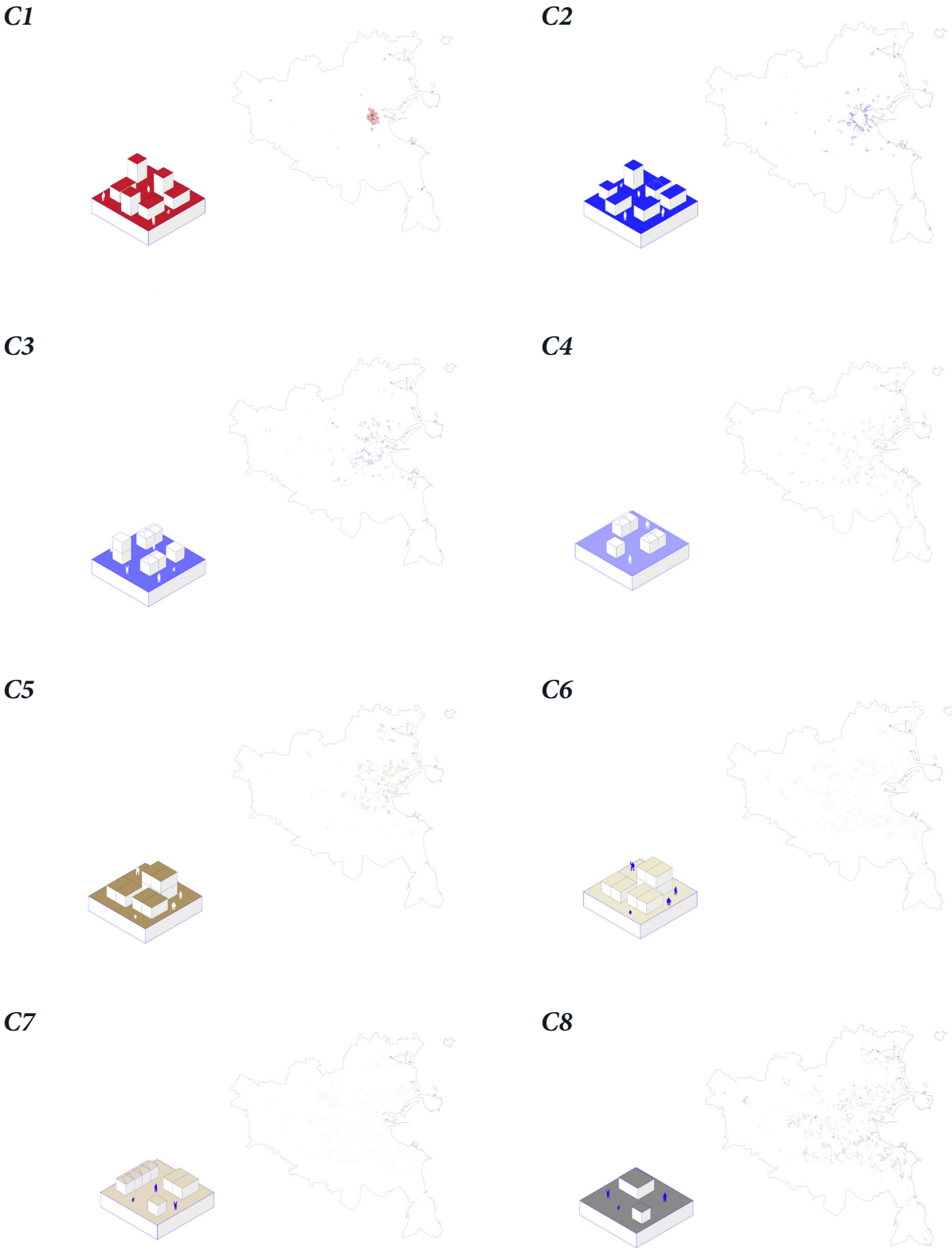
### The Peripheral Fringe: Spatial Diffusion & Mono-Use Fabric:

At the outer edge of the metropolitan region, the built environment shows increased spatial fragmentation and lower physical density. The urban fabric transitions predominantly into residential use, where local functional completeness varies significantly. While established mid-20th-century suburbs often feature integrated local infrastructure (such as schools and neighbourhood retail), late 20th century peripheral developments frequently have more mono-use residential enclaves. These outer zones accommodate a significant portion of the population but contain lower local amenity access, resulting in a structural dependence on the core and regional peripheral centralities.

This structural gradient illustrates how local accessibility and functional completeness vary across the metropolitan layout. This analysis allows the concentration of activities and the degree of centrality across the region to be revealed. The clusters of highest activities in the periphery are used as the focus of the study and solidify findings thus far. Further details of the specific typologies and components used to get to this result are outlined on the following pages.







Constructing urban typologies allows the results of spatial analysis to be interpreted as patterns of urbanity across the city. By clustering variables such as amenity density, population density, built intensity, and network centrality, distinct clusters emerge that correspond to different degrees of urbanity.

A clear gradient is typically observed, where levels of urbanity decrease with distance from the metropolitan core. However, this pattern is not uniform. Instead, pockets of higher urbanity appear within peripheral areas, forming clusters of intensified activity and density that function as secondary or alternative centres. These peripheral centralities operate at varying scales and levels of intensity, reflecting both historical development patterns and contemporary planning dynamics including land ownership.

As such, urbanity should not be understood as a singular, centre based condition, but as a distributed and multi-scalar phenomenon, where differentiated typologies reveal a fragmented yet interconnected urban structure.

| CA                                                                                                                                                              | Components Used for the Centrality Analysis                                                                                                                                                                         |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| D                                                                                                                                                               | <b>Demographics:</b><br>Population density per sqkm (CSO)                                                                                                                                                           |
| LU                                                                                                                                                              | <b>Land Use:</b><br>Built density - building footprint calculation<br>Parks and beaches (OSM & Local Authorities)<br>Amenities services (OSM)<br>Leisure (OSM)<br>Education (OSM)<br>Health (OSM)<br>Religion (OSM) |
| T                                                                                                                                                               | <b>Transport:</b><br>Street network segments distances (OSM)<br>Public transport stops (NTA)                                                                                                                        |
| Please refer to the appendix for dataset sources and the appendix which provides the R Scripts used for filtering, classifying, and calculating the components. |                                                                                                                                                                                                                     |







Dublin Metropolitan Region Centrality Typology Clusters Results

K-Medians, 10 clusters, standardised Z-scores, Manhattan distance · 54.3% between-cluster variance (vs 48.7% for 8 clusters) · ~628k buildings, Dublin metropolitan region

8 Clusters  
48.7%

10 Clusters Better  
54.3%

Correlates to Geoda's Automatic Cluster Number - see appendix

|    |     |                                                                                                    | Parks | Retail | POIs | Pop. Density | Built Density | Centre Point | Health | Education | Religion | Amenity Services | Transport |
|----|-----|----------------------------------------------------------------------------------------------------|-------|--------|------|--------------|---------------|--------------|--------|-----------|----------|------------------|-----------|
| 1  | C10 | Urban Core / Primary Centre<br>~16k buildings · avg within-cluster distance 16.90                  | 100%  | 100%   | 100% | 100%         | 100%          | 16%          | 100%   | 100%      | 100%     | 100%             | 100%      |
| 2  | C9  | *Major Regional Centre<br>~38k buildings · avg within-cluster distance 9.27                        | 81%   | 56%    | 56%  | 83%          | 75%           | 100%         | 51%    | 47%       | 35%      | 36%              | 58%       |
| 3  | C8  | De Facto Service Centre – Undesignated<br>~47k buildings · avg within-cluster distance 6.05        | 50%   | 53%    | 31%  | 70%          | 56%           | –            | 26%    | 28%       | 19%      | 19%              | 54%       |
| 4  | C6  | *Named Local Centre<br>~58k buildings · avg within-cluster distance 5.78                           | 33%   | 35%    | 21%  | 47%          | 44%           | 77%          | 18%    | 23%       | 14%      | 17%              | 37%       |
| 5  | C5  | Established Neighbourhood (Green & Transport)<br>~65k buildings · avg within-cluster distance 4.28 | 85%   | 14%    | 19%  | 72%          | 52%           | –            | 6%     | 14%       | –        | 3%               | 34%       |
| 6  | C3  | Neighbourhood with Basic Services<br>~92k buildings · avg within-cluster distance 3.36             | 21%   | 17%    | 13%  | 57%          | 43%           | –            | 7%     | 21%       | –        | 1%               | 30%       |
| 7  | C4  | Suburban (Green Residential)<br>~67k buildings · avg within-cluster distance 2.78                  | 40%   | 5%     | 11%  | 32%          | 31%           | –            | –      | –         | –        | –                | 21%       |
| 8  | C1  | Dense Residential (Low Activity)<br>~101k buildings · avg within-cluster distance 2.63             | 23%   | 1%     | 7%   | 92%          | 57%           | –            | –      | –         | –        | –                | 14%       |
| 9  | C2  | Outer Suburban Dormitory<br>~92k buildings · avg within-cluster distance 1.98                      | 5%    | –      | 4%   | 46%          | 41%           | –            | –      | –         | –        | –                | 7%        |
| 10 | C7  | Peripheral / Rural Fringe<br>~50k buildings · avg within-cluster distance 1.40                     | –     | –      | 3%   | 2%           | 7%            | –            | –      | –         | –        | –                | –         |

Low  High · values = % of variable maximum across all clusters

\* = study focus peripheral centralities

Components:

- Parks

Retail

POIs

Pop. Density

Built Density

Centre pt
- Health

Education

Religion

Amenity Services

Transport
- Park area within 800m (arw800fpk)

– Retail area within 800m (arw800ftr)

– Points of interest within 800m (arw800fpi)

– Population density (pop\_densit)

– Building footprint coverage % (b\_percent)

– Named centre point proximity (arw800fct)
- Health facilities within 800m (arw800fhe)

– Education within 800m (arw800fed)

– Places of worship within 800m (arw800fre)

– Amenity services – banks etc. (arw800fas)

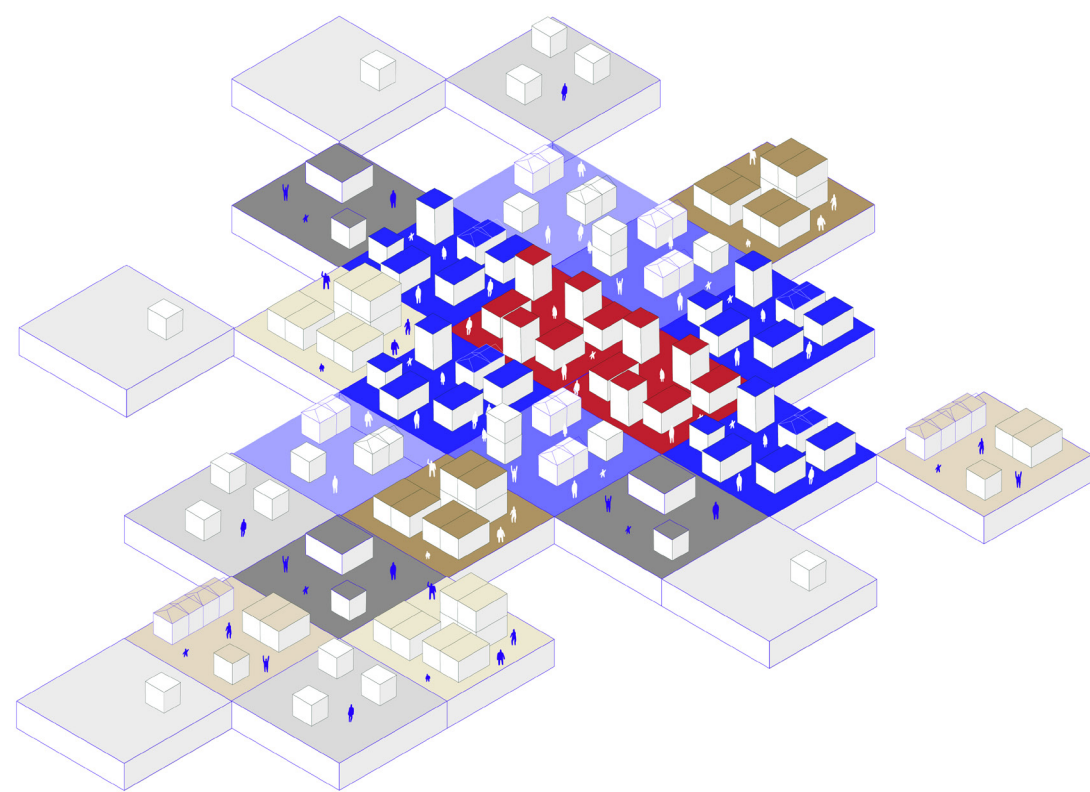
– Public transport stops within 800m (arw800fpt)

analysis

**Constructing the Metropolitan Region's Typologies**  
**Conclusion**

This analysis allows the concentration of activities and the degree of centrality across the region to be revealed. The clusters of highest activities in the periphery are used as the focus of the study and solidify findings thus far. Case areas are chosen based on the peripheral centrality clusters identified, in addition to considerations of socio-economic conditions such as the Pobal deprivation index. The next part of this analysis looks more into the smaller scale spatial qualities of the cluster types.

*Fig 51, Centrality Types Abstraction Metropolitan Region  
Make Up  
Source: Author*





# Planning Peripheral Centralities

*Irish Planning System*

*Why have the peripheral centralities formed this way?*

# Planning Peripheral Centralities

## Irish Planning System

### Comparing the New Planning Act

To understand why the periphery has come to be the way it is today, this part of the analysis outlines the Irish planning system currently and the topical on-going planning reform. The reformed Act aims to be modernise, cater to a growing country and address previous failures of the fragmented planning system.

As previously outlined in the analysis thus there has been a key number of variations to planning legislation in Ireland. Recently, the Planning and Development Act 2024, Act attempts to introduce a sense of speed, certainty, and top-down discipline into a historically the previously less ordered system.

These are the main changes:

- \* It replaces loose ministerial guidelines with legally mandatory National Planning Statements
- \* Local authorities will move from 4 year development plans to 10-year ones, to encourage longer term certainty,
- \* Introduces new area based plans
- \* Introduces strict statutory timelines for planning decisions
- \* Replaces An Bord Pleanála with a newly structured body called An Coimisiún Pleanála
- \* Reforms the Judicial Review process in hopes to reduce planning projected being caught in the legal system which has delayed major housing and infrastructure projects for long periods of time



Fig 52. Planning & Development Act 2024, Source Government of Ireland, (2024).

The main impact for peripheral centralities will be seen in the new area based plans and longer term development plan of 10 years time period. By shifting to a strictly plan-led system where the more local level plans must legally align with the National Planning Framework, the Act removes the ability of local county councillors to rezone land for shorter term political gain for example. This should impact the peripheral centralities areas the most as development will have to occur there.

A review of the previous Local Area Plans (LAPs) since their introduction with the Planning and Development Act 2000 revealed:

- \* Overzoning of land by councillors for land owners for political gain, not in keeping with population projections or national spatial guidelines (NPF), in which the LAPs were allowed to deviate from
- \* LAPs process was much slower to react to national policy changes
- \* No mechanism for infrastructural delivery, they were simply zoning plans with no supportive measures
- \* Urban design measures were taken at the development management / planning application stage.
- \* Plans were extended and incorporated into development plans as they expired meaning some centralities were subject to outdated plans

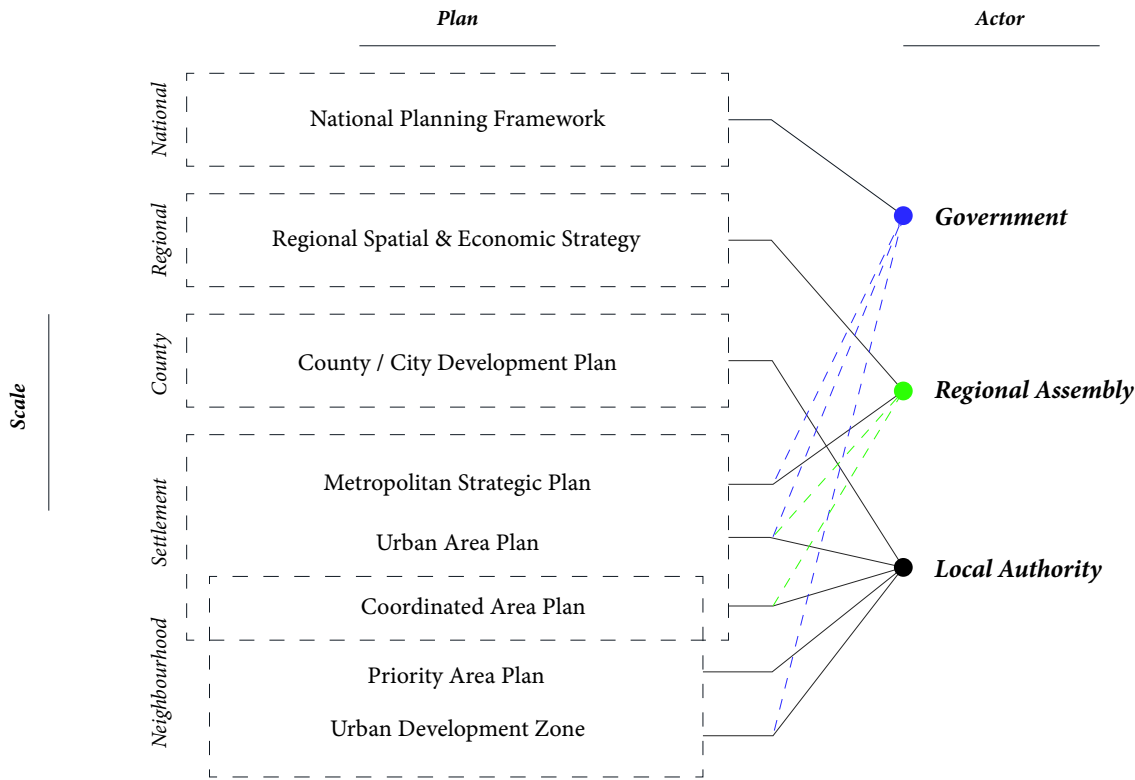


Fig 53. Area Plans, Scales, & Actors under new Act, Source Author.

### Local Area Plans (LAPs) to Urban Area Plans (UAPs)

Formally maps out specific settlements (greater than 1,500 population) identified in the development plan. Most importantly, all of the statutory zoning moves up to the aligns with the development plan level to keep zoning in line with national housing targets, while the UAP focuses strictly on operational delivery and local objectives.

### Strategic Development Zones / Masterplans to Priority Area Plans (PAPs)

Targeted specifically at parts of a city or town planned for significant growth, regeneration, or more complex infrastructural alignment.

### Cross-Boundary LAPs to Coordinated Area Plans (CAPs)

Across administrative boundaries cooperation is now formally required.



## *Irish Planning System*

### *Planning Policies & Tools*

Looking towards current planning policy in the metropolitan region, we see that across the seven governing local authorities, there are varying approaches to planning. The development plans of these authorities aim to outline the future development of their respective areas. The problem with these plans is that they remain heavily site-based, using wording that increased building height 'may be appropriate', in certain areas, or higher densities should be encouraged near transport corridors. The language implies a degree of flexibility for each site, not being definite in explicit terms for the form of development that is permitted on a site. This also applies to the regional assembly, the EMRA which has a Metropolitan Area Strategic Plan, however this is vague and not so detailed, nor democratic.

This ambiguity creates difficulty and interpretation that varies by municipality. This leaves the door open to interpretation, which changes over time and depending on the actors involved. This site-based planning is felt on the ground and has lead to inconsistent spatial qualities, affecting liveability, which will be outlined in the coming section of the report (field work).

### *National Policy Objective 2a*

*A target of half (50%) of future population and employment growth will be focused in the existing five cities and their suburbs. NPF, 2025*

### *National Policy Objective 3b*

*Deliver at least half (50%) of all new homes that are targeted in the five Cities and Suburbs of Dublin, Cork, Limerick, Galway and Waterford, within their existing built-up footprints.*

*NPF, (2025)*

To give an example of the types of policies contained within the NPF and the MASP there are many that will impact the future development of the types of areas, for example:

Policy “RPO 4.3” within the regional planning states to “*support the consolidation and re-intensification of infill/brownfield sites to provide high density and people intensive uses within the existing built up area of Dublin City and suburbs and ensure that the development of future development areas is co-ordinated with the delivery of key water infrastructure and public transport projects*”, the plan lacks detail of how and where this might happen leaving the specifics to the local authorities.

While these objectives are logical, they set vague specifications of how the liveability in these urban areas will be achieved. The result and lack of strategy specifically for the peri-urban areas in which much of this growth will and is taking place is left primarily to developer led planning system. For the five-year period between 2017 to 2022, the system allowed a by-pass of strategic housing developments (SHD) (plus 100 units) of the local authority to go directly to the An Coimisiún Pleanála (the national planning board). There were also special parameters in place that allowed these developments to overlook the Local Authority's own Development Plan, undermining the Local Authority's role in planning large scale urban areas.

This continues today, while the system to by-pass the Local Authority for large scale housing development planning application has been removed (SHD) by the Large Scale Residential development process (LRD), the autonomy of the local government and public is still being undermined via the aim to move more towards a plan based development approach. Introducing this process has been top-down. The new plans are (UAPs, PAPs, CAPs). UDZs require approval from national government.

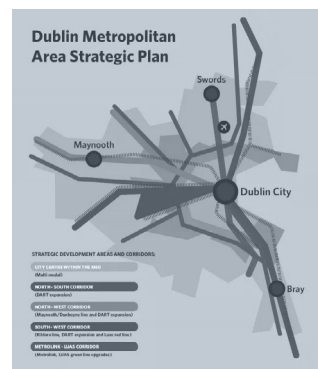


Fig 54.  
MASP Strategy Plan  
within RSES,  
Source, EMRA, (2018).



Fig 55.  
Plans National to Local Scale,  
Source, Government of Ire-  
land, (2025), EMRA (2018),  
SDCC(2020).

An existing tool the local authorities have to address this is urban development zones, or priority area plans (formerly local area plans) which are typically more prescriptive for development. However, across the study area, there are a total of 9 active local area plans in place (April, 2026).

Dublin County:

2x Dublin City Council  
3x Fingal County Council  
1x South Dublin County Council  
2x Dún Laoghaire Rathdown County Council

Surrounding Counties:

2x Kildare County Council  
1x Wicklow County Council  
0x Meath County Council

Many of these plans are made and extended for a period of a maximum five years beyond their intended six year life-span. It is found that there is a variation between the local authorities, with some having many plans that will expire reaching their maximum time of eleven years, while some have all younger plans and some a mixture. Overall, these plans are not utilised to apply to more areas, thus leading to majority site based planning in the remaining areas.

Fig.56, Plan Types & Spatial Scales  
Source: Author

## Types of Area Based Plans

The Planning and Development Act of 2024 introduced three new area based plans with specific intentions. These are as follows:

### Urban Area Plans (UAPs):

Intended for towns or large settlements that the Local Authority's overall Development Plan identifies as needing a specific layout. These outline exactly how local design, architecture, parks, and community facilities will be implemented.

### Priority Area Plans (PAPs):

Targets a smaller, specific section of a town intended for renewal, regeneration, or development. Councils can appoint a local sub-committee to assist in overseeing this.

### Coordinated Area Plans (CAPs):

Utilised when a town or area crosses a boundary between different local council regions and requires a synchronised approach. A joint 'Coordinated Area Plan Committee' is formed to build the plan together.

### Conditions:

Only one type of these plans can apply to a single spatial boundary, no more.

The plan must be consistent with the policies within the county/city level Local Authority's Development Plan.

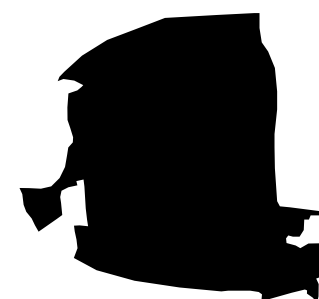
Similarly to the Development Plans, the plans are intended to last for 10 years, or until the Development Plan is replaced, whichever is sooner. However, when a council makes a Development Plan, they can choose to extend the existing local plan for the remainder of its 10-year term, provided it is formally proven that it still follows the new Development Plan's principles.

The Local Authorities can change or withdraw a plan at any time following the same strict legal procedures used to build them.

There is a fourth type of plan that is intended not for the local scale but rather for an entire city district or town. This has special provisions such as national strategic importance and requires approval from the national government for such plan.

### Urban Development Zones:

A planning framework must be created by the Local Authority for the area, which includes outlining core masterplan principles, infrastructure strategies, critical lands, scales, and type of development allowed. A key difference also from the other three local plans is that this can deviate from the Development Plan, but not national planning policy.



Urban Area Plan Potential Example:  
Swords Town



Priority Area Plan Potential Example:  
Clondalkin Village Centre



Coordinated Area Plan Potential Example:  
Cityedge - South Dublin County Council with  
Dublin City Council

## Area Plan Process

- 1 Drafting & Environmental Screening: The council's Chief Executive (CE) writes the first draft. Before it goes public, the council must run mandatory environmental and wildlife checks to determine if a full Strategic Environmental Assessment (SEA) or Natura Impact Report is required.
- 2 Public Consultation (Minimum 6 Weeks): The draft and environmental reports are published online and in local newspapers. Government bodies, transport agencies, the general public, and explicitly children or youth advocacy groups are invited to submit feedback. To ensure transparency, all public submissions must be uploaded to the council's website within 10 working days of receipt.
- 3 The Chief Executive's Report (12-Week Deadline): Within 12 weeks of publishing the notice, the CE must compile all public comments, provide an official expert opinion on the issues raised, and formally recommend whether to alter the plan.
- 4 The Council Vote (6-Week Window): Local elected politicians (councillors) receive the CE's report. If they do nothing, the plan automatically passes based on the CE's recommendations after 6 weeks. To change or reject it, a resolution must be voted on and passed by at least half of the total members of the planning authority.
- 5 The "Material Alteration" Loop: If politicians demand a major ("material") change that wasn't in the initial draft, the plan cannot be passed immediately. They must pause, publish the new proposed changes for a fresh 4-week public viewing, complete new environmental screenings, and have the CE draft a secondary report within 8 weeks. The council then has 6 weeks to hold a final vote on the modified plan.

## The Problem?

The system remains highly centralised for municipalities while public input is weakened at planning permission level. Planning remains centralised as the OPR can overrule any plan made by a municipality to align it with national planning policy.

Spitting local planning into threem creates a cluttered and confusing hierarchy. Potential overlap and duplication of responsibilities at the settlement/town and neighbourhood scales.

The legislation introduces altering wording such as children, greater good, and others meaning the plans must include an interpretation of these phrases, for the inclusion of children for example, this could increase the need for youth club, schools interaction in plan making. Plans must now also align directly with transport plans from the National Transport Authority meaning municipalities can no longer make masterplans for larger areas without public transport plans first.

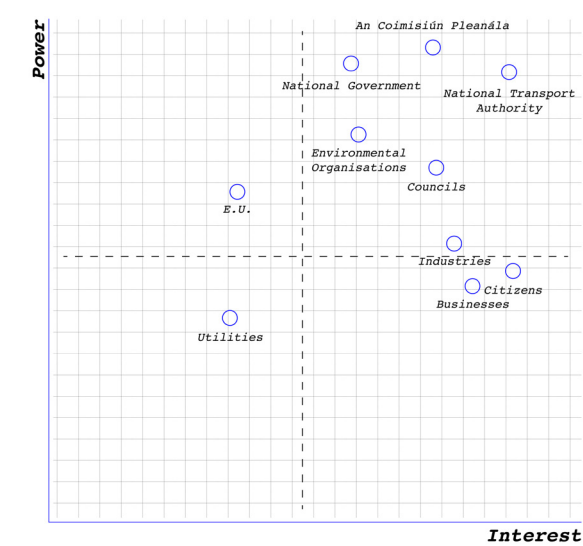


Irish Planning System

Where does this leave local authorities in terms of autonomy?

The implementation of the Planning and Development Act 2024/2025, further reduces the local authority autonomy in Ireland, making the system more top-down. The Council of Europe's Congress of Local and Regional Authorities (2023) declared Ireland to be 'one of the most centralised countries in Europe,' positioning the state near the absolute bottom of the international Local Autonomy Index (LAI) alongside countries such as Hungary and Moldova, before the new planning act was implemented. By replacing discretionary ministerial guidelines with legally mandatory National Planning Statements and locking local councils into rigid, top-down ten-year development frameworks, the 2024/2025 legislative change effectively neutralizes the primary remaining mechanism of local spatial discretion: land-use zoning. For Irish local authorities, these changes codify their transition from democratic, localised policymaking bodies into mere administrative delivery arms of central government. Consequently, while the framework stops political deviation from national compact growth metrics on paper, it further violates the European principle of subsidiarity and leaves peripheral centralities entirely dependent on national state bureaucracy to execute and fund their own urban futures.

Fig 57.  
Power Interest Matrix,  
Source, Author.



There is no directly elected mayor for the city, with the real executive power sitting with the Chief Executive of the council. The Chief Executive is an unelected civil servant appointed by a national body (the Public Appointments Service), not by people. While the elected councillors pass resolutions and debate, the chief executive and their executive team who manage the budget, direct staff, and handle day to day administration.

The limited powers of the council are as follows:

- \* Limited to local roads, social housing allocation, bins (mostly privatised), and parks.
- \* Heavily reliant on central government grants. No control over broad-based taxes, except local property tax. No incentive to save money as the benefits are not given back to the council.
- \* Decisions are dictated nationally (top-down) local structures act as administrative delivery arms.

Conclusion

The combination of strong land ownership rights and lack of strategic spatial planning has led to hap-hazard site based development that the metropolitan area has fell victim to and is now dealing with the consequences of. Development was consequently highly political and market orientated.

The 2024/2025 Act aims to successfully fix elements of the administrative and legal mechanics of planning, it aims to put an end to uncoordinated and strategy planning methods on paper, which remains to be seen how effective this will be.

However, it fails to fix the execution problem. To make peripheral centralities truly liveable places, the region requires recognition and a metropolitan authority that can function in bridging the gap between local authorities and the national government.

Irish Planning System

Weaknesses of System / Conclusion

Urban planning is highly centralised in the country, with it being dictated by shorter term political agendas which has a had spatial consequences e.g. the rural urban divide which persists.

Lack of specific metropolitan level peripheral centrality framework for co-ordination

Differing approaches to land use management which is apparent in the periphery where the local authority borders are.

The context of strong land ownership rights makes it difficult to change zoning and co-ordinate with contemporary urban planning practices.

The input for public participation is narrowing and less tangible for the public as the system moves the time where citizen engagement is

There is social inequality which is reinforced by financial consequences for the local authorities, property tax income varies throughout the region meaning access to funding is different throughout the

The system relies on private developers to provide private and public open space which can be avoided with certain site constraints or other reasons by paying development contributions to the councils.

New urban area based plans create three new types of urban plans replacing one type causing confusion and overlap in their purpose.

Limited local authority autonomy with no directly elected mayor or sufficient fiscal powers.

The input for public participation is narrowing and less tangible for the public as the system moves the time where citizen engagement is carried out.

The changes within the Planning and Development Act 2024, still appears to be too private market and developer focused, with the system being rearranged to cater to them.

The absence of effective metropolitan or cross-boundary planning mechanisms, resulted in a fragmented governance structure in which urban regions were managed through multiple local authorities rather than as integrated systems.

*Regional, District, & Local Scale Peripheral Centralities  
on the ground*

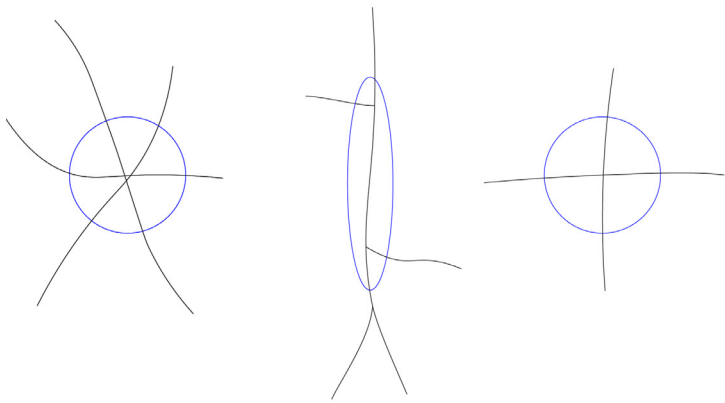


# Spatial Conditions of Centralities

## Dublin Metropolitan Region Morphological Peripheral Centrality Analysis

As is previously established by the introduction, and analysis thus far, peripheral centralities are not created equally, representing the period of urban planning and ideologies of the time that they were developed in, some emerged and developed solely by private land owners, while others were planned specifically by the state or local authorities to provide housing and expand the city in to the metropolitan region we know today (the cluster typologies).

