

Sustainable Mobility Strategy

Northwest Quadrant (Naas) Framework Masterplan

Project number: 60727567

May 2026

Prepared for:

Kildare County Council

AECOM Ireland Limited

4th Floor

Adelphi Plaza

Georges Street Upper

Dun Laoghaire

Co. Dublin A96 T927

Ireland

T: +353 1 696 6220

aecom.com

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1. Introduction

1.1 Overview

AECOM has been tasked by Kildare County Council (KCC) to develop a Sustainable Mobility Strategy (SMS) for Northwest Quadrant (Naas) lands for which a Framework Masterplan is being prepared. The Northwest Quadrant (Naas) is hereafter referred to as “NWQ”. The SMS is a key input into the preparation of the Framework Masterplan that aims to provide an ambitious and coherent development framework for an exemplar urban extension. The SMS and hence the Framework Masterplan’s development is informed by best practice case studies and a collaborative multi-disciplinary approach to design. The SMS aims to promote sustainable travel for residents, workers and visitors in line with national transport policy, while also facilitating private motor vehicle access and movement within a filtered permeability street network. This document highlights the key sustainable mobility components included in the masterplan and explains the integrated approach to sustainable travel in the infrastructure which is proposed. The final section summarises the measures in the SMS and the importance of future monitoring.

1.2 Background

The NWQ is the largest urban extension in County Kildare. It aims to create a sustainable low carbon urban district to the northwest of Naas, comprised of town centre, multiple neighbourhoods and employment areas. The NWQ is expected to accommodate approximately 4,000 homes, while the proposed land use split for employment lands is expected to create approximately 5,000 jobs, which will contribute towards a wider objective of increasing the jobs ratio for Naas to 1.25 jobs: 1 population of labour market age.

Figure 1.1 highlights the location of the NWQ in the wider context of Naas and Sallins.

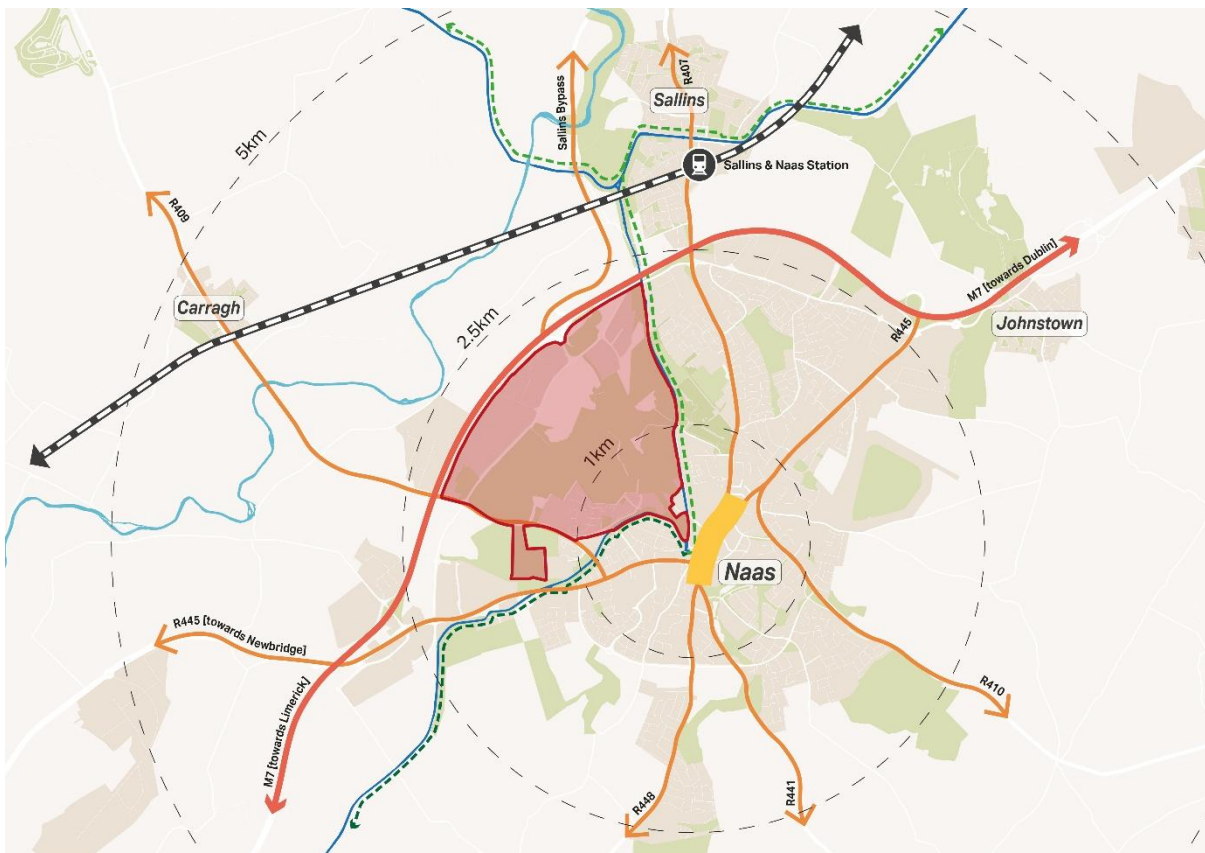


Figure 1.1- NWQ Location Context

AECOM previously undertook, in conjunction with KCC, a wider Naas – Sallins Transport Strategy (NSTS) (2020), which in turn informed the Naas Local Area Plan 2021 – 2027 to address the then transportation issues and anticipate future challenges within the Naas and Sallins area.

Key components of the previous NSTS were:

Public Transport Improvements

- Development of a priority bus route linking Naas town centre with Sallins via the NWQ.
- Enhancements to bus frequency and reliability to encourage greater use of public transport.
- Introduction of a town bus service to link residents with schools, the hospital and train station

Active Transportation

- Comprehensive walking and cycling network proposed to enhance accessibility for active travel across Naas and Sallins.

Traffic Management

- Implementation of traffic calming measures and optimized signal timings to improve road safety and reduce congestion.
- Several new road links proposed, with associated walking and facilities
- Encouragement of electric and low-emission vehicle use through infrastructural support like charging stations.

Integration with Land Use Planning

- Support for transit-oriented development and mixed-use areas to minimize travel distances and enhance urban liveability.
- Preservation and enhancement of green spaces to support active travel and reduce environmental impact.

The NSTS was the starting point for the development of the SMS for the Framework Masterplan, but in developing the framework, the masterplanning team went back to first principles to put together a transport strategy through a multi-disciplinary design process that considered land use, transport, urban design, and other specialist inputs to the design process in parallel. The resultant masterplan also takes into account the views of the National Transport Authority in designing the bus-based public transport system for the NWQ to ensure business case feasibility in the context of the major development proposed at the NWQ and the available bus system budget for Naas. The SMS in this report reflects the latest approach presented in the masterplan design

1.3 Report Structure

The Strategy is structured into the following sections:

- Section 2: Exemplar Case Study Review
- Section 3: Policy Review
- Section 4: Baseline Review
- Section 5: Principles and Objectives
- Section 6: Proposed Masterplan
- Section 7: Transport Strategy by Mode
- Section 8: NWQ Sustainable Mobility Strategy

- Section 9: Planning Process and Transport Assessments

2. Exemplar Case Study Review

2.1 Introduction

A case study review was undertaken encompassing ten examples from European masterplan sites with high sustainable travel mode share, many of which could be described as transit oriented development (TOD).

TOD is an urban development approach that maximises the amount of residential, business, and leisure space within walking distance of public transport. The key elements of TOD include:

- Providing a higher density mixed used development, incorporating residential, commercial and retail spaces within close proximity to public transport and urban centres to reduce the need for long commutes;
- Providing a compact urban form which promotes vertical growth and higher densities near public transport stations/ corridors to make efficient use of space;
- Creating well-designed transit hubs that serve as central nodes for various transportation modes, facilitating easy and convenient transfers;
- Ensuring that homes, workplaces, and amenities are within walking distance (typically 400 to 800 meters) of transit hubs; and
- Implementing zoning laws that support mixed-use development and higher densities near transit hubs whilst also allowing flexibility to accommodate changing needs over time.

TOD therefore has a direct impact on urban mobility and the economy, reducing travel times, congestion and emissions while expanding access to different areas of the town and thereby stimulating economic activity.

The NWQ will not be a TOD as it will not meet all criteria which are typically associated with TODs with regard to densities and public transport quality and frequency, but the Framework Masterplan nevertheless aims to apply similar principles and learn from best practice case studies to achieve an effective bus-based public transport system and strong active travel culture for shorter trips in an edge of town centre area, in alignment with the Sustainable Residential Development and Compact Settlements Guidelines for Planning Authorities (s28 GPA for SRD+CS)

This section provides a summary of the outcomes of the case study, with the full document included in Appendix A.

2.2 Key Themes

Following the review of the ten exemplar case studies, several key themes have been identified that should be applied to the NWQ in order to achieve a sustainable development connected by a walkable and cyclable network, which is compact and consolidated with an aspiration to achieve decarbonisation and sustainability.

2.2.1 Sustainable Objectives

Within each of the reviewed examples, their development was based upon a clear set of sustainable objectives, with which all aspects of design, from inception through to implementation, were assessed against. Key objectives in relation to transport that have produced successful developments have related to: -

- Creating a low-car, sustainable residential community;
- Enhancing connectivity and public transportation; and
- Integrating mixed-use development to enhance liveability and economic vitality.

2.2.2 Provision of a Public Transport Network

In all instances, the establishment of a cohesive and interconnected public transportation system has played a crucial role in promoting car-free or reduced-car developments. By providing access to bus and rail links that

connect to larger interurban services, a significant modal share has been achieved for this mode of transportation. A key factor in this success has been the placement of bus stops or rail halts within a 5-minute walking distance from any point of interest within the development. It should be noted that the infrastructure should be in place before the residential/ commercial development is occupied.

Moreover, examples where the public transportation network has driven the planning and execution of the development have proven to be the most effective. By allowing the scale of residential or commercial land use to be determined by the accessibility of public transport connections, these developments have seen the greatest success.

The Hammarby Sjöstad and Vauban case studies have shown the effectiveness of providing a central spine corridor that is limited to public transport and active travel.

2.2.3 Provision of Car Parking

The size and placement of parking facilities, whether for private residences or public use, have been proven to significantly impact the development of car-free or reduced-car communities. Examples such as Vauban and Bo01, which did not include parking in their central areas and instead limited it to the outskirts or specific locations, achieved low levels of car ownership and high usage of public transportation. Conversely, when parking is available on residential streets or in commercial areas, even with limited space relative to land use, private cars continue to be the preferred mode of transportation.

2.2.4 Policy and Engagement

In instances where zero or minimal car parking is available, specific policies have been implemented in the area. Prospective residents are required to agree to not own a private car, and commercial entities are prohibited from providing any parking facilities. If a resident does choose to own a private car, a financial fee is imposed to support the maintenance of designated parking areas. Additionally, metered fees are applied to any public or commercial parking spaces.

Numerous successful examples have demonstrated the effectiveness of this approach. However, the key to this success lies in early engagement with stakeholders and end-users to establish the vision for the development. This engagement continues throughout the development process, ensuring that residents and end-users embrace and uphold sustainable practices.

2.2.5 Maintaining a Separation between Public Space and Vehicles

Many urban development projects have successfully implemented a 'donut' approach, in which the inner areas are designated as car-free, pedestrianised public spaces, while the outer periphery remains accessible to vehicles. This strategy has proven to enhance the utilisation of public spaces, creating an appealing and liveable environment without impeding commercial or economic activities. Additionally, it promotes cleaner air quality and contributes to a healthier population, especially in areas with ample green spaces.

The EVA-Lanxmeer project serves as a prime example of how this approach can accommodate servicing requirements without hindering access for delivery and service vehicles. By carefully planning and clearly marking routes, these vehicles can still navigate the area effectively.

2.2.6 Walking and Cycling Connections

While the examples align with cities and areas that have a well-established culture of walking and cycling, supported by a comprehensive network for pedestrians and cyclists, the provision of such infrastructure is crucial in reducing reliance on private vehicles. Incorporating greenway connections to other urban areas can be advantageous, but creating a neighbourhood that is easily walkable and cycle-friendly can significantly decrease the necessity for short car trips, such as school commutes or trips to local shops. Implementing a "10-minute town" or "15-minute neighbourhood" approach in these examples has resulted in increased levels of walking and cycling, as well as a decrease in private car ownership.

2.2.7 Car Pools and Car Share

One crucial aspect of the examples provided is the implementation of a carpool or car-sharing program. These initiatives acknowledge that, although a robust public transportation system and walking/cycling infrastructure can reduce the reliance on private vehicles, there are situations where using a car or van is convenient or necessary. Therefore, offering residents the option to utilise a shared vehicle instils a sense of convenience in not owning a personal vehicle or a second vehicle within a household, making it easier for them to comply with any policies or regulations aimed at limiting car ownership.

2.3 Recommendations

Based on the case study review and the common themes generated, in terms of the NWQ it is recommended that:

- A clear set of sustainable objectives should be established to inform the land use approach and proposed connections;
- Proposed residential areas should be low-car and located towards the south of the NWQ, whereas commercial areas should be located on the periphery i.e. Millennium Park/ New Caragh Road, therefore limiting the permeability of vehicles;
- In higher density areas, car-parking should be located in specific designated areas;
- The bus route/active travel corridor will be critical to the delivery of low car sustainable development. Ideally this route should be in place before the residential/ commercial development opens to allow people to move to this area with viable non-car alternatives in place;
- It is recommended that mobility hubs be established. These hubs would be connected to bus services and carpooling facilities, providing convenient and sustainable transportation solutions for the area. By offering various modes of transport for the "first mile" or "last mile" of a journey, these facilities could effectively manage transportation demand in the NWQ;
- Establishing a direct connection to the Sallins rail station is essential for facilitating access to the Greater Dublin Area and facilitating commuting to and from the NWQ. This connection could be complemented by the implementation of park and ride facilities that link to the NWQ, serving both the Sallins station and any external trips originating from the M7.

3. Policy Review

3.1 Introduction

This section sets out the details of relevant transport related policies at a National, Regional and Local level which support the objectives of the Sustainable Mobility Strategy and focus on encouraging development that maximises use of sustainable travel modes in areas with good public transport connectivity.

3.2 Policy Review

3.2.1 National

3.2.1.1 National Planning Framework - 2025

Project Ireland 2040 – National Planning Framework (NPF) provides a high-level strategic planning framework to guide development and investment. The NPF notes that Naas is located in the Eastern and Midland Region which has experienced population growth at more than twice the national rate. A population of 2.58 million is forecast by 2040 in the Eastern and Midland Region; 500,000 more people than live there at present.

Key future planning policy priorities for the Eastern Region which are relevant to Naas include:

- *“Enabling the complementary development of large and county towns... on the key strategic and public transport routes in a regionally co-ordinated manner, with an enhanced emphasis on measures to promote self-sustaining economic and employment based development opportunities to match and catch-up on rapid phases of housing delivery in recent years.”¹*
- *“...developing an integrated network of greenways, blueways and peatways, that will support the diversification of rural and regional economies and promote more sustainable forms of travel and activity based recreation utilising canal and former rail and other routes.”¹*

Another applicable objective is the NPF’s National Policy Objective (NPO) 37 that states:

- *“Ensure the integration of safe and convenient alternatives to the car into the design of our communities, by prioritising walking and cycling accessibility to both existing and proposed developments and integrating physical activity facilities for all ages.”²*

3.2.1.2 National Development Plan 2021 - 2030

Released in September 2021 and covering the years 2021 to 2030, the current National Development Plan (NDP) sets out the investment priorities that underpin the successful implementation of the NPF. The Plan is designed to guide National, Regional, and Local planning and investment decisions in Ireland over the next decade. The NDP demonstrates the Government’s commitment to meeting Ireland’s infrastructure and investment needs over the next ten years, through a total investment estimated at €165 billion over the lifetime of the plan.

The NDP details 10 national strategic outcomes, those of most relevance to the NWQ include:

- NSO 1 Compact Growth – this outcome targets “sustainable growth of more compact urban and rural settlements supported by jobs, housing, community services and amenities”. It also recognises the importance of transport-led development in the creation of sustainable, well-connected communities where active travel is feasible for local trips and there is adequate public transport to service longer trips;
- NSO 2 Enhanced Regional Accessibility – this outcome aims to “enhance intra-regional accessibility through improving transport links between key urban centres of population and their respective regions, as well as improving transport links between the regions themselves”. The investment priority for

¹ Project Ireland 2040 – National Planning Framework, p.35

² Project Ireland 2040 – National Planning Framework, P82

improving transport links set out in this plan is active travel infrastructure first, followed by public transport and then national road improvements;

- NSO 4 Sustainable Mobility – the Plan recognises how important facilitating and investing in sustainable mobility is to achieving population targets and compact growth, a transition to a low-carbon society and the economic competitiveness of the country. The Plan provides for significant investment in active travel, bus, and rail infrastructure over the course of the Plan to support the expansion of sustainable mobility in cities, towns, and villages; and
- NSO 8 Transition to a Climate-Neutral and Climate Resilient Society – this outcome is noted as central to all other outcomes of the Plan. Sustainable transport is highlighted as an important element of achieving this outcome and priorities detailed included a significant transition to electric vehicles and provision of additional charging infrastructure, an increase in the number of sustainable mobility trips taken per day and an expansion of the sustainable transport network available to the population.

3.2.1.3 National Investment Framework for Transport in Ireland (NIFTI)

The National Investment Framework for Transport in Ireland (NIFTI) is a high-level strategic framework for prioritising future investment in the land transport network published at the end of 2021.

NIFTI outlines 10 key transport challenges faced by the transport network both today and into the future, the most relevant challenges to the NLTP include:

- Decarbonising the transport sector while facilitating increased travel demand;
- Increasing sustainable mode share to reduce emissions and address urban congestion;
- Balancing the protection and renewal of existing assets with significant investment in new infrastructure within available resources; and
- Incorporating innovative and emerging technologies within the future transport system.

The four investment priorities described by the Framework to address the 10 challenges are:-

- Decarbonisation,
- Protection and Renewal,
- Mobility of People and Goods in Urban Areas, and
- Enhanced Regional and Rural Connectivity.

These priorities are further supported by modal and intervention hierarchies.

The modal hierarchy places active modes first, followed by public transport and then private vehicles. Where more sustainable modes are unsuitable, the onus will be on project sponsors to demonstrate why they do not achieve the project objectives. Active travel is described in the document as the most sustainable mode of travel, and it is noted that the attractiveness of active travel is dependent on infrastructure.

Chapter five of the document sets out some proposals for how the investment framework will be implemented in the coming years. One of the relevant aspects of this section is the fact that at each Decision Gate in the future appraisal and funding process, a project's strategic fit with the framework's Investment Priorities will need to be assessed. Sponsoring agencies will be required to demonstrate that the development and appraisal of options adhere to the principles of the modal and intervention hierarchies. Specific guidance on how to meet these requirements will be set out in the Common Appraisal Framework for Transport Projects and Programmes (CAF).

Chapter 5 also notes that the Department of Transport will develop "strengthened requirements around spatial and land use considerations as part of updated sectoral appraisal guidance", which is likely to cover sequencing, parking provision and how adverse effects of NIFTI Investment Priorities can be mitigated. The Framework highlights the possibility of unintended consequences of transport investment if it is not coordinated and integrated across multiple sectors, particularly with spatial planning.

3.2.1.4 National Sustainable Mobility Policy

The Department of Transport's National Sustainable Mobility Policy, published in April 2022, sets out a strategic framework to 2030 for active travel and public transport to support Ireland's overall requirement to achieve a 51% reduction in carbon emissions by the end of this decade. It includes a vision for sustainable mobility in Ireland in 2030 'to connect people and places with sustainable mobility that is safe, green, accessible and efficient'.

Sustainable mobility is defined in the policy as: 'Connecting people and places in a sustainable way by supporting:

- Safe, accessible, comfortable, and affordable journeys to and from home, work, education, shops and leisure;
- Travel by cleaner and greener public transport;
- A shift away from the private car to greater use of active travel and public transport; and
- The policy seeks to deliver at least 500,000 additional daily active travel and public transport journeys and a 10 percent reduction in kilometres driven by fossil fuelled cars by 2030.

The policy approach which sets out to achieve a more sustainable transport sector is based on the 'Avoid-Shift-Improve' principle which encompasses measures to reduce the frequency and distance of trips, move towards more environmentally friendly modes of transport, and promote efficient fuel and vehicle technologies. The policy is guided by three key principles which are underpinned by ten high-level goals. There are five goals under the 'Safe and Green Mobility' principle, including:

- Improve mobility safety;
- Decarbonise public transport;
- Expand availability of sustainable mobility in metropolitan areas;
- Expand availability of sustainable mobility in regional and rural areas; and
- Encourage people to choose sustainable mobility over the private car.

There are three goals under the 'People Focused Mobility' principle, including:

- Take a whole of journey approach to mobility, promoting inclusive access for all;
- Design infrastructure according to Universal Design Principles and the Hierarchy of Road Users model; and
- Promote sustainable mobility through research and citizen engagement.

There are two goals under the 'Better Integrated Mobility' principle, including:

- Better integrate land use and transport planning at all levels; and
- Promote smart and integrated mobility through innovative technologies and development of appropriate regulation.

Almost all of the above goals are highly relevant to the NWQ. Goal 9, which aims to 'support compact growth and transport-orientated development through better integrated land use and transport planning' is of particular relevance.

3.2.1.5 Climate Action Plan 2024

Transport was responsible for 15.7% of Ireland's greenhouse gas emissions in 2021 and was second only to agriculture in terms of emission share by sector. Road transport accounted for the majority of these emissions, with private cars accounting for 40%. Heavy Goods Vehicles (HGVs) for 18% and Light Goods Vehicles (LGV) for 6.2%.

Climate Action Plan 2024 is the third annual update to Ireland's Climate Action Plan 2019 and the second to be prepared under the Climate Action and Low Carbon Development (Amendment) Act 2021. It builds on the introduction of carbon budgets and sectoral emissions ceilings in Climate Action Plan 2023 and sets a course for Ireland's targets to halve emissions by 2030 and reach net-zero no later than 2050. These national targets align with Ireland's obligations under EU and international treaties, most notably the Paris Agreement (2015) and the

European Green Deal (2020). One of the key aims cited is to increase the number of walking and cycling networks so that walking, cycling and public transport will account for 50% of all journeys made by 2030.

