Kilkenny Local Transport Plan

Baseline Conditions and Policy Context Report

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Kilkenny County Council

Kilkenny Local Transport Plan

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Contents

1. Introduction

1.1 Overview

Kilkenny County Council (KCC) has commissioned Jacobs Engineering Ireland Ltd. (Jacobs) to develop a Local Transport Plan for the City of Kilkenny and its Environs. Kilkenny City is a designated 'Key Town' in the recently adopted *Regional Spatial and Economic Strategy* (RSES) *for the Southern Region* and the second largest settlement in the South-East Region.

Kilkenny City's development in the period up to 2040 is based upon ambitious growth targets, investment in sustainable transport, and a regeneration agenda predicated on the redevelopment of accessible town centre sites and the '10-minute city' concept. The Kilkenny Local Transport Plan (KLTP) must therefore articulate these ambitions in a robust and evidence-based fashion to provide Kilkenny with a framework for prioritising and obtaining sustainable transport investment.

The KLTP is envisaged to be a short to medium term plan to cover the period 2020-2026 and beyond to support the development of a comprehensive, sustainable transport network and to inform the preparation of the forthcoming *Kilkenny City and County Development Plan 2020-2026*.

Jacobs will undertake the KLTP in line with the *Area Based Transport Assessment (ABTA) Guidance Note* produced by Transport Infrastructure Ireland (TII) and the National Transport Authority (NTA). The overarching aim of the ABTA process is to place the integration of land use and transport planning at the centre of the Plan preparation process. The methodology for the development of the ABTA is outlined as follows:

- Baseline Assessment;
- Establish Context for ABTA;
- Options Assessment;
- Refinement and Sense-Check the Proposals; and
- Finalisation of the Plan.

1.2 Purpose of this Report

The purpose of this Report is to establish the baseline conditions for Kilkenny City and its Environs. A key outcome of this initial stage is to develop a clear understanding of the Study Area regarding existing spatial characteristics, transport network, travel patterns, relevant land-use plans and transport policies at all levels, and environmental conditions. Having a fully developed appreciation of these is fundamental to robustly underpinning the development of the KLTP ensuring that the analysis delivers an optimal solution. This Report will inform the subsequent stages of the ABTA process.

1.3 Report Structure

The Report is structured as follows:

- **Section 2:** Review of all relevant national, regional and local plans, policy and guidance;
- **Section 3:** Outline of Study Area, existing land-use patterns and demographic data;
- **Section 4:** Review of the current transport network and supply for all modes;
- **Section 5:** Summary of existing travel demand patterns and characteristics;
- **Section 6:** Summarises and concludes the Report with a SWOT analysis.

2. Policy Review

2.1 Overview

This section of the Report provides a comprehensive overview of policy, guidance and studies relevant to the development of Kilkenny Local Transport Plan.

National Level

- National Planning Framework 2040
- National Development Plan 2018-2027
- Ireland Planning Policy Statement 2015
- Smarter Travel: Towards a Sustainable Transport Future 2009-2020
- Rebuilding Ireland: Action Plan for Housing and Homelessness
- Climate Action Plan 2019: To Tackle Climate Breakdown
- National Cycle Policy Framework
- Planning Policy Statement 2015
- National Policy Framework for Alternative Fuels Infrastructure for Transport 2017-2030
- Building on Recovery: Infrastructure and Capital Investment 2016–2020
- Planning Land Use and Transport Outlook 2040 (PLUTO)
- Area Based Transport Assessment Guidance Note
- Urban Design Manual: A Best Practise Guide
- Design Manual for Urban Roads and Streets (updated 2019)
- Permeability: A Best Practice Guide
- National Cycle Manual
- Spatial Planning and National Roads: Guidelines for Planning Authorities
- Sustainable Urban Housing: Design Standards for New Apartments
- Traffic Management Guidelines
- Sustainable Residential Development in Urban Areas
- Achieving Effective Workplace Travel Plans: Guidance for Local Authorities
- Sustainable Development Goals
- Healthy Ireland Framework 2019-2025
- Healthy Ireland's National Physical Activity Plan

Regional Level

Regional Spatial and Economic Strategy for the Southern Region (RSES)

Local Level

- Kilkenny City and Environs Development Plan 2014-2020
- Kilkenny County Development Plan 2014-2020
- Kilkenny County Development Plan Pre-Draft Issues Paper 2020-2026
- Western Environs Local Area Plan 2004-2010
- Loughmacask Local Area Plan 2008-2014
- Draft Kilkenny City Mobility Management Plan
- Parking Options Study 2017
- VELOCITY – Imagining a Public Bike Scheme in Kilkenny
- Kilkenny City and Environs Heavy Commercial Vehicle Management Plan
- Kilkenny Noise Action Plan 2014-2018
- Kilkenny Orientation Strategy
- Climate Change Adaptation Strategy 2019-2024
- Kilkenny Age-Friendly Strategy 2017-2022
- Aalborg Charter

2.2 National Level Policy and Guidance

2.2.1 United Nations: Sustainable Development Goals

The 2030 Agenda for Sustainable Development, adopted by all United Nations Member States including Ireland in 2015, provides a shared blueprint for peace and prosperity for people and the planet, now and into the future. At its heart are the 17 Sustainable Development Goals (SDGs), which are an urgent call for action by all countries. The KLTP will contribute towards efforts to achieve the following SDGs:

- SGD 3 Good Health and Well-Being: Ensure healthy lives and promote well-being for all at all ages;
- SDG 8 Decent Work and Economic Growth: Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all;
- SDG 9 Industry, Innovation and Infrastructure: Build resilient infrastructure, promote inclusive and sustainable industrialisation and foster innovation;
- SDG 11 Sustainable Cities and Communities: Make cities and human settlements inclusive, safe, resilient and sustainable;
- SDG 13 Climate Action: Take urgent action to combat climate change and its impacts; and
- SDG 15 Life on Land: Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and biodiversity loss.

There is significant alignment between the UN SDGs and the *National Planning Framework*'s National Strategic Outcomes (see Section 2.2.2).

2.2.2 Project Ireland: National Planning Framework 2040

The *National Planning Framework 2040* (NPF) is the Government's high-level strategic framework that sets out the long-term plan for shaping the future growth and development of Ireland up to 2040. The NPF is underpinned by a series of principles, National Strategic Outcomes, including: Compact Growth; Enhanced Regional Accessibility; Sustainable Mobility; Transition to a Low Carbon and Climate Resilient Society; and Enhanced Amenity and Heritage. These principles are translated by supporting policies and actions at sectoral, regional and local level.

Under the Framework three regional assemblies have been identified, Eastern and Midland, Northern and Western and Southern. Kilkenny is located within the South-East Region of the Southern Regional Assembly. The NPF has identified that the most significant challenge for the Southern Region in the period up to 2040, will be to position its cities to be more significantly scaled, compact and attractive, acting as metropolitan drivers

for the region, and as effective complements to the economic strength of the Greater Dublin Area. The NPF has set a target that at least 40% of all new housing is to be delivered within the existing built-up areas of cities, towns and villages on infill and/or brownfield sites

2.2.3 Project Ireland: National Development Plan 2018-2027

The *National Development Plan 2018-2027* (NDP) is a companion document to the NPF and is set to drive Ireland's long term economic, environmental and social progress. The NDP is fully integrated with the approach to Ireland's spatial planning in the NPF and sets out a framework for public capital investment of almost €116 million, ensuring a coherent and unified plan for the country.

Under NSO 2, Enhanced Regional Accessibility, the NDP states that new town bus services in urban centres such as Carlow, Kilkenny and Mullingar, subject to the availability of operational funding support, will be provided to enable their development growth and provide a public transport option for residents and visitors. In December 2019, a bus service funded by the NTA commenced operation in Kilkenny, providing two cross-city routes; KK1 and KK2. These local bus services are discussed in greater detail later in the report.

2.2.4 Planning Policy Statement 2015

Planning legislation in Ireland seeks to ensure, in the interests of the common good, the proper planning and sustainable development of urban and rural areas. The *Planning Policy Statement 2015*, published by the Department for the Environment, Community and Local Government, sets out 10 key principles which should be used as a strategic guide to "ensure the right development takes place in the right locations and at the right time in providing the social, economic and physical infrastructure necessary to meet the needs of our people in a way that protects the many qualities of our natural and built environment".

These 10 principles are as follows:

- Planning must be plan-led and evidence-based;
- Planning must proactively drive and support sustainable development;
- Planning is about creating communities and further developing existing communities in a sustainable manner;
- Planning must support the transition to a low carbon future and adapt to a changing climate;
- Planning must ensure that development facilitates and encourages greater use of public transport as well as making walking and cycling more attractive for people;
- Planning will encourage the most efficient and effective use of previously developed (brownfield) land;
- Planning will enhance the sense of place;
- Planning will conserve and enhance the rich qualities of natural and cultural heritage;
- Planning will support the protection and enhancement of environmental quality; and
- Planning will be conducted in a manner that affords a high level of confidence.

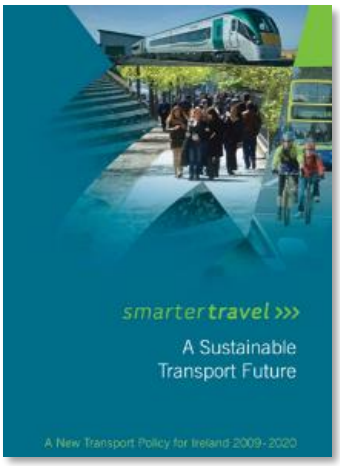
2.2.5 Smarter Travel: A Sustainable Transport Future 2009-2020

Smarter Travel: A Sustainable Transport Future 2009–2020 recognises the vital importance of continued investment in transport to ensure an efficient economy and continued social development. It also acknowledges, however, that continued growth and dependency on the private car is not sustainable due to its contribution to climate change, congestion, poor air quality and increasingly sedentary lifestyles.

The Plan's main objective is to promote a significant modal shift in favour of public transport, walking and cycling up to 2020. It sets out the necessary steps and measures necessary to achieve this. *Smarter Travel* outlines a key target to reduce work-related commuting by car from a current modal share of 65% to 45%, with commuting by alternative sustainable modes rising to 55% by 2020. Managing development so that it is well-

served by and orientated around sustainable transport modes (Public Transport Orientated Development (PTOD) for example) is one such measure set out by *Smarter Travel* to achieve this shift.

Key goals of *Smarter Travel* include:



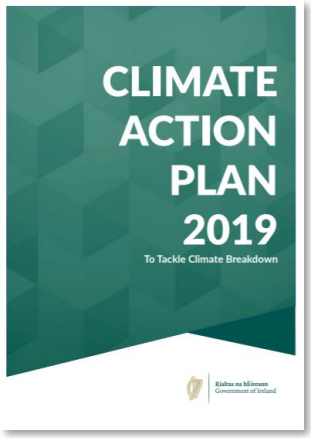
- Improve quality of life and accessibility to transport for all with an emphasis on those with reduced mobility and/or who may experience social isolation;
- Improve economic competitiveness by maximising the efficiency of the transport system and alleviating congestion and infrastructural bottlenecks;
- Minimise the negative impacts of transport on the environment by reducing carbon emissions; and
- Reduce overall travel demand and commuting distances travelled by the private car.

2.2.6 Climate Action Plan: To Tackle Climate Breakdown

The *Climate Action Plan: To Tackle Climate Breakdown* was published by the Government in June 2019. The Plan identifies how Ireland will achieve its 2030 targets for reduction in carbon emissions and a pathway towards achieving a net zero emissions by 2050.

Tackling emissions from the Transport sector (accounting for almost 20% of Ireland's greenhouse gases in 2017) is of significant relevance to the KLTP. The Government's approach to reducing emissions from the Transport sector is to adopt policies to influence both the transport intensity of growth and the carbon intensity of travel.

To make growth less transport intensive, key objectives of the Plan relevant to the KLTP include:



- The successful execution of the NPF designed to promote compact, connected and sustainable living;
- Expansion of walking, cycling and public transport networks to promote modal shift;
- Giving Local Authorities more discretion in designating low emission zones;
- Better use of market mechanisms to support modal shift; and
- The successful roll-out of the National Broadband Plan, which can promote remote working and wider activities which reduce unnecessary journeys.

The electrification of transport (both public and private) features prominently in the Plan with a range of initiatives to boost the roll-out of low emission buses, Electric Vehicle Charge Points (EVCP) and to decarbonise heavy and light goods vehicles. As part of this, it is envisaged to have zero emission postal deliveries in Kilkenny by 2020, as well as in Cork, Galway, Limerick and Waterford.

2.2.7 National Cycle Policy Framework 2009-2020

Ireland's first *National Cycle Policy Framework 2009-2020's* vision is that all cities, towns, villages and rural areas will be bicycle friendly. The overarching mission of the Framework is to create a strong national cycling culture to align with *Smarter Travel's* objective that 10% of all trips will be by bike by 2020.

The Framework sets out a comprehensive package of interventions – both 'hard' (planning and infrastructure) and 'soft' (communication and education) – to make cycling a convenient and safe option for everyone. The approach recommended is a hierarchy of measures, including:

- Reducing volumes of through-traffic, especially HGVs, in city and town centres and especially in the vicinity of schools and colleges;
- Calming traffic/ enforcing low traffic speeds in urban areas; and
- Making junctions safe for cyclists and removing multi-lane one-way street systems.

Some objectives relevant to the KLTP include:

- Support the planning, development and design of towns and cities to support cyclists and pedestrians;
- Provide cycling-friendly routes to all schools, adequate cycle parking facilities within schools, and cycling training to all students;
- Provide secure parking for bikes;
- Ensure proper integration between cycling and public transport;
- Evaluate and monitor the implementation of measures;
- Ensure that all cycling networks - both urban and rural - are signposted to an agreed standard; and
- Ensure that the urban road infrastructure (with the exception of motorways) and traffic management measures are designed/ retrofitted in line with best practice cycle design standards.

2.2.8 Building on Recovery: Infrastructure and Capital Investment 2016–2020

Building on Recovery: Infrastructure and Capital Investment 2016-2020, published by the Department of Public Expenditure and Reform in 2016, presents the Government's new €42 billion framework for infrastructure investment in Ireland over the period 2016 to 2021. The Exchequer transport capital allocation is largely framed by the recommendations and priorities set out in the *Strategic Investment Framework for Land Transport* (superseded by the *Planning Land Use and Transport Outlook 2040* in 2018). These priorities are threefold:

- Maintain and renew the strategically important elements of the existing land transport system;
- Address urban congestion; and
- Improve the efficiency and safety of existing transport networks.

Under the Plan, €100 million is being committed to smarter travel and carbon reduction measures, including Greenways, to ensure that the transport sector makes a major contribution to climate change mitigation targets.

2.3 National Level Guidance

2.3.1 Area Based Transport Assessment (ABTA) Guidance Note

The *Area Based Transport Assessment Guidance Note* was produced by Transport Infrastructure Ireland (TII) and the National Transport Authority (NTA) in 2018. The Guidance Note outlines an overview of the key stages of the process to develop an ABTA. An ABTA is intended to establish and give expression at the local level, to integrated land use and transport planning policies and objectives, at the national and regional levels. It sets out the principle parts of the ABTA process as presented in Figure 2-2.

The KLTP will be developed in line with this Guidance Note.

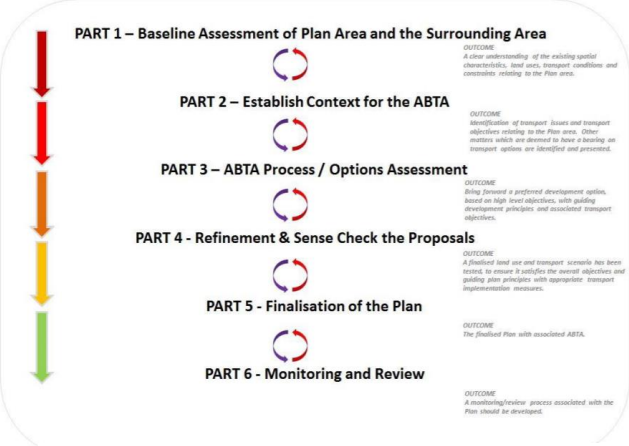


Figure 2-2 Stages of ABTA Process. Source: ABTA Guidance Note, TII and NTA, 2018.

2.3.2 Design Manual for Urban Roads and Streets

The *Design Manual for Urban Roads and Streets* (DMURS), updated by the Department of Transport, Tourism and Sport in 2019, promotes a holistic approach to the design of roads and streets within urban areas focused on balancing the needs of all users. It aims to put well designed streets at the heart of sustainable communities to promote access by walking, cycling and public transport, influenced by the type of place in which the street is located.

The principles, approaches and standards set out in the Manual apply to the design of all urban roads and streets (with a speed limit of 60 km/h or less), except motorways and, in exceptional circumstances, certain urban roads and streets with the written consent of sanctioning authorities.

The Manual is underpinned by a holistic design-led approach, predicated on a collaborative and consultative design process. There is specific recognition of the importance to create secure and connected places that work for all, characterised by creating new and existing streets as attractive places with high priority afforded to pedestrians and cyclists while balancing the need for appropriate vehicular access and movement.

DMURS was updated in 2019 to take into consideration changes to government agencies, initiatives such as BusConnects and four new Advice Notes relating to: Transition Zones and Gateways; Geometric Standards; Materials and Specifications; and Quality Audits.

To achieve a more place-based and integrated approach to road and street design, the following four core principles are promoted within the Manual:

- **Connected Networks:** Support the creation of integrated street networks which promote higher levels of permeability and legibility for all users, and with emphasis on more sustainable forms of transport;
- **Multi-Functional Streets:** Promote multi-functional, place-based streets that balance the needs of all users within a self-regulating environment;
- **Pedestrian Focus:** Quality of the street is measured by the quality of the environment user hierarchy as shown in Figure 2-3 with pedestrians considered first; and
- **Multi-Disciplinary Approach:** Greater communication and co-operation between design professionals through the promotion of a plan-led, multidisciplinary approach to design.

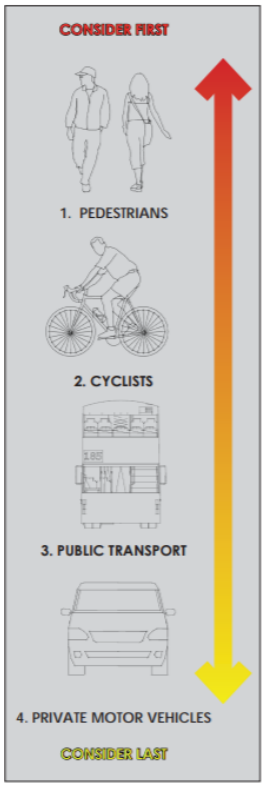


Figure 2-3 User hierarchy. Source: DMURS, 2019.

2.3.3 Spatial Planning and National Roads Guidelines for Planning Authorities

The *Spatial Planning and National Roads Guidelines for Planning Authorities*, published by the Department of Environment, Community and Local Government in 2012, sets out planning policy considerations relating to development affecting National roads. National roads play an integral role within Ireland's overall transport system and in the country's economic, physical and social development. The primary purpose of the National road network is to provide strategic connectivity between the main centres of population and employment, including key international gateways such as airports and ports, and to provide intra-regional connectivity.

In recent years, however, an increase in population and car ownership rates, changes in lifestyle and improvements in the quality of the road network have all contributed to the unsustainable sprawl of urban areas and car dependent forms of development. This development pattern can make it difficult to provide public transport, walking and cycling networks, have a detrimental impact on the viability of urban centres, and undermine the strategic function of the National road network.

Government policy, therefore, no longer proposes to cater for this type of unlimited road traffic growth and development. These Guidelines state that "any local transport function of National road bypasses and relief roads in respect of the urban areas they pass through is, and must continue to be, secondary to the role of these roads in catering for strategic traffic" (p.3). Strategic traffic is defined in relation to National roads as comprising primarily "major interurban and inter-regional traffic, whether HGV, car, public transport bus services or other public service vehicles, which contributes to socio-economic development, the transportation of goods and products, especially traffic to/from the main ports and airports, both freight and passenger related" (p.3). These Guidelines also outline that new accesses to National roads and associated junctions must be avoided to safeguard and maintain its operating efficiency and carrying capacity.

2.3.4 National Cycle Manual

The *National Cycle Manual*, developed by the NTA in 2012, presents the current best practice and advice in providing cycling facilities in urban and suburban environments. It promotes safe environments for cyclists, and all other road users, by integrating the design requirements of cyclists into the design for urban areas more generally. It underlines the importance of integrating high-quality cycle infrastructure in the planning and designing of new developments at all levels of the network including the strategic level, the route planning level and at design level. It provides technical information on the design of junctions, roundabouts, crossings, bus stops and so on to ensure the optimum balance between the various modes and road functions is reached.

2.3.5 Permeability: A Best Practice Guide

The *Permeability: A Best Practice Guide* produced by the NTA in 2015, sets out guidance on how best to facilitate demand for walking and cycling in existing built-up areas. The concept of permeability describes the extent to which an urban area permits ease of movement of people by walking or cycling when accessing their homes, shops, schools, local services, places of work and public transport stops and stations. Characteristics of a permeable environ are as follows:

- Interconnected pedestrian and cycle street network;
- Absence of high walls and fences segregating housing areas and local/district centres;
- Absence of cul-de-sacs for pedestrians and cyclists; and
- Secure, well-lit, overlooked pedestrian and cycle links between housing areas and between housing and local/district centres.

2.3.6 Sustainable Urban Housing: Design Standards for New Apartments

Apartments are likely to form a significant portion of the housing form in Kilkenny City Centre, either as part of their Living City Initiative or infill development. This 2018 document represents an update on the earlier design standards guidelines issued in 2015 by the Department of Housing, Planning and Local Government.

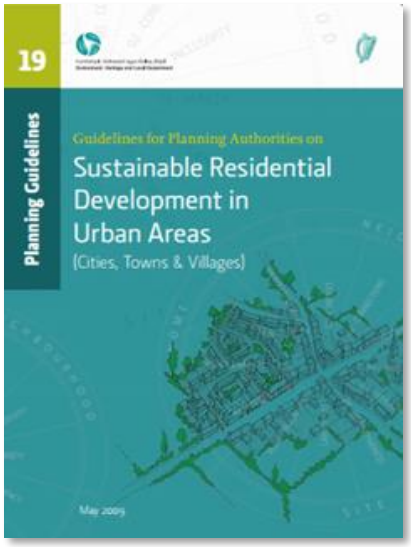
The updated standards contain a number of transport-related issues relevant to the development of the KLTP including the following:

- A default policy for car parking provision to be minimised, substantially reduced or wholly eliminated in highly accessible areas such as in or adjoining city cores or at a confluence of public transport systems such as rail and bus stations located in close proximity. Typically, these locations are within 15 minutes walking of city centres or within 10 minutes walking distance of commuter rail or bus stops or within 5 minutes walking distance of high frequency bus services;
- A reduced overall parking standard and application of a maximum car parking standard of for housing schemes with more than 45 dwellings per hectare net in suburban/urban locations served by public transport or close to town centres or employment areas;
- A requirement that cycling is fully integrated into the design and operation of all new schemes; and

- A significant uptake in the quantity and quality of cycle parking provision in relation to the location; quantity; design, and management of bicycle storage areas.

2.3.7 Guidance for Planning Authorities on Sustainable Residential Development in Urban Areas

The *Guidance for Planning Authorities on Sustainable Residential Development in Urban Areas* sets out the key planning principles which should be reflected in development plans and local area plans. It also guides the preparation and assessment of planning applications for residential development in urban areas.



This Guidance promotes residential layouts that:

- Prioritise walking, cycling and public transport, and minimise the need to use cars;
- Ensure legibility and ease of access;
- Promote the efficient use of land and energy, and minimise greenhouse gas emissions; and
- Provide for a mix of land uses to minimise transport demand.

2.3.8 Achieving Effective Workplace Travel Plans: Guidance for Local Authorities

Achieving Effective Workplace Travel Plans Guidance for Local Authorities aims to assist local authorities to fully integrate the principles and practice of Workplace Travel Plans into both the development plan and the development management processes. The *Kilkenny City and Environs Development Plan 2014-2020* already sets out an objective that Workplace Travel Plans are required for trip-intensive development.

A Workplace Travel Plan is an effective instrument used within the planning process to promote and support sustainable travel patterns to work at a site-specific level. It consists of a package of actions and measures to promote more sustainable and cost-effective travel habits among employees, clients and visitors. International experience has shown that a methodical and planned approach to targeting commuting and visitor patterns at an organisational level, can pay major dividends in terms of promoting sustainable travel.

2.3.9 Urban Design Manual: A Best Practice Guide

Urban Design Manual: A Best Practice Guide (Department of Environment, Heritage and Local Government, 2009) provides advice on implementing sustainable residential development in urban areas. The Manual is intended to be read in conjunction with *Guidelines for Planning Authorities on Sustainable Residential Development in Urban Areas*.

The Manual showcases best practice examples that address the practical aspects of creating successful neighbourhoods. It does so under 12 criteria, shown in Figure 2-4 which encapsulate a range of design considerations for different spatial scales.

Figure 2-4 12 criteria to create successful neighbourhoods. Source: Urban Design Manual, 2009.

2.3.10 Traffic Management Guidelines

The *Traffic Management Guidelines* (Department of the Environment and Local Government and Dpt. of Transport, 2003) provide guidance on a variety of issues including traffic planning, traffic calming and management, incorporation of speed restraint measures and the

provision of suitably designed facilities for public transport users and for vulnerable road users such as cyclists and pedestrians, including those with disabilities.

2.3.11 Planning Land Use and Transport – Outlook 2040 (PLUTO)

PLUTO is an update of the existing framework for transport investment that was published in 2015 (*Investing in Our Transport Future – Strategic Investment Framework for Investment in Land Transport*) and was initiated in 2018. Its primary objectives are to ensure a joined-up approach to land use and transport planning and to ensure that there is a framework in place to prioritise parts of Ireland's overall transport network in tandem with investment availability. The NPF's proposals and projections around population and settlement patterns are at the heart of PLUTO.

PLUTO identifies the following Transport 2040 Priorities:

- A land transport network which delivers a high level of service for the population of Ireland;
- Enabling the delivery of the NPF objectives regarding where people live and work;
- Maximising the sector's contribution to Ireland's economic competitiveness; and
- Realising a low-carbon, sustainable transport system.

Other considerations within PLUTO include the sequencing of investment, roles and responsibilities of local, regional and central Governmental and ensuring processes such as the *Common Appraisal Framework* are appropriate to ensure value for money and efficient project delivery.

2.3.12 National Policy Framework for Alternative Fuels Infrastructure for Transport 2017-2030

The *National Policy Framework on Alternative Fuels Infrastructure for Transport* (Department of Transport, Tourism and Sport, 2017) represents the first step in communicating the Government's long-term national vision for decarbonising transport by 2050, the cornerstone of which is the ambition that by 2030 all new cars and vans sold in Ireland will be zero-emissions capable. While a multi-faceted set of measures (energy efficiency, demand management, modal shift, spatial planning, behavioural change and fiscal incentives) will be deployed to help decarbonise transport over this period, this particular Framework focuses exclusively on reducing transport's dependency on oil through the provision of infrastructure and common standards for alternative fuels, such as Electric Vehicle Charging Points (EVCPs) and biofuels.

2.3.13 Healthy Ireland Framework 2019-2025

Healthy Ireland's vision is to create "a Healthy Ireland, where everyone can enjoy physical and mental health and wellbeing to their full potential, where wellbeing is valued and supported at every level of society and is everyone's responsibility". The Framework is based around four key goals to:

- Increase the proportion of people who are healthy at all stages of life;
- Reduce health inequalities;
- Protect the public from threats to health and wellbeing; and
- Create an environment where every individual and sector of society can play their part in achieving a healthy Ireland.

The implementation of *Smarter Travel: Our Sustainable Transport Future* is acknowledged within the Framework as being important to achieving some of the targets and indicators relating to these four goals with the built environment being one of the key determinants of physical activity behaviour.

2.3.14 Healthy Ireland's National Physical Activity Plan

There is strong evidence to support the multiple benefits of physical activity to health and wellbeing. It promotes healthy growth and development in children and young people. It contributes to cognitive function. It is

important for healthy ageing and helps to maintain quality of life and independence when we grow older. It is also a preventative factor for many non-communicable diseases.

On the other hand, physical inactivity is a demonstrated clear risk to health and wellbeing in Ireland. Physical inactivity and sedentary behaviours are associated with numerous chronic diseases. A cross-sectoral working group, co-chaired by the Department of Health and the Department of Transport, Tourism and Sport, was established to develop this *National Physical Activity Plan* to increase population levels of physical activity which would lead to health, economic and social benefits. Increased levels of physical activity can be supported and integrated into daily life by designing the built environment and transport networks in a manner that prioritises walking and cycling.

Relevant Actions of the *National Physical Activity Plan* to the KLTP include:

- Action 32: Develop and promote walking and cycling strategies in each Local Authority area; and
- Action 33: Ensure that the planning, development and design of towns, cities and schools promotes cycling and walking with the aim of delivering a network of cycle routes and footpaths.

2.4 Regional Level

2.4.1 Regional Spatial and Economic Strategy for the Southern Region

The *Regional Spatial and Economic Strategy for the Southern Region* (RSES) was finalised by the Southern Regional Assembly in January 2020. The RSES translates the objectives of the NPF at a regional level and provides a link between the NPF and Kilkenny County Council's Development Plans and Local Area Plans.

Kilkenny City is the fourth largest settlement in the Southern Region and was identified as one of the six Key Towns by the RSES. Key objectives relevant to the KLTP are outlined below.

2.4.1.1 Regional Policy Objective 11

This RPO outlines the key objectives for Key Towns, including:

- Local Transport Plans will be prepared for all the Key Towns;
- Target growth of more than 30% for each Key Town subject to capacity analysis and sustainable criteria. The appropriate level of growth is to be determined by the Core Strategy of Development Plans;
- Seek investment in holistic infrastructure inclusive of utilities, transportation, social and community, digital infrastructure and smart technologies environmental, climate change adaptation and future proofing infrastructure, recreational and cultural that will deliver sustainable growth;
- Support and promote vibrant, culturally rich and revitalised Key Towns with enhanced social inclusion, sustainable neighbourhoods and a high level of environmental quality to ensure an excellent quality of life for all; and
- Support and promote place-making to include public realm and urban renewal initiatives and public private partnership approaches for town centre regeneration.

2.4.1.2 Key Infrastructural Requirements

Transport infrastructure priorities for Kilkenny are as follows:

- Enhanced rail services and improved line speeds;
- Improved accessibility to the Port of Waterford and Rosslare Europort by road and rail to serve as a viable alternative to Dublin Port;
- Investment in smarter travel projects in support of the compact '10-minute city' concept; and
- Investment to support city centre regeneration, including development of the Abbey Quarter.

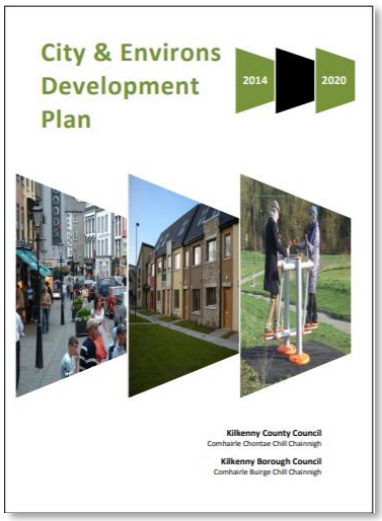
2.4.1.3 Regional Policy Objective 12

This RPO outlines the key objectives for Kilkenny, including:

- Strengthen the role of Kilkenny City as a self-sustaining regional economic driver with significant zone of influence and Key Town on the Dublin-Carlow-Kilkenny-Waterford M9 Road/Rail Axis, links to the Eastern Corridor. The RSES seeks to leverage its strategic location and accessibility to the Port of Waterford, Rosslare Europort and Waterford Airport, and to build upon its inherent strengths including the finance, technology and creative sectors, skills, innovation and enterprise, tourism, and retail services;
- Strengthen 'steady-state' investment in existing rail infrastructure and seek investment for improved infrastructure and services to ensure its continued renewal and maintenance to high level to provide quality levels of safety, service, accessibility and connectivity including improved frequency and journey times;
- Support development of freight rail services and facilities including rail freight links to the ports;
- Support urban regeneration through investment in the Abbey Quarter and other initiatives to improve the public realm and regenerate underused land in Kilkenny City;
- Seek investment in sustainable transport measures through a Local Transport Plan including development of town bus services in support of the Compact '10-minute city' concept;
- Support the delivery of the infrastructural requirements identified for Kilkenny City including the delivery of the northern extension of the ring road from the N77 Castlecomer Road to the R693 Freshford Road as part of the western by-pass for the city from the Castlecomer Road to the Waterford Road;
- Support for the City as a 'Hero site' within the Fáilte Ireland's branding of Ireland's Ancient East. The 'Medieval Mile' package which brings together public realm improvements linking Kilkenny Castle to St Canice's Cathedral and other significant attractions in between, such as the Medieval Mile Museum, the new Butler Gallery, the Smithwick's Experience and Rothe House; and
- Support for the quality of life offer in Kilkenny City which is renowned as evidenced in its population growth which has exceeds the national average over the period 2006-2016.

2.5 Local Level

2.5.1 Kilkenny City and Environs Development Plan 2014-2020



The *Kilkenny City and Environs Development Plan 2014-2020* was adopted by Kilkenny Borough Council and Kilkenny County Council in 2014.

The Plan's strategic aim in relation to transport is "to co-ordinate transport and land use planning, reducing the demand for travel and the reliance on the private car in favour of public transport, cycling and walking".

Key strategic transport objectives set out in the Plan for Kilkenny City and Environs include:

- Promote and strengthen the concept of the ten-minute city;
- Complete the demarcation of the Gateways and Pedestrian Portals as part of the Pedestrian and Cycle Network;
- Investigate more opportunities for pedestrian prioritisation in the City Centre following implementation of the Central Access Scheme;
- Plan for the provision of the Greensbridge Way and the Ossory Bridge connection.
- Facilitate parking provision for tourist coaches and buses within the City Centre;
- Develop and agree an appropriately planned policy response for access to Leggetsrath roundabout on the N10;

- Widen the Castlecomer Road to provide for two lanes southbound and one lane northbound;
- Reserve:
  - the proposed line of the western bypass for the city from the Castlecomer Road to the Callan Road free from development, including for a river crossing;
  - the line of Phase 2 and Phase 3 of proposed Central Access Scheme free from development and to complete Phase 1 of the Central Access Scheme within the plan period;
  - the proposed line of a new road link from the Callan Road to the Waterford Road roundabout free from development;
- Complete a number of Schemes including:
  - R697 Kells Road Improvement Scheme from Upper Patrick St. to the Kells Road Roundabout;
  - N10 Road Improvement Scheme from the Dublin Road Roundabout to the Leggettsrath Roundabout;
  - Bohernatounish Road Traffic Management Scheme;
  - Outrath Road Improvement Scheme;
  - Traffic Management Scheme at Loughboy Shopping Centre;
  - Traffic management and calming schemes for the City and Environs; and
  - Works from the Parade Plaza to Dean Street under the Medieval Mile Project.

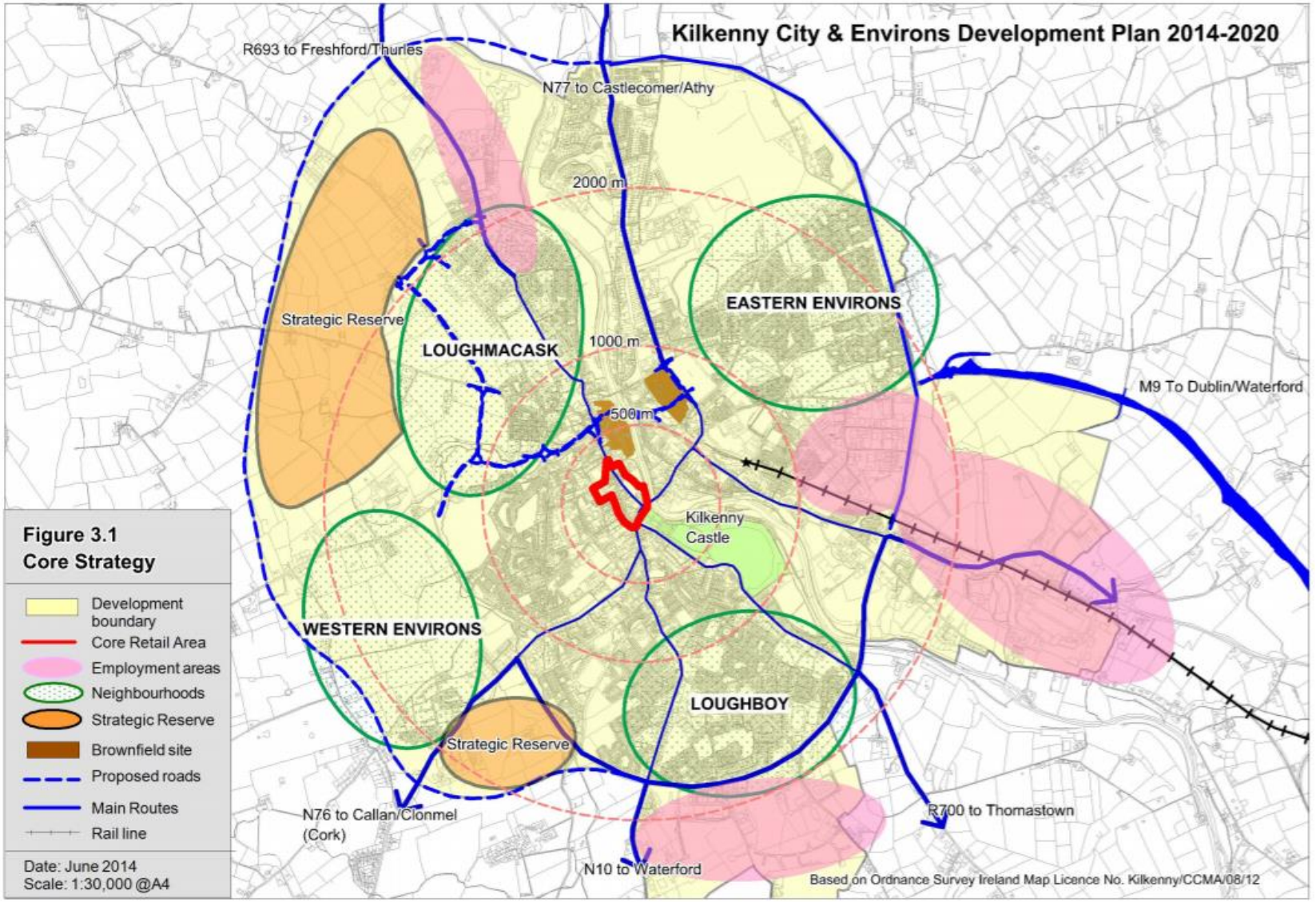


Figure 2-5 Kilkenny City Core Strategy. Source: Kilkenny City & Environs Development Plan 2014-2020.