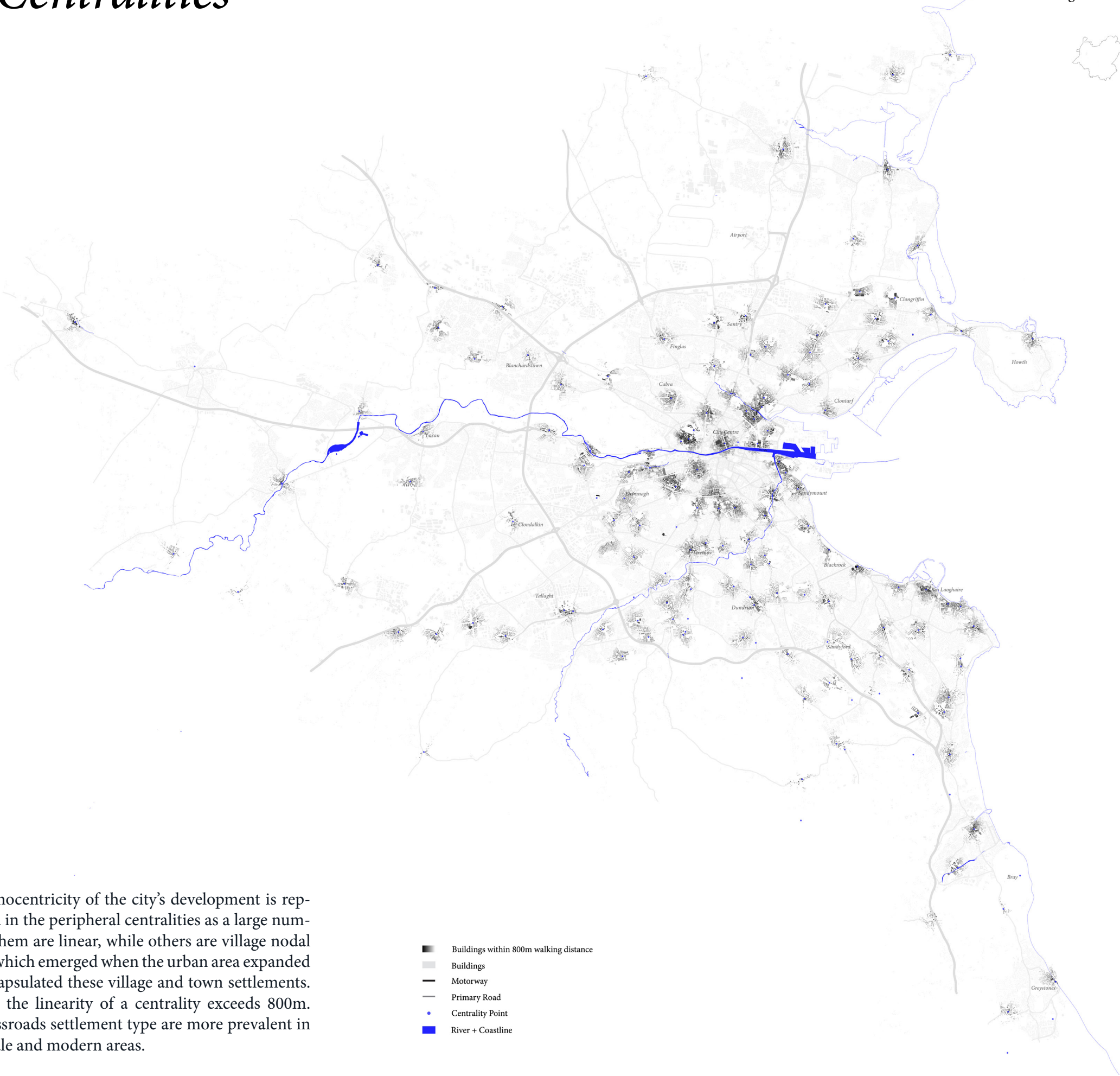
In addition modern transport methods has led to Dublin losing it's compactness and thus resulting in decentralisation as confirmed by the NAIC and NAIC analysis, this has led to varying qualities and liveability factors of each peripheral centrality. A decentralisation in morphology terms but not in strategic liveable polycentric neighbourhood centres, which the clusters show, exist in varying degrees throughout the metropolitan area.



Focusing on the morphology of the streets within the centrality clusters, it is found that there are three main types of morphologies, demonstrated in the abstraction above. These are multiple converging streets converging to create a nodal point, a linear centrality where mostly two roads converge, and a simple crossroads of two streets. Others not represented include having harsh borders such as along a coastline, or in infrastructure.

The monocentricity of the city's development is represented in the peripheral centralities as a large number of them are linear, while others are village nodal points, which emerged when the urban area expanded and encapsulated these village and town settlements. In cases the linearity of a centrality exceeds 800m. The crossroads settlement type are more prevalent in local scale and modern areas.

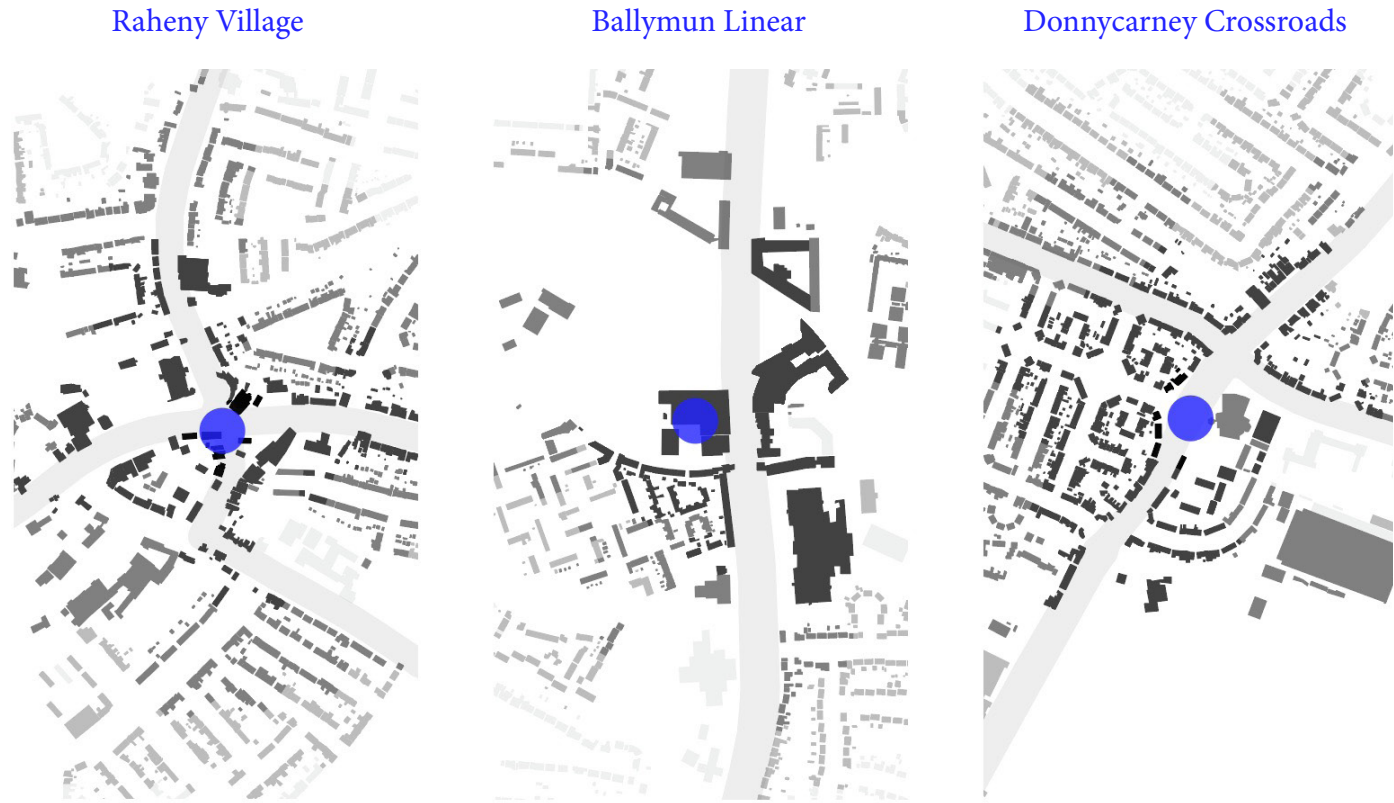
Fig 58. Centrality Points with buildings reachable of street network 800m walking distance, Author



analysis

**Dublin Metropolitan Region**  
**Morphological Peripheral Centrality Analysis**

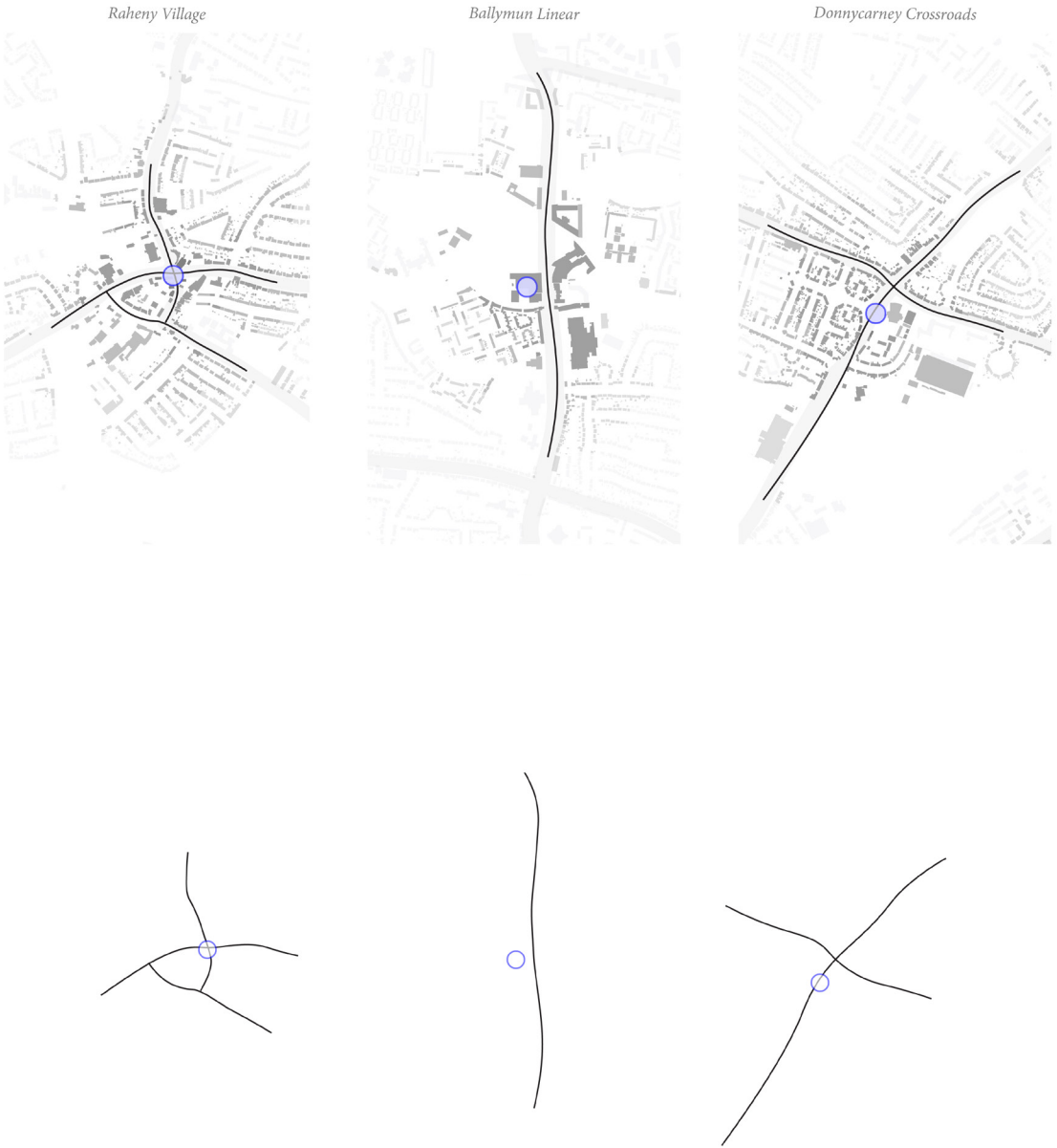
Fig 59. Morphological Conditions within three of Dublin 's Peripheral Centrality Areas, Source: Author.



**Core:**  
The core cluster is characterised by a dense, fine-grained, and highly continuous urban morphology, with a street network that is dense, diverse, and interconnected, maximising spatial efficiency and structural legibility. Centrality is structural, contiguous, and multi-directional. The high density of activity (red colour) allows a spatial boundary of the urban core to be defined, indicating a zone of highest accessibility and urbanity where the level of activities from the components taken is the highest. Centrality here is a properties of the whole phenomenon. The core area here operates even beyond the metropolitan region level.

**Periphery:**  
The morphology progressively fractures. The building block sizes become coarser, the fabric becomes discontinuous, and the network topology shifts toward more segregated, car-centric configuration (such as cul-de-sacs or dendritic street patterns) typical of suburban expansions. As you move outward, centrality reduces. However, centrality does not disappear entirely, instead, it shifts from a continuous surface to more localised, isolated pockets and forms represented by the morphology of the place.

- Buildings within 800m walking distance
- Buildings
- Motorway
- Primary Road
- Centrality Point
- River + Coastline





## Introduction of Case Areas Scales & Typologies of the Metropolitan Region

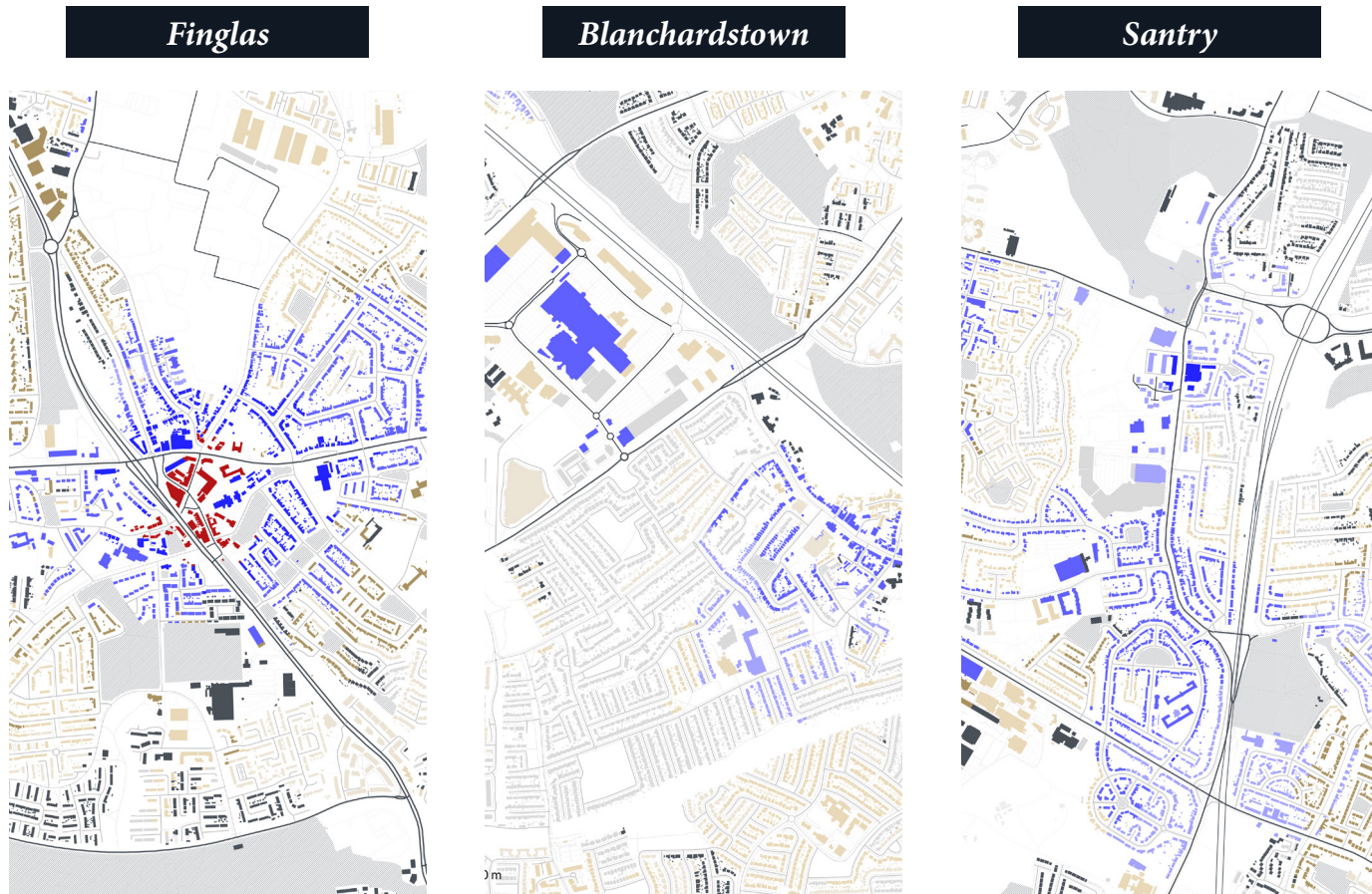


Fig.61, Centralities Types Zoom Ins  
Source: Author

From the construction of typologies analysis, it becomes clear there are peripheral centralities with varying roles which correspond to their level of importance in the overall metropolitan area. These can generally be defined as local (XS), neighbourhood (S), district (M), regional (L), metropolitan (XL). It can occur that these classifications of roles and scales co-exist alongside each other which can lead to differing spatial outcomes for the people who live in these areas.

To understand what this means and looks like, zooming on these areas is important to gain an insight into peoples lived experiences of the metropole from multiple scales. There are constant synergies and conflicts that can occur between them and that is what makes a successful understanding of the study area.

On the ground, some people will feel that at XS scale the XL scale seems more arbitrary and out of people's lived experiences of space. However, this is not the

The three case areas of Finglas, Blanchardstown, and Santry were chosen for their peripheral location in the city confirmed by the previous analysis. They are within the cluster typology of highest degree, or are partially within the typology cluster of highest centrality. In addition, supporting research allowed, the support of distinguishment between the spaces within this cluster, for example, due to their differing morphological make up, spatial qualities, land uses, scales of operation i.e. position within metropolitan region, potential of transformation, demographics, and socio-economic dynamics, as outlined in the previous analysis sections.

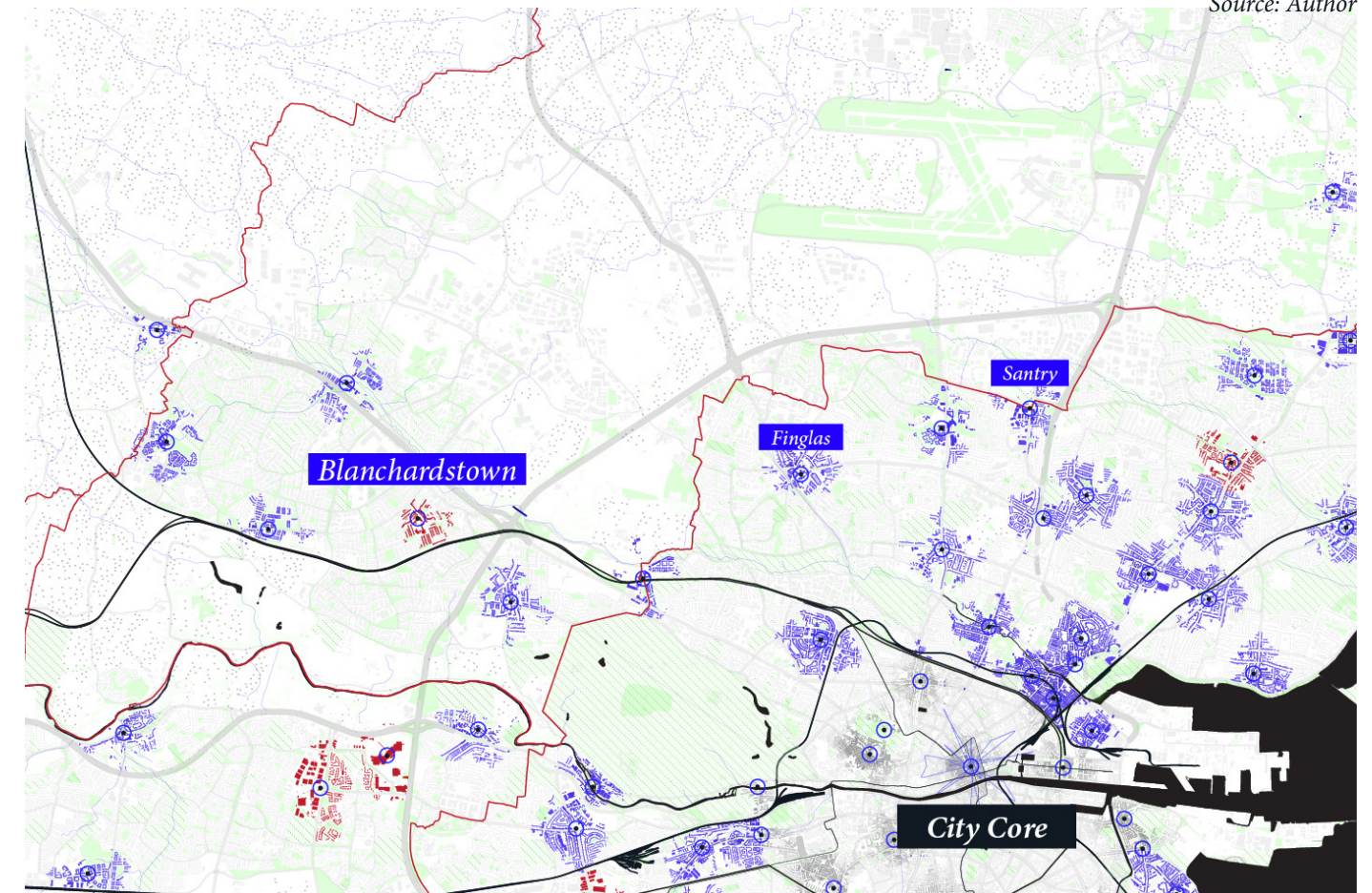


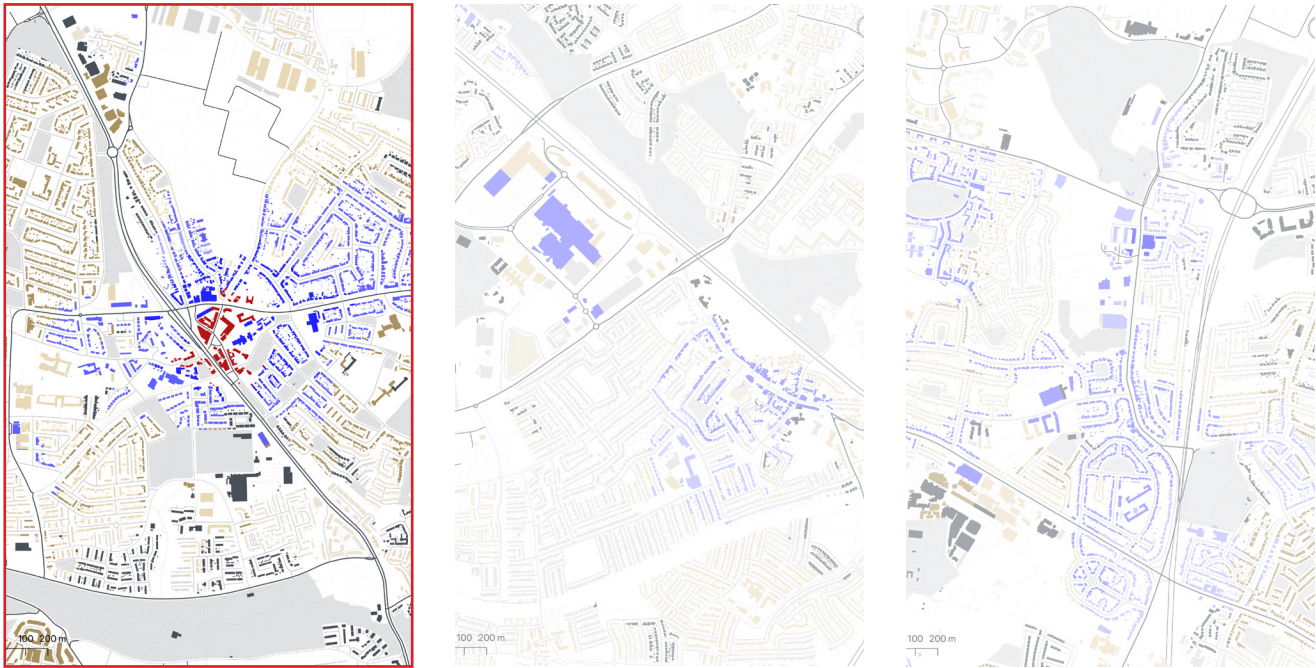
Fig.62, North City Centralities  
Source: Author



Fig.63, North City Imagery  
Source: Apple Maps



Finglas



Finglas, a cluster of highest activity with extremely poor spatial conditions with regard to place-making and liveability, this is an example of how a centrality on paper can appear as the most central place, thus it is assumed the spatial conditions there must be optimal, however, the findings here contest this. The follow section evaluates the centrality on the ground for liveability metrics.

Referring to the images on the right, the streets do not follow encourage a natural flow towards the area with the highest level of centrality. There are poor spatial conditions, with high amounts of car parking space, low quality footpaths, lack of porous surfaces, and green spaces, large space for automobiles, low walkability with few safe crossing points, utility services are exposed, the land uses are retail and commercial, in the form of low rise and are largely mono use, there are some vacant properties and sites a result of land hoarding (planning policy link).

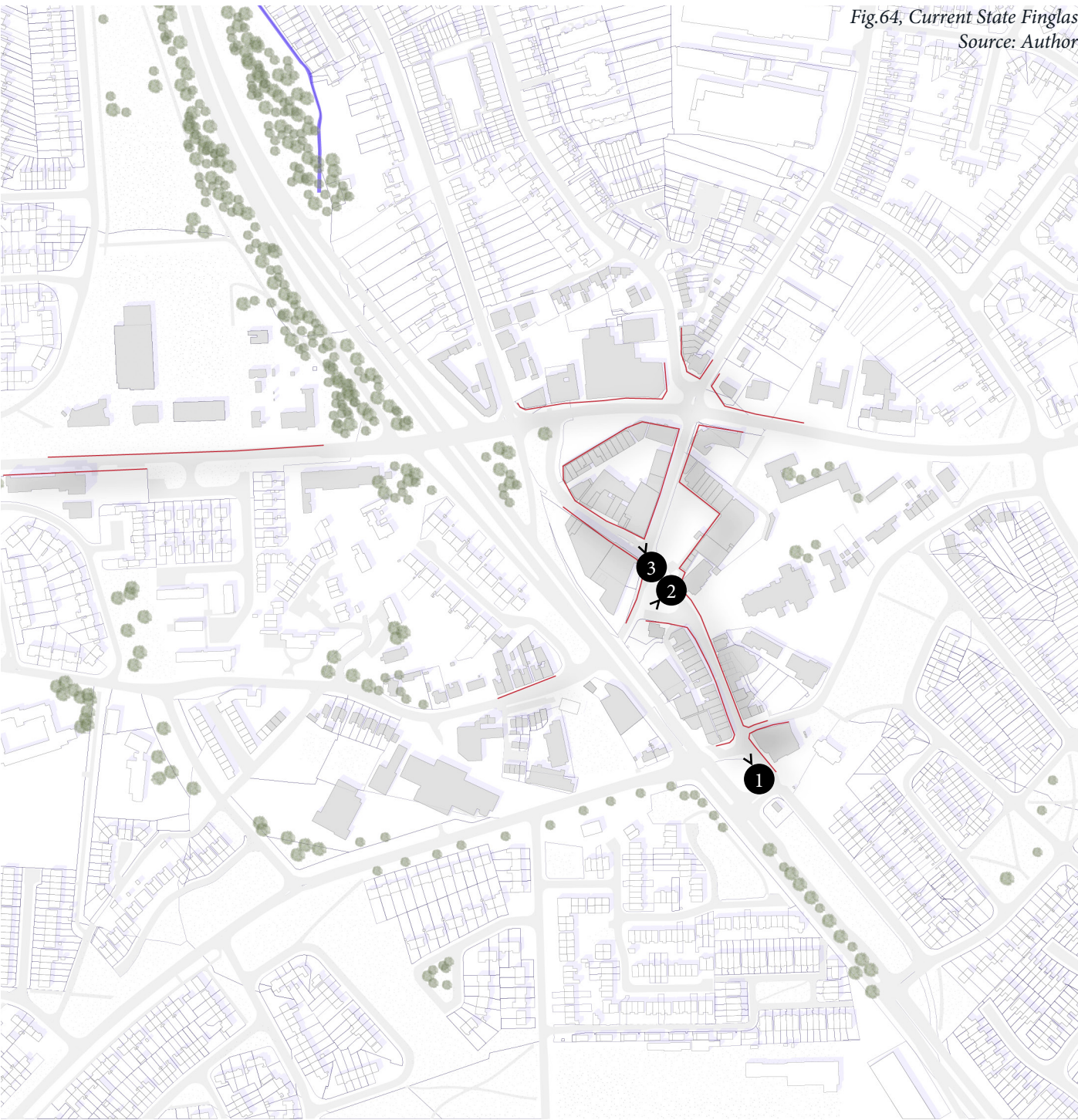


Fig.64, Current State Finglas  
Source: Author



Fig.65, Photographs Finglas, March 2026  
Source: Author

analysis



Case Area

Finglas Urban Profile

Finglas, a cluster of highest activity with extremely poor spatial conditions with regard to place-making and liveability, this is an example of how a centrality on paper can appear as the most central place, thus it is assumed the spatial conditions there must be optimal, however, the findings here contest this. The follow section evaluates the centrality on the ground for liveability metrics.



| Study Area 1: Finglas                |                                                                                                                         |          | Date of Observations: 10.03.2026 |
|--------------------------------------|-------------------------------------------------------------------------------------------------------------------------|----------|----------------------------------|
| 1. Service & Amenity Provision       |                                                                                                                         |          |                                  |
| Indicator                            | Observation                                                                                                             | Rating*  |                                  |
| Retail Variety                       | Range of retail types present: convenience, comparison, specialist. Note anchor stores vacant units                     | ●●●●○    |                                  |
| Food & Hospitality                   | Cafes, restaurants, takeaways, public houses. Day and night economy                                                     | ●●○○○    |                                  |
| Personal Services                    | Pharmacies, hairdressers, banks, ATMs, post offices, general practitioners, dentists, everyday services                 | ●●●●○    |                                  |
| Employment Anchors                   | Offices, enterprise, light industry, evidence of daytime working or opposite dormitory/commuter populations             | ●●●●○    |                                  |
| Civic & Community                    | Libraries, community centres, places of worship, childcare, note opening hours and activities/events                    | ●●●●○    |                                  |
| Cultural & Leisure                   | Parks, sports facilities, arts/cultural venues, music, evening & weekend draws, note ownership of facilities            | ●●○○○    |                                  |
|                                      |                                                                                                                         | Average: | ●●●●○                            |
| 2. Urban Form & Mixed Use            |                                                                                                                         |          |                                  |
| Indicator                            | Observation                                                                                                             | Rating*  |                                  |
| Active Frontages                     | Proportion of ground-floor units with windows, entrances, displays. Dead frontages (blank walls, shutters)              | ●●●●○    |                                  |
| Mixed Use                            | Vertical and horizontal mixing of residential, commercial, civic. Single-use blocks vs integrated grain                 | ●●●●○    |                                  |
| Building Condition                   | State of repair, vacancy, dilapidation, recent investment. Heritage or notable building fabric, land marks              | ●●○○○    |                                  |
| Street Network                       | Grid vs cul-de-sac, permeability, legibility. Ease of navigation without a map                                          | ●●●●○    |                                  |
| Vacancy Rate                         | Estimated % of ground-floor units vacant. Note clustering or spread of vacancies                                        | ●●○○○    |                                  |
|                                      |                                                                                                                         | Average: | ●●●●○                            |
| 3. Public Space, Safety, & Waste     |                                                                                                                         |          |                                  |
| Indicator                            | Observation                                                                                                             | Rating*  |                                  |
| Public Space Quality                 | Squares, plazas, pocket parks. Seating, planting, maintenance, comfort. Programmable vs residual space                  | ●○○○○    |                                  |
| Pedestrian Priority                  | Pavement width, crossing provision, shared surfaces. Conflict between pedestrian and car movement                       | ●○○○○    |                                  |
| Green Infrastructure                 | Street trees, planters, green roofs, biodiversity, air quality, micro-climate contribution, noise levels                | ●●○○○    |                                  |
| Cleanliness & Upkeep                 | Graffiti, litter, fly-posting. Evidence of local stewardship or neglect, evidence of community collaboration vs council | ●●●●○    |                                  |
| Lighting & Safety                    | Evidence of lighting, CCTV, natural surveillance, eyes on the street at different times, active & passive               | ●●●●○    |                                  |
| Age Friendly                         | Play facilities, safe crossings, level surfaces, visually impaired infrastructure, general inclusivity of public realm  | ●○○○○    |                                  |
|                                      |                                                                                                                         | Average: | ●○○○○                            |
| 4. Accessibility & Transport         |                                                                                                                         |          |                                  |
| Indicator                            | Observation                                                                                                             | Rating*  |                                  |
| Public Transport                     | Bus routes, Luas, rail. Frequency, real-time info, shelter quality, integration. GTFS data alignment                    | ●●●●○    |                                  |
| Walkability (800m)                   | Can everyday needs be met on foot? 15- minute city principles. Walk score impression                                    | ●●●●○    |                                  |
| Cycling Provision                    | Protected lanes, bike sharing schemes, cycle parking. Subjective safety for cycling                                     | ●○○○○    |                                  |
| Car Dominance                        | Car prevalence in centrality, car parking quantities, through-traffic volume, rat- running, car-centric design          | ●●○○○    |                                  |
| Universal Access                     | Dropped kerbs, tactile paving, ramp access, audio crossing signal, DMURS compliance evidence                            | ●●○○○    |                                  |
|                                      |                                                                                                                         | Average: | ●●○○○                            |
| 5. Spatial Equity & Social Dimension |                                                                                                                         |          |                                  |
| Indicator                            | Observation                                                                                                             | Rating*  |                                  |
| Demographic Activity                 | Age range of observed users. Evidence of inclusive or exclusionary spaces, note time of day affects this                | ●●●●○    |                                  |
| Income Signals                       | Equality, look for charity shops, discount retailers, evidence of gentrification pressure or socio-economic stress      | ●●○○○    |                                  |
| Social Infrastructure                | GP, mental health, housing support services, community-facing vs private provision                                      | ●●●●○    |                                  |
| Ownership                            | Private vs public services and amenities, signage indicating funders, owners                                            | ●●●●○    |                                  |
| Democracy                            | Evidence of protest, signage, desire for urban improvement, colloquial understanding of area needs                      | ●○○○○    |                                  |
|                                      |                                                                                                                         | Average: | ●●●●○                            |

Service & Amenity Provision:

While the centrality functions as a solid self-contained hub with all the essential amenities and services, it suffers from a daytime use functional commercial identity. The area lacks night and evening uses, with also a lack of mixed use developed such as density of residential above active ground floors. Employment anchors exist (e.g., Jamestown and North Road commercial areas), but they are more toward low-density industrial and logistics rather than integrated modern enterprise which would be expected of a centrality operating at this scale.



Fig 67. Finglas before the regional road that divided the village (1970s).  
Source: Glasnevin Heritage Group, Facebook, n.d.

Public Space, Safety, & Waste:

Despite proximity to larger regional parks like the Tolka Valley, localised Public Space Quality and Green Infrastructure within the village core feel much to desire, with few gathering spaces or attractive nodal points, and a lack of greenery and porous surfaces. Pedestrian Priority and Age Friendly infrastructure score low due to car dominated public space. Wide road layouts create hostile environments for more vulnerable road users.

Street clutter, a lack of passive surveillance from blank facades, and localised maintenance/litter challenges further lower the subjective sense of safety and solidifying the area as an attractive central place.

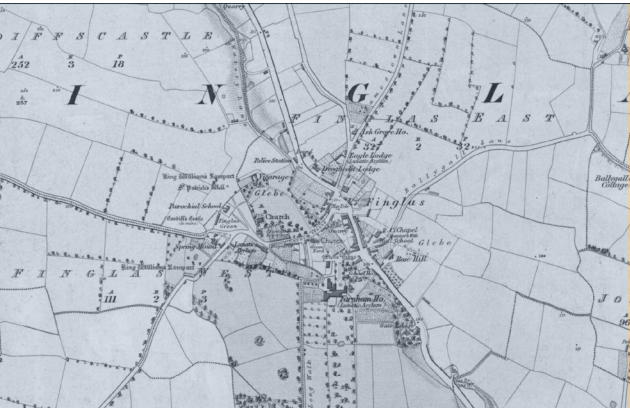


Fig 66. Finglas OSI Map 1844.  
Source: National Library of Scotland (2014) Dublin Sheet 14, Ordnance Survey Six-inch to the mile, Ireland. Surveyed 1837–1843.