3.2.1.6 Connecting Ireland Rural Mobility Plan

The Connecting Ireland Rural Mobility Plan is a major national public transport initiative developed by the National Transport Authority (NTA) with the aim of increasing connectivity, particularly for people living outside major cities and towns.

Connecting Ireland seeks to make public transport for communities more useful for more people and aims to achieve this by improving existing services, adding new services, and enhancing the current Demand Responsive Transport network which meets the transport needs of people who live in remote locations.

Figure 3.1 shows the proposed public transport network for Kildare where several regional corridor routes and local routes have been proposed to add to the existing network. The proposed 880 local route will run directly through Naas, connecting it to the surrounding towns in the settlement. In addition, the 7,17,13 and 14 regional corridor proposed routes will run just north of Naas and will stop at Stallins Station. This will give Naas a wider regional reach further supporting its status as a Key Town.

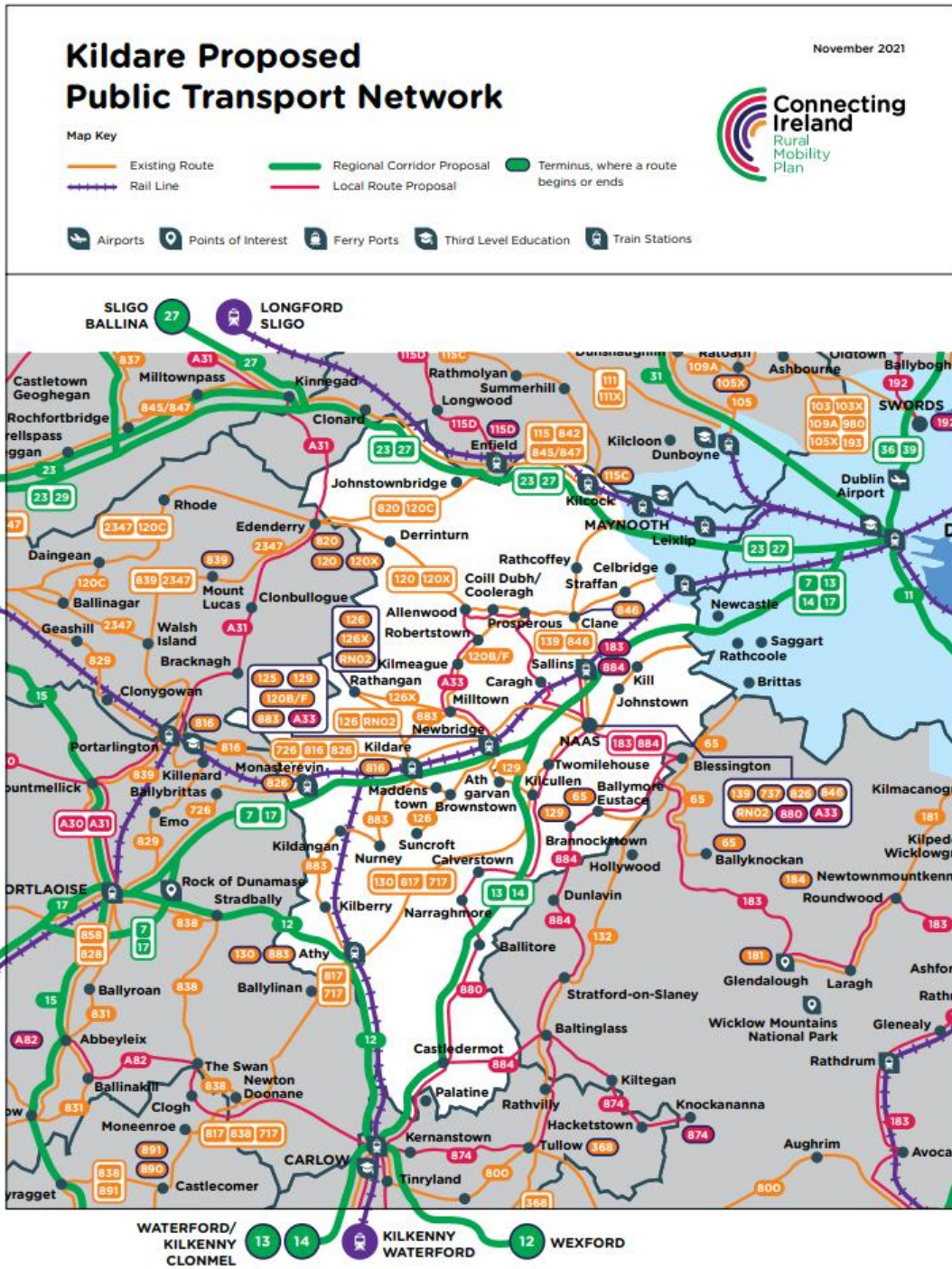


Figure 3.1: Kildare proposed public transport network.

Source: Connecting Ireland Rural Mobility Plan.

3.2.1.7 All-Island Strategic Rail Review - 2024

Jointly commissioned by the Department of Transport in Ireland and the Department for Infrastructure in Northern Ireland, the All-Island Strategic Rail Review sets out a high-level vision and a comprehensive framework for the future development and transformation of the rail system across the island of Ireland, focusing on the period up to 2050.

The report provides 32 strategic recommendations designed to enhance and expand the rail network, aligning with climate commitments and promoting sustainable connectivity between major cities, regions, and rural communities. Through evidence-based analysis, the document examines how an upgraded and expanded rail system can support decarbonisation goals, foster balanced regional development, improve accessibility, and deliver significant economic and social benefits to both Ireland and Northern Ireland.

Figure 3.2 is an interpretation of the railway recommendation presented within the document. It displays new railway and track upgrades in the Kildare area.

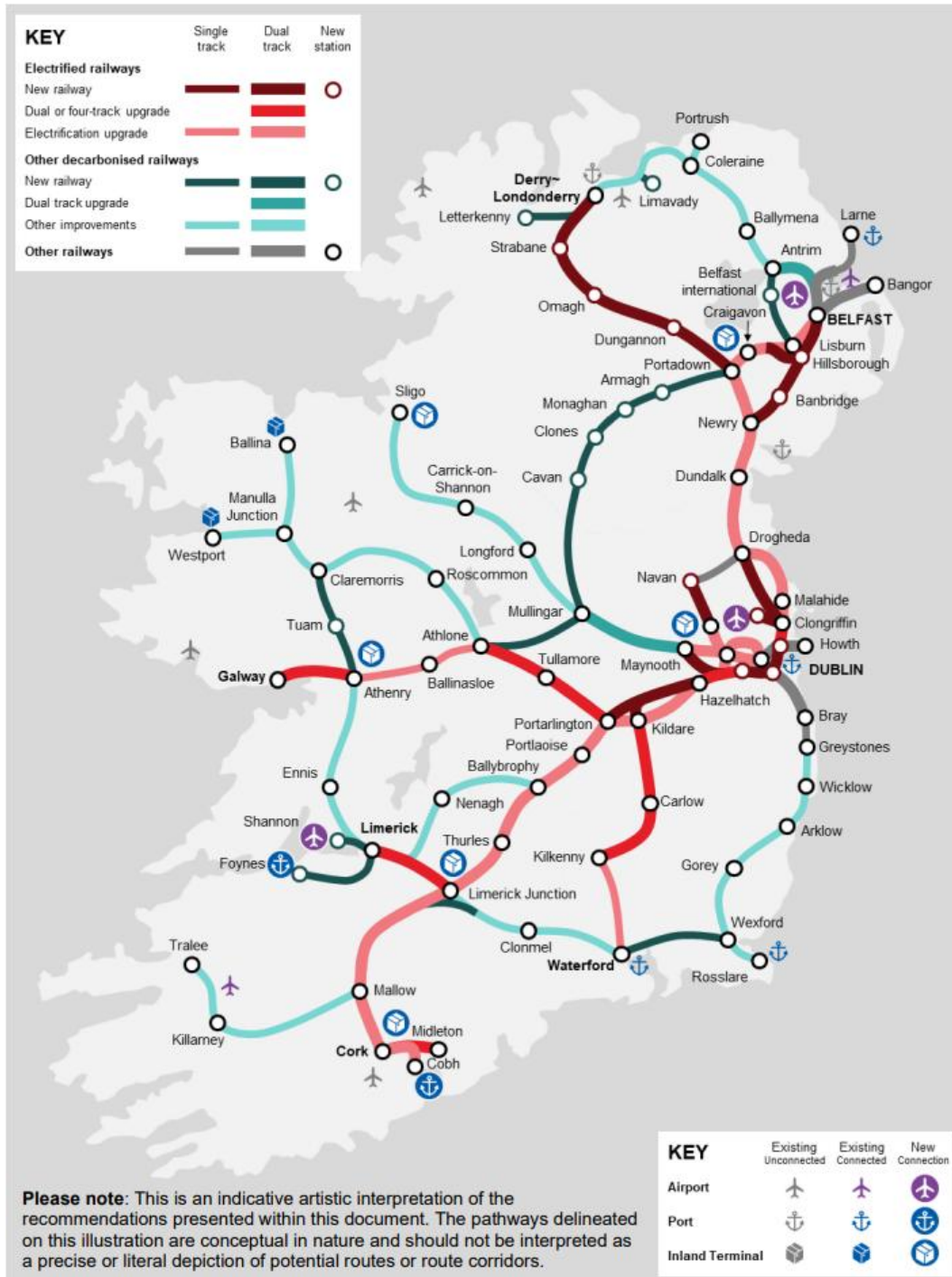


Figure 3.2: Ireland potential railway network improvements.

Source: All-Ireland Strategic Rail Review.

3.2.1.8 Sustainable Residential and Compact Settlements Guidelines for Planning Authorities

The Guidelines set out policy and guidance in relation to the planning and development of both urban and rural settlements, with a focus on sustainable residential development and the creation of compact settlements.

In terms of proximity and accessibility to services and public transport, the Guidelines set out definitions to define the accessibility of different types of development land. This is shown in Figure 3.3.

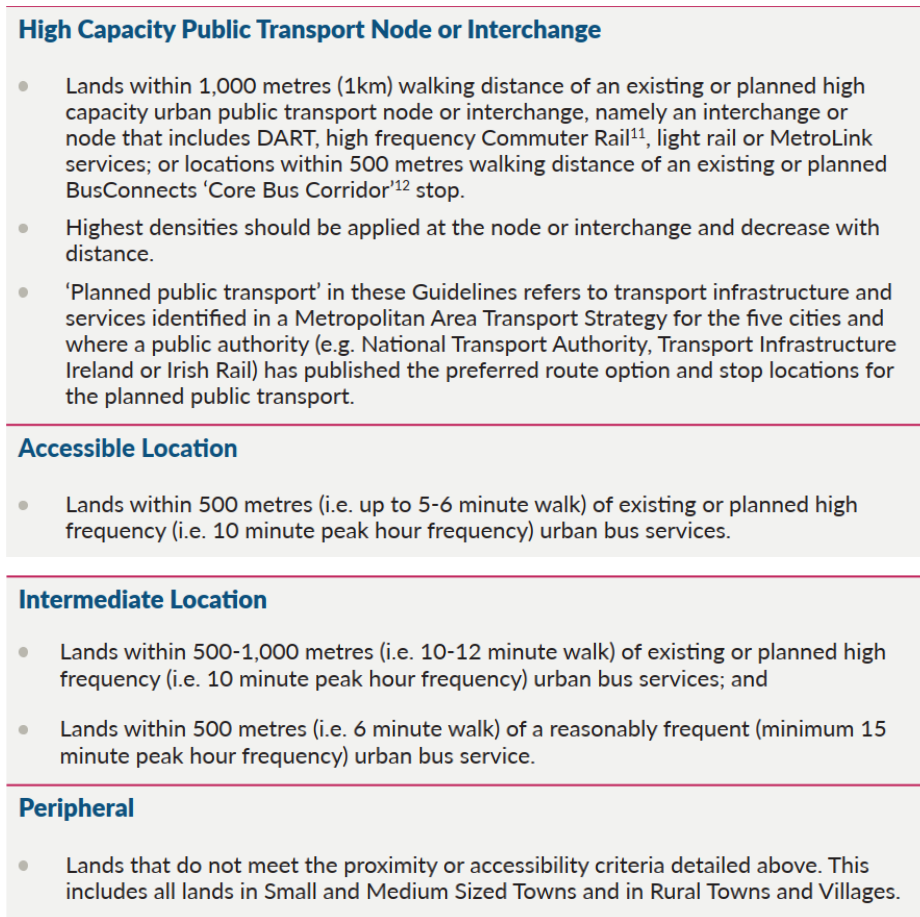


Figure 3.3 Definition of Accessible Lands in the Guidelines

The Sustainable Residential and Compact Settlements Guidelines for planning authorities sets out 4 separate guidelines for developers to follow. The car parking and cycle parking guidelines, which are relevant to the transport strategy for Naas are listed below:

- SPPR 3 – This policy sets out a location-specific approach to car parking provision, aiming to minimise or eliminate car parking in city centres and urban neighbourhoods of Ireland’s five cities, with a recommended maximum rate of one space per dwelling where justified. In accessible locations, the maximum car parking rate is 1.5 spaces per dwelling, while intermediate and peripheral sites may allow up to two spaces per dwelling, subject to planning authority approval and a requirement for applicants to provide justification for any parking proposed, especially near the upper limit. These standards exclude spaces for car clubs, short-stay electric vehicle charging, and accessible parking, but do include provision for visitor parking. The requirements do not apply to applications in Strategic Development Zones until planning schemes have been amended accordingly.
- SPPR 4 – This policy establishes clear standards for cycle parking and storage to ensure that all new housing schemes, including mixed-use residential schemes, provide safe and secure cycle storage for residents and visitors. The specific requirements are twofold: First, in developments where residential units do not feature ground-level open space or have smaller terraces, a general minimum standard of one cycle storage space per bedroom is set, with visitor cycle parking also required. The planning authority

retains discretion over variations to this standard, which must be justified based on factors like location, facility quality, or future potential for enhancement. It is further emphasised that provision should be made for larger and heavier bicycles, including cargo and electric bikes, and individual lockers to promote ease of use and security. Second, the design requirement for cycle storage mandates dedicated facilities of permanent construction, either within the building footprint or in an adjacent purpose-built structure. Facilities should ensure cyclists feel safe, prioritising secure cages, compounds, or preferably locker systems.

3.2.1.9 National Roads 2040

National Roads 2040 is TII's long term investment framework for the maintenance, development and management of Ireland's National Roads network.

The National Roads network consists of almost 5,300 km of roads: National Primary roads (including motorways) and National Secondary roads. The network forms vital transport infrastructure for all sectors of society. The network facilitates movement of people and goods and a wide range of trip purposes including health, education, employment, tourism and access to key services.

3.2.1.10 National Cycle Network

The National Cycle Network (NCN) aims to link towns, cities and destinations across Ireland with a safe, connected and inviting cycle network, encouraging more people away from their cars and onto their cycles.

The NCN is composed of 85 corridors, integrating existing and planned greenways and other cycling infrastructure such as the Eurovelo routes, as well as an extensive new network of safe cycle routes along existing roads. It will also link to destinations such as transport hubs, centres of education, employment, leisure and tourist destinations, making it easier and safer for people throughout the country to choose cycling as part of their daily activities. The aim is that 80% of households and nearly 90% of jobs will be located within 5 km of the network.

Naas will be bisected by 2 of the proposed corridors that make up the National Cycle Network Plan. The first of which is Portlaoise to Naas (Corridor 59). The Portlaoise to Naas corridor has two options, Option A via Kildare & Newbridge and Option B via Rathangan & Sallins. Option A is via Kildare which is a secondary node so it must be included in the network. Given this, Option A is preferred in the map shown in Figure 3.4.

The designated sites traversed by both options are the River Barrow and River Nore SAC, Derries Wood pNHA, Emo Court pNHA, the Great Heath of Portlaoise pNHA, Dunamase Woods pNHA, Ridge of Portlaoise pNHA, and Grand Canal pNHA. Option A also traverses Pollardstown Fen SAC and pNHA, and Curragh (Kildare) pNHA.

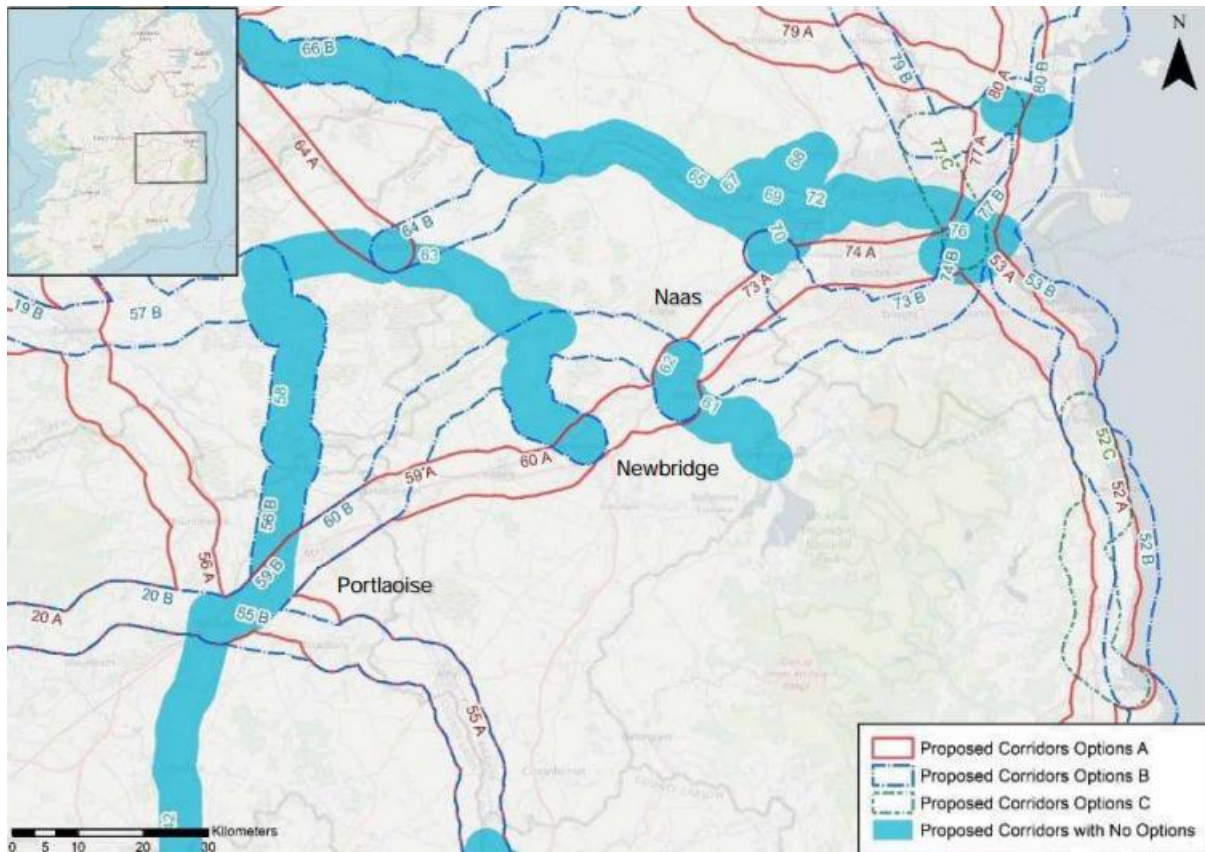


Figure 3.4: Corridor Options 58-60.

Source: National Cycle Network Plan 2023.

The second of the corridors is Naas to Dublin (Corridor 73) shown in Figure 3.5. The Naas to Dublin corridor has two options, Option A via Clondalkin and Option B via Tallaght. Option A is the preferred corridor due to its integration with the Grand Canal Greenway. The corridor option runs along the route of the Grand Canal pNHA. No other designated sites are located in the vicinity the corridor.

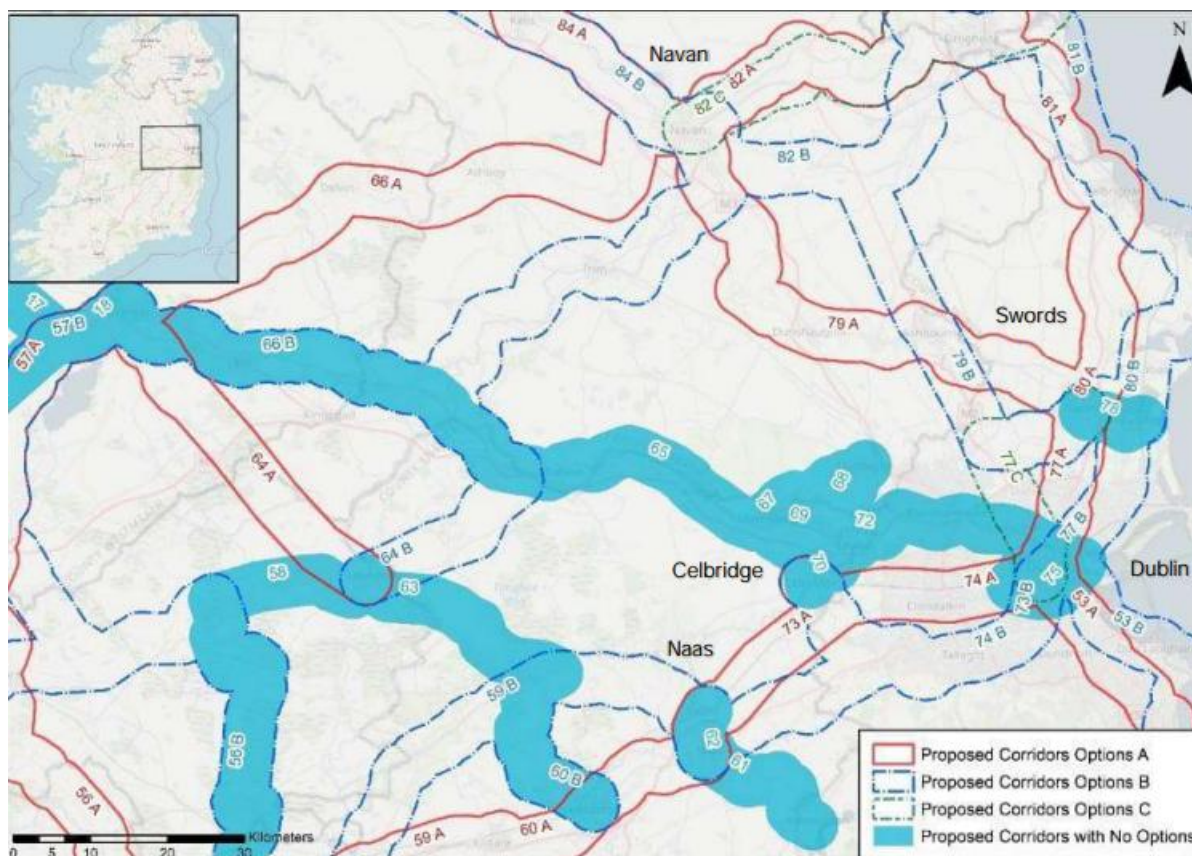


Figure 3.5: Corridor Options 73-74.