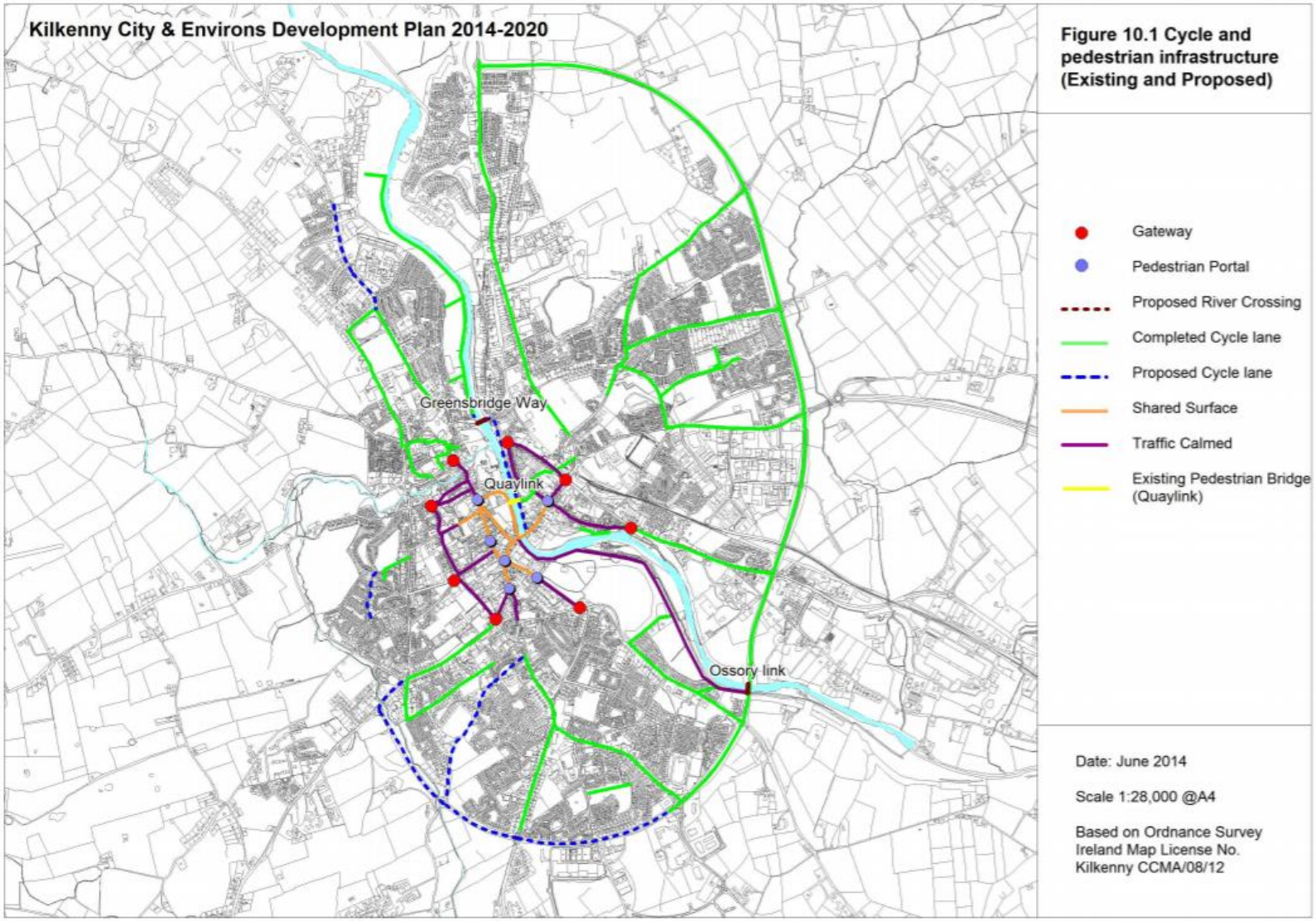


Figure 2-6 Existing and Proposed Cycle and Pedestrian Infrastructure. Source: Kilkenny City & Environs Development Plan 2014-2020.

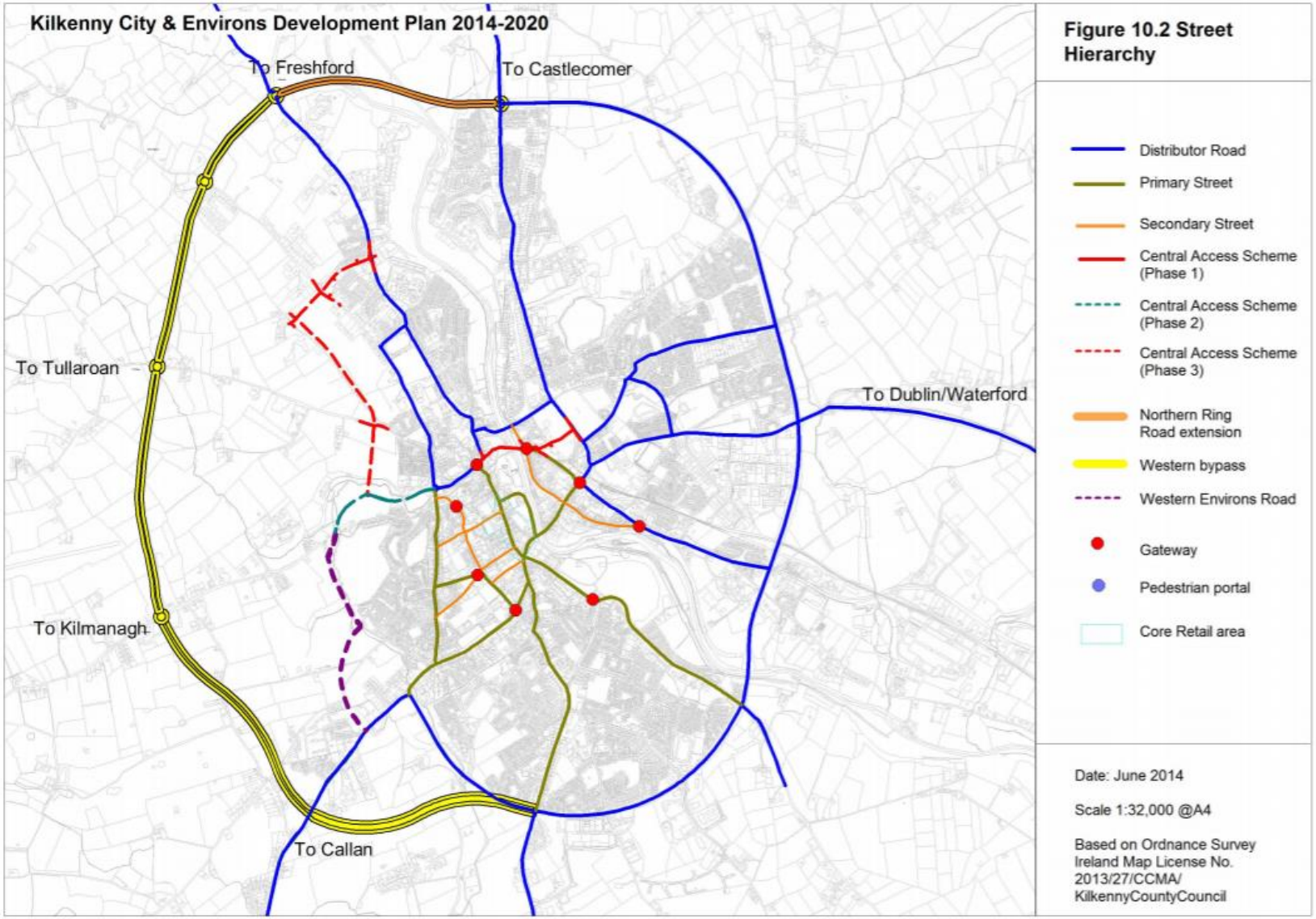


Figure 2-7 Kilkenny City Street Hierarchy. Source: Kilkenny City & Environs Development Plan 2014-2020.

2.5.2 Kilkenny County Development Plan 2014-2020

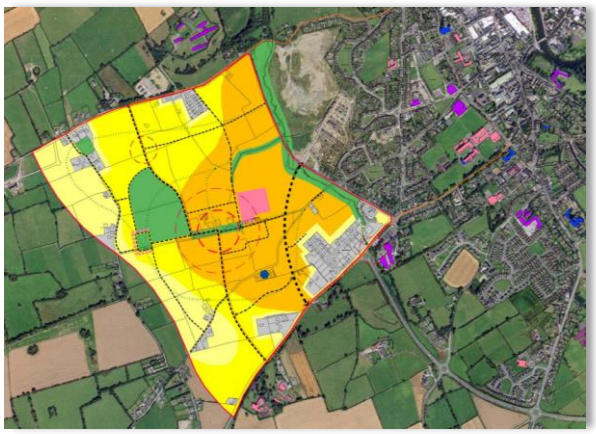
The *Kilkenny County Development Plan* sets out the policies and objectives for the proper planning and sustainable development of the County during the period 2014-2020. Kilkenny City is the administrative capital of the County.

Transport related objectives relevant to the KLTP include:

- Investigate the establishment of a Transport Forum to oversee transport policy for the County;
- Facilitate parking provision for tourist buses in towns and villages and at tourist attractions;
- Support increased frequency of rail services and reduced journey times between Kilkenny and Waterford/Dublin;
- Promote the potential for use of the rail network and Maddockstown rail cargo depot for freight services through appropriate land use measures;
- Ensure as far as feasible that public spaces are accessible to the broadest range of users, based on the principles of Universal Design;
- Develop and agree an appropriately planned policy response to access for Glanbia and the Leggetsrath roundabout;
- Support the completion of the Kilkenny Ring Road;
- Ensure that future development affecting national primary or secondary roads shall be assessed in accordance with the guidance given in *Spatial Planning and National Roads - Guidelines for Planning Authorities*;
- Improve substandard sections of regional roads throughout the County;
- Support the Government's target on Electric Vehicles by facilitating the roll out of charging infrastructure; and
- Support the continued development and potential future expansion of airport facilities at Kilkenny aerodrome, three miles to the west of the City.

2.5.3 Kilkenny County Development Plan Pre-Draft Issues Paper 2020-2026

In 2018, Kilkenny County Council began the statutory process of reviewing its Development Plan. As part of this process, an Issues Paper was published highlighting several local transport issues that would be considered by under this review including: a closer integration of land-use planning and transport; reducing the need to travel; management of private car access and car parking; identification of strategic infrastructural requirements and re-shaping roads and streets to safely accommodate more walking, cycling and public transport.



2.5.4 Western Environs Local Area Plan 2004-2010

Whilst the *Kilkenny City and Environs Development Plan 2014-2020* is now the relevant planning policy document for development in the Western Environs, the

expired Plan is used as a supplementary guidance document.

The Plan set out objectives for the Western Environs as it evolves as an integral part of Kilkenny City while at the same time retaining its own unique village identity. Kilkenny Western Environs has an advantage that, being largely undeveloped at present, there is an opportunity to prioritise sustainable transport from the outset.

2.5.5 Loughmacask Local Area Plan 2008-2014

The *Loughmacask Local Area Plan* was adopted in 2008 by Kilkenny Borough Council and Kilkenny County Council. It covers an area of approximately 114.8 hectares to the north-east of Kilkenny City Centre. The Plan's vision is for this distinct landscape to be developed as a sustainable collection of neighbourhoods, set around a green corridor and a village core, providing residents with a great place to live and a strong sense of community. Some transport objectives include:

- Estate roads will be traffic calmed throughout with speed limits of 30kph;
- Facilitate a 'walking bus' scheme for students throughout Kilkenny City and Environs, with assistance from Council;
- Prioritise the movement of cyclists and pedestrians over the private car; and
- Promote interconnectivity between all modes of transport (vehicular, pedestrian, cycle and public transport) in order to link the LAP area with the City and its wider hinterland.

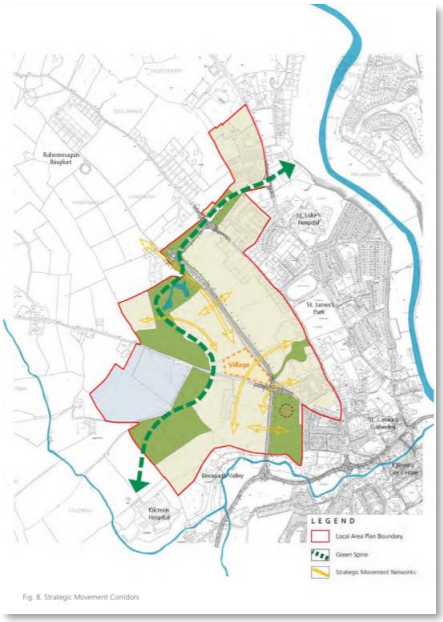


Fig. 8. Strategic Movement Corridors

2.5.6 Draft Kilkenny City Mobility Management Plan

A Projects and Initiatives Report was prepared in December 2018 for the *Kilkenny City Mobility Management Plan* (MMP) which is in draft form and currently under review. The Projects and Initiatives Report identified 22 potential projects and initiatives to be included in the final MMP such as:

- Strategic Cycle and Pedestrian Routes;
- Safe Routes to School;
- Ring Road Crossings;
- Age-Friendly Initiative;
- Car and Bike Sharing Schemes; and
- Traffic Access Strategy.

2.5.7 Parking Options Study 2017

A *Parking Options Study* was carried out in 2017. The purpose of this Study was to assess the parking requirement to serve the Abbey Quarter development and the City Centre more generally, including the Medieval Mile. It also identified potential sites for multi-storey car parks to serve these requirements.

The Study assesses the occupancy of existing carparking facilities and the potential spare capacity within them to serve as Park and Walk facilities, which are an additional objective of Variation 1 of *Kilkenny City and Environs Development Plan*.

The car parking requirement was assessed based on the likely number of trips the site would generate, determined by TRICS. A 20% reduction to the trip generation rate was applied to take account of the assumed mobility management that would be adopted by employers and multi-function/shared-use parking. A further 20% was deducted to take account of long-stay trips that would be deterred due to assumed increase in parking charges. Table 2-1 details the Study's recommended parking requirement for the Abbey Quarter and Medieval Mile.

Table 2-1 Recommended Parking Requirement. Source: Parking Options Study, 2017.

Parking Spaces	**Weekday**	**Location**
Abbey Quarter	900	Adjacent to the Abbey Quarter
	100	Within Abbey Quarter
	500	Within existing carparks (spare capacity)
	172	City Core (replacing lost spaces at Market Yard)
Tourist	80	Northern end of Medieval Mile
City Centre	60	City Core
Total	**1,1812**	

The Study stated that 600 spaces of the recommended 1,812 can be accommodated for within existing car parks that have spare capacity (i.e. 100 within Abbey Quarter site and 500 within Market Cross and Ormonde Street car parks). It recommends for the remaining 1,212 spaces to be accommodated for within two new multi-storey car parks to serve the Abbey Quarter, at Bateman Quay and Green Street.

The Study also recommended the consideration of additional measures to reduce the demand for car parking spaces:

- Scaled pricing, whereby a basic complement of parking spaces per building is provided at a low rate, with additional spaces available at an increasing annual unit charge rate;
- Multi-function parking, whereby parking spaces can accommodate for different uses throughout the day/night and weekdays/weekends;
- Companies to provide employees with a relocation allowance to live in the City Centre to enable them to walk, cycle or take public transport to work; and
- Mobility Management Plans to be prepared by all businesses.

2.5.8 VELOCITY – Imagining a Public Bike Scheme in Kilkenny

VELOCITY– Imagining a Public Bike Scheme in Kilkenny was commissioned by Kilkenny Leader Partnership in 2018. Through desk research, stakeholder consultation, surveys, analysis and

observation, the Study sought to evaluate the feasibility, scale and scope of a Bike Share Scheme (BSS) for the City. The Report concluded that Kilkenny is in a unique and beneficial situation where few changes are deemed necessary in the existing network of cycle lanes and tracks in order to have a minimum suitable for a BSS as the existing/ proposed network is well-developed, provides reasonably good connectivity and is suitable also for novice and casual riders.

The Report set out a number of suggestions regarding the extension of existing connections and provisions for certain areas, both to ensure safety and comfort for all potential users. Whilst the Report conclude that a BSS would not be viable at present, it sets out an example framework for a potential BSS in the future, based on international comparative case studies.

2.5.9 Kilkenny City and Environs Heavy Commercial Vehicle Management Plan

A draft *Kilkenny City and Environs Heavy Commercial Vehicle Management Plan* was advertised in September 2014. The Plan was divided into three phases:

- Pre-Central Access Scheme Bridge;
- Post-Central Access Scheme Bridge and Pre-Northern Ring Road Extension; and
- Post-Central Access Scheme Bridge and Northern Ring Road Extension.

The Plan seeks to achieve measures such as:

- Implement a gross vehicle weight restriction and an articulated vehicle ban on:
  - Newpark Drive;
  - Lover's Lane;
  - Ballybought Street;
  - Dominic Street/Stephen Street;
  - O'Loughlin Road;
  - Hebron Road (Pennyfeather Way to McDonagh Junction);
  - Bateman Quay (part of);
- Place time restrictions on articulated vehicles for deliveries in the core City Centre (6pm to 8am);
- Extend the 3.5 tonne weight limit for delivery vehicles beyond High Street (no deliveries by vehicles greater than 3.5tonne GVW between 11am and 6pm);
- Introduce a designated route for tourist buses/coaches parking on Castle Road;
- Implement an inward one-way system for articulated vehicles along Kennyswell Road;

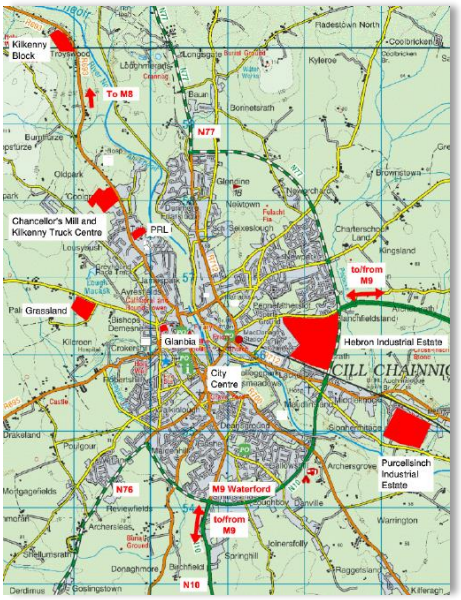


Figure 2-8 Existing Sources of HGV Traffic. Source: Kilkenny County Council, 2019.

- Implement a one-way system for articulated vehicles along Freshford Road, southwards from its junction with Granges Road; and
- Implement a west to east one-way system for articulated vehicles on Greens Bridge/New Road.

2.5.10 Kilkenny Noise Action Plan 2014-2018

The aim of the *Kilkenny Noise Action Plan 2014-2018* is to define a common approach intended to avoid, prevent or reduce the harmful effects, including annoyance, due to exposure to environmental noise.

The Plan identifies areas that are subject to the criteria set out in noise management legislation and guidance such as the M8, M9, N10, N24, sections of the N77, R693, R950, Freshford Road and Parliament Street. The long-term objective of the Plan is to either eliminate or substantially reduce the noise exposure to residents within these areas requiring noise mitigation measures. It proposes a number of mitigation and protection measures to achieve this. The Plan also includes an approach to the prioritisation and analysis of areas for which mitigation measures are required and the determination of Quiet Areas.

It is understood that a draft *Noise Action Plan 2019-2023* was published for public consultation in 2018.

2.5.11 Kilkenny Orientation Strategy

The *Kilkenny Orientation Strategy* is being devised as part of the Destination Kilkenny Partnership, led by Fáilte Ireland. The aim of the Strategy is to increase visitor dwell time in Kilkenny City and to encourage visitors to explore destinations beyond the Castle along the medieval mile and further afield. The purpose of the Study was to also examine physical access, public realm, ease of movement in and around the City and general awareness of what is on offer.

Key recommendations of the Study include:

- Wayfinding: Review and redesign signage - too many signs not always in the right place;
- Mapping: Redesign the mapping focussing on key pedestrian routes and highlight all significant landmarks and main visitor destinations – use as base map for all maps;
- Improved Crossing: Encourage natural easy flow of visitors past the Parade and throughout all streets;
- Emphasise Centre of Gravity for the City: Tholsel;
- Define Visitor Carparks: Make it easy for tourists accessing City by car or bus; and
- Continue to Improve Public Realm: Lanes, lighting and so on.

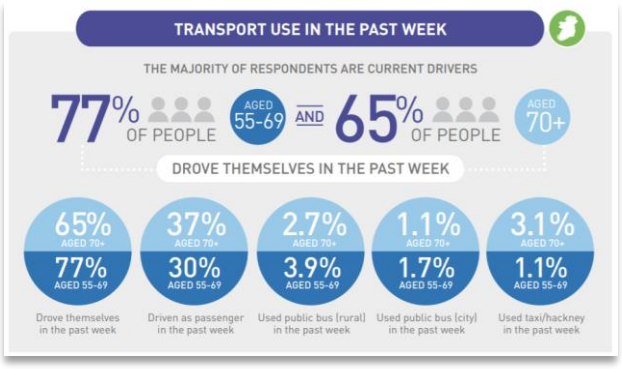
2.5.12 Kilkenny Age-Friendly Strategy 2017-2022

Kilkenny is an Age-Friendly County, which is an initiative spearheaded by the World Health Organisation (WHO). Two of the key pillars of the Age-Friendly initiative are Transport and Outdoor Spaces and Buildings.

Some of the Goals identified to achieve the outcomes of these pillars include:

- Kilkenny Recreation & Sports Partnership (KRSP) through the Active Travel programme will assist the County in the development of a mobility plan for Kilkenny City;

- Develop a comprehensive city transport system, ensuring connectivity with areas of usage for older people hospital, shopping areas and residential areas. Location and quality of bus stops and timetables will form an important part of the service; and
- Kilkenny County Council will ensure that Age and Dementia Friendly design and planning principles are embedded in local authority planning and development, e.g. public spaces, parking, signage.



2.5.13 Climate Change Adaptation Strategy 2019-2024

Kilkenny County Council's *Climate Change Adaptation Strategy 2019-2024* contains a total of 95 individual actions under five headings: Energy & Buildings; Flood Resilience; Transport; Resource Management; and Nature & Communities. 18 of these actions relate to transport and include:

- Promote pedestrian priority in the City Centre;
- Identify gaps in the cycle provision within the City Centre gateways to make it safer and easier to cycle;
- Provide additional Electric Vehicle Charge Points (EVCP); and
- Increase public transport mode share.

2.5.14 Aalborg Charter

Kilkenny Borough Council is one of three Irish local authorities who signed the Aalborg Charter in 1994. The Aalborg Charter is a commitment towards the sustainable development of cities and towns and is the largest European movement of its type. It began the European-wide Sustainable Cities and Towns Campaign, with a commitment to ten aspects of sustainability:

- Governance;
- Local Management Towards Sustainability;
- Natural Common Goods;
- Responsible Consumption and Lifestyle Choices;
- Planning and Design;
- Better Mobility, Less Traffic;
- Local Action for Health;
- Vibrant and Sustainable Local Economy;
- Social Equity and Justice; and
- Local to Global.

2.6 Summary

There are many long-standing plans and policy objectives in relation to land-use and transport planning at all levels that support sustainable development and transport for Kilkenny City and Environs. National level policy takes the lead in providing a robust framework for sustainable development and mobility, reflecting the international step-change toward creating more liveable cities and tackling climate change. These objectives are translated at a regional and local level to further promote closer integration of land use and transport planning, compact growth and enhanced accessibility and connectivity for walking, cycling and public transport.

The existing plans and policy objectives outlined above will provide a robust foundation to the development of the Kilkenny Local Transport Plan and inform the ABTA process.

3. Study Area

3.1 Study Area Definition

Kilkenny City is the principal town of County Kilkenny, located in the south-east of Ireland. It a designated Key Town in the RSES, the second largest settlement in the South East Region and is the 8th largest employment base in the State. The City is internationally renowned as an historic medieval city with many tourist attractions such as Kilkenny Castle and Rothe House, and an important hub for the arts, including high profile annual festivals. Kilkenny also has a strong industrial and enterprise tradition, both indigenous (e.g. Kilkenny Design Workshops) and international (e.g. Glanbia).

Kilkenny City has a compact urban structure whose character is a result of a combination of natural features including the Rivers Nore, Breagagh and Pococke, its medieval streetscape and numerous landmark buildings and structures of significant historical and archaeological value. Kilkenny Castle and St. Canice's Cathedral are two landmark features which flank the opposing poles of the central area of the City. The enclaves of these two buildings and the spaces which link them – Irishtown, Parliament Street and High Street – form the 'Medieval Mile' and spine of the central area. Characterised by its medieval heritage, the City Centre contains a network of back lanes or 'slips' as they are known locally, which are a particular feature of the overall townscape.

The River Nore is the principal river flowing through the City and together with the River Pococke, forms part of the Natura 2000 Network. The River Nore is an asset to the City providing attractive amenity areas and green spaces along its banks. It is also a major physical barrier within the City Centre. A number of bridges cross the River Nore including Green's Bridge, St. Francis Bridge, St. John's Bridge and Lady Desart Bridge.

Kilkenny City and Environs are largely contained by an extensive Ring Road which stretches from the Castlecomer Road in the north to the Callan Road in the south-west.

The Study Area is based on the extents of the Kilkenny Electoral Divisions (EDs) defined by the CSO, covering both Urban and Rural EDs and is illustrated in Figure 3-1.

Image 3-1 River Nore within Kilkenny City, showing St. John's Bridge and Kilkenny Castle.

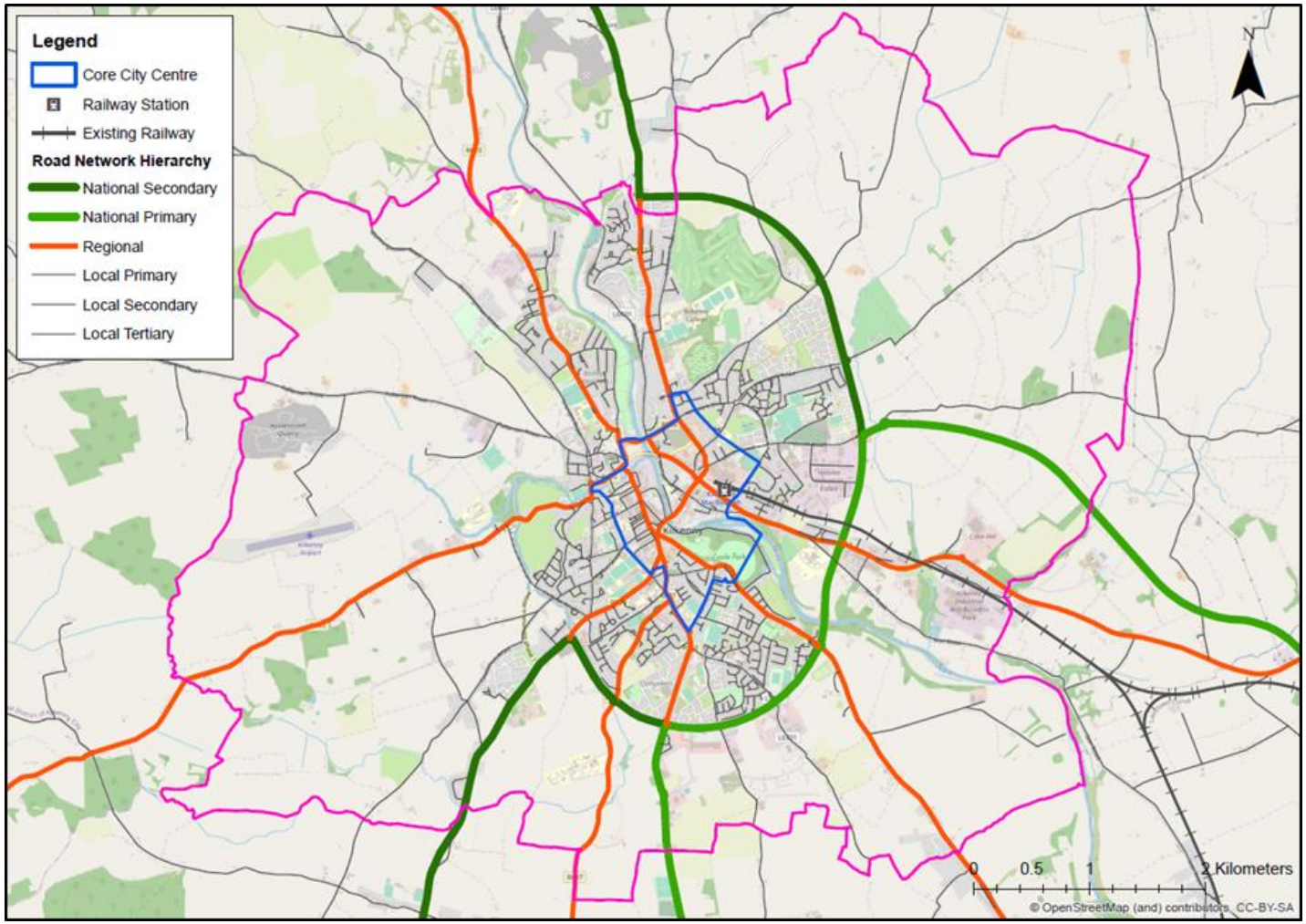


Figure 3-1 Study Area Context Map

3.2 Existing Development Patterns

3.2.1 Population

Kilkenny City and Environs has a population of 26,512, according to the most recent 2016 census. Table 3-1 outlines the population growth for the area over the last 20 years. It has experienced an average growth rate of 9% every census period (6 years).

Table 3-1 Population growth in Kilkenny City and Environs between 1996-2016. Source: CSO.

Year	1996	2001	2006	2011	2016
Total Population	**18,696**	**20,735**	**22,179**	**24,423**	**26,512**
Growth		**+10.9%**	**+7.0%**	**10.1%**	**+8.6%**

Figure 3-2 presents the population density by 2016 CSO defined Small Areas. It is evident that the population density is highest within the City Centre and its immediate surrounding areas, particularly Newpark Lower and Upper to the north-east and the areas of Smithland and Loughboy to the south. Household occupancy per Small Area is presented in Figure 3-3. The maps show a correlation between higher density areas and lower household occupancy rates.

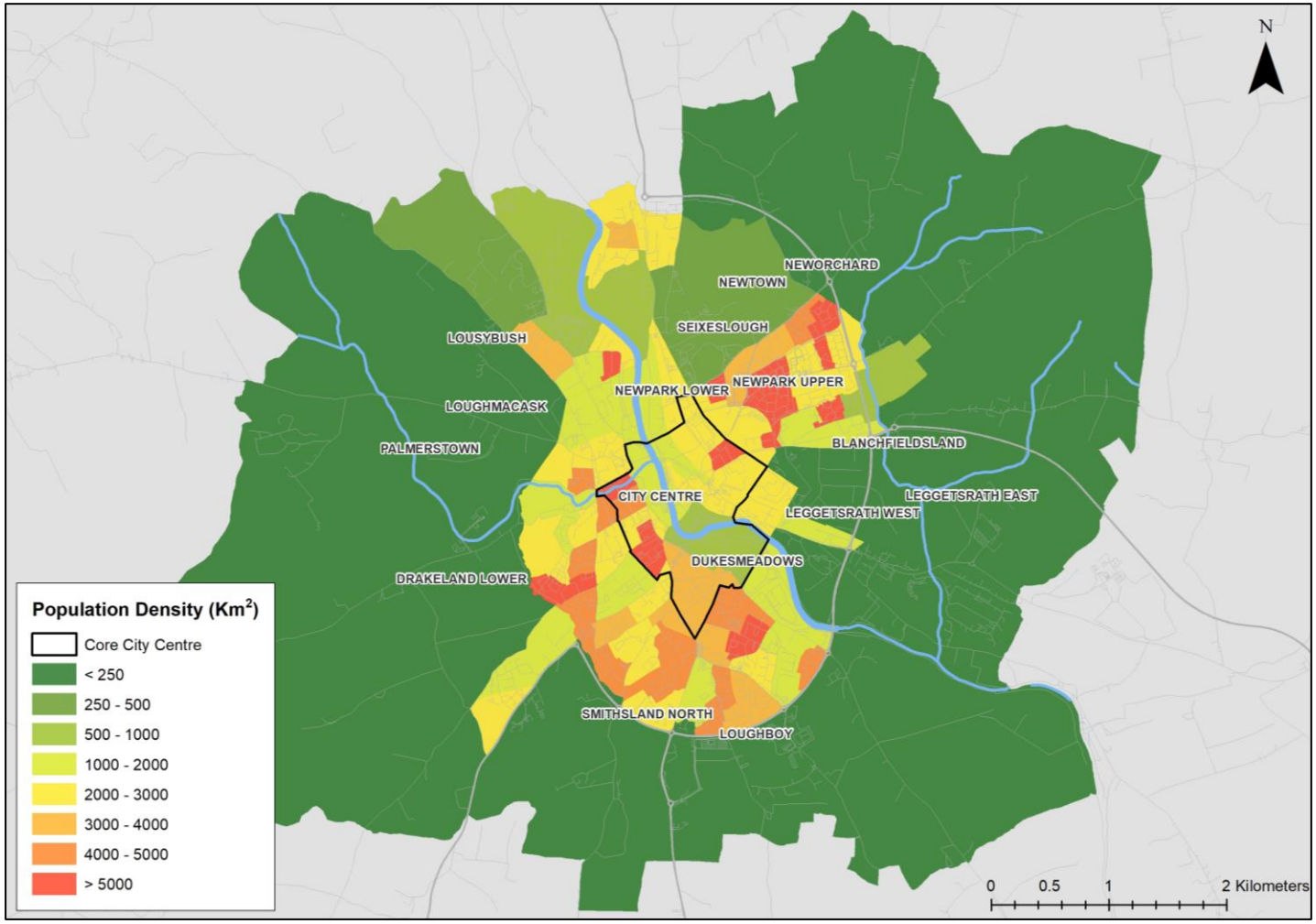


Figure 3-2 Kilkenny 2016 Population Density (per square kilometre)

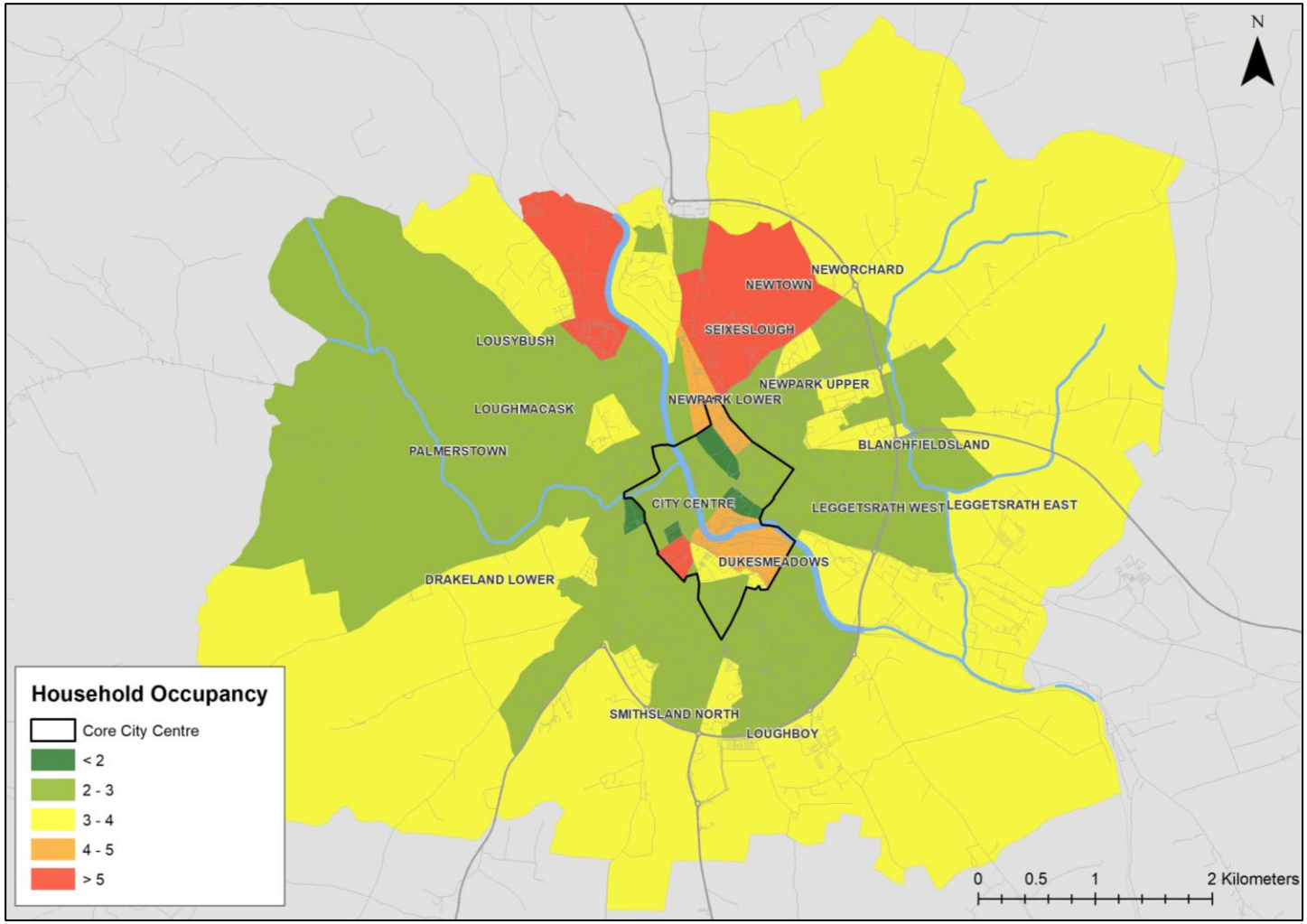


Figure 3-3 Household Occupancy per Small Area

3.2.2 Employment

A planning data sheet was developed from the CSO's 2011 Small Areas Population Statistics (SAPs) database as part of the NTA's Regional Modelling System (RMS). Job density per km^2 was extracted from this planning data sheet and mapped in Figure 3-4.