Urban Form & Mixed Use:

The 70s saw the Finglas Road dual carriageway cut the historic village centre in two, while it was a young suburb at the time with growing residential areas surrounding the centrality, it has heavily impacted the centrality form and functions today. The walkability of the centre is low with mixed level surfaces, large open roads for motor traffic, lack of safe and clear crossing points.



Fig 68. One of the main commercial areas in the centrality  
Source: Author.



Case Area  
Finglas Urban Profile

**Accessibility & Transport:**  
Here the affects are felt of the friction of peripheral centrality, it is highly connected to the wider region but poorly integrated locally. Positioned near the M50 motorway and crossed by the N2 corridor, the area is dominated by car infrastructure. It functions as a high-volume transit funnel for north-west Dublin. The area relies currently on buses for public transport, a Luas (tram) is planned for the coming years.

As previously outlined, the active travel modes are of a poor quality and experience in the space, decreas-



Fig 69. Centre division road (N2) of centrality, the transport infrastructure weighs heavy on the experience of space and connectivity on the local scale.  
Source: Author.



Fig 70. Finglas Library, edge of centrality.  
Source: Dublin City Council (2023).

**Social Equity & Social Dimension:**  
The centrality area contains a high level of civic and community focused uses to help with the historic socio-economic disadvantages. These are spread throughout the area, this also contributes to the higher level of activities and centrality of the area. There are considerations here with the administrative borders of Dublin City and Finglas County Councils nearby the centrality.

Liveability Performance Results

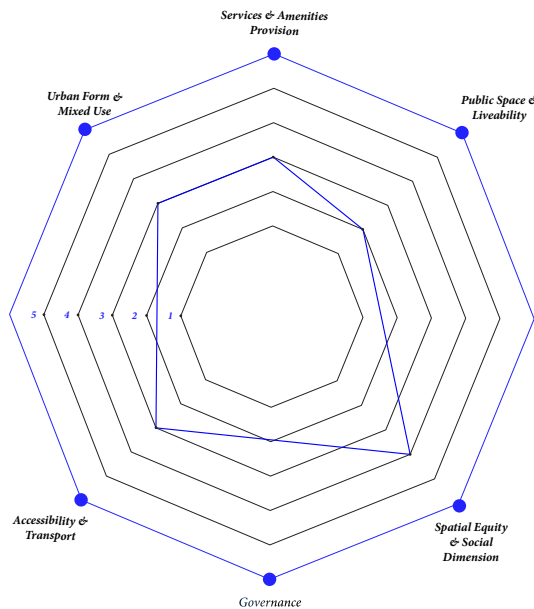
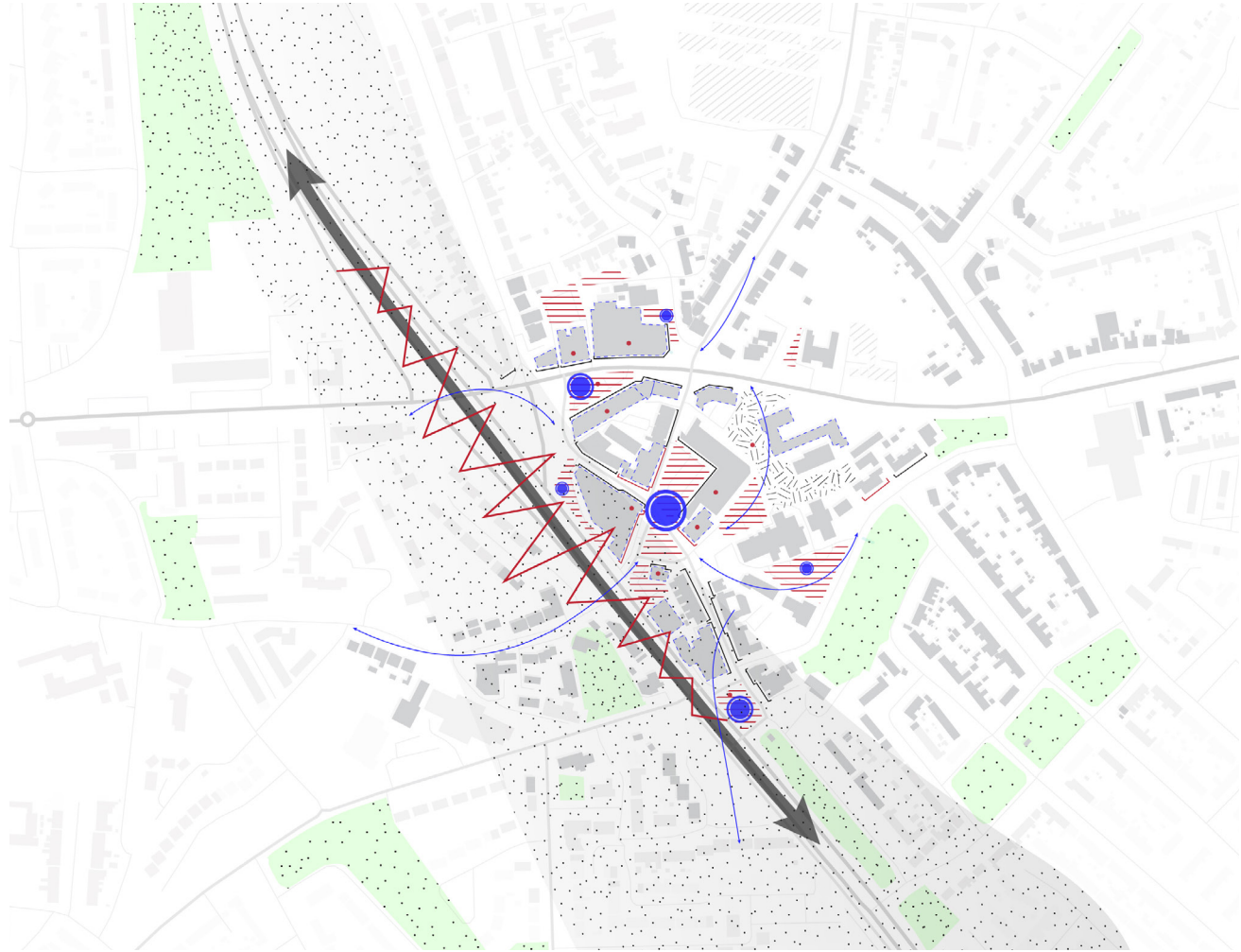


Fig 71. Mapping the SWOT Finglas  
Source: Author



S.W.O.T.

| Strengths     | <ul style="list-style-type: none"><li>Historic village core provides a natural nodal point for the neighbourhood</li><li>Area has a good foundation of amenities and services within an existing typology of active frontaged and plinths</li><li>Public transport connects both radially + orbitally with multiple routes available and a tram line extension proposed</li><li>Commercial mix of uses supports vitality across different times of day, reducing dead period</li><li>Established civic + community</li></ul>  | Weaknesses | <ul style="list-style-type: none"><li>Topology of the centrality</li><li>Lack of cycling infrastructure</li><li>Highly paved areas</li><li>Car Centric</li><li>Lack of age friendly infrastructure</li><li>Lack of greenery + green infrastructure</li><li>High quantity of car parking</li><li>Presence of vacant + derelict units</li><li>Reliance on retail in the core</li></ul> |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Opportunities | <ul style="list-style-type: none"><li>Increasing liveability score</li><li>Proximity to City Centre potential for increased linkages + strategic metro function</li><li>Creation of new public space</li><li>Making centre more walkable</li><li>Drawing on morphology of the place</li><li>Establishing higher level of connectivity to surrounding residential areas</li><li>Extracting identity of the place</li><li>Opening up existing amenities + facilities</li><li>Introducing green infrastructure in core</li></ul> | Threats    | <ul style="list-style-type: none"><li>Stagnant core</li><li>Potential loss of village character</li><li>Land ownership</li><li>Shared use + joint use agreements</li><li>Space for green infrastructure</li><li>Opposition to transition of NBH C</li></ul>                                                                                                                          |



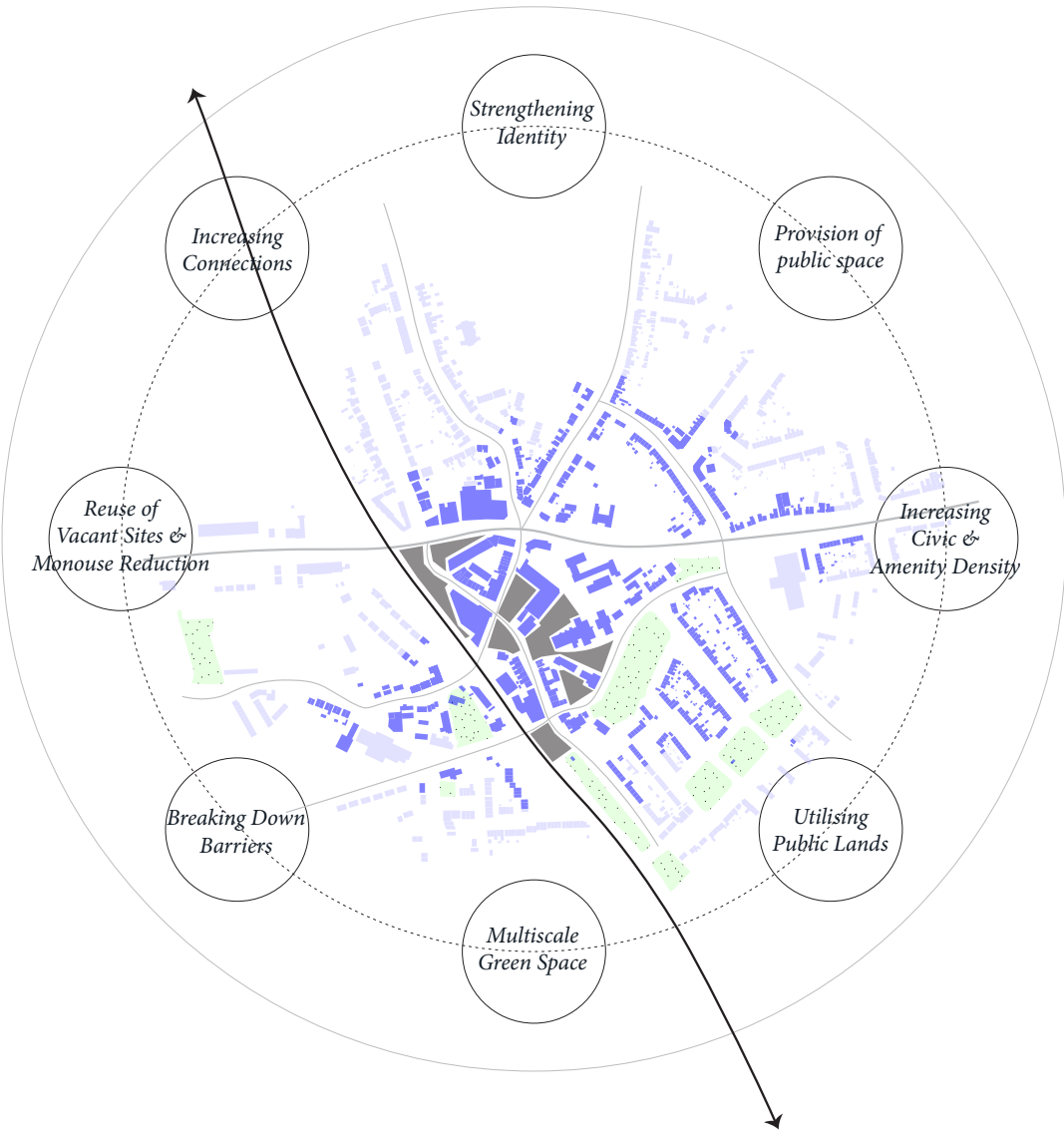
Case Area  
Finglas Urban Profile



Fig. 72. Photographs of Finglas March 2026  
Source: Author.

Conclusion

Fig.73, Photographs Finglas, March 2026  
Source: Author



analysis

The fieldwork demonstrates that while Finglas maintains a high level of activity reflected in the centrality type, its liveability is severely compromised by the spatial make up, coming from its main development in the 20th-century, from a village to a suburbs. The N2 dual carriageway and the fragmented, low-density residential surrounding grain present clear structural barriers to permeability and active travel. Moving forward into the design phase, the primary objective will be to transform this peripheral centrality from a hostile corridor into a more integrated, human-scale urban node and give it an identity.

This requires leveraging the upcoming Luas Finglas extension to bridge the physical divides, alter the street network, , introduce high-quality public spaces with active frontages, and densify. Within the wider Dublin metropolitan region, Finglas must shift from a car-dependent edge settlement into a highly connected, mixed-use northern anchor that balances regional accessibility with localised, pedestrian-focused liveability, which will allow the region to grow in a compact way.



Blanchardstown

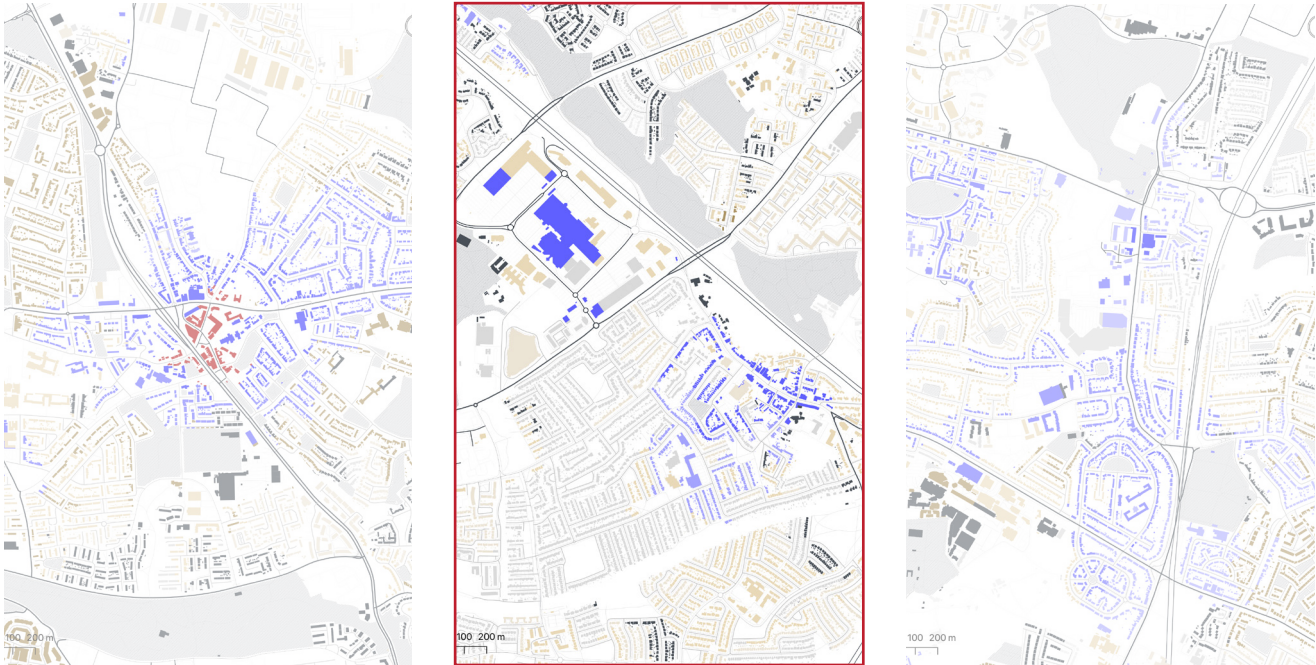


Fig. 74, Photographs of Blanchardstown March 2026  
Source: Author.



Case Area

Blanchardstown Urban Profile

Blanchardstown functions as a more dominant regional commercial peripheral centrality type, scoring maximum score across retail, food, and employment infrastructure. The centrality does not suffer from a lack of evening uses, but instead, its retail variety and food and hospitality options are incredibly high, implying the regional attraction of the space day and night. The centrality in this case, like other planned areas at the time retains the duality between the new commercial core and the historic linear village core.



Study Area 2: Blanchardstown

Date of Observations: 11.03.2026

1. Service & Amenity Provision

| Indicator          | Observation                                                                                                  | Rating*        |
|--------------------|--------------------------------------------------------------------------------------------------------------|----------------|
| Retail Variety     | Range of retail types present: convenience, comparison, specialist. Note anchor stores vacant units          | ●●●●●          |
| Food & Hospitality | Cafes, restaurants, takeaways, public houses. Day and night economy                                          | ●●●●●          |
| Personal Services  | Pharmacies, hairdressers, banks, ATMs, post offices, general practitioners, dentists, everyday services      | ●●●●○          |
| Employment Anchors | Offices, enterprise, light industry, evidence of daytime working or opposite dormitory/commuter populations  | ●●●●○          |
| Civic & Community  | Libraries, community centres, places of worship, childcare, note opening hours and activities/events         | ●●●●○          |
| Cultural & Leisure | Parks, sports facilities, arts/cultural venues, music, evening & weekend draws, note ownership of facilities | ●●○○○          |
|                    |                                                                                                              | Average: ●●●●○ |

2. Urban Form & Mixed Use

| Indicator          | Observation                                                                                                | Rating*         |
|--------------------|------------------------------------------------------------------------------------------------------------|-----------------|
| Active Frontages   | Proportion of ground-floor units with windows, entrances, displays. Dead frontages (blank walls, shutters) | ●●●●○           |
| Mixed Use          | Vertical and horizontal mixing of residential, commercial, civic. Single-use blocks vs integrated grain    | ●●○○○           |
| Building Condition | State of repair, vacancy, dilapidation, recent investment. Heritage or notable building fabric, land marks | ●●●●○           |
| Street Network     | Grid vs cul-de-sac, permeability, legibility. Ease of navigation without a map                             | ●●○○○           |
| Vacancy Rate       | Estimated % of ground-floor units vacant. Note clustering or spread of vacancies                           | ●●●●○           |
|                    |                                                                                                            | Average: ●●●○○○ |

3. Public Space, Safety, & Waste

| Indicator            | Observation                                                                                                             | Rating*         |
|----------------------|-------------------------------------------------------------------------------------------------------------------------|-----------------|
| Public Space Quality | Squares, plazas, pocket parks. Seating, planting, maintenance, comfort. Programmable vs residual space                  | ●○○○○           |
| Pedestrian Priority  | Pavement width, crossing provision, shared surfaces. Conflict between pedestrian and car movement                       | ●●○○○           |
| Green Infrastructure | Street trees, planters, green roofs, biodiversity, air quality, micro-climate contribution, noise levels                | ●●○○○           |
| Cleanliness & Upkeep | Graffiti, litter, fly-posting. Evidence of local stewardship or neglect, evidence of community collaboration vs council | ●●●●○           |
| Lighting & Safety    | Evidence of lighting, CCTV, natural surveillance, eyes on the street at different times, active & passive               | ●●○○○           |
| Age Friendly         | Play facilities, safe crossings, level surfaces, visually impaired infrastructure, general inclusivity of public realm  | ●○○○○           |
|                      |                                                                                                                         | Average: ●●○○○○ |

4. Accessibility & Transport

| Indicator          | Observation                                                                                                   | Rating*         |
|--------------------|---------------------------------------------------------------------------------------------------------------|-----------------|
| Public Transport   | Bus routes, Luas, rail. Frequency, real-time info, shelter quality, integration. GTFS data alignment          | ●●●○○           |
| Walkability (800m) | Can everyday needs be met on foot? 15-minute city principles, Walk score impression                           | ●●●○○           |
| Cycling Provision  | Protected lanes, bike sharing schemes, cycle parking. Subjective safety for cycling                           | ●○○○○           |
| Car Dominance      | Car prevalence in centrality, car parking quantities, through-traffic volume, rat-running, car-centric design | ●●○○○           |
| Universal Access   | Dropped kerbs, tactile paving, ramp access, audio crossing signal, DMURS compliance evidence                  | ●●○○○           |
|                    |                                                                                                               | Average: ●●○○○○ |

5. Spatial Equity & Social Dimension

| Indicator             | Observation                                                                                                        | Rating*         |
|-----------------------|--------------------------------------------------------------------------------------------------------------------|-----------------|
| Demographic Activity  | Age range of observed users. Evidence of inclusive or exclusionary spaces, note time of day affects this           | ●●●○○           |
| Income Signals        | Equality, look for charity shops, discount retailers, evidence of gentrification pressure or socio-economic stress | ●●○○○           |
| Social Infrastructure | GP, mental health, housing support services, community-facing vs private provision                                 | ●●●○○           |
| Ownership             | Private vs public services and amenities, signage indicating funders, owners                                       | ●●●●○           |
| Democracy             | Evidence of protest, signage, desire for urban improvement, colloquial understanding of area needs                 | ●○○○○           |
|                       |                                                                                                                    | Average: ●●●○○○ |

Service & Amenity Provision:

Despite this immense functional density, civic and community-focused infrastructure feels secondary due to the sheer scale of private commercial activity, operating at a different pace than the traditional, organic village core, which feels segregated and not connected to each other in this case. The density of amenities and services while high, the efficiency use of the land here is low, with low density car orientated development, fragmenting the commercial areas and lack of residential use in the centrality limits the efficiency and is telling people that this space while a high activity centre, is not a space for living or key elements of liveability.



Fig 76. Segregation of types of centralities. Fragmented urban area, due to land ownership and historical development. Source: Author.

Public Space, Safety, & Waste:

In terms of the public realm, there is a large different between the organic main street and isolated commercial type. Dedicated civic public space quality and green infrastructure within the core commercial zones leave much to be desired. The environment is heavily engineered for vehicles and regional focus, meaning pedestrian priority and age-friendly infrastructure score poorly. Navigating between the massive commercial zones involves crossing wide, hostile road layouts and navigating large asphalt parking areas, which severely degrades the active travel experience for vulnerable road users and fails to provide attractive, human-scale nodal gathering points for the centrality.



Fig 75. Blanchardstown OSI Map 1844. Source: National Library of Scotland (2014) Dublin Sheet 14, Ordnance Survey Six-inch to the mile, Ireland. Surveyed 1837–1843.

Urban Form & Mixed Use:

The urban form of Blanchardstown reflects a completely different era of planning layout compared to historic suburban cores, defined by late-20th-century edge-city expansion. The building conditions and vacancy rates score exceptionally well due to continuous private investment and high demand. However, the street network is highly auto-centric, characterized by expansive, single-use retail blocks and surface car parks rather than a fine, integrated urban grain. While there are pockets of newer, high-density residential developments, mixed-use is still largely absent across the primary commercial footprint, leaving the physical form feeling fragmented and heavily segregated by land use.



Fig 77. Commercial Area of Blanchardstown 2002, Source: Blanchardstown Shopping Centre (2002).



Case Area  
Blanchardstown Urban Profile

**Accessibility & Transport:**  
The area sits off the N3 corridor and immediate M50 junctions, making it a massive regional transport attractor. While its public transport baseline relies heavily on high-frequency bus corridors, with bus terminus points in the commercial core on private land, and nearby heavy rail access, its internal environment on a local scale is dominated by vehicular access and urban form configurations supporting this. Consequently, localised walkability (within the 800m catchment) and cycling provisions are of poor quality, this is better in the organic historic main street but still the two areas remain divided.



Fig 78 Commercial Regional Area of Blanchardstown.  
Source: Author.



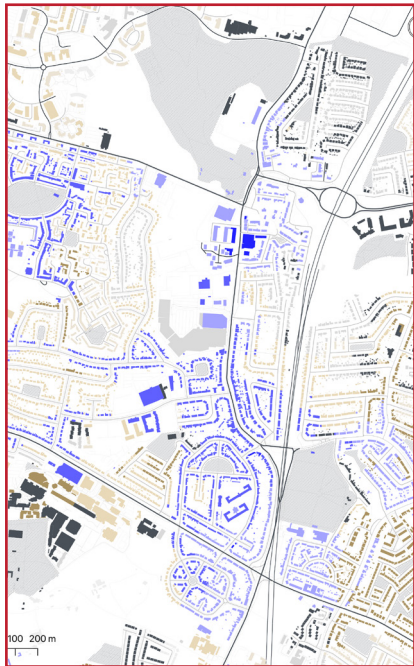
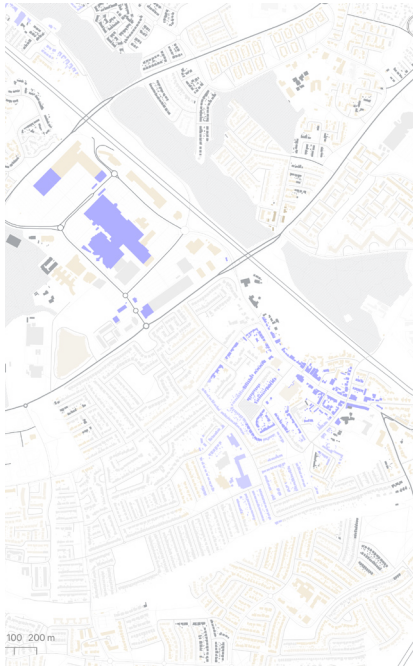
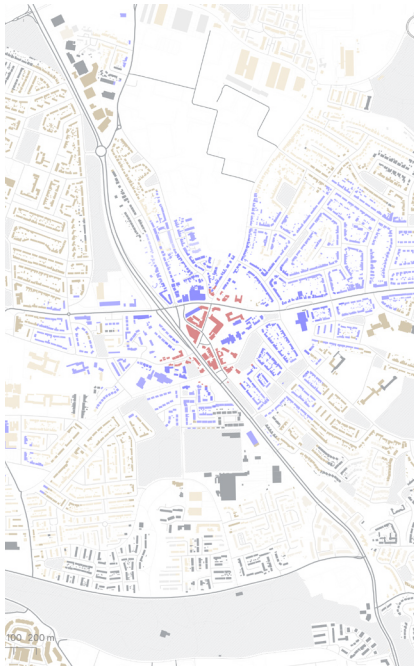
Fig 79. Main Street, organic local core type.  
Source: Author.

S.W.O.T.

| Strengths     | <ul style="list-style-type: none"><li>Regional core with significant metropolitan draw + function</li><li>A historic strong village centre</li><li>Level of amenities + services available is high</li><li>Area has heavy rail line</li><li>High economic value by employment + commercial aspects provided</li></ul>              | Weaknesses | <ul style="list-style-type: none"><li>Duality of regional + local centres providing contrasting interests that clash</li><li>Car centric, walkability low with low levels of permeability + legibility and navigation</li><li>Lack of cycling infrastructure</li><li>Highly paved areas</li><li>Lack of active frontages + large block structure</li><li>Lack of greenery + green infrastructure</li><li>High quantity of car parking</li></ul> |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Opportunities | <ul style="list-style-type: none"><li>Strategic value in the north west of metro</li><li>Utilising transport connections</li><li>Creation of new public space</li><li>Retrofitting urban design + blocks to be mixed use, more walkable</li><li>Proximity to Dublin Airport</li><li>Connection to other peripheral areas</li></ul> | Threats    | <ul style="list-style-type: none"><li>Dominance of Regional Centre</li><li>Conflict between regional &amp; local interests</li><li>Land ownership &amp; intent</li><li>Shared use + joint use agreements</li></ul>                                                                                                                                                                                                                              |

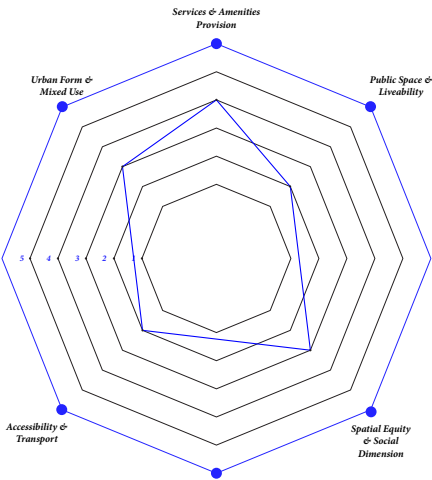
Case Area  
Santry

Santry



analysis

Liveability Performance Results





Case Area

Santry Urban Profile

Service & Amenity Provision:

Santry operates on a much lower functional baseline than the other centralities, scoring low-to-moderate across the board. While it maintains a decent retail variety, due to the Omni Park Shopping Centre acting as its primary anchor, it struggles heavily with localised daily services and civic infrastructure.

|                                   |                                                                                                                         |          |                                  |
|-----------------------------------|-------------------------------------------------------------------------------------------------------------------------|----------|----------------------------------|
| Study Area 3: Santry              |                                                                                                                         |          | Date of Observations: 10.03.2026 |
| 1. Service & Amenity Provision    |                                                                                                                         |          |                                  |
| Indicator                         | Observation                                                                                                             | Rating*  |                                  |
| Retail Variety                    | Range of retail types present: convenience, comparison, specialist. Note anchor stores vacant units                     | ●●●●○    |                                  |
| Food & Hospitality                | Cafes, restaurants, takeaways, public houses. Day and night economy                                                     | ●●○○○    |                                  |
| Personal Services                 | Pharmacies, hairdressers, banks, ATMs, post offices, general practitioners, dentists, everyday services                 | ●●○○○    |                                  |
| Employment Anchors                | Offices, enterprise, light industry, evidence of daytime working or opposite dormitory/commuter populations             | ●●○○○    |                                  |
| Civic & Community                 | Libraries, community centres, places of worship, childcare, note opening hours and activities/events                    | ●●○○○    |                                  |
| Cultural & Leisure                | Parks, sports facilities, arts/cultural venues, music, evening & weekend draws, note ownership of facilities            | ●●○○○    |                                  |
|                                   |                                                                                                                         | Average: | ●●○○○                            |
| 2. Urban Form & Mixed Use         |                                                                                                                         |          |                                  |
| Indicator                         | Observation                                                                                                             | Rating*  |                                  |
| Active Frontages                  | Proportion of ground-floor units with windows, entrances, displays. Dead frontages (blank walls, shutters)              | ●○○○○    |                                  |
| Mixed Use                         | Vertical and horizontal mixing of residential, commercial, civic. Single-use blocks vs integrated grain                 | ●●○○○    |                                  |
| Building Condition                | State of repair, vacancy, dilapidation, recent investment. Heritage or notable building fabric, land marks              | ●●○○○    |                                  |
| Street Network                    | Grid vs cul-de-sac, permeability, legibility. Ease of navigation without a map                                          | ●●○○○    |                                  |
| Vacancy Rate                      | Estimated % of ground-floor units vacant. Note clustering or spread of vacancies                                        | ●●○○○    |                                  |
|                                   |                                                                                                                         | Average: | ●●○○○                            |
| 3. Public Space, Safety, & Waste  |                                                                                                                         |          |                                  |
| Indicator                         | Observation                                                                                                             | Rating*  |                                  |
| Public Space Quality              | Squares, plazas, pocket parks. Seating, planting, maintenance, comfort. Programmable vs residual space                  | ●○○○○    |                                  |
| Pedestrian Priority               | Pavement width, crossing provision, shared surfaces. Conflict between pedestrian and car movement                       | ●○○○○    |                                  |
| Green Infrastructure              | Street trees, planters, green roofs, biodiversity, air quality, micro-climate contribution, noise levels                | ●●○○○    |                                  |
| Cleanliness & Upkeep              | Graffiti, litter, fly-posting. Evidence of local stewardship or neglect, evidence of community collaboration vs council | ●●●○○    |                                  |
| Lighting & Safety                 | Evidence of lighting, CCTV, natural surveillance, eyes on the street at different times, active & passive               | ●●○○○    |                                  |
| Age Friendly                      | Play facilities, safe crossings, level surfaces, visually impaired infrastructure, general inclusivity of public realm  | ●○○○○    |                                  |
|                                   |                                                                                                                         | Average: | ●●○○○                            |
| Accessibility & Transport         |                                                                                                                         |          |                                  |
| Indicator                         | Observation                                                                                                             | Rating*  |                                  |
| Public Transport                  | Bus routes, Luas, rail. Frequency, real-time info, shelter quality, integration. GTFS data alignment                    | ●●●○○    |                                  |
| Walkability (800m)                | Can everyday needs be met on foot? 15-minute city principles, Walk score impression                                     | ●●○○○    |                                  |
| Cycling Provision                 | Protected lanes, bike sharing schemes, cycle parking. Subjective safety for cycling                                     | ●●○○○    |                                  |
| Car Dominance                     | Car prevalence in centrality, car parking quantities, through traffic volume, rat-running, car-centric design           | ●○○○○    |                                  |
| Universal Access                  | Dropped kerbs, tactile paving, ramp access, audio crossing signal, DMURS compliance evidence                            | ●○○○○    |                                  |
|                                   |                                                                                                                         | Average: | ●●○○○                            |
| Spatial Equity & Social Dimension |                                                                                                                         |          |                                  |
| Indicator                         | Observation                                                                                                             | Rating*  |                                  |
| Sociographic Activity             | Age range of observed users. Evidence of inclusive or exclusionary spaces, note time of day affects this                | ●●●○○    |                                  |
| Price Signals                     | Equality, look for charity shops, discount retailers, evidence of gentrification pressure or socio-economic stress      | ●●●○○    |                                  |
| Infrastructure                    | GP, mental health, housing support services, community-facing vs private provision                                      | ●●○○○    |                                  |
| Ownership                         | Private vs public services and amenities, signage indicating funders, owners                                            | ●●○○○    |                                  |
| Agency                            | Evidence of protest, signage, desire for urban improvement, colloquial understanding of area needs                      | ●●○○○    |                                  |
|                                   |                                                                                                                         | Average: | ●●○○○                            |

Urban Form & Mixed Use:

The physical fabric of Santry shows extreme fragmentation, scoring poorly on structural cohesion. The most apparent issue is active frontages, with a lot of blank facades, surface parking buffers, and commercial boundary walls. The spatial layout is a typical single-use suburban design, Mixed Use, Building Condition, Street Network, and Vacancy Rate all score low. Instead of a fine, integrated urban grain or residential development above active ground floors, Santry is defined by a long linear, car-centric, big-box commercial layouts and low-density housing clusters that severely lower local permeability and spatial legibility. Dividing on the neighbourhood scale.



Fig 80. Santry OSI Map 1837.  
Source: National Library of Scotland (2014) Dublin Sheet 14, Ordnance Survey Six-inch to the mile, Ireland. Surveyed 1837–1843.