Source: National Cycle Network Plan 2023.

3.2.2 Regional

3.2.2.1 Regional Spatial and Economic Strategy for the Eastern and Midland Region 2019-2031

The Regional Spatial and Economic Strategy (RSES) for the Eastern and Midland Region 2019-2031 sets out a framework to direct future growth. The RSES identifies Naas as the county town of Kildare and a Key Town within the Hinterland of Ireland’s Eastern and Midland Region. The RSES recognises that there are strong links between Naas and the nearby settlements of Sallins and Newbridge, with a strong interrelationship of services, employment and education facilities. A core theme of the RSES in relation to Naas is to enhance links to Sallins train station and improve sustainable travel options.

The RSES sets out the following key regional policy objectives specific to Naas:

- *“RPO 4.48: Promote the improvement of the transport network within and serving Naas town, including delivery of a robust and efficient walking, cycling and bus network with strong links to Sallins Railway Station, key destinations within the town and to the North West Quadrant and town centre area.”*
- *“RPO 4.49: Support the development of the Grand Canal for amenity, recreation and sustainable transport purposes including the Naas to Sallins and Naas to Corbally harbour greenways and linking these to the national Grand Canal Greenway.”*
- *“RPO 4.50: Regeneration and consolidation of the historic centre to improve the retail and commercial functions of the town core, with enhanced permeability and sustainable mobility within the town centre and improve links between the core and surrounding residential and employment areas through the further development of walking and cycling routes and improved public transport.”*

- *“RPO 4.51: Strengthen the local employment base including through the development of MERITS, Millennium Park in the North West Quadrant and the regeneration of underutilised lands including industrial lands in the north east of the town.”*
- *“RPO 4.52: Support the delivery of new and enhanced public transport infrastructure in Naas and Sallins, including Park and Ride and interchange facilities as identified by the NTA and Kildare County Council.”*
- *“RPO 4.53: Support an enhanced role and function of Naas as the County town of Kildare, particularly as a hub for high quality employment, residential and amenities.”*

3.2.2.2 Greater Dublin Area Transport Strategy 2022 – 2042

The overall aim of the GDA transport strategy is:

“To provide a sustainable, accessible and effective transport system for the Greater Dublin Area which meets the region's climate change requirements, serves the needs of urban and rural communities, and supports economic growth”.

The strategy notes that a wide range of challenges facing transport in the GDA were taken into account in formulating the strategy, including:

- Climate Change;
- Recovery from the Covid-19 pandemic;
- Servicing legacy development patterns, in particular low density, car-dependent suburban areas;
- Revitalisation of Dublin City Centre and other town centres in the GDA region;
- Transformation of the urban environment, including a re-balancing of road space to favour sustainable transport modes and a strong focus on investment in the public realm;
- Ensuring access for all, in accordance with the principles of Universal Design;
- Serving rural needs, by acknowledging, protecting, and enhancing the socio-economic and cultural fabric of rural areas;
- Improving health and equality;
- Fostering economic development; and
- Delivering transport schemes.

Four objectives were established for the strategy as outlined below:

- To create a better environment and meet our environmental obligations by transitioning to a clean, low emission transport system, reducing car dependency, and increasing walking, cycling and public transport use;
- To enhance the health and quality of life of our society by improving connectivity between people and places, delivering safe and integrated transport options, and increasing opportunities for walking and cycling;
- To support economic activity and growth by improving the opportunity for people to travel for work or business where and when they need to and facilitating the efficient movement of goods; and
- To deliver a high quality, equitable and accessible transport system, which caters for the needs of all members of society.

The strategy contains numerous measures relevant to the NWQ, with key aspects for the NWQ listed below:

- Measure PLAN5 - Transit-Oriented Development: The NTA will continue to support and facilitate the delivery of Transit-Oriented Development at locations identified as appropriate for such;
- Measure PLAN7 - Filtered Permeability: Development Plans, SDZ Planning Schemes and Local Area Plans in the GDA should ensure that the road and street networks in new development areas are

designed on the basis of providing for filtered permeability and should incorporate measures which deliver filtered permeability in existing neighbourhoods;

- Measure PLAN16 - The Road User Hierarchy: The NTA, in the decision-making process around the design, planning and funding of transport schemes in the GDA, will be guided by the priority afforded to each mode in the Road User Hierarchy as set out in the Transport Strategy. [first pedestrians, then cyclists, public transport, goods vehicles, and private motor vehicles];
- Measure BUS12 - Bus Priority in Towns and Villages: The NTA and local authorities will implement bus priority measures in towns and villages in the GDA in order to reduce delays to bus services;
- Measure TM3 - Reduced Speed Limits: In accordance with speed limit policies to be determined by each local authority following consultation with the NTA, the reduction of speed limits to 30 kph on urban roads and streets will be supported; and
- Measure TM17 - On-Street Parking: The NTA will support local authorities in seeking to reduce the level of free or cheaply available on-street parking with a view to the reallocation of the road space to sustainable modes, and/or the implementation of charging regimes which facilitates motorists contributing to the local economy.
- Measure LRT10 – New Light Rail Stops: The NTA, in conjunction with TII, will monitor the changes in demand for travel on the Green and Red lines and consider the development of additional stops where sufficient passenger usage has been identified. A new stop on the Naas Road will be provided as part of the early phases of the City Edge development.
- Measure RAIL 6 – New Rail Stations: The NTA, in conjunction with Irish Rail, will develop new rail stations at Cabra, Glasnevin, Heuston West, Kylemore, Woodbrook, west of Sallins (see Figure 3.6 below), west of Louisa Bridge and west of Maynooth. Kishoge station will also open in the short term as development of the Clonburriss SDZ is realised. Other stations will be considered where development patterns support such provision.
- Measure RAIL3 – Dart Extension: The NTA and Irish Rail will, over the lifetime of the Strategy, extend the DART to deliver electrified rail services to the following towns: Sallins / Naas; Kilcock; and Wicklow.

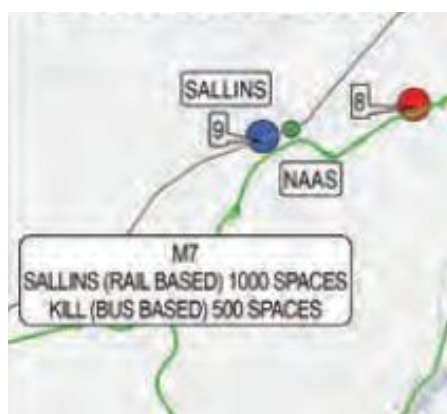


Figure 3.6 Proposed Sallins Park & Ride in GDA Transport Strategy

3.2.2.3 Greater Dublin Area Cycle Network Plan

The Greater Dublin Area Cycle Network Plan is the National Transport Authority's (NTA) plan for a regional cycle network. The Cycle Network Plan aims to ensure that cycling is supported and enhanced in order to achieve strategic objectives and reach national goals for cycle usage.

Figure 3.7 illustrates the proposed cycle network plan for Naas and Sallins.

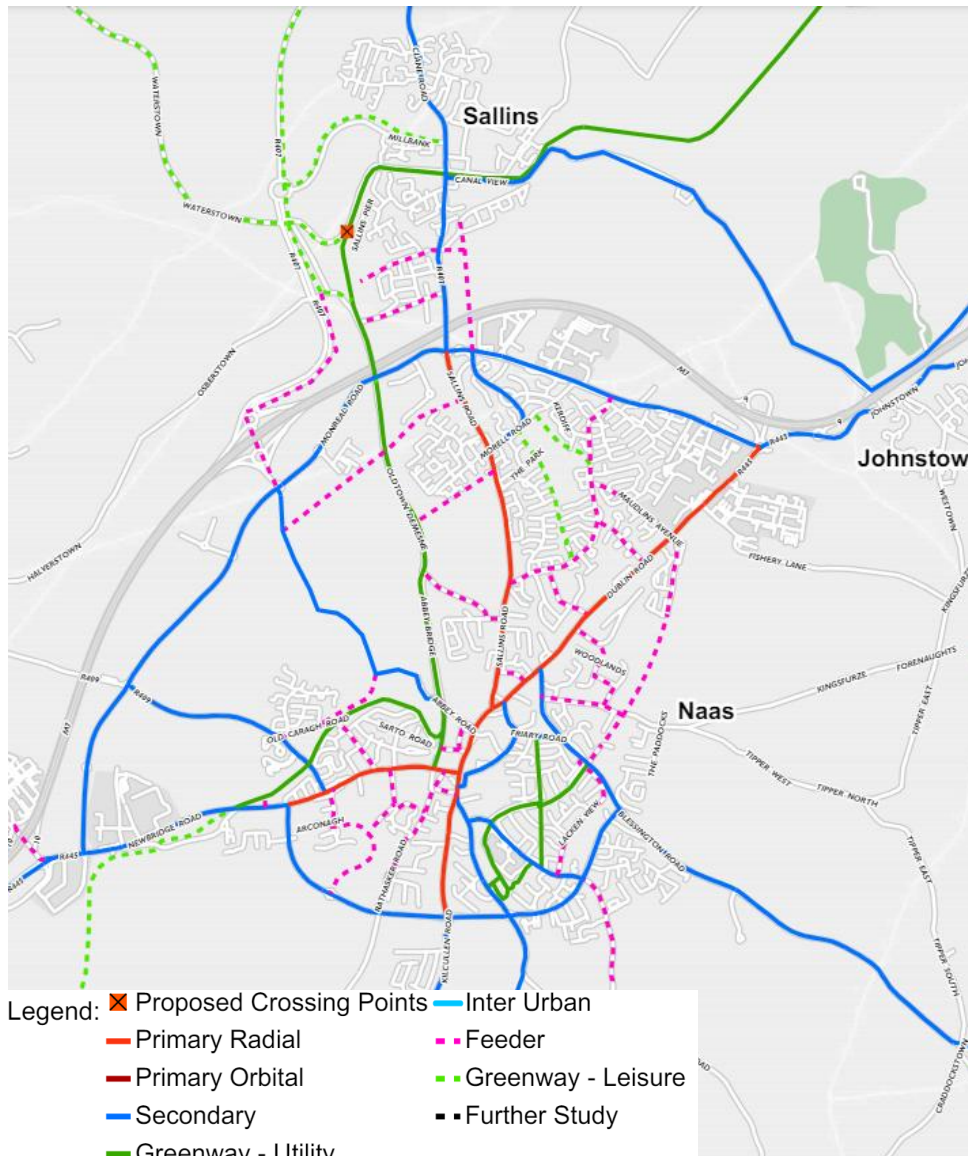


Figure 3.7: Greater Dublin Area Cycle Network Plan – Naas and Stallins.

Source: <https://www.nationaltransport.ie/wp-content/uploads/2023/01/2022-GDA-Cycle-Network.pdf>

3.2.2.4 DART+ Programme

DART+ is a transformative programme of investment which will provide a sustainable, electrified, reliable, frequent rail service significantly increasing capacity on all the rail corridors serving the Greater Dublin Area, through investment in infrastructure and a fleet of new trains.

In terms of Naas’ location, the DART+ South West will likely benefit Naas in the future should the line extend. Forecast demand for travel, when considered in tandem with the need to reduce transport emissions, has shown that, over the lifetime of the Transport Strategy, there may be a requirement to extend the DART+ programme to key locations in the GDA. An extension of the DART service on the Kildare Line to Naas / Sallins would provide additional capacity to this area, including to the planned regional Park & Ride site in this vicinity. Currently the line is proposed to provide services between Hazelhatch and Celbridge station and Dublin City Centre only, as shown in Figure 3.8.



Figure 3.8: DART+ South West Route Map.

Source: DART+ Programme

3.2.3 Local

3.2.3.1 Kildare County Development Plan 2023 - 2029

The ‘Strategic Vision’ for the County as outlined in the Plan is:

“To build on the strengths of the county in order to improve the quality of life of all residents, through the creation of high-quality job opportunities, by the provision of high-quality residential development supported by adequate community infrastructure, through the provision of a high-quality sustainable transport network, by healthy placemaking and transformational regeneration, by supporting the transition to a low carbon climate resilient environment, by embracing inclusiveness and by enhancing our natural and built environment for future generations.”

Each chapter identifies an ‘Aim’ supported by policies, objectives, actions, and targets (as appropriate). Ten key ‘overarching guiding principles’ are set out in the first chapter, the first four of which have particular relevance to the NWQ. These four are:

- To develop a county that is resilient to climate change, plans for and adapts to climate change and flood risk, facilitates a low carbon future, supports energy efficiency and conservation, and enables the decarbonisation of our lifestyles and economy;
- To ensure the compact growth and regeneration of lands within all settlements across the Settlement Hierarchy;
- To promote the sustainable development of communities by locating residential, employment, social and community facilities in close proximity to each other; and
- To support national investment in public transport services to achieve the better integration of land uses and high-quality public transport provision and to reduce car dependency throughout the county.

Chapter 5 of the focused on Sustainable Mobility and Transport. The ‘Aim’ set out is:

“To promote and facilitate ease of movement within and access to County Kildare, by integrating sustainable land use planning and a high-quality integrated transport system; and to support and prioritise investment in more sustainable modes of travel, the transition to a lower carbon transport system, and the development of a safer, efficient, inclusive, and connected transport system.”

There are numerous specific objectives and actions associated within each policy in the Chapter. All policies (excluding aviation related policies) are outlined below.

- TM P1: Promote sustainable development through facilitating movement to, from, and within the County that is accessible to all and prioritises walking, cycling and public transport;

- TM P2: Prioritise and promote the development of high-quality, suitable, safe, and sustainable walking and cycling pathways and facilities, both inter-county, intra-county (in consultation with all relevant stakeholders including neighbouring local authorities) and within the towns and settlements of County Kildare within a safe road/street environment that will encourage a shift to active travel that is accessible for all, regardless of age, physical mobility, or social disadvantage;
 - TM P3: Promote the sustainable development of the county by supporting and guiding national agencies in delivering major improvements to the public transport network and to encourage a shift from car-based travel to public transport that is accessible for all, regardless of age, physical mobility, or social disadvantage;
 - TM P4: Ensure ongoing competitiveness and the efficient movement of people and goods in the county through the improvement and expansion of the road and street network within the county to support economic development and provide access to new and existing communities, employment areas and development, all while prioritising sustainable modes of transport;
 - TM P5: Work with Transport Infrastructure Ireland to develop and operate the motorway network through the County and to ensure that the carrying capacity, efficiency and safety of the network and associated junctions is protected, maintained, and improved and to prevent development that could hinder the future upgrading of motorway routes and interchanges;
 - TM P6: Maintain and improve the capacity, safety, and function of the regional road network (as finance becomes available) and to ensure that it is planned for and managed to enable the sustainable economic development of the county and wider area while encouraging a shift towards more sustainable travel and transport in accordance with the Core Strategy, the Spatial Planning and National Roads Guidelines (2012) and the Draft Transport Strategy for the Greater Dublin Area 2022-2042;
 - TM P7: Ensure that the safety and capacity of the local road network is maintained and improved where funding allows and to ensure that local streets and roads within the county are designed to a suitable standard to accommodate sustainable modes of transport and the future needs of the county. These roads and streets should be appropriately designed for all road users regardless of age, physical mobility, or social disadvantage;
 - TM P8: Ensure that streets and roads within the county are designed to balance placemaking and movement, to prioritise sustainable modes of transport and to provide a safe traffic calmed street environment in accordance with the principles set out in the Design Manual for Urban Roads and Streets (2019) while meeting the needs of road users of all ages and abilities;
 - TM P9: Effectively manage and minimise the impacts of traffic in urban areas and prioritise the movement of pedestrians, cyclists, and public transport particularly at key junctions, while maximising the efficient use of existing resources;
 - TM P10: Balance the demand for parking against the need to promote more sustainable forms of transport, to limit traffic congestion and to protect the quality of the public realm from the physical impact of parking, while meeting the needs of businesses and communities; and
 - TM P11: Ensure street lighting is provided in accordance with Kildare County Councils 'Street Lighting and Planning Guidance' policy document in either draft or adopted form. The document outlines the general principles and requirements for street lighting in the county.
- In addition to this, it is a target of the council to increase the car share modal share from journeys to work from 4% (what it is currently at) to 8% during the lifetime of the plan, as per TM T7.

Chapter 15 focusses on Development Management Standards, where the design standards for cycle parking, car parking and EV parking are set out. The relevant standards for each of these topics are outlined in the tables below.

Cycle Parking Requirements

The CDP (as varied by Variation No. 3³) states the following: ‘The cycle parking standards set out ... shall be taken as minimum standards. In the case of strategic and sustainable development sites, key development areas, masterplan areas and candidate Urban Development Zones, the Planning Authority may determine higher minimum standards for cycle parking on a plan-led basis, having regard to the overall approach to provision within the area.’ These are shown in Table 3.1.

Table 3.1: Minimum cycle parking standards

Minimum cycle parking standards

Accommodation	
Apartments	1 space per bedroom + 1 visitor space per 2 apartments
Hotel / Guesthouse	1 space per 10 bedrooms + 1 space per 5 staff
Nursing Home	1 space per 10 residents + 1 space per 5 staff
Student Accommodation	1 space per bedroom + 1 visitor space per 5 bedrooms
Houses	1 space per bedroom in cases where dwellings do not have appropriate ground floor private amenity spaces or have smaller terraces. Visitor parking should also be provided, determined on a case-by-case basis and agreed with the planning authority. Any deviation from these standards shall be at the discretion of the planning authority and agreed at the application stage on a case-by-case basis.
Retail	
<100 sqm GFA	1 space per 20 sqm gross floor area or 1 space per car space, whichever is greater
>100 sqm GFA and <500 sqm GFA	1 space per 40 sqm gross floor area or 1 space per 2 car spaces, whichever is greater
>500 GFA	1 space per 10 car parking spaces or 1 space per 100 sqm gross floor area, whichever is greater
Warehousing / Showrooms	1 space per 250 sqm gross floor area
Other Commercial	
Bank / Financial Institution	1 space per 100 sqm gross floor area
Lounge / Bar / Restaurant / Café / Function Room	1 space per 30 sqm dining / public floorspace
Enterprise / Employment	
Industry / Manufacturing	1 space per 100sqm gross floor area
Warehousing	1 space per 100sqm gross floor area
Office	1 space per 50 sqm gross floor area
Education / Childcare	
Creche	1 space per 5 staff + 1 space per 10 children
Primary School	1 space per 5 staff + 1 space per 5 students
Secondary School	1 space per 5 staff + 1 space per 3 students
University / College of Higher Education	1 space per 5 staff + 1 space per 2 students
Medical	
Hospital	1 space per 5 staff + 1 space per 10 beds
Clinic / Group Medical Practices	1 space per 5 staff + 0.5 space per consulting room

³ At the time of writing this report, Variation No. 3 is proposed but expected to be adopted very soon

Minimum cycle parking standards

Community / Recreational

Theatre, Cinema, Stadium, Place of Worship	1 space per 10 seats
Playing Fields	20 spaces per pitch
Gymnasium / Recreation Centre	1 space per 50 sqm gross floor area
Community Centre / Library	1 space per 10 sqm gross floor area
Funeral Home	1 space per 15 sqm gross floor area

Source: Kildare County Development Plan 2023 - 2029

Car Parking Requirements

The CDP (as varied by Variation No. 3⁴) states the following: ‘Car parking standards are set out... below to guide proposed development. Parking standards are maximum standards.

The Planning Authority may determine lower maximum car parking standards for strategic and sustainable development sites, key development areas, masterplan areas and candidate Urban Development Zones on a plan led basis. Determination of such area-based standards will incorporate considerations which include, but are not limited to, the following:

- The provisions of relevant Section 28 Guidelines/ National Planning Statements;
- The nature and density of development, together with the overall approach to car parking within the area; and
- The achievement of wider objectives relating to climate change, placemaking, urban design and the proper planning and sustainable development of the area.’

These standards are set out in Table 3.2.

Table 3.2: Maximum car parking standards.

Maximum car parking standards

Residential	
House	1.5 spaces per unit in accessible locations where maximum provision is justified to the satisfaction of the Planning Authority. Car parking should be substantially reduced in accessible locations. 2 spaces per unit in intermediate and peripheral locations where maximum provision is justified to the satisfaction of the Planning Authority.
Apartment	1.5 spaces per unit + 1 visitor space per 4 apartments
Other Accommodation	
Hotel / Guesthouse	1 per bedroom
Nursing Home	1 per 3 residents
Student Accommodation	To be determined by the Planning Authority on a case-by-case basis
Retail	
Convenience	1 per 20sqm gross floor area
Convenience > 1000 sqm GFA	1 per 15 sqm gross floor area

⁴ At the time of writing this report, Variation No. 3 is proposed but expected to be adopted very soon

Maximum car parking standards

Comparison	1 per 20sqm gross floor area
Warehousing / Showrooms	1 per 30 sqm gross floor area
Other Commercial	
Bank / Financial Institution	1 per 14sqm gross floor area
Lounge / Bar	1 per 15sqm gross floor area
Restaurant / Café	1 per 10sqm gross floor area
Takeaway	1 per 20sqm gross floor area
Function Room, Club	1 per 10sqm gross floor area
Enterprise / Employment	
Industry / Manufacturing	1 per 33 sqm gross floor area
Warehousing	1 per 100sqm gross floor area
Office Town Centre	1 per 30 sqm gross floor area
Office Park	1 per 20 sqm gross floor area Where the floor area exceeds 1500 sqm, 1 space per 50 sqm
Education / Childcare	
Creche	0.5 per staff member plus 1 per 4 children
Primary School	2 per classroom
Secondary School	2 per classroom
University / College of Higher Education	1 per classroom + 1 per 5 students
Medical	
Hospital	1.5 per bed
Clinic / Group Medical Practices	2 per consulting room
Community / Recreational	
Theatre, Cinema	1 per 4 seats
Church or other place of worship	1 per 4 seats
Stadium	1 space per 3 seats
Playing fields	15 spaces per pitch
Gymnasium / Recreation Centre	1 per 15 sqm gross floor area
Community Centre / Library	1 per 10 sqm gross floor area
Funeral Home	1 per 10 sqm gross floor area

Source: Kildare County Development Plan 2023 - 2029

Electric Vehicle Charging Requirements

The requirements for electric vehicle charging are set out in Table 3.3.