The most notable concentration of employment is the City Centre, particularly around High St., St. Kiernan's St., Parnell St. and James's St., where the job density is greater than 5,000 jobs per km^2. This is the Study Area's Central Business District (CBD); the focal point for commercial, financial, retail and hospitality uses. A vast range of retail outlets such as the Market Cross Shopping Centre, independent shops and international chains are located here, as well as a number of restaurants, cafés, offices and services such as An Post, banks and travel agents. Job density is concentrated around this central area, with levels decreasing moving out from it.

Another area of note is to the south-east of the Study Area where the job density is between 1,000 and 1,500 per km^2. St. Canice's Hospital, Hebron Industrial Estate, Purcellsinch Business Park, Cillín Hill Agri-Business Park and the IDA Loughboy Business and Technology Park are all located here comprising a wide range of companies such as VHI Healthcare, Veolia Water Ireland, Duelchem and a number of retail warehouses. Glanbia, a global agri-food and nutrition business, has its headquarters in Kilkenny with several premises across these parks.

Other clusters include an area to the north of the Study Area where Aut Even Hospital and St. Luke's General Hospital are located has a job density of between 1,500 and 3,000 per km^2.

There are a number of out-of-town retail outlets such as LIDL, ALDI, Woodies and the Loughboy Shopping Centre, all located to the south of the City Centre along the Waterford Road and Bohernatounish Road.

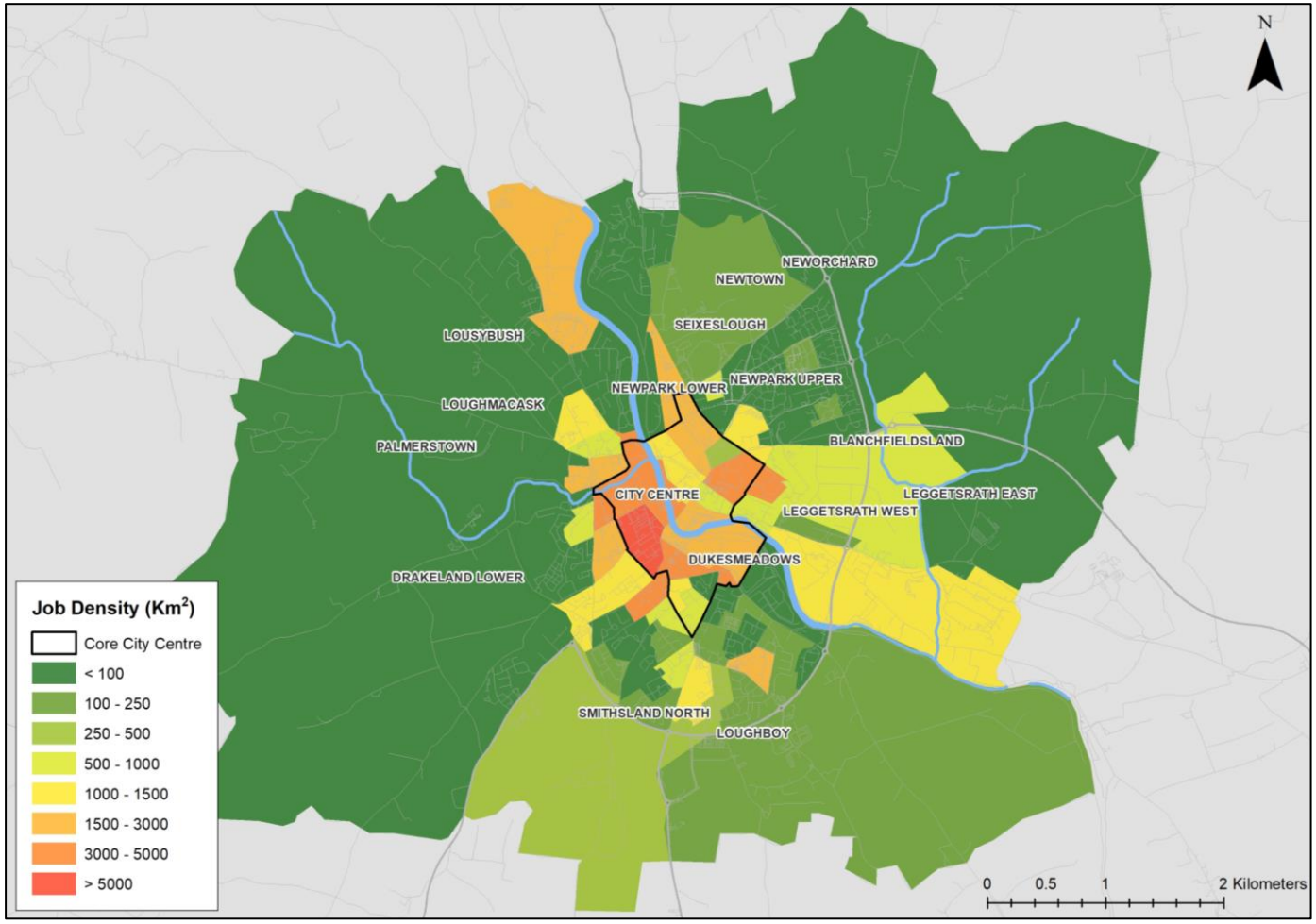


Figure 3-4 2012 Jobs Density (per square kilometre)

3.2.3 Land Use Zoning

The purpose of land use zoning is to indicate the planning control objectives of the Council for all lands in its administrative area. The integration of land use and transport planning is imperative to achieving sustainable development. This integration ensures that travel demands can be catered for in a sustainable way. This requires that planning for future provision of homes, jobs, education and community facilities takes place in tandem with planning for transport infrastructure and services. Such planning fundamentally addresses the future quality of life and social inclusion of the people living in these areas, reduces dependency on the private car and reduces the carbon intensity of travel.

Kilkenny City and Environs Development Plan 2014-2020's current zoning map is presented in Figure 3-5.

There is a significant amount of Existing Residential lands concentrated around the City Centre. It has been a long-established principle in the *Kilkenny City and Environs Development Plan* that the expansion of the City and any new significant residential development would occur in phased blocks based on four neighbourhoods; two of which are built out, Loughboy/Archerstreet and Newpark Upper/Eastern Environs. The remaining two neighbourhoods are zoned for development, namely the West Environs and Loughmacask. Local Area Plans were previously prepared for these areas and while they have since expired, they still remain useful as guidance.

There is a concentration of lands zoned for Office, Mixed Commercial and Industrial uses on the eastern and southern peripheries of the Study Area, along and outside of the Kilkenny Ring Road.

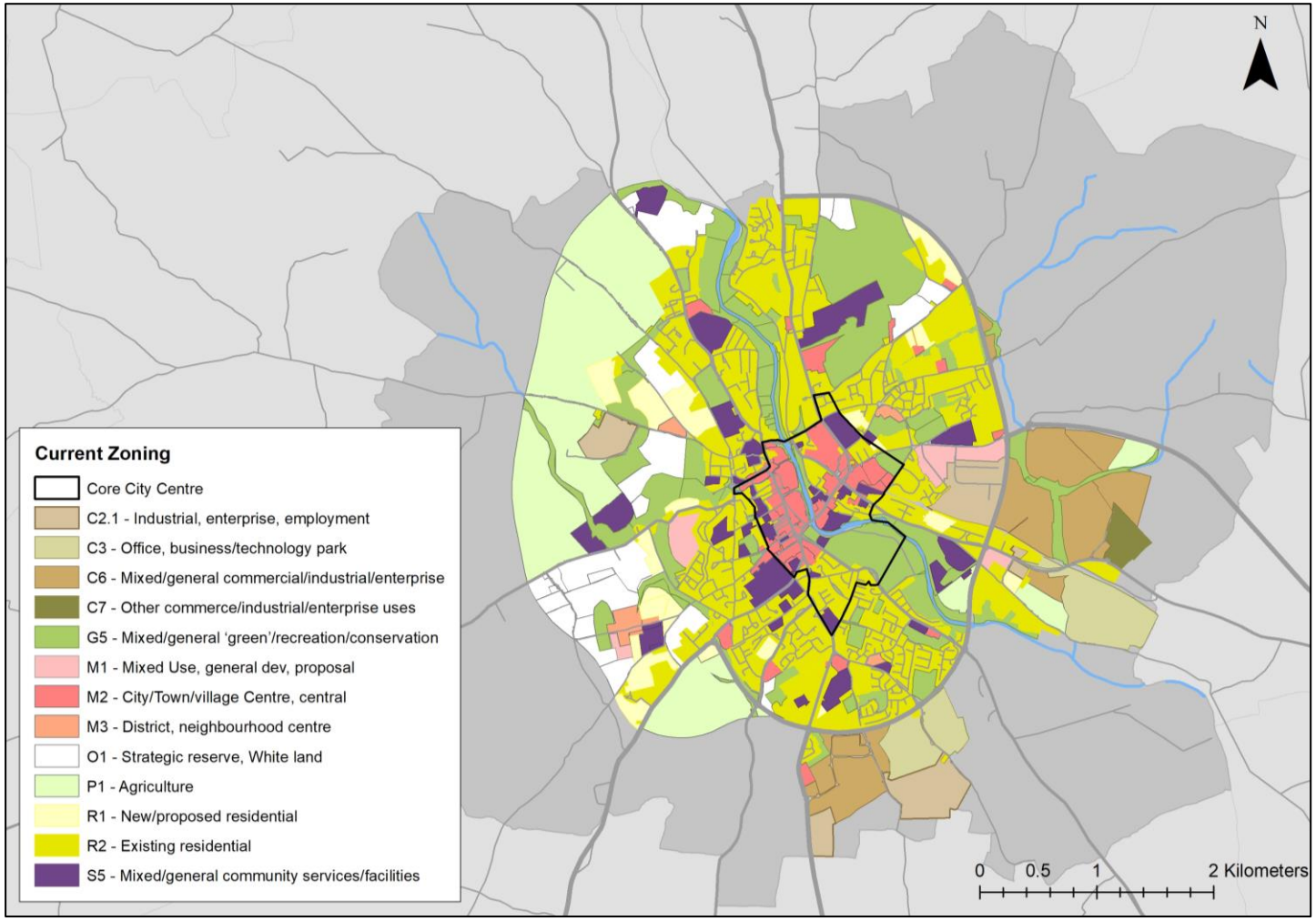


Figure 3-5 Current Land Use Zoning in Kilkenny City and Environs Development Plan 2014-2020

4. Existing Transport Network

The following sections summarise the existing transport network, services and facilities within Kilkenny City and Environs.

4.1 Road Network

The Study Area is well served by its existing road and street network. Figure 4-1 illustrates the existing road network hierarchy.

4.1.1 National Road Network

The National road network provides the basis for Kilkenny's national-level and inter-regional connectivity. There are a number of National roads in the Study Area N10 (National Primary), the N76 (National Secondary), the N77 (National Secondary) and the N78 (National Secondary). The M9 (Motorway) is, while outside of the Study Area, located in proximity to it. These roads connect the following:

- **M9:** Dublin to Waterford;
- **N10:** Radial route linking Kilkenny to the M9 Dublin to Waterford;
- **N76:** Radial route linking Kilkenny to the N24 east of Clonmel, County Tipperary;
- **N77:** Radial route linking Kilkenny to the M7 at Portlaoise, County Laois; and
- **N78:** Links the N77 north of Kilkenny to the M9 at Mullamast, County Kildare.

4.1.1.1 Kilkenny Ring Road

The Kilkenny Ring Road is a key part of Kilkenny's road network, comprising the N76, N10 and N77. This orbital route bounds most of the Study Area, stretching from the south-west at Callan Road to the north at Castlecomer Road, as follows:

- **N76:** Callan Road Roundabout to Waterford Road Roundabout;
- **N10:** Waterford Road Roundabout to Hebron Road Roundabout including a bridge crossing over the River Nore; and
- **N77:** Hebron Road Roundabout to Castlecomer Road Roundabout.

The road's cross-section consists generally of a single lane carriageway with a cycle track and footpath on one side, separated from the road by a grass verge. The speed limit along the length of this road is 100kph.

There are ten roundabouts along the route connecting to radial routes such as R697, R910, R700, and R712 and a number of Local roads providing access to residential developments and the Loughboy IDA Business and Technology Park, for example. Some roundabouts provide dropped kerbs and tactile paving to facilitate crossing for pedestrians and cyclists.

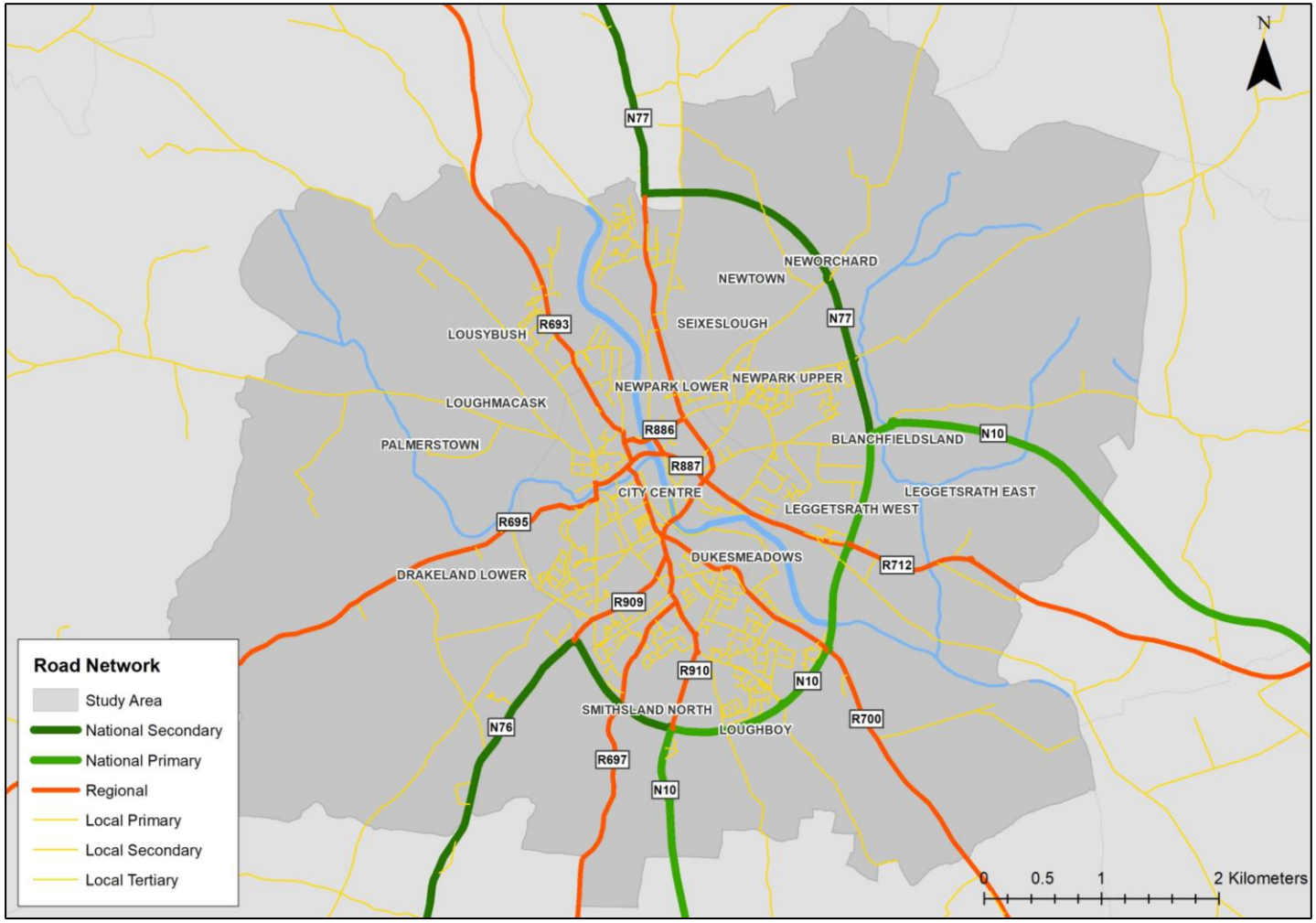


Figure 4-1 Existing Road Network

4.1.2 Regional Road Network

The Study Area's Regional road network comprises mainly of radial routes connecting the City Centre to the National road network and wider environs, including:

- **R697:** Radial route connecting Kilkenny City to the N24 in Carrick-on-Suir;
- **R693:** Radial route connecting Kilkenny City to the M8 via Urlingford and Freshford;
- **R700:** Radial route connecting Kilkenny City Centre to New Ross, County Wexford via Bennettsbridge, Thomastown and Inistioge;
- **R712:** Links Kilkenny City to Paulstown via Dublin Road;
- **R886 (New Road):** Forms part of the City Centre Street Network connecting New Road Roundabout to Vicar St. via Green's Bridge;
- **R887:** Forms part of the City Centre Street Network connecting Green's Hill to Kilkenny Castle along the eastern bank of the River Nore via St. John's Bridge;
- **R910 (Waterford Road):** Links Upper Patrick St. to the Waterford Road Roundabout on the Kilkenny Ring Road; and
- **R909 (College Road):** Links Patrick St. to the Callan Roundabout on N76.

There are a number of roundabouts along these Regional routes in and near the City Centre such as Newpark Drive Roundabout and College Road Roundabout, which can hinder the safe movement of cyclists and pedestrians.

4.1.3 Central Access Scheme

Phase 1 of the Central Access Scheme was completed in 2016, comprising the construction of St. Francis Bridge, a single-carriageway road providing east-west connectivity over the River Nore. It also links the Abbey Quarter to the Old Mart Site – two brownfield sites earmarked for significant development. St. Francis Bridge has provisions for footpaths and cycle lanes on both sides. Subsequent phases of the CAS will form an Inner Western Relief Road, linking the City Centre with the Breagagh Valley/ Loughmacask area. It is intended that the CAS will connect with a new LIHAF funded road between the Callan and the Kilmanagh Roads, thereby significantly opening up the Western Environs which has been identified as a focal area for future residential expansion.

4.1.4 Bridge Crossings

Five bridges provide connectivity between eastern and western banks of the River Nore, as follows (from south to north):

- **N10:** Part of the Kilkenny Ring Road;
- **St. John's Bridge:** Narrow footpaths on both sides;
- **Lady Desart Bridge:** Pedestrian bridge;
- **St. Francis Bridge:** Footpaths and cycle lanes on both sides; and
- **Green's Bridge:** Narrow footpath on one side.

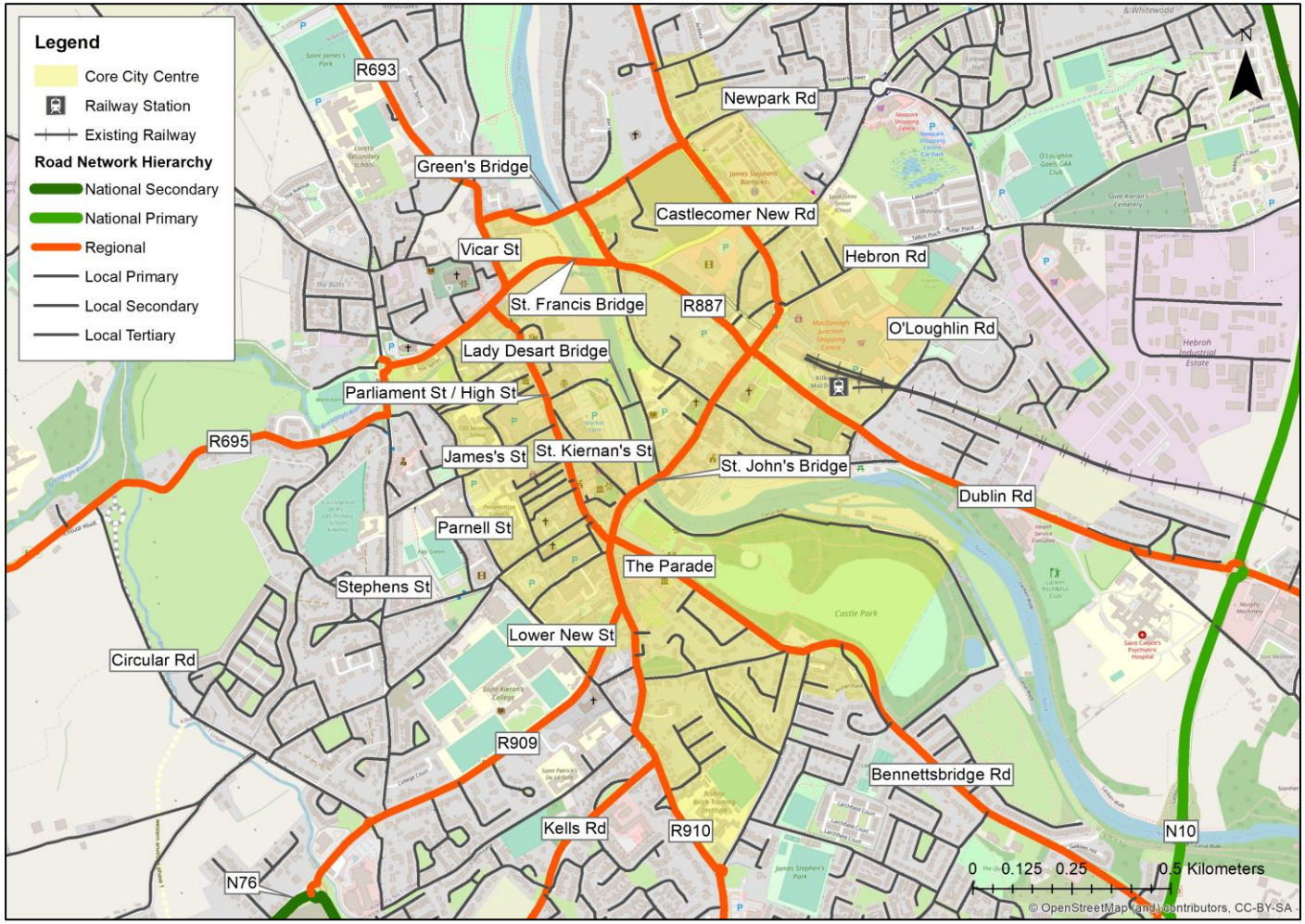


Figure 4-2 Existing City Centre Street Network

4.1.5 City Centre Street Network

Figure 4-2 presents the existing City's Street Network Hierarchy.

Kilkenny's City Street Network plays an important role linking the City Centre Core with its inner neighbourhoods as well as strategic routes. Characterised by its medieval origins, the City Centre contains a streets network of back lanes, or 'slips' as they are known locally. Some serve as short cuts for pedestrians across the width of particularly long blocks and offer enhanced permeability and connectivity such as New Building Lane, Pennyfeather Lane or St. Mary's Lane. However, the medieval fabric and street pattern of the City Centre also creates challenges in trying to cater for all modes and varying needs of the community.

The majority of the City's urban roads and streets have adopted a speed limit of 30kph which begin at defined gateways on the periphery of the City Centre Core.

Greater detail on the City's Street Network is provided later in the Report under Pedestrian Network.

4.1.6 Typical Traffic Conditions

Figure 4-3 and Figure 4-4 present the typical traffic conditions of the Study Area. Kilkenny's road network typically operates within capacity, with some junctions experiencing some congestion during peak periods such as the Bennettsbridge Road Roundabout, the Old Dublin Road Roundabout and Johnswell Road Roundabout. Areas in the City Centre Core including High St., The Parade and St. John's Bridge attract high volumes of vehicular traffic throughout the entire day.

The Study Area's road network experiences some levels of congestion between 08:30 and 09:30 with junctions on the south of the Kilkenny Ring Road most affected, as well as Grange Road.

The Study Area's road network experiences another period of congestion between 19:00 and 21:00, with the Kilkenny Ring Road experiencing most congestion, particularly along the N77.

Traffic surveys and site visits to be undertaken at a later date.

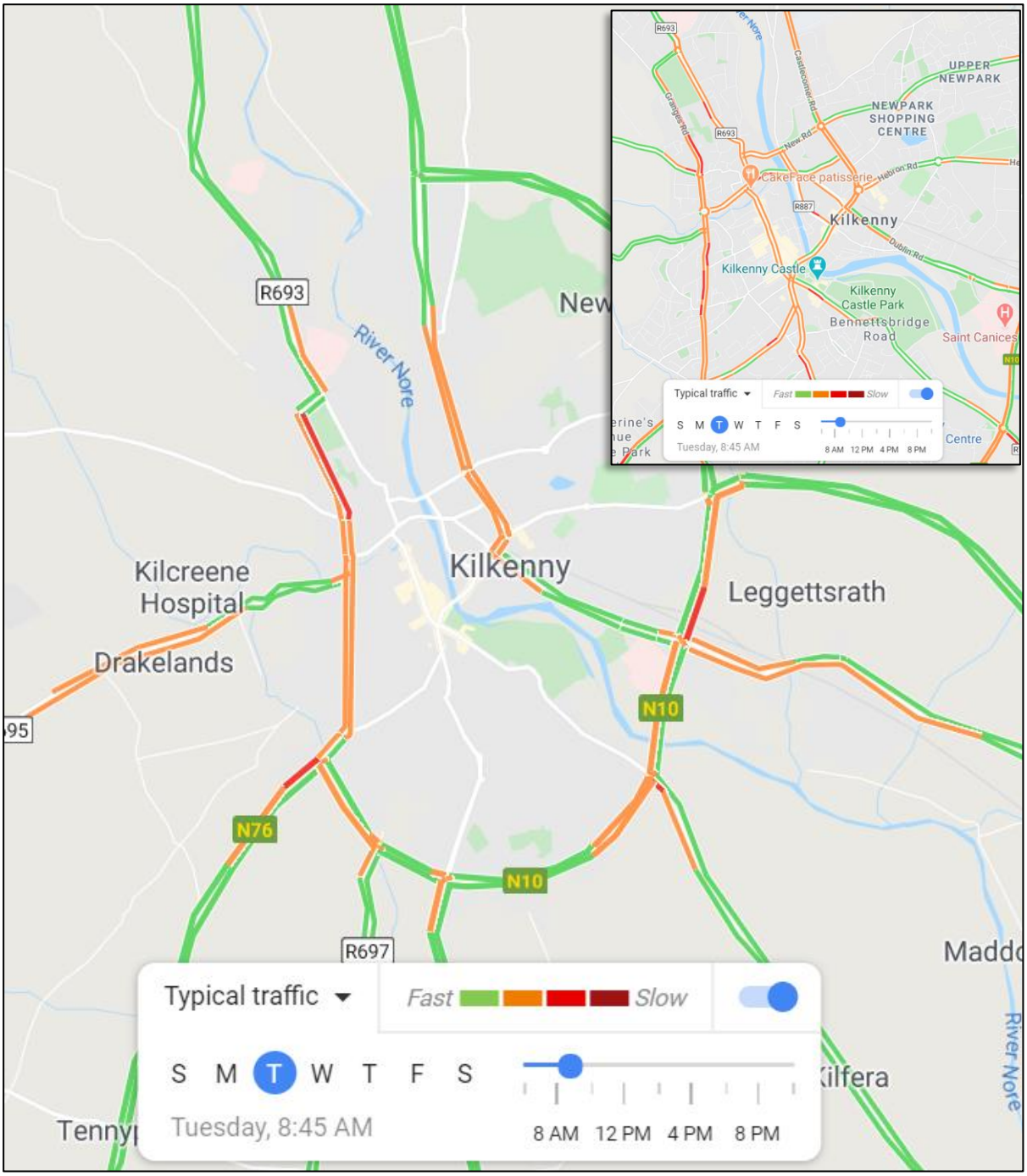


Figure 4-3 Typical AM Traffic in Study Area. Source: Google Maps, April 2020.

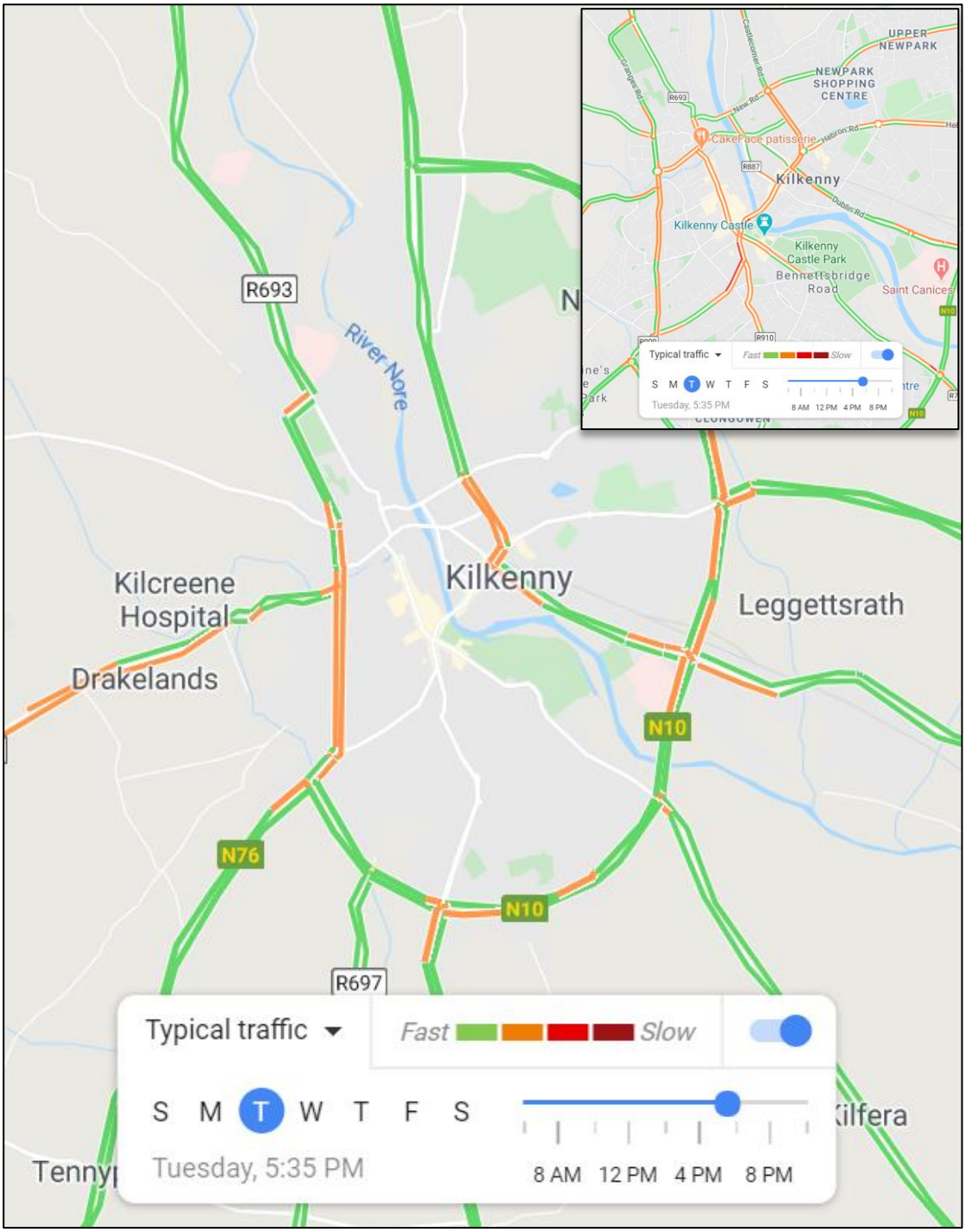


Figure 4-4 Typical PM Traffic in Study Area. Source: Google Maps, April 2020.

4.2 Pedestrian Network Audit

4.2.1 Introduction

This section provides an overview and high-level assessment of Kilkenny's existing pedestrian network.

4.2.2 Methodology

Kilkenny's existing walking network is assessed in terms of footpath provision and junction treatment. The baseline conditions have been informed by a desktop review of the most recent aerial photography and Google Streetview.

The assessment focuses on pavement conditions and junction treatments.

The *Design Manual for Urban Roads and Streets* (DMURS) sets out that a minimum footpath width of 1.8m is considered adequate for areas of low pedestrian activity, whilst the desirable width is 2.5m, as shown in Figure 4-5. A minimum width of 3.0m is considered adequate for areas of moderate to high pedestrian activity. A minimum width of 4.0m is considered adequate in areas of high pedestrian activity.

Pedestrian crossings are described in terms of frequency, type and provision of dropped kerbs and tactile paving.

The assessment focuses on high-demand desire lines along Radial Routes and the City Centre Network, as illustrated in Figure 4-6.

Figure 4-5 Diagram showing the amount of space needed for pedestrians to pass each other with regard to pedestrian activity levels Source: Pg. 87, DMURS, 2019.

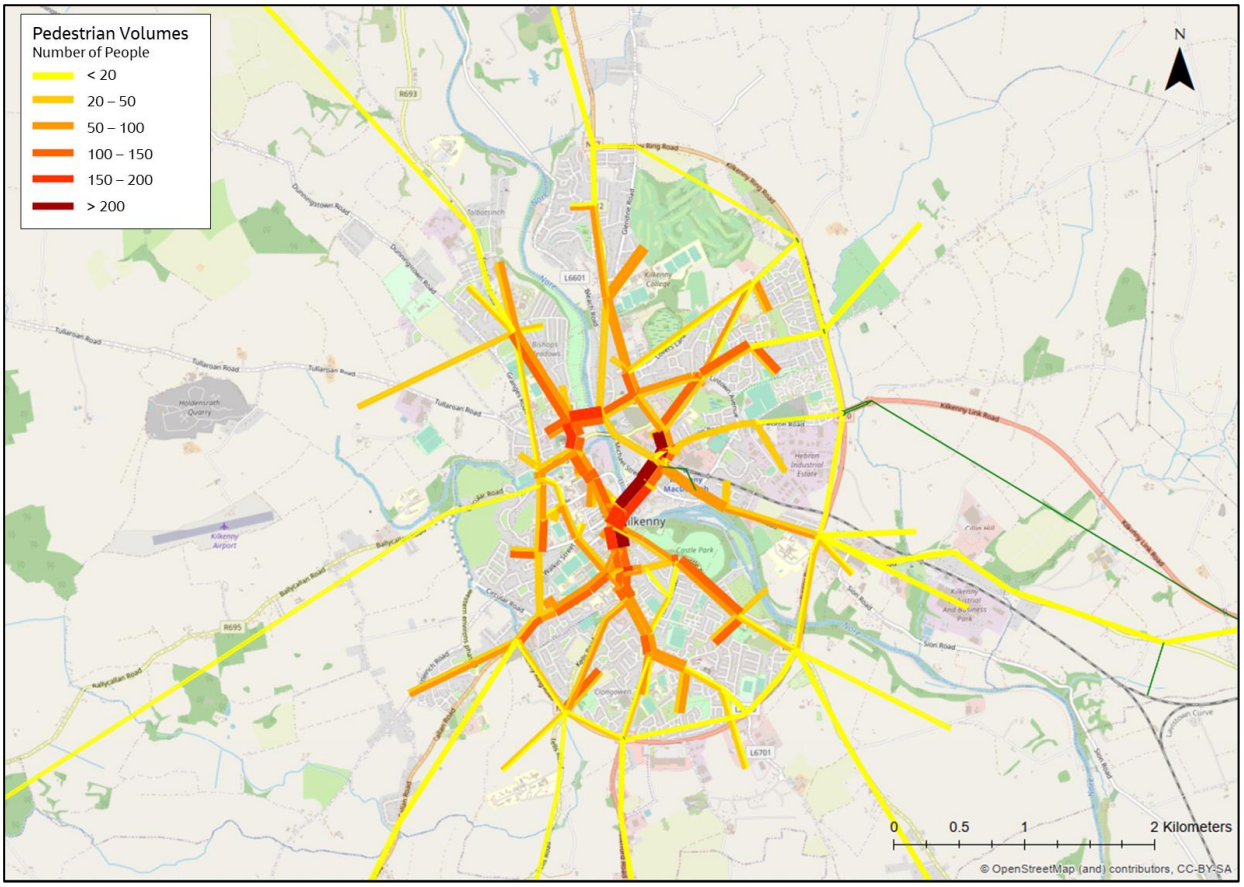


Figure 4-6 SERM AM Peak Pedestrian Numbers.