Public Space, Safety, & Waste:

The public realm in Santry presents a highly sanitised but hostile environment for pedestrians. Green Infrastructure and Cleanliness & Upkeep manage a moderate score, reflecting reasonable landscape maintenance along the main corridors and shopping center property. However, genuine civic infrastructure is non-existent, e.g. no library. Public Space Quality, Pedestrian Priority, Lighting & Safety, and Age Friendly infrastructure score low. The entire area is geared towards car efficiency, lacking attractive nodal gathering spaces, social plazas, or porous, human-scale spaces, creating a public realm that offers little to no comfort or civic draw.



Fig 81. Expression of local frustration of lack of strategy in planning the centrality.  
Source: Author.

Accessibility & Transport

Despite having a bypass, it is positioned directly along the Swords Road (R132) strategic corridor connecting Dublin Airport to the city centre, the public transport options are reasonable due to high-frequency bus routes. However, the internal layout is entirely hindered by infrastructure designed for this regional traffic. Walkability (800m), Cycling Provision, and Universal Access all score poorly. The space is defined by large roads and junctions, with minimal pedestrian priority, which degrades the active travel experience and disconnects the local catchment in conjunction with the urban form it has created a very linear centrality.



Fig 82. Main Street of Santry.  
Source: Author.



Case Area  
Santry Urban Profile

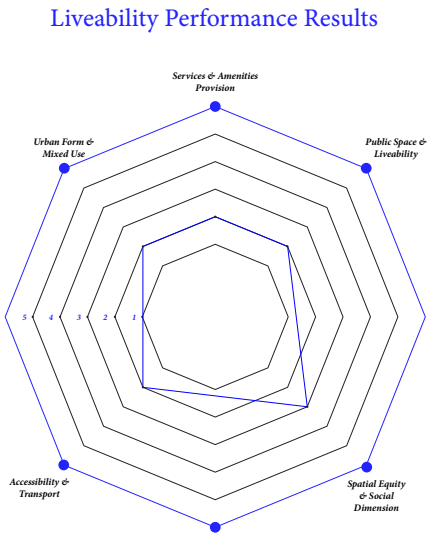
**Service & Amenity Provision:**  
The social dimension of Santry is distinctly marked by private retail dominance and socio-economic transition along its main axes. Its Demographic Activity, Income Signals, Social Infrastructure, Ownership, and Democracy indicators all hold a consistent, moderate score. While there is a stable residential community nearby, the commercial core functions as a corporate, heavily monitored pseudo-public space rather than a truly democratic civic center. Private corporate interests dictate the usage and management of the primary spaces, leaving little room for visible community space, local spatial democracy, or dedicated public infrastructure that directly addresses local socio-economic nuances.



Fig 83. Commercial Area of Santry.  
Source: Author.

S.W.O.T.

|           |                                                                                                                                                                                                                                                                                                                                                 |            |                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Strengths | <ul style="list-style-type: none"><li>Nearby to a university</li><li>Economic value + strength of the area</li><li>Mobilisation of the community</li><li>Proximity to City Centre</li></ul>                                                                                                                                                     | Weaknesses | <ul style="list-style-type: none"><li>Lack of identity</li><li>Lack of active street frontages</li><li>No public and gathering spaces in the core</li><li>Car Centric, high proportion of car parking, lack of pedestrian crossings, walkability low</li><li>Lack of age friendly infrastructure</li><li>Lack of greenery + green infrastructure</li><li>Few amenities + facilities, those that are there are located within the shopping centre</li></ul> |
|           | <ul style="list-style-type: none"><li>Increasing the walkability</li><li>Proximity to City Centre</li><li>Creation of new public space</li><li>Extracting the identity in the area</li><li>Presence of large vacant + derelict sites</li><li>Linking with the nearby university</li><li>Giving the area a metropolitan scale function</li></ul> |            | <ul style="list-style-type: none"><li>Land ownership &amp; development intent</li><li>Lack of converging natural nodal points</li><li>Shared use + joint use agreements</li><li>Space for green infrastructure</li><li>Opposition to transition of neighbourhood centre</li></ul>                                                                                                                                                                          |



Case Area  
Santry

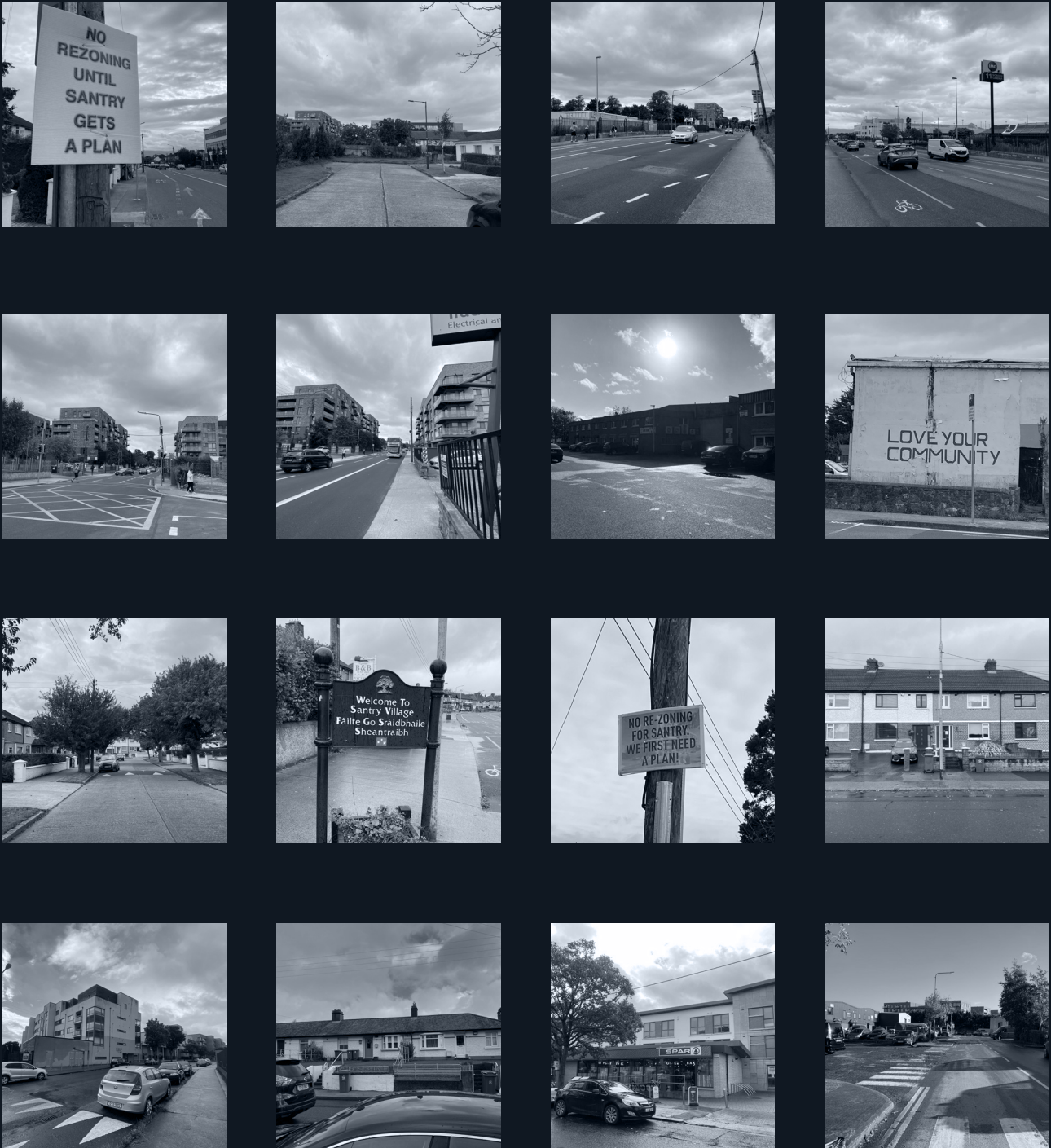


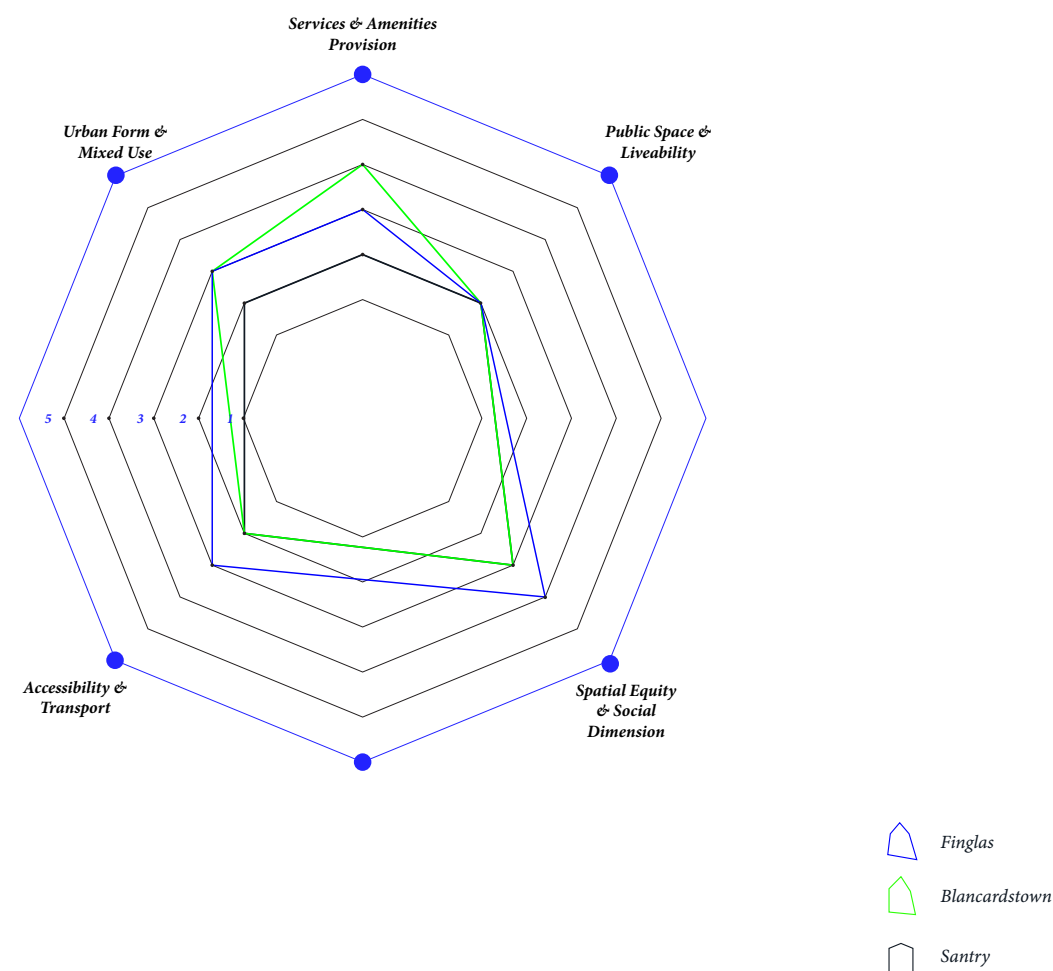
Fig. 84. Photographs of Santry March 2026  
Source: Author.



**Case Area**  
**Conclusions**

From the types analysis, on the ground it is found that there is varying spatial qualities in the centralities, that show in different forms and thus level of activities. The elements of liveability however differencate the most between these areas. There are contrasts that exists between the functional capacity of these nodes. Blanchardstown operates as a hyper-dominant, high-intensity regional economic centrality. On the other hand, Finglas and Santry currently function more as as local and district levels. While Finglas retains a solid, self-contained civic and community base rooted in its historic village identity, Santry scores the lowest functionally, relying almost entirely on its shopping center anchor while lacking components of liveability in the centrality.

**Liveability Performance Results**  
**3 Areas Comparision**



Moving into the design phase, the interventions cannot use a one size fits all approach depending on the type of centrality:

- \* **Finglas** requires breaking down infrastrucutral boundaries, creating public spaces, drawing on the historical and organic nodal point of the centrality. Connecting the sides of the centrality.
- \* **Blanchardstown** requires a largers scale district plan, governance and masterplanning focus that bridges the gap between the urban village and private ownership commercial core, converting surface car parks, and monouse areas into,vertical mixed-use residential liveable areas.
- \* **Santry** requires structural reconfiguration to create public spaces and civic uses. The commercial activites here are largely in the incorrect unit types, allowing opportunities for transformation. The by-pass, location along radial route to centre and airport, along with a nearby university campus, shows the potential for a shift in centrality type to be more intensive.

# A Multiscalar Metropolitan Area

*Multi-Scalar Metropolitan Region*

*Metropolitan Scale Design Interventions*

*Designing Peripheral Centralities*

*Planning Peripheral Centralities*

*Public Space Design*



Growth Corridors

North City:

As is established the city has grown in a radial manner, this plan proposes a series of strategic growth corridors throughout the city for this in between scale of local and regional. The radial growth corridors are shown below in a single blue line while the orbital corridors are represented with a dashed blue line.

Growth corridors have a specific function and qualities that differ to the centralities themselves. Their role is catering to the Metropolitan scale movement and scales supporting and connecting the peripheral centralities themselves.

Fig.85, North City Corridors Proposal,  
Source: Author.

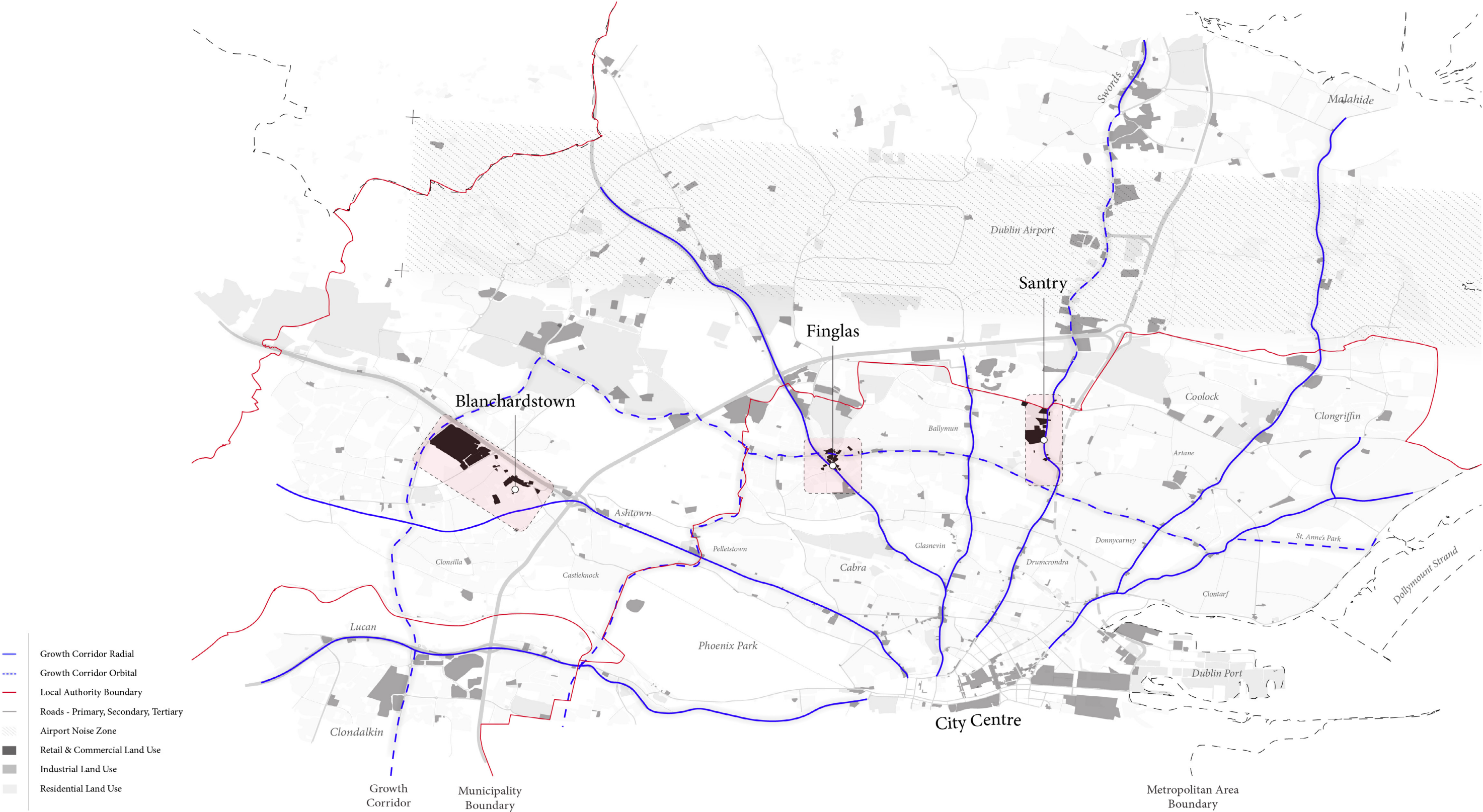
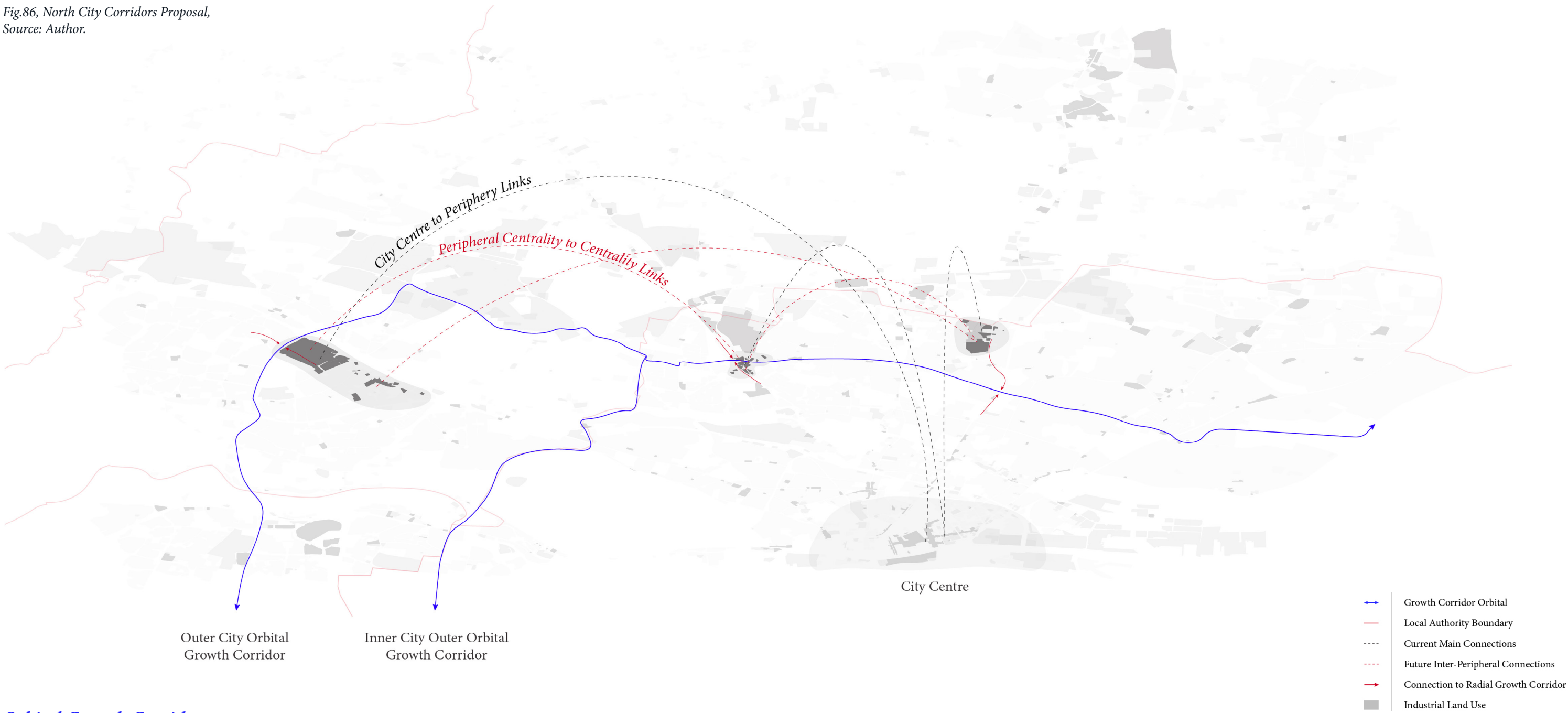


Fig.86, North City Corridors Proposal,  
Source: Author.



### Orbital Growth Corridors

#### Outer & Inner City:

In addition to the radial growth corridors, orbital growth corridors are also proposed. Here, the focus is on the peripheral centralities becoming part of an orbital city structure. The centralities will form part of the key crossing points along the corridors in general, but they will work in harmony to form a strong outer and inner level of new important peripheral places across the metropolitan area.

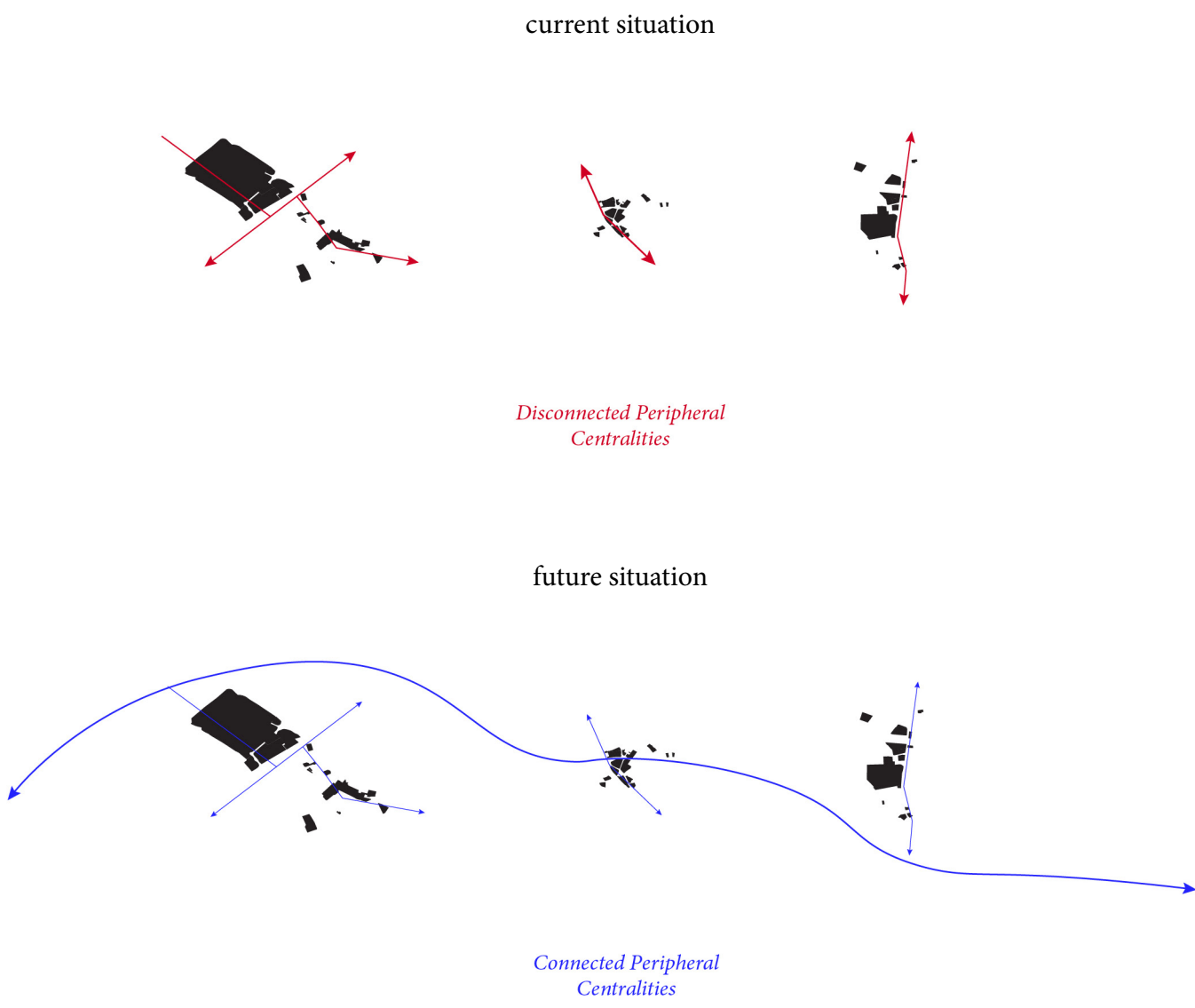
The growth of the peripheries should not contribute to sprawl or be a validation of such but rather the growth will be contained, co-ordinated in and around the centralities, and along the growth corridors. This will help the metropolitan region to grow stronger while connecting and providing a network of liveable, attractive, and a functional peri-urban city that is not solely reliant on the city centre.

Taking the case areas as examples, the orbital corridor here aims to connect the areas via the

The spatial qualities will vary along the orbital corridors vs the radial ones. The orbital corridors in this case focused in the peri-urban area of the city. This will require an alternative scale as the capacity of the orbital street network and opportunity for up scaling is more limited than the radial corridors, which have already been established for growth or have centralities long them which are of a larger scale. This makes the crossing points of the corridors important areas for activity.



Fig.87, Orbital Corridors Proposal,  
Source: Author.



Plan Allocation & Co-Ordination

Each case area is given a plan based on the respective suitability for the centrality.

- Step 1: Designation in the Local Authority's Development Plan
- Step 2: Choosing a suitable area plan
- Step 3: Implementing Multi-Scalar Design + Policy Principles

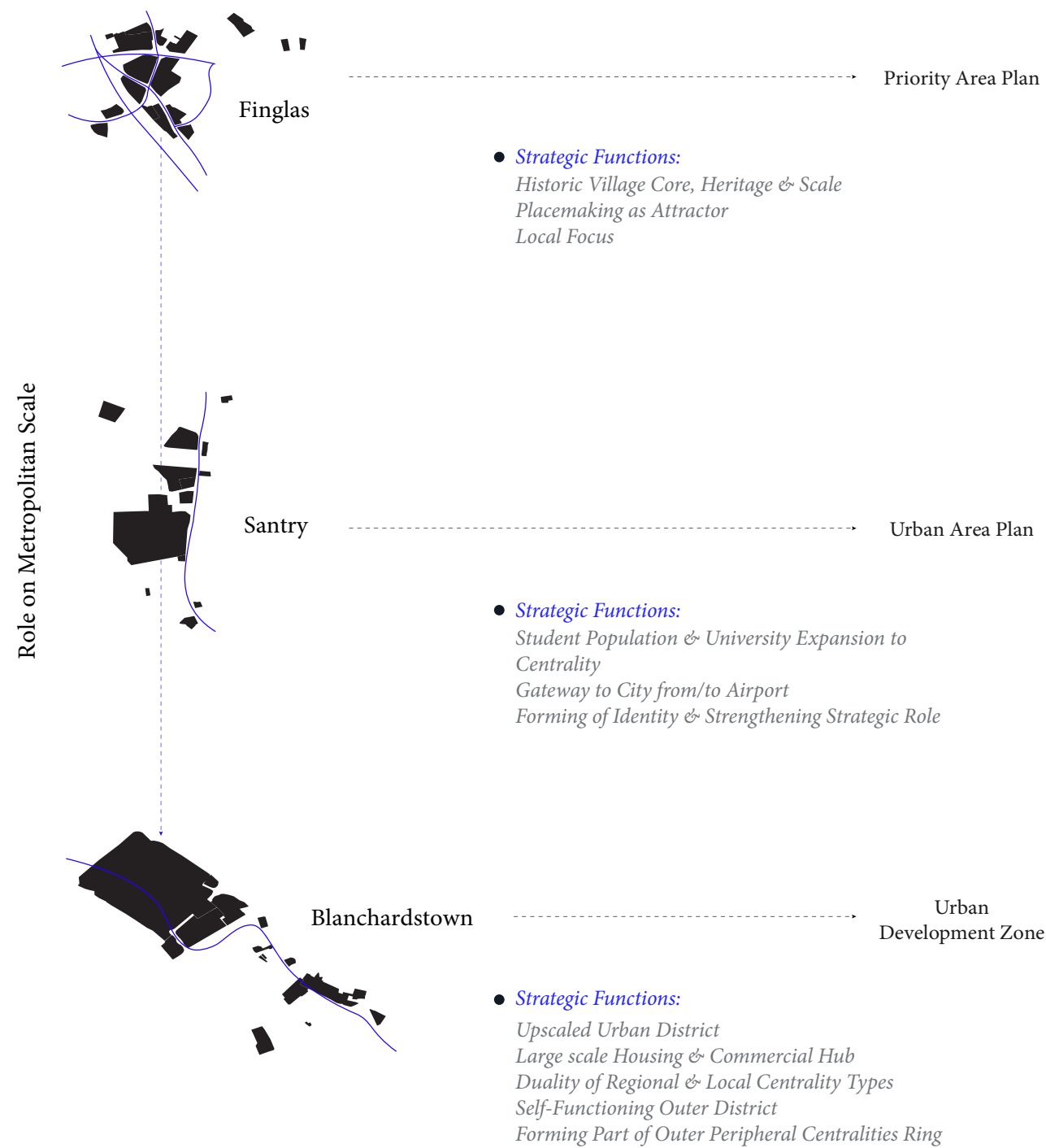


Fig.88, Plans, Areas, & Strategies Metropolitan Scale  
Source: Author.

This plan type is chosen due to the current scale of this centrality and potential for transformation. The area is village like in scale with a number of historic buildings meaning the interventions and protection of the centrality is vital to its success.

Santry could be subject to an UAP due to its Metropolitan scale and function potential. Nearby is a major university and the airport, alongside a significant amount of light industrial lands this creates the conditions suited to larger scale transformation, allowing the area to absorb population growth provided components of liveability are being met.

The largest plan type is applicable in this case, with two distinct centrality types nearby, one that functions primarily on a local scale and one on a regional scale. The area could become a significant district that can be fully self-sufficient in the Metropolitan Region, a key centrality in the outer peripheral centralities, forming

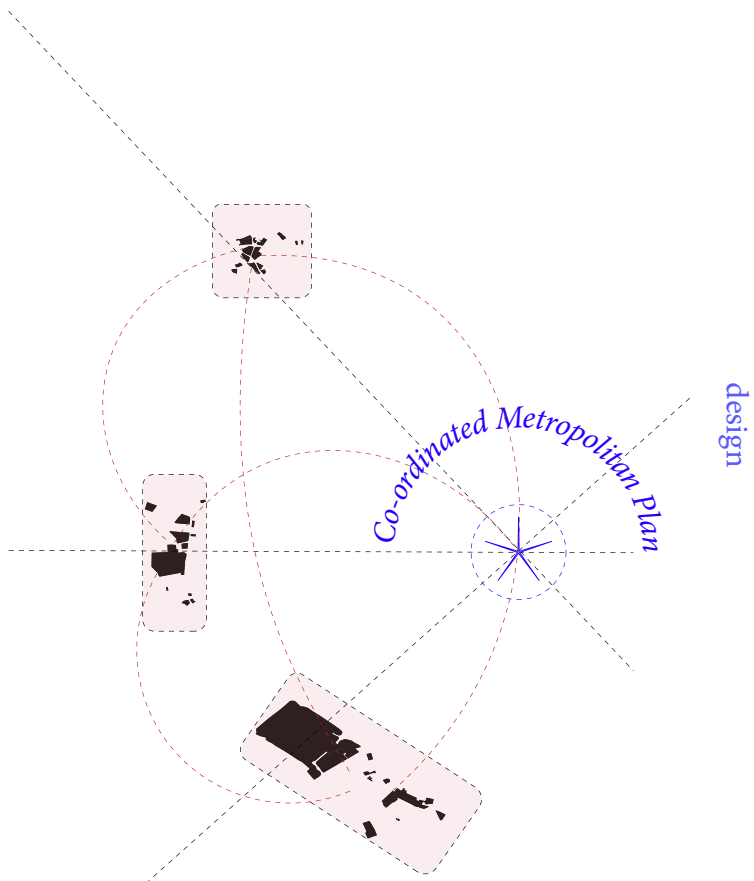


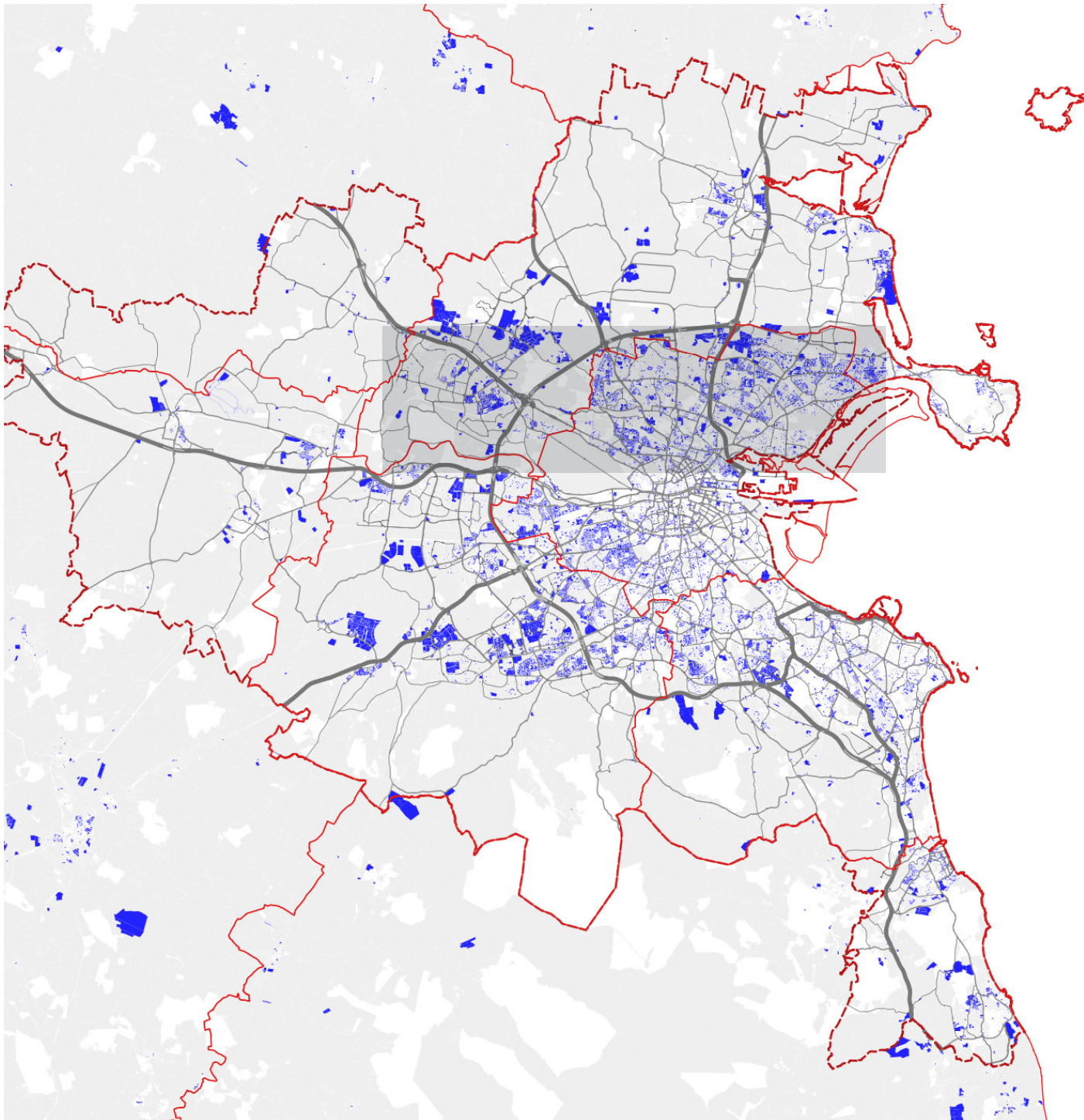
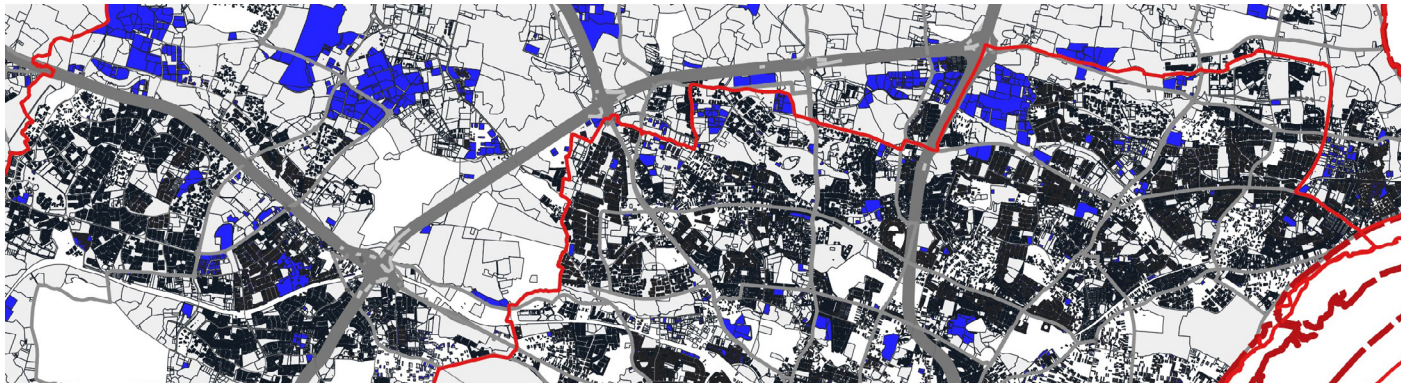
Fig.89 Coordinated Plan Metropolitan Scale  
Source: Author.