Table 3.3: EV parking requirements.

EV parking requirements

New buildings or buildings undergoing major renovations (containing one or more than one dwelling)	As per Chapter 5 - Objective TM O117 and TM O118 (both below).
New buildings or buildings undergoing major renovations (other than a dwelling)	As per Chapter 5 - Objective TM O117 (below).

Source: Kildare County Development Plan 2023 – 2029

The relevant CDP objectives are as follows:

- TM O117: Support the Government’s targets for electric vehicles on roads by prioritising parking for Electric Vehicles (EVs) in central locations, by supporting the provision of charging facilities on public and private land. Ensure a future proofed approach to the rollout of EV charging infrastructure by means of planning decisions by applying the following requirements of the EU (Energy Performance of Buildings) Regulations 179 2021 (S.I. 393 2021) for Electric Vehicle recharging infrastructure:
 - New buildings or buildings undergoing major renovations (other than a dwelling) shall install at least one recharging point and ducting infrastructure for at least one in every 5 car parking spaces to enable the subsequent installation of recharging points for electric vehicles.
 - New buildings or buildings undergoing major renovations (containing one or more than one dwelling), which has more than 10 car parking spaces, shall install ducting infrastructure for each car parking space to enable the subsequent installation of recharging points for electric vehicles.
- TM O118: Ensure the electrical wiring that developers install for all new residential units includes a double socket Home Charge Point for Electric Vehicles in order to comply with the Sustainable Energy Authority of Ireland (SEAI) Triple E Register and to promote the use of night-time renewable electricity in transport. In this regard developers shall provide for within curtilage/driveway car parking unless otherwise agreed in writing with the Planning Authority.

3.2.3.2 Naas Local Area Plan (LAP) 2021 – 2027

The Naas Local Area Plan 2021-2027 is the existing local area plan for Naas. The Local Area sets out the strategy for the sustainable development of Naas. In terms of Movement and Transport, the overall aim is: -

“Promote and develop a sustainable, integrated transport system for Naas that prioritises walking, cycling and public transport, and provides an appropriate level of road infrastructure, road capacity and traffic management to support future development.”

The Plan sets out proposed minimum modal shift targets as summarised in Table 3.4 and Table 3.5.

Table 3.4: Minimum Modal Shift Targets (Work).

Mode Share	2016 Baseline (%)	2027 Target (%)	2035 Target (%)	2035 Overall % Change
Car	79.6	64.8	62.6	-17
Public Transport	7.9	14.8	19.9	+12
Walking	9.8	10.38	10.8	+1
Cycling	2.7	10.0	6.7	+4

Source: Naas Local Area Plan 2021-2027

Table 3.5: Minimum Modal Shift Targets (Education).

Mode Share	2016 Baseline (%)	2027 Target (%)	2035 Target (%)	2035 Overall % Change
Car	48.6	36.9	39.6	-9
Public Transport	18.4	21.3	23.4	+5
Walking	30.6	31.7	32.6	+2
Cycling	2.4	10.0	4.4	+2

Source: Naas Local Area Plan 2021-2027

Key policies in relation to sustainable mobility for the NWQ are listed below and will be supported by the objectives of the strategy: -

- Policy NWQ1 – Northwest Quadrant, It is the policy of the council to ensure that the lands located within the Northwest Quadrant (NWQ) are developed in a sustainable manner and the future development strategy should recognise the strategic location of the lands proximate to the existing town centre and the unique opportunities presented by the unique environmental and landscape features.
- Policy MT1 – Walking and Cycling, states that It is the policy of the Council to promote enhanced universal permeability for pedestrians and cyclists within Naas in order to improve access to the town centre, local schools, residential areas, recreational facilities, public transport services and other amenities.
- Policy MT2 – Public Transport, states, it is the policy of the Council to promote the sustainable development of Naas by supporting and guiding the relevant national agencies in delivering improvements to the public transport network and to public transport services for all users.

4. Baseline Review

4.1 Introduction

The mobility strategy for the NWQ should take into consideration the typical movement patterns of the broader Naas area as this will serve as a reference point for establishing sustainable targets. Therefore, the following section provides an update of the 2022 Census data over the 2016 data utilised during the development of the NSTS and the associated proposed modal networks. This is followed by a short review of pertinent planning permissions within the NWQ.

4.2 Mode and Car Ownership

4.2.1 Travel to Work

The overall number of people commuting to work is approximately 87%, with 13% working from home, as illustrated in Figure 4.1. The data results identify that 7.7% walk, 2.2% cycle and a total of 8.2% use public transport. A total of 68.3% travel by car/ van comprising 64.3% as drivers and 4% as passengers. 12.9% of residents work from home, which eliminates the need for commuting trips and reduces car use.

In comparison to the 2016 Census data, those traveling by car have fallen from 77.5% to 68.3%, however the reduction has been attributed to a greater number of residents working from home (2.7% circa 2016) and modes other than the private car have remained low. This is further highlighted when considering Table 3.4 in the previous section, as the car as an overall mode share has fallen from the 2016 equivalent but is still approximately 3.5% higher than the 2027 target. Public transport remains as a low mode share well below the 14.8% 2027 target.

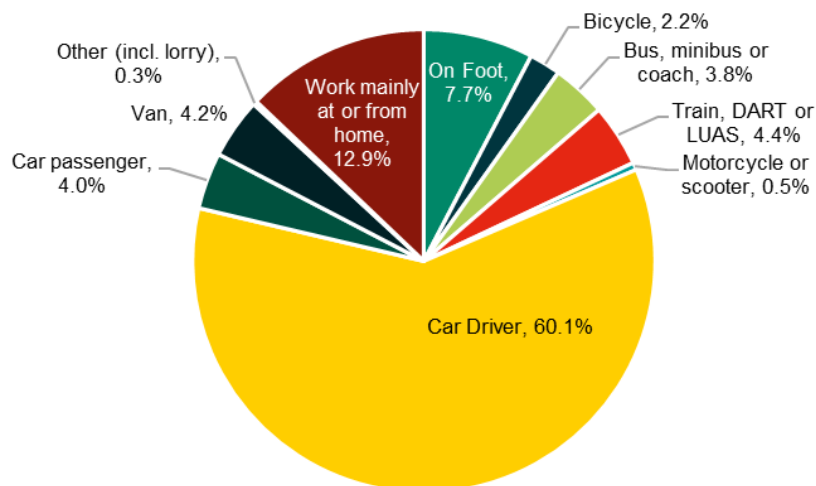


Figure 4.1:- Current Modal Split – Naas Town Residents (2022) – Travel to Work

Source: CSO Census 2022

4.2.2 Travel to School/ College/ Childcare

Figure 4.2 illustrates the principal mode of travel used for travel to school/ college/ childcare. It can be seen that 27.4% walk, 5.3% cycle and a total of 16.1% use public transport. A total of 50.6% travel by car/ van comprising 3.7% as drivers and 46.9% as passengers. In comparison to the 2016 data, this denotes a slight increase in car usage whereby a total of 48.6% travelled by car.

The proximity of school locations to residences has a major impact on the number of children walking/cycling to school. The location of a large Piper’s Hill school complex to the south of Naas, beyond walking distance, has had a negative impact in this regard with walking modal split falling from 30.6% in 2016 to 27.4% in 2022. The NWQ masterplan site will have local schools within walking distance and so it is likely to have a higher proportion of walking/cycling trips to school than Naas town as a whole.

With reference to Table 3.5 in the previous section, the car as an overall mode share is higher than the 2016 equivalent and therefore needs addressed in the mobility strategy. Public transport usage is lower than the 2016 equivalent and hence below the 21.3% 2027 target.

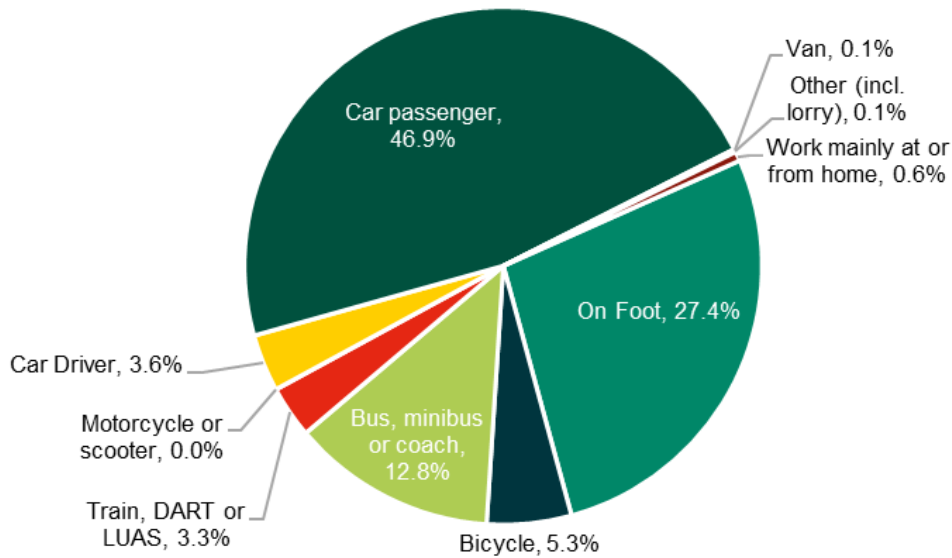


Figure 4.2:- Current Modal Split (2022) – Travel to School/ College/ Childcare

Source: CSO Census 2022

4.2.3 Car Ownership

According to the Census 2022 data, approximately 92% of the Naas population own or have access to a motor vehicle. 38.2% of the population have one motor car whilst 53.7% have two or more motor cars, as illustrated in Figure 4.3. The results are broadly similar to the 2016 Census data where 91% owned at least one vehicle, with 51% owning at least two vehicles. In terms of the NWQ the mobility strategy should seek to ensure a reduced level of car ownership.

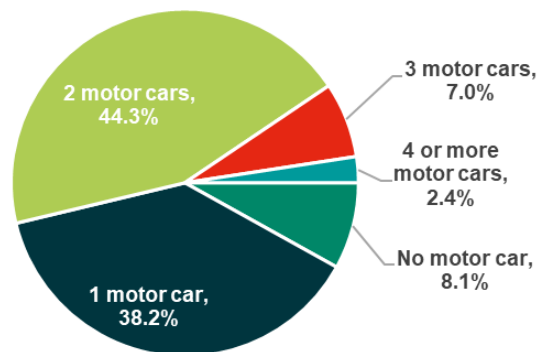


Figure 4.3:- Car Ownership – Naas Town (2022)

Source: CSO Census 2022

5. Principles and Objectives

5.1 Introduction

This section details the principles and objectives of the Sustainable Mobility Strategy. This strategy is informed by exemplary case study recommendations, current policy guidelines, and the imperative to mitigate the potential negative impacts of private car usage as identified through a review of transportation and settlement contexts.

5.2 Principles

The principles for the Sustainable Mobility Strategy are outlined below, these intend to align with the aims of the Kildare County Development plan, the conclusions of the exemplar case study review and the needs of the NWQ. The principles for the SMS are as follows:

- **Land Use Integration:** Align transport planning with land use planning to reduce travel distances and promote sustainable urban development;
- **Seamless Connectivity:** Create a well-integrated transport network that allows for smooth transitions between different modes of transport, such as walking, cycling, public transit, and private vehicles;
- **Enhance Safety:** Prioritise measures that improve the safety of all transport users, particularly vulnerable groups such as pedestrians and cyclists; and
- **Equitable Access:** Guarantee that all demographic groups, including the elderly, disabled, and low-income individuals, have equal access to transportation options.

5.3 Objectives

The SMS principles will be supported through a series of objectives related to each mode of transport, listed in this section.

5.3.1 Public Transport Objectives

1. Link new development with a dedicated urban bus service
2. Provide bus priority through the NWQ connecting to Naas town centre and Sallins
3. Ensure that bus stops are provided at suitable locations within the NWQ (and along the route) complete with suitable bus stop infrastructure

5.3.2 Cycling Objectives

1. Integrate the NWQ into the wider Naas area in accordance with the NTAs Cycle Network Plan
2. Provide safe cycle infrastructure in accordance with the NTA Cycle Design Manual
3. Define the quality and quantity of cycle facilities that should be delivered within the NWQ
4. Prioritise safe routes to schools with the aim of increasing cycling mode share and making cycling easier
5. Improve junctions on Millenium Park Road for cycling and ensure sufficient provision of safe crossing facilities

5.3.3 Walking Objectives

1. Provide an integrated walking network for the NWQ and connections into the NWQ
2. Provide permeability to enhance access to homes, job, schools and services
3. Ensure that streets are designed to ensure pedestrian safety in accordance with DMURS
4. Improve junctions on Millenium Park Road for walking and ensure sufficient provision of safe crossing facilities

5.3.4 Parking Objectives

1. Provide guidance on car parking levels in the new development
2. Provide guidance on EV charging and cycle parking standards for the new development
3. Develop and provide a car share scheme for NWQ residents.

5.3.5 Road and Street Objectives

1. Reduce any unnecessary vehicular trips through the NWQ
2. Ensure that the design speed of streets reflects the street hierarchy
3. Incentivise sustainable transport mode choice through the design of the mobility and street network
4. Provide signalised crossings at access points to the NWQ

6. Framework Masterplan

6.1 Site Layout

The proposed NWQ masterplan site layout is shown in Figure 6.1. The Sustainable Mobility Strategy documents the transport elements which have been incorporated into the masterplan and elaborates on their role from a transport planning perspective, showing how they create an integrated plan to promote sustainable travel.

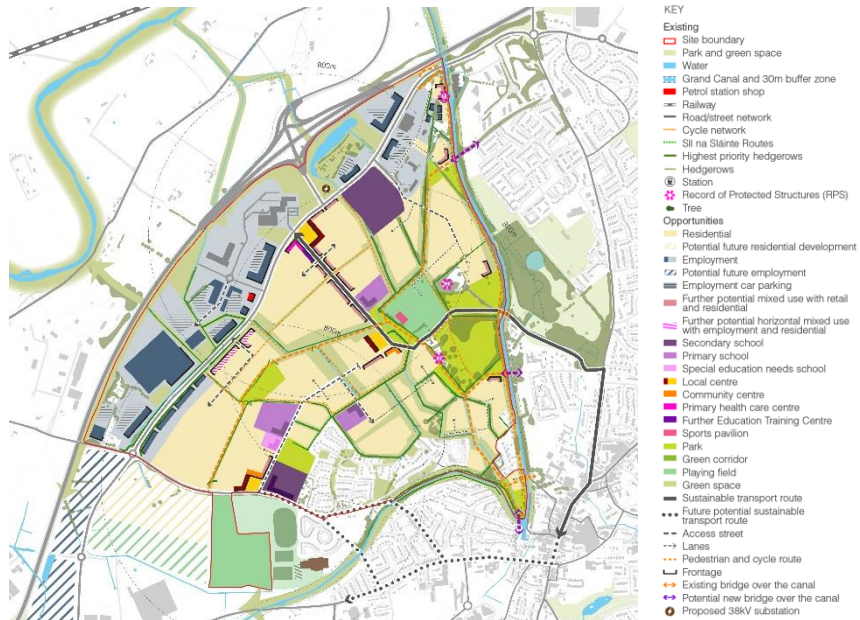


Figure 6.1 Proposed NWQ Framework Masterplan Layout

6.2 Sustainable Mobility Design Principles

The masterplan design principles in relation to sustainable travel are shown below:

SUSTAINABLE MOBILITY	
1.	Prioritise active travel - Design safe, attractive walking and cycling routes as the backbone of everyday movement.
2.	Reduce car dependency - Limit parking provision and traffic-dominated streets, promoting compact, mixed-use layouts that reduce the need for private car journeys. Street design should ensure that walking and cycling are the most convenient options for short distances, while driving becomes less direct or slightly inconvenient. This could be achieved through one-way systems, filtered streets, and limited parking.
3.	Strengthen connectivity - Establish an integrated street and path network linking neighbourhoods, centres, green spaces, and public transport.
4.	Apply filtered permeability - Use selective vehicular connections to prioritise active and public transport while reducing through-traffic.
5.	Enhance public transport - Support sustainable travel with well-connected bus services, with stops within easy walking distance. Bus stop locations along the bus route should service key destinations such as neighbourhood / local centres, canal walk, and Millennium Park Road.
6.	Introduce a mobility hub - Provide shared transport facilities, cycle parking, and services in central locations to encourage low-carbon travel choices.

6.3 Housing Density Approach

The densities set out in the NWQ Framework Masterplan have regard to the Section 28 Guidelines for Planning Authorities on Sustainable Residential Development and Compact Growth, which have been incorporated into the Plan through Variation No. 3 to the Kildare County Development Plan.

The NWQ will deliver approximately 4,000 new homes at a range of densities. The overall housing mix comprises flats, duplexes and houses.

The highest residential densities, at 90+ dwellings per hectare (dph), are located along the Millennium Park Road, Western and Central local centres. High densities within the range of 60-70dph front onto either side of the primary street and the local centres. Medium densities within the range of 50-60dph form the largest part of the site, particularly within the local centres and along the edges, directly connecting to the high and highest density areas. Lower densities within the range of 40-50dph are mainly located in the centre of the development.

The proposed housing densities are shown across the NWQ site in Figure 6.2. From a transport perspective, the higher housing densities are located near bus access, local jobs and the neighbourhood centres. This will encourage walking to the local shop or school, non-car ownership and walking to use the bus to access longer distance destinations.

7. Transport Strategy by Mode

The sustainable mobility strategy is focused on three modes; active travel, public transport and private motor vehicles. The strategy for each mode is presented in the order of the NIFTI modal hierarchy, with active travel presented first and private motor vehicles outlined last.

7.1 Active Travel Strategy

7.1.1 Masterplan Approach to Active Travel

The NWQ Framework Masterplan active travel strategy promotes a highly connected movement network designed around walking and cycling. It introduces a fine-grained system of safe, direct, and appealing routes that link key destinations within the site and integrate smoothly with the surrounding urban area. Cycling is embedded within the street hierarchy, with segregated cycleways along primary routes and shared low-speed carriageways on local streets. Main pedestrian and cycle corridors provide continuous, high-quality paths for both commuting and leisure, while secondary routes offer shared paths to support local trips and recreation. Strong links to neighbouring areas are central to the design, with three new pedestrian bridges proposed alongside existing canal crossings to improve access to nearby communities and the town centre, ensuring the NWQ is fully connected to its wider context.

7.1.2 Mobility Hubs

Mobility hubs act as a central interchange, integrating multiple transport modes and supported by high-quality infrastructure to promote sustainable travel choices. By providing easy access to shared and active travel options, these hubs help reduce reliance on private cars, with car-club membership offering a practical alternative. They enable efficient 'first mile' and 'last mile' connections, helping to balance transport demand across the NWQ.

Within the masterplan, all proposed mobility hubs are strategically located in local centres and positioned near bus stops to maximise access to public transport and make sustainable travel an attractive option. The masterplan includes three mobility hubs across the site:

- **M1 Mobility Hub – Millennium Park Road Neighbourhood Centre**

The M1 mobility hub is situated at the Millennium Park Road Neighbourhood Centre, positioned at the intersection between the neighbourhood access route and the public bus corridor. As the largest centre within the NWQ, this location includes extensive retail and community facilities and accommodates a multi-storey car park. The car park serves nearby residential apartments and centre-based uses, while also providing limited parking for users of the mobility hub. The M1 hub is envisioned as a key interchange point, offering access to a range of travel modes including car parking (limited), public transport, car clubs, EV charging, and secure cycle parking.

- **M2 Mobility Hub – Central Local Centre**

The M2 mobility hub is located within the Central Local Centre, at the heart of the NWQ. Its central position maximises accessibility to public transport while co-locating with other sustainable travel options such as cycle hire, e-bike, and e-scooter charging facilities. The M2 hub will act as a focal point for multimodal connectivity, promoting active travel and supporting local movement patterns.

- **M3 Mobility Hub – Western Neighbourhood Centre**

The M3 mobility hub is located within the Western Neighbourhood Centre, which similarly includes retail and community uses supported by a multistorey car park. Consistent with the M2 hub, M3 will facilitate connections between multiple travel modes, including public transport, shared mobility (car clubs), active travel, EV charging, and limited car parking provision.

The NWQ mobility hubs are intended to operate as both physical and informational travel planning points, offering guidance on sustainable travel choices alongside access to transport infrastructure. Each hub will provide:

- Secure cycle parking and maintenance facilities
- Car hire and car club spaces – in M1 and M3 only

- Adjacent bus stops with real-time service information
- Comfortable, sheltered waiting and seating areas
- Safe, accessible, and convenient interchange between modes
- Commercial and community-oriented amenities e.g. parcel lockers

These features will help make public transport and shared mobility within the NWQ a practical, efficient, and attractive choice for everyday travel

7.1.3 Walking and Cycling Network

Figure 7.1 shows the proposed walking and cycling network in the NWQ masterplan site. There are three types of walking/cycling link shown in the map, these are:

- Primary Route – These provide continuous, segregated walking and cycling routes to access work and school
- Secondary Route – These are shared walk/cycle paths that complement the primary route network by providing local access to neighbourhoods
- Bridge crossings – Three new pedestrian / cycle bridges are proposed to enhance access between existing parts of the town and the NWQ site, in addition to the existing canal crossings.

There is no vehicular through-traffic across the site, with private cars restricted to cul-de-sac routes to access homes or businesses. This approach creates a competitive advantage for the active travel, as the walk/cycle network provides for through-trips and permeability across the site. Lower speed limits and crossing points are also in place across the site to improve safety for pedestrians and cyclists.