4.2.3 Assessment of Radial Routes

The key radial routes with the highest demand, as illustrated in Figure 4-6 include:

- Castlecomer Road;
- Johnswell Road;
- Golflinks Road;
- Hebron Road
- Dublin Road;
- Bennettsbridge Road;
- Bohernatounish Road;
- Bennettsbridge Road;
- Bohernatounish Road;
- Waterford Road;
- Kells Road;
- College Road;
- Grange Road; and
- Freshford Road.

In general, there is a continuous provision of footpaths both inbound and outbound from the City Centre along these routes. However, the pedestrian environment is negatively impacted by the dominance of car traffic, a proliferation of roundabout junctions, narrow footpaths and a lack of priority at junctions.

Table 4-1 presents a high-level baseline assessment of the existing walking conditions along each route.

Table 4-1 Pedestrian Network Audit of Radial Routes (and Kilkenny Ring Road).

Road Name	Length (approx.)	Key Origins/Destinations	Footpath Provision	Junction Treatment
Castlecomer Road/Castlecomer New Road Google Streetview: August 2018/September 2019. Small section between Richview and Glendine Inn dates from June 2009.	2.5km	Kilkenny College, Kilkenny Model School, many residential estates such as The Weir View, Glenbawn and Meadow Way and some retail outlets.	▪ Continuous provision of footpaths on both sides of the road. Very narrow in parts. ▪ Mixed pavement quality. ▪ Intermittent shared facilities with cyclists reduces the Quality of Service for pedestrians, particularly those who are visually impaired.	▪ 4 controlled pedestrian crossings. ▪ 1 uncontrolled pedestrian crossing. ▪ 1 roundabout (New Road Roundabout). Dropped kerbs and tactile paving present. No priority for pedestrians. ▪ No pedestrian priority over local junctions. ▪ Dropped kerbs and tactile pavement are provided in most cases.
Golflinks Road Google Streetview: September 2019.	1km	Runs in a north-south direction connecting New Orchard Road to Johnswell Road and Castlecomer Road. Many residential estates, Newpark Shopping Centre and St. John's Senior National School are located along the route.	▪ Continuous provision of footpaths on both sides of the road. Overall good quality. ▪ Shared facilities with cyclists reduce the Quality of Service for pedestrians, particularly those who are visually impaired.	▪ 4 uncontrolled crossings. ▪ 1 signalised junction. ▪ 2 roundabouts. Dropped kerbs and tactile paving present at both. No priority for pedestrians. ▪ Several junctions (incl. roundabouts and entrances) with wide corner radii, increasing crossing time and distance, and reducing pedestrian safety. ▪ No pedestrian priority over local junctions. ▪ Dropped kerbs and tactile paving are provided in most cases.
Johnswell Road Google Streetview: September 2019.	1km	Many residential estates and LIDL. Some permeability is provided through these residential estates for pedestrians and cyclists onto New Orchard Road which runs in parallel to the north, and Hebron Road which runs in parallel to the south.	▪ Continuous provision of footpaths on both sides of the road. Overall good quality. ▪ Shared facilities with cyclists reduce the Quality of Service for pedestrians, particularly those who are visually impaired.	▪ 1 controlled pedestrian crossing. ▪ 1 roundabout (Newpark Drive Roundabout). Dropped kerbs and tactile paving present at both. No priority for pedestrians. ▪ Several junctions (incl. roundabouts and entrances) with wide corner radii, increasing crossing time and distance, and reducing pedestrian safety. ▪ No pedestrian priority over local junctions. ▪ Dropped kerbs and tactile paving are provided in most cases.
Hebron Road Google Streetview: September 2019.	1.3km	Nowlan Park, O'Loughlin GAA Gaels Club, Intreo Centre, ALDI, many residential and industrial estates.	▪ Continuous provision of footpaths on both sides of the road. ▪ Narrow in sections.	▪ 1 signalised junction. ▪ 2 roundabouts. Dropped kerbs and tactile paving at O'Loughlin Road Roundabout. No tactile paving or dropped kerbs are provided at roundabout near MacDonagh Junction. Signalised crossing on approach on Hebron Road. ▪ Several junctions (incl. roundabouts and entrances) with wide corner radii, increasing crossing time and distance, and reducing pedestrian safety. ▪ No pedestrian priority over local junctions.
Dublin Road Google Streetview: September 2019.	1.3km	St. Canice's Hospital, Kilkenny MacDonagh Train Station, several residential estates such as Shandon Park and Lacken Drive and a number of industrial estates outside of the Kilkenny Ring Road in the Leggettsrath area.	▪ Continuous provision of footpaths on both sides of the road. ▪ Mixed quality. Pedestrian environment disimproves significantly on approach to City Centre, particularly around MacDonagh Station with multi-stage crossings, slip lanes and guardrails present. ▪ Shared facility on part of the route which reduces the Quality of Service for pedestrians, particularly vulnerable pedestrians.	▪ 2 controlled crossings. ▪ 1 signalised junction at MacDonagh Junction which is car dominated and hostile to pedestrians with a lack of active frontage and wide, multi-stage crossings, guardrails and slip lanes. Wayfinding and legibility from the Station to the City Centre is poor.
Bennettsbridge Road/Castle Road Google Streetview: May 2017/September 2019.	1.3km	Many residential areas such as Larchfield, Dukesmeadow Avenue and Melville Heights.	▪ Continuous provision of footpaths on both sides. ▪ Narrow in sections.	▪ 1 controlled pedestrian crossing. ▪ 1 uncontrolled pedestrian crossing. ▪ Several junctions (incl. roundabouts and entrances) with wide corner radii, increasing crossing time and distance, and reducing pedestrian safety.

Road Name	Length (approx.)	Key Origins/Destinations	Footpath Provision	Junction Treatment
Bohernatounish Road Google Streetview: May 2017/September 2019.	900m	Loughboy Shopping Centre, Presentation Secondary School, The Watershed sports complex, LIDl, ALDI and a number of residential estates. Route also extends beyond the Kilkenny Ring Road to the IDA Kilkenny Business and Technology Park.	▪ Continuous provision of footpaths on both sides. ▪ Overall good quality. Some instances of rutting and ravelling. ▪ Narrow in sections.	▪ 3 controlled pedestrian crossings. ▪ 1 roundabout. ▪ Several junctions (incl. roundabouts and entrances) with wide corner radii, increasing crossing time and distance, and reducing pedestrian safety. ▪ No pedestrian priority over local junctions. ▪ Dropped kerbs and tactile paving are provided at most junctions.
Waterford Road Google Streetview: May 2017/September 2019.	1.2km	Kilkenny Project National School, LIDL, ALDI, St. John of God National School and several residential estates such as Hollybank Park and Hawthorn Walk.	▪ Continuous provision of footpaths on both sides. ▪ Generally good quality. Some bleeding and ravelling of pavement.	▪ 1 controlled pedestrian crossing. ▪ 2 roundabouts – multi-stage signalised crossing present on southern arm of each roundabout. Dropped kerbs and tactile paving provided on all arms. ▪ Dropped kerbs and tactile paving are not provided at most local junctions (e.g. sideroads)
Kells Road Google Streetview: September 2019.	800m	Many residential estates such as Maiden Hill, Rose Garden and The Paddocks.	▪ Continuous provision of footpaths on both sides. ▪ Overall good quality pavement. It begins to disimproves on the approach to the City Centre. For example, there is some rutting and raveling along Corcoran Terrace. ▪ Footpath narrows on approach to City Centre. ▪ Shared facilities with cyclists which reduces the Quality of Service for pedestrians, particularly those who are visually impaired.	▪ 1 uncontrolled pedestrian crossing.
College Road Google Streetview: May 2017.	900m	St. Kiernan's College, a number of retail outlets such as Spar and Centra, St. Patrick's Catholic Church and several residential estates such as College Square.	▪ Continuous provision of footpaths on both sides. ▪ Overall good quality pavement with few visible defects. ▪ Shared facility on part of the route which reduces the Quality of Service for pedestrians, particularly those who are visually impaired.	▪ 2 controlled pedestrian crossings. ▪ 1 signalised junction. ▪ Several junctions (incl. roundabouts and entrances) with wide corner radii, increasing crossing time and distance, and reducing pedestrian safety. ▪ No pedestrian priority over local junctions.
Parkview Drive/Grange Road Google Streetview: September 2019.	1km	St. James's Park, St. Canice's Co-Ed National School, Loreto Secondary School and residential areas.	▪ Continuous provision of footpaths on both sides. ▪ Footpath narrows on some sections. ▪ Pedestrian environment could be improved through traffic calming and urban design measures around Loretto Secondary School.	▪ 1 uncontrolled pedestrian crossing. ▪ 1 signalised pedestrian crossing. ▪ Several junctions (incl. mini roundabout and entrances) with wide corner radii, increasing crossing time and distance, and reducing pedestrian safety. ▪ No pedestrian priority over local junctions. ▪ No dropped kerbs or tactile paving provided at mini roundabout near Lord Edward Street.
Freshford Road Google Streetview: May 2017/June 2017/ September 2019.	2.2km	Aut Even Hospital, St. Luke's General Hospital, Loreto Secondary School, St. James Park, Kilkenny Greyhound Stadium and a number of residential estates such as The Sycamores and Talbot's Gate.	▪ Sparse footpath provision on some sections of the northern half of the road, particular on the eastern side. ▪ No footpath provision beyond the entrance into Aut Even Hospital. ▪ Overall poor quality footpaths, i.e. narrow in parts, patching in poor condition.	▪ 1 controlled pedestrian crossing. ▪ No pedestrian crossing in the vicinity of St. Luke's Hospital or the bus stop.

4.2.4 Assessment of City Centre Network

Kilkenny has a relatively compact urban footprint lending itself to a walkable City Centre. The City's commercial centre is approximately 0.5km wide and 0.5km long, therefore making it possible to walk its extent in approximately 10-minutes (assuming a walking speed of 5kph). The concept of the '10-minute city' is a long-standing policy objective of Kilkenny County Council.

High-quality public realm and the City's unique heritage contribute to an overall attractive pedestrian environment. Characterised by its medieval origins, the City Centre contains a network of back lanes, or 'slips' as they are known locally, which are a particular feature of the overall townscape. Some serve as short cuts for pedestrians across the width of particularly long blocks and tend not to have active frontage, while others are narrow streets enclosed by shopfronts and residential developments fronting onto them such as Abbey Street and New Building Lane. These back lanes offer enhanced permeability and connectivity with the wider City and its environs.

However, the medieval fabric and street pattern of the City Centre also creates challenges in trying to cater for all modes. Many of the streets such as Rose Inn Street., Parliament Street and James Street are narrow in parts and heavily trafficked, presenting a challenging environment for pedestrians, particularly those with reduced mobility. The provision of on-street parking, taxi ranks and delivery facilities put further pressure on demand for street space.

High Street is the City Centre's main thoroughfare. The quality of the pedestrian environment along this street varies. Flower boxes, seating and high-quality paving contribute to an attractive public realm. However, the street attracts large volumes of vehicular traffic with several of the City's main car parks located in the vicinity. Furthermore, delivery bays and taxi ranks create pinch points for pedestrians on footpaths.

St. Kieran's Street, which runs parallel to High Street, was successfully pedestrianised with urban design improvements including seating, planters and street art contributing to the area's vibrancy. It joins Parliament Street to the north creating a small plaza.

The Parade, directly adjacent to Kilkenny Castle, is a grand civic space utilised as a place for gatherings, markets and festivals. The junction between The Parade, Patrick's Street and High Street is an area of high pedestrian activity with the main retail area and Kilkenny Castle attracting a lot of footfall. Whilst improvements have been made in recent years, further improvements are required to prioritise pedestrian movement and improve legibility at this location.

There are four bridges connecting the east and west banks of the River Nore in the City Centre:

- St. John's Bridge: Narrow footpaths on both sides;
- Lady Desart Bridge: Pedestrian bridge;
- St. Francis Bridge: Footpaths on both sides; and
- Green's Bridge: Narrow footpath on one side.

4.2.5 Examples of Pedestrian Network Issues

Table 4-2 highlights examples of issues on the existing pedestrian network in terms of pavement conditions and junction treatment.

Table 4-2 Examples of Pedestrian Network Issues. Source: Google Streetview.

Pavement Conditions	 Example of a section of good quality pavement with no visible defects or obstructions on Castlecomer Road (September 2019).	 Example of patching in poor condition and sunken ironwork along the dropped kerb on Castlecomer Road. No tactile paving provided (September 2019).	 Narrow footpath, with no tactile paving on Castlecomer Road (September 2019).	 Example of rutting and ravelling of shared pedestrian/cycle facility on Bohernatounish Road (September 2019).
Junction Treatment	 Multi-stage crossing and guardrails on one arm of the roundabout on Waterford Road (May 2017).	 The corner radii are quite wide at some junctions, increasing crossing time and distance for pedestrians. Footpaths rarely continue at grade across entrances to housing estates. No tactile paving is provided at this example on Johnswell Road (September 2019).	 While dropped kerbs and tactile paving is provided, pedestrians have no priority at roundabouts throughout the Study Area (May 2017).	 Multi-stage crossings, slips lanes and guardrails at MacDonagh Junction all negatively impact on the legibility and safety of the junction for pedestrians (September 2019).
Public Realm	 Attractive public realm with street trees, seating, high-quality paving and flowers leading onto pedestrianised St. Kieran's Street from High Street (September 2019).	 There is little to no seating provided along the radial routes in/out of the City Centre. Some seating areas are provided on Golflinks Road (as shown) and Dublin Road. The provision of rest areas would serve to enable older adults and vulnerable pedestrians who may have reduced mobility to walk more (May 2017).	 There are long continuous stretches of walls (e.g. Johnswell Road) and building lines set back from the road, along many of the radial routes. These offer no passive surveillance and impede permeability. Furthermore, shared pedestrian/cycle facilities are present across the Study Area, such as at the location pictured here on Johnswell Road. These reduce the Level of Service for both pedestrians and cyclists as outlined in Section 4.3.3 (September 2019).	 There is a proliferation of guardrails across the Study Area. Guardrails can be a hazard for cyclists, reduce footpath widths, create visual clutter and give rise to feelings of constraint and restriction to pedestrian movement (September 2019).

4.3 Cycle Network Audit

4.3.1 Introduction

Kilkenny is relatively flat and compact with 75% of its population living within a 10-minute catchment of the City Centre, making it an ideal location for both leisure and utility cycling. The concept of the '10-minutes city' is a long-standing policy objective of Kilkenny County Council. Assuming an average cycling speed of 12kph, it is possible to cover 2km to/from the City Centre in 10-minutes. Depending on the link type, Quality of Service and other variables regarding the cycle network, an average cycling speed of between 12kph and 20kph is usually assumed.

This section provides an overview and high-level assessment of Kilkenny's existing cycle network in relation to its Quality of Service (QoS). The baseline conditions have been informed by a desktop review of the most recent aerial photography and Google Streetview.

There are a number of different existing facility types in place within the Study Area, including cycle lanes, shared facilities and greenways as illustrated in Figure 4-7.

4.3.2 Methodology

The National Transport Authority (NTA) has developed a methodology to quantify the attributes and needs of cyclists along a particular route, and is outlined in the *National Cycle Manual* (NCM). The assessment is based on reviewing the quality of the cycling environment to identify the route's Quality of Service (QoS). The appropriate QoS is influenced by the characteristics of vehicular, cycle and pedestrian traffic and by network characteristics. Higher Quality of Service is required to attract risk-averse cyclists and meet the five needs of the cyclist:

- Road Safety;
- Coherence;
- Directness;
- Attractiveness; and
- Comfort.

The following five criteria are recorded to identify the QoS of each route:

- **Pavement Conditions Index:** Visual inspection is a measure of the physical integrity of the cycling surface. It is determined by comprehensive visual inspection as set down by the Department of Transport, Tourism and Sport (DTTaS) within their 2013 guidance, *Urban Flexible Roads Pavements*;
- **Number of Adjacent Cyclists (width):** Capacity for cycling two abreast and/or overtaking. "2+1" accommodates two abreast plus one overtaking;
- **Number of Conflicts per 100m:** Measure of the potential interruptions to a cyclist per 100m and may include bus stops, side-roads, driveways, entrances, junctions, pedestrian crossings, parking and loading etc.;
- **Junction Time Delay:** Measure of the time delay at junctions as a percentage of the overall journey time, assuming an average journey speed of 15km; and
- **HGV Influence:** Measures of the number of HGVs and buses adjacent to a cyclist as a percentage of the total traffic during peak hours.

The *National Cycle Manual* sets thresholds/values for each criterion. As outlined in Table 4-3, the QoS is ranked from Level A+ (highest) to Level D (lowest). To achieve the overall QoS level for cycling facilities, at least three of the four criteria must be achieved. The fourth may be no more than one level lower.

Table 4-3 Quality of Service Evaluation of Existing Cycle Facilities. Source: Pg.10, National Cycle Manual, National Transport Authority.

Quality of Service	Pavement Condition (PCI Range)	Number of Adjacent Cyclists	Number of Conflicts per 100m of Route	Journey Time Delay	HGV Influence
Level A+	86-100	2+1	0-1	0-5%	0-1%
Level A	66-85	1+1	0-1	6-10%	0-1%
Level B	51-65	1+1	1-3	11-25%	2-5%
Level C	41-50	1+0	4-10	26-50%	6-10%
Level D	20-40	1+0	>10	>50%	>10%

For the purposes of this assessment, Junction Treatment has been reviewed for each route instead of Journey Time Delay, as set out in Table 4-4. This is in line with the methodology developed for BusConnects Dublin, in agreement with the NTA. Roundabouts, junctions and crossings can all have a fundamental impact on the cycling network and the five needs of the cyclist: Road Safety, Coherence, Attractiveness, Comfort, and Directness. Assessing junction treatment in relation to cyclists, therefore, presents a greater insight in determining the quality of the cycling infrastructure.

Table 4-4 QoS Evaluation of the Junction Treatment.

QoS	Junction Treatment
A+	Traverse junction without stopping.
A	Cyclists stop but have green signal priority.
B	Toucan crossing.
C	Cyclists share green with traffic.
D	No specific bicycle facilities.

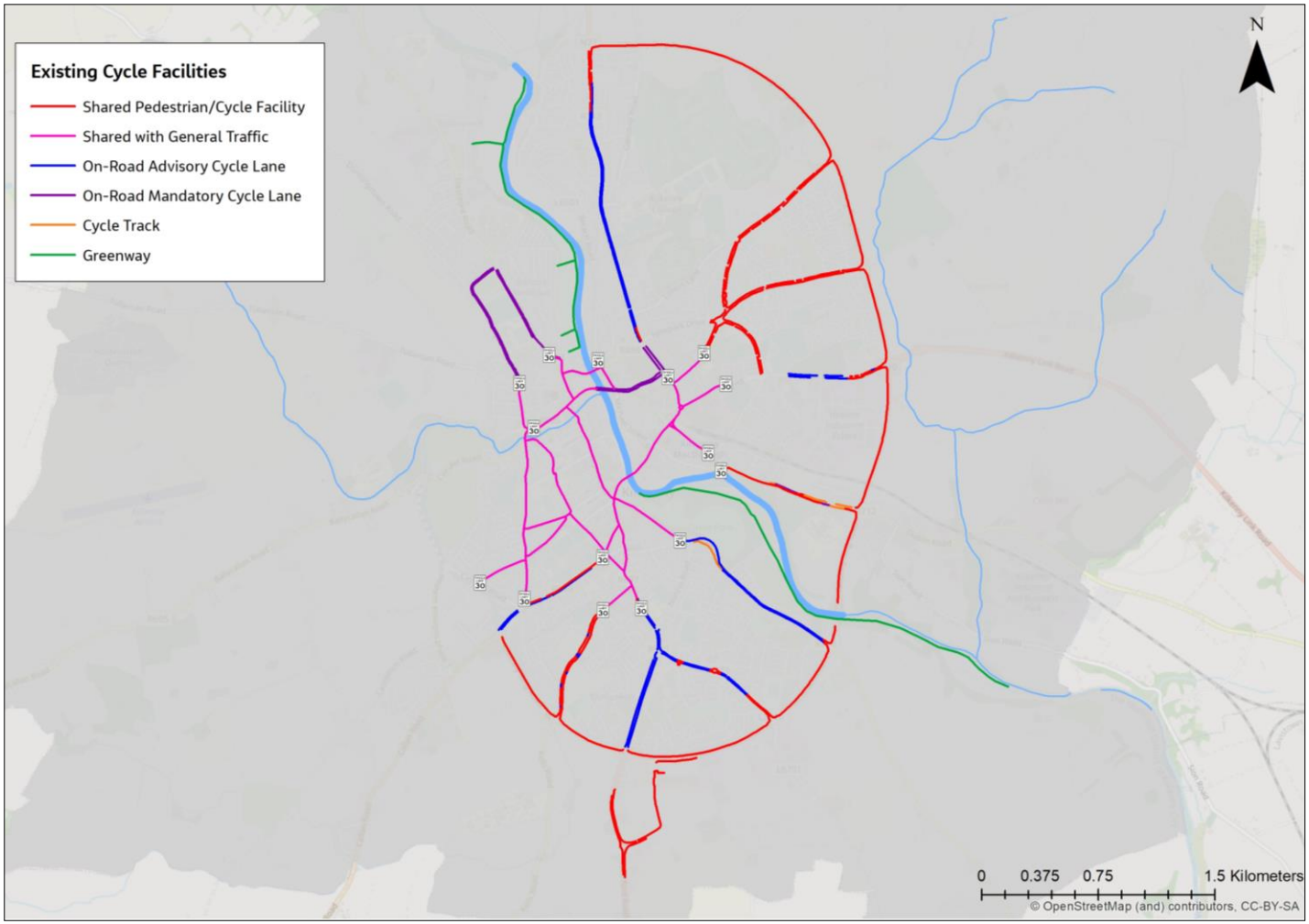


Figure 4-7 Existing Cycle Facilities.

4.3.3 Existing Cycle Facilities

Figure 4-7 presents the existing cycle facilities in the Study Area. There are a number of different facility types in place, including cycle lanes and shared facilities. A description of each as per the NTA's *National Cycle Manual* is outlined below.

Shared Cycle/Pedestrian Facility (Shared Facility)

Shared facilities are where pedestrians and cyclists share the same path. In many cases, the path is separated by a painted white line to delineate space for pedestrians and cyclists. However, this approach is not recommended by the *National Cycle Manual*. Even with good signage, pedestrians frequently disregard these lines and will walk or stand on the cycling side.

Furthermore, this type of facility can hinder accessibility for those who are visually impaired, as they rely on a longitudinal kerb to demarcate the edge of the footpath. The kerb provides a tapping edge to help them negotiate their way along the footpath. Importantly, the level change tells them which surface the footpath is and which is the road, cycle facility or other surface. The principle of "Up = Safe" is of fundamental importance to the visually impaired.

The *National Cycle Manual* states that shared facilities can "result in reduced Quality of Service for both modes. With the exception of purpose-designed shared streets, shared facilities should be avoided in urban areas as far as possible". However, the Manual states that shared facilities might be appropriate at locations where footpaths are wide and the volume of pedestrians and cyclists is low, or at particular infrastructure features.

Where shared facilities cannot be avoided, there are a number of considerations that will help both cyclists and pedestrians to be aware of the other's presence:

- Pedestrian should always have priority, reinforced by signage;
- Cyclists should consider themselves as 'cycling on the footpath';
- Segregate pedestrians and cyclists vertically and/or horizontally;
- Delineation markings should not be used as they give cyclists an incorrect sense of a dedicated cycle space;
- Sufficient width of footpath and cycle track will help both modes to travel in comfort;
- Sufficient width to facilitate evasive action and/or avoidance of potential conflict;
- Shared facilities next to vehicular traffic should have a minimum combined width 3.0m; and
- Cycling alignment and speed reduction measures should be considered.

Shared with General Traffic

These are streets where no dedicated cycle infrastructure is provided, and cyclists share the road with motor traffic. The *National Cycle Manual* sets out that this approach is suitable in low traffic single lane environments where the maximum speed limit is 30kph.

Mandatory Cycle Lane

Mandatory Cycle Lanes are marked by a continuous white line which prohibits motorised traffic from entering the lane, except for access. Parking is not permitted on mandatory cycle lanes. Mandatory Cycle Lanes are 24 hours unless time plated in which case, they are no longer cycle lanes.

Advisory Cycle Lane

Advisory Cycle Lanes are marked by a broken white line which allows motorised traffic to enter or cross the lane. They are used where a Mandatory Cycle Lane leaves insufficient residual road space for traffic, and at junctions where traffic needs to turn across the cycle lane. Parking is not permitted on advisory cycle lanes other than for set down and loading. Advisory cycle lanes are 24 hours unless time plated.

Cycle Track

Cycle Tracks are different from Cycle Lanes in that they are physically segregated from motorised traffic. This is achieved by either a kerb with a level change, bollards etc. They have limited points of access and egress and therefore these locations need to be carefully detailed. Cycle Tracks are generally for situations where the traffic regime is unsuitable for cycling and cannot be otherwise mitigated. For this reason, it is important that cycle tracks retain their function at all times – otherwise cyclists may be forced into an unsuitable traffic regime. The transitions from Cycle Track to Cycle Lane and vice versa are central to the success of Cycle Tracks.

4.3.4 Existing Demand

Figure 4-8 illustrates the existing cycling demand during the AM peak period based on the outputs of link flow analysis undertaken using the SERM.

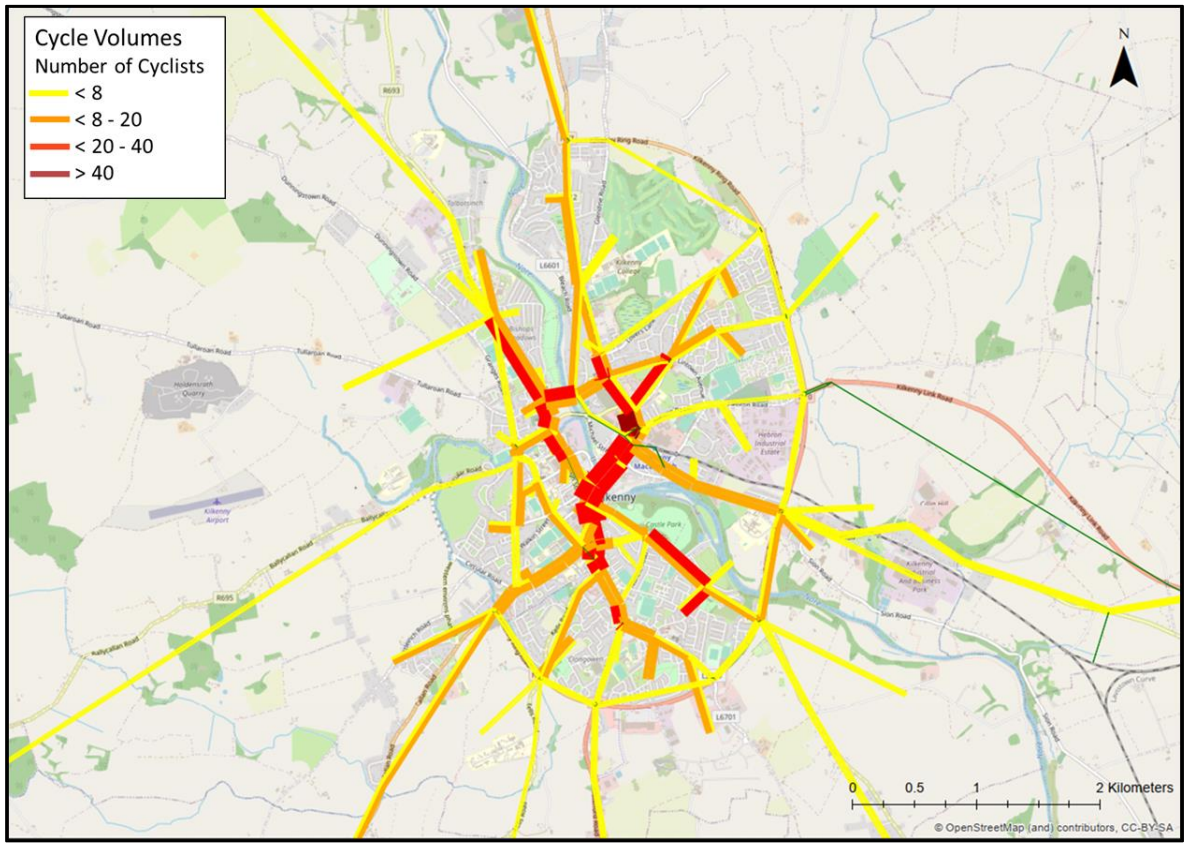


Figure 4-8 AM Peak Cycling Volumes

4.3.5 Assessment of Radial Routes

An assessment of the existing cycle facilities on the radial routes in line with the methodology outlined in Section 4.3.2 has been undertaken and is presented in Table 4-6.

The radial routes that have been assessed are those that currently experience the highest demand, as illustrated in Figure 4-8.

Table 4-5 shows the colour coding for each Quality of Service Level.

Table 4-5 Quality of Service Colour Coding.

Quality of Service	Colour Code
Level A+	
Level A	
Level B	
Level C	
Level D	

Table 4-6 Cycle Network Audit

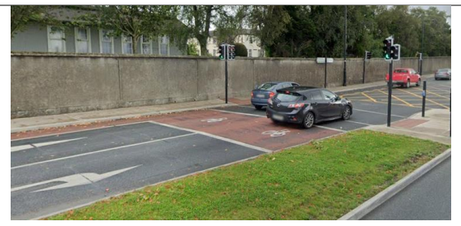
Road Name	Length (approx.)	Key Origins/Destinations	Overview	Pavement Conditions	No. of Adjacent Cyclists	No. of Conflicts per 100m	HGV Influence	Junction Treatment	QoS
Castlecomer Road Google Streetview: September 2019/August 2018. Small section between Richview and Glendine Inn dates from June 2009.	1.9km	Kilkenny College, Kilkenny Model School and many residential estates such as The Weir View, Glenbawn and Meadow Way.	The cycle facilities between Castlecomer Road Roundabout and New Road Roundabout comprise of a mixture of advisory cycle lanes and shared facilities. Shared facilities, whilst segregated from vehicular traffic, are not recommended by the *National Cycle Manual* as the optimal solution as they generally result in reduced Quality of Service for pedestrians and cyclists.	50 - some very localised structural distress like edge break-up and rutting, particularly at junctions. Patching in good condition. Some ravelling present. Surface distortion at driveways. QoS Level C	Southbound QoS Level C Northbound QoS Level C	Southbound QoS Level D Northbound QoS Level D	QoS Level B	**2 Signalised Pedestrian Crossings:** ▪ Cycle lanes are present. Cyclists share green with traffic. ▪ Cycle lane ends before junction due to footpath build-out. Cyclists share green with traffic. **1 Roundabout:** ▪ Tactile paving is provided at each arm, however there are no dedicated cycling facilities for cyclists to navigate the roundabout safely. They must either dismount and cross, or cycle with general traffic. **Entrances:** ▪ In most cases, cycle facilities continue across entrances. QoS Level C	**QoS C**
Castlecomer New Road Google Streetview: September 2019.	600m	Street is lined with individual houses and a number of commercial outlets such as Lenehan's, Ladbrokes, King's Cuts and the Driver Theory Test Centre.	The cycle facilities between New Road Roundabout and the junction with Dublin Road comprise of mandatory cycle lanes on both sides of the carriageway. Southbound, cycle lanes are provided up to the junction with Ballybought Street. Northbound, cycle lanes are provided between New Road Roundabout and signalised junction with Old Mart Road. The provision for cyclists at junctions is poor.	80 - Generally good pavement quality. Some ravelling present. QoS Level A	Southbound QoS Level C Northbound QoS Level C	Southbound QoS Level B Northbound QoS Level B	QoS Level B	**2 Signalised Junctions:** ▪ Cycle lanes and ASLs are present. Cyclists share green with traffic. Toucan crossing present. ▪ No cycle facilities. Within 30kph zone. **1 Roundabout:** ▪ There are no dedicated cycling facilities for cyclists to navigate the roundabout safely. Cycle lanes end on the approach to the roundabout. They must either dismount and cross, or cycle with general traffic. QoS Level C	**QoS C**
New Orchard Road Google Streetview: September 2019	790m	Residential estates such as The Orchard, Ashfield and The Fairways. Some permeability is provided through these residential estates for pedestrians and cyclists onto Johnswell Road which runs in parallel to the south.	The cycle facilities between New Orchard Road Roundabout and the junction with Golf Links Road comprise of shared facilities on both sides of the carriageway. Shared facilities, whilst segregated from vehicular traffic, are not recommended by the *National Cycle Manual* as the optimal solution as they generally result in reduced Quality of Service for pedestrians and cyclists.	80 - Generally good pavement quality. Some ravelling present. QoS Level A	Westbound QOS Level B Eastbound QoS Level B	Westbound QoS Level B Eastbound QoS Level B	QoS Level C	**2 Uncontrolled Pedestrian Crossings:** ▪ Belisha beacons present on both sides within the cycle facility. **1 Roundabout:** ▪ No priority given to cyclists. Dropped kerbs are provided. **Entrances:** ▪ Cyclists do not have priority in most cases. QoS Level C	**QoS C**
Golflinks Road Google Streetview: September 2019.	1km	Runs in a north-south direction connecting New Orchard Road to Johnswell Road and Castlecomer Road. Many residential estates, Newpark Shopping Centre and St. John's Senior National School.	The cycle facilities between the junction with New Orchard Road and Ballybought Street, via Johnswell Road, comprise of continuous shared facilities on both sides of the carriageway. Shared facilities, whilst segregated from vehicular traffic, are not recommended by the *National Cycle Manual* as the optimal solution as they generally result in reduced Quality of Service for pedestrians and cyclists.	90. Overall good quality of pavement. Very few issues. Some localised ravelling at junctions. QoS Level A+	Southbound QoS Level B Northbound QoS Level B	Southbound QoS Level B Northbound QoS Level B	QoS Level B	**4 Uncontrolled Crossings:** ▪ Where there are shared facilities, belisha beacons are located in the middle of the cycle facility. **1 Signalised Junction:** ▪ No dedicated cycle provision. **2 Roundabouts:** ▪ No priority given to cyclists. Dropped kerbs are provided. **Entrances:** ▪ Cyclists do not have priority in most instances. QoS Level D	**QoS B**

Road Name	Length (approx.)	Key Origins/Destinations	Overview	Pavement Conditions	No. of Adjacent Cyclists	No. of Conflicts per 100m	HGV Influence	Junction Treatment	QoS
Johnswell Road Google Streetview: September 2019.	1km	Many residential estates and LIDL. Some permeability is provided through these residential estates for pedestrians and cyclists onto New Orchard Road which runs in parallel to the north, and Hebron Road which runs in parallel to the south.	The cycle facilities between Johnswell Road Roundabout and Newpark Drive Roundabout comprise of continuous shared facilities on both sides of the carriageway. Shared facilities, whilst segregated from vehicular traffic, are not recommended by the *National Cycle Manual* as the optimal solution as they generally result in reduced Quality of Service for pedestrians and cyclists.	70. Overall good quality. Extensive sections of ravelling and some localised bleeding. A few instances of sunken ironworks. QoS Level A.	Westbound QoS Level B Eastbound QoS Level B	Westbound QoS Level B Eastbound QoS Level B	QoS Level B	**1 Signalised Pedestrian Crossing:** ▪ As there is a shared facility, cyclists can move straight through this junction. **1 Roundabout:** ▪ Poor provision for cyclists to navigate this roundabout safely. **Entrances:** ▪ Cyclists do not have priority across most entrances. QoS Level C	**QoS B**
Hebron Road Google Streetview: September 2019.	1.3km	Nowlan Park, O'Loughlin GAA Gaels Club, Intreo Centre, ALDI, many residential and industrial estates.	The cycle facilities between Hebron Road Roundabout and the junction with Castlecomer New Road comprise of a very sparse and inconsistent provision of shared facilities and advisory cycle lanes on both sides of the carriageway with lanes stopping and starting abruptly. Shared facilities, whilst segregated from vehicular traffic, are not recommended by the National Cycle Manual as the optimal solution as they generally result in reduced Quality of Service for pedestrians and cyclists.	60 - Some surface opening issues around manholes and ironworks such as cracking and depressions. Well sealed patching. Some raveling present. Surface distortion at driveways. QoS Level B.	Westbound QoS Level C Eastbound QoS Level C	Westbound QoS Level B Eastbound QoS Level B	QoS Level C	**1 Signalised Junction:** ▪ No cycle provision. **2 Roundabouts:** ▪ No dedicated provision for cyclists. **Entrances:** ▪ In most cases, cyclists do not have priority. QoS Level D	**QoS D**
Dublin Road Google Streetview: September 2019.	1.3km	St. Canice's Hospital, Kilkenny MacDonagh Train Station, several residential estates such as Shandon Park and Lacken Drive and a number of industrial estates outside of the Kilkenny Ring Road in the Leggettsrath area.	The cycle facilities between Old Dublin Road Roundabout and the junction with Castlecomer New Road are of mixed quality and typology. Westbound, there is a mixed provision of advisory cycle lanes and shared facilities up to the junction with Maudlin Street. Eastbound, there is intermittent provision of advisory cycle lanes and shared facilities.	50 - Some ravelling present. A number of narrow cracks. A couple of isolated incidents of failed pavement in the vicinity of ironworks. QoS Level C	Westbound QoS Level C Eastbound QoS Level C	Westbound QoS Level B Eastbound QoS Level B	QoS Level C	**2 Signalised Pedestrian Crossings:** ▪ Cyclists can move straight through as they are on a shared facility. Traffic lights, guardrails and a utility box located within cycle path of the shared facility. **1 Signalised Junction:** ▪ Located near MacDonagh Junction. No dedicated cycle facilities. **2 Mini Roundabouts** ▪ No dedicated cycle facilities. QoS Level C	**QoS C**
Bennettsbridge Road/Castle Road Google Streetview: May 2017/September 2019.	1.3km	Many residential areas such as Larchfield, Dukesmeadow Avenue and Melville Heights.	The cycle facilities along this route comprise of continuous advisory cycle lanes up to 30kph zone, on both sides of the carriageway. There is a section of the inbound cycle lane which is off-road and provides access to Tigh Anthony and Fanad House.	50 - Extensive ravelling present. A number of narrow cracks. A couple of isolated incidents of failed pavement in the vicinity of ironworks. Patching in good condition. QoS Level C	Northbound QoS Level C Southbound QoS Level C	Northbound QoS Level B Southbound QoS Level B	QoS Level B	**1 Pedestrian Crossing:** ▪ Cycle lane present. Share green with general traffic. **Entrances:** ▪ In most cases, cycle facilities continue across. QoS Level C	**QoS C**