Land Ownership

Fig.90, Indication of Land Ownership Cadastral Data  
Leasehold & Freehold.  
Source: Tailte Eireann.

leasehold freehold

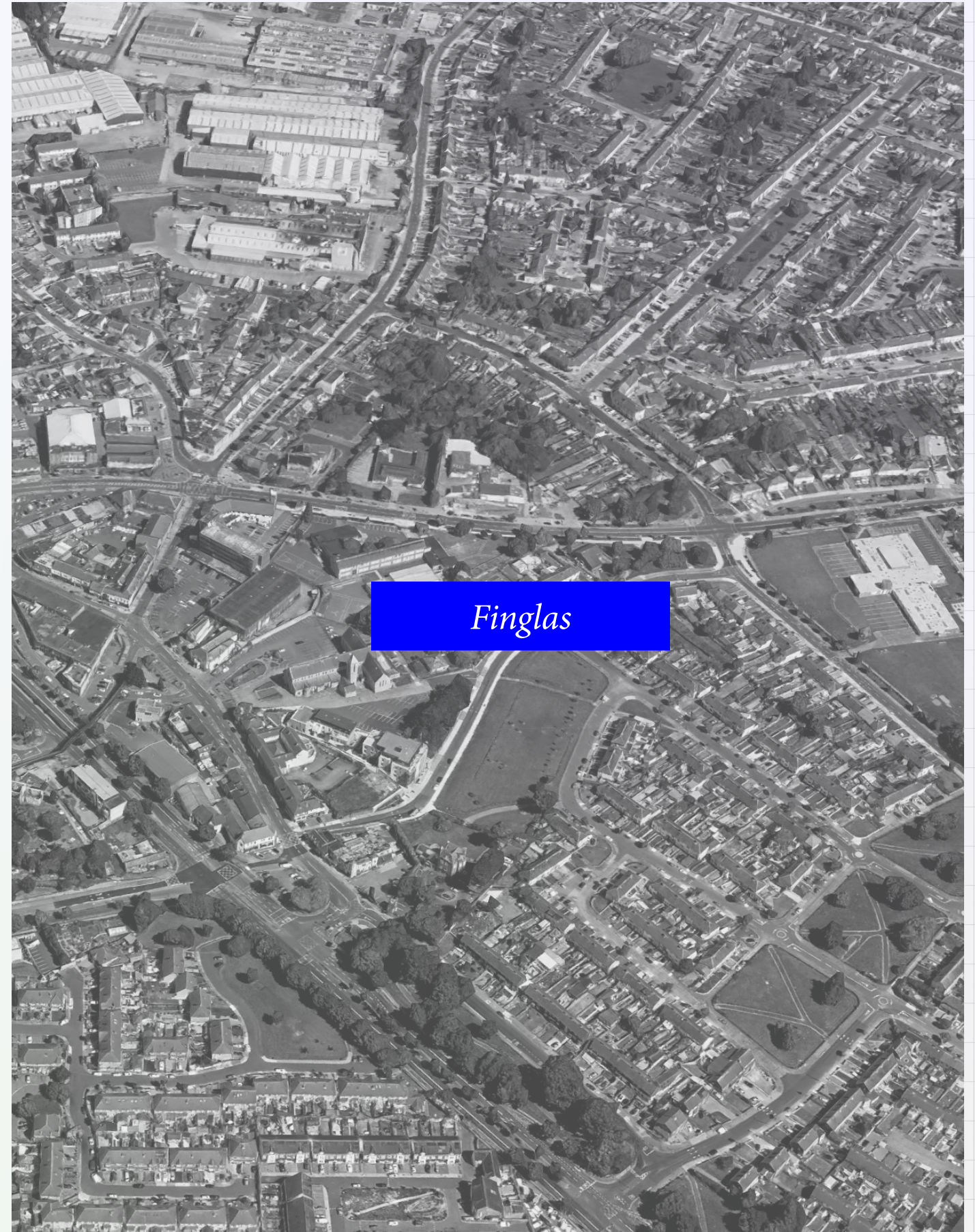


*Retrofitting Peripheral Centralities*





Fig.91 Satellite Imagery Finglas.  
Source: Apple Maps.



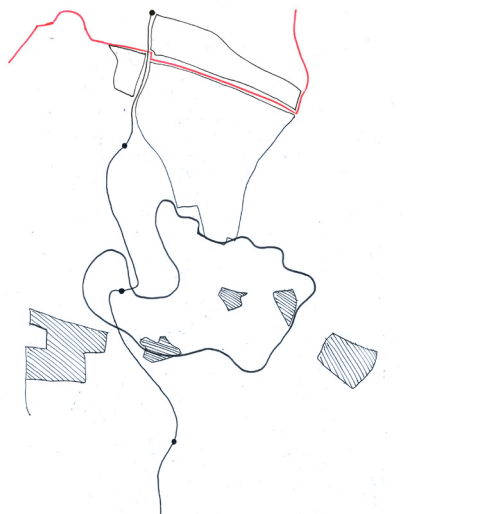
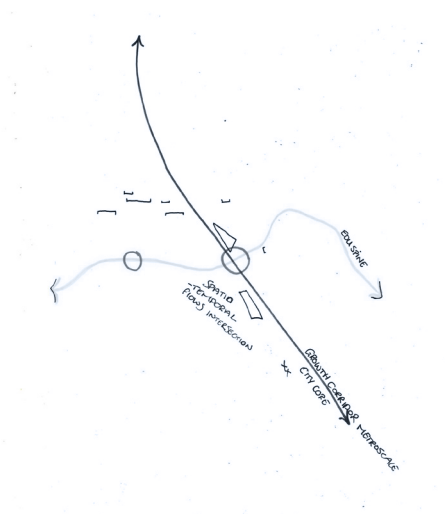
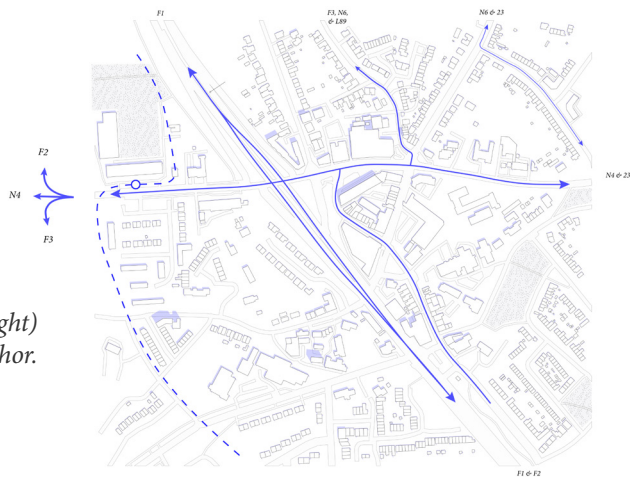


Experimenting with Design Capacity:

Finglas Centrality Type Capacity Experimentation of Potentials for Transformations:

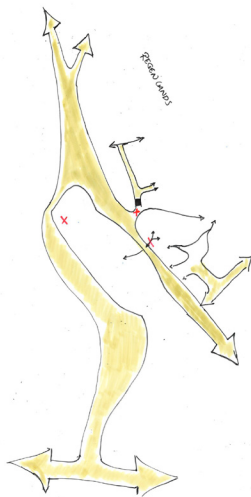
This section of the report moves towards designing the centrality type for Finglas. Sketches are shown of the design exploration of possibilities with regard to the previous analysis and growth corridor proposals.

Fig 91. Public transport network (right)  
Source: Author.



Social local axis in contrast to regional axis

Public transport and education uses with centrality boundary and local authority boundaries (red)



What is the green space network potential



Internal green network



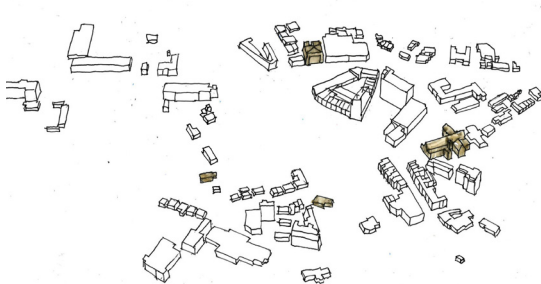
Combined network of green spaces operating at different scales



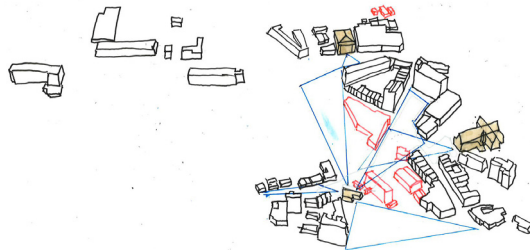
Green spaces and main crossing points and road network overlaps



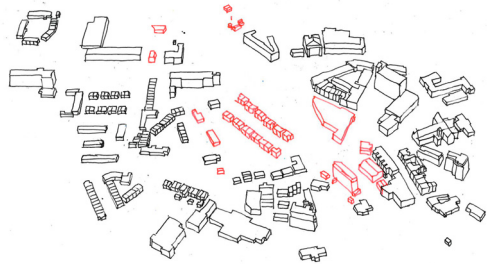




Landmark and heritage buildings



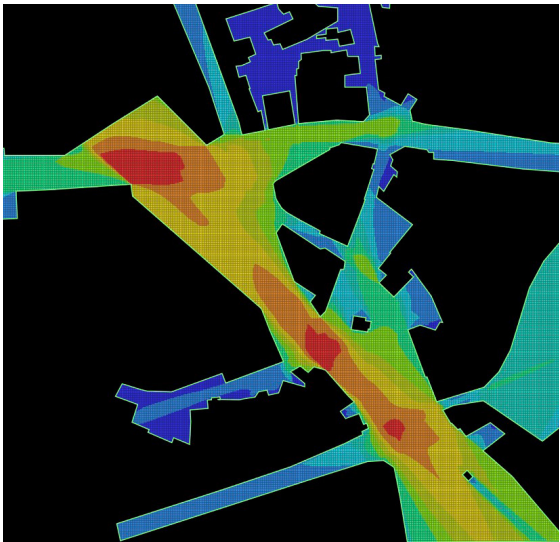
Reviewing sightlines and landmark buildings as guiding principles



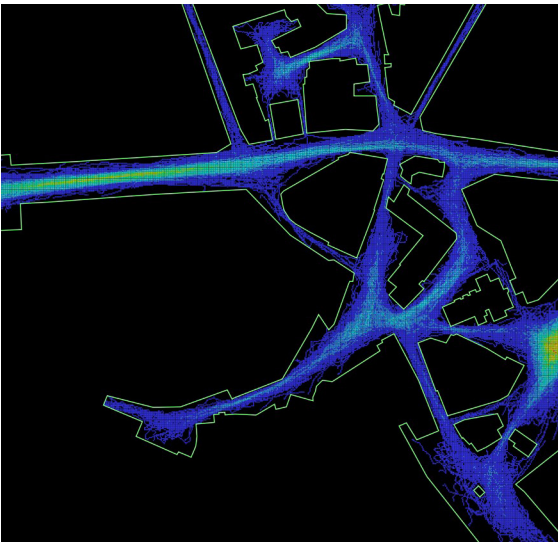
What could be removed and kept



Upscaling the neighbourhood and public space creation



Where are the most viewed spaces



How would people move through the space

Fig 93. Depthmap Analysis  
Source: Author.

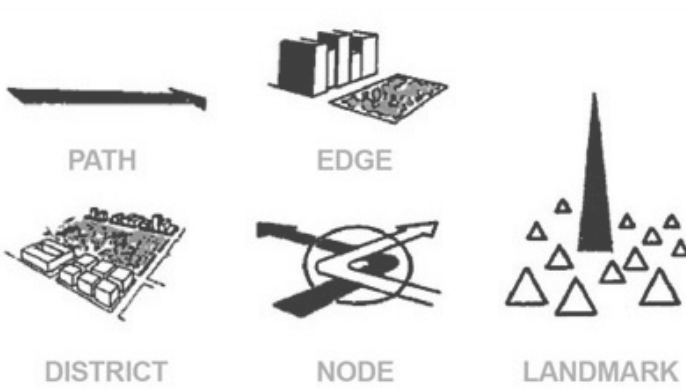
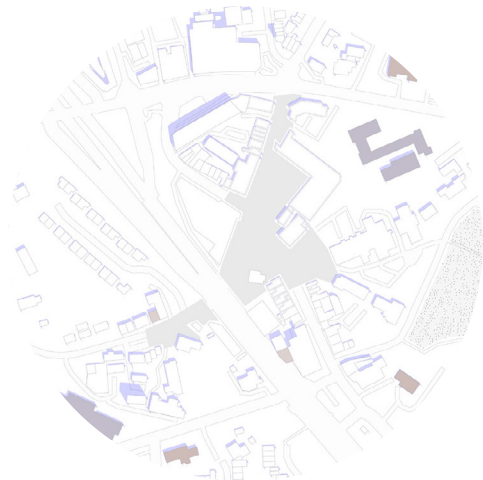


Fig 93. Image of the City  
Source: Lynch, (1960)

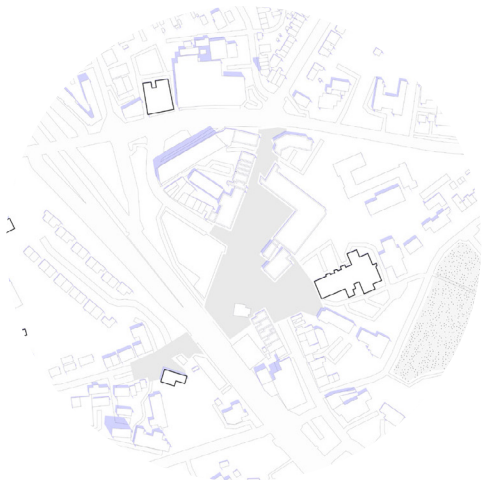
Key Design Principles: Urban Village

Finglas Centrality Future:

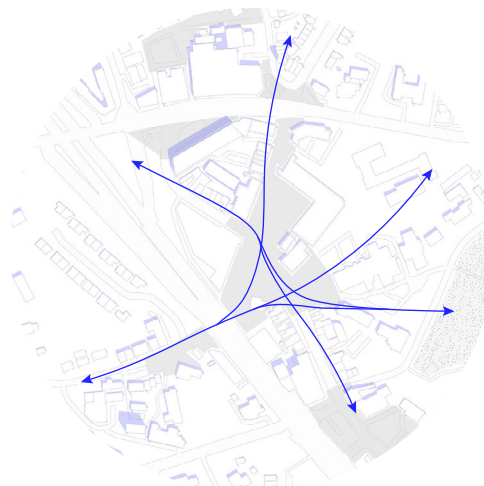
The following key design principles are drawn out for this centrality type to increase liveability.



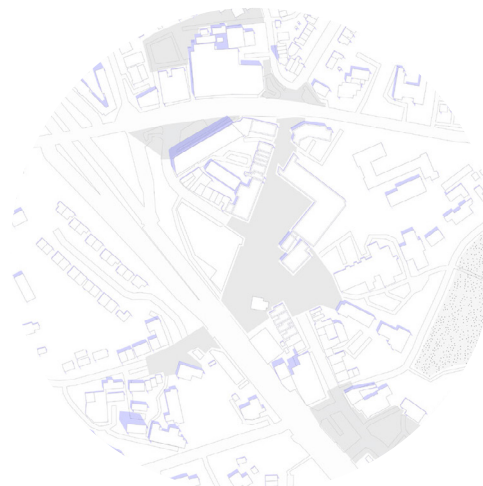
Place civic buildings by public space & vica versa



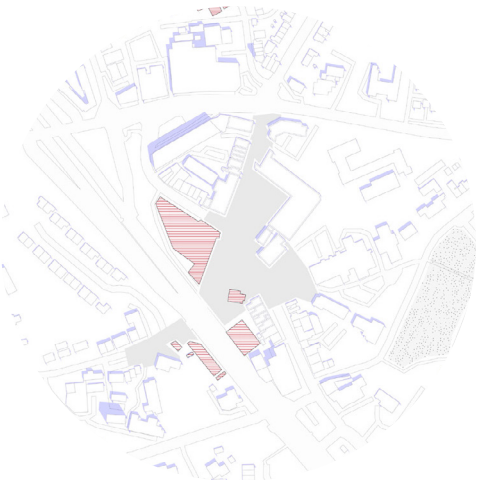
Noting the landmark buildings for sense of place, identity, and legibility creation



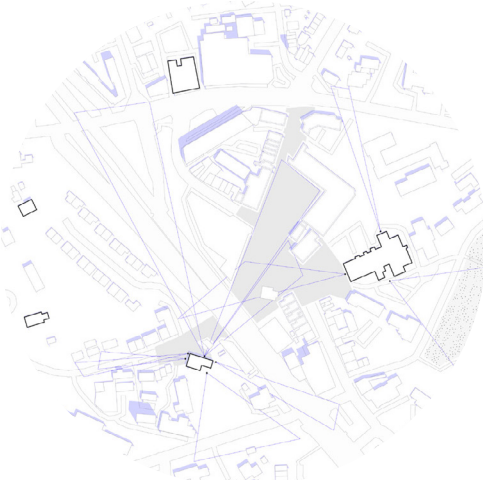
Improving permeability and legibility  
Connecting the centre east-west once again



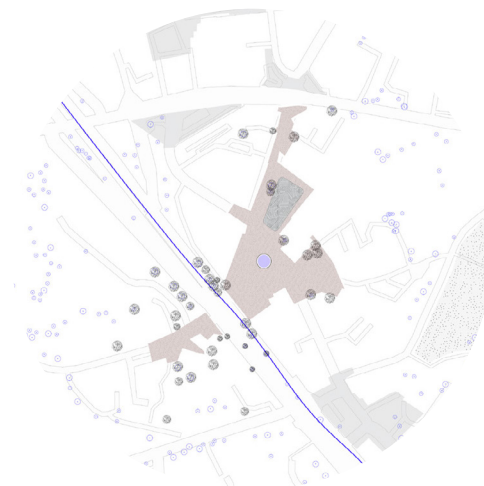
Creation of public square network with key focal point



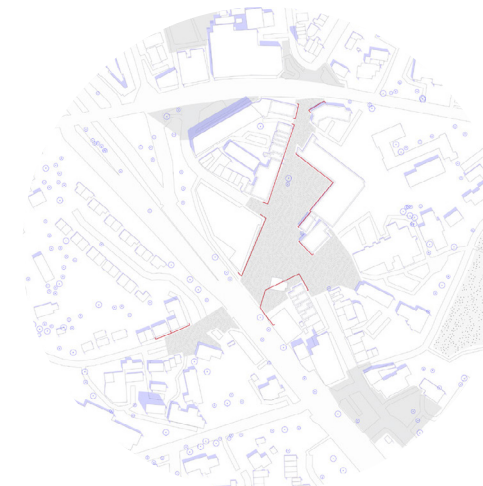
Removing unsuited buildings due to quality, scale, use, and orientation



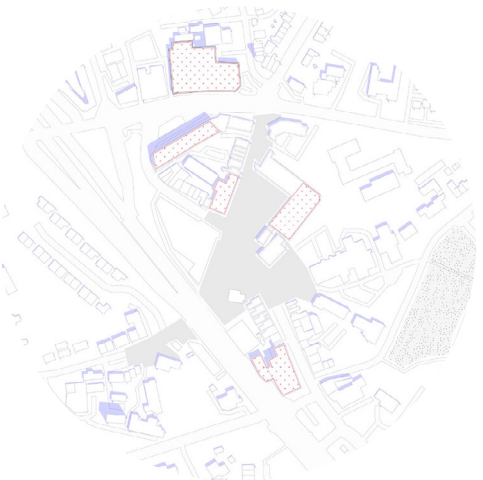
Reviewing sightlines from landmark buildings



Introducing a green network and re-exposing the stream into the public space



Active ground floor mixed use frontages on the main public space



Densifying existing buildings for passive surveillance and mixed use



Proposing new buildings for intensification and utilisation of land

Fig 95. (Above)Design Principles.  
Source: Author.



Strategic Actions: Urban Village

Finglas Centrality Future:

The following conceptual conclusions are provided for the retrofitting of the area to increase liveability.



Fig 96. BB Section Finglas, see page 162.  
Source: Author.

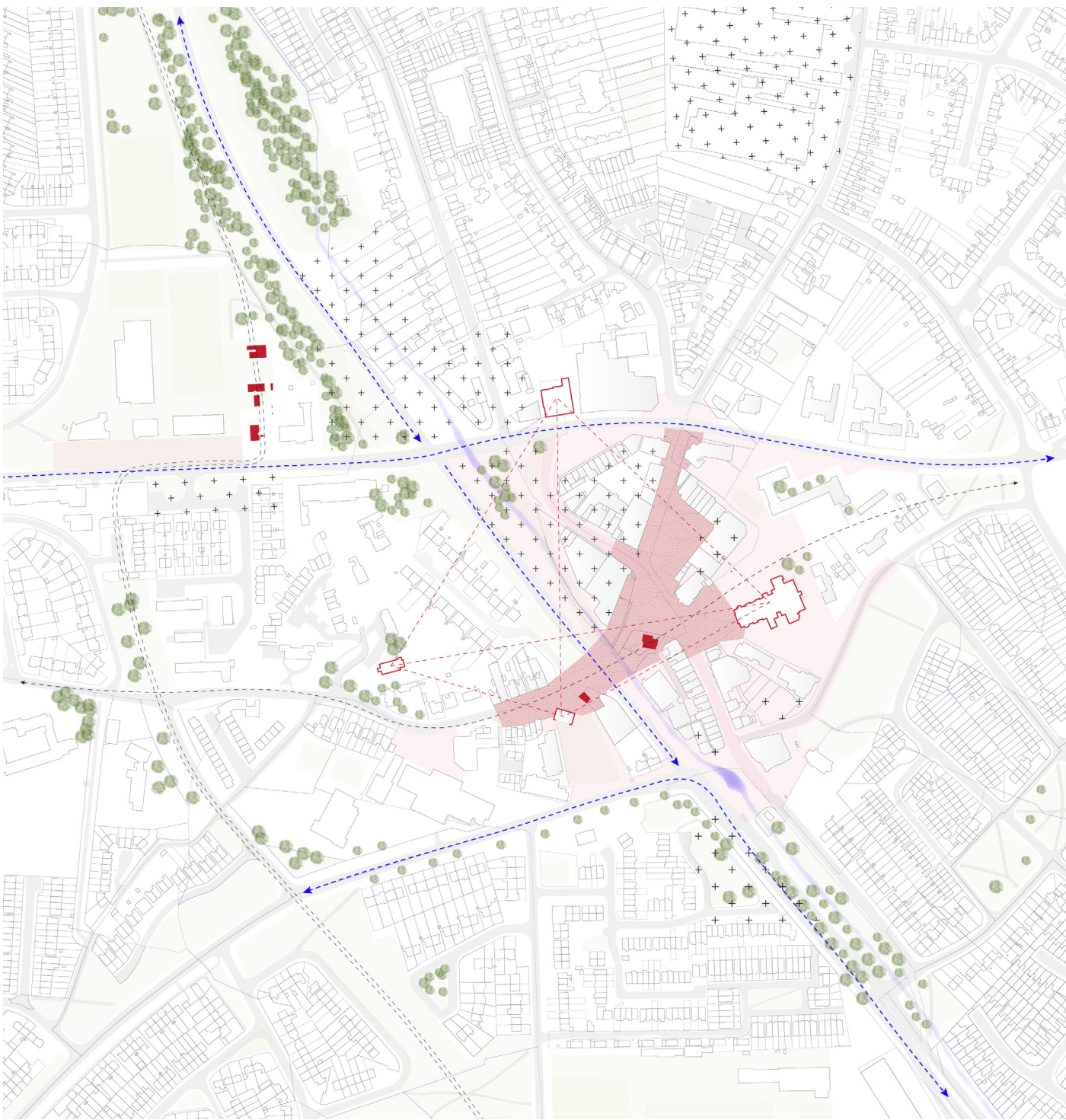
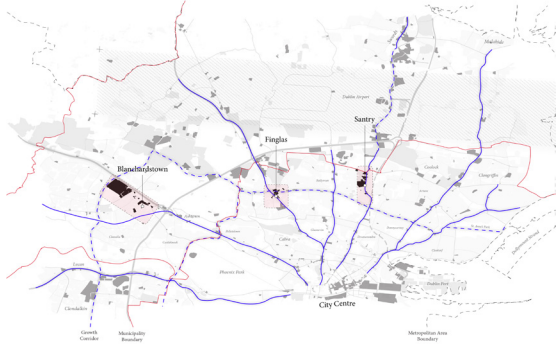


Fig 97. Conceptual Plan Finglas  
Source: Author.

Finglas Centrality Future:

Drawing out the identity of the place, the proposals draw out the historic value in the centrality, using monument and landmark buildings (highlighted in red above) to be guiding factors in the design of the public space. In addition, the uses such as civic are considered. The exposing of the stream allowed a green network to be connected on the larger scale while the local scale becomes more connected to the stream in which it gets its name after. The Finglas Bypass road is significantly narrowed, and changed to one way to facilitate local connections and creation of public spaces. It will no longer function as a bypass. Mixed use is introduced.





Current Context

Summary of key issues in the main part of the centrality.

Fig 98. Axonometric of Centrality Finglas Spaces for Transformation  
Source: Author.

- Large Divisive Regional Roads
- Dispersed Civic Uses
- Human Centric Green Space
- Lack of Attractive Focal Points - Core Gathering Spaces
- Under Utilised Car Centric Public Spaces
- Hidden Natural Elements (Stream)
- Disconnected & Underutilised Landmark Buildings & Lack of Identity
- Potential Infill & Den-sification Spaces



design



Strategic Actions: Urban Village

Finglas Centrality Future:

The following urban planning and design interventions are recommended for this centrality type.

LUP1

Plan Area  
Designation

LUP2

Growth  
Corridor Node

DP1

Drawing on  
Heritage for  
Identity &  
Placemaking

DP1

Regional Scale  
Public Space

DP1

Creating  
Local Scale  
Functional Pub-  
lic Space

DP1

Connecting &  
Strengthening  
Green Spaces

DP1

Re-exposing the  
Stream

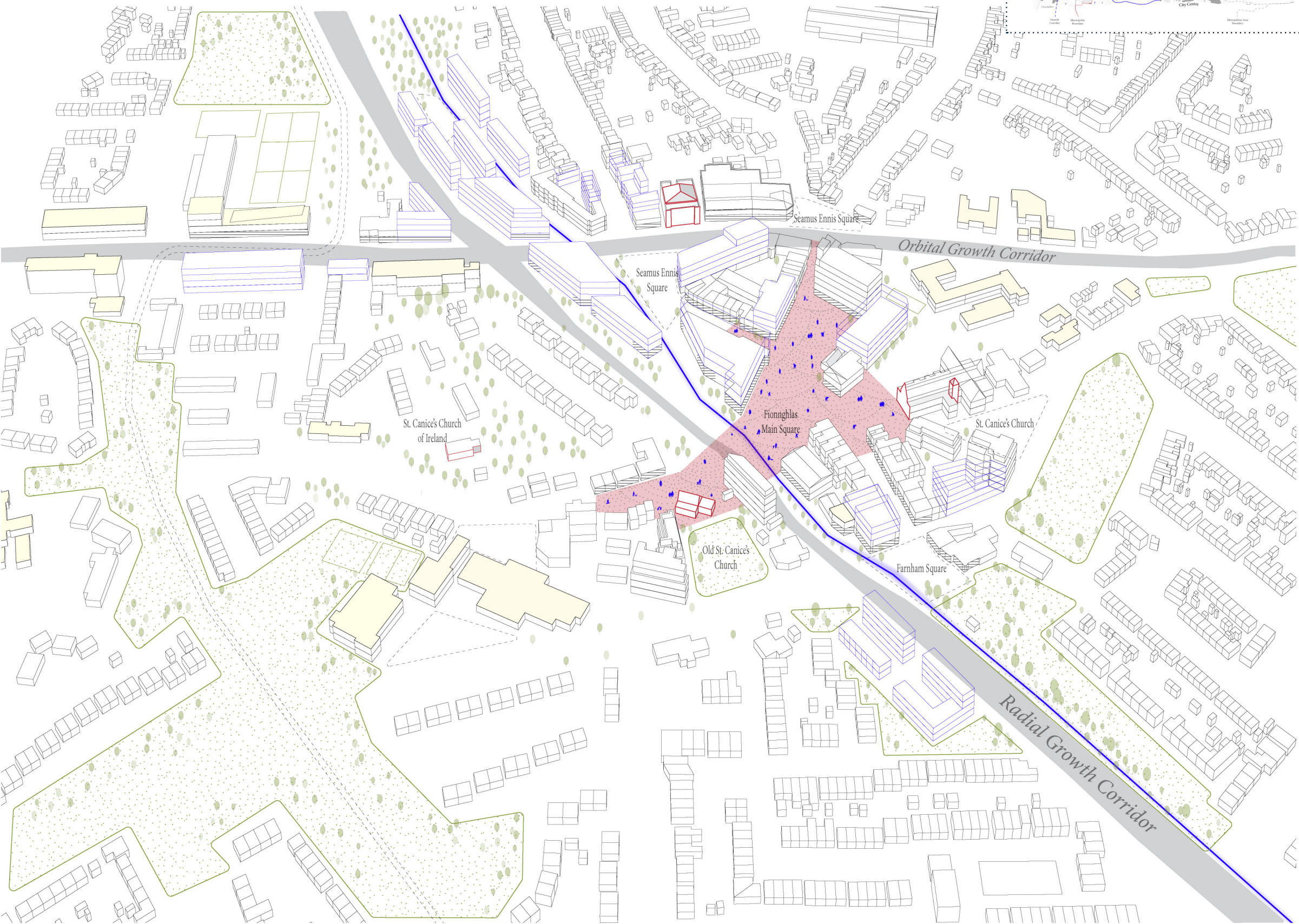
FP3

Integrating &  
Connecting  
Civic Uses

LUP1

Denisification  
& Mixed Use  
Expansion

Fig 99. Axonometric of Centrality Finglas Retrofitted  
Source: Author.



DESIGN & POLICY INTERVENTIONS -  
POLICY FOLLOWS DESIGN PLEASE REFER TO POLICY  
SECTION (IN COMING PAGES) FOR MORE DETAILS



Public Space Design

Main Square:

The Main Square of Finglas Centrality sits at the intersection of a cultural local axis that connects the civic amenities in the neighbourhood along with the two types of growth corridors, making this point a strategic key point in the city scale network of spaces.

Here it is proposed to create significant increase in public spaces with varying functions. The aim here is to facilitate and draw out the functional and identity of the neighbourhood through public space design, placing the historic heritage ‘landmark’ buildings’ at the heart of these spaces.

The regional dual carriageway that once divided the neighbourhood is significantly reduced, while it will remain a transport corridor as it is a key radial growth corridor, its expansiveness is drastically reduces to facilitate the local level programme for increased liveability at this location. The road will be reduced to being only one way southbound with traffic calming measures in place.

While the reduction of the scale of the road helps connect the neighbourhood, the element of the elevational differences between the eastern and western side of the neighbourhood remains, this is utilised as a quality of the space. The Main Street and core centrality lies upon a hill. This will be used as an advantage in the public space to frame the landmark buildings, create a multi-function tearoom space to create identity and placemaking.

Wayfinding elements will be introduced that are consistent across the peripheral centralities within the metropolitan area to signal the type of place that people are in and create a most holistic and cohesive city area.

Fig 100. Photographs, Urban Design  
Source: Dún Laoghaire Rathdown County Council (2025),  
Handyside Gardens, Kings Cross (n.d.).