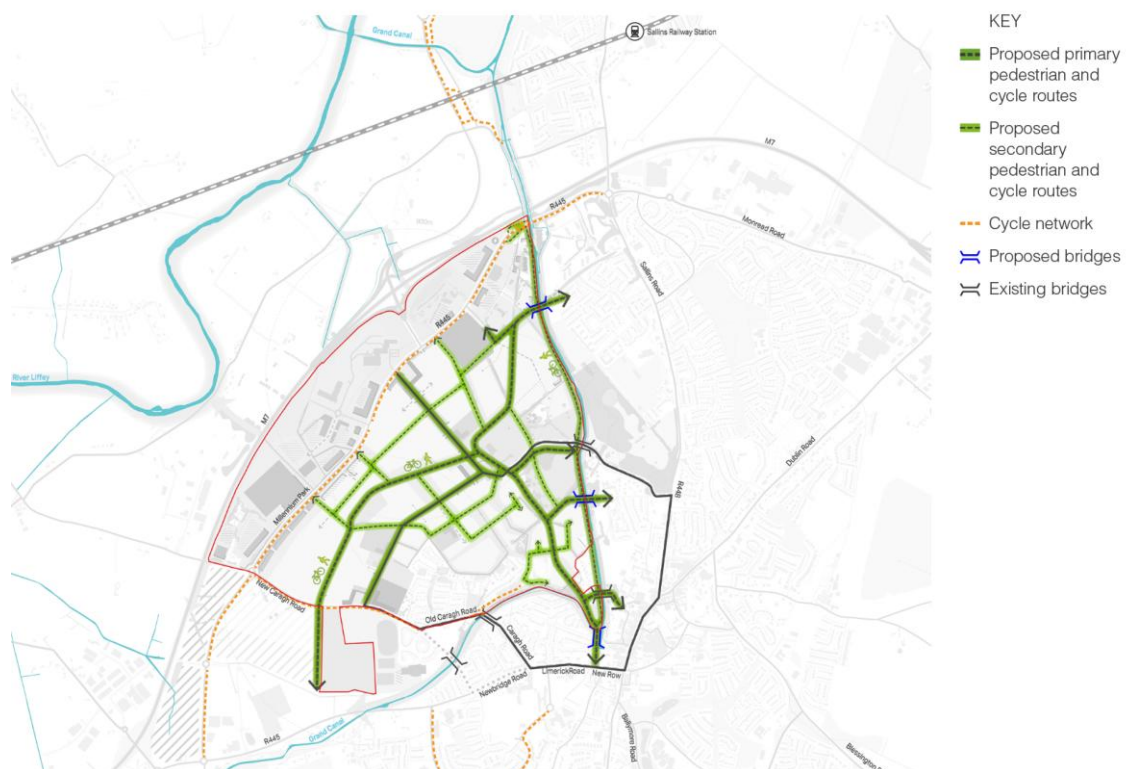


Figure 7.1 Proposed Pedestrian and Cycle Network

7.1.4 Cycle Parking

The Kildare County Development Plan 2023 – 2029 outlines comprehensive standards for cycling parking across all land uses, with notable ratios for the likely NWQ land uses. The cycle parking levels for each development type are documented in the Local Policy Review in this report. In addition to this, on-street cycle parking will be required throughout the site as well as bike lockers at mobility hubs to facilitate multi-modal interchange.

7.1.5 Active Travel Strategy Measures

The active travel measures are listed in Table 7.1.

Table 7.1 Active Travel Strategy Measures

Measure No.	Description
AT01	Walking / cycle network – primary routes
AT02	Walking / cycle network – secondary routes
AT03	New pedestrian / cycle bridge over canal at Landen Park
AT04	New pedestrian / cycle bridge over canal at Millbridge Way
AT05	Convert Abbey Bridge to active travel priority bridge with local access vehicular traffic only in line with masterplan design
AT06	New active travel bridge in Naas Harbour, linking masterplan active travel network to Harbour View
AT07	Pedestrian Crossing Points throughout site e.g. zebras
AT08	M1 Mobility Hub – Millennium Park Road Neighbourhood Centre
AT09	M2 Mobility Hub – Central Local Centre
AT10	M3 Mobility Hub – Western Neighbourhood Centre

7.2 Public Transport Strategy

To successfully encourage a shift from private car usage to public transportation, and to ensure seamless connectivity both within and outside the NWQ, it is imperative to prioritise the development of public transportation infrastructure. This section provides an overview of the measures to be delivered through the sustainable mobility strategy, which align with the proposals in the NWQ Masterplan Report.

7.2.1 NTA Town Bus Project

At present, Naas has no internal bus service. An urban bus service is proposed for Naas and Sallins in the LAP and the NSTS, with one route serving the NWQ development in the west of the town. The introduction of a bus route serving the NWQ site would provide a sustainable travel alternative for residents, workers and visitors and help to promote modal shift.

The Naas LAP did not define the bridge locations for the bus service to use to access the NWQ. The NTA’s Bus Planning Project will define the urban bus routes for Naas. The bus route options outlined in the Framework Masterplan represent KCC’s proposal and are intended to be inputs to the NTA’s process. Two options are shown and the preferred option will be dependent on frequency and capacity requirements and available resources. Both options serve the NWQ site, Naas town centre and Sallins Train Station. The main difference between the options relates to the bridge used to cross the Naas Branch of the Grand Canal to the east of the NWQ.

7.2.1.1 Lower Frequency / Capacity Bus Service

The route of the proposed lower frequency bus service option is shown in yellow in Figure 7.2. It is assumed that this option would have a frequency of every 30 minutes and that it would involve the use of smaller buses.

To deliver this bus service, two improved bridge crossings are required over the Naas Branch of the Grand Canal to carry buses to the NWQ site. The northern bridge crossing for this option is Tandy’s Bridge, while the south-

western crossing will use Old Carragh Road / Ploopluck Bridge, which is currently used for only active travel. Both bridges will require upgrades to accommodate bus traffic.

In addition, Mill Lane which connects to Tandy's Bridge would also need to be widened to facilitate a two-way bus route to/from the NWQ masterplan area.



Figure 7.2: Location of Tandy's Bridge and Proposed Bus Route

7.2.1.2 Higher Frequency / Capacity Bus Service

Depending on anticipated demand, it may be necessary to provide a more frequent and/or higher capacity bus service which would run every 15 minutes and/or which would use larger buses. In this case, it would not be possible to accommodate the bus route on Tandy's Bridge and instead, it would need to be accommodated on Millbridge Street bridge. The route of the proposed higher frequency / capacity bus service option is shown in Figure 7.3.



Figure 7.3: Location of Millbridge Street Bridge and Proposed Bus Route

7.2.2 Sustainable Travel Corridor and Bus Gate

The NWQ Framework Masterplan incorporates a new dedicated bus route between Sallins Railway Station and Naas Town Centre via the NWQ. To improve the effectiveness of public transport within the site, there will be a bus gate after development parcel access junctions. The approximate location of the busgate indicated in the diagram in Figure 7.4. This Primary Street is the only continuous through-road across the NWQ Masterplan site, as can be observed in Figure 7.4. This will create a filtered permeability measure / bus gate to stop through-traffic by private motor vehicles to improve bus reliability and journey times. In effect, the bus gate and active travel elements incorporated into the Primary Street design, will create an east-west sustainable travel corridor across the site where buses, pedestrians and cyclists are prioritised.

The sustainable travel corridor for the lower frequency / capacity bus service will extend from Tandy’s Bridge to the Millenium Park Road across the NWQ site, as shown in Figure 7.4

The sustainable travel corridor for the higher frequency / capacity bus service variant will extend from Millbridge Street Bridge to the Millenium Park Road across the NWQ site, as shown in Figure 7.5. This alternative route would be adopted if the bus frequency levels became higher than the capacity of Tandy’s Bridge could facilitate.

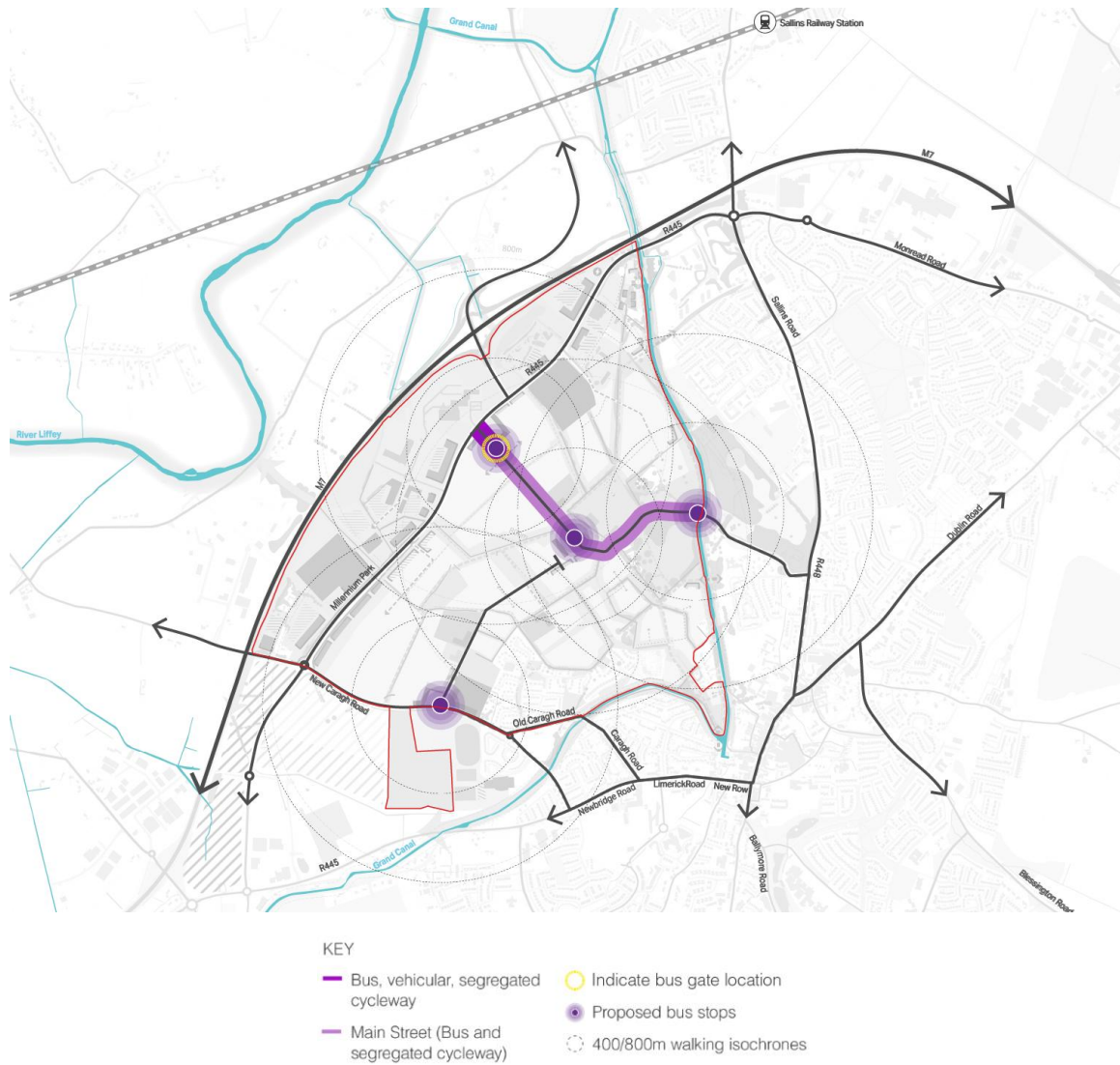


Figure 7.4 Location of Sustainable Travel Corridor (Tandy's Bridge to Millenium Park Road)

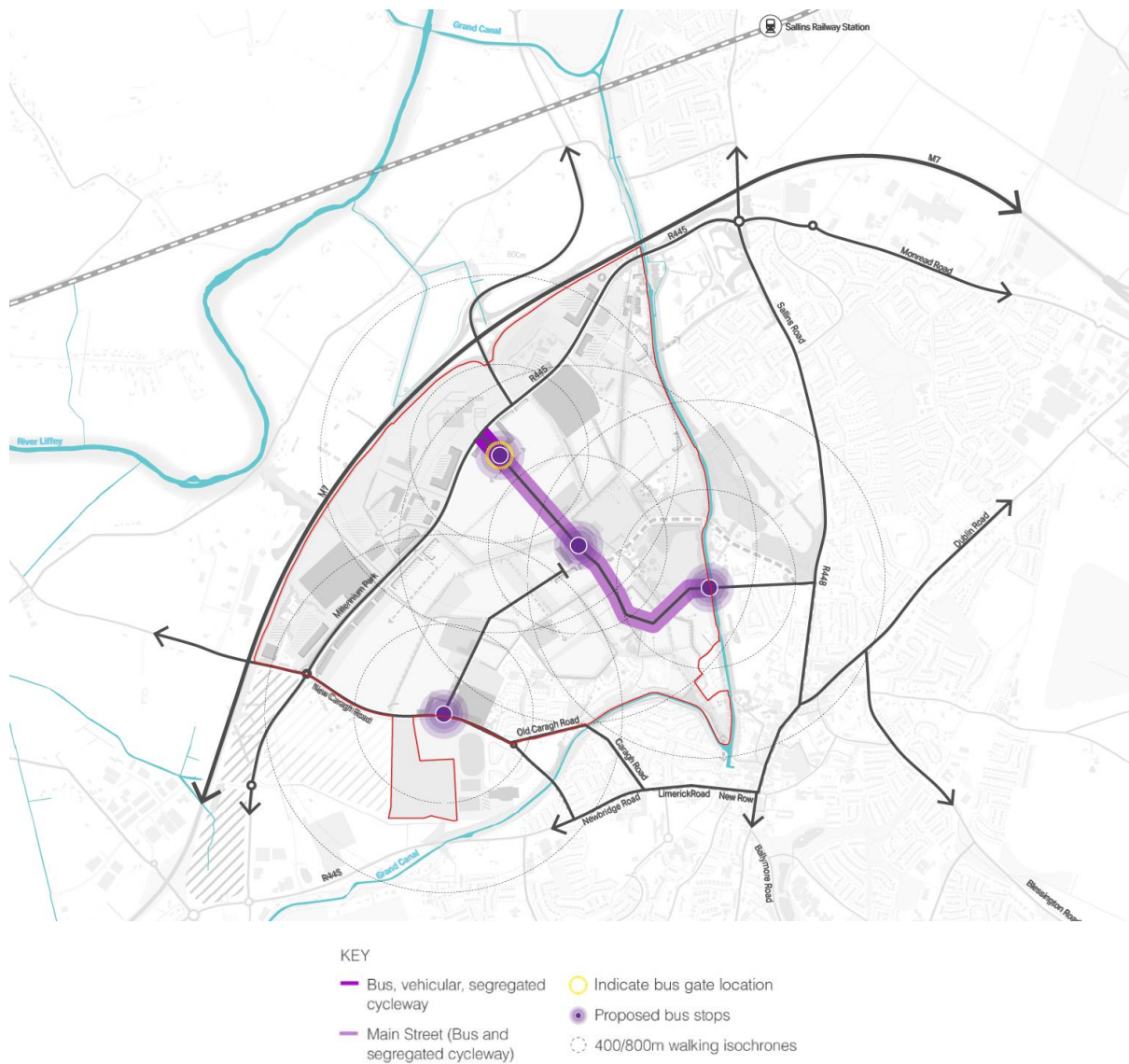


Figure 7.5 Location of Alternative Sustainable Travel Corridor for Higher Bus Frequencies (Millbridge Street Bridge to Millennium Park Road)

7.2.3 Bus Stop Standards

In Figure 7.2 and Figure 7.3, four bus stops are proposed within the NWQ site, distributed throughout the masterplan area. The new bus stops are primarily located at local centres and key destinations within the NWQ. The stops are designed to complement existing bus stops along the wider route, ensuring integration with the broader transport network. The positioning of new stops has been guided by accessibility principles, with the intention that all parts of the NWQ are within a 5–10 minute walking distance of public transport access. This approach ensures equitable access to public transport and supports the development of a compact, walkable neighbourhood structure in accordance with the objectives of the LAP.

There will be additional bus stops outside the NWQ site, located across Naas and Sallins, but these are not documented in the SMS. The location of bus stops outside the masterplan area will be determined by the NTA and KCC. The bus stops within the NWQ site will be of a high standard, with a passenger shelter, travel information, bus stop pole, live information sign, public lighting, passenger seating and a safe crossing point to access the stop.

7.2.4 Public Transport Strategy Measures

The public transport strategy consists of measures listed in Table 7.2.

Table 7.2 Public Transport Measures

Measure No.	Description
PT 01	Tandy's Bridge - Upgrade to facilitate bus and private vehicle traffic, linked to improvements on Mill Lane and Primary Road plans in the masterplan
PT 02	Upgrade Old Caragh Road / Ploopluck Bridge to accommodate bus and active travel trips
PT 03	Mill Lane works to widen it to facilitate two-way bus route and primary road for vehicles to masterplan site.
PT 04	Construct bus stops in the study area – Each consisting of a shelter, information poll, live information lighting, seating and safe crossing point
PT 05	The connection from Tandy's Bridge to Sallins Road will require infrastructural improvements to enable an effective bus service to operate (e.g. widening of Mill Lane or passing places, traffic control system, or connection through Millbridge Way)
PT 06	New town bus service linking masterplan area to Sallins train station and town centre

7.3 Private Motor Vehicle Strategy

This section outlines the main concepts in the private motor vehicle (PMV) strategy, which includes the street hierarchy and measures to manage travel demand via car parking supply restrictions. It is acknowledged that streets will have a multi-modal role, providing access for cars, pedestrians, cyclists and buses.

7.3.1 Street Hierarchy

There are three key levels in the street hierarchy used in the masterplan site, these are explained below and shown in Figure 7.6:

- **Primary Streets** – There are four primary street typologies in the masterplan, three connecting Millenium Park Road to Tandy’s Bridge east-west across the site to facilitate the bus route, and another primary street connecting to Old Caragh Road and providing access to the south of the masterplan area. The primary streets are multi-modal corridors designed to accommodate buses, motor vehicle traffic, pedestrians and traffics. However, the Primary Streets aim to prioritise sustainable travel by stopping through-traffic by private motor vehicles with the use of filtered permeability / a bus gate in the centre of the site.
- **Access Streets** – Access Streets link individual development parcels to the Primary Street network. Access Streets accommodate a mix of road users, providing access to homes and businesses.
- **Local Streets** – Local Streets are the smallest streets in the in the masterplan site, providing short local connections to the larger Access and Primary Streets.

The street network will be accessed by five key access points also shown in Figure 7.6. The junction types will be determined as part of detailed design process for the masterplan site.

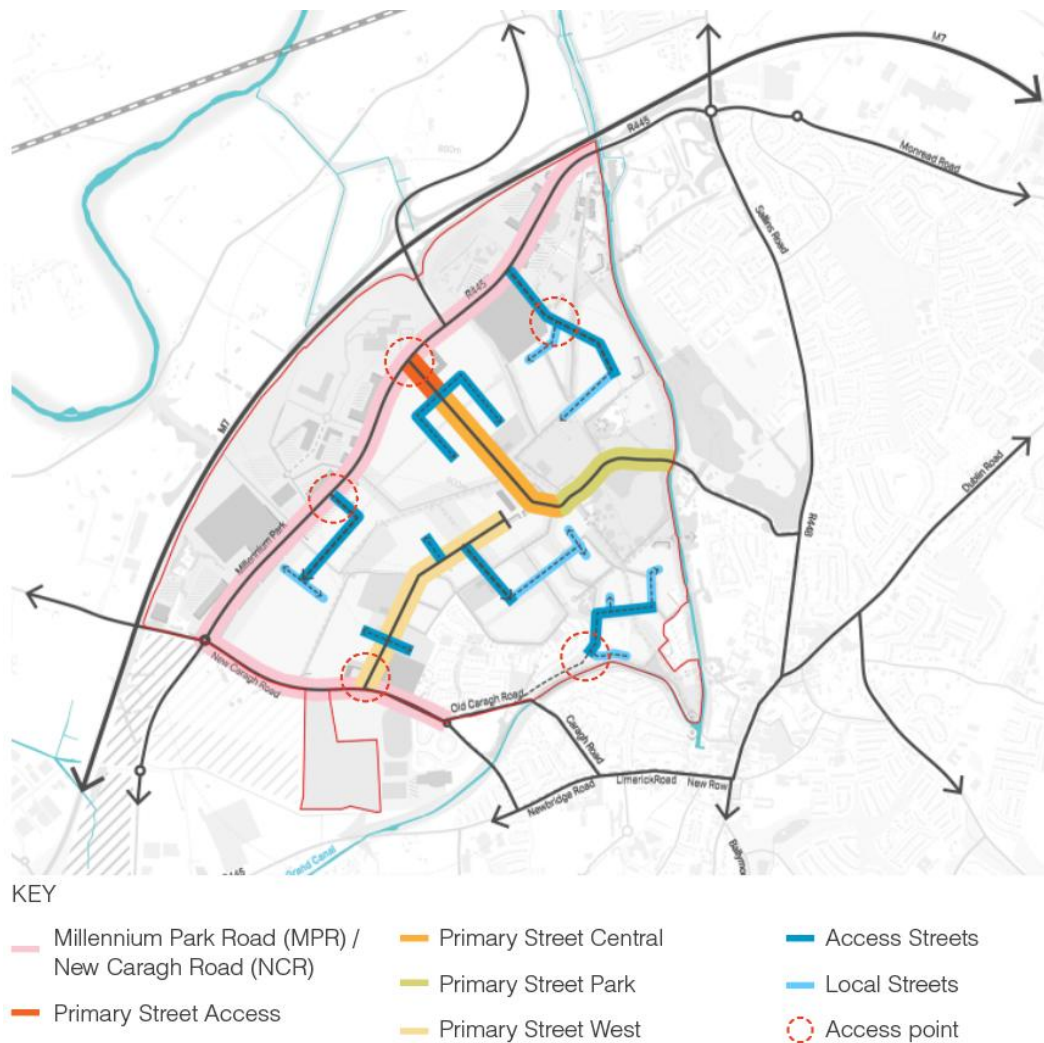


Figure 7.6 NWQ Masterplan Street Hierarchy

7.3.2 Multi-Storey Parking

Multi-storey car parks are proposed as the solution to car parking supply for the Millennium Park Neighbourhood Centre and the New Caragh Road Local Centre to address shared mixed use car parking requirements including neighbourhood / local centre use related parking as well as residential parking for the residents of the apartment buildings along the centre. The multi-storey car parks can be designed as a stand-alone buildings or within a shared use with residential above.

The proposed locations are shown in Figure 7.7. This will provide efficient use of the land within the urban centres.



Figure 7.7 Proposed Location of Multi-Storey Car Parks and Catchments

7.3.3 Car Park Provision

Residential and commercial parking supply levels are an important part of demand management, with lower parking supply increasing the potential for modal shift towards sustainable transport. In the NWQ masterplan, three multi-storey car parks are designed to take a lot of parking demand, which reduces the level of supply required at street level and allows more space to be allocated to active travel infrastructure. However, residential street parking and business-adjacent parking spaces are still required, but in smaller volumes than in a typical modern development.