Road Name	Length (approx.)	Key Origins/Destinations	Overview	Pavement Conditions	No. of Adjacent Cyclists	No. of Conflicts per 100m	HGV Influence	Junction Treatment	QoS
Bohernatounish Road Google Streetview: September 2019/May 2017.	900m	Loughboy Shopping Centre, Presentation Secondary School, The Watershed sports complex, LIDl, ALDI and a number of residential estates. Route also extends beyond the Kilkenny Ring Road to the IDA Kilkenny Business and Technology Park.	The cycle facilities along this route from Bohernatounish Road Roundabout to the junction with Waterford Road comprise of continuous advisory cycle lanes on both sides of the carriageway, with 200m of shared facilities on the approach to and from the Bohernatounish Road Roundabout. Shared facilities, whilst segregated from vehicular traffic, are not recommended by the *National Cycle Manual* as the optimal solution as they generally result in reduced Quality of Service for pedestrians and cyclists. There are some areas where cyclists must dismount or travel on road because the cycle facilities are disconnected at the intersections.	60 - Extensive ravelling. Narrow cracking on edge of pavement. QoS Level B	Northbound QoS Level B Southbound QoS Level B	Northbound QoS Level B Southbound QoS Level B	QoS Level B	**3 Signalised Pedestrian Crossings:** ▪ Cycle lanes present. Cyclists share green time with general traffic. Outbound cycle lane disappears either side of the crossing, forcing cyclists to dismount or share the general traffic lane. ▪ Cycle lanes present. Cyclists share green time with general traffic. **2 Mini Roundabout:** ▪ Shared facility allows cyclists to move around the roundabout relatively safely. **1 Roundabout:** ▪ No dedicated cycle facilities. **Entrances:** ▪ In most instances, cyclists do not have priority across entrances. QoS Level C	**QoS B**
Waterford Road Google Streetview: September 2019/May 2017.	1.2km	Kilkenny Project National School, LIDL, ALDI, St. John of God National School and several residential estates such as Hollybank Park and Hawthorn Walk.	The cycle facilities along this route from Waterford Road Roundabout and Upper Patrick Street comprise of a continuous provision of advisory cycle lanes on both sides of the carriageway.	60 - Extensive ravelling. Narrow cracking on edge of pavement. QoS Level B	Northbound QoS Level B Southbound QoS Level B	Northbound QoS Level C OUTBOUND QoS Level C	QoS Level B	**1 Signalised Pedestrian:** ▪ Cycle lanes present. Cyclists share green time with general traffic. **2 Roundabouts:** ▪ Cycle lanes stop at each arm of the roundabout. QoS Level D	**QoS B**
Kells Road Google Streetview: September 2019.	800m	Many residential estates such as Maiden Hill, Rose Garden and The Paddocks.	The cycle facilities from Kells Road Roundabout to Corcoran Terrace comprise of a continuous provision of shared facilities and advisory cycle lanes between Ring Road and 30kph zone on both sides of the carriageway. Shared facilities, whilst segregated from vehicular traffic, are not recommended by the *National Cycle Manual* as the optimal solution as they generally result in reduced Quality of Service for pedestrians and cyclists.	80 - Generally good pavement quality. Some ravelling present. QoS Level A	Eastbound QoS Level B Westbound QoS Level B	Eastbound QoS Level B Westbound QoS Level B	QoS Level B	**1 Uncontrolled Pedestrian Crossing:** ▪ No cycle facilities. Can traverse junction without stopping if no pedestrians crossing. Within 30kph zone. QoS Level A+	**QoS B**
College Road Google Streetview: May 2017.	900m	St. Kiernan's College, a number of retail outlets such as Spar and Centra, St. Patrick's Catholic Church and several residential estates such as College Square.	The cycle facilities along this route from College Road Roundabout to Lower New Street comprise of an intermittent mix of advisory cycle lanes and shared facilities on both sides of the carriageway. Shared facilities, whilst segregated from vehicular traffic, are not recommended by the *National Cycle Manual* as the optimal solution as they generally result in reduced Quality of Service for pedestrians and cyclists.	60 - Extensive raveling. Some areas of patching and utility repairs in fair condition. QoS Level B	Eastbound QoS Level B Westbound QoS Level B	Eastbound QoS Level B Westbound QoS Level C	QoS Level B	**1 Mini Roundabout:** ▪ No dedicated provision for cyclists. **2 Signalised Pedestrian Crossings:** ▪ Inbound shared facility allows cyclists to travel through junction. Outbound cycle lane disappears either side of the crossing, forcing cyclists to dismount or share the general traffic lane. **1 Signalised Junction:** ▪ No dedicated cycle facilities. Shared facility ends before junction on the approach to the City Centre forcing cyclists to dismount. QoS Level C	**QoS B**

Road Name	Length (approx.)	Key Origins/Destinations	Overview	Pavement Conditions	No. of Adjacent Cyclists	No. of Conflicts per 100m	HGV Influence	Junction Treatment	QoS
Parkview Drive/Grange Road Google Streetview: September 2019.	1km	St. James's Park, St. Canice's Co-Ed National School, Loreto Secondary School and residential areas.	The cycle facilities along this route from Parkview Drive to Butt's Green/Thomas's Square on Grange Road comprise of narrow mandatory cycle lane in both directions with o physical segregation from general traffic. Filtered permeability allows cyclists to travel off-road to Dean Street from Butt's Green, avoiding the roundabout.	60 - Bleeding, raveling, depressions around drains, QoS Level B	Southbound QoS Level D Northbound QoS Level D	Southbound QoS Level C Northbound QoS Level C	QoS Level C	**1 Uncontrolled Pedestrian Crossing:** ▪ Cycle lanes present. **1 Signalised Pedestrian Crossing:** ▪ Cycle lanes disappear either side of the crossing, forcing cyclists to dismount or share the general traffic lane. **Entrances:** ▪ Cycle facilities do not always continue across entrances. QoS Level C	**QoS C**
Freshford Road Google Streetview: May 2017/June 2017/ September 2019.	2.2km	Aut Even Hospital, St. Luke's General Hospital, Loreto Secondary School, St. James Park, Kilkenny Greyhound Stadium and a number of residential estates such as The Sycamores and Talbot's Gate.	The cycle facilities along this route from Aut Even Hospital to Green Street comprise of mandatory cycle lanes from The Sycamores on both sides until the 30kph zone. No physical segregation from general traffic.	70 - Overall good quality pavement. Extensive sections of ravelling. QoS Level A	Southbound QoS Level D Northbound QoS Level D	Southbound QoS Level B Northbound QoS Level B	QoS Level B	**1 Mini Roundabout:** ▪ No dedicated provision for cyclists. **1 Signalised Pedestrian Crossing:** ▪ Cycle lanes stop either side of the crossing, forcing cyclists to dismount or share the general traffic lane. **Entrances:** ▪ In most instances, cycle facilities continue across junctions. QoS Level C	**QoS D**
Kilkenny Ring Road Google Streetview: September 2019.	7.8km	The Kilkenny Ring Road is an orbital route comprising the N76, N10 and N77. This orbital route bounds most of the Study Area, stretching from the south-west at Callan Road to the north at Castlecomer Road. It connects all National roads in the Study Area, the main radial routes and a number of Local roads providing access to residential developments and the Loughboy IDA Business and Technology Park.	The cycle facilities along the Ring Road comprise of a bidirectional shared facility on one side of the carriageway, separated from the road by a grass verge. This facility is continuous, except for the river crossing (N10) and by eight roundabouts which have low levels of provision for cyclists.	90 - Overall good quality of pavement. Very few issues. Some localised raveling and cracked tactile paving at junctions. QoS Level A+	QoS Level B	QoS Level A	QoS Level C	**10 Roundabouts** ▪ Dropped kerbs from the shared facilities and central islands are provided for cyclists to navigate the roundabouts and are afforded some level of segregation. However, cyclists do not have priority and may have to cross many times making it indirect and uncomfortable. **Entrance to Kilkenny Retail Park** ▪ No provision for cyclists to cross from shared facility into Kilkenny Retail Park directly. Cyclists must access the Park indirectly via Waterford Road Roundabout or Bohernatounish Road Roundabout. QoS D	**QoS D**

Table 4-7 Examples of Issues on Radial Routes of the Existing Cycle Network. Source: Google Streetview.

Pavement Conditions	 Example of extensive ravelling of cycle lane on Dublin Road (September 2019).	 Example of patching in poor condition and sunken ironwork along the dropped kerb (September 2019)	 Example of edge break-up, rutting and ravelling on Castlecomer Road (September 2019).	 Example of a section of good quality pavement with no visible defects (May 2017).
Junction Treatment	 Guardrails and utility box cause obstructions for cyclists at this signalised crossing on Dublin Road (September 2019).	 No priority for cyclists or pedestrians across many junctions/accesses throughout the Study Area. This example is located on Johnswell Road (September 2019).	 No provision for cyclists on New Road Roundabout on Castlecomer Road/Newpark Drive (May 2017).	 Cycle lane stops at both sides of crossing and no Advance Stacking Location (ASL) is provided for cyclists. This example is located outside Loreto Secondary School (September 2019).
	 Cycle lane continues across this entrance on Kells Road. However, the legibility of this junction for cyclists turning right is poor and is further hindered by the presence of guardrails on the central island (September 2019).	 Advance Stacking Location (ASL) for cyclists provided on some arms of this junction on Castlecomer Road, but not all (September 2019).	 There is a proliferation of roundabouts throughout the Study Area. Dropped kerbs are provided in most instances where there is a cycle track, but there is no priority for cyclists (September 2019).	 Cycle facility ends here at this junction with Castlecomer Road/Lower New Street forcing cyclists to dismount (September 2019).
Other Issues	 Path is indented at sharp angles to facilitate perpendicular parking (September 2019).	 Belisha beacons located in the middle of the cycle facility. There are several examples of these located on New Orchard Road and Golflinks Road (September 2019).	 Shared cyclist/pedestrian facilities account for a significant proportion of the existing cycle facilities. The *National Cycle Manual* states that shared facilities result in reduced QoS for both modes and should be avoided in urban areas as they are particularly problematic for those who are visually impaired (September 2019).	 No provision for cyclists to access Kilkenny Retail Park from shared facility. Cyclists must continue to Waterford Road Roundabout or Bohernatounish Road Roundabout to access the Park (September 2019).

4.3.6 City Centre Network

As can be seen from Figure 4-7, there are no dedicated cycling facilities in the City Centre Core within which cyclists share the road with general traffic. The speed limit in this area, as highlighted by the map, is 30kph.

This approach is in line with the *National Cycle Manual* and DMURS, as can be seen from Figure 4-9 which is a guidance graph for the provision of cycle facilities based on traffic speed and volume. There is potential for improvements to the cycle network within the City Centre, however, through traffic reduction measures and junction improvements, to ensure that people of all ages and abilities feel safe and comfortable cycling around the City.

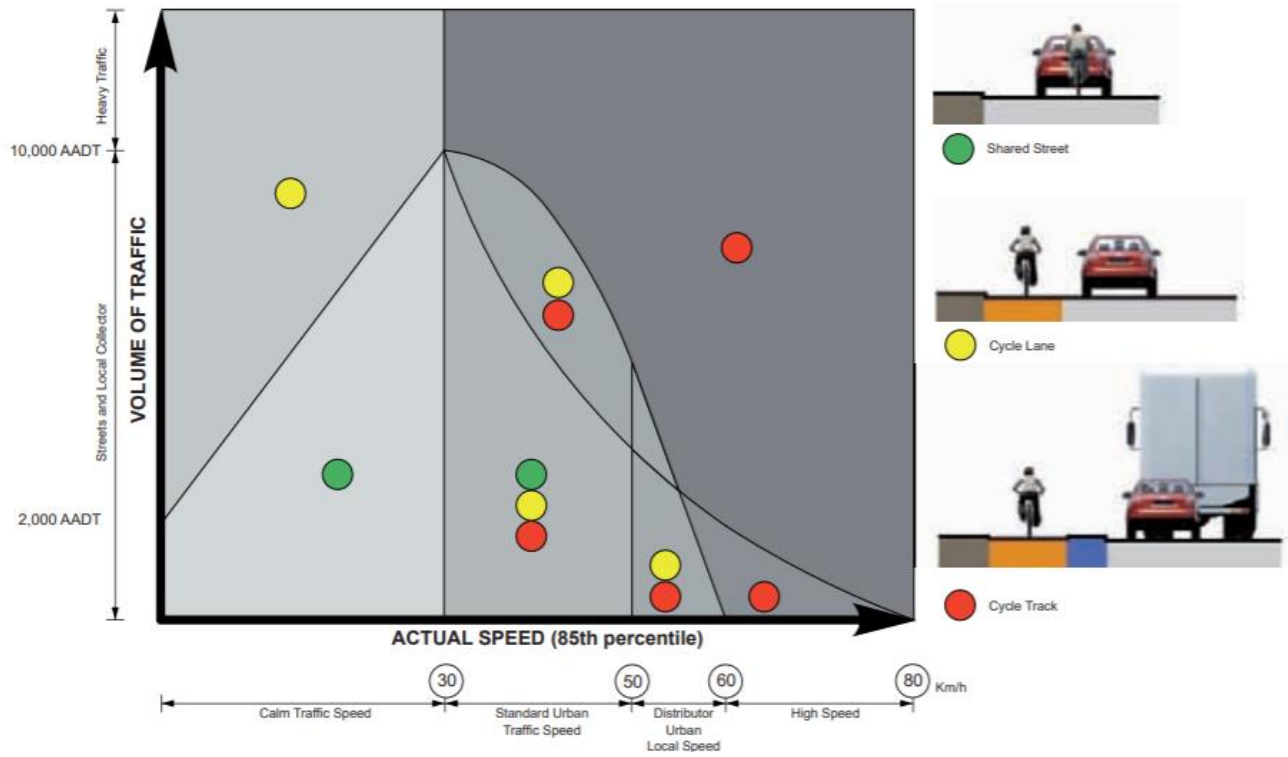


Figure 4-9 Guidance Graph for the Provision of Cycle Facilities Based on Traffic Speed and Volume. Source: Section 1.7.4, National Cycle Manual, National Transport Authority.

4.4 Permeability Assessment

4.4.1 Introduction

Providing for permeability is an essential component of supporting a more walkable and cycle friendly Kilkenny City and environs. Good permeability is achieved through direct connections between origins and destinations that are accessible, safe and secure. A fully permeable environment for pedestrians and cyclists provides a competitive advantage over motorised forms, particularly the private car; thereby incentivising walking and cycling as the modes of choice.

The following section presents a high-level permeability assessment of the Study Area highlighting existing barriers to permeability, which can also be viewed as opportunities to improve permeability. This analysis has been informed by a desktop review of the most recent aerial photography and Google Streetview.

4.4.2 Permeability Assessment

Figure 4-10 highlights existing barriers to permeability in the Study Area. Major barriers to permeability include the River Nore, River Breagagh, the railway line and the Kilkenny Ring Road. In general pedestrian and cycle permeability is relatively good in Kilkenny with the networks typically catering for movements between parallel radial streets. There is a proliferation of barriers such as cul-de-sacs and continuous stretches of walls around residential estates and schools with few entrances for pedestrians.

Figure 4-10 Barriers to Permeability throughout the Study Area.

4.4.3 Examples of Existing Permeability Barriers

At present, there are some areas with good levels of internal permeability such as within residential estates adjacent to Johnswell Road. There are still many areas, however, surrounded by walls, fences and cul-de-sacs which pose significant barriers to pedestrian movement as illustrated by Figure 4-10. The following Figures illustrate examples of poor permeability.

Johnswell Road

Figure 4-11 shows the distance one must travel at present from a point in Lintown Grove to Newpark Shopping Centre; either 500m or 650m, depending on the route. The distance between these two points as the crow flies is approximately 40m. Permeability could be easily provided by removing a section of the wall.

Figure 4-11 Lintown Grove to Newpark Shopping Centre. Source: Google Maps.

Presentation Secondary School

Figure 4-12 shows the distance one must travel between the Presentation Secondary School and the entrance to Hollybank Park; 850m. The distance between these two points as the crow flies is approximately 130m. Permeability may be difficult to create here in the short-term due to a row of individual dwellings, but it should be an objective to promote permeability between schools and surrounding residential areas to increase the walking and cycling catchment.

Figure 4-12 Residential estates adjacent to Waterford Road to Presentation Secondary School. Source: Google Maps.

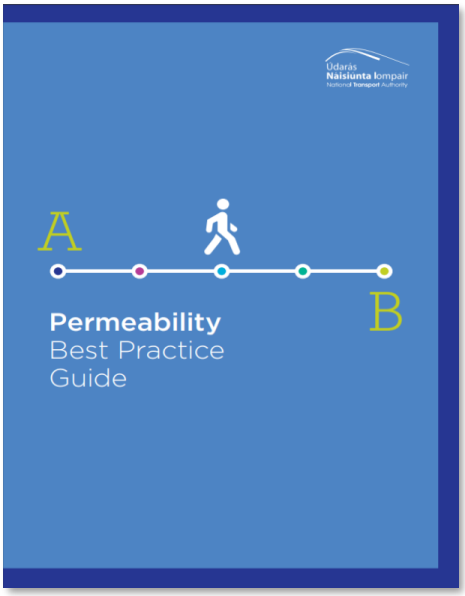
Kilkenny Project National School

Similarly, Figure 4-13 shows the distance one must travel between Kilkenny Project National School to Hollybank Lane; 600m. The distance between these two points as the crow flies is approximately 30m. Permeability could be easily provided by removing a section of the wall, thereby increasing the walking and cycling catchment of the school.

Figure 4-13 Kilkenny Project National School to Hollybank Lane. Source: Google Maps.

4.4.4 Recommendations to Improve Permeability

Opportunities to improve permeability to existing developed areas and overcome the barriers identified in Figure 4-10 should be actively sought in conjunction with the implementation of the public transport, pedestrian and cycle network enhancements proposed by the Kilkenny Local Transport Plan.



The National Transport Authority's *Permeability Best Practice Guide* outlines measures to address the legacy of severance built-in to recent development.

Permeability measures could include:

- Direct, high-quality pedestrian connections matching desire lines to bus stops and key destinations;
- Pedestrian and cycle crossings to link areas that are separated by roads or other physical barriers such as the River Nore or railway line;
- Planning and design of permeability measures that ensures accessibility for all, including persons with mobility challenges; and
- Low cost measures such as filtered permeability can be used to unlock access, reduce severance and rat-running and form direct connections to local services and longer distance dedicated walking and cycling routes. This could include the opening of a wall or cul-de-sac.

4.5 Bus Network

4.5.1 City Bus Services

Kilkenny was referenced by the NDP as an urban centre that would benefit from capital investment in bus services and infrastructure. In December 2019, a new city bus service commenced operation. It consists of two routes, KK1 and KK2, operated by City Direct and funded by the National Transport Authority (NTA).

Figure 4-14 and Figure 4-15 present Kilkenny's city bus service. The two routes combined serve 33 stops, feeding into a central spine crossing St. John's Bridge to the City Centre sharing stops at Parliament Street, Market Yard and John Street Upper. Bus shelters are provided at key locations.

Both routes have circuitous alignments, designed to broaden their catchment areas including areas of high population density and low car ownership identified in Figure 3-2 and Figure 5-7. However, this reduces their directness and increases journey times.

At present, there is a lack of bus priority measures which would improve reliability and speed of service.

Table 4-8 Kilkenny City Bus Services.

Service	Route	Stops	Frequency Mon-Sat	Frequency Sun
KK1	Loughboy Retail Park – N77 Roundabout	Upper Patrick Street; McDonagh Junction; Castlecomer Road	30mins	1hr
KK2	Purcellsinch – St. Luke's Hospital	Dublin Road; New Park Shopping Centre; McDonagh Station; Nowlan Park; Loreto	30mins	1hr

4.5.2 Local Link

Local Link is a service operated by the NTA to provides rural bus services across Ireland, both door-to-door and scheduled services in towns, villages and rural areas.

Local Link operates in Kilkenny under the local name 'Ring a Link'. In addition to a number of scheduled services, some are Demand Responsive and must be booked in advance. These have flexible routes within a defined area to serve dispersed mobility needs, low demand hours and areas of low population. There are approximately 13 routes in operation.

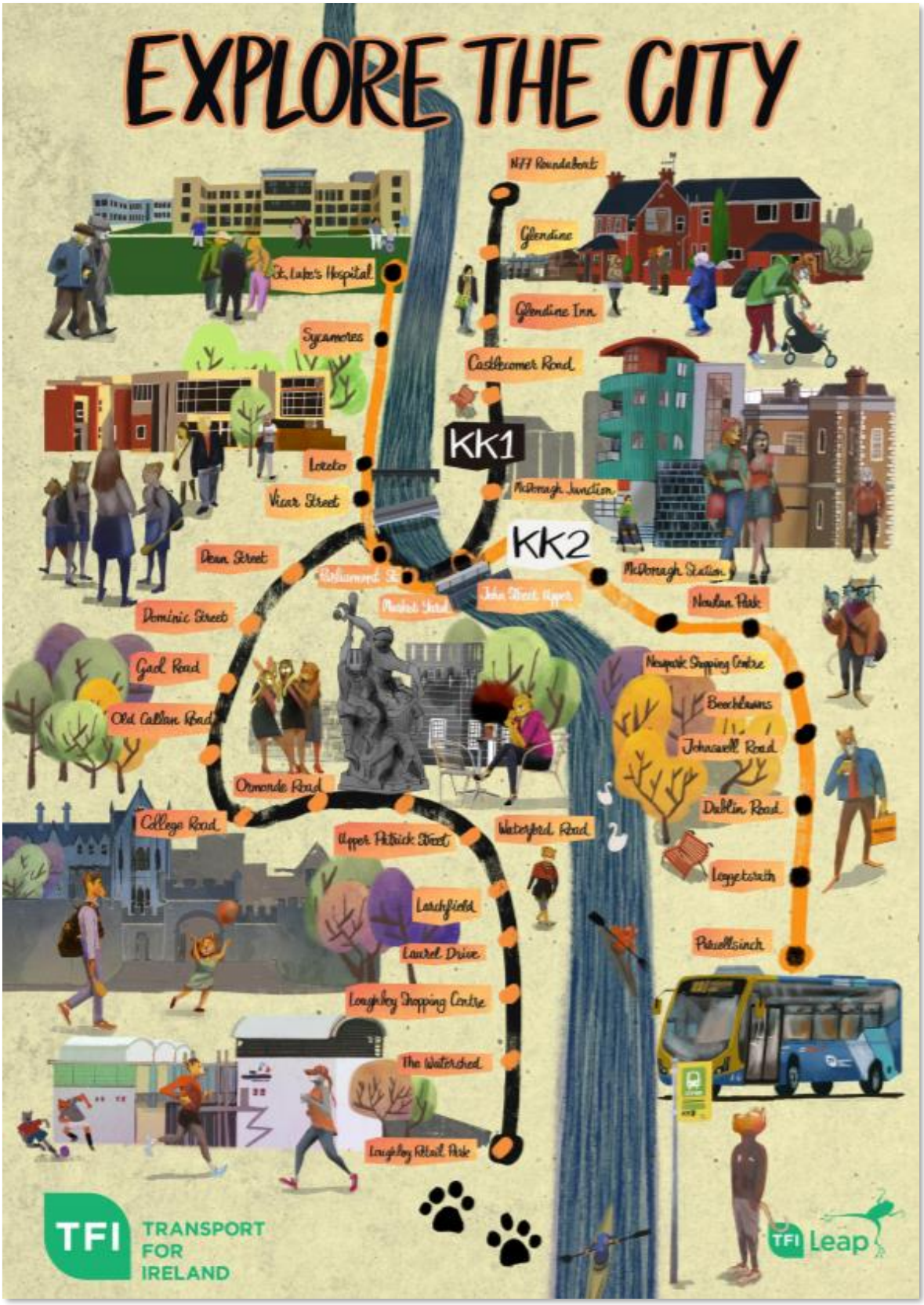


Image 4-1 Illustrated Map of KK1 and KK2. Source: Transport for Ireland, 2019.

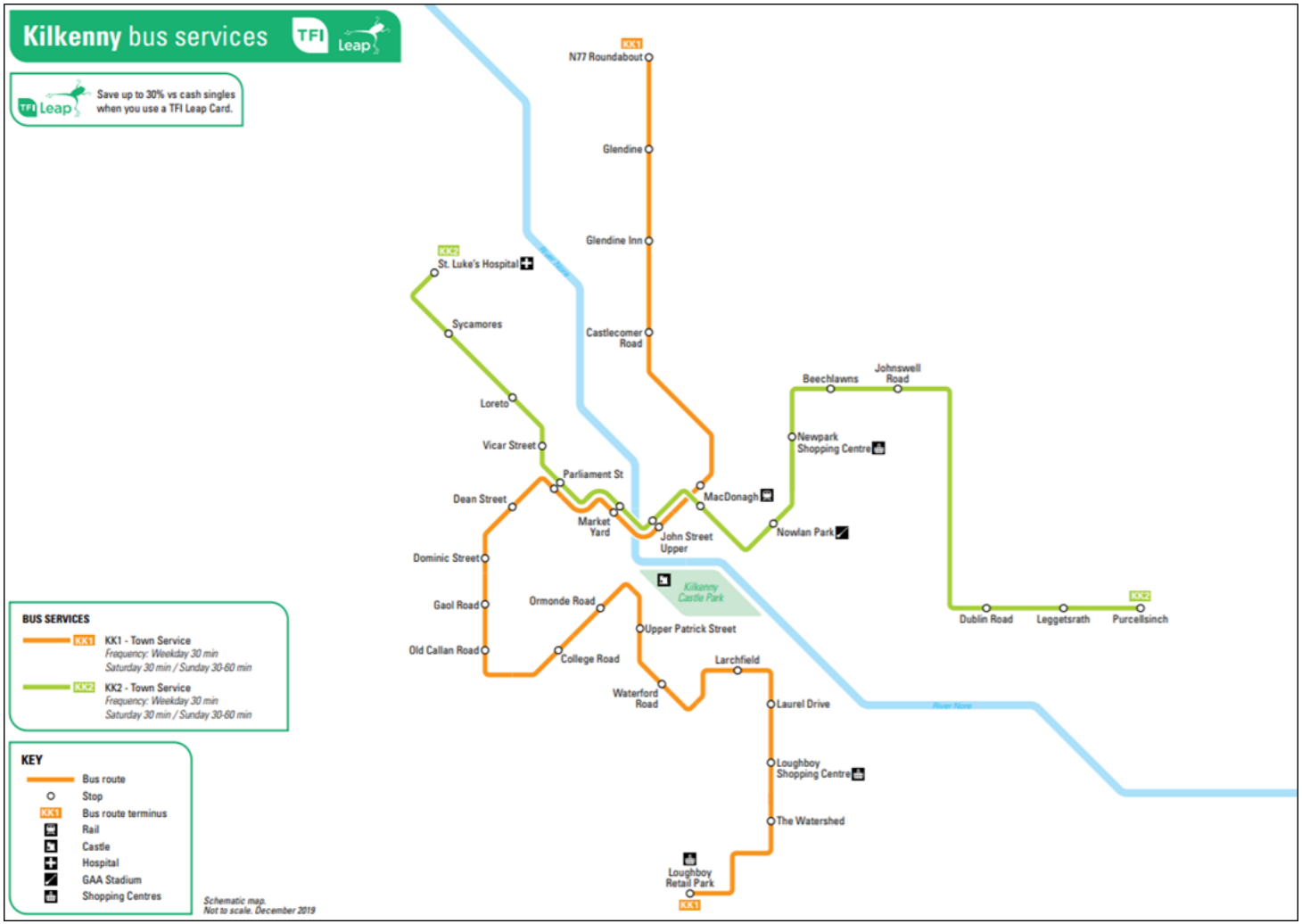


Figure 4-14 Existing City Bus Service in Kilkenny City. Source: Transport for Ireland, 2019.

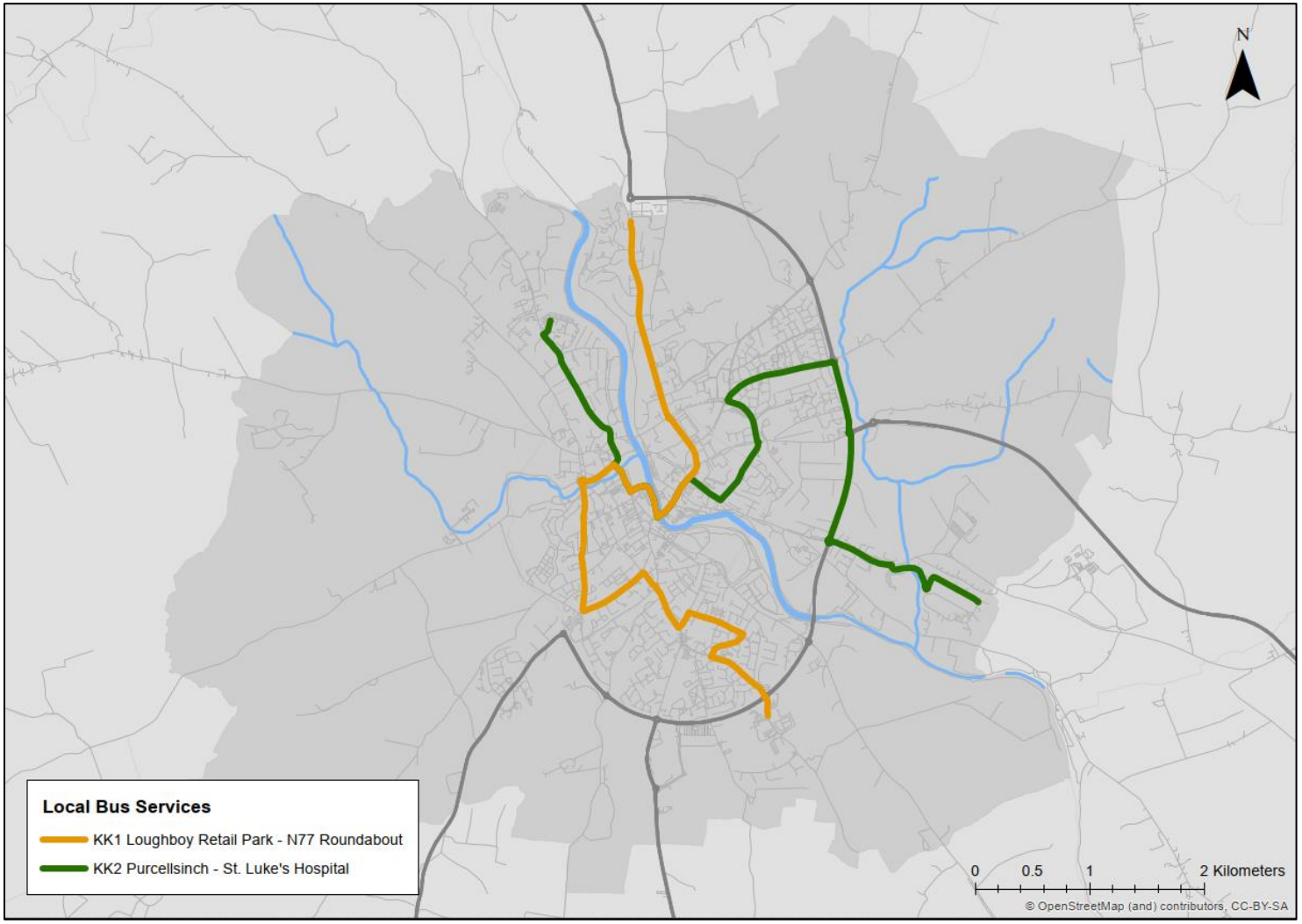


Figure 4-15 Existing Local Bus Services.

4.5.3 Regional Bus Services

The Study Area is well served by a number of regional services as summarised in Table 4-9 and mapped in Figure 4-16 providing national and regional connectivity to key urban centres such as Dublin, Cork and Waterford.

As there is no formal transport hub in Kilkenny, most regional services stop at Ormond Road, The Parade/ Kilkenny Castle or MacDonagh Junction. In addition to the two city bus services, six regional services cross St. John's Bridge namely the: 817; 890; 891; 73; 600; and 881/2.

Table 4-9 Regional Bus Services Operating in Kilkenny City. Source: TFI Public Transport Data, 2020.

Service	Route	Operator
736	Dublin Airport - Tramore	Kenneally's Bus Service
817	Ormond Road, Kilkenny – Dublin City Centre	Bernard Kavanagh & Sons
871	Urlingford – MacDonagh Junction Shopping Centre	Bernard Kavanagh & Sons
873	Carlow – Kilkenny Castle	JJ Kavanagh & Sons
890	Castlecomer – Kilkenny Castle	K Buggy Coaches
891	Castlecomer – Loughboy	K Buggy Coaches
881	Graiguenamanagh – Kilkenny Castle	Michael Kilbride Coach
882	New Ross (The Quay) – Kilkenny, Ormond Road	Michael Kilbride Coach
374	New Ross – Kilkenny MacDonagh Station	Bus Éireann
4/ X4	Dublin Airport – Carlow – Thomastown – Waterford – New Ross	Bus Éireann
73	Waterford Bus Station – Kilkenny MacDonagh Station – Athlone Station	Bus Éireann
600	Cork – Waterford – Kilkenny – Dublin	Dublin Coach

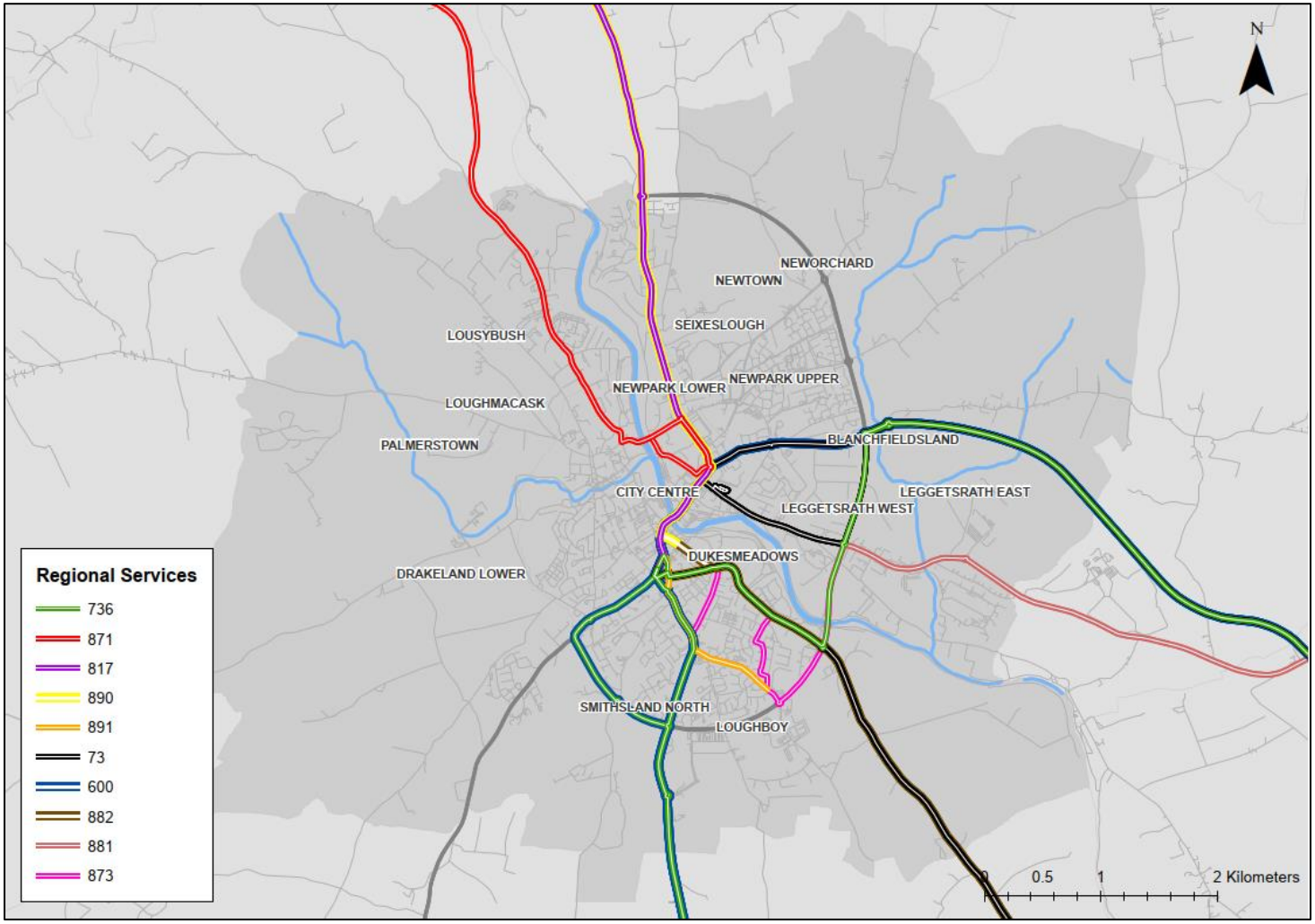


Figure 4-16 Existing Regional Bus Services Operating in Kilkenny City and Environs.