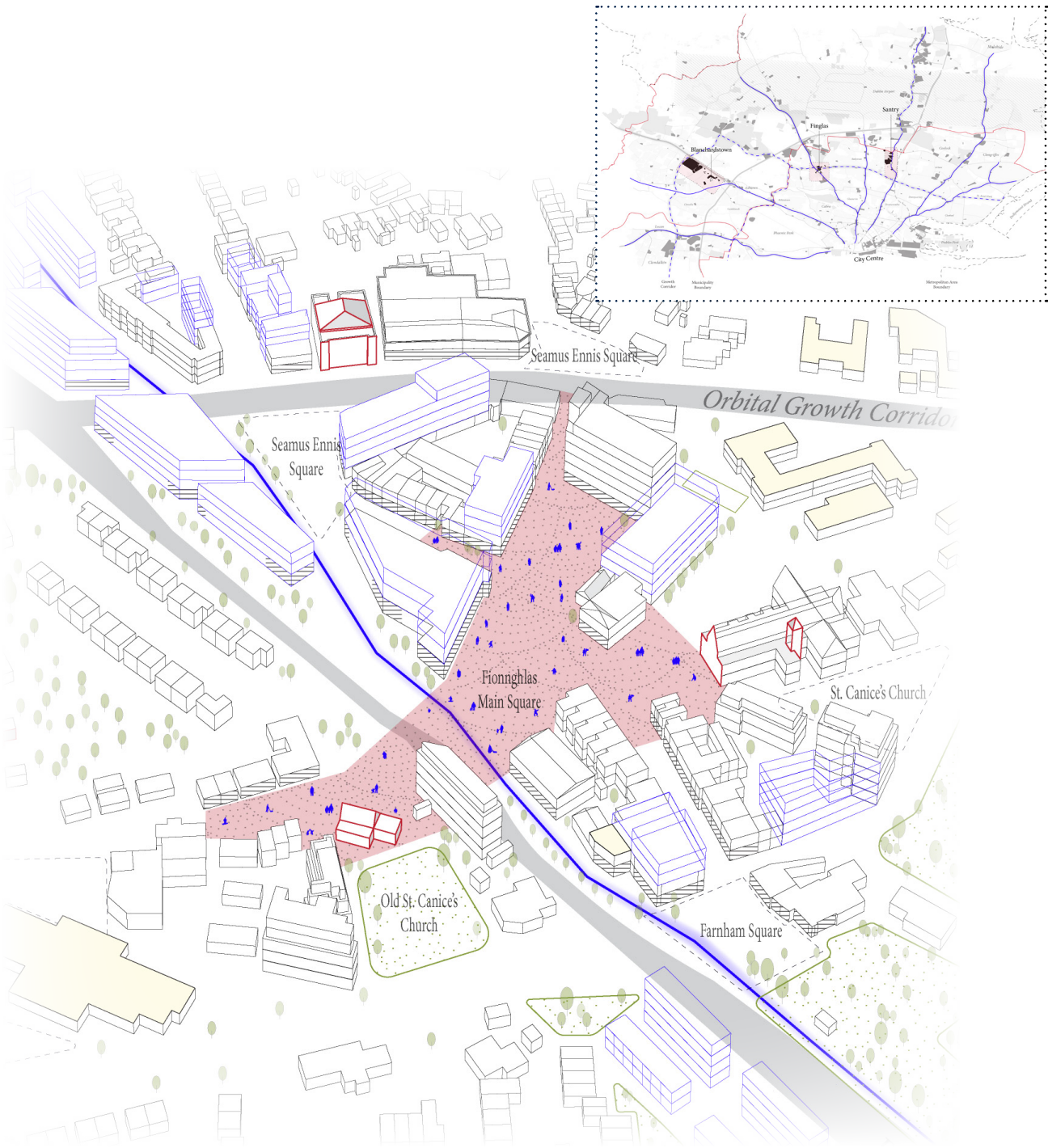


Fig 101. Axonometric of Centrality Finglas Retrofitted  
Source: Author.

Environment

The area will once again see the stream that it got its name after be re-exposed in an attempt to connect the people to the place. The stream feeds into the Tolka Valley River and will therefore form part of the metropolitan system of green blue spaces. Here the water will also be used as a placemaking ‘tool’. Parts of the area have been flooded in the past and this will help to decrease the risk of flooding while providing an attractive urban space. The green spaces will be more connected by the public space as the new spaces will incorporate more sustainable design.

Neighbourhood Upscaling:

Alongside vast public space increase, it is proposed to upscale the neighbourhood by densification of the centrality’s existing buildings and utilising infill sites to deliver increased residential and mixed use capacity for the centrality. Many of the current buildings where once suited and represented the areas peripheral location will be replaced and upscaled to reflect this adjustment of the centrality on the metropolitan scale.





Fig 102. (Above) Public Space Design Finglas.  
Source: Author.

AA Section

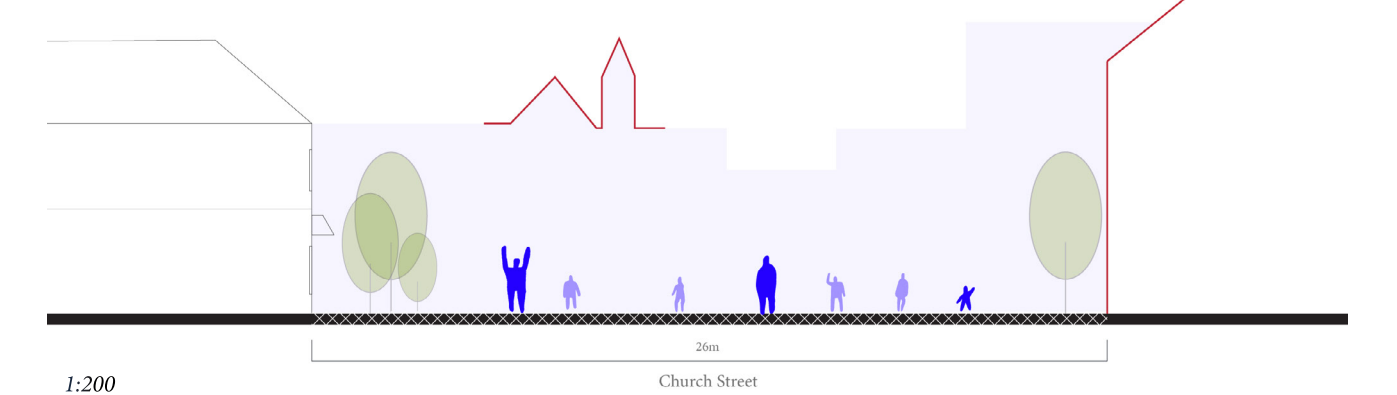


Fig 103. AA Section Finglas.  
Source: Author.

- 1 Main Square
- 2 Steps & Ramp
- 3 Nature Space
- 4 Narrowed One Way Street
- 5 New civic building
- 6 Landmark Building
- 7 Exposed Stream
- 8 Water Feature
- 9 Water Square
- 10 Linear Park Entrance
- 11 Outdoor Dining Space
- 12 Tearooms Multi-Functional Space
- 13 Pedestrianised Streets
- 14 Play Space
- 15 Grass Green Space
- 16 Richard McKee Memorial
- 17 St. Canice's Finglas Visitor Centre
- 18 Market Stall Space
- 19 Densification

Main Square Details:

1. A large central square is proposed as a key gathering space and a connector of the neighbourhood.
2. For accessibility and placemaking dealing with level changes, the public realm is level and provides accessible ramps.
3. Nature spaces are introduced to increase the permeability of surfaces, improve air quality, decrease noise pollution, and for placemaking.
4. The large road that once divided the centrality is narrowed significantly and converted to one way only, north to south movement.
5. The introduction of a civic building in the heart of the neighbourhood allows part of the space to be given back for public uses.
6. The landmark buildings become back into focus giving the space and centrality overall identity and placemaking. They are framed to compliment the public space and vica versa.
7. The exposed stream introduces the natural element into the area again and connects the area more to the Tolka River.
8. A water square is proposed here.
9. A fountain is proposed to connect the area with it's natural blue component.
10. Connecting and strengthening the green spaces.
11. Activation of the public space.
12. Tearoom (as was once common across the city) is proposed as a multi-functional civic and hospitality space that is at the heart of the centrality, this is an element that will be consistent across the centralities in the region and tell people that this is a centrality design for people first. The evaluational changes with half of the centrality being located on a hill, is used as a quality by improving legibility and path guidelines in the space, the tearooms will hang over a elevated space to place it at the heart of the area.
13. Creating people first safe spaces that is for pedestrians only allowing the public space to be utilised for events, markets, landscaping, outdoor dining, seating.

BB Section

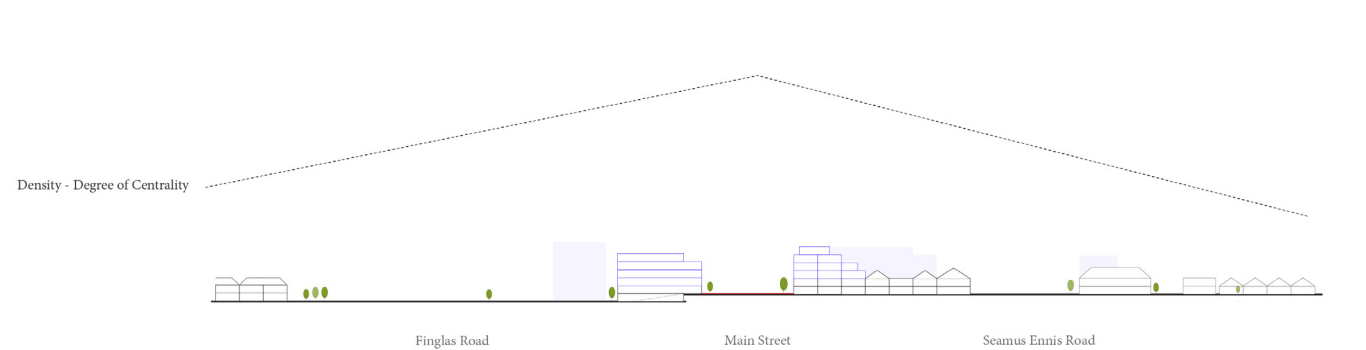
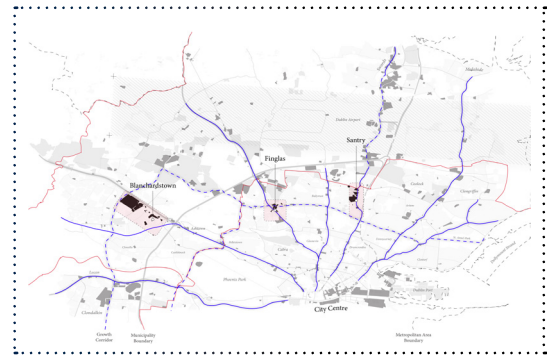
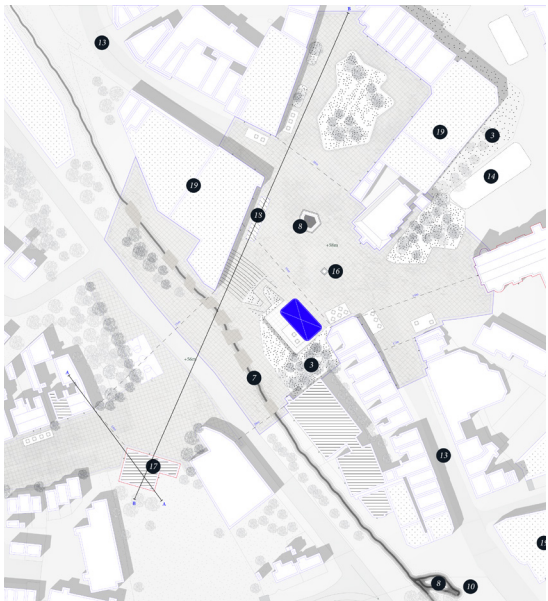


Fig 104. BB Section Finglas.  
Source: Author.



Main Square Details (Continued):



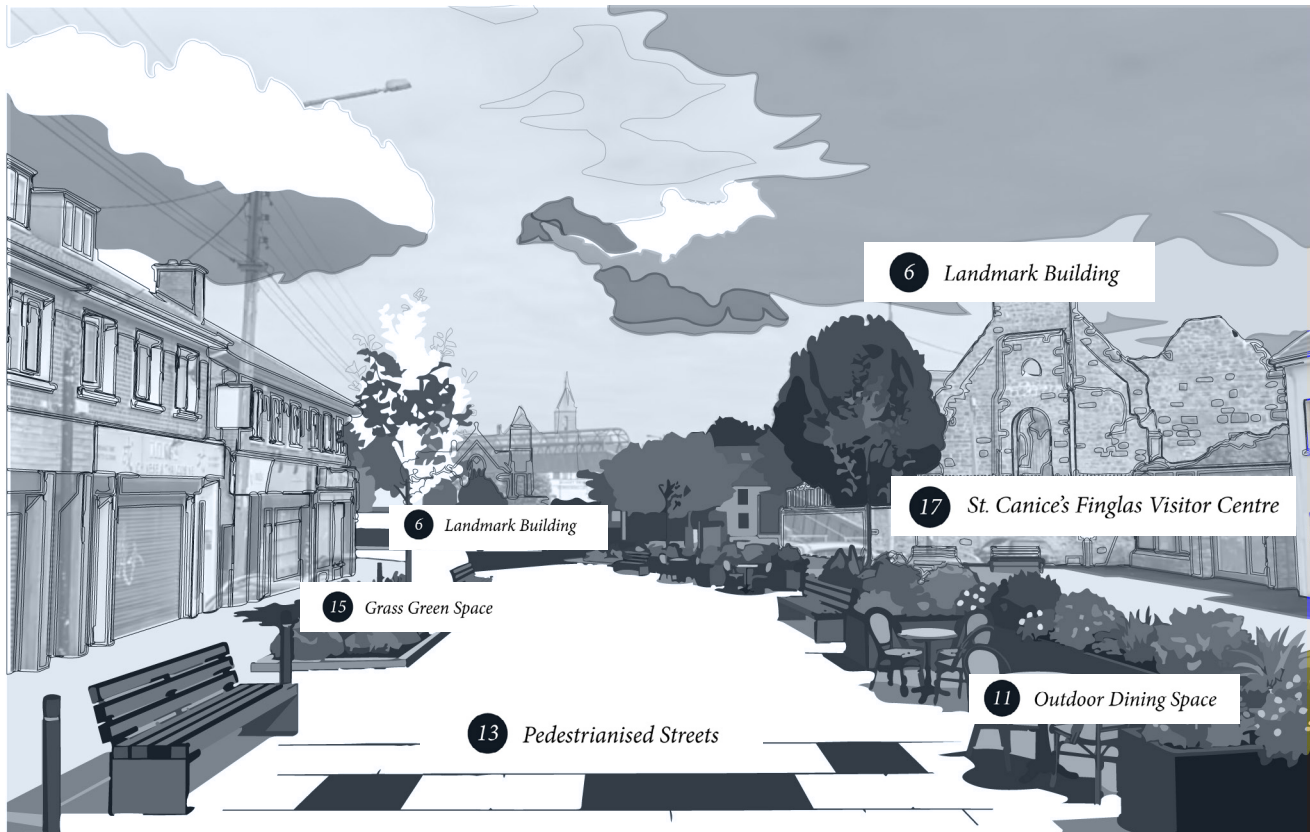
- 14. Play spaces, and market stall spaces are introduced to activate the public space and change the centrality to a place to stay and gather rather than a functional through movement temporal space.
- 15. Areas for permeability porous surfaces and human enjoyment of grass spaces.
- 16. An existing monument is slightly relocated.
- 17. Creation of a visitor centre for regional attraction and identity making placing the centrality in a new attraction use in the region.
- 18. Market stall / a flexible outdoor use space is introduced to activate the public space and change the centrality to a place to stay and gather rather than a functional through movement temporal space.
- 19. Buildings are densified to ensure overlooking and passive surveillance in the public space, while introducing more civic uses into the area. The centralities will have a tea-room which were common in the city's past to function as a multi-functional social and hospitality space for gathering and placemaking.

Visualisations

Fig 105. AA View towards the Main Square & Centre looking eastwards - current state



Fig 106. AA Render Finglas.  
Source: Author Edited\* Rendered with AI Gemini 3.0 via Adobe Illustrator





Visualisations

Fig 107. View towards the Main Square looking eastwards - current state  
Source: Apple Maps



Fig 108. Render Finglas.  
Source: Author Edited\* Rendered with AI ChatGPT





*What are the Policy Recommendations to Support the  
Delivery of the Peripheral Centralities?*



Dublin Metropolitan Region  
Core Policy Recommendations

This part of the design chapter outlines the policy recommendations required for peripheral centralities to reach their full potential as high standard of liveability.

Authorities

AP1

Creation of a Dublin Metropolitan Region Authority (DMRA)

P

Policy:

Establish a unified, tier-one Metropolitan Dublin Region Authority (DMRA) governed by a Directly Elected Mayor (See Policy AP3), which structurally replaces the non-binding Metropolitan Area Strategic Plan (MASP) framework and holds legally supreme, cross-boundary statutory planning and executive powers over the seven Dublin local authorities.

M

Mechanism:

Allowing the step between the existing regional (RSES) independent of the RSES and replacing the non-binding MASP strategy within, and local authorities for the Metropolitan area the size of the Dublin Region will allow for increase co-ordination of land use policies, and implementation of cross boundary policies for Metroscale planning of growth corridors, linked to Policy FP1. Operating at a strict functional economic scale, this new DMRA has the explicit legal power to require Coordinated Area Plans and issue binding zoning directives that crosses the invisible borders of administrative boundaries. This synchronizes cross-boundary metroscale growth corridors, such as the Santry-Finglas-Blanchardstown orbital corridor link and legally binds local development strategies to integrated, transport and active travel infrastructure. Crucially, this executive shift embeds a tier of democratic legitimacy absent from existing bureaucratic arrangements. Direct elections grant the DMRA a clear public mandate, elevated visibility, and a transparent platform. Because the planning stakes are elevated to a metropolitan scale, this framework creates the necessary conditions for more meaningful citizen engagement, transforming regional governance into a visible space for public participation.

I

Impact on Liveability:

This shift will encourage the transformation Dublin’s car-dependent peripheral centralities from fragmented, low-density suburban dormitories and satellite towns into highly connected, European-standard urban functional places. Rather than assuming an immediate physical overhaul, the establishment of the DMRA primarily creates the structural conditions for streamlined co-ordination and more efficient planning, establishing the institutional baseline required to drive this spatial evolution.

By executing masterplans at a metropolitan scale, it eliminates the boundary drop-off effect that has resulted in land use mismatches,. Thus meaning public parks, protected primary cycle routes, and community infrastructure are delivered contiguously and be consistent in spatial quality, rather than stopping/changing suddenly at local authority borders. By intensifying low-density commercial retail parks with high-density, mid-rise perimeter blocks directly unlocks the 10-minute neighbourhood model for peripheral centralities. Residents in Blanchardstown, Finglas, and Santry gain street-level vibrancy, high-quality public squares, and direct orbital transport connectivity to neighbouring centralities.

EC

Example Case:

Structure:

Established to resolve fragmented local governance across London’s distinct boroughs, the Greater consists of a Directly Elected Mayor and a strategic regional assembly operating at a functional economic scale.

Planning Supremacy:

The Mayor’s statutory ‘London Plan’ sets legally supreme spatial planning directives that local boroughs must comply with. This mechanisms eliminates boundary drop-off friction, ensuring contiguous infrastructure, protected cycle paths, and masterplanned growth corridors are delivered seamlessly across administrative borders.

Democratic Requirement:

The high visibility of the mayoral office ensures clear political accountability and intense civic engagement, proving that consolidating macroscale powers under an elected figurehead creates the ideal baseline conditions for efficient, democratic metropolitan planning.

Fig 107. London Metropolitan Spatial Plan  
Source: Greater London Authority, (2025).





AP2

## Metropolitan Active Planning Body and Public Land Banking Policy

**P** The dedicated new DMRA that looks at Land Banks operated directly by public lands, working alongside the existing Land Development Agency (LDA), in co-ordination and use of compulsory purchase order (CPO) powers.

**M** **Mechanism:**  
Instead of leaving urban infill and brownfield development to a fragmented private market in peripheral centralities, the Metropolitan Region alongside the local authorities actively purchases, consolidates, remediates, and masterplans centralities. The state then services the site with utilities, working with developers to ensure the land capability and capacity is maximised but remaining in public ownership (freehold) utilising leasehold agreements by joint venture opportunities. Profits will relate to fiscal policy F1.

**I** **Impact on Liveability:**  
This prevents land hoarding and ensures that development is cohesive rather than piecemeal. It allows for the deliberate design of the 15-minute city layout, ensuring parks, schools, and commercial units are integrated seamlessly into new residential zones.

EC

## Example Case: Structure:

The City of Helsinki acts as an active, centralised public land bank, owning approximately 70% of the land within its municipal boundaries to systematically direct urban growth and prevent private market fragmentation.

## Land Assembly and CPO Power:

Rather than relying on passive zoning, the municipality strategically uses its first-right-of-purchase and compulsory acquisition powers to assemble, remediate, and masterplan large infill and brownfield sites before development occurs.

## Freehold Retention and Leasehold Agreements:

The city retains ultimate freehold ownership of the land. It provides serviced sites to private developers and housing cooperatives through long-term leasehold agreements (typically 60 to 100 years). These leases contain legally binding, fine-grained clauses regarding land capability, architectural quality, and strict delivery timelines.

## Impact on Liveability:

By maintaining leasehold control and bypassing speculative market forces, Helsinki prevents land hoarding and ensures that public parks, schools, and commercial premises are delivered contiguously alongside new residential units. This active mechanism creates the precise baseline conditions needed to implement complete, well-integrated 15-minute centralities.



AP3

Directly Elected Mayor

Policy:

P

Establish a democratically mandated, Directly Elected Mayor, governing the new DMRA. This policy shifts executive and strategic planning powers away from unelected Local Authority Chief Executives to a single, politically accountable leader, embedding stronger public participation and deliberative citizen engagement at the core of metropolitan governance.

Mechanism:

M

Similarly, to the functional powers of the Mayor of London, the Dublin Elected Mayor would be legally mandated to author a binding Metropolitan Plan, a metropolitan spatial development strategy with which the development plans of all seven individual regional local authorities must coordinate together under the Planning and Development Act 2024/2025, this would alter the Act as a new proposal. The mayor would have executive oversight over a consolidated metropolitan transport and asset-management body (the Dublin equivalent of Transport for London) in cooperation with key stakeholders such as the NTA. While this was implemented before for a one year period in 2008, this would be different as there is a new Metropolitan Authority. This also allows national government departments and politics to not remain focused and stuck in local level politics.

To prevent this centralised executive power from creating a democratic deficit away from the local authorities, it would include statutory Citizen Participation Infrastructure including civic engagement strategies, combining continuous digital co-design platforms, neighbourhood-level Citizen Assemblies, and participatory budgeting. This public engagement is legally embedded at the diagnostic and draft phases a new Dublin Metropolitan Region Plan. This ensures that popular views from the entire metropolitan population with this co-designed public consensus, the Mayor could possess the legal authority to override localized county councillor resistance or institutional gridlock, for example, ensuring strategic metroscale growth corridors are delivered cohesively.

I

Impact on Liveability:

This structural evolution provides the necessary political gravity and democratic legitimacy to execute large-scale, transformative urban retrofitting in Dublin's peripheral centralities and allow for strategic land use planning for natural, agricultural, commercial, and industrial among other land uses.

AP4

Statutory Citizen Participation Infrastructure

Policy:

P

Legally embed a comprehensive, multi-tiered Statutory Citizen Participation Infrastructure into the diagnostic, drafting, and implementation phases of all Dublin Metropolitan Region Plans, establishing civic co-design as a mandatory prerequisite for macroscale spatial governance.

Mechanism:

M

To prevent this centralised executive power from creating a democratic deficit away from the local authorities, it would include statutory Citizen Participation Infrastructure including civic engagement strategies, combining continuous digital co-design platforms, neighbourhood-level Citizen Assemblies, and participatory budgeting. This public engagement is legally embedded at the diagnostic and draft phases a new Dublin Metropolitan Region Plan. This ensures that popular views from the entire metropolitan population with this co-designed public consensus, the Mayor could possess the legal authority to override localized county councillor resistance or institutional gridlock, for example, ensuring strategic metroscale growth corridors are delivered cohesively.

I

Impact on Liveability:

By formalising these deliberative platforms, this policy directly protects local liveability against top-down institutional imposition. It ensures that the densification of peripheral centralities is guided by real, street-level insights from residents in the centralities from e.g. Blanchardstown, Finglas, and Santry. This creates a highly transparent planning system where community infrastructure, public squares, and active travel links directly reflect a co-designed public consensus, significantly reducing civic alienation.

This policy democratises macroscale planning by shifting citizens from passive consultees to active co-designers. By legally binding the Mayor's executive override powers to a verified public consensus, it creates a bulletproof planning mechanism: it gives the authority the democratic mandate to bypass local political agendas and gridlock, whilst simultaneously ensuring that the resulting metropolitan corridors are deeply rooted in genuine civic consensus and local need.



# Fiscal

## FP1 Funding Rings for Growth Corridors

- P

**Policy:**  
Legally ring fence a fixed portion of local development levies collected in the peripheral centralities and surrounding areas to fund the creation of adequate orbital transport corridors, and active travel, breaking the metropolitan area’s historic hub and spoke radial bias. This funding framework deliberately transitions the focus away from exclusive transport corridors towards comprehensive growth corridors. Rather than treating transit in isolation, this policy targets the simultaneous delivery of mixed-use zoning, civic infrastructure, and high-quality public realms, directly derived from the local-scale spatial analysis and design frameworks established within this study.
- M

**Mechanism:**  
Historically, Dublin’s public transport infrastructure has favoured bringing people from the suburbs into the city centre. Moving from Blanchardstown to Santry or Finglas is more difficult. This proposal requires that high-density zoning under the new 10-year plans is conditionally unlocked only when paired with immediate, funding for growth corridors, especially orbital routes. Pairing with stakeholders such as the NTA for the BusConnects project on orbital public transport, while the Local Authority itself will provide specific active travel, wayfinding, public realm works among others. Implementation of this successfully relies on co-ordination with other Local Authorities via the new Metropolitan Co-ordination framework. The precise boundaries, sequencing, and morphological targeting of these funding rings are directly derived from the local-scale design and spatial clustering analysis conducted in this study, ensuring fiscal resources are mathematically aligned with actual spatial capacity and local infrastructural deficits
- I

**Impact on Liveability:**  
It decouples peripheral urban living from required car ownership. By making it easy to travel between peripheral centralities rather than just into the city centre, it reduces local traffic congestion, allows for the creation of low traffic neighbourhoods, pedestrianisation of public space, narrowing of street sections, frees up space spent on car parking, and improves air and noise quality, and pedestrian safety. By transitioning the focus from an exclusive transit link to a holistic growth corridor, this local-scale design intervention ensures that peripheral centralities evolve into self-sustaining economic and social hubs, securing long-term spatial quality and structural liveability rather than just mobility.

## FP2 Local Authority Self-Funding Measures

- P

**Policy:**  
Move away from competitive, centralised funding models, for example, the Urban Regeneration and Development Fund (URDF) toward Tax Increment Financing and more localised revenue retention.

Giving powers for the Local Authority to have for fiscal authority by the introduction of multiple fiscal measures to include:

  - \* Local Variation Taxes on PAYE (personal income tax),
  - \* Commercial Stamp Duty,
  - \* Set rate Local Property Taxes
- M

**Mechanism:**  
Similarly, to successful Swiss and Scandinavian models, the national Revenue Commissioners would continue to collect income tax centrally via PAYE but would add a discretionary (e.g., between 0.5% and 1.5%) set annually by the elected local council. The revenue generated from this surcharge stays entirely within Metropolitan Region and can be linked to *Policy LUP1*. To make this more just, the rate can vary depending on the level on income and personal circumstances, or via the introduction of Local Authority Tax Credits which compliments the existing Irish tax system of tax credits.  
Currently, when land is sold and transferred the windfall taxes go to the national government.
- I

Local Property Taxes will be independent of political influences and consistent across the region alongside the new Metropolitan Authority, this relates to *Policy FP3* also.

**Impact on Liveability:**  
The increase of taxes on citizens and private land owners will be done in a fair and just way with it being relative to the level of income and other circumstances. There is also a link with *Policy DPI* where by private developments may not have to provide public open space in centralities as this will be done by the local authority and existing public land ownership, meaning the availability of such spaces remain in creating centres of high liveability standards. However, these interventions will take time to manifest and realise to secure the centralities transformation.

FP3 Metropolitan Social Equity

- P

Policy:

Co-ordinate the tax incomes from Local Property Taxes to spread income wealth across the Metropolitan Region with the funds targeting lower performing peripheral centralities in terms of liveability metrics.
- M

Mechanism:

To solve the internal wealth divide within the Dublin region, the newly created Metropolitan Development Authority (*Policy API*) would implement the redistribute local tax revenues by the creation of a Metropolitan Equalisation Pool. Currently, affluent, low-density residential zones, such as parts of Dún Laoghaire-Rathdown enjoy high Local Property Tax (LPT) revenues but require less structural retrofitting, while industrial and older peripheral nodes (like Finglas and Santry) face a large spatial urban environment and non-spatial liveability deficits being in less affluent areas.
- I

Impact on Liveability:

Allows liveability metrics across the region to be more equal in terms of spatial and non-spatial metrics for the improvement of the Metropolitan Region in creating for socially just urban areas.

DP1 Performance Standards Design Metrics

- P

Policy:

Developments proposed in peripheral centralities will be assessed qualitative liveability performance metrics.
- M

Mechanism:

While the new urban plans will set rigid frameworks and policies for how the peripheral centralities will be developed, as urban areas are dynamic it will be important to evaluate individual planning applications in terms of development designs based on liveability outcomes, for example design standards such as dual-aspect apartment units requirement, insulation, access daylight, removal of private inaccessible spaces, and how might the development affect the dynamics of the neighbourhood in terms of demographics. This is a protection against sudden rises in new trends in urban housing for example, co-living or developments aiming at a temporal demographic, it is about building strong and balanced local peripheral centralities.
- I

Impact on Liveability:

Density has a negative connotation in Dublin, as people equate it with bleak, monolithic towers, and past failed social housing projects. Transitioning to performance-based design allows for higher density, mid-rise (5-to-8 story) perimeter block, the urban typology that makes cities such as Amsterdam, Copenhagen, Barcelona more liveable and provision of high quality civic space and amenities viable, age and family friendly, and vibrant at street level when taking into account the components of liveability.



# Land Use

LUP1

Strategic Activation of Area Based Plans for Peripheral Centrality Retrofitting

- P

Policy:  
Local authorities should designate under-utilised, low density retail parks, commercial, and industrial estates that are within peripheral centralities, as candidate area based plan depending on their suitability. Development will be prioritised in these centralities before an urban edge expansion occurs.
- M

Mechanism:  
The 2024/2025 Act explicitly introduces area based plans to help fast-track large-scale, transport-led developments. Once a local authority establishes a Development Scheme for a UDZ for example, planning applications that comply are fast tracked with no right of appeal to An Coimisiún Pleanála, ensuring that Local Authorities have autonomy and confidence in their own Plans which will be prescriptive, and will not be undermined by the National Planning Board, unless in extreme scenarios. Policy will first target areas like the low quality urban design of Blanchardstown Centre or aging unsuited commercial and industrial units in Santry/Finglas to help deliver national and regional targets. This should not increase commuting patterns or decrease employment within the Metropolitan Region’s peripheral centralities as the analysis shows the uses are unsuitable to their building and plots.
- I

Impact on Liveability:  
Peripheral centralities will be properly developed before any other large-scale greenfield site on the edge of the existing built up area is master planned. Meaning the existing peripheral centralities within the region are no longer left behind in the provision of high standard of liveability. Private land owners and developers will see the benefits from the intensification of land either within a centrality or along a growth corridor, while the NPF and development plans can legally demand that this density is paired with for example, built-in civic plazas, street-level retail, and public services and more.

LUP2

Urban Radial & Orbital Growth Corridors

- P

Policy:  
Under the statutory new Dublin Metropolitan Region Authority, this policy can utilise the Coordinated Area Plan (CAP) established under the Planning and Development Act to enforce a single, legally binding land-use strategy across radial and orbital growth corridors to achieve the spatial qualities required to meet Metropolitan and National scale urban planning policies.
- M

Mechanism:  
The mechanism operates via three distinct structural pillars:
  - \* Infrastructure-Led Phasing Triggers: Implements an ‘un-bypassable’ infrastructure first mechanism. Upscaling and intensification of land along the routes are legally ‘locked’ until the delivery of primary public transport links (such as orbital Bus Rapid Transit networks or Luas (tram line) extensions, cycle lanes) are delivered, ensuring density doesn’t outpace carrying capacity.
  - \* Active Land Assembly & Freehold Retention: The DMRA’s development department, can utilise compulsory purchase powers and state equity to bring together fragmented brownfield industrial plots for example. These sites can be developed via Joint Ventures where the state retains 100% of the freehold, using its position as the ‘developer’ to require delivery timelines and completely eliminate private land hoarding.
- I

Urban Form Typology Mandates: Enforces suitable density thresholds depending on centrality type. The policy will explicitly bans traditional, low-density suburban semi-detached housing and mono-use sites depending on the scale. Instead, it mandates European-style perimeter block layouts (averaging 4 to 6 storeys) featuring a continuous building line and compulsory active ground-floor interfaces.

Impact on Liveability:  
Human-Scale Streets and Protected Spaces: Transitioning to 4-to-6 storey perimeter blocks (where possible) - see example designs previous pages. Creating high-quality, vibrant streetscapes at ground level while enclosing Creating, quiet inner courtyards. This provides residents with safe, traffic-free communal spaces for people to gather, directly reducing peripheral social isolation.

LUP2 Urban Radial & Orbital Growth Corridors (continued)

**I** Elimination of the infrastructure delay, via legally locking density to infrastructure delivery, residents are entirely insulated from the traditional Irish grievance of moving into un-serviced estates. High-quality public parks, schools, and transport links are delivered alongside homes, not decades later, a problem currently for the peripheral centralities that are left behind while new vast urban master planned edge greenfield sites are planned.

Transport-Adjacent Living: Removing mono-use retail parks commercial areas, for higher density nodes means everyday needs and components of liveability can be met within an 800m walking distance.



# Conclusions

*Addressing the Research Questions*

*Sub-Research Questions*

*Main Research Question*

# Sub-Research Questions

*How do definitions of urban centrality in understanding everyday liveability in Dublin, and how do they challenge existing hierarchical models of centres and urban villages?*

Traditional national and regional planning frameworks in Ireland structure growth through hierarchical models of settlement and service provision. Premerely, rooted in conventional central place theory, these frameworks organise spaces into ranked tiers based on population size, catchments, and top-down administrative designations. This approach assumes that urban centrality is a stable, bounded, and static condition tied exclusively to formally designated locations or historic urban villages.