7.3.3.1 Non-Residential Parking

There are different maximum non-residential car parking standards for different land uses, as shown in Table 7.3. Maximum parking standards are determined by the Gross Floor Area (GFA) of new development for most land uses, with parking spaces allocated according to the volume of growth proposed for each land use type.

Table 7.3 Maximum Non-Residential Car Parking Standards

Employment Type	One space per X m2 (unless otherwise stated)
Retail / café / restaurant / bar / retail office	25
Retail warehouse / showrooms	50
Retail/Hospitality	50
Community/Library	50

Healthcare (Services / Hospital)	100
Office	30
Offices where floorspaces greater than 1,500sqm	50
Light industry	100
Logistics	150
School	100
Gymnasium / Active Recreation Centre	20
Playing fields	10 per pitch
Crèche	50

7.3.3.2 Residential Parking

Residential car parking standards are defined as maximum standards and depend on the type of housing unit and its size in respect to bedrooms, as well as the accessibility of the location. Maximum standards are lower than the County Development Plan to constrain demand for private motor vehicles and promote the use of sustainable travel alternatives. As noted previously, proposed Variation No. 3 of the Kildare CDP notes that the Planning Authority “*may determine lower maximum car parking standards for strategic and sustainable development sites, key development areas, masterplan areas and candidate Urban Development Zones on a plan led basis*”.

Three location categories have been defined for the NWQ:

- **NWQ accessible locations:** Housing lands within 800m (10-minute walk) of the Town Centre (Primary Street)
- **NWQ intermediate locations:** Housing lands within 500m of proposed urban bus routes/the NWQ proposed bus corridor
- **NWQ peripheral locations:** Areas not proximate to the town centre or proposed bus routes – residual of the NWQ

Maximum residential car parking standards for the NWQ masterplan are defined in Table 7.4.

Table 7.4 Maximum Residential Car Parking Standards

Residential Unit Type	No of bedrooms	NWQ accessible locations	NWQ intermediate locations	NWQ peripheral locations
Apartment	1	0.75	1	1.25
	2	1	1.25	2
Houses and duplexes	2	1	1.5	2
	3	1.5	2	2
Houses	4/4+	1.5	2	2
Visitor parking spaces	n/a	1 space per 10 units for 1 and 2 beds	1 space per 10 units for 1 and 2 beds	1 space per 10 units for 1 beds

7.3.4 Complementary Measures

In addition to the main measures focused on private motor transport, a series of complimentary measures are also proposed to reduce the climate impact of car use:

- Provision of electric vehicle charging points at homes, businesses and mobility hubs in line with Kildare County Council and national policy requirements
- Provision of car share spaces (e.g. GoCar) in residential and commercial areas to support non-car owning households and workers. The number of spaces to be set in line with Kildare County Council policy. The mobility hubs will offer car share / car club facilities to promote non-car living.
- 30kph speed limit to be imposed across the NWQ masterplan site to ensure safe streets for all road users
- Streets will be designed to have a clear design speed of 30kph utilising placemaking techniques to achieve this. Private Motor Vehicle Measures

Table 7.5 provides a list of the measures proposed in relation to private motor vehicles.

Table 7.5 Private Motor Vehicle (PMV) Measures

Measure No.	Description
PMV 01	Create proposed masterplan Primary Street Network
PMV 02	Create proposed masterplan Access Street network
PMV 03	Create proposed masterplan Local Street network
PMV 04	Create two multi-storey car parks proposed in the masterplan
PMV 05	Commercial and residential parking provision measures
PMV 06	EV charging point infrastructure
PMV 07	Car share scheme spaces and associated infrastructure
PMV 08	30kph speed limit across the site
PMV 09	Streets will be designed to have a self-regulating design speed of 30kph utilising placemaking techniques to achieve this

8. NWQ Sustainable Mobility Strategy

8.1 Strategy Measures

The combined sustainable mobility strategy across all modes of transport is summarised in Table 8.1.

Table 8.1 Sustainable Mobility Strategy

Mode	Measure No.	Description
Active Travel	AT 01	Walking / cycle network – primary routes
Active Travel	AT 02	Walking / cycle network – secondary routes
Active Travel	AT 03	New pedestrian / cycle bridge over canal at Landen Park
Active Travel	AT 04	New pedestrian / cycle bridge over canal at Millbridge Way
Active Travel	AT 05	Convert Abbey Bridge to active travel priority bridge with local access vehicular traffic only in line with masterplan design
Active Travel	AT 06	New active travel bridge in Naas Harbour, linking masterplan active travel network to Sarto Road
Active Travel	AT 07	Pedestrian Crossing Points throughout site e.g. zebras
Active Travel	AT 08	M1 Mobility Hub – Millenium Park Road Neighbourhood Centre
Active Travel	AT 09	M2 Mobility Hub – Central Local Centre
Active Travel	AT 10	M3 Mobility Hub – Western Neighbourhood Centre
Public Transport	PT 01	Tandy's Bridge - Upgrade to safely manage bus, walking and cycling movements safely, linked to improvements on Mill Lane and Primary Street plans in the masterplan
Public Transport	PT 02	Upgrade Old Caragh Road / Ploopluck Bridge to accommodate bus and active travel trips
Public Transport	PT 03	Implement suitable measures to facilitate buses to use Mill Lane in two directions (to be determined and could potentially involve widening, provision of passing places, signalisation or connection to Millbridge Way)
Public Transport	PT 04	Construct bus stops in the study area – Each consisting of a shelter, information poll, live information lighting, seating and safe crossing point
Public Transport	PT 05	Filtered permeability / bus gate and sustainable travel corridor to ensure Bus-Only through traffic in the masterplan site. Enforcement measures required (e.g. rising bollards) to ensure compliance.
Public Transport	PT 06	New town bus service linking masterplan area to Sallins train station and town centre
Road Transport	PMV 01	Create proposed masterplan Primary Street Network
Private Motor Vehicles	PMV 02	Create proposed masterplan Access Street network
Private Motor Vehicles	PMV 03	Create proposed masterplan Local Street network
Private Motor Vehicles	PMV 04	Create two multi-storey car parks proposed in the masterplan

Private Motor Vehicles	PMV 05	Commercial and residential parking provision measures
Private Motor Vehicles	PMV 06	EV charging point infrastructure
Private Motor Vehicles	PMV 07	Car share scheme spaces and associated infrastructure
Private Motor Vehicles	PMV 08	30kph speed limit across the site
Private Motor Vehicles	PMV 09	Streets will be designed to have a self-regulating design speed of 30kph utilising placemaking techniques to achieve this

8.2 Strategy Phasing

In a masterplan site, typically all infrastructure proposed in the design is constructed on the ground, so the importance of phasing is lessened as each element is part of an integrated plan. In respect to phasing the transport measures, the most important issue is ensuring the transport and mobility infrastructure measures are in place prior to occupancy of the site by residents and businesses, or implemented as close to occupancy as possible. This is particularly important for the following transport infrastructure, but it is acknowledged that the masterplan will probably be developed in phases and this may not be possible in all cases:

- The bus route, bus stops, supporting bus priority measures and bus upgrades should be operational prior to the occupancy of residences or employment areas
- The active travel infrastructure, including bridges, should be constructed prior to the occupancy of homes and businesses, in respect to both internal links and connections to the wider Naas pedestrian and cycle network
- Mobility hubs should be active with all the required infrastructure in place prior to occupancy of the site by residents and businesses.
- Parking restrictions need to be strictly⁵ enforced to manage private motor vehicle demand and increase the appeal of sustainable travel measures

By providing transport and mobility infrastructure prior to occupancy, there is a greater chance of influencing travel behaviour of residents, workers and visitors to the site. It may also help to attract new residents who are non-car owning or from less car dependent households, who are more likely to use the sustainable travel infrastructure.

Rather than providing a detailed list of SMS measures and phasing, this task is completed in the NWQ Masterplan Infrastructure Delivery Schedule (IDS), which considers this issue in greater detail and combines the transport measures with the other infrastructure on site.

8.3 Strategy Monitoring

A monitoring programme will need to be implemented to assess the success of the transport strategy in promoting sustainable travel and limiting car dependency. A monitoring report should be produced by Kildare County Council in the 1st year after opening the NWQ development, the 5th year and the 10th year. If additional measures are required to promote modal shift, these can be introduced by revisions to the County Development Plan or Urban

⁵ It is Kildare County Council's strong preference to constrain car parking supply in line with the standards set out and to promote more sustainable mobility solutions. However, Kildare County Council may offer some flexibility for pragmatic reasons on maximum car parking standards for residential development in the "intermediate" location type until the NWQ urban bus route is programmed by the NTA. Applicants should provide a rationale and justification for any deviation from the NWQ Intermediate location maximum standard for the consideration of the planning authority.

Area Plan. Use of full population data, such as Census 2027 and future Census years, will be invaluable in establishing a baseline of travel behaviour for new residents and then monitoring its change over time.

If future monitoring observes higher than expected levels of car dependency in the NWQ site, additional measures will be required to support sustainable travel and promote modal shift. These could include:

- Behaviour change measures to promote active travel e.g. cycle libraries in local schools, free Leap card credit schemes in workplaces to encourage bus travel, strengthened Mobility Management Plans.
- Introduction or strengthening of paid parking regime to promote non-car use
- Additional bus frequency to make sustainable travel alternatives more attractive
- Public information campaign on sustainable travel options when travelling to/from NWQ lands

9. Planning Process and Future Transport Assessments

The NWQ Framework Masterplan will be integrated into the statutory planning framework by means of a variation to the Kildare County Development Plan. Kildare County Council has committed to exploring the potential for the NWQ to be designated as an Urban Development Zone (UDZ)⁶, which is a new form of designation under the PDA 2024 similar to the Strategic Development Zones designated under the PDA 2000. Such a designation would give the Framework Masterplan enhanced status in the planning process.

Owners of the land in the NWQ site will seek to develop their sites in line with the masterplan design. When they apply for planning permission, detailed designs and assessment reports will be produced to support their applications. For a large development, a Traffic and Transport Assessment (TTA) or Traffic Impact Assessment (TIA) is typically produced. This stage is where the ability of the road network to accommodate the additional traffic from the NWQ site is assessed and modelled in detail.

A typical TTA would contain the following content:

- The quantum of proposed development under each land-use type
- Data collection on the surrounding road network e.g. M7 Jc. 9a traffic surveys
- Trip rates for different land-use types in this location based on TRICS data
- An estimate of future travel demand based on trip rates and the scale of growth
- Transport modelling of the potential impacts e.g. LinSig modelling of signalised junctions or a Local Area Model (e.g. Saturn or VISUM based).
- Analysis on the impact of development on the transport network and mitigation measures

As part of assessing the planning permission, the Council will receive submissions from state transport agencies such as the National Transport Authority (NTA) and Transport Infrastructure Ireland (TII), who will focus on the size of development and the analysis contained in the TTA. TII will focus on the impact of additional traffic on M7 Junction 9a, while the NTA will be more concerned with active travel linkages with the existing urban areas of Naas, demand management and public transport provision. At this stage, there will be engagement between the developer's design team, the Council and the NTA/TII to discuss the impacts on the road network and agree on mitigation measures (e.g. different junction types or capacity upgrades) to protect the strategic role of the national road network and ensure that the appropriate infrastructure and services are provided to promote sustainable mobility.

⁶ <https://www.gov.ie/en/department-of-housing-local-government-and-heritage/press-releases/minister-browne-signs-order-for-local-authorities-to-identify-suitable-sites-for-urban-development-zones-udzs/>

Appendix A – Sustainable Masterplan Exemplar Case Study Review

Sustainable Mobility Oriented Exemplar Masterplan Case Studies

Northwest Quadrant (Naas) Framework Masterplan

Kildare County Council

Project number: 60727567

26 June 2024

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1. Introduction

1.1 Background

As part of the Northwest Quadrant Urban Extension Framework Masterplan, AECOM have been commissioned by Kildare County Council to conduct a case study review encompassing ten examples of European masterplan sites with high sustainable travel mode share. The purpose of the review is to inform the integrated approach to land use and sustainable transport in the Framework Masterplan.

1.2 Northwest Quadrant (Naas)

The NWQ, which is illustrated in Figure 1-1 is the largest development site in County Kildare. The Northwest Quadrant Framework Masterplan sets out a clear and deliverable vision for a major urban extension to Naas, supporting its role as a Key Town. The plan will deliver up to 4,000 homes alongside employment, community facilities and supporting infrastructure within a sustainable, mixed-use district. Hence a development which is proactive in delivering sustainable transport modes for future residents and employment sites will be crucial.

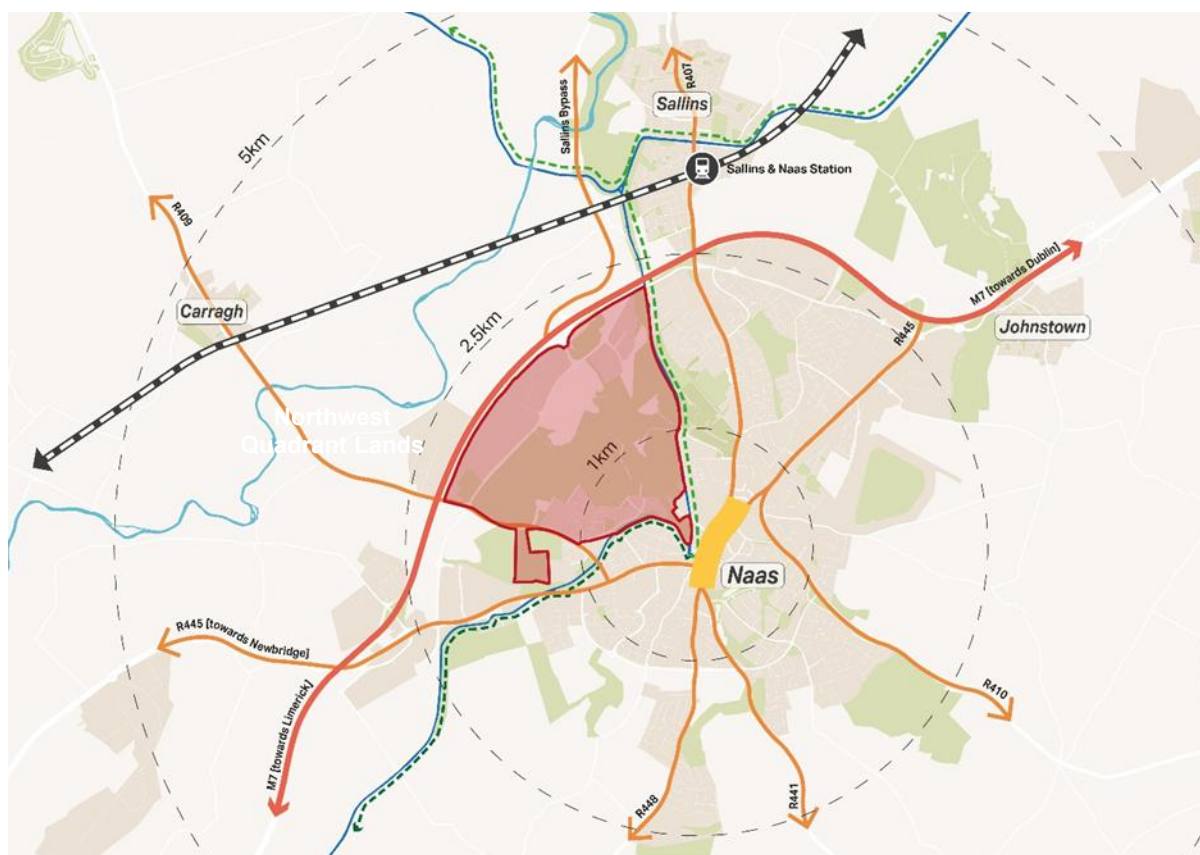


Figure 1-1 NWQ Location Context

Naas is a medium sized town, although it will be a large town when NWQ is built out. The NWQ encompasses both edge of town centre and suburban areas. The NWQ is not a Transit Oriented Development (TOD) but the Framework Masterplan nevertheless aims to apply similar principles and learn from best practice case studies to achieve sustainable outcomes.

1.3 Case Study Approach

Within the NWQ, the provision of public transport connections, a permeable walking and cycling network, and a constrained approach to car parking are considered essential components for achieving a sustainable mobility strategy. These key aspects play a crucial role in promoting modal shift away from private car usage.

A total of ten case studies have been compiled, featuring sites from various locations in Ireland, the United Kingdom and Europe. Each case study provides an overview of the development, highlighting the integrated transport systems in place. The effectiveness of these sustainable transit orientated elements in generating modal shift away from private cars is thoroughly examined. In each of the case studies, the main objective was to achieve a sustainable development that promotes sustainable mobility and sustainable transport, which is also the aim of the NWQ.

Furthermore, the key lessons learned from each case study are presented, demonstrating how they can be applied to the emerging sustainable mobility strategy in the NWQ. By analysing which approaches and transport systems have been most impactful, the review aims to identify the most suitable strategies to be implemented in the NWQ.

2. Hammarby Sjöstad Regeneration, Sweden

2.1 Overview

Hammarby Sjöstad¹ is a prominent example of sustainable urban redevelopment located in Stockholm, Sweden. Initially, an industrial waterfront area, approximately 160 hectares, it was transformed into a modern, eco-friendly urban district that serves as a model for sustainable living. Originally planned as an ecological sports arena and athlete's village as part of the 2004 Olympics bid, which was lost, the Stockholm municipality opted to create its first Ecocity. Similar to the NWQ the area is bounded by major strategic corridors which limited permeability to adjacent districts/ areas.

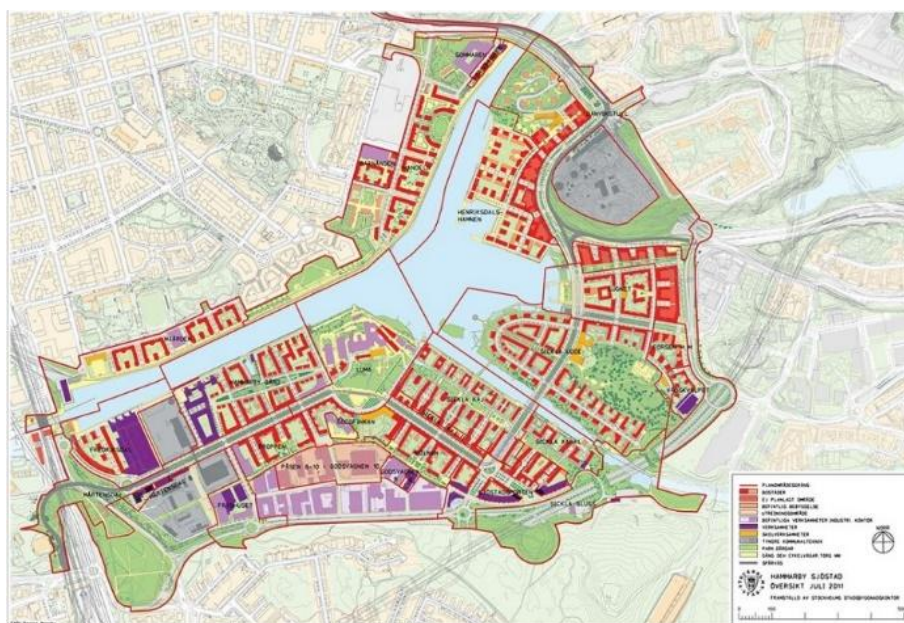


Figure 2.1 Hammarby Sjöstad Regeneration Site, Sweden

Source: Stockholm City Planning Administration

The primary objectives of the redevelopment project included: -

- Reducing environmental impact;
- Promoting sustainable transportation; and
- Enhancing quality of life for residents.

2.2 Integrated Transport Systems

The incorporation of transportation and land-use planning played a crucial role in enhancing the sustainability of the project. A pivotal element was the implementation of a district spine, a 37.5-metre wide boulevard and transit corridor that serves as a vital connection linking key transport nodes and public landmarks. This created a central accessible hub for activities and commerce within the district, supported by a comprehensive sustainable movement network that prioritises walking, cycling, and a tram system. Additionally, the introduction of car pools, along with designated car parking spaces and restrictions on private car parking, significantly reduced car dependency in the district. Subsequently Transport-related emissions for inhabitants of Hammarby Sjöstad are less than half those of an average Stockholm citizen and less than a third those on average in Sweden. In 2007, 79% of Hammarby Sjöstad residents walked, cycled or used public transport for commuting.

¹ <https://www.neighbourhoodguidelines.org/hammarby-sjostad-case-study>

2.3 Lessons Learnt

- **Single ownership:** Almost the entire site was in a single proprietorship from the start. This meant that no competing interest unsettled the plan;
- **Long-term vision** of the masterplan;
- **Massive early infrastructure:** Major public funding was key to delivery – with power, water, recycling – all put in place initially;
- **Collaborative method:** Developers and architects looked at how they could achieve a workable solution for each development area. Many different developers produced each zone with variations and changes to the design, while remaining under the same wider master plan;
- **Clear delivery mechanisms:** Developers had to pay for each site on a per-square-metre-of-development basis. This narrowed down the range of bidding, because of the restrictions enforced by the masterplan – enabling a greater focus on the design to meet end-user needs; and
- **Flexible mix of uses:** The masterplan envisaged a blend of non-residential uses but didn't impose constraints on them. Ground floor areas in certain key frontage zones had to be active, while being flexible for the end tenant.

2.4 Relevance to Naas NWQ

Similar to the NWQ, Hammarby Sjöstad was originally a vast, unrestricted site with the potential to incorporate multiple land uses. The central spine approach, focused on sustainable modes of transportation, has proven to be successful within the Hammarby Sjöstad district without hindering commercial activities. Therefore, the Western Spine Bus route/active travel corridor, as detailed in the Naas – Sallins Transport Strategy, can be viewed as both a crucial component of the NWQ and a significant driver of sustainability. Additionally, the example of Hammarby Sjöstad demonstrates that reducing private car parking and offering viable alternative transportation options can effectively encourage behavioural change and promote a lasting shift in transportation modes.

The Hammarby Sjöstad area should be viewed within the broader context of its location within the Stockholm city area, which offers a higher level of amenities and services compared to Naas. As a result, the accessibility to the extensive public transport network in Stockholm plays a significant role in the decreased reliance on private car usage in the area.

3. Vauban, Freiburg, Germany

3.1 Overview

Vauban^{2 3} is a sustainable district located in Freiburg, Germany. Built on the site of a former French military base, it is renowned for its innovative approach to urban planning, emphasising car-free living and environmental sustainability. A specific traffic concept was designed including a car-free approach and alternative mobility, supported by low energy houses and a central market place and a community centre.