4.6 Rail Network

Kilkenny MacDonagh Station is located along the Dublin Road, approximately 800m from High Street and Kilkenny Castle. Figure 4-17 illustrates the location of the Station and the existing railway line.

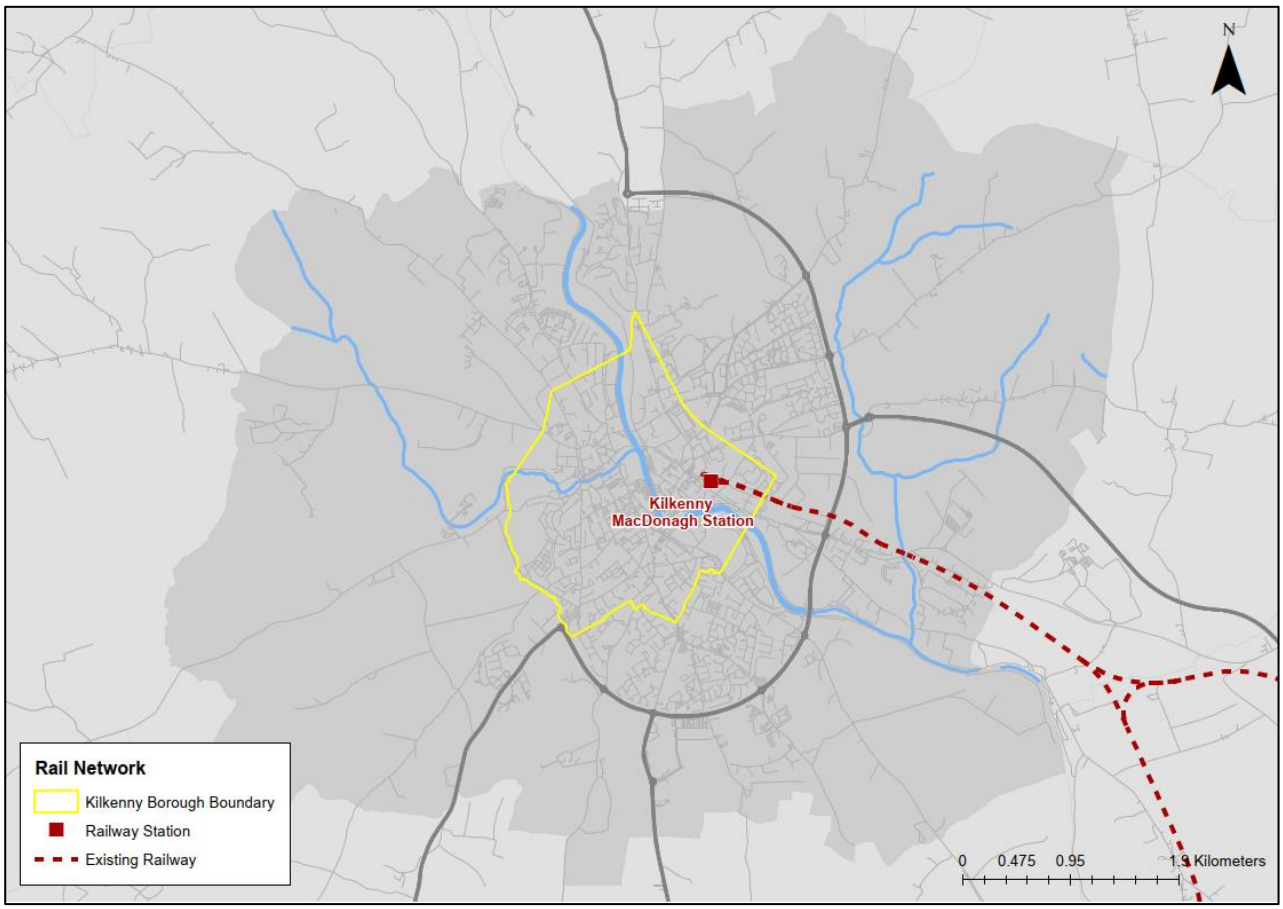


Figure 4-17 Kilkenny MacDonagh Station and Railway Line.

The Station has two platforms, which were upgraded in recent years to provide level access between them and improve accessibility for all users. Prior to this, a footbridge was the only connection between the two platforms.

It is served by the Dublin-Waterford InterCity Route, connected by a short spur off the main railway line, at a distance of approximately 4.5 km from the Lavistown Loop Line. The route serves the following stations:

- Dublin Heuston;
- Newbridge;
- Kildare;
- Athy;
- Carlow;
- Muine Bheag;
- Kilkenny MacDonagh;
- Thomastown; and
- Waterford Plunkett.

Journey time between Dublin and Kilkenny is approximately 1.5-hours, and approximately 40-minutes between Kilkenny and Waterford. Figure 4-10 summarises the timetable (refer to Appendix A for full schedule). While the current schedule facilitates outward commuter to both Waterford City and Dublin City, it does not facilitate inward commuting from the north (Dublin City) for a standard 09:00-17:00 working day.

Table 4-10 Summary of Dublin-Waterford InterCity Route Timetable. Source: Irish Rail, 2018.

Route		Daily Services	First Service	Last Service
Dublin - Waterford	Mon-Sat	8	07:25	20:15
	Sun	4	09:10	18:40
Waterford - Dublin	Mon-Sat	7	06:00	18:25
	Sun	4	09:05	18:05

The Station building is equipped with a ticket vending machine, a ticket office, a small newsagents and toilet facilities. Paid parking is available at the station at daily, monthly and yearly rates. There are approximately 170 parking spaces in the car park, with 7 disabled spaces and 2 Electric Vehicle Charging Points (EVCP). Sheltered cycle parking is located near the entrance of the station building.

The Station is located at the top of a long ramp which has a narrow footpath on one side. This is the only access point for motorists and cyclists. There is a lift at the base of ramp which accesses the Station car park, as well as an entrance to the MacDonagh Junction Shopping Centre, providing a more comfortable and accessible alternative to the steep and narrow path for pedestrians. The immediate environment around the Station is car dominated and hostile to pedestrians with a lack of active frontage and wide, multi-stage crossing at junctions. Wayfinding and legibility from the Station to the City Centre is poor.

 r

Image 4-2 Entrance to MacDonagh Train Station and Shopping Centre. Source: Google Maps, 2019.

4.1 Public Transport Interchange

Kilkenny lacks a formal, high-quality transport hub which would contribute towards connectivity and transfer between services and modes. At present, there is a bus shelter located at the side of MacDonagh Station. It is served by a number of regional services operated by Bus Éireann no. X4, 73 and 374 and the no. 871 service, operated by Bernard Kavanagh and Sons. In addition, the KK2 city bus service stops adjacent to the Station on

the Dublin Road meaning passengers travelling from the south must walk across the multi-stage junction shown in Image 4-2 to access the Station.

4.2 Parking Supply

Kilkenny is served by approximately 4,500 parking spaces, on-street and off-street, public and private. Most of these spaces are located in proximity to the commercial and retail core, drawing vehicular traffic into these areas such as The Parade and High St. At present, there are no Park and Ride facilities in the Study Area.

A comprehensive analysis of Kilkenny's parking supply was undertaken by Kilkenny County Council in December 2017, see Section 2.5.7. Figure 4-18 illustrates in detail the location and quantity of parking.

4.2.1 Parking Beat Surveys

Parking Beat Surveys will be undertaken at a later date.

4.2.2 Loading and Illegal Parking Surveys

Loading and Illegal Parking Surveys will be undertaken at a later date.

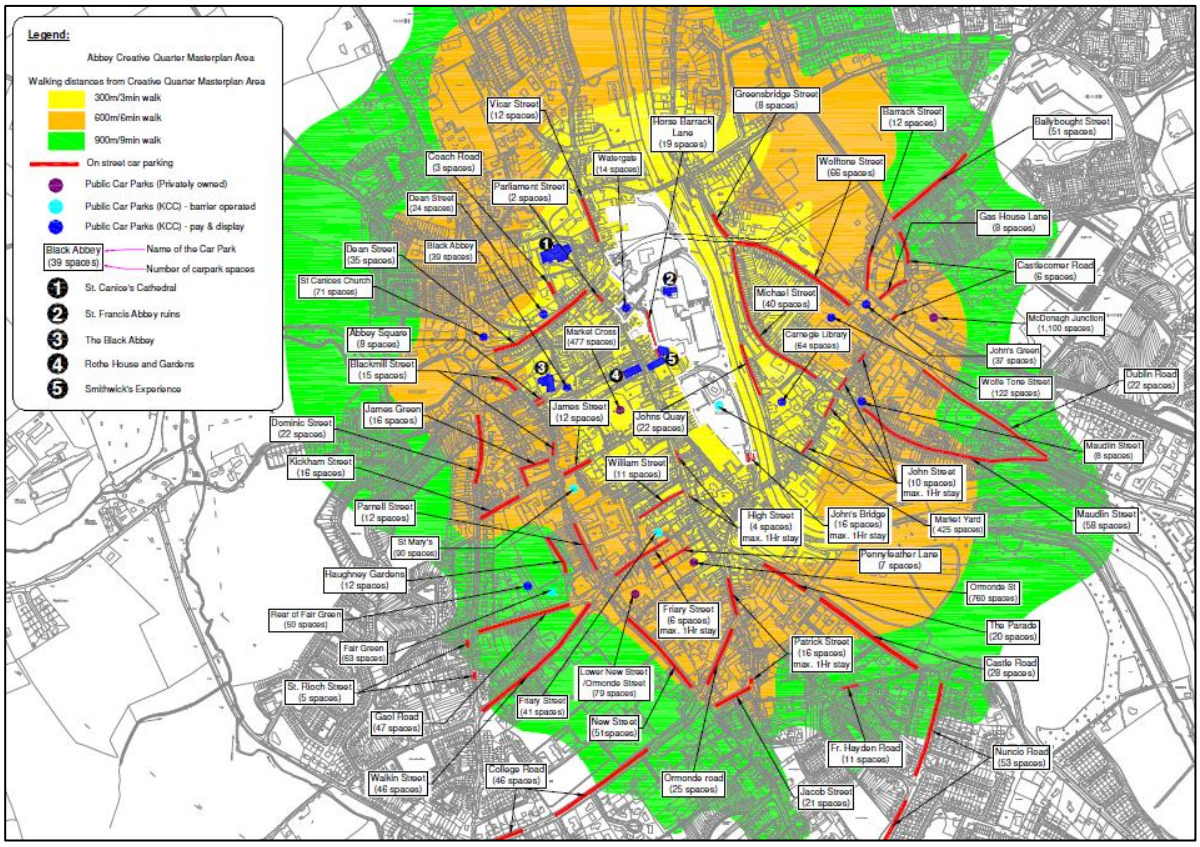


Figure 4-18 Parking Supply in Kilkenny City. Source: Parking Options Study, 2017.

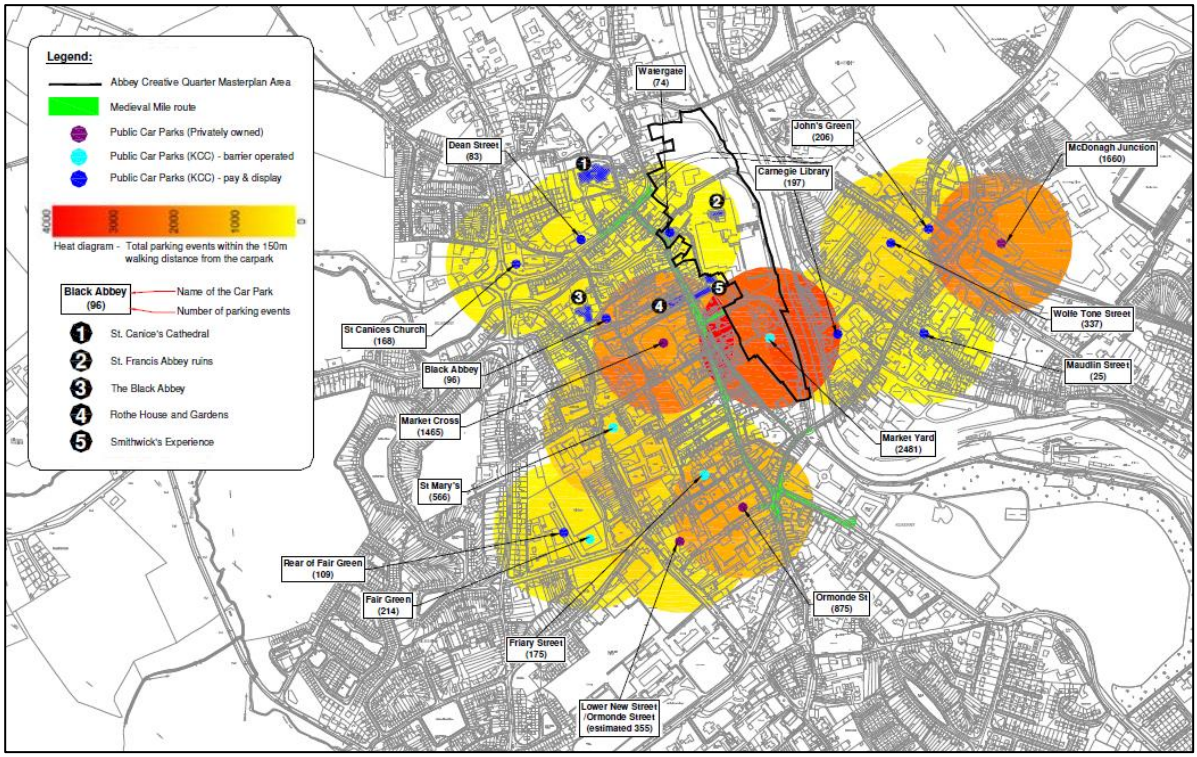


Figure 4-19 Heat Diagram showing Parking Activity in Kilkenny City. Source: Parking Options Study, 2017.

5. Existing Transport Demand

5.1 Data Sources

5.1.1 Census Data 2016

The latest Census data was collected in 2016 and provides a wealth of data on population and social demographics at a CSO Small Area level. In addition to this, the CSO collates extensive information on commuting travel patterns for all work and education trips, including mode choice, time of departure, trip duration and destination choice which is collated as part of the Place of Work, School or College – Census of Anonymised Records (POWSCAR).

5.1.2 NTA South East Regional Model

Data was extracted from the NTA's South East Regional Model (SERM) in order to understanding the overall characteristics of demand within the Study Area. The SERM is one of the five regional models which comprises the NTA Regional Modelling System (RMS). The SERM covers the counties of Carlow, Kilkenny, Waterford, Wexford and South Tipperary.

Travel demand within the model is segmented according to trip purpose, car availability, employment, type and educational level. The model represents an average weekday with five separate peak period modelled, as follows:

- AM Peak (07.00-10.00);
- Morning Inter Peak (10.00-13.00);
- Afternoon Inter Peak (13.00-16.00);
- PM Peak (16.00-19.00) and
- Off Peak (19.00-07.00).

The data presented in Section 5.3 NTA South East Regional Transport Analysis has been extracted from the 2012 base year model which is, at present, the most updated version available. The 2012 base year model was calibrated to data from the 2012 National Household Travel Survey (NHTS) and Census 2011 Place of Work, School or College – Census of Anonymised Records (POWSCAR).

It is worth noting that the road and public transport network has changed in recent years, including the implementation of local bus routes, as detailed in this report, and the construction of road and pedestrian links such as Lady Desart Footbridge and St. Francis Bridge. The data extracted for the purpose of this analysis are based on the 2012 road and public networks.

5.2 Existing Transport Demand Characteristics

This section presents the existing transport demand characteristics for the Study Area taken from both 2016 Census data and from the NTA SERM.

5.2.1 Mode Share by Trip Purpose – Work and Education

Figure 5-1 presents the mode share breakdown for commuting trips to work, school and college combined for the CSO defined Small Areas within Kilkenny Urban and Rural Electoral Divisions. It shows a dominant car mode share of 63.5%, which includes trips by car as driver and passenger. The second most used mode is walking which represents 23.3% of trips to work, school or college throughout a 24-hour period. Public transport stands for a small part of the total with 4%, however it is important to note that the new city bus services began operation in December 2019, after this data was collated.

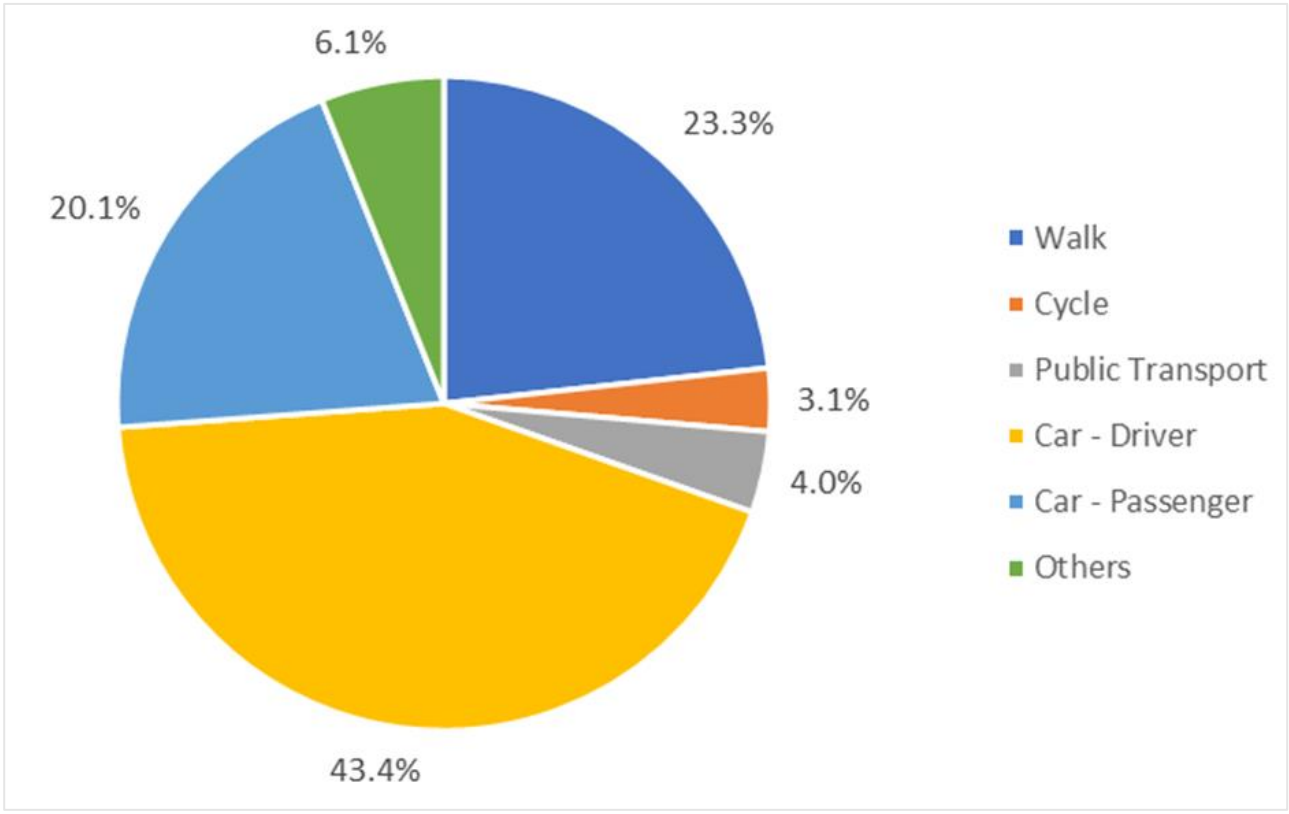


Figure 5-1 Mode Share by Trip Purpose – Work and Educational Trips Combined

A further breakdown of mode share by work and education purposes is illustrated in Figure 5-2. The graphs show that the majority of trips are people driving to work, whilst just over 18% are by foot. Educational trips show that nearly 50% of trips comprise car-passengers, whilst approximately 35% of trips are by foot. Public transport accounts for a low share of trips for both work and educational, however, this data pre-dates the new city bus service.

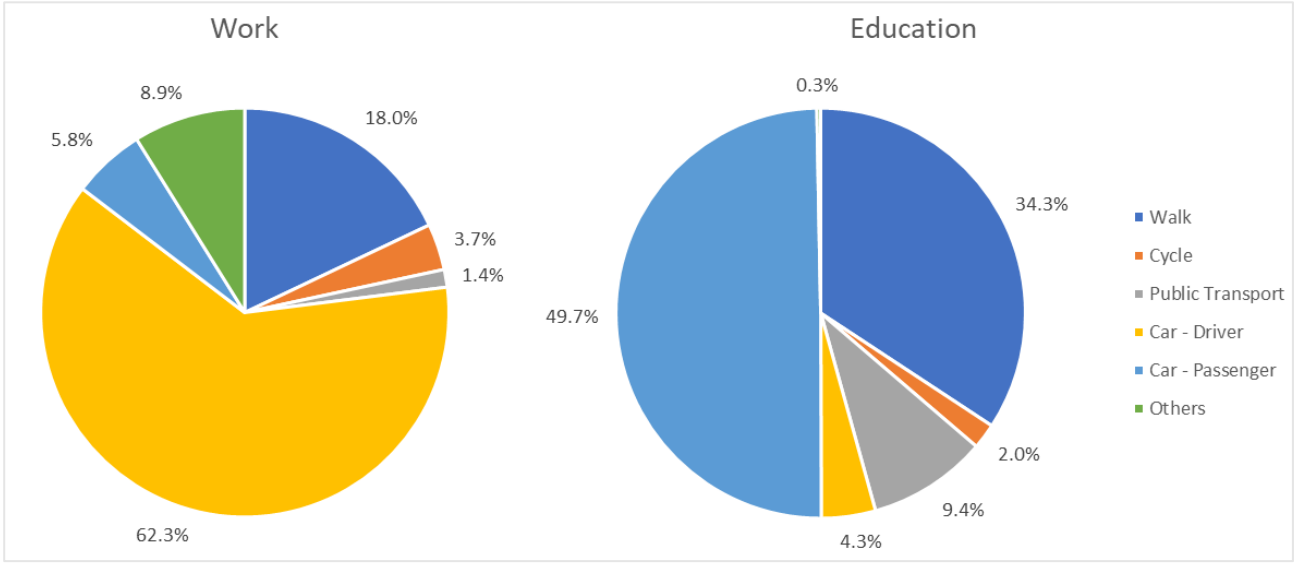


Figure 5-2 Breakdown of Mode Share by Trip Purpose

5.2.2 Mode Share by Area

Figure 5-3 presents the mode share split in Kilkenny Urban and Kilkenny Rural. It demonstrates that there are 10% more trips by car passenger and car driver in Kilkenny Rural, and a significant 20% decrease in walking mode share when compared to Kilkenny Urban.

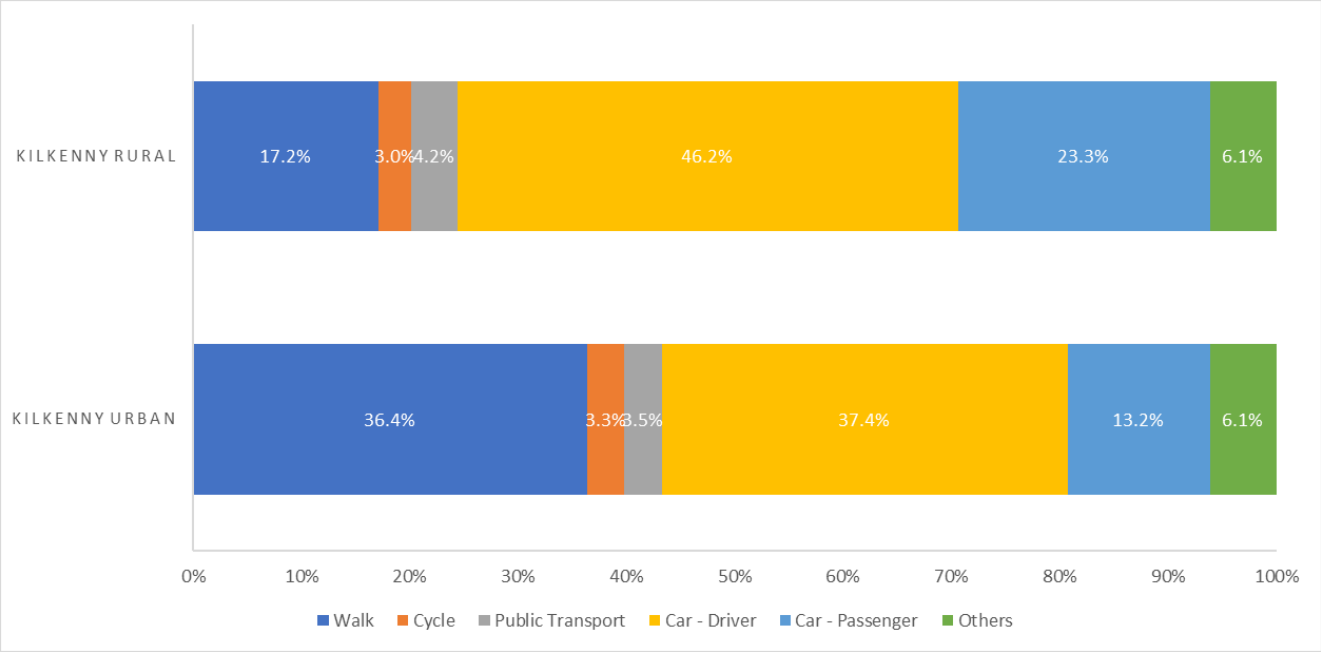


Figure 5-3 Mode Share Split by Area

The following maps illustrate the mode share for each CSO Small Area. Figure 5-4 highlights that the car mode share per Small Area increases the further out from the City Centre it is. The area with the lowest car mode share, i.e. less than 20%, is a block to the west of High St. with the remaining Small Areas of the City Centre having a car mode share of between 20% and 50%. There are pockets of high car more share in areas just inside the Kilkenny Ring Road, adjacent to junctions such as the Castlecomer Road Roundabout and New Orchard Road Roundabout.

Figure 5-5 highlights that overall, the public transport mode share is low, less than 8% in most Small Areas. However, it is important to note that this data pre-dates the commencement of Kilkenny's new city bus services and it is therefore likely that public transport mode share may change once these new services have bedded down.

Figure 5-6 highlights that the active mode share per Small Area decreases the further out from the City Centre it is, with areas along the Medieval Mile having the highest active mode share of over 40%. Areas outside of the Kilkenny Ring Road have the lowest active mode share of less than 5%.

The Small Area located to the north of Newpark presents an anomaly, with a low car and high active mode share compared to its surrounding areas. This is likely attributed to the presence of Kilkenny College, a day and boarding secondary school.

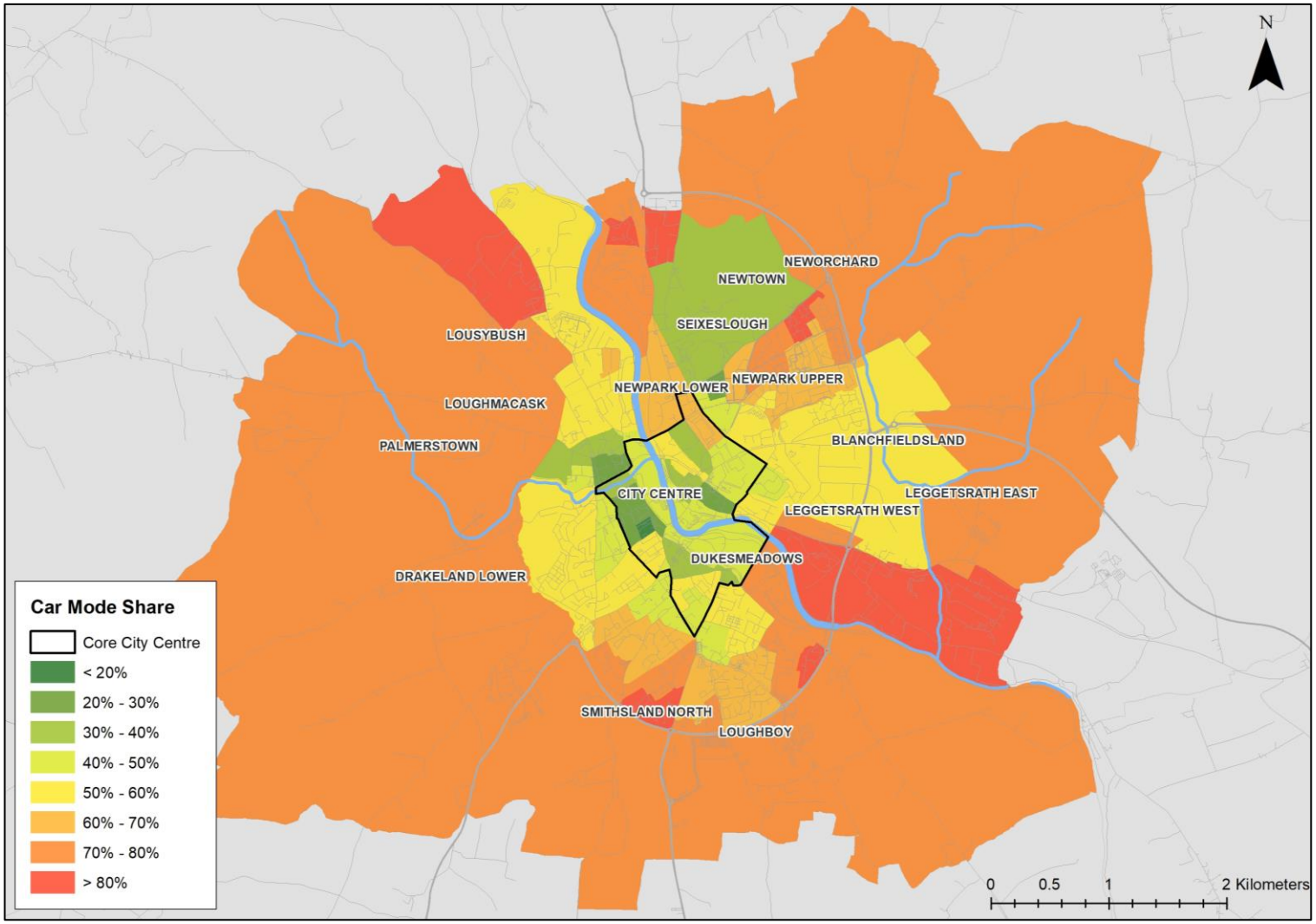


Figure 5-4 Car Mode Share by Small Areas

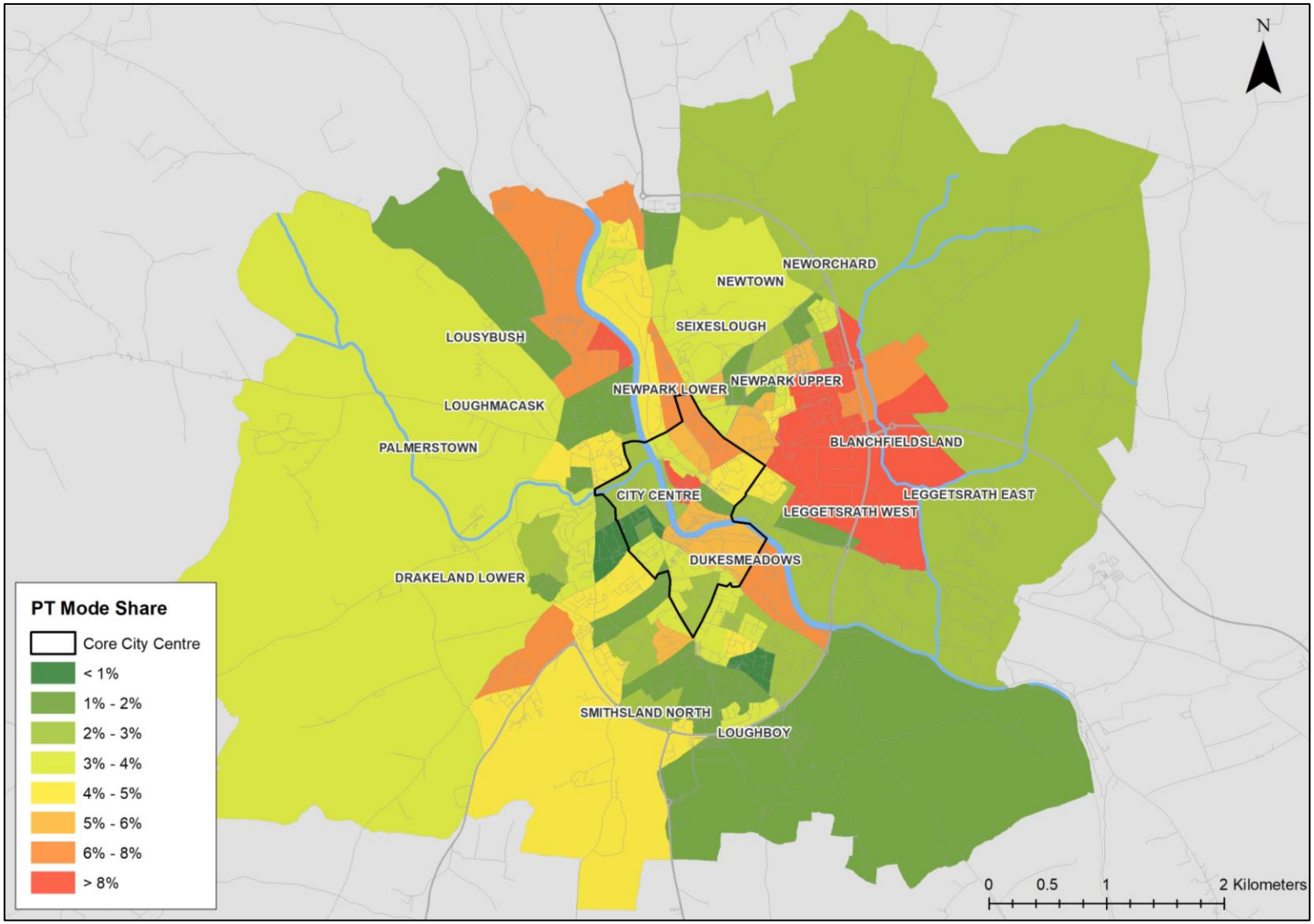


Figure 5-5 Public Transport Share by Small Areas

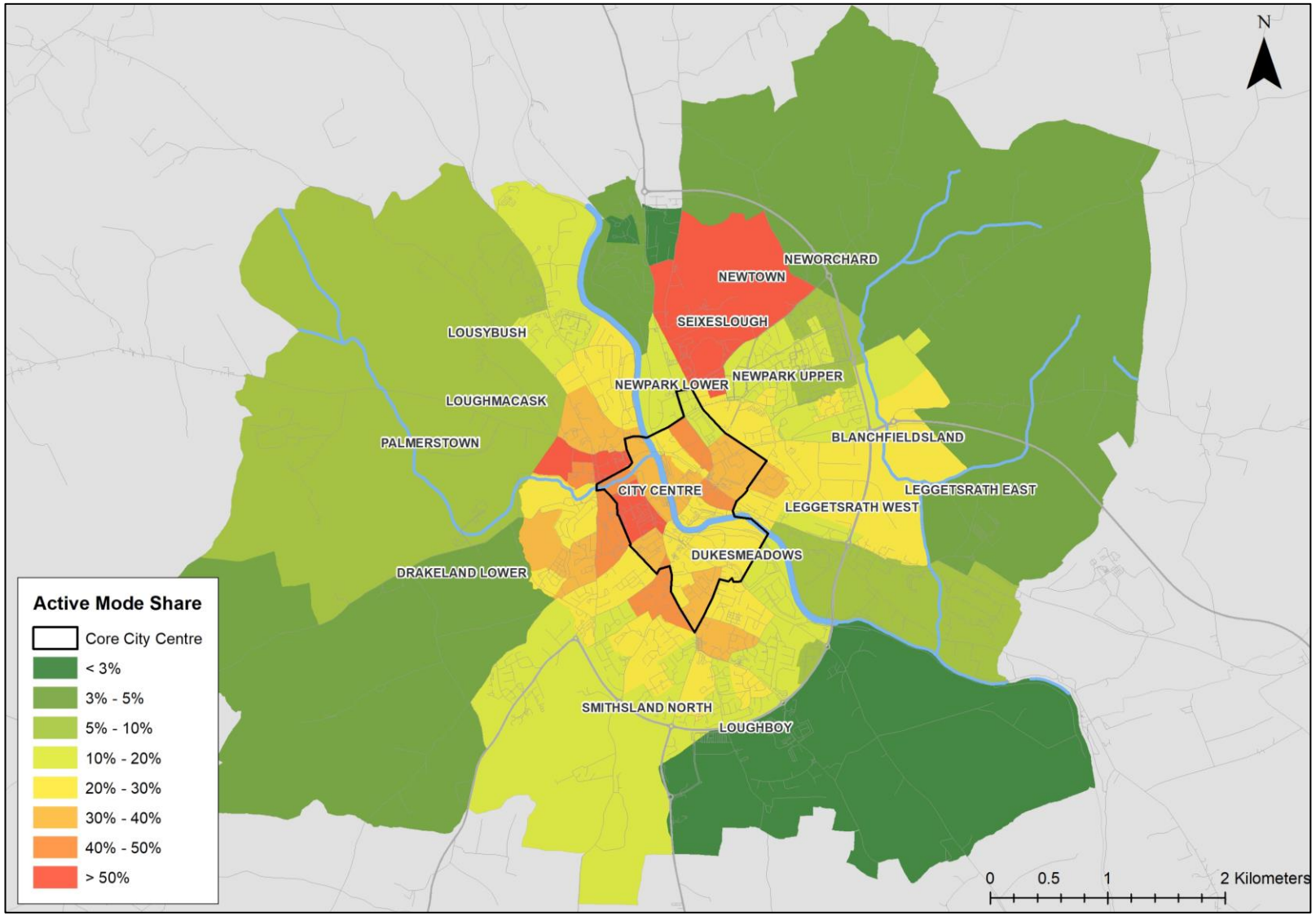


Figure 5-6 Active Mode Share by Small Areas

5.2.3 Household Car Ownership

Car ownership levels in the Study Area per household are illustrated in Figure 5-7 and Figure 5-8. The figures demonstrate that households in the City Centre area have overall low levels of car ownership, with 40-50% of households not owning a car. Car ownership levels increase progressively moving out from the City Centre, with more than 90% of households on the outskirts of the defined urban area having at least one car available.