This thesis challenges these rigid models by framing centrality as a dynamic, performance-based condition produced through everyday use, physical proximity, and temporal overlap. By evaluating the city through a relational lens, the research demonstrates that everyday patterns of movement, consumption, and social interaction increasingly diverge from formal hierarchies. There is a lack of recongition that there are many types of peripheral spaces. Th are y types of urban spaces in the periphery which require their own strategies for retrofitting in a way that is cohesive and consistent in achieving liveability metrics and a equalitable metropolitan region. Redefining centrality through actual urban performance revealed a mismatch between how Dublin is officially planned and how space is actually lived, providing a clearer framework for measuring and supporting everyday liveability across the region.

*What does Dublin's urban form, street networks, and socio-economic conditions look like in shaping the emergence and functioning of everyday urban hubs across the metropolitan region?*

Dublin's metropolitan layout has been shaped by a long-term historical process of urban diffusion and coalescence. Urban growth spread outward radially from the core before gradually consolidating, resulting in a highly fragmented pattern of dispersed development and uneven consolidation. This historical trajectory has created severe structural variations in liveability across the region. While older, affluent inner suburbs like Rathmines retain a fine-grained urban structure that performs strongly, later peripheral centralities display a highly mismatched form.

In the northern suburbs, for example, services are predominantly delivered via low-density, mono-use commercial shopping centres rather than integrated main streets. When subjected to Space Syntax network modelling, a clear contradiction emerges between network potential and real-world performance. Normalised Angular Integration (NAIN) analysis demonstrates that peripheral hubs like Finglas appear highly accessible on paper, successfully channeling metropolitan-scale destination movement to their cores. However, on-the-ground evaluation and governance analysis reveals that there are varying spatial qualities and functions in the centrality which undermining local liveability. These spaces function as self-contained service hubs but are dominated by hostile infrastructure, monouse, low-quality public realm and spaces, lack of green space and connections, all elements that also affect liveability.

*Why do emerging and peripheral hubs that contribute to everyday liveability remain under-recognised or unsupported within Dublin's current planning and governance frameworks?*

These peripheral centralities remain unsupported due to extreme institutional centralisation, governance fragmentation, and a unique legislative focus on private property rights. Ireland ranks low in the Local Autonomy Index. Local councils possess very little fiscal or policy independence while on the regional scale it lacks a directly elected mayor with sufficient powers and a strategy plan. The real executive power resides with the Chief Executive, an unelected civil servant appointed by a national body. The implementation of the Planning and Development Act 2024 further strips local autonomy, locking municipalities into rigid, top-down ten-year frameworks and replacing local discretion with mandatory National Planning Statements. This structure leaves local planning highly vulnerable to shorter-term national political agendas and the persistent urban-rural divide.

Furthermore, at the metropolitan scale, Dublin is fragmented across seven independent local authorities. Without a statutory metropolitan authority, differing approaches to land-use management create a distinct drop-off effect right where local authority borders meet, preventing the coordination of integrated hubs. This governance failure is heavily compounded by land ownership patterns. When Ireland adopted its planning mechanics from the UK via the 1963 Act, it intentionally strengthened land ownership rights as a post-colonial state. This constitutional protection of private property makes strategic land assembly and public intervention incredibly slow and complex. Local authorities and developers have consequently bypassed existing peripheral centres in favour of less complex, greenfield agricultural sites on the outer edge, leading to rural ribbon development and sprawl. Meanwhile, accessible peripheral centres are left to suffer from fragmentation and lower metrics of liveability. The framework proposes the maximising of co-operation mechanisms between government departments to achieve liveable urban spaces by utilising public land,

*How can a revised centrality framework better identify, classify, and support urban hubs as places of everyday life and liveability across administrative boundaries?*

A revised framework must replace arbitrary, static policy labels with a data-informed, multi-scalar analytical workflow. The research prvoides a baseline of information to find the cluster types in the region executed directly on the building layer for rich and fine data. By combining the data to find the framework groups geographically distant areas based on true statistical similarity. This isolates the precise pockets where high local activity and network accessibility intersect with underutilised land or poor spatial conditions.

To support the centrlaities across fragmented borders, the framework builds upon the new spatial coordination mechanisms, specifically Coordinated Area Plans (CAPs) alongside Urban Area Plans (UAPs) and Priority Area Plans (PAPs). These statutory plans combine with a metropolitan wide strategy network of Radial and Orbital Growth Corridors that intentionally link peripheral centralities into a cohesive metropolitan structure, preventing further outward sprawl.

The framework updates developer contribution policies, it transitions away from the current market-reliant system where private developers routinely pay financial contributions to councils to entirely bypass their statutory obligations to provide high-quality public open space thus the ring fencing allows for the money gained to go only towards to centralities for the creation of this public space.



# Main Research Question

*How can Dublin reconceptualise and operationalise urban centrality to identify, support, and govern emerging and peripheral hubs that shape everyday liveability across the metropolitan region?*

Overall synthesis conclusion that addressing the main research question:

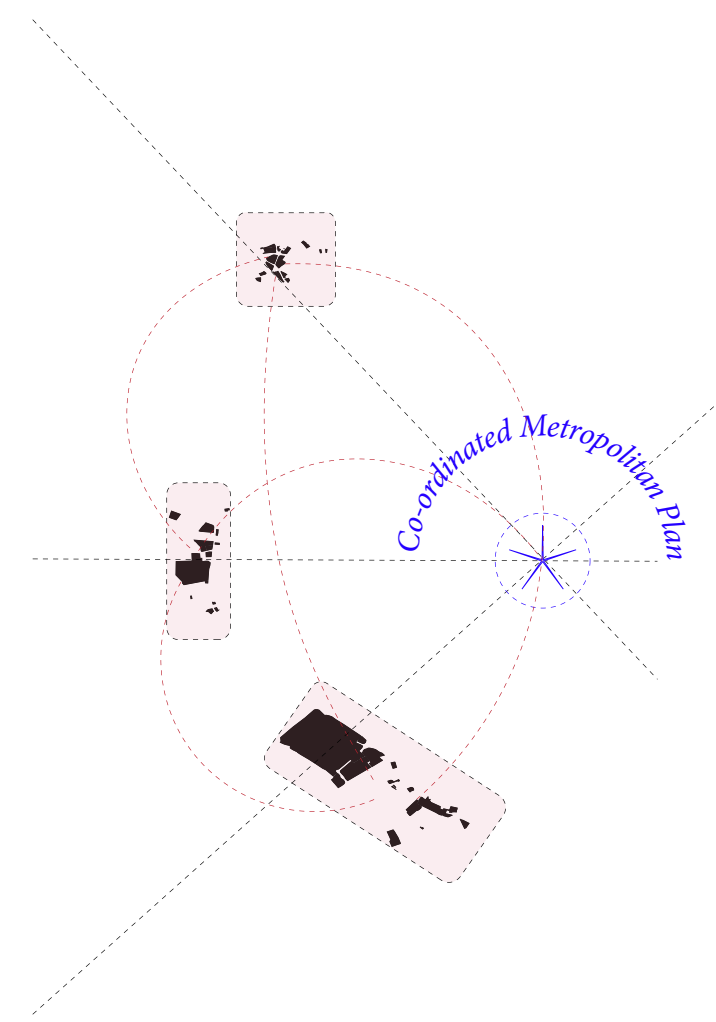
Through the research in this study, it has been outlined how the metropolitan region of Dublin has a lack of strategic metropolitan-level planning, which has led to an uneven formation of types of urban spaces in the region that each have varying spatial qualities. This has impacted the development of the peripheral area and thus the centralities within a negative way. The most impact being on vast residential areas developed by the state and local authorities in the mid to late 20th century, also the period when the state lacked any national spatial strategy with huge growth. Once again, the region is experiencing a high level of growth with ambiguous spatial planning strategies in place, impacting how people’s lived experiences are realised in the peripheral areas of the city, specifically.

Dublin can achieve liveable peripheral centralities by transitioning from a static, mono-centric hierarchical planning ideology to a dynamic, multi-scalar performance-based framework that aligns spatial form, governance, and everyday human movement. Reconceptualising centrality will require the use of evidence-based spatial data clustering to identify latent, underperforming centrality types to determine the network accessibility and land use intensity in combination with real-life experiences that should be combined in a democratic participative way.

To operationalise and govern the Metropolitan Area, effectively and efficiently, Dublin must introduce a major structural institutional reform, creating a unified Dublin Metropolitan Region Authority (DMRA) led by a Directly Elected Mayor. As the Irish planning system is highly top-down and political in nature, this institutional fragility is a permanent factor that planners and designers must work directly into their proposals or the proposals may not be realised.

This new authority must structurally replace the non-binding MASP framework and hold legally supreme, cross-boundary statutory planning and executive powers over the seven local authorities within the region. Operating at a functional economic scale, the DMRA bypasses localised boundary drop-off effects by executing and implementing the new Area Based Plans, which can be funded through ring-fenced local development levies for the strategic growth of the region, for example, for the proposed functional growth corridors.

By utilising both concrete liveability metrics, spatial qualities for centralities, and governance with clear spatial rules, including creation of public spaces and infrastructure first phasing planning, and an active public land assembly, the framework can actively transform the city’s left behind peripheral centralities into upscaled and strategic yet sustainable, human-scale, liveable centralities that are socially equitable across the region. The framework gives insight into how a centrality type can be operationalised, providing the 10-minute (800m) neighbourhood model to enable upscaling of findings to deliver equitable liveability across the entire metropolitan region for each type of centrality.



conclusions

# Reflection

*Social, Scientific, & Professional Relevance*

*Personal Progression*

*Transferability*



## Societal, Scientific, & Professional

R1

### Societal:

Dublin’s ongoing urban growth, characterised by a fragmented pattern of dispersed development, continues to manifest as uneven liveability across the metropolitan area. By evaluating the persistent under performance of peripheral centralities, this research directly addresses the structural mismatch between high-level strategic planning and the everyday realities faced by people who live in the peri-urban areas of cities. For example, those with long daily commutes, a lower density of local services, and limited access to high-quality public spaces which all lead to factors and spatial outcomes of lower liveability.

As demonstrated through the spatial analysis, the historical layout of Dublin’s expansion has resulted in a clear spatial divide between the types of places and their degree of urbanity, for example, the density of amenity areas and car-dominated, single-use retail developments in the outer periphery is not equal. Throughout the project, this was also revealed by the contrast in land ownership and historical development patterns affecting the liveability of an area, leading to varying standards of living within altering centrality types across the region. This study argues that urban liveability cannot be measured solely through abstract density targets or policy benchmarks, it depends on how spatial form, governance, and everyday practices interact to support the well-being of a community. In this context, strengthening underperforming peripheral centralities is fundamentally an issue of social equity, ensuring that the right to a liveable urban environment is distributed across the entire metropolitan region rather than being isolated within the historic core.

## Societal, Scientific, & Professional

### Scientific

From a theoretical perspective, this thesis contributes to contemporary urban studies by linking historical processes of suburban growth with modern institutional challenges in metropolitan governance and liveability. Rather than treating spatial imbalances as present-day phenomena, this research applies a cyclic diffusion-coalescence framework to Dublin’s morphological evolution, tracing how early market-led expansion and subsequent public housing policies continue to shape the performance profiles of modern peripheral centralities today. For example, it was found that access to green spaces, including tree canopy cover, can be an indicator of liveability but is linked to socio-economic conditions such as land ownership and historical development of the city.

Furthermore, this study advances the literature on peripheral centralities by bridging the gap between quantitative spatial morphology and qualitative lived experience. By cross-examining relational concepts of centrality alongside Space Syntax methodologies (such as NAIN analysis), this thesis reframes ‘centrality’ not as a static designation within a fixed settlement hierarchy, but as a dynamic performance metric produced through network accessibility, land-use mix, and everyday human movement. Finally, by deploying an integrated workflow of computational building-layer clustering and strategic research by design, the study demonstrates how spatial analysis can function as an active research instrument, offering a transferable methodological model for analysing suburban fragmentation in other urban areas across the country and beyond. The design element provides a link between local scale and bottom-up practices, such as the recommendation for the implementation of a new metropolitan strategic framework, that can be achieved.

## Societal, Scientific, & Professional

R1

### Professional:

For the planning and urban design professions, this thesis aimed to address the clear mismatch between high-level strategic ambitions for polycentric development and the fragmented spatial realities delivered on the ground. While overarching documents like the National Planning Framework (NPF) champion sustainable mobility and the development of local centralities, their implementation remains compromised by siloed sectoral responsibilities and a lack of coordinated, cross-boundary metropolitan governance. By moving past abstract land-use designations and introducing performance-based classification, this work provides a practical model for how practitioners can evaluate underutilised peri-urban spaces based on actual local use and network accessibility. Crucially, the spatial diagnostic 'toolkit' and typology framework developed in this study are highly transferable. The methodology can be upscaled and implemented across other Irish metropolitan areas, such as Cork, Limerick, Galway, and Waterford and their respective local authorities. By applying data clustering to local building layers, network configurations, and amenity mixes, and other configurations, the local authorities can systematically identify and support their own underperforming area types to provide an strategic actions for those spaces relevant to the local context .

Ultimately, this offers a structured path toward reforming and strengthening the National Planning Framework itself. Instead of enforcing a rigid, uniform top-down settlement hierarchy that routinely fails when confronted with local morphological conditions and property constraints, national policy can become more bottom-up directed. By learning from the typologies of places rather than relying on abstract, top-down policy designations, the profession can transition toward more agile, context-dependent spatial guidelines. This approach allows practitioners and policymakers to design interventions that align directly with the structural realities of local public spaces, ensuring that national strategic goals effectively support everyday liveability on the ground.

## Personal Progress

R2

### Personal Progress

Over the course of this thesis, I have tracked the moments that most challenged my development as an 'urbanist', intellectually, methodologically, and structurally. Rather than simply evaluating the final output, this reflection captures the evolving considerations and key shifts in perspective I faced throughout the research process in which I have learned a lot about the process making a thorough plan all the way from fascination, literature, analysis to design. This has resulted in a chronological understanding of my own progress, structured around two fundamental turning points that define how I interpret, analyse, and design within complex metropolitan systems.

### Spatialising a Lived Context

The initial phase of this project was defined by the unique challenge of returning to my home country as a research context. While choosing Dublin allowed me to apply the theoretical insights gained throughout the Master of Urbanism programme at TU Delft, it also required me to consciously manage my own lived familiarity with the study area. Early in the process, my understanding of the city's rhythms was predominantly narrative and qualitative. I found myself guided by an intuitive interest in how ordinary movements, everyday spatial practices, and localised social encounters construct the wider urban landscape.

The turning point emerged when I had to translate these personal, narrative observations into a rigorous urban design and planning framework. I realised that to do justice to the lived experiences and the inequality in liveability of these spaces, I needed to ground my intuitive understanding within structural morphological concepts. Reframing the project through a spatial and governance lens allowed me to transition from an anecdotal awareness of Dublin's fragmentation to an objective investigation of its spatial form, ensuring that my familiarity with the context functioned as an asset rather than a analytical blind spot.

### Symbiosis of Data and Design

The primary challenge of my master's journey at TU Delft has been learning how to balance this narrative sensitivity with advanced, data-informed spatial analysis. Transitioning from abstract conceptualisations of urban fragmentation to managing intensive, large-scale computational data work flows allowed me to up skill this process from literature, analysis, to design. I learned to stop viewing quantitative data and qualitative design as competing ideologies, but rather as symbiotic tools. This project has given me the confidence to stand between disciplines: using data to rigorously diagnose structural imbalances, while relying on spatial design and policy insight to advocate for the lived, human experience of space.



# Transferability

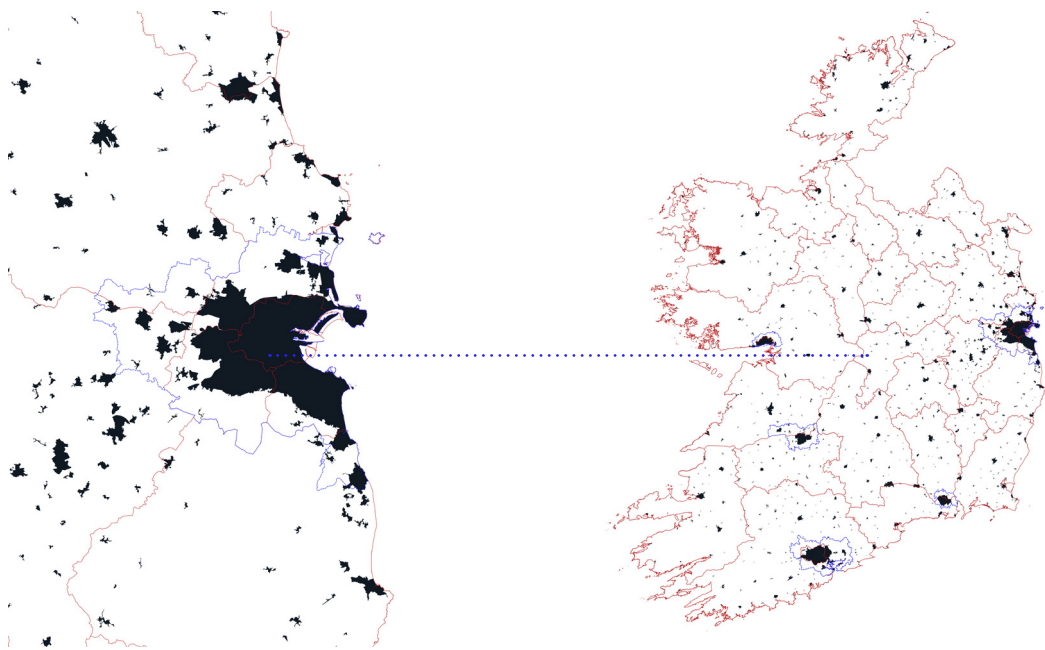
R3

Transferability:

This project was developed with transferability in mind, focusing not on producing one-size-fits-all designs, but on identifying how specific spatial conditions relate to the performance of public spaces across a region. By building a clear framework around relational centrality, the planning system, and the ways land ownership forms peripheral spaces, It was established a foundation of themes that can apply to multiple urban contexts. Testing this methodology against the case of metropolitan Dublin helped to determine which morphological frictions and governance issues were unique to this specific region and which were broader structural patterns.

Ultimately, the research zooms in on a highly prevalent urban typology: the car-dominated, single-use peripheral service centrality. The design interventions and governance tools proposed for these spaces, such as creation of public spaces directly address the structural deficits found in this peripheral type that addresses the liveability. Since fragmented, vehicle-oriented suburban centralities are a consistent feature across the Irish landscape, the structure of these findings is highly relevant elsewhere. Other local authorities in metropolitan areas like Cork, Limerick, Galway, or Waterford can upscale and implement these frameworks, adapting them to their own municipal contexts.

Crucially, to support this transferability in practice, the entire empirical workflow was built using public open software and custom-built R scripts, enabling a fully open-source and reproducible data pipeline. This means the methodology is not restricted to a fixed, static site intervention. Instead, planning practitioners and local councils can seamlessly integrate their own regional datasets into the existing code to identify latent hubs. By automating the data workflow, the project moves past abstract top-down guidelines, offering an adaptable toolkit that allows practitioners to learn directly from the typologies of places and build a more bottom-up directed spatial planning framework.



reflection

# Bibliography



# References

## Text

Abercrombie, P., Kelly, S. and Kelly, A. (1922) Dublin of the future: The new town plan. Liverpool: University Press of Liverpool.

Alexander, C. (1965). A city is not a tree. Architectural Forum, 122(1), 58–62.

Beavon, K. S. O. (1977). Central place theory: a reinterpretation.

Bertolini, L. (1999). Spatial development patterns and public transport: The application of an analytical model in the Netherlands. Planning practice and research, 14(2), 199-210.

Biddulph, M. (2007). Villages don't make a city. Journal of Urban Design, 12(1), 65–84.

Biddulph, M., Franklin, B. & Tait, M. (2002) – The Urban Village: A Real or Imagined Contribution to Sustainable Development?

Brennan M. , Mills G., Ningal T., (2017). Dublin Tree Canopy Study. University College Dublin.

Brenner, N. (2014). Implosions/explosions: Towards a study of planetary urbanisation.

Byrne, M. (2020). Generation rent and the fictionalisation of housing: a comparative exploration of the growth of the private rental sector in Ireland, the UK and Spain. Housing Studies, 35(4), 743–765. <https://doi.org/10.1080/02673037.2019.1632813>

Caulfield, B., & Ahern, A. (2014). The green fields of Ireland: The legacy of Dublin's housing boom and the impact on commuting. Case Studies on Transport Policy, 2(1), 20-27. <https://doi.org/10.1016/j.cstp.2013.12.001>

Central Statistics Office (2025) Regional population projections 2023-2042. Available at: <https://www.cso.ie/en/releasesandpublications/ep/p-rpp/regionalpopulationprojections2023-2042/>

Christaller W (1933) Die Centralen Orte in Suddeutschland/The Central Places in the South of Germany. Jena: Gustav Fischer.

Christaller W and Baskin CW (1966) Die Zentralen Orte in Suddeutschland. Central Places in Southern Germany. Translated by Baskin CV. Upper Saddle River, NJ: Prentice-Hall.

Clavin, A., Moore-Cherry, N., & Mills, G. (2021). Mapping Green Dublin: Co-Creating a Greener Future With Local Communities. Urban Planning, 6(4), 96-109. <https://doi.org/10.17645/up.v6i4.4533>

Dietzel, C., Herold, M., Hemphill, J. J., & Clarke, K. C. (2004). Spatio-temporal dynamics in California's urban growth. Environment and Planning B, 31(5), 705–727.

Dietzel, C., Oguz, H., Hemphill, J. J., Clarke, K. C., & Gazulis, N. (2005). Diffusion and coalescence of the Houston Metropolitan Area: Evidence supporting a new urban theory. Environment and Planning B, 32(2), 231–246.

Dublin City Council. (2019). Dublin City parks strategy 2019–2022. <https://www.dublincity.ie/parks-and-nature/dublin-city-parks/dublin-city-parks-strategy>

Dublin City Council (2022) Dublin City Development Plan 2022–2028. Dublin: Dublin City Council. <https://www.dublincity.ie/dublin-city-development-plan-2022-2028>

E. van Bueren et al. (eds.), Sustainable Urban Environments: An Ecosystem Approach, Chapter 8 – Liveability (van Dorst), 223 DOI 10.1007/978-94-007-1294-2\_8 , Springer Science+Business Media B.V. 2012

Environmental Protection Agency (EPA), (2024) Ireland's Environment: An Integrated Assessment 2024. Environmental Protection Agency. <https://www.epa.ie/publications/monitoring--assessment/assessment/state-of-the-environment/EPA-SOE-Report-2024-BOOK-LOWRES-FINALfor-WEB.pdf>

Environmental Protection Agency (EPA), (2024). Land. In Ireland's state of the environment report 2024 (pp. 113–133). <https://www.epa.ie/publications/monitoring--assessment/assessment/state-of-the-environment/EPA-SOER-2024-Chapter-05-Land.pdf>

European Commission. (2021). 'Fit for 55': Delivering the EU's 2030 climate target on the way to climate neutrality (COM/2021/550 final). <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CEL>

European Environment Agency (2024) Transport in Europe: Some signs of progress but difficult journey ahead to sustainability, 10 October. Available at: <https://www.eea.europa.eu/en/newsroom/news/transport-in-europe>.

Fox-Rogers, L., Murphy, E., & Grist, B. (2011). Legislative change in Ireland: a Marxist political economy critique of planning law. Town Planning Review, 82(6), 639-668. <https://doi.org/10.3828/tpr.2011.37>

Gaspar, J. (1985). A dinâmica funcional do centro de Lisboa. Lisbon: Livros Horizonte.  
Government of Ireland. (2021). Climate Action Plan 2021. Department of the Environment, Climate and Communications.

Government of Ireland, (2018) Project Ireland 2040: National Planning Framework. Dublin: Government Publications

Haase, T., & Pratschke, J. (2023). 2022 Pobal HP deprivation index [Data set]. Pobal. <https://data.pobal.ie/Portal/apps/sites/#/pobal-maps>

Hillier, B. (1999). Centrality as a process. Urban Design International, 4, 107–127.

Houlden, V., Porto de Albuquerque, J., Weich, S. and Jarvis, S. (2019) 'A spatial analysis of proximate greenspace and mental wellbeing in London', Applied Geography, 109, 102036. doi: 10.1016/j.apgeog.2019.102036.

Jabbar, M., Yusoff, M.M. & Shafie, A. Assessing the role of urban green spaces for human well-being: a systematic review. GeoJournal 87, 4405–4423 (2022). <https://doi-org.tudelft.idm.oclc.org/10.1007/s10708-021-10474-7>

Lynch, K., 1960. The image of the city. Cambridge, Mass.: MIT Press.

Ladner, A., Keuffer, N. and Bastianen, A. (2021). Local Autonomy Index in the EU, Council of Europe and OECD countries (1990-2020). Release 2.0. Brussels: European Commission .

Lefebvre, H. (1989). Quand la ville se perd dans une métamorphose planétaire. Le Monde diplomatique.

Lefebvre, H. (1991). The production of space. Oxford: Blackwell.

Moore-Cherry, N. and Tomaney, J. (2018) Spatial planning, metropolitan governance and territorial politics in Europe. Dublin as a case of Metro-phobia? European Urban and Regional Studies.

Ó Maitiú, S. (2003). Dublin's Suburban Towns, 1834-1930 : Governing Clontarf, Drumcondra, Dalkey, Killiney, Kilmainham, Pembroke, Kingstown, Blackrock, Rathmines and Rathgar. Dublin: Four Courts Press.

OECD (2023). Ireland. In OECD regional outlook 2023: The 2030 Agenda and the transition to net zero. OECD Publishing, Paris.

# References

## Text Continued

OECD (2019), Making Decentralisation Work: A Handbook for Policy-Makers, OECD Multi-level Governance Studies, OECD Publishing, Paris. <https://doi.org/10.1787/g2g9faa7-en>OECD (2019) OECD principles on urban policy. Paris: OECD Publishing. <https://doi.org/10.1787/9789264296937-en>

OECD (2020), “Smart Cities and Inclusive Growth: Building on the outcomes of the 1st OECD Roundtable for Smart Cities and Inclusive Growth”, OECD Regional Development Papers, No. 91, OECD Publishing, Paris, <https://doi.org/10.1787/8a4ce475-en>.

OECD (2022), Redesigning Ireland’s Transport for Net Zero: Towards Systems that Work for People and the Planet, OECD Publishing, Paris, <https://doi.org/10.1787/b798a4c1-en>.

Pereira, R. H. M., Nadalin, V., Monasterio, L., & Albuquerque, P. H. (2013). Quantifying urban centrality. *Applied Geography*, 40, 149–160.

Phelps, N. A., Keil, R. & Maginn, P. J. (2025) Peripheral Centralities: The Lost and Past Urbanity of the Suburbs

Planning and Development Act 2024 (Act No. 34 of 2024). <https://www.irishstatutebook.ie/eli/2024/act/34/enacted/en/html>

Roberts, M. & Turner, C. (2005) Conflicts of liveability in the 24-hour city

RTÉ Archives, (2018, July 22). Rathmines a Dublin village. RTÉ. <https://www.rte.ie/archives/2018/0722/979093-rathmines-a-dublin-village/>

Sabedotti, M. E. S., O’Regan, C. A., & Nyhan, M. M. (2023). Data insights for sustainable cities: Associations between Google Street View-derived urban greenspace and Google Air View-derived pollution levels. *Environmental Science & Technology*, 57(51), 19637–19648. <https://doi.org/10.1021/acs.est.3c05000>

van Dorst, K. (2012) ‘Liveability’, in van Bueren, E. et al. (eds.) *Sustainable Urban Environments: An Ecosystem Approach*. Dordrecht: Springer, pp. 223.

Viganò, P. (2016) *Territories of urbanism: The project as knowledge producer*. Lausanne: EPFL Press.

## Figures

Abercrombie, P., Kelly, S. and Kelly, A. (1922) *Dublin of the future: The new town plan*. Liverpool: University Press of Liverpool.

Apple (2026). Apple Maps 3D satellite view, multiple locations, Dublin, Ireland. Apple Maps Mac Application.

Dublin Inquirer (n.d.) Will you draw your neighbourhood for us?.

EPA (2023) *State of the Environment Report*. Chapter 5: Land. Estimated Percentage Area of Land Ownership Ireland. Environmental Protection Agency. Government of Ireland.

French, R., & Lawrence, W. (1865). *The O’Connell Monument*, O’Connell Street, Dublin City, Co. Dublin.

Joint Research Centre (2025) ‘Demography 2040: cities keep growing, while population shrinks in remote rural regions’, European Commission, 4 April. Available at: [https://joint-research-centre.ec.europa.eu/jrc-news-and-updates/demography-2040-cities-keep-growing-while-population-shrinks-remote-rural-regions-2025-04-04\\_en](https://joint-research-centre.ec.europa.eu/jrc-news-and-updates/demography-2040-cities-keep-growing-while-population-shrinks-remote-rural-regions-2025-04-04_en)

Ordnance Survey (1837–1842) *Ordnance Survey Six-inch Ireland, 1837-1842*. Edinburgh: National Library of Scotland. Available at: <https://maps.nls.uk/os/6inch-ireland/counties.html>

Ordnance Survey. Dublin, Sheet 14 (6-inch to the mile). Surveyed 1837; printed 1843. National Library of Scotland, <https://www.quora.com/What-s-the-best-way-to-create-a-map-if-you-have-specific-locations-in-mind-but-no-overall-route>

Van De Voorde, T., Van Der Kwast, J., Poelmans, L., Canters, F., Binard, M., Cornet, Y., Engelen, G., Uljee, I., Shahumyan, H., Williams, B., Convery, S., Lavalley, C., 2016. Projecting alternative urban growth patterns: the development and application of a remote sensing assisted calibration framework for the greater Dublin area. *Ecol. Indic.* 60, 1056–1069. <https://doi.org/10.1016/j.ecolind.2015.08.035>.

## Newspaper Quotes

McWilliams, D. (2024). After 30 years of relative success, is Dublin city going backwards again?, August 10, *The Irish Times*. <https://www.irishtimes.com/opinion/2024/08/10/david-mcwilliams-after-30-years-of-relative-success-is-dublin-city-going-backwards-again/>

O’Donovan, D. (2018). Rural Ireland will survive, but our biggest city is now eating itself, February 24, *Irish Independent*. <https://www.independent.ie/opinion/comment/rural-ireland-will-survive-but-our-biggest-city-is-now-eating-itself/36637376.html>

RTÉ News (2025) Climate protest takes place in Dublin, 15 November. Available at: <https://www.rte.ie/news/ireland/2025/1115/1544168-climate-protest-dublin/>

TheJournal.ie (2023) ‘Ireland is “slowly” becoming more unequal as wealthy pull ahead, report finds’, 2 November. Available at: <https://www.thejournal.ie/ireland-becoming-unequal-6212424-Nov2023/>

## Artificial Intelligence (AI)

During the preparation of this report Gemini 3.0. and Claude AI were utilised in parts to synthesise text, improve writing style and check grammar and spelling, and formulate R Studio Scripts. After using this tool, the content was reviewed and edited as required and takes full responsibility for the content of the publication.