The basic principles for the district were: -

- A car-reduced traffic concept;
- A social mixture in the district;
- A preference of private co-building groups and cooperative self-help models;
- A short-ways concept of the infrastructure (similar to 10 minute neighbourhood); and
- An ecological local heating concept.

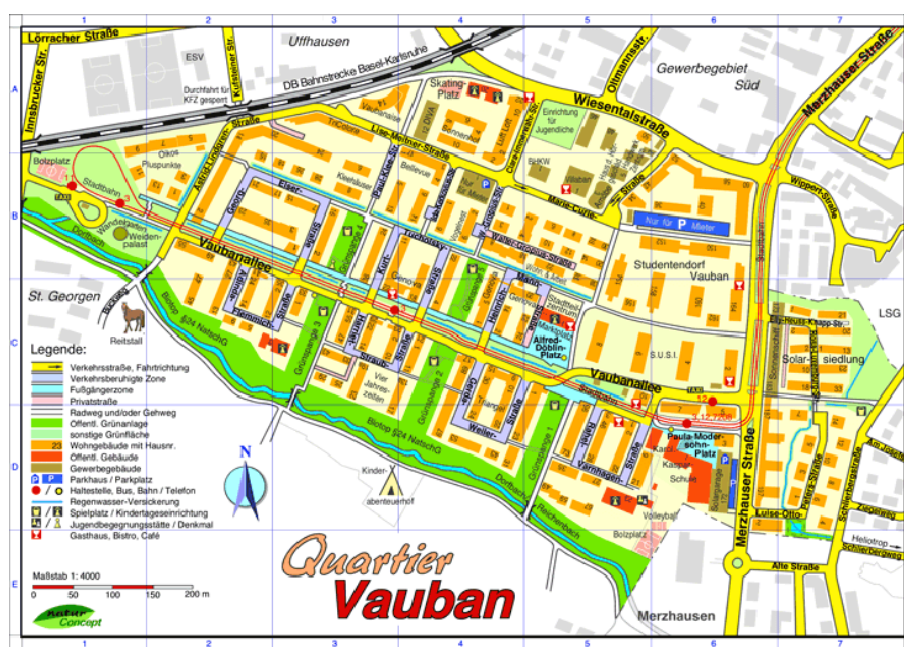


Figure 3.1 Masterplan of Vauban in Freiburg, Germany

Source: greenlivingpedia.org

3.2 Integrated Transport Systems

The district is served by a central avenue, the Vaubanallee, running east – west through the centre of the district which connects into the main strategic arterial route and light rail corridor into Freiburg. Parking is only allowed on Vaubanallee, in part to support retail enterprises along this main street. Otherwise, residents who do own cars are required to park them in one of the two garages, which are located at the northern and eastern edges of the district. Both garages are covered by arrays of photovoltaic panels producing significant amounts of electricity.

Subsequently, parking is not allowed in front of dwellings on the narrow residential streets, supported by a policy where residents agree that they do not and will not own a car however Vauban must certify that there is land dedicated to parking if the resident chooses to own a car, such as the garages. This is achieved through the “Vauban Club for Car-Free Living” where a member signs a commitment to remain car-free and pays a membership fee of €3,700. If the members of the club decide later to purchase a car, they must pay more than

² <https://use.metropolis.org/case-studies/sustainable-urban-district-vauban>

³ <https://www.witpress.com/Secure/ejournals/papers/D&NE080401f.pdf>

€15,000 to the Club, which is the cost of constructing a parking space in one of the garages. The penalty for purchase of a car without notifying the city can be as high as €100,000.

Car-free residents can, however, have access to cars when they need them by becoming members of the "Freiburger Auto Gemeinschaft", a car sharing club which makes available five cars and a van parked in one of the district's garages. Club members also receive a free pass for all forms of public transit in Freiburg and as well as a Bahn card giving them 55% off on every train ticket, making public transit even more attractive and affordable.

To aid in a car free environment, the district is a high-density, compact, mixed-use community equivalent to a 10 minute neighbourhood. Walking and cycling routes are given preference within the district over typical car dominated streets, with many areas inaccessible to cars. For external connections a light rail service provides access to the wider Freiburg areas, with the light rail stations providing interchange connections to bus or heavy rail routes.

3.3 Lessons Learnt

Modal Shift Impact: Vauban has achieved a dramatic modal shift, with around 70% of trips made by bike or on foot, and car ownership significantly below the national average;

Liveability and Quality of Life: Vauban has attracted a young demographic and mostly composed of young people and young families, as streets and other public spaces have been reclaimed for outdoor activities; and

End User/ Community Commitment: the success of Vauban has relied on residents and commercial users to engage with and participate in the car free policies and requirements.

3.4 Relevance to Naas NWQ

Vauban is a significant development site similar in size to the NWQ, with a focus on creating a well-connected network for walking, cycling, and public transportation. This network is designed to facilitate both internal movements within the development and external movements to and from the site. The limitations on private car access, including restrictions on permeability within the site and parking provisions, play a crucial role in reducing reliance on private vehicles.

The success of limiting car parking to specific areas can be applied to the NWQ and demonstrates that such measures can be implemented without negatively impacting the commercial or residential appeal of an area. Therefore, implementing car-free zones within the NWQ and restricting car access to the periphery, M7, and Millennium Park areas could be feasible solutions. Additionally, ensuring the availability of high-quality walking, cycling, and public transportation options is essential for achieving a sustainable development in the NWQ.

4. Bo01, Malmö, Sweden

4.1 Overview

Bo01⁴, located in the Western Harbour (Västra Hamnen) district of Malmö, Sweden, is a pioneering example of sustainable urban development. Initially developed for the European Housing Expo in 2001, Bo01 has since become a thriving residential area known for its innovative approaches to environmental sustainability and urban living.

The City of Malmö prepared a holistic concept first to reduce the need for transport then to support the most environmentally favourable modes, including walking and cycling and making buses accessible at less than 300 metres from each inhabitant, with a high service frequency. A mobility management system provided a methodology to access 'green' vehicles and carpooling options.

The primary objectives of the Bo01 project included: -

- Showcasing sustainable living and advanced ecological solutions;
- Reducing environmental impact through innovative design and technology; and
- Creating a vibrant, attractive urban area that promotes a high quality of life.



Figure 4.1 Bo01, Malmö, Sweden

Source: <https://makinglewes.org/category/eco-districts/>

4.2 Integrated Transport Systems

The Bo01 district has implemented a grid system to designate specific areas for vehicles and non-motorised users. Vehicle routes are located on the periphery, while the internal areas are reserved for walking and cycling. The district's close proximity to Malmö allows for seamless integration into the existing walking and cycling network. In Malmö, 40% of trips to school or work are made by bicycle, highlighting the city's commitment to sustainable transportation.

The central train station and bus interchange are conveniently located less than 1.5 miles from Bo01, supported by well-connected walking, cycling, and public transport routes. This infrastructure discourages the use of private cars, promoting a car-free environment. Parking standards are limited to 0.7 spaces per unit, with a parking garage available at the district's periphery for residents who own private vehicles.

To ensure the sustainability of the district, residential, commercial, and recreational spaces are strategically combined, creating a vibrant, mixed-use environment. Residents have easy access to shops, cafes, and parks, fostering a strong sense of community and convenience. The district also boasts numerous green spaces,

⁴ <https://www.neighbourhoodguidelines.org/quality-program-malmo-sweden>

⁵ file:///C:/Users/CraigP/Downloads/Case_Study_and_Sustainability_Assessment_of_Bo01_M.pdf

including parks, waterfront promenades, and communal gardens, enhancing the overall quality of life and providing ample recreational opportunities for residents.

4.3 Lessons Learnt

Modal Shift Impact: Bo01 has successfully reduced car dependency, with a significant proportion of residents opting for walking, cycling, and public transportation. This shift has contributed to lower traffic congestion and reduced carbon emissions;

Sustainability: The district is internationally recognised as a model for sustainable urban development, attracting attention for its innovative approaches and successful implementation of ecological solutions; and

Importance of Integrated Planning: Successful sustainable urban development requires an integrated approach that combines various aspects of environmental, social, and economic planning. Bo01's holistic design, which incorporates renewable energy, green spaces, and mixed-use development, demonstrates the effectiveness of such an approach.

4.4 Relevance to Naas NWQ

The Bo01 district serves as a prime example of how areas within the NWQ can be developed to promote sustainability and create a car-free environment. Through meticulous planning of its streetscape and strategic identification of car accessible and inaccessible areas, a harmonious balance has been achieved between accessing amenities and preserving pedestrian and cycle-friendly spaces. The integration of high-quality connections to existing walking, cycling, and public transport networks has effectively reduced the need for private car ownership. Additionally, the provision of off-site parking garages caters to those who still rely on private vehicles.

In contrast, the context of Naas and the NW presents a different challenge. The Bo01 district in Malmö had the advantage of an established walking and cycling network in close proximity, as well as a population that was already less reliant on private cars. Therefore, the transition to sustainable modes of transportation may not be as seamless in car-dominated areas like Naas.

5. Porta Nuova, Milan, Italy

5.1 Overview

Porta Nuova⁶ ⁷ is a mixed-use regeneration project near the centre of Milan covering approximately 29 hectares of land. The develop provides a mixture of office space, residential units, retail and public parks. Whilst the development has a heavy focus on modern architecture, sustainability underlies its success. The primary objectives of the Porta Nuova project included: -

- Revitalizing a central but underutilized area of Milan;
- Promoting sustainable urban development and reducing environmental impact;
- Creating a vibrant mixed-use district with residential, commercial, and cultural spaces; and
- Enhancing connectivity and public transportation.



Figure 5.1 Porta Nuova, Milan, Italy

Source: https://www.theplan.it/eng/whats_on/porta-nuova-milan-sustainable-neighborhood

5.2 Integrated Transport Systems

The Porta Nuova development in Milan emphasises connectivity and sustainability through its integrated transport systems. These systems are designed to reduce car dependency and promote the use of public transportation, walking, and cycling.

The area is integrated into Milan's tram and bus network, offering convenient options for local and city-wide travel and multiple tram and bus lines run through or near Porta Nuova, ensuring frequent and reliable services. Porta Nuova is adjacent to major train stations, including Milano Porta Garibaldi, which is a key hub for regional and national rail services. This station provides connections to high-speed trains and regional commuter trains, facilitating travel beyond the city. Milan's suburban rail network, offering convenient options for commuters from surrounding areas, can also be accessed through the development.

Pedestrians are prioritised, with wide, well-maintained footways and pedestrian-only zones, designed to encourage walking, with easy access to amenities, shops, and green spaces. Whilst dedicated cycle lanes are integrated throughout Porta Nuova, connecting to Milan's broader cycling network and provide safe and efficient routes for cyclists, encouraging the use of bicycles for commuting and leisure. Additional support for cycling is through the bike-sharing programs, such as BikeMi, with several docking stations located within the district.

⁶ https://www.theplan.it/eng/whats_on/porta-nuova-milan-sustainable-neighborhood

⁷ https://casestudies.uli.org/wp-content/uploads/2016/02/portoNuova_16pg_F.pdf

Whilst the development does provide 3,000 car parking spaces, to reduce private car ownership and promote sustainable mobility, Porta Nuova encourages the use of car-sharing services such as Share Now and Enjoy are available in the area. The electric vehicle network has been expanded within the network with multiple charging stations available.

To further enhance the above, Porta Nuova leverages smart mobility solutions, including apps that provide real-time information on public transport schedules, traffic conditions, and availability of shared vehicles. These tools enhance the convenience and efficiency of using sustainable transport options.

5.3 Lessons Learnt

- **Sustainability:** Porta Nuova has set new standards for sustainable urban development in Italy, with many buildings achieving Leadership in Energy and Environmental Design (LEED) certification and incorporating green technologies;
- **Multimodal Accessibility:** Providing easy access to various forms of transportation encourages residents and visitors to opt for sustainable transport options over private vehicles;
- **Mixed-Use Development:** Integrating residential, commercial, and cultural spaces within walking distance reduces the need for long commutes and supports local economies; and
- **Community Integration:** Integrating the new development with the existing urban fabric and local communities required careful planning and continuous engagement.

5.4 Relevance to Naas NWQ

The Porta Nuova district serves as a prime example of how a neglected area can be revitalised into a sustainable development within a bustling city environment. Despite having more permeability for private vehicles than other similar projects, the implementation of a well-planned and interconnected network for walking, cycling, and public transportation has effectively reduced reliance on cars and promoted sustainable modes of transportation.

In the context of Naas and the NWQ, this example underscores the importance of connections to the Sallins train station, the various types of streets within the NWQ (such as pedestrianised, shared use, or mixed traffic), and the availability of cycle paths. These elements will play a crucial role in establishing a sustainable area that prioritises environmentally friendly transportation options.

6. Old Nordhavn Port, Copenhagen, Denmark

6.1 Overview

Old Nordhavn⁸ ⁹, a former industrial port area in Copenhagen, Denmark, covering a 200 hectare area, is undergoing a large-scale redevelopment to transform it into a sustainable, mixed-use urban district. The project, part of Copenhagen's broader efforts to become carbon-neutral by 2025, emphasises sustainability, innovative urban design, and high-quality living standards.

The primary objectives of the Old Nordhavn redevelopment include:

- Creating a sustainable, carbon-neutral urban district;
- Promoting green mobility and reducing car dependency;
- Integrating mixed-use development to enhance liveability and economic vitality; and
- Implementing innovative solutions for energy, water, and waste management.



Figure 6.1 Old Nordhavn Port, Copenhagen, Denmark

Source: <https://www.ramboll.com/en-apac/projects/real-estate/nordhavn-blueprint-for-a-5-minute-city>

6.2 Integrated Transport Systems

Nordhavn was designed as a “5-minute neighbourhood” (where a public transport stop is always within a 5-minute walk). The streets were designed specifically so that pedestrians, cyclists and public transport vehicles could move quicker than the private car. To allow for more space for pedestrians and bicycles on the street, cars are preferably be parked in the central multi storey carpark, with minimal on street parking facilities.

The ambition is, as a minimum, to live up to the objective of the City of Copenhagen of achieving at least one-third of all traffic in the area being cyclists, at least one-third being public transport, and car traffic should account for no more than one-third. Therefore, it should be easier to walk, cycle or use public transport than to travel by car in Nordhavn. To achieve this the district is design to have short distances from housing and workplaces to public transport, cycle paths, green areas, public institutions and commercial facilities.

The district is served by a local train that stops at Nordhavn Station, along with several buses, which run along a corridor known as the “green circuit.” The development also features an elevated metro track and a greened

⁸ <https://eic-uk.co.uk/case-studies/nordhavnen/>

⁹ <https://www.21stcenturydevelopment.org/media/1278/nordhavnen.pdf>

bicycle network. The elevated track functions as a cover for the bicycle 'highway,' so cyclists can stay dry in all weather.

A 13-kilometre pedestrian and cycle path (The Harbour Circle) provides a scenic route around Copenhagen's harbour and contributes to the city's "bicycle architecture" strategy to make cycling fun and accessible.

6.3 Lessons Learnt

- **Holistic Approach:** Integrating various modes of transport, including public transit, cycling, and pedestrian pathways, creates a seamless and efficient mobility network. Ensuring connectivity between these modes encourages the use of sustainable transport options over private cars;
- **Public Transport Accessibility:** Making public transport easily accessible and reliable is crucial. The extension of the Copenhagen Metro (M4 line) to Old Nordhavn significantly improved connectivity to the city centre and other areas, demonstrating the importance of integrating new developments into existing transit networks;
- **Cycling Infrastructure:** Extensive and well-designed cycling paths promote cycling as a primary mode of transport. The "Cycle Superhighways" concept provides safe, direct, and convenient routes for cyclists, encouraging more people to cycle;
- **Pedestrian-Friendly Design:** Prioritizing wide sidewalks, pedestrian zones, and safe crossings makes walking an attractive and convenient option. This enhances the liveability of the area and reduces reliance on motorised transport; and
- **Limited Car Access:** Restricting car access in certain areas and providing ample facilities for alternative transport modes helps reduce car dependency. Parking spaces are minimized and strategically placed to discourage unnecessary car use.

6.4 Relevance to Naas NWQ

Nordhavn is a larger site comparable to the NWQ that has looked to provide a cohesive walking, cycling and public transport network to facilitate the internal movements and external movements to the development. The constraints of access to the private car both in terms of permeability through the site and the parking provision have been essential in providing a method to reducing private car use.

In the context of the NWQ, the example highlights that limiting car parking to specific areas is viable and does not impact the commercial or residential attraction of the area. Therefore, applying principles of car free zones with the NWQ and limiting car access to the periphery/ M7/ Millennium Park areas can be considered viable. Furthermore, the provision of high quality walking, cycling and public transport connections is again fundamental to achieving a sustainable development.

7. GWL Terrein, Amsterdam, Netherlands

7.1 Overview

GWL Terrein^{10 11} (Gemeente Waterleidingen Terrein) is a sustainable residential neighbourhood in Amsterdam, developed in the 1990s on the site of a former municipal water company. The development is known for its pioneering approach to sustainable urban living, GWL Terrein emphasises car-free living, green spaces, and community involvement. Whilst covering a small area, approximately 6 hectares, the development has a very high residential density of 100 dwellings per hectare.

The primary objectives of the GWL Terrein project included:

- Creating a car-free, sustainable residential community;
- Promoting environmentally friendly living practices;
- Encouraging community engagement and social cohesion;
- Incorporating green spaces and water management solution.



Figure 7.1 GWL Terrein, Amsterdam, Netherlands

Source: <https://weerproof.nl/project/het-gwl-terrein/>

7.2 Integrated Transport Systems

The inner area of the development is designated as car-free, with only emergency vehicles permitted on site. Residents were requested to voluntarily endorse the car-free concept by signing a declaration of support. None of

¹⁰ <https://gwl-terrein.nl/app/uploads/2022/12/low-carbon-communities-GWL-only.pdf>

¹¹ https://issuu.com/josiahlindquist/docs/gwl_design_10-12_final

the 600 residential units within the development include parking spaces. However, there are several on-street parking spaces available along the perimeter, and a limited number of parking permits are offered to residents.

A total of 129 on-street parking spaces are situated on the west side of the district, with five reserved for carsharing vehicles and two for individuals with disabilities. The remaining 122 spaces, equivalent to 0.2 spaces per residential unit, are part of the city's public parking supply and are subject to metered tariffs.

Carsharing services are provided by two organisations, Greenwheels and Diks, with a total of five vehicles available at the development's border. This initiative aligns with the development's objective of reducing car ownership while ensuring residents have access to transportation when needed.

To uphold the car-free policy, the development is elevated from street level, preventing motorised vehicles from entering the inner area. Signs are prominently displayed at entry points to reinforce this restriction.

GWL Terrein benefits from excellent public transportation options with the Van Halstraat station, located just outside the development. The site is served by both tram lanes and bus lines, providing residents with convenient access to public transportation options.

7.3 Lessons Learnt

- **Feasibility of Car-Free Zones:** The successful implementation of a largely car-free environment at GWL Terrein demonstrates that urban areas can thrive without the dominance of private vehicles;
- **Peripheral Parking:** Strategically placing parking on the periphery of the neighbourhood reduces car traffic within the area, creating a safer and more pleasant environment for pedestrians and cyclists;
- **Proximity to Public Transport:** Ensuring that the neighbourhood is well-served by public transport, such as nearby tram and bus stops, enhances accessibility and reduces the need for private car use. Easy access to public transport options makes sustainable commuting more attractive;
- **Designing Appealing Spaces:** Developing green spaces, parks, and communal areas that are easily accessible by foot or bike enhances the appeal of car-free living. Attractive public spaces encourage people to spend time outdoors and use non-motorised transport;
- **Managing Car Dependency:** Transitioning to a car-free model requires addressing initial resistance and managing the needs of residents who may still rely on cars for certain activities. Providing adequate peripheral parking and promoting alternative transport options can help mitigate these challenges; and
- **Reduced Emissions:** By minimizing car traffic, GWL Terrein has achieved significant reductions in air pollution and greenhouse gas emissions. This contributes to improved air quality and supports broader climate goals.

7.4 Relevance to Naas NWQ

GWL Terrein serves as a prime example of a thriving car-free development. Although smaller in size, the principles utilised can be effectively applied to areas within the NWQ, especially those with higher residential density. A crucial factor in implementing the car-free model in the NWQ will be ensuring that public transportation connections are reliable and frequent, while also providing viable walking and cycling options as alternatives to private vehicles.

In line with other successful examples, car ownership is discouraged at a policy level, with prospective residents agreeing not to own a car and this may be a requirement for the NWQ.

The success of the GWL Terrein must also be viewed within the broader context of Amsterdam's culture of walking and cycling. The city as a whole promotes sustainable modes of transportation, providing a solid foundation for the GWL Terrein to thrive, which currently does not exist in the wider Naas area.

8. EVA-Lanxmeer, Culemborg, Netherlands Overview

8.1 Overview

EVA-Lanxmeer¹² is a sustainable residential and work community in Culemborg, Netherlands. Initiated in the late 1990s, it is recognized for its innovative approach to integrating ecological principles into urban development on a 24 hectare greenfield site. The project focuses on environmental sustainability, community involvement, and creating a high-quality living environment.

The primary objectives of the EVA-Lanxmeer project included:

- Promoting sustainable living and reducing ecological footprints;
- Fostering a strong sense of community and social cohesion;
- Integrating green spaces and enhancing biodiversity; and
- Utilizing sustainable building practices and renewable energy.

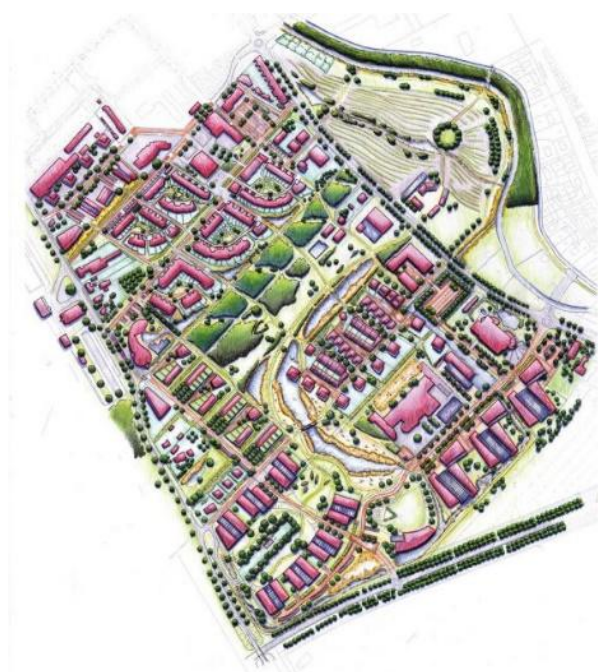


Figure 8.1 EVA-Lanxmeer, Culemborg, Netherlands

Source: <https://urbangreenbluegrids.com/projects/eva-lanxmeer-results/>

8.2 Integrated Transport Systems

The design of EVA-Lanxmeer places a strong emphasis on prioritising pedestrian and cyclist movement by restricting car access within the residential areas to deliveries only, with a ratio of 0.7 parking spaces per dwelling. Vehicles are primarily parked on the outskirts, resulting in reduced traffic and increased safety for residents. Additionally, EVA-Lanxmeer promotes car-sharing schemes to decrease the need for private car ownership.