Car ownership is a key determinant of travel behaviour, inextricably linked to the availability of public transport and parking provision. This is supported by a study carried out by Transport for London in 2012, *Residential Parking Provision in New Developments*, which analysed 800 new developments with varying levels of public transport accessibility and car parking levels. The study concluded that:

- Developments with more parking promote car usage thereby producing more car trips;
- As public transport accessibility increases, car ownership levels in new developments decreases; and
- The more parking provided by a new development, the higher the household car ownership levels.

Recent changes to National policy in Ireland, such as the NPF and *Sustainable Urban Housing: Design Standards for New Apartments*, support the application of low-car or car-free development in order to enable a shift toward sustainable transport use and reduce dependency on the private car.

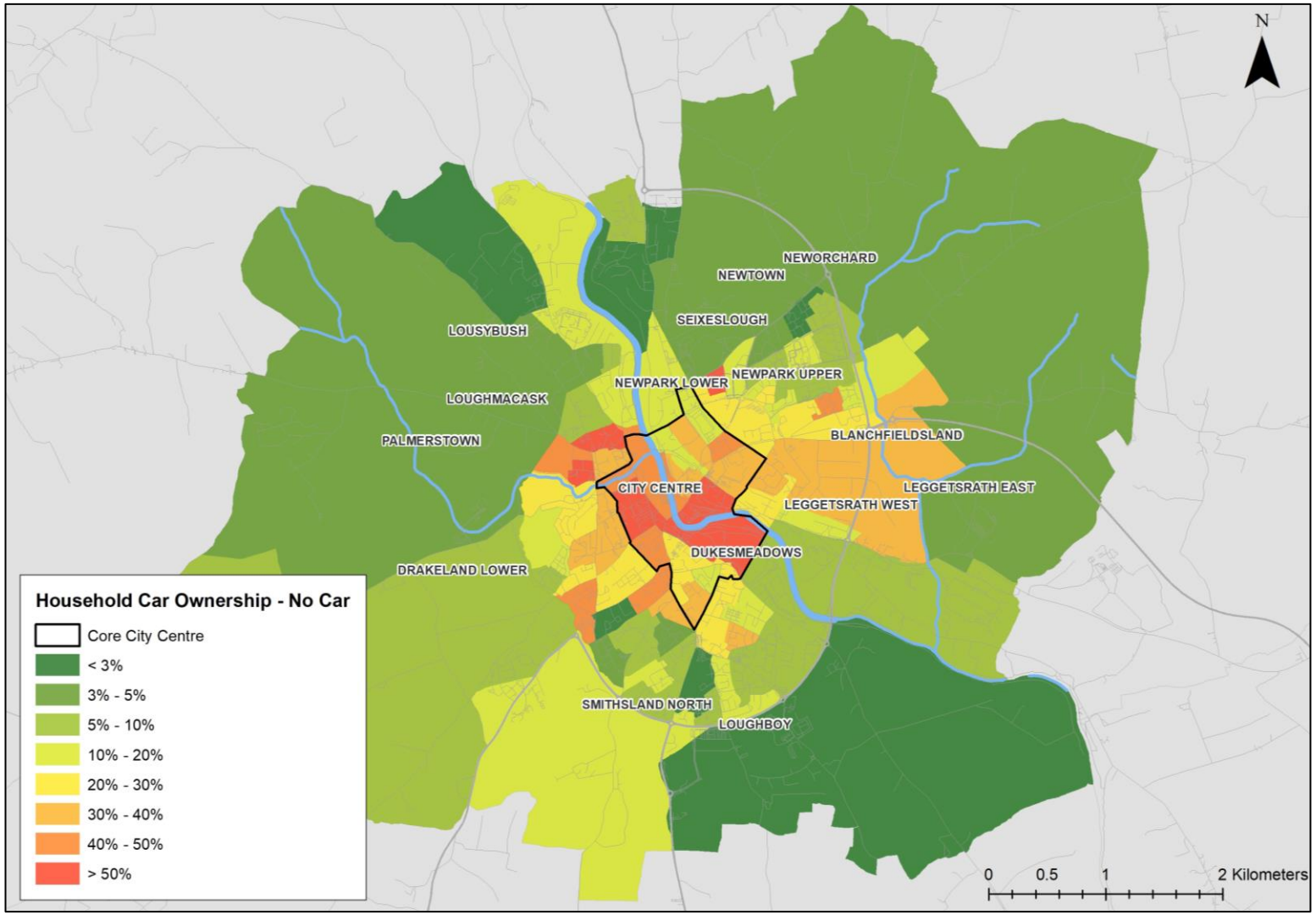


Figure 5-7 Household Car Ownership - No Car Available

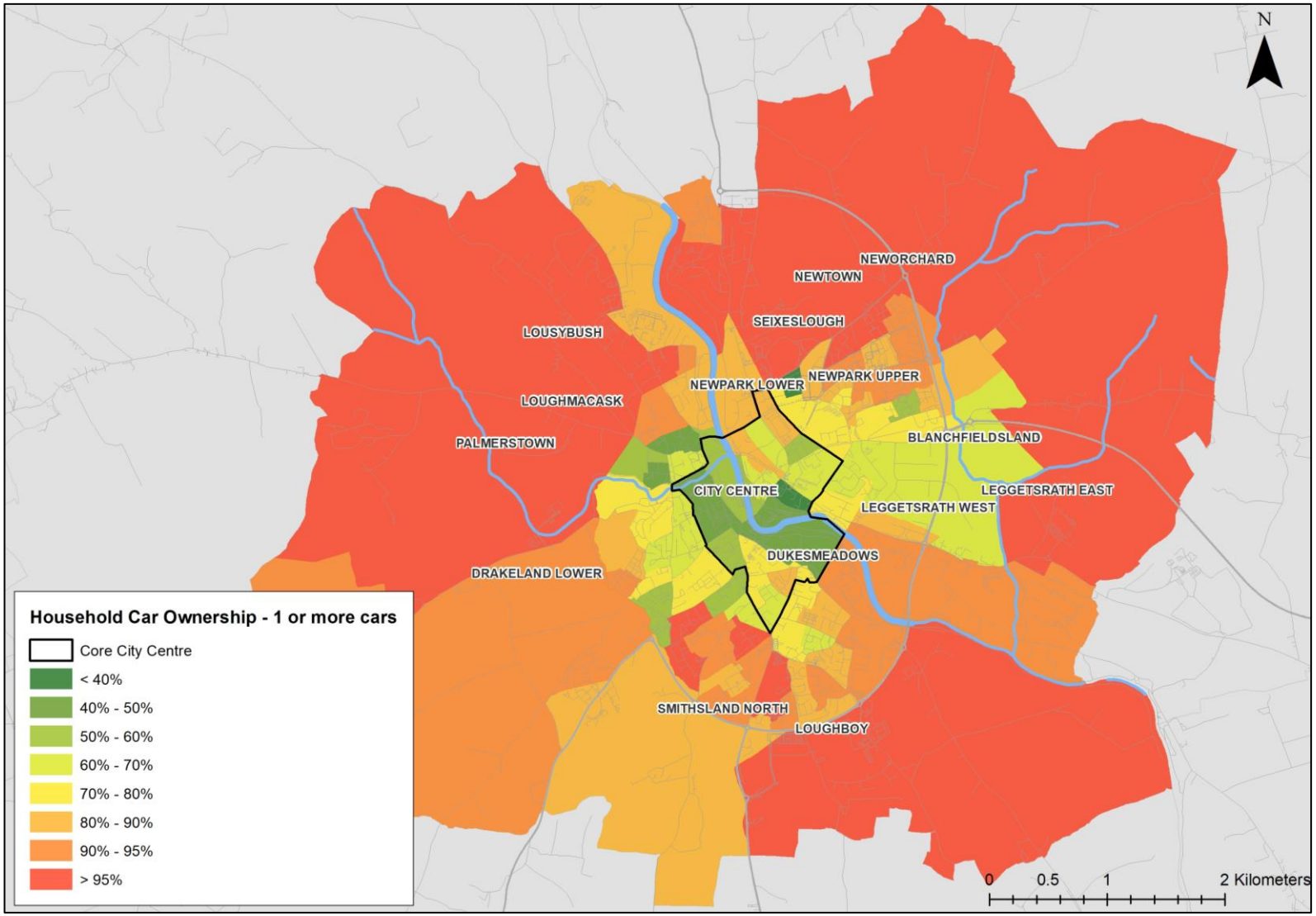


Figure 5-8 Household Car Ownership - 1 or More Cars Available

5.3 NTA South East Regional Transport Model Analysis

Data has been extracted from the South East Regional Model (SERM) in order to examine the transport networks within the Study Area.

All data reported in this section has been extracted from the 2012 base year model which has been calibrated with data from the 2012 National Household Travel Survey (NHTS) and 2011 Census as well as traffic counts and public transport count data.

5.3.1 Profile Demand throughout the Day

In total, there are approximately 92,000 trips originating within Kilkenny City and Environs over the 24-hour period. The percentage breakdown of demand between the five modelled period is show in Figure 5-9. The busiest periods in terms of total demand are the Afternoon Inter peak and the PM peak, with 25.9% and 23.5% respectively.

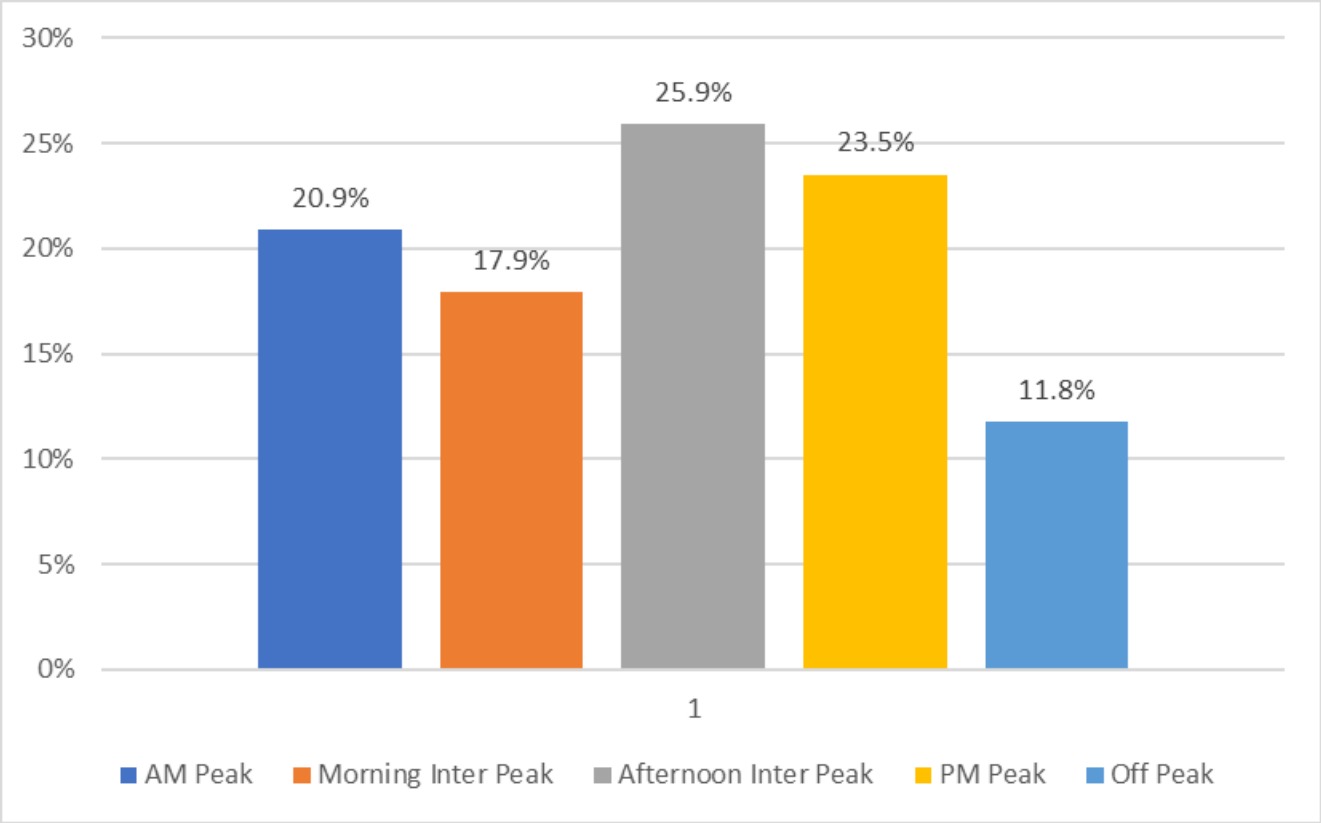


Figure 5-9 Percentage of Demand by Time Period

5.3.2 Mode Share

The mode share for the 24-hour demand is illustrated in Figure 5-10. It shows a dominant car mode share of 77.2%. Walking accounts for a significant proportion of the remaining mode share with 18.8%, followed by public transport and cycling, which both have low mode shares.

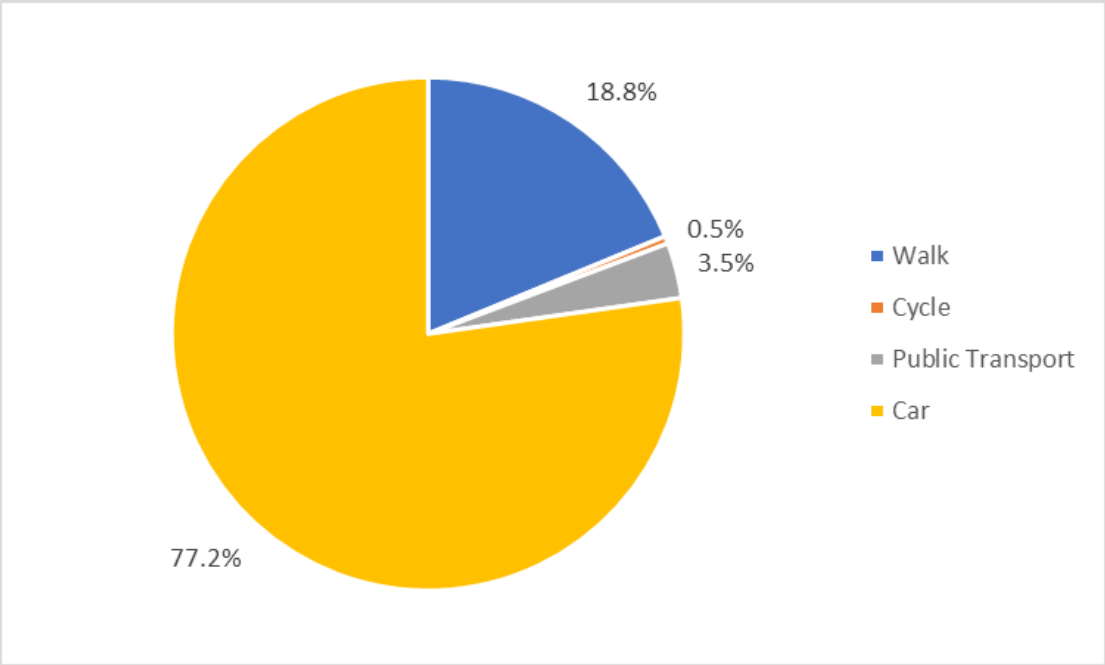


Figure 5-10 Kilkenny City and Environs 24-Hour Mode Share Split

A breakdown of mode share by time period is show in Figure 5-11. Car mode share has the highest percentage across all periods when compared to public transport and active modes. The AM period has the highest walking and cycling mode share and the lowest car mode share of all time periods. The highest car mode share is observed during the off-peak hours (19.00-07.00).

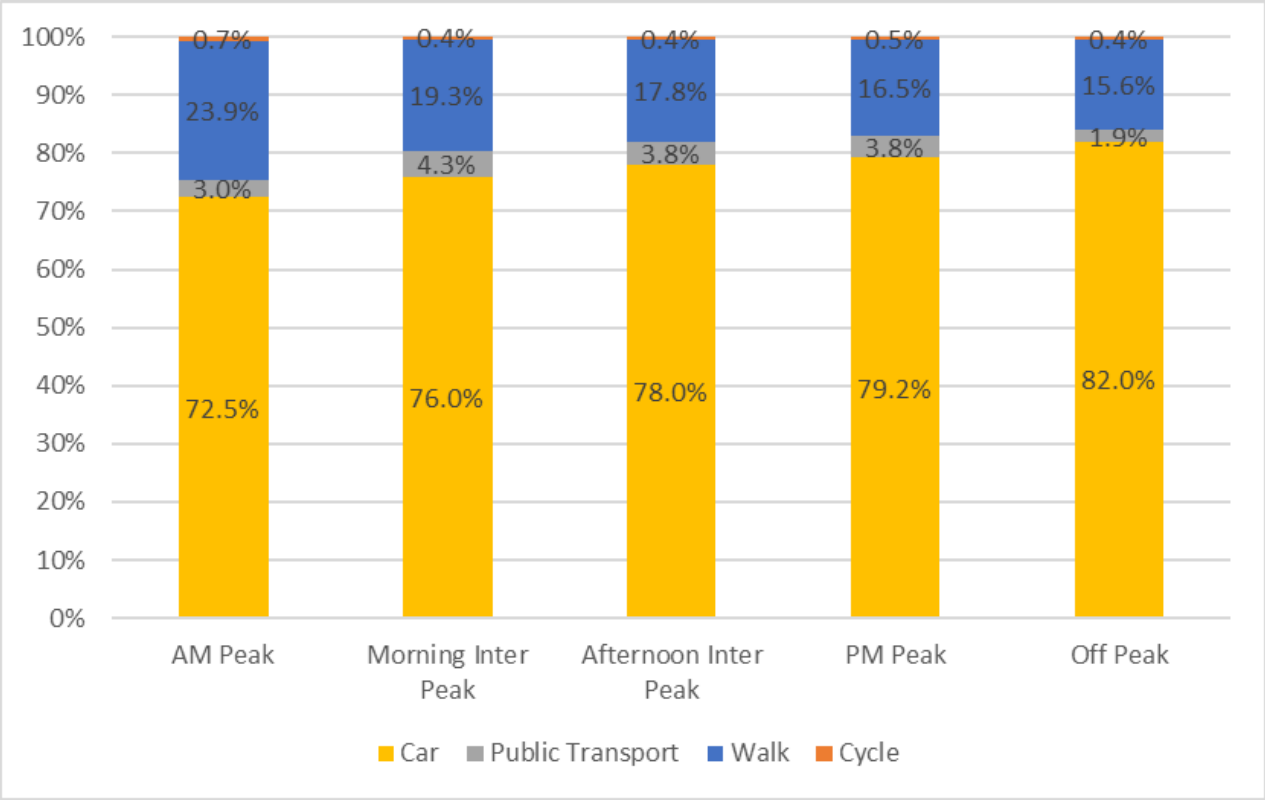


Figure 5-11 24-Hour Mode Share by Time Period

A comparison of mode share for the AM peak period between the 2012 SERM and the 2016 CSO data is shown in Table 5-1. The results show similarities between both sources, which indicates that the SERM is a robust tool to be used for the assessment.

Table 5-1 AM Peak Mode Share Comparison

Mode	2012 SERM	2016 CSO
Walk	23.9%	24.8%
Cycle	0.7%	3.3%
Public Transport	3%	4.3%
Car	72.5%	67.6%

5.3.3 Sectoral Analysis

Movement between sectors was analysed for both the AM peak and 24-hour periods. Figure 5-12 summarises movements within and outside the Study Area. Table 5-2 outlines the 24-hour total trip demand.

The map shows a significant percentage of trips to outside the Study Area, mainly from the Core City Centre, 46% and Kilkenny Environs, 48%. Trips to outside the Study Area account for the highest proportion of trips from all four zones. The zone named Kilkenny City is the main attractor of trips within the Study Area, being a destination for 33% from the Core City Centre and 32% from Kilkenny Environs.

In contrast to the other zones, internal trips in Kilkenny City surpasses the number of trips to the rest of the SERM. Kilkenny Environs has the lowest percentage of trips attracted to the zone with only 3% of trips from outside the Study Area.

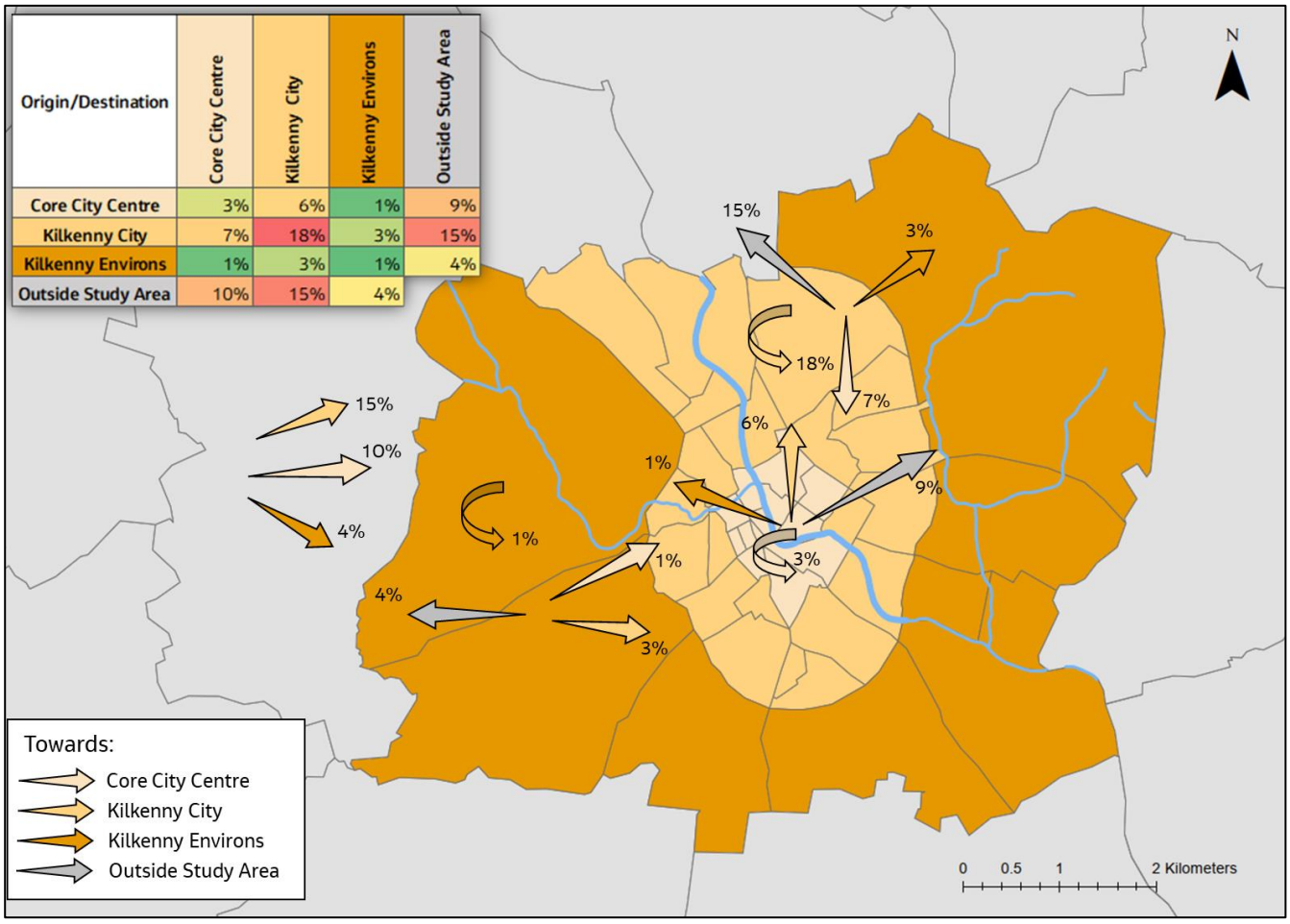


Figure 5-12 24-Hour Destination Demand

Table 5-2 Total 24-Hour Demand

24-Hour Demand		Destination			
		Core City Centre	Kilkenny City	Kilkenny Environs	Outside Study Area
Origin	Core City Centre	4,180	8,373	1,149	11,731
	Kilkenny City	9,087	23,923	3,457	20,049
	Kilkenny Environs	1,233	3,363	899	5,034
	Outside Study Area	12,831	20,211	5,211	

Figure 5-13 illustrates the sectors used in the analyses based on the SERM zone system. Physical boundaries such as the River Nore, and National and Regional roads were taken into account when grouping the existing 44 zones into 10. Table 5-3 and Table 5-4 present the sector to sector demand for the AM peak and 24-hour periods, respectively.

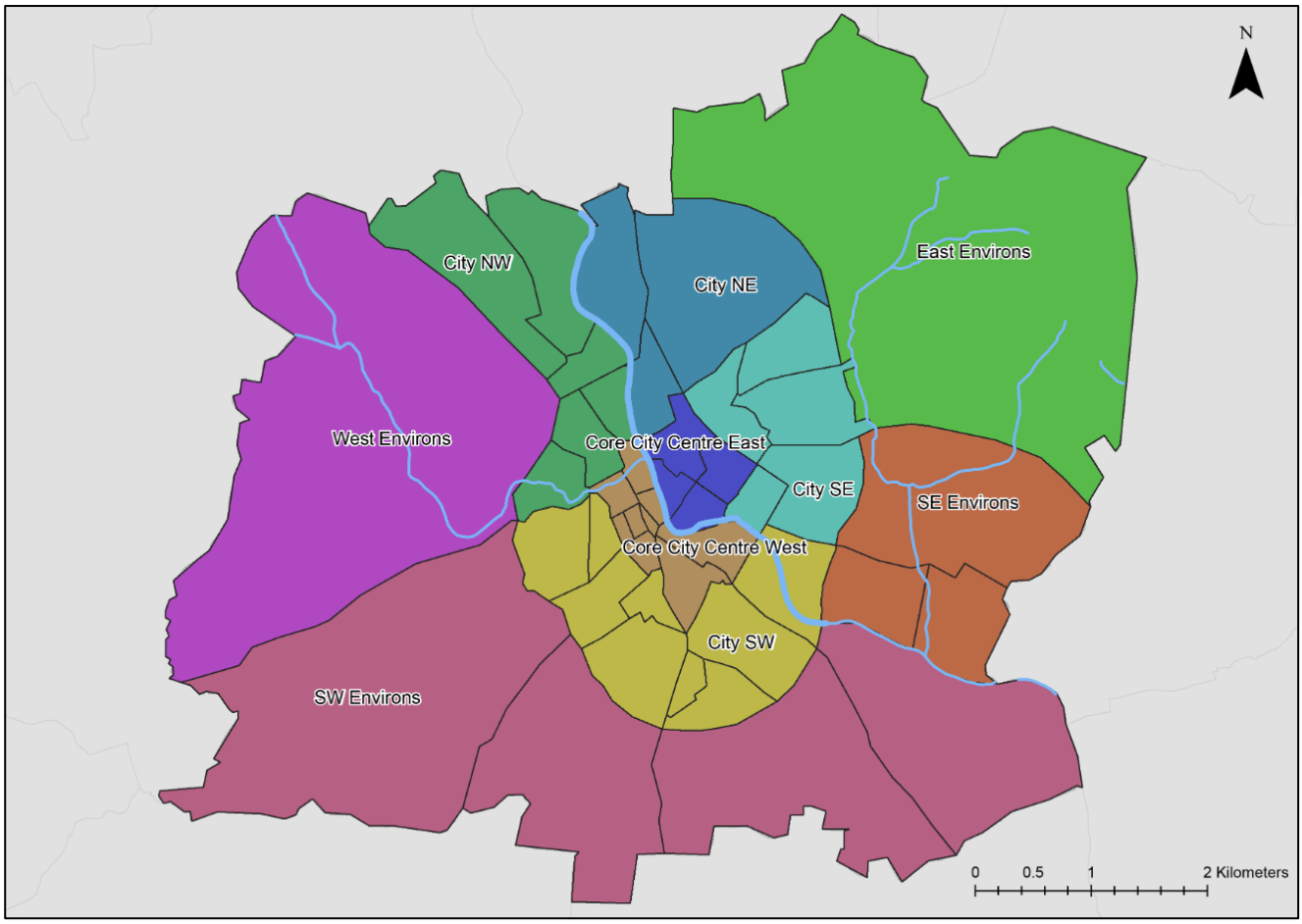


Figure 5-13 Sector System used for Origin-Destination Analysis

The results from the sector to sector analysis from the SERM are summarised below:

- Within Kilkenny City the City South West sector has the largest number of internal trips, with approx. 2,000 internal trips in the AM Peak period;
- There is also a large attraction between the City South West and Core City Centre sectors with 1,500 trips travelling between the sectors;
- 900 trips are made internal within the City Centre;
- There are a large number of trips travelling from outside the study area travelling to Kilkenny City Centre (3,500 trips) and to Kilkenny South West sector (3,000 trips); and
- In general, there are larger trips within and between the City Sectors that from the wider City Environs sectors.

Table 5-3 Sector to Sector AM Peak Demand

AM Peak Sector to Sector Demand		Destination										
		Core City Centre West	Core City Centre East	City SE	City SW	City NW	City NE	East Environs	SE Environs	SW Environs	West Environs	Outside Study Area
Origin	Core City Centre West	538	94	167	385	218	73	8	46	76	21	813
	Core City Centre East	155	103	67	114	89	34	4	22	25	7	239
	City SE	657	199	508	506	449	177	23	145	136	27	681
	City SW	1,167	236	298	1,945	582	152	20	190	312	55	1,308
	City NW	460	102	160	368	661	94	10	56	75	31	657
	City NE	254	69	97	192	214	514	8	46	48	12	316
	East Environs	21	6	12	19	15	9	6	5	5	1	39
	SE Environs	53	14	29	62	31	14	2	34	13	2	148
	SW Environs	175	34	47	238	91	25	3	26	99	8	261
	West Environs	48	9	12	44	39	8	1	5	7	16	61
	Outside Study Area	3,479	893	961	2,963	2,111	663	84	829	949	186	310,987

Table 5-4 Sector to Sector 24 Hour Demand

24 Hour Sector to Sector Demand		Destination										
		Core City Centre West	Core City Centre East	City SE	City SW	City NW	City NE	East Environs	SE Environs	SW Environs	West Environs	Outside Study Area
Origin	Core City Centre West	2,499	572	1,610	2,921	1,366	588	62	198	480	143	9,175
	Core City Centre East	583	526	573	706	411	198	23	80	126	36	2,556
	City SE	1,695	595	2,028	1,430	1,119	453	72	328	340	85	3,789
	City SW	3,262	773	1,464	6,455	1,792	575	78	476	917	191	8,660
	City NW	1,454	428	1,104	1,688	2,401	497	50	170	307	132	5,684
	City NE	661	218	469	584	529	1,333	30	112	131	40	1,917
	East Environs	61	23	68	71	47	27	24	13	15	4	266
	SE Environs	230	87	327	462	177	106	14	145	77	16	1,904
	SW Environs	524	134	339	890	314	124	16	76	354	31	2,343
	West Environs	139	35	80	171	124	35	4	14	29	66	522
	Outside Study Area	10,055	2,776	3,868	8,560	5,949	1,834	285	1,953	2,399	574	1,196,924

5.3.4 Link Flow Analysis

A link flow analysis was undertaken using the SERM 2012 base year scenario. Traffic volumes on the road network, and public transport and active mode flows were extracted for the AM and PM peak periods. Figure 5-14 and Figure 5-15 show the peak traffic volumes for the road network during the AM and PM peak periods respectively. The results for the public transport network are presented in Figure 5-16 and Figure 5-17. Figure 5-18 and Figure 5-19 show the number of people walking and Figure 5-20 and Figure 5-21 represent results for cycling for both AM and PM peak periods.

it is important to note that as the assessment was undertaken using the 2012 base year scenario, recent changes to the road and public transport networks, including the implementation of two local bus routes, and the construction of new road and pedestrian links such as Lady Desart Footbridge and St. Francis Bridge are not included in the model.

Key results are summarised below:

- Significant volume of traffic in the south and south-east side of the City Centre;
- Dark red links on the Kilkenny Ring Road, which represent traffic volumes above 1,000 vehicles, can be seen in both periods modelled. An increase in traffic flow during the PM period is observed;
- Significant outbound traffic flow in the AM period on the National and Regional roads, which indicates demand leaving the City during the morning peak;
- Link roads within the Ring Road consistently experience a significant volume of traffic, especially both cross-river connections in the Core City Centre Area;
- Highest public transport passenger numbers can be seen on the south-east side of the Study Area. Passenger flows can also be observed along the north-south axis. As well as the road traffic volumes, the outbound passenger flows are slightly higher than in the opposite direction;
- Highest pedestrian and cyclist flows within the City are during the AM peak period, especially in the Core City Centre Area;
- Low average values for cyclists. It is worth noting, however, that the SERM underrepresents cycling numbers due to the cycle network. These numbers can therefore be multiplied by 4;
- Both City Centre cross-river connections modelled present the highest active mode volume flows; and
- Significant pedestrian flows in links connecting residential areas within the Road Ring to the Core City Centre Area.