# Appendix

Appendix

Geoda - Cluster Place Types Analysis

Method: K Medians  
Number of clusters: 10  
Initialization method: Random  
Initialization re-runs: 150  
Maximum iterations: 1000  
Transformation: Standardize (Z)  
Distance function: Manhattan

Cluster centers: (median)

|     |  | arw800fpk |  | arw800frt |  | arw800fpi |  | pop_densit |  | b_percent |  | arw800fct |  | arw800fhe |  | arw800fed |  | arw800fre |  | arw800fas  |  | arw800fpt |  |
|-----|--|-----------|--|-----------|--|-----------|--|------------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|------------|--|-----------|--|
|     |  | -----     |  | -----     |  | -----     |  | -----      |  | -----     |  | -----     |  | -----     |  | -----     |  | -----     |  | -----      |  | -----     |  |
| C1  |  | 1.02408   |  | 0.0350325 |  | 2.23874   |  | 91.2253    |  | 21.932    |  | 0         |  | 0         |  | 0         |  | 0         |  | 1.77762    |  |           |  |
| C2  |  | 0.237764  |  | 0         |  | 1.25606   |  | 46.0894    |  | 15.755    |  | 0         |  | 0         |  | 0         |  | 0         |  | 0.904712   |  |           |  |
| C3  |  | 0.93439   |  | 0.442795  |  | 4.0998    |  | 56.9378    |  | 16.472    |  | 0         |  | 0.480565  |  | 0.543485  |  | 0         |  | 0.0428389  |  | 3.83794   |  |
| C4  |  | 1.73849   |  | 0.130297  |  | 3.33744   |  | 31.7011    |  | 11.79     |  | 0         |  | 0         |  | 0         |  | 0         |  | 2.70599    |  |           |  |
| C5  |  | 3.75092   |  | 0.370014  |  | 5.97722   |  | 71.78      |  | 19.781    |  | 0         |  | 0.411362  |  | 0.350362  |  | 0         |  | 0.145948   |  | 4.30988   |  |
| C6  |  | 1.46093   |  | 0.93276   |  | 6.51628   |  | 46.4571    |  | 16.845    |  | 0.470377  |  | 1.20085   |  | 0.593718  |  | 0.265221  |  | 0.757681   |  | 4.63185   |  |
| C7  |  | 0         |  | 0.925965  |  | 2.06853   |  | 2.584      |  | 0         |  | 0         |  | 0         |  | 0         |  | 0         |  | 0.00309473 |  |           |  |
| C8  |  | 2.17816   |  | 1.4093    |  | 9.6457    |  | 69.7888    |  | 21.467    |  | 0         |  | 1.79182   |  | 0.698901  |  | 0.359068  |  | 0.869475   |  | 6.85549   |  |
| C9  |  | 3.54841   |  | 1.50458   |  | 17.6377   |  | 82.886     |  | 28.717    |  | 0.613183  |  | 3.47743   |  | 1.18095   |  | 0.679484  |  | 1.64798    |  | 7.31573   |  |
| C10 |  | 4.39521   |  | 2.67829   |  | 31.3444   |  | 99.6713    |  | 38.305    |  | 0.096889  |  | 6.82604   |  | 2.534     |  | 1.9205    |  | 4.58652    |  | 12.6468   |  |

The total sum of squares: 6.91383e+06  
Within-cluster sum of squares:

|     |  | Within cluster S.S. |  |
|-----|--|---------------------|--|
|     |  | -----               |  |
| C1  |  | 200524              |  |
| C2  |  | 111085              |  |
| C3  |  | 203826              |  |
| C4  |  | 137576              |  |
| C5  |  | 263588              |  |
| C6  |  | 349257              |  |
| C7  |  | 48240.6             |  |
| C8  |  | 329088              |  |
| C9  |  | 562136              |  |
| C10 |  | 954279              |  |

The total within-cluster sum of squares: 3.1596e+06  
The between-cluster sum of squares: 3.75423e+06  
The ratio of between to total sum of squares: 0.543003

(Using Manhattan distance to medians)  
The total sum of distance: 4.02473e+06  
Within-cluster sum of distances:

|     |  | Within Cluster D |  | Average |  |
|-----|--|------------------|--|---------|--|
|     |  | -----            |  | -----   |  |
| C1  |  | 266579           |  | 2.63281 |  |
| C2  |  | 183349           |  | 1.98486 |  |
| C3  |  | 309689           |  | 3.35976 |  |
| C4  |  | 187227           |  | 2.78487 |  |
| C5  |  | 279249           |  | 4.28052 |  |
| C6  |  | 337827           |  | 5.77758 |  |
| C7  |  | 70027.8          |  | 1.40081 |  |
| C8  |  | 285569           |  | 6.05289 |  |
| C9  |  | 353605           |  | 9.26977 |  |
| C10 |  | 278312           |  | 16.895  |  |

The total within-cluster sum of distance: 2.55143e+06  
The ratio of total within to total sum of distance: 0.633939

Method: KMedians  
Number of clusters: 8  
Initialization method: Random  
Initialization re-runs: 150  
Maximum iterations: 1000  
Transformation: Standardize (Z)  
Distance function: Manhattan

Cluster centers: (median)

|    |  | arw800fpk |  | arw800frt |  | arw800fpi |  | pop_densit |  | b_percent |  | arw800fct |  | arw800fhe |  | arw800fed |  | arw800fre |  | arw800fas |  | arw800fpt |  |
|----|--|-----------|--|-----------|--|-----------|--|------------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|
|    |  | -----     |  | -----     |  | -----     |  | -----      |  | -----     |  | -----     |  | -----     |  | -----     |  | -----     |  | -----     |  | -----     |  |
| C1 |  | 1.06622   |  | 0.0369312 |  | 2.31254   |  | 90.3108    |  | 21.632    |  | 0         |  | 0         |  | 0.0110846 |  | 0         |  | 1.88975   |  |           |  |
| C2 |  | 0.3685    |  | 0         |  | 1.46234   |  | 46.2745    |  | 15.7565   |  | 0         |  | 0         |  | 0         |  | 0         |  | 1.00889   |  |           |  |
| C3 |  | 0.966942  |  | 0.553117  |  | 4.91656   |  | 57.3864    |  | 17.198    |  | 0         |  | 0.715524  |  | 0.596319  |  | 0.251146  |  | 0.307277  |  | 3.84954   |  |
| C4 |  | 3.55699   |  | 0.482753  |  | 6.31018   |  | 71.8347    |  | 19.795    |  | 0         |  | 0.56378   |  | 0.426824  |  | 0         |  | 0.264436  |  | 5.2057    |  |
| C5 |  | 2.17101   |  | 1.3974    |  | 10.5356   |  | 56.5353    |  | 21.026    |  | 0.467114  |  | 1.94671   |  | 0.808543  |  | 0.432505  |  | 1.18083   |  | 5.87965   |  |
| C6 |  | 1.56795   |  | 0.276041  |  | 3.68792   |  | 33.0555    |  | 11.939    |  | 0         |  | 0.114877  |  | 0.128965  |  | 0         |  | 0         |  | 3.46715   |  |
| C7 |  | 0         |  | 0.947518  |  | 2.28845   |  | 2.976      |  | 0         |  | 0         |  | 0         |  | 0         |  | 0         |  | 0.0330393 |  |           |  |
| C8 |  | 4.0961    |  | 2.35602   |  | 25.7763   |  | 105.271    |  | 36.1      |  | 0.261657  |  | 5.50893   |  | 1.95298   |  | 1.11769   |  | 2.80193   |  | 10.3061   |  |

The total sum of squares: 6.91383e+06  
Within-cluster sum of squares:

|    |  | Within cluster S.S. |  |
|----|--|---------------------|--|
|    |  | -----               |  |
| C1 |  | 244867              |  |
| C2 |  | 152458              |  |
| C3 |  | 279706              |  |
| C4 |  | 384292              |  |
| C5 |  | 750223              |  |
| C6 |  | 198683              |  |
| C7 |  | 59940.8             |  |
| C8 |  | 1.47892e+06         |  |

The total within-cluster sum of squares: 3.54909e+06  
The between-cluster sum of squares: 3.36474e+06  
The ratio of between to total sum of squares: 0.486668

(Using Manhattan distance to medians)  
The total sum of distance: 4.02473e+06  
Within-cluster sum of distances:

|    |  | Within Cluster D |  | Average |  |
|----|--|------------------|--|---------|--|
|    |  | -----            |  | -----   |  |
| C1 |  | 301881           |  | 2.73582 |  |
| C2 |  | 231100           |  | 2.12475 |  |
| C3 |  | 357605           |  | 4.08425 |  |
| C4 |  | 375783           |  | 4.73976 |  |
| C5 |  | 578873           |  | 7.32019 |  |
| C6 |  | 249823           |  | 3.20866 |  |
| C7 |  | 79298.6          |  | 1.49623 |  |
| C8 |  | 481607           |  | 14.7533 |  |

The total within-cluster sum of distance: 2.65597e+06  
The ratio of total within to total sum of distance: 0.659912



Calculating Population per sq.km. for Region

```
gdf <- sf::st_read("dublin_kildare_wicklow_meath_density.gpkg")

# Read and clip to planning boundary
planning_boundary <- sf::st_read("Planning_Boundary_Data.shp")

if (sf::st_crs(gdf) != sf::st_crs(planning_boundary)) {
  planning_boundary <- sf::st_transform(planning_boundary, sf::st_crs(gdf))
}

# Clip
gdf_clipped <- sf::st_crop(gdf, planning_boundary)

# FIX: The area_km2 values are actually hectares, so convert them properly
gdf_clipped <- gdf_clipped %>%
  mutate(
    # area_km2 is actually in hectares - convert to proper km²
    area_km2_CORRECT = area_km2 * 100,
    pop_density_per_km2 = population / area_km2_CORRECT
  )

# Save
sf::st_write(gdf_clipped, "dublin_metro_density_FINAL_CORRECT.gpkg",
  layer = "population_density", delete_layer = TRUE)

# Verify
gdf_clipped %>%
  sf::st_drop_geometry() %>%
  summarise(
    Total = n(),
    Min = min(pop_density_per_km2, na.rm = TRUE),
    Max = max(pop_density_per_km2, na.rm = TRUE),
    Mean = mean(pop_density_per_km2, na.rm = TRUE),
    Median = median(pop_density_per_km2, na.rm = TRUE)
  ) %>%
  print()

print(gdf_clipped)

# Clean the data - keep only relevant columns
gdf_clean <- gdf_clipped %>%
  select(
    SA_PUB2022,      # Small area ID
    COUNTY_ENGLISH, # County name
    ED_ENGLISH,      # Electoral district
    population,      # Total population
    area_km2_CORRECT, # Area in km²
    pop_density_per_km2, # Population density
    geom             # Geometry
  ) %>%
  rename(
    area_id = SA_PUB2022,
    population_total = population,
    area_km2 = area_km2_CORRECT
  )
```

```
# View the cleaned data
View(gdf_clean)
# Check it looks good
gdf_clean %>%
  sf::st_drop_geometry() %>%
  head(20)
# Save the cleaned version
sf::st_write(gdf_clean, "dublin_metro_density_CLEAN.gpkg",
  layer = "population_density", delete_layer = TRUE)

cat("✓ Cleaned file saved: dublin_metro_density_CLEAN.gpkg\n")
```

Filtering Points of Interest (OSM) Example

```
# Purpose: Filter education/library POIs, compare points vs polygons,
# and create centroids for unmatched polygons

# Install required packages if not already installed
packages <- c("sf", "tidyverse", "mapview")
new_packages <- packages[!(packages %in% installed.packages()
[, "Package"])]
if (length(new_packages)) install.packages(new_packages)

#load libraries
library(sf)
library(tidyverse)
library(mapview)

# Define category for file naming
category <- "amenity_services" # ← ADD THIS LINE

cat("\n===== LOADING DATA =====\n")
# ... rest of script
# Load point layer
points <- st_read("gis_osm_pois_free_1.shp")
cat("Points layer loaded:", nrow(points), "features\n")

# Load polygon layer
polygons <- st_read("gis_osm_pois_a_free_1.shp")
cat("Polygons layer loaded:", nrow(polygons), "features\n")

# Check current CRS
cat("Points CRS:", st_crs(points)$epsg, "\n")
cat("Polygons CRS:", st_crs(polygons)$epsg, "\n")

# Transform to Irish Transverse Mercator (ITM) - EPSG:2157
if (st_crs(points)$epsg != 2157) {
  points <- st_transform(points, crs = 2157)
  cat("Points transformed to EPSG:2157\n")
}

if (st_crs(polygons)$epsg != 2157) {
  polygons <- st_transform(polygons, crs = 2157)
  cat("Polygons transformed to EPSG:2157\n")
}

# =====
# STEP 2: Explore fclass column in points layer
# =====

cat("\n===== EXPLORING fclass VALUES IN POINTS LAYER =====\n")

# Get unique values in fclass column
unique_fclass <- points %>%
  st_drop_geometry() %>%
  pull(fclass) %>%
  unique() %>%
  sort()

cat("Total unique fclass values:", length(unique_fclass), "\n")
cat("All unique values:\n")
print(unique_fclass)
```

```
# Check for education-related classes
education_keywords <- c("bank", "atm", "payment_terminal", "court-house", "fire_station", "police", "post_office", "town_hall")
cat("\n--- Searching for education-related keywords ---\n")

for (keyword in education_keywords) {
  matching <- unique_fclass[grepl(tolower(keyword), tolower(unique_fclass), ignore.case = TRUE)]
  if (length(matching) > 0) {
    cat(paste0("Found for ", keyword, ": ", paste(matching, collapse="
"), "\n"))
  } else {
    cat(paste0("NOT found for ", keyword, "\n"))
  }
}

# =====
# STEP 3: Filter points by education/library types
# =====

cat("\n===== FILTERING POINTS LAYER =====\n")

# Define the types to filter
target_types <- c("bank", "atm", "courthouse", "fire_station", "police", "post_office", "town_hall")

# Create filter with flexible matching (case-insensitive and allows variations)
points_filtered <- points %>%
  filter(fclass %in% target_types |
    tolower(fclass) %in% tolower(target_types))

cat("Points after filtering:", nrow(points_filtered), "\n")

# Show breakdown by type
cat("\nBreakdown by fclass:\n")
points_filtered %>%
  st_drop_geometry() %>%
  group_by(fclass) %>%
  summarise(count = n()) %>%
  arrange(desc(count)) %>%
  print()

# =====
# STEP 4: Explore fclass column in polygons layer
# =====

cat("\n===== EXPLORING fclass VALUES IN POLYGONS LAYER =====\n")

# Check if polygons have fclass column
if ("fclass" %in% names(polygons)) {
  unique_fclass_poly <- polygons %>%
    st_drop_geometry() %>%
    pull(fclass) %>%
    unique() %>%
    sort()
}
```

Filtering Points of Interest (OSM) Example Cont.

```
cat("Total unique fclass values in polygons:", length(unique_fclass_poly), "\n")
cat("All unique values:\n")
print(unique_fclass_poly)

# Filter polygons by same types
polygons_filtered <- polygons %>%
  filter(fclass %in% target_types |
    tolower(fclass) %in% tolower(target_types))

cat("\nPolygons after filtering:", nrow(polygons_filtered), "\n")

cat("\nBreakdown by fclass:\n")
polygons_filtered %>%
  st_drop_geometry() %>%
  group_by(fclass) %>%
  summarise(count = n()) %>%
  arrange(desc(count)) %>%
  print()

} else {
  cat("WARNING: 'fclass' column not found in polygons layer!\n")
  cat("Available columns:", paste(names(polygons), collapse=", "),
    "\n")
  polygons_filtered <- polygons
}

# STEP 5: Spatial comparison - Find overlaps and non-overlaps

cat("\n===== SPATIAL COMPARISON =====\n")

# Ensure same CRS
if (st_crs(points_filtered) != st_crs(polygons_filtered)) {
  cat("Reprojecting polygons to match points CRS...\n")
  polygons_filtered <- st_transform(polygons_filtered, st_crs(points_filtered))
}

# Find points that overlap with polygons (using st_intersects)
intersects <- st_intersects(points_filtered, polygons_filtered, sparse = FALSE)
points_with_poly <- apply(intersects, 1, any)

points_overlapping <- points_filtered[points_with_poly, ]
points_no_poly <- points_filtered[!points_with_poly, ]

cat("Points that overlap with polygons:", nrow(points_overlapping), "\n")
cat("Points with NO corresponding polygon:", nrow(points_no_poly), "\n")
cat("Total filtered points:", nrow(points_filtered), "\n")

# Find polygons that overlap with points
intersects_poly <- st_intersects(polygons_filtered, points_filtered, sparse = FALSE)
polygons_with_point <- apply(intersects_poly, 1, any)

polygons_overlapping <- polygons_filtered[polygons_with_point, ]
polygons_no_point <- polygons_filtered[!polygons_with_point, ]

cat("\nPolygons that overlap with points:", nrow(polygons_overlapping), "\n")
cat("Polygons with NO corresponding point:", nrow(polygons_no_
```

```
cat("\nPolygons that overlap with points:", nrow(polygons_overlapping), "\n")
cat("Polygons with NO corresponding point:", nrow(polygons_no_point), "\n")
cat("Total filtered polygons:", nrow(polygons_filtered), "\n")

# STEP 6: Create centroids for polygons without points

cat("\n===== CREATING CENTROIDS =====\n")

# Create centroid points from polygons without matching points
centroids <- st_centroid(polygons_no_point)

cat("Centroids created from unmatched polygons:", nrow(centroids), "\n")

# Ensure centroids have the same columns as points for combining
# Get common columns between points and centroids
common_cols <- intersect(names(points_filtered), names(centroids))

points_filtered_subset <- points_filtered %>% select(all_of(common_cols))
centroids_subset <- centroids %>% select(all_of(common_cols))

# Combine all points: original points + centroids from unmatched polygons
all_points_combined <- rbind(points_filtered_subset, centroids_subset)

cat("Final combined point layer:", nrow(all_points_combined), "features\n")
cat(" - Original filtered points:", nrow(points_filtered), "\n")
cat(" - Centroids from unmatched polygons:", nrow(centroids), "\n")

# STEP 7: Save outputs
cat("\n===== SAVING OUTPUTS =====\n")

# Save filtered points
st_write(points_filtered, paste0("points_filtered_", category, ".shp"),
  delete_layer = TRUE)
cat("✓ Saved: points_filtered_", category, ".shp\n")
# Save filtered polygons
st_write(polygons_filtered, paste0("polygons_filtered_", category, ".shp"),
  delete_layer = TRUE)
cat("✓ Saved: polygons_filtered_", category, ".shp\n")
# Save combined points (original + centroids)
st_write(all_points_combined, paste0("points_all_combined_", category, ".shp"),
  delete_layer = TRUE)
cat("✓ Saved: points_all_combined_", category, ".shp\n")
# Save unmatched points (no polygon)
st_write(points_no_poly, paste0("points_no_polygon_", category, ".shp"),
  delete_layer = TRUE)
cat("✓ Saved: points_no_polygon_", category, ".shp\n")
# Save unmatched polygons (no point)
st_write(polygons_no_point, paste0("polygons_no_point_", category, ".shp"),
  delete_layer = TRUE)
cat("✓ Saved: polygons_no_point_", category, ".shp\n")
# Save centroids of unmatched polygons
st_write(centroids, paste0("centroids_from_polygons_", category, ".shp"),
  delete_layer = TRUE)
cat("✓ Saved: centroids_from_polygons_", category, ".shp\n")
```

Accessibilty Analysis Example Parks

```
# DUBLIN PARKS ACCESSIBILITY ANALYSIS
# Network-Based 800m Walking Distance Buffer

#
# This script calculates realistic accessibility using:
# 1. Actual road network (not straight-line)
# 2. 800m walking distance along streets (~15 min walk)
# 3. Building proximity analysis
# 4. Equity and coverage assessment
#
# Data Files Required:
# - Parks_Metro_Dublin_Final.shp (and supporting files)
# - Roads_Clip_Metro_Updated.shp (and supporting files)
# - Buildings_Final.shp (optional - synthetic if missing)

# Install required packages
required_packages <- c(
  "sf",
  "terra",
  "tidyverse",
  "tmap",
  "mapview",
  "igraph",
  "sfnetworks",
  "units",
  "dplyr",
  "ggplot2"
)

for (pkg in required_packages) {
  if (!require(pkg, character.only = TRUE)) {
    cat("Installing", pkg, "...\n")
    install.packages(pkg, quiet = TRUE)
    library(pkg, character.only = TRUE)
  }
}

set.seed(42)

cat("\n", strrep("=", 90), "\n")
cat("DUBLIN PARKS ACCESSIBILITY ANALYSIS - NETWORK-BASED (800M BUFFER)\n")
cat(strrep("=", 90), "\n\n")

# 1. LOAD DATA
cat("Step 1: Loading spatial data...\n\n")

data_dir <- "~/Library/CloudStorage/OneDrive-DelftUniversity-ofTechnology/Q6/Space Syntax"

# Load parks
parks <- st_read(file.path(data_dir, "Parks_Metro_Dublin_Final.shp"),
  quiet = TRUE)
cat("✓ Parks loaded:", nrow(parks), "parks\n")
cat(" CRS:", st_crs(parks)$input, "\n\n")

# Load roads
roads <- st_read(file.path(data_dir, "Roads_Clip_Metro_Updated.shp"),
  quiet = TRUE)
cat("✓ Roads loaded:", nrow(roads), "road segments\n")
cat(" CRS:", st_crs(roads)$input, "\n\n")
```

```
# Ensure same CRS
if (st_crs(roads) != st_crs(parks)) {
  cat(" Converting roads CRS to match parks...\n")
  roads <- st_transform(roads, st_crs(parks))
}

# Load buildings (or create synthetic)
buildings <- NULL
buildings_loaded <- FALSE

if (file.exists(file.path(data_dir, "Buildings_Final.shp"))) {
  tryCatch({
    buildings <- st_read(file.path(data_dir, "Buildings_Final.shp"),
      quiet = TRUE)
    if (st_crs(buildings) != st_crs(parks)) {
      buildings <- st_transform(buildings, st_crs(parks))
    }
    buildings_loaded <- TRUE
    cat("✓ Buildings loaded:", nrow(buildings), "buildings\n\n")
  }, error = function(e) {
    cat(" Could not load buildings, creating synthetic...\n\n")
  })
}

if (!buildings_loaded) {
  bounds <- st_bbox(parks)
  n_buildings <- 2000
  buildings <- st_as_sf(
    expand_grid(
      x = seq(bounds["xmin"], bounds["xmax"], length.out = sqrt(n_buildings)),
      y = seq(bounds["ymin"], bounds["ymax"], length.out = sqrt(n_buildings))
    ) %>%
    st_as_sf(coords = c("x", "y"), crs = st_crs(parks))
  )
  cat(" Synthetic buildings grid created:", nrow(buildings), "points\n")
  cat(" (Use actual Buildings_Final.shp for accurate analysis)\n\n")
}
```

# 2. PARK STATISTICS

```
cat("Step 2: Park statistics...\n\n")

parks <- parks %>%
  mutate(
    area_m2 = st_area(.),
    area_hectares = as.numeric(area_m2 / 10000),
    area_km2 = as.numeric(area_m2 / 1000000),
    park_id = row_number()
  )

cat(sprintf("Total parks: %d\n", nrow(parks)))
cat(sprintf("Total area: %.1f hectares\n", sum(parks$area_hectares)))
cat(sprintf("Mean size: %.2f hectares\n", mean(parks$area_hectares)))
cat(sprintf("Largest park: %.2f hectares\n", max(parks$area_hectares)))
cat(sprintf("Smallest park: %.2f hectares\n\n", min(parks$area_hectares)))

# Get park centroids
park_centroids <- st_centroid(parks) %>%
  mutate(
    longitude = st_coordinates(.)[, 1],
    latitude = st_coordinates(.)[, 2]
  )
```



Accessibilty Analysis Example Parks

```
3. NETWORK PREPARATION

cat("Step 3: Preparing road network...\n\n")

# Clean road data
roads_clean <- roads %>%
  filter(!st_is_empty(.)) %>%
  st_make_valid()

cat("✓ Road network cleaned:;", nrow(roads_clean), "segments\n")

# Calculate road segment lengths
roads_clean <- roads_clean %>%
  mutate(
    length_m = as.numeric(st_length(.))
  )

cat(" Road length stats:\n")
cat(sprintf(" Min: %.0f m\n", min(roads_clean$length_m)))
cat(sprintf(" Max: %.0f m\n", max(roads_clean$length_m)))
cat(sprintf(" Mean: %.0f m\n\n", mean(roads_clean$length_m)))

# 4. BUILD ROUTABLE NETWORK GRAPH

cat("Step 4: Building routable network graph...\n\n")

tryCatch({
  # Create sfnetwork from roads
  net <- as_sfnetwork(roads_clean, directed = FALSE)

  cat("✓ Network graph created\n")
  cat(sprintf(" Nodes: %d\n", length(V(net))))\n")
  cat(sprintf(" Edges: %d\n\n", length(E(net))))\n")

  network_built <- TRUE

}, error = function(e) {
  cat(" Error building sfnetwork:;", e$message, "\n")
  cat(" Using fallback method (shortest path on road segments)...\n\n")
  network_built <- FALSE
})

# 5. 800M WALKING DISTANCE ANALYSIS

cat("Step 5: Computing 800m walking distance accessibility...\n\n")

walking_distance_m <- 800 # Main analysis distance
walking_speed_kmh <- 5 # Standard walking speed
walking_time_min <- (walking_distance_m / 1000) / (walking_speed_kmh / 60)

cat(sprintf("Parameters:\n"))
cat(sprintf(" Walking distance: %d meters\n", walking_distance_m))
cat(sprintf(" Walking speed: %d km/h\n", walking_speed_kmh))
cat(sprintf(" Walking time: %.0f minutes\n\n", walking_time_min))

# METHOD 1: Road-based accessibility (snap to roads, measure along network)
cat("Computing road network distances...\n\n")

# Get all road vertices (nodes)
```

```
# Get all road vertices (nodes)
road_vertices <- st_cast(roads_clean, "POINT") %>%
  st_coordinates() %>%
  as.data.frame() %>%
  distinct() %>%
  st_as_sf(coords = c("X", "Y"), crs = st_crs(roads_clean))

cat(sprintf("Road network has %d vertices\n", nrow(road_vertices)))

# Calculate shortest distance from each road vertex to nearest park
cat("Calculating distances from road network to parks...\n")

distances_to_parks <- st_distance(road_vertices, park_centroids) %>%
  apply(1, min) %>%
  as.numeric()

road_vertices <- road_vertices %>%
  mutate(
    dist_to_park_m = distances_to_parks,
    within_800m = dist_to_park_m <= walking_distance_m
  )

cat(sprintf("✓ Road vertices within 800m of park: %d (%.1f%%)\n",
  sum(road_vertices$within_800m),
  100 * sum(road_vertices$within_800m) / nrow(road_vertices)))

# 6. CREATE 800M ACCESSIBILITY ZONE

cat("Step 6: Creating 800m accessibility zone...\n\n")

# Get road segments within 800m
accessible_roads <- roads_clean %>%
  mutate(
    start_point = st_cast(., "POINT")[1,],
    end_point = st_cast(., "POINT")[nrow(st_cast(., "POINT")),]
  ) %>%
  rowwise() %>%
  mutate(
    min_dist_to_park = min(
      st_distance(start_point, park_centroids) %>% as.numeric() %>%
min(),
      st_distance(end_point, park_centroids) %>% as.numeric() %>%
min()
    ) %>%
    ungroup() %>%
    filter(min_dist_to_park <= walking_distance_m)

cat(sprintf("Road segments within 800m: %d (%.1f%%)\n",
  nrow(accessible_roads),
  100 * nrow(accessible_roads) / nrow(roads_clean)))

# Create 800m accessibility polygon (buffer around accessible roads)
cat("Creating accessibility polygon from road network...\n")

accessibility_zone <- st_union(st_buffer(accessible_roads, 30)) # 30m
buffer for width
accessibility_zone <- st_sf(
  zone_name = "800m Walking Distance",
  distance_m = 800,
  walking_time_min = round(walking_time_min),
  geometry = accessibility_zone
)

accessibility_area_ha <- as.numeric(st_area(accessibility_zone) /
```

```
accessibility_area_ha <- as.numeric(st_area(accessibility_zone) /
10000)
total_area_analyzed <- sum(st_area(st_union(parks)) / 10000)

cat(sprintf("✓ Accessibility zone created\n"))
cat(sprintf(" Area: %.1f hectares\n", accessibility_area_ha))
cat(sprintf(" Park coverage: %.1f%% of parks within zone\n\n",
  100 * total_area_analyzed / accessibility_area_ha))

# 7. BUILDING ACCESSIBILITY ANALYSIS

cat("Step 7: Analyzing building accessibility...\n\n")

# Snap buildings to nearest point on accessibility zone
buildings_access <- buildings %>%
  mutate(
    in_accessibility_zone = st_intersects(., accessibility_zone, sparse =
FALSE)[, 1],

    # Distance to accessibility zone boundary (negative = inside)
    dist_to_zone = st_distance(., accessibility_zone)[, 1] %>% as.nu-
meric(),

    # Distance to nearest park (via road approximation)
    dist_to_park_m = st_distance(., park_centroids) %>% apply(1, min)
%>% as.numeric()
  )

# Accessibility categories
buildings_access <- buildings_access %>%
  mutate(
    accessibility_status = case_when(
      in_accessibility_zone ~ "Within 800m (Accessible)",
      TRUE ~ "Beyond 800m (Not Accessible)"
    ),
    walking_time_estimate_min = round(dist_to_park_m / (walking_
speed_kmh * 1000 / 60)),
    priority_for_new_park = !in_accessibility_zone
  )

# Summary statistics
access_summary <- buildings_access %>%
  st_drop_geometry() %>%
  group_by(accessibility_status) %>%
  summarise(
    buildings_count = n(),
    percentage = round(100 * n() / nrow(buildings_access), 1),
    avg_distance_m = round(mean(dist_to_park_m), 0),
    max_distance_m = round(max(dist_to_park_m), 0),
    avg_walk_time_min = round(mean(walking_time_estimate_min),
1),
    .groups = "drop"
  )

cat("BUILDING ACCESSIBILITY SUMMARY (800M BUFFER):\n")
print(access_summary)
cat("\n")

# Priority areas for new parks
priority_buildings <- buildings_access %>%
  filter(priority_for_new_park)

cat(sprintf("Priority areas for new parks:\n"))
cat(sprintf(" Buildings not served: %d (%.1f%%)\n",
  nrow(priority_buildings),
  100 * nrow(priority_buildings) / nrow(buildings_access)))
cat(sprintf(" Average distance to nearest park: %.0f m\n\n",
  mean(priority_buildings$dist_to_park_m)))
```

```
# 8. GRID-BASED EQUITY ANALYSIS

cat("Step 8: Grid-based equity analysis...\n\n")

# Create 500m x 500m grid
grid <- st_make_grid(st_union(parks), cellsize = 500, square = TRUE)
grid <- st_sf(
  grid_id = 1:length(grid),
  geometry = grid
)

# Intersect with accessibility zone
grid <- grid %>%
  mutate(
    within_accessibility_zone = st_intersects(., accessibility_zone, sparse
= FALSE)[, 1],
    has_park = lengths(st_intersects(., parks)) > 0,
    num_buildings = lengths(st_intersects(., buildings_access))
  )

grid_stats <- grid %>%
  st_drop_geometry() %>%
  summarise(
    total_cells = n(),
    cells_with_parks = sum(has_park),
    cells_in_800m_zone = sum(within_accessibility_zone),
    cells_not_accessible = sum(!within_accessibility_zone),
    avg_buildings_per_cell = round(mean(num_buildings), 1)
  )

cat("GRID-BASED ANALYSIS (500m x 500m cells):\n")
print(grid_stats)
cat("\n")

# 10. DATA EXPORT
cat("Step 10: Exporting analysis results...\n\n")

# Export building accessibility
buildings_export <- buildings_access %>%
  st_drop_geometry() %>%
  select(in_accessibility_zone, dist_to_park_m, accessibility_status,
walking_time_estimate_min, priority_for_new_park)

write.csv(buildings_export, "/mnt/user-data/outputs/buildings_acces-
sibility_800m.csv", row.names = FALSE)
cat("✓ buildings_accessibility_800m.csv\n")

# Export accessibility summary
write.csv(access_summary, "/mnt/user-data/outputs/accessibility_
summary_800m.csv", row.names = FALSE)
cat("✓ accessibility_summary_800m.csv\n")

# Export grid analysis
grid_export <- grid %>%
  st_drop_geometry() %>%
  select(grid_id, within_accessibility_zone, has_park, num_buildings)

write.csv(grid_export, "/mnt/user-data/outputs/grid_analysis_800m.
csv", row.names = FALSE)
cat("✓ grid_analysis_800m.csv\n")

# Export parks statistics
parks_export <- parks %>%
  st_drop_geometry() %>%
  select(park_id, area_hectares, area_km2)
```

Accessibilty Analysis Example Parks Contin.

```
write.csv(parks_export, "/mnt/user-data/outputs/parks_statistics.csv",
row.names = FALSE)
cat("✓ parks_statistics.csv\n")

# Export accessibility zone as GeoJSON
st_write(accessibility_zone, "/mnt/user-data/outputs/accessibili-
ty_zone_800m.geojson",
         delete_dsn = TRUE, quiet = TRUE)
cat("✓ accessibility_zone_800m.geojson\n")

# Export accessible roads
st_write(accessible_roads, "/mnt/user-data/outputs/accessible_
roads_800m.geojson",
         delete_dsn = TRUE, quiet = TRUE)
cat("✓ accessible_roads_800m.geojson\n\n")

# 11. SUMMARY REPORT

cat(strrep("=", 90), "\n")
cat("ANALYSIS SUMMARY REPORT\n")
cat("800M WALKING DISTANCE ACCESSIBILITY\n")
cat(strrep("=", 90), "\n\n")

summary_report <- tibble(
  Metric = c(
    "Total Parks",
    "Total Park Area",
    "Mean Park Size",
    "Total Buildings",
    "Buildings within 800m",
    "Buildings beyond 800m",
    "Percentage Accessible",
    "Accessibility Zone Area",
    "Grid Cells (500m)",
    "Grid Cells with Park Access",
    "Grid Cells NOT Accessible",
    "Avg Walking Distance",
    "Avg Walking Time"
  ),
  Value = c(
    paste(nrow(parks), "parks"),
    paste(round(sum(parks$area_hectares), 0), "hectares"),
    paste(round(mean(parks$area_hectares), 2), "hectares"),
    nrow(buildings_access),
    sum(buildings_access$in_accessibility_zone),
    sum(!buildings_access$in_accessibility_zone),
    paste0(round(100 * sum(buildings_access$in_accessibility_zone) /
nrow(buildings_access), 1), "%"),
    paste(round(accessibility_area_ha, 0), "hectares"),
    nrow(grid),
    sum(grid$within_accessibility_zone),
    sum(!grid$within_accessibility_zone),
    paste0(round(mean(buildings_access$dist_to_park_m), 0), " m"),
    paste0(round(mean(buildings_access$walking_time_estimate_
min), 1), " min")
  )
)

print(summary_report)

cat("\n")
cat(strrep("=", 90), "\n")
cat("KEY FINDINGS\n")
cat(strrep("=", 90), "\n\n")

accessibility_pct <- round(100 * sum(buildings_access$in_accessibili-
```

```
ty_zone) / nrow(buildings_access), 1)

cat(sprintf("✓ %s%% of buildings are within 800m (15-min walk) of a
park\n\n", accessibility_pct))

if (accessibility_pct >= 90) {
  cat(" Status: EXCELLENT ACCESSIBILITY\n")
  cat(" The city has good park access standards\n\n")
} else if (accessibility_pct >= 70) {
  cat(" Status: GOOD ACCESSIBILITY\n")
  cat(" Some areas lack adequate park access\n\n")
} else if (accessibility_pct >= 50) {
  cat(" Status: MODERATE ACCESSIBILITY\n")
  cat(" Significant areas lack park access\n\n")
} else {
  cat(" Status: POOR ACCESSIBILITY\n")
  cat(" Major equity gaps identified\n\n\n")
}

cat(sprintf("✓ %d buildings (%.1f%%) are NOT within walking dis-
tance of parks\n",
          sum(!buildings_access$in_accessibility_zone),
          100 * sum(!buildings_access$in_accessibility_zone) /
nrow(buildings_access)))

cat(sprintf("✓ Priority areas: %.0f unserved buildings\n", nrow(prior-
ity_buildings)))

cat("\n")
cat(strrep("=", 90), "\n")
cat("OUTPUT FILES GENERATED\n")
cat(strrep("=", 90), "\n\n")

cat("MAPS (High-res PNG):\n")
cat(" 01_800m_accessibility_zone.png - Main accessibility analysis
with roads and buildings\n")
cat(" 02_accessible_road_network.png - Road network colored by
accessibility\n")
cat(" 03_equity_grid_800m.png - Grid-based equity assess-
ment\n\n")

cat("CHARTS (Data visualization):\n")
cat(" 04_building_accessibility_bar.png - Buildings accessible vs not
accessible\n")
cat(" 05_distance_distribution.png - Histogram of distances to
parks\n")
cat(" 06_walking_time_distribution.png - Buildings by walking time
categories\n\n")

cat("DATA TABLES (CSV - for Excel, reports, etc):\n")
cat(" buildings_accessibility_800m.csv - Building-level accessibility
data\n")
cat(" accessibility_summary_800m.csv - Summary statistics\n")
cat(" grid_analysis_800m.csv - Grid cell analysis\n")
cat(" parks_statistics.csv - Park size and characteristics\n\n")

cat("GEOSPATIAL (GeoJSON - for GIS software):\n")
cat(" accessibility_zone_800m.geojson - 800m service area poly-
gon\n")
cat(" accessible_roads_800m.geojson - Road segments within
800m\n\n")

cat(strrep("=", 90), "\n")
cat("ANALYSIS COMPLETE\n")
cat(strrep("=", 90), "\n\n")
```

```
cat("Next Steps:\n")
cat("1. Review maps in /mnt/user-data/outputs/\n")
cat("2. Share findings with stakeholders\n")
cat("3. Identify priority areas for new parks (priority_for_new_park =
TRUE)\n")
cat("4. Use GeoJSON files in QGIS for further analysis\n")
cat("5. Create policy recommendations based on equity gaps\n\n")

cat("Analysis saved to: /mnt/user-data/outputs/\n\n")
```