The development features well-planned and extensive cycling paths that link residential areas to key destinations in Culemborg and beyond, ensuring that cycling is a secure and appealing mode of transportation. This is

¹² <https://www.upv.es/contenidos/CAMUNISO/info/U0511300.pdf>

complemented by ample and secure cycle storage facilities, making biking a practical choice for commuting and daily activities.

Situated near the Culemborg train station, EVA-Lanxmeer offers residents convenient access to regional and national rail networks. This connectivity enables easy commuting to major cities like Utrecht and Amsterdam without relying on cars. The train station also serves as a hub for various bus routes, expanding public transport coverage.

A crucial element of EVA-Lanxmeer's transportation strategy is the active involvement of residents in planning and managing transport initiatives. This participatory approach ensures that the community's needs and preferences are taken into account, fostering a sense of ownership and dedication to sustainable transport solutions.

8.3 Lessons Learnt

- **Social:** The bottom up approach of involving the intended residents in all aspects of the project's conception, planning, design and construction is showing positive results in terms of awareness and sustainable behaviour;
- **Reduced Car Dependency:** The emphasis on walking, cycling, and public transport has significantly reduced car dependency among residents. The design encourages a lifestyle that prioritizes sustainable transport options;
- **Improved Quality of Life:** By creating a safe, green, and accessible environment, EVA-Lanxmeer has improved the quality of life for its residents. The car-free zones and extensive green spaces make the area more liveable and attractive;
- **Environmental Impact:** The transport initiatives at EVA-Lanxmeer have contributed to lower emissions, reduced traffic congestion, and a smaller ecological footprint for the community; and
- **Balancing Accessibility and Car Restrictions:** While reducing car access within the development is beneficial, it is essential to ensure that residents still have convenient access to transport options for longer journeys or specific needs.

8.4 Relevance to Naas NWQ

The EVA-Lanxmeer development presents a compelling case study similar to the NWQ, as both are large-scale projects built on previously undeveloped greenfield land. This example demonstrates the feasibility of creating car-free or car-reduced developments on a larger scale. Like the NWQ, the EVA-Lanxmeer site is surrounded by major roads and features several waterways.

In the context of the NWQ, this case study underscores the importance of engaging with stakeholders and end-users early on and maintaining their involvement throughout the development process to ensure sustainability. It also showcases the effectiveness of restricting vehicle access to deliveries only in preserving a car-free environment and supporting commercial activities. This approach could potentially benefit the NWQ, particularly in relation to the commercial activities surrounding Millennium Park.

As seen in other examples, establishing a robust network for walking, cycling, and public transportation is essential for creating a sustainable mixed-use environment. This emphasis on alternative modes of transportation not only reduces reliance on cars but also promotes a healthier and more environmentally friendly way of living.

9. Barking Riverside, London

9.1 Overview

Barking Riverside^{13 14} is a significant sustainable development project located in East London. It is one of the largest (180 hectare) brownfield developments in Europe, transforming a former industrial site along the River Thames into a vibrant, sustainable community. The project aims to provide approximately 10,800 new homes, along with a range of amenities and infrastructure to support a growing population. To unlock the full scale of the development, planning permission for the site requires significant investment in transport infrastructure, to improve the accessibility and connectivity of the site to the local area and London.

Key objectives of the project included: -

- To regenerate the brownfield site along the River Thames, transforming it from a disused industrial area into a thriving and sustainable urban community.
- To stimulate economic growth and investment in the area, creating jobs and opportunities for local residents
- To improve transport connectivity by extending the London Overground to Barking Riverside, providing convenient access to central London and other areas.
- To prioritise walking and cycling infrastructure, making it safe and convenient for residents to use active transport modes.



Figure 9.1 Barking Riverside, London

Source: <https://ids-uk.com/projects/infrastructure/barking-riverside/>

9.2 Integrated Transport Systems

The development at Barking Riverside features a new London Overground station, which enhances connectivity to central London and promotes the use of public transportation. Comprehensive bus services are also integrated into the development to ensure accessibility and reduce reliance on private cars.

A mixed-use approach has been applied to the development, incorporating residential, retail, commercial, and office spaces to create a self-sufficient community. Schools, healthcare centres, and community spaces have also been included to meet the needs of residents.

¹³ <https://content.tfl.gov.uk/fpc-20150730-part-1-item11-barking-riverside.pdf>

¹⁴ <https://greenblue.com/gb/case-studies/barking-riverside/>

Dedicated cycling paths have been integrated throughout the development to encourage cycling as a primary mode of transport. Wide, well-lit pedestrian pathways have been designed to make walking safe and convenient.

The approach to car parking at Barking Riverside is part of a broader strategy to promote sustainable living and reduce car dependency. The development maintains a relatively low car parking ratio (around 0.5 to 0.7 spaces per dwelling) compared to traditional developments, with a focus on minimising the number of spaces per household. Certain areas within the development are designed to be car-free or have limited car access to prioritize pedestrian and cyclist movement.

In addition to car parking, extensive secure bicycle parking facilities are provided to encourage cycling as a sustainable transportation option.

9.3 Lessons Learnt

- **Modal Shift:** The development has significantly increased the use of public and active transport modes due to the high-quality transport infrastructure;
- **Transport Infrastructure Timing:** Ensuring transport infrastructure is developed in tandem with housing to meet residents' needs, or other land use requirements, from the outset is crucial i.e. the extension of the London Overground to Barking Riverside was a pivotal aspect of the development, providing essential connectivity to central London and other areas;
- **Community Engagement:** Continuous engagement with the community to promote the benefits of sustainable transport and provide information about available options has been key. This helps residents make informed choices and fosters a culture of sustainability;
- **Mixed-Use Development Enhances Transport Sustainability:** By integrating residential, commercial, educational, and recreational spaces within close proximity, Barking Riverside ensures that residents can access most of their daily needs locally. This reduces the reliance on cars and promotes walking, cycling, and the use of public transport;
- **Car Parking Management:** Barking Riverside has a relatively low car parking ratio, which discourages excessive car ownership. The development also includes car-sharing schemes and promotes the use of electric vehicles, further reducing the carbon footprint;
- **Flexibility:** The development has incorporated future-proofing measures such as electric vehicle charging points and the potential for further enhancements to public transport services. This ensures that the transport infrastructure can adapt to future changes and continue to meet residents' needs.

9.4 Relevance to Naas NWQ

Barking Riverside serves as a prime example of a large-scale development that has successfully integrated sustainable principles into its planning. Much like the NWQ, this site has the capacity to generate a significant number of vehicle trips. However, this potential impact has been mitigated by ensuring that any proposed land use has a viable sustainable alternative in close proximity. This approach demonstrates how the implementation of sustainable infrastructure prior to land development can unlock its full potential for higher densities.

In the case of the NWQ, prioritising connections to the Sallins station and enhancing public transport corridors should drive the development of the masterplan. Additionally, a strict limitation on car parking spaces and a well-coordinated network for walking and cycling have proven to be crucial in delivering a sustainable development and reducing reliance on private vehicles.

10. Cherrywood, Dublin, Ireland

10.1 Overview

Cherrywood^{15 16} is a major ongoing sustainable urban development project located in the southern suburbs of Dublin, Ireland. The project, covering a 360 hectare area, aims to create a vibrant, mixed-use community that integrates residential, commercial, and recreational spaces with sustainable design principles and efficient transport infrastructure.

The development goals include: -

- To create an environmentally friendly urban area with low carbon emissions and high energy efficiency;
- To provide excellent public transport links and reduce reliance on private cars;
- To offer high-quality living standards with ample green spaces and community facilities; and
- To foster economic opportunities through the development of commercial and business hubs.

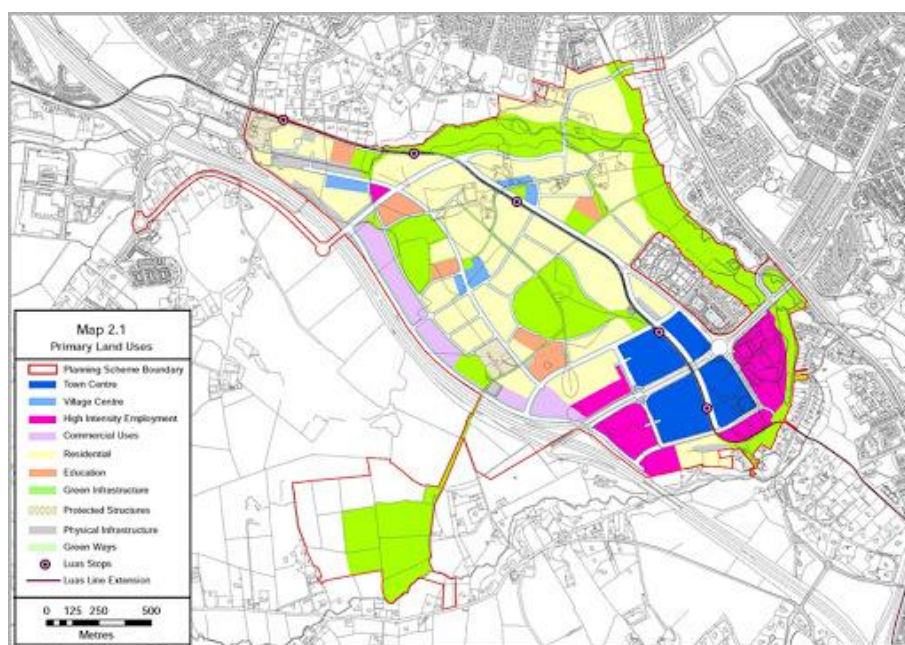


Figure 10.1 Cherrywood, Dublin

Source: *Cherrywood Planning Scheme*

10.2 Integrated Transport Systems

The land use strategy for Cherrywood aims to create a dynamic mixed-use quarter, incorporating a blend of employment, residential, retail, commercial, and community spaces. This strategy is centred around the area's primary function as a commercial hub, catering to a significant daytime working population. Careful consideration has been given to the placement of different land uses, ensuring a clear separation between residential and commercial areas to provide peaceful living environments.

A key focus of the development has been the implementation of a light rail system, with four stations connecting to the Luas Green Line. This provides efficient and reliable transportation links to Dublin city centre and other important destinations. Additionally, the area benefits from a well-developed bus network, further enhancing public transport accessibility.

Extensive cycling and pedestrian pathways have been integrated throughout the development, linking the retail-focused town centre, three smaller village centres, offices, and schools. This promotes active transportation and

¹⁵ <http://www.cherrywood.ie/development-land/>

¹⁶ <https://www.arup.com/projects/cherrywood-infrastructure-and-town-centre-development>

reduces reliance on cars. Car-sharing programs and electric vehicle charging stations are available to support sustainable transport options, with limited car parking provided for all land uses.

Grand Parade Road serves as the main thoroughfare of the town centre, accommodating all modes of transport. Side streets feature a combination of walking and cycling infrastructure, enhancing the overall streetscape.

10.3 Lessons Learnt

- **Effective Use of Light Rail:** The integration of the Luas Green Line has been critical in providing reliable and efficient public transport. Ensuring that new developments are well-connected by high-capacity public transit can significantly reduce car dependency;
- **Strategic Planning:** Aligning residential and commercial zones with existing and planned public transport routes enhances accessibility and encourages public transit use;
- **Integrated Transport Hubs:** Creating transport hubs that connect different modes of transport (e.g., light rail, buses, cycling) provides seamless transitions and improves overall system efficiency;
- **Comprehensive Cycling and Walking Infrastructure:** Building extensive and safe cycling paths and pedestrian walkways encourages residents to choose active transport modes. Connectivity between residential areas, commercial hubs, and public spaces is crucial; and
- **Prioritising Non-Motorised Transport:** Designing car-free zones and prioritising pedestrian and cyclist movement over cars can create a more sustainable and liveable environment.

10.4 Relevance to Naas NWQ

The Cherrywood example illustrates the importance of carefully planning land use allocations in order to determine the most suitable transportation methods available. This approach can be applied to the NWQ, where the distribution of residential, commercial, and mixed-use areas should be considered in relation to the M7 and Millennium Park road. While commercial land uses should maintain strategic connections to key corridors, they do not necessarily need to extend throughout the entire development.

Although Cherrywood benefits from light rail connections, similar principles can be implemented in the NWQ by establishing high-quality links to the Sallins train station and creating quality bus corridors to Naas and the surrounding area.

11. Adamstown, Dublin, Ireland

11.1 Overview

Adamstown^{17 18}, located in the southwestern suburbs of Dublin and representing an area of approximately 223 hectares, is a planned new town that emphasizes sustainable development principles, particularly in transportation. Initiated in the early 2000s, Adamstown is designed to accommodate a growing population while reducing environmental impact and promoting high-quality urban living.

The aims of the development included: -

- Addressing Urban Sprawl by creating a well-planned, high-density urban area that efficiently utilizes land and resources;
- To develop an environmentally friendly urban area with a focus on sustainability in all aspects of planning, construction, and living;
- To provide comprehensive and efficient public transport options, reducing reliance on private cars and promoting sustainable mobility; and
- To ensure strong connectivity to Dublin city centre and other key areas through well-integrated rail and bus services.



Figure 11.1 Adamstown, Dublin

Source: SDCC, 2014

11.2 Integrated Transport Systems

Adamstown railway station is a key focal point for the development, providing a short 14 minute commute to Dublin, equally the light rail Luas provides connection with other inner city areas. The station acts as a comprehensive interchange providing a multitude of covered cycle parking, connections to bus routes and a park

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<https://ore.exeter.ac.uk/repository/bitstream/handle/10036/4252/Appraising%20infrastructure%20for%20new%20towns%20in%20Ireland.pdf;jsessionid=E00AE830DF5C57E9CD300985B147AF2D?sequence=6>

¹⁸ https://www.academia.edu/22614958/A_Case_Study_of_Adamstown_South_Dublin_County_Council_Ireland

and ride facility. The implementation of the DART expansion programme will provide DART+ services for the developing Adamstown area.

Two Quality Bus Corridors are provided in Adamstown, one north–south and one east–west (151 and 25X bus routes) that connect through to Dublin’s city centre.

An Adamstown cycling strategy was developed, which set out a hierarchy of links and recommended cycle facilities and broadly introduced on-road cycle tracks and segregated routes through the associated parkland areas. The strategy also includes a higher tier of cycle parking facilities both for residential and commercial land uses.

The development is based on 5 and 10 min walking schemes to the district centre and public transport systems, to reinforce the permeability for walking and reduce the need for short distance private car trips.

Whilst every effort has been made to avoid domination of cars within the Adamstown development, provision has been made to accommodate them within the development albeit with a more constrained parking ratio. An approximate 900 underground parking spaces have been allocated within the higher density developments of Adamstown Central.

11.3 Lessons Learnt

Rail Services: Adamstown benefits from a dedicated train station on the Dublin-Kildare railway line. The frequent and reliable train service connects residents to Dublin city centre and other key destinations, reducing the need for car travel;

Bus Network: The area is served by multiple bus routes that link Adamstown to surrounding neighbourhoods and the wider Dublin area. Bus services are coordinated to provide seamless connections with train schedules;

Cycle Lanes: Extensive cycling paths and lanes are integrated throughout the development, providing safe and convenient routes for cyclists. These paths connect residential areas with schools, shopping centres, parks, and public transport hubs;

Compact and Dense Development: Adamstown is designed with higher density and mixed land use to create a compact urban environment. This design reduces the distance between destinations, making walking, cycling, and public transport more viable and attractive; and

Parking Provision: According to a survey of Adamstown’s residents in July 2008, the majority of respondents (57%) used a car as the primary mode of transportation, with 26% uses buses, 17% using trains, 8% walking/ cycling and only 4% did not own a car. Whilst sustainable modes are available, the ability to own and park a private car, allows for its continued preference.

11.4 Relevance to Naas NWQ

The Adamstown development serves as a valuable case study, shedding light on long-term trends in sustainable transport-focused developments. Similar to the NWQ, there was a risk of Adamstown generating an excessive number of private car trips, which could have had a detrimental impact on both Adamstown and the broader road network in the Greater Dublin Area. However, this potential issue has been effectively mitigated through the implementation of heavy and light rail links, as well as a comprehensive quality bus network.

Despite these efforts, the use of private cars remains prevalent in Adamstown compared to other examples. This is likely due to the higher provision and more lenient approach to car parking. Therefore, in the context of the NWQ, the approach to parking provision levels and enforcement will be crucial in reducing dependency on private cars.

12. Key Themes and Recommendations

12.1 Key Themes

Following the review of the ten exemplar case studies, several key themes have been identified that should be applied to the NWQ in order to achieve a sustainable development connected by a walkable and cyclable place, compact and consolidated with an aspiration to achieve carbon zero.

12.1.1 Sustainable Objectives

Within each of the review examples, their development was based upon a clear set of sustainable objectives, with which all aspects of design from inception through to implantation were assessed against. Key objectives in relation to transport that have produced successful developments have related to: -

- Creating low-car, sustainable residential community;
- Enhancing connectivity and public transportation; and
- Integrating mixed-use development to enhance liveability and economic vitality.

12.1.2 Provision of a Public Transport Network

In all instances, the establishment of a cohesive and interconnected public transportation system has played a crucial role in promoting car-free or reduced-car developments. By providing access to bus and rail links that connect to larger interurban services, a significant modal share has been achieved for this mode of transportation. A key factor in this success has been the placement of bus stops or rail halts within a 5-minute walking distance from any point of interest within the development. It should be noted that the infrastructure should be in place before the residential/ commercial development is occupied.

Moreover, examples where the public transportation network has driven the planning and execution of the development have proven to be the most effective. By allowing the scale of residential or commercial land use to be determined by the accessibility of public transport connections, these developments have seen the greatest success.

The Hammarby Sjöstad and Vauban examples have shown the effectiveness of providing a central spine corridor that is limited to public transport and active travel.

12.1.3 Provision of Car Parking

The size and placement of parking facilities, whether for private residences or public use, have been proven to significantly impact the development of car-free or reduced-car communities. Examples such as Vauban and Bo01, which did not include parking in their central areas and instead limited it to the outskirts or specific locations, achieved low levels of car ownership and high usage of public transportation. Conversely, when parking is available on residential streets or in commercial areas, even with limited space relative to land use, private cars continue to be the preferred mode of transportation.

12.1.4 Policy and Engagement

In instances where zero or minimal car parking is available, specific policies have been implemented in the area. Prospective residents are required to agree to not own a private car, and commercial entities are prohibited from providing any parking facilities. If a resident does choose to own a private car, a financial fee is imposed to support the maintenance of designated parking areas. Additionally, metered fees are applied to any public or commercial parking spaces.

Numerous successful examples have demonstrated the effectiveness of this approach. However, the key to this success lies in early engagement with stakeholders and end-users to establish the vision for the development. This engagement continues throughout the development process, ensuring that residents and end-users embrace and uphold sustainable practices.

12.1.5 Maintaining a Separation between Public Space and Vehicles

Many urban development projects have successfully implemented a 'donut' approach, in which the inner areas are designated as car-free, pedestrianized public spaces, while the outer periphery remains accessible to vehicles. This strategy has proven to enhance the utilisation of public spaces, creating an appealing and liveable environment without impeding commercial or economic activities. Additionally, it promotes cleaner air quality and contributes to a healthier population, especially in areas with ample green spaces.

The EVA-Lanxmeer project serves as a prime example of how this approach can accommodate servicing requirements without hindering access for delivery and service vehicles. By carefully planning and clearly marking routes, these vehicles can still navigate the area effectively.

12.1.6 Walking and Cycling Connections

While the examples align with cities and areas that have a well-established culture of walking and cycling, supported by a comprehensive network for pedestrians and cyclists, the provision of such infrastructure is crucial in reducing reliance on private vehicles. Incorporating greenway connections to other urban areas can be advantageous, but creating a neighbourhood that is easily walkable and cycle-friendly can significantly decrease the necessity for short car trips, such as school commutes or trips to local shops. Implementing a "10-minute town" or "15-minute neighbourhood" approach in these examples has resulted in increased levels of walking and cycling, as well as a decrease in private car ownership.

12.1.7 Car Pools and Car Share

One crucial aspect of the examples provided is the implementation of a carpool or car-sharing program. These initiatives acknowledge that, although a robust public transportation system and walking/cycling infrastructure can reduce the reliance on private vehicles, there are situations where using a car or van is convenient or necessary. Therefore, offering residents the option to utilise a shared vehicle instils a sense of convenience in not owning a personal vehicle, making it easier for them to comply with any policies or regulations aimed at limiting car ownership.

12.2 Recommendations

Based on the case study review and the common themes identified, in terms of the NWQ it is recommended that:-

- A clear set of sustainable objectives should be established which will be key and will inform to land use approach and proposed connections and therefore determine the Sustainable Mobility Strategy;
- Proposed residential areas should be low-car and located towards the south of the NWQ, whereas commercial areas should be located on the periphery i.e. Millennium Park/ New Caragh Road, therefore limiting the permeability of vehicles;
- In higher density areas, car-parking should be located in specific designated areas;
- The Western Spine Bus route/active travel corridor will be critical to the delivery of a car free/ reduced sustainable development. Ideally this route should be in place before the residential/ commercial development opens to allow people to move to this area with viable non-car alternatives in place. Connections to the wider Naas area will be crucial in restriction private car ownership and access;
- It is recommended that mobility hubs be established. These hubs would be connected to bus services and carpooling facilities, providing convenient and sustainable transportation solutions for the area. By offering various modes of transport for the "first mile" or "last mile" of a journey, these facilities could effectively manage transportation demand in the NWQ;
- Establishing a direct connection to the Sallins rail station is essential for facilitating access to the Greater Dublin Area and facilitating commuting to and from the NWQ. This connection could be complemented by the implementation of park and ride facilities that link to the NWQ, serving both the Sallins station and any external trips originating from the M7.