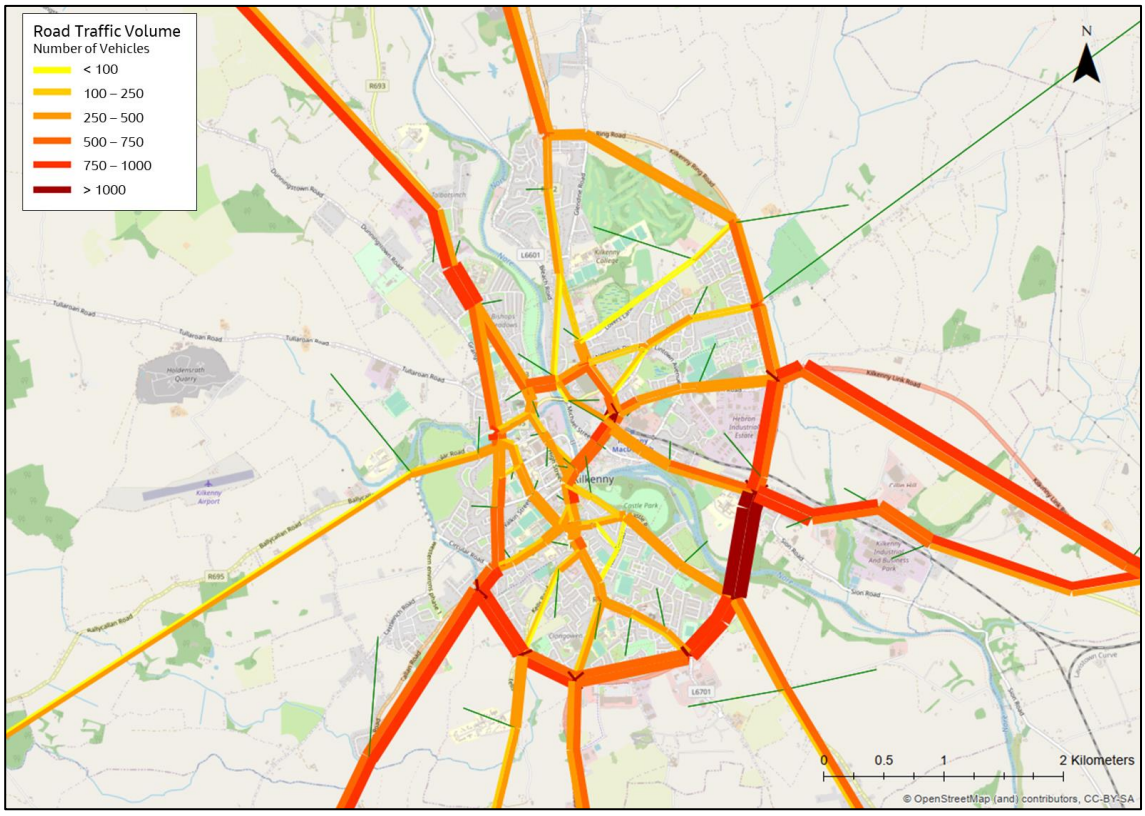


Figure 5-14 SERM AM Peak Traffic Volumes

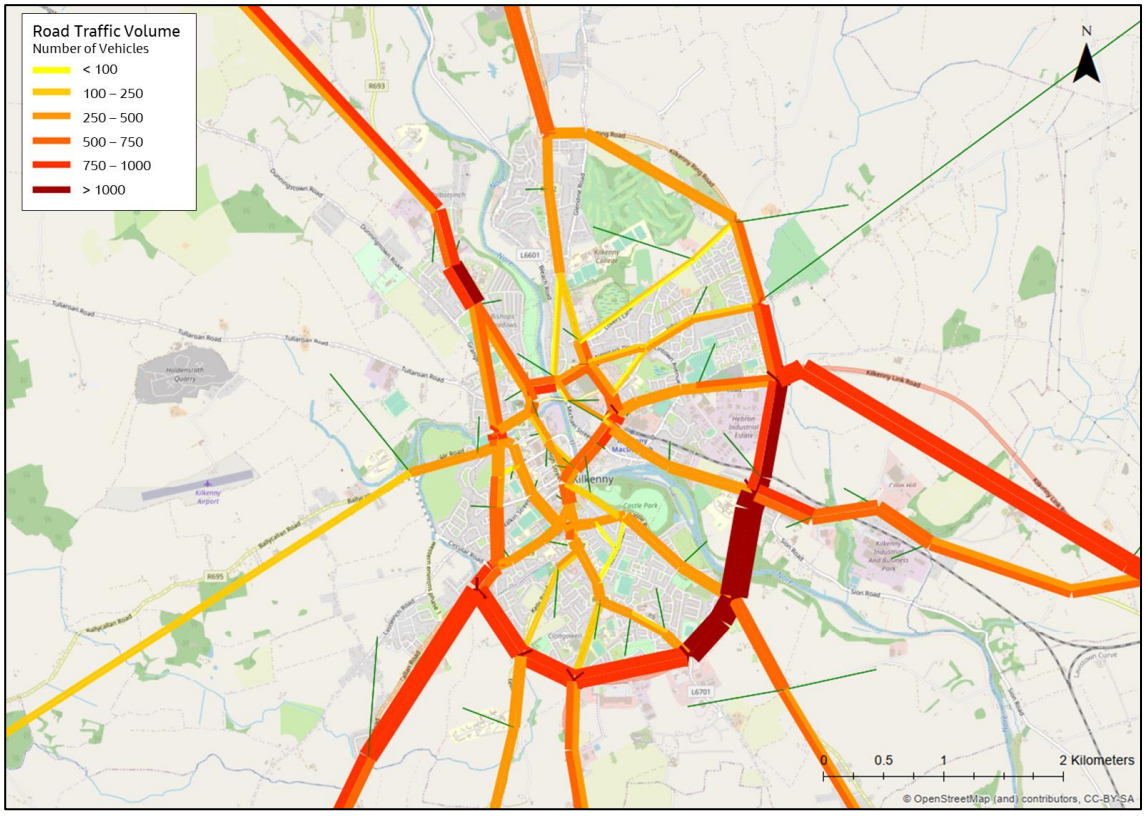


Figure 5-15 SERM PM Peak Traffic Volumes

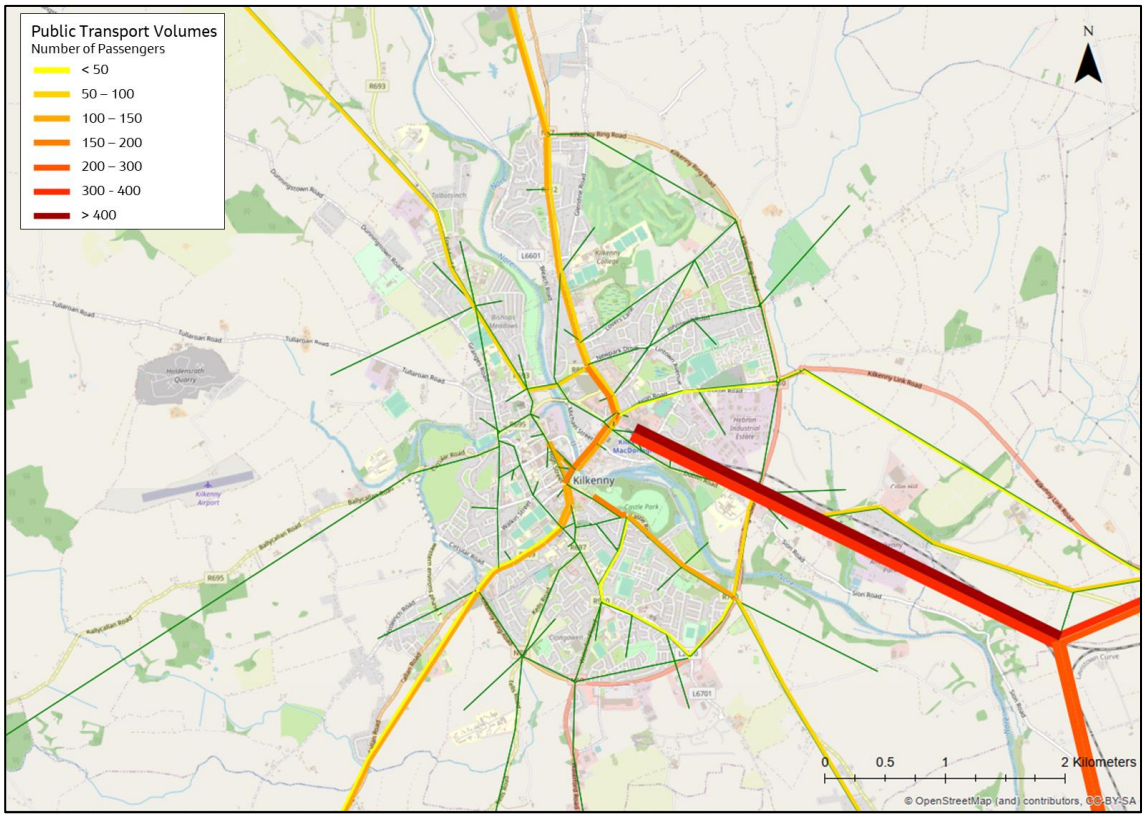


Figure 5-16 SERM AM Peak Public Transport Passenger Numbers

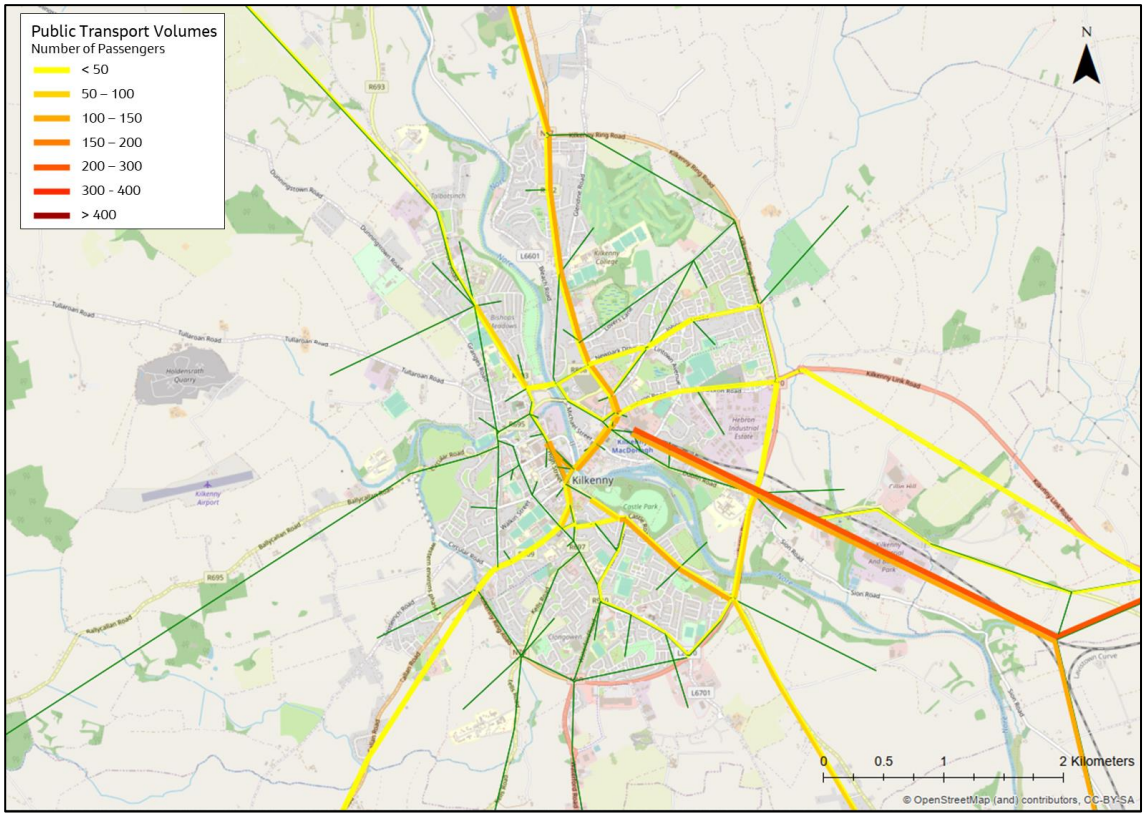


Figure 5-17 SERM PM Peak Public Transport Passenger Numbers

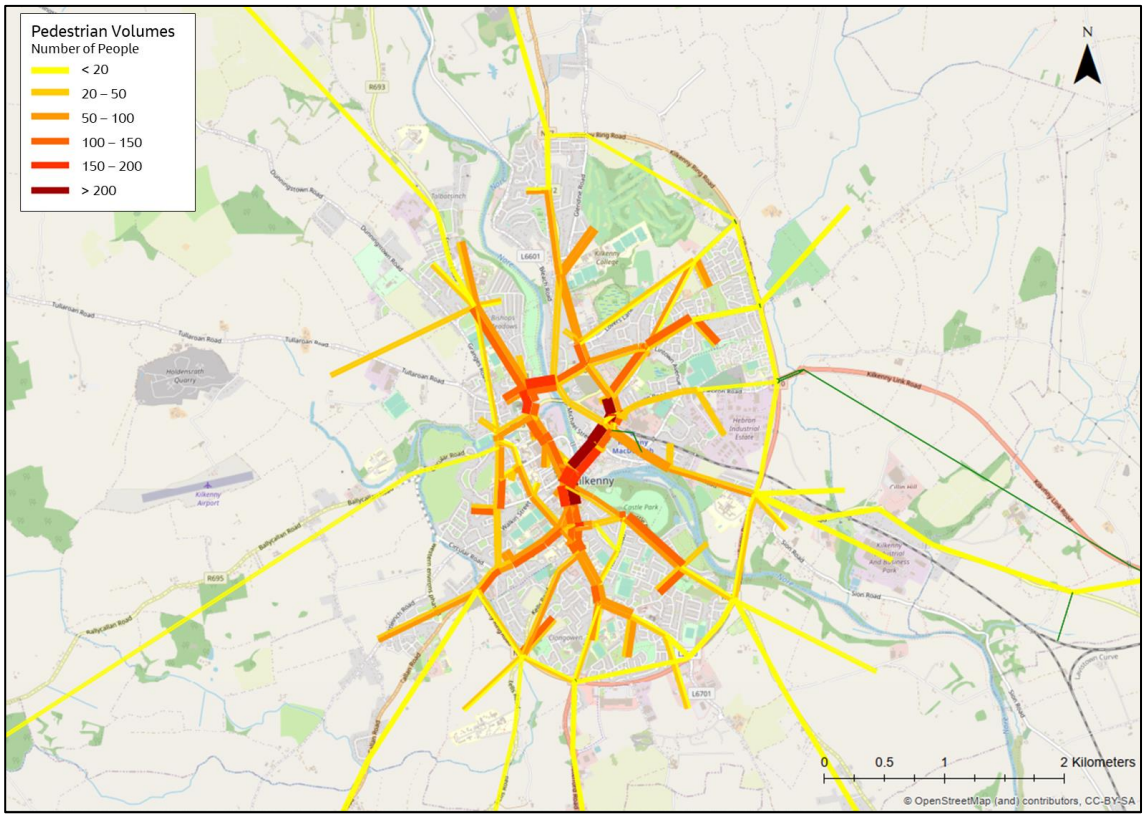


Figure 5-18 SERM AM Peak Pedestrian Numbers

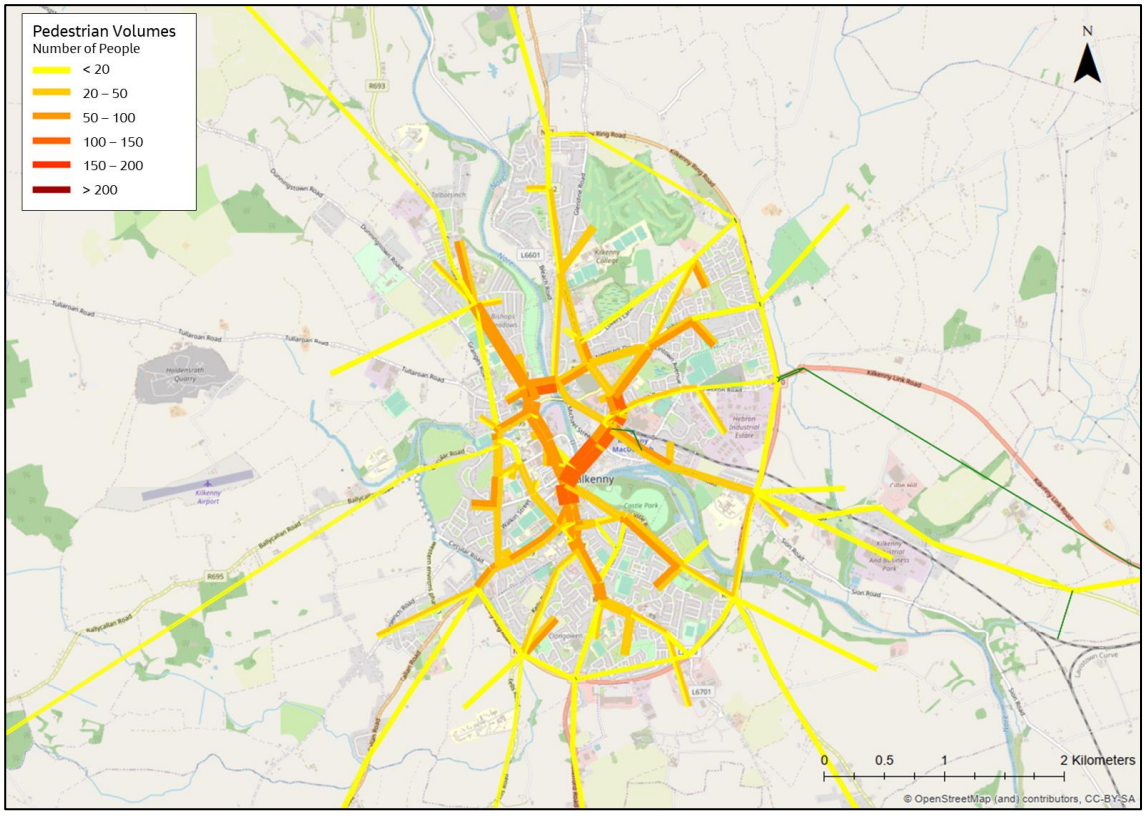


Figure 5-19 SERM PM Peak Pedestrian Numbers

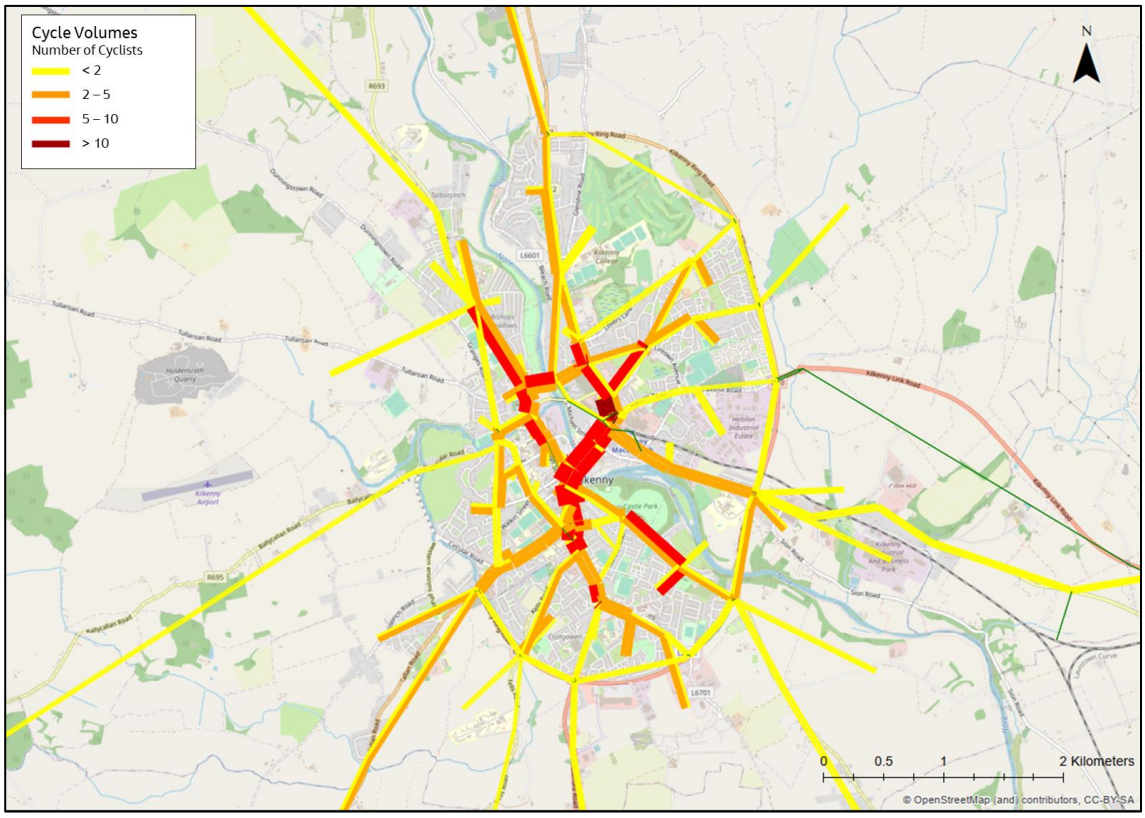


Figure 5-20 SERM AM Peak Cycling Numbers

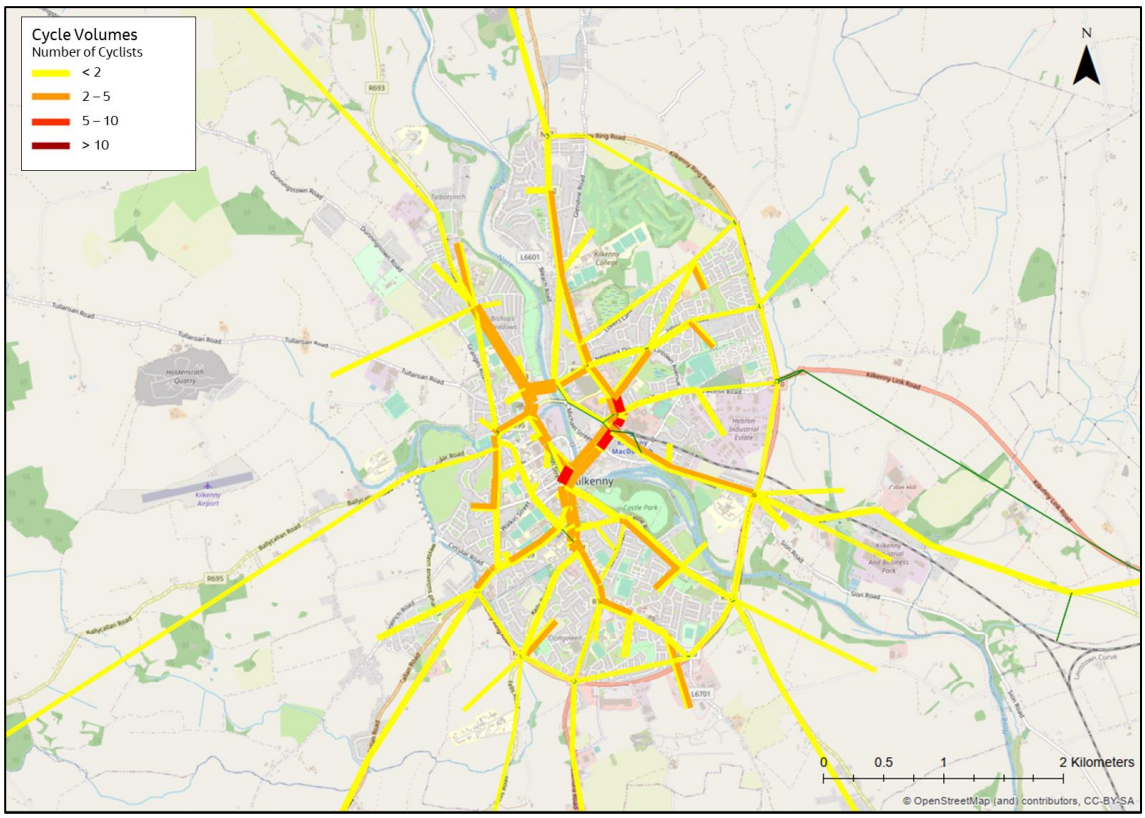


Figure 5-21 SERM PM Peak Cycling Numbers

6. Summary and Conclusions

6.1 SWOT Analysis

The baseline assessment of Kilkenny City and Environs is summarised in the form of a Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis in Table 6-1.

6.2 Conclusion

This Report provides a comprehensive assessment of the baseline conditions in relation to existing transport planning policy, transport infrastructure and services, and travel demand and movement patterns in Kilkenny City and Environs.

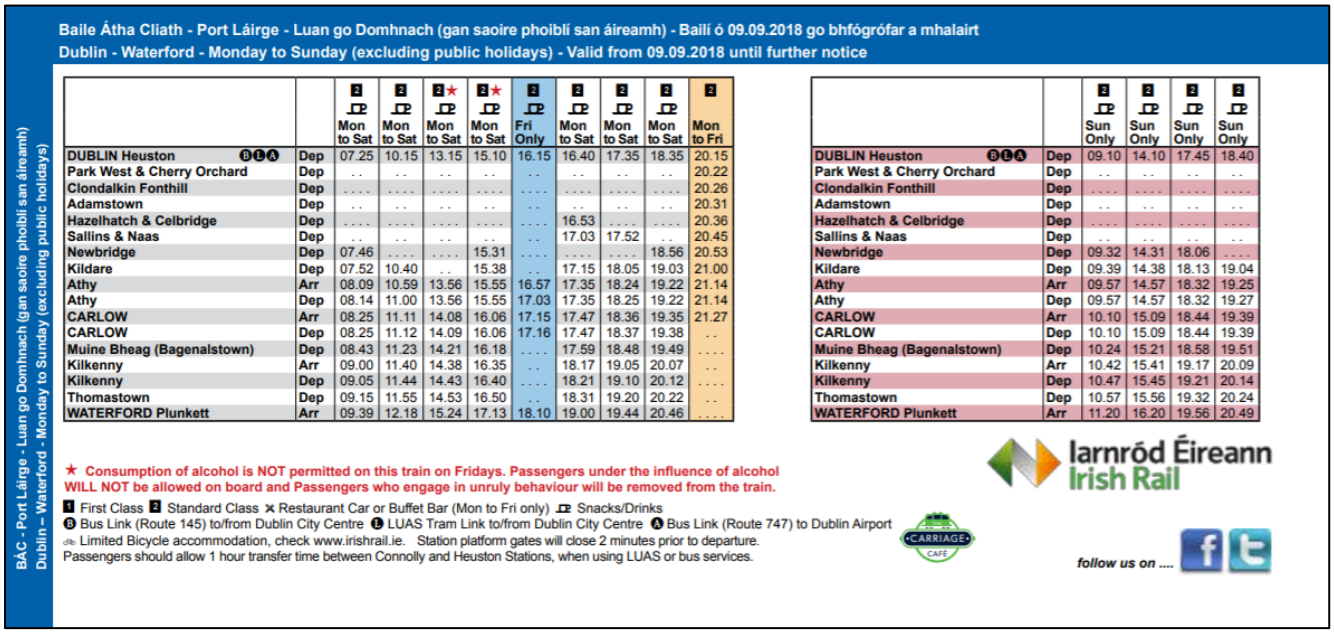
It concludes that there are many long-standing plans and policy objectives in relation to land-use and transport planning at all levels that support sustainable development and transport for the Study Area. National level policy takes the lead in providing a robust framework for sustainable development and transport, reflecting the international step-change toward creating more liveable cities and tackling climate change. Moreover, whilst there are high levels of car dependency and car ownership throughout some parts of the Study Area, Kilkenny's compact urban form and existing transport network present a strong foundation to facilitate a shift toward sustainable mobility for residents and visitors.

This baseline assessment will provide a robust underpinning to the subsequent stages in the development of the Kilkenny Local Transport Plan.

Table 6-1 SWOT Analysis of Study Area

STRENGTHS	WEAKNESSES
▪ Recognition in the RSES as a Key Town and a significant zone of influence centrally located in the South-East Region; ▪ International connectivity with direct access routes to the Ports of Waterford, Rosslare and Dublin, and airports at Dublin and Waterford; ▪ Kilkenny Ring Road connects to all National roads in the vicinity as well as the M9 and M8 linking with Dublin, Waterford and Cork; ▪ MacDonagh Junction Train Station connects the City to the Dublin-Waterford InterCity route; ▪ Compact urban footprint that supports the '10-minute city' concept which is a long-standing policy objective of KCC; ▪ Strong policy basis for compact growth and the integration of land use and sustainable transport; ▪ Existing street network provides a strong basis to provide for sustainable transport; ▪ New city bus services funded by the NTA commenced operation in December 2019; ▪ Favourable topography and compact urban structure for walking and cycling; ▪ Recent improvements to the pedestrian environment including public realm around The Parade and the pedestrianisation of St. Kiernan's St.; and ▪ Kilkenny is internationally renowned as a historic medieval city with major tourist attractions and an important centre for arts and culture lending to a vibrant sense of place for residents and visitors.	▪ Lack of formal transport hub to facilitate interchange between bus and rail services; ▪ Lack of bus priority measures; ▪ Heavy reliance on the private car as a means of travel into and around Kilkenny, particularly in Kilkenny Rural, will invariably worsen with future growth if not managed; ▪ New city bus services have circuitous alignments which can increase journey times; ▪ Poor pedestrian and cyclist wayfinding and legibility, particularly between MacDonagh Junction Station, Kilkenny Castle and the City Centre Core; and ▪ Lack of dedicated cycle provision in the City Centre Core.
OPPORTUNITIES	**THREATS**
▪ Opportunity to further consolidate growth within the City's existing built-up footprint; ▪ Realisation of the Abbey Quarter, a brownfield site in the heart of the City Centre, earmarked for mixed-use development. It has received approval in principal for €6.15m through URDF for public realm and community projects; ▪ Urban regeneration of other brownfield sites in the City Centre such as the Old Mart Site; ▪ Development of the 'Medieval Mile' which brings together public realm and wayfinding improvements; ▪ Potential to significantly improve sustainable transport mode share and network priority measures; and ▪ Build on existing walking and cycling infrastructure and complete the Pedestrian and Cycle Network including gateways, pedestrian portals and the River Nore linear park.	▪ High car dependency and ownership, especially outside the City Centre; ▪ A 'Business as Usual' approach to land use, transport planning, sustainable transport provision and parking policy; ▪ A change in the economic outlook leading to uncertainty about required capital infrastructure funding and private investment; ▪ Proliferation of out-of-town retail and commercial uses; and ▪ High level of existing and proposed parking in City Centre Core locations attracting vehicular traffic into the core retail area and undermining sustainable modes.

Appendix A. Train Timetables



Baile Átha Cliath - Port Láirge - Luan go Domhnach (gan saoire phoiblí san áireamh) - Bailí ó 09.09.2018 go bhfógrófar a mhalairt
Dublin - Waterford - Monday to Sunday (excluding public holidays) - Valid from 09.09.2018 until further notice

BÁC - Port Láirge - Luan go Domhnach (gan saoire phoiblí san áireamh)
Dublin – Waterford - Monday to Sunday (excluding public holidays)

		Mon to Sat	Mon to Sat	Mon to Sat	Mon to Sat	Fri Only	Mon to Sat	Mon to Sat	Mon to Sat	Mon to Fri
DUBLIN Heuston BLA	Dep	07.25	10.15	13.15	15.10	16.15	16.40	17.35	18.35	20.15
Park West & Cherry Orchard	Dep	..	..	..	..	..	..	..	..	20.22
Clondalkin Fonthill	Dep	....	....	....	....	....	....	....	....	20.26
Adamstown	Dep	..	..	..	..	..	..	..	..	20.31
Hazelhatch & Celbridge	Dep	....	....	....	....	....	16.53	....	....	20.36
Sallins & Naas	Dep	..	..	..	..	..	17.03	17.52	..	20.45
Newbridge	Dep	07.46	....	....	15.31	....	....	....	18.56	20.53
Kildare	Dep	07.52	10.40	..	15.38	..	17.15	18.05	19.03	21.00
Athy	Arr	08.09	10.59	13.56	15.55	16.57	17.35	18.24	19.22	21.14
Athy	Dep	08.14	11.00	13.56	15.55	17.03	17.35	18.25	19.22	21.14
CARLOW	Arr	08.25	11.11	14.08	16.06	17.15	17.47	18.36	19.35	21.27
CARLOW	Dep	08.25	11.12	14.09	16.06	17.16	17.47	18.37	19.38	..
Muine Bheag (Bagenalstown)	Dep	08.43	11.23	14.21	16.18	....	17.59	18.48	19.49	....
Kilkenny	Arr	09.00	11.40	14.38	16.35	..	18.17	19.05	20.07	..
Kilkenny	Dep	09.05	11.44	14.43	16.40	....	18.21	19.10	20.12	....
Thomastown	Dep	09.15	11.55	14.53	16.50	..	18.31	19.20	20.22	..
WATERFORD Plunkett	Arr	09.39	12.18	15.24	17.13	18.10	19.00	19.44	20.46	....

		Sun Only	Sun Only	Sun Only	Sun Only
DUBLIN Heuston BLA	Dep	09.10	14.10	17.45	18.40
Park West & Cherry Orchard	Dep	..	..	..	..
Clondalkin Fonthill	Dep	....	....	....	....
Adamstown	Dep	..	..	..	..
Hazelhatch & Celbridge	Dep	....	....	....	....
Sallins & Naas	Dep	..	..	..	..
Newbridge	Dep	09.32	14.31	18.06	....
Kildare	Dep	09.39	14.38	18.13	19.04
Athy	Arr	09.57	14.57	18.32	19.25
Athy	Dep	09.57	14.57	18.32	19.27
CARLOW	Arr	10.10	15.09	18.44	19.39
CARLOW	Dep	10.10	15.09	18.44	19.39
Muine Bheag (Bagenalstown)	Dep	10.24	15.21	18.58	19.51
Kilkenny	Arr	10.42	15.41	19.17	20.09
Kilkenny	Dep	10.47	15.45	19.21	20.14
Thomastown	Dep	10.57	15.56	19.32	20.24
WATERFORD Plunkett	Arr	11.20	16.20	19.56	20.49

★ Consumption of alcohol is NOT permitted on this train on Fridays. Passengers under the influence of alcohol WILL NOT be allowed on board and Passengers who engage in unruly behaviour will be removed from the train.

1 First Class 2 Standard Class ✕ Restaurant Car or Buffet Bar (Mon to Fri only) Snacks/Drinks
B Bus Link (Route 145) to/from Dublin City Centre L LUAS Tram Link to/from Dublin City Centre A Bus Link (Route 747) to Dublin Airport
Limited Bicycle accommodation, check www.irishrail.ie. Station platform gates will close 2 minutes prior to departure.
Passengers should allow 1 hour transfer time between Connolly and Heuston Stations, when using LUAS or bus services.

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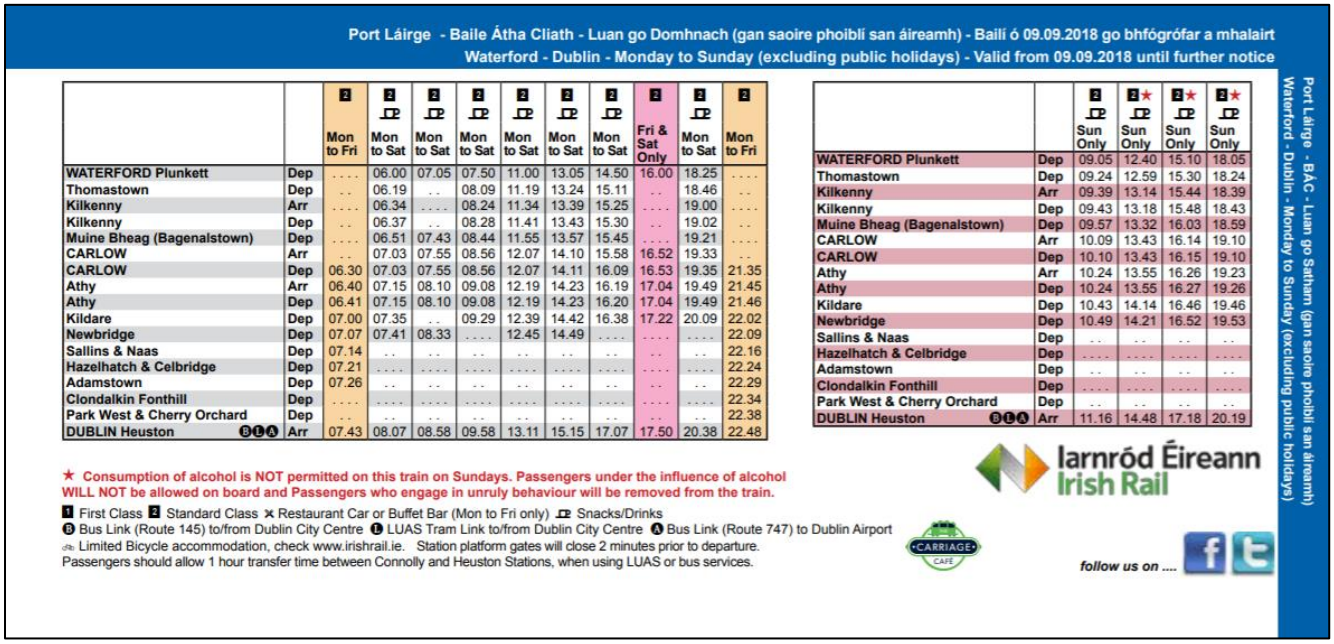
Figure 6-1 Dublin - Kilkenny - Waterford Train Timetable. Source: Irish Rail, 2018.



Port Láirge - Baile Átha Cliath - Luan go Domhnach (gan saoire phoiblí san áireamh) - Bailí ó 09.09.2018 go bhfógrófar a mhalairt
Waterford - Dublin - Monday to Sunday (excluding public holidays) - Valid from 09.09.2018 until further notice

Port Láirge - BÁC - Luan go Sathairn (gan saoire phoiblí san áireamh)
Waterford - Dublin - Monday to Sunday (excluding public holidays)

		Mon to Fri	Mon to Sat	Mon to Sat	Mon to Sat	Mon to Sat	Mon to Sat	Mon to Sat	Fri & Sat Only	Mon to Sat	Mon to Fri
WATERFORD Plunkett	Dep	....	06.00	07.05	07.50	11.00	13.05	14.50	16.00	18.25	....
Thomastown	Dep	..	06.19	..	08.09	11.19	13.24	15.11	..	18.46	..
Kilkenny	Arr	....	06.34	....	08.24	11.34	13.39	15.25	....	19.00	....
Kilkenny	Dep	..	06.37	..	08.28	11.41	13.43	15.30	..	19.02	..
Muine Bheag (Bagenalstown)	Dep	....	06.51	07.43	08.44	11.55	13.57	15.45	....	19.21	....
CARLOW	Arr	..	07.03	07.55	08.56	12.07	14.10	15.58	16.52	19.33	..
CARLOW	Dep	06.30	07.03	07.55	08.56	12.07	14.11	16.09	16.53	19.35	21.35
Athy	Arr	06.40	07.15	08.10	09.08	12.19	14.23	16.19	17.04	19.49	21.45
Athy	Dep	06.41	07.15	08.10	09.08	12.19	14.23	16.20	17.04	19.49	21.46
Kildare	Dep	07.00	07.35	..	09.29	12.39	14.42	16.38	17.22	20.09	22.02
Newbridge	Dep	07.07	07.41	08.33	....	12.45	14.49	....	....	....	22.09
Sallins & Naas	Dep	07.14	..	..	..	..	..	..	..	..	22.16
Hazelhatch & Celbridge	Dep	07.21	....	....	....	....	....	....	....	....	22.24
Adamstown	Dep	07.26	..	..	..	..	..	..	..	..	22.29
Clondalkin Fonthill	Dep	....	....	....	....	....	....	....	....	....	22.34
Park West & Cherry Orchard	Dep	..	..	..	..	..	..	..	..	..	22.38
DUBLIN Heuston BLA	Arr	07.43	08.07	08.58	09.58	13.11	15.15	17.07	17.50	20.38	22.48

		Sun Only	Sun Only	Sun Only	Sun Only
WATERFORD Plunkett	Dep	09.05	12.40	15.10	18.05
Thomastown	Dep	09.24	12.59	15.30	18.24
Kilkenny	Arr	09.39	13.14	15.44	18.39
Kilkenny	Dep	09.43	13.18	15.48	18.43
Muine Bheag (Bagenalstown)	Dep	09.57	13.32	16.03	18.59
CARLOW	Arr	10.09	13.43	16.14	19.10
CARLOW	Dep	10.10	13.43	16.15	19.10
Athy	Arr	10.24	13.55	16.26	19.23
Athy	Dep	10.24	13.55	16.27	19.26
Kildare	Dep	10.43	14.14	16.46	19.46
Newbridge	Dep	10.49	14.21	16.52	19.53
Sallins & Naas	Dep	..	..	..	..
Hazelhatch & Celbridge	Dep	....	....	....	....
Adamstown	Dep	..	..	..	..
Clondalkin Fonthill	Dep	....	....	....	....
Park West & Cherry Orchard	Dep	..	..	..	..
DUBLIN Heuston BLA	Arr	11.16	14.48	17.18	20.19

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1 First Class 2 Standard Class ✕ Restaurant Car or Buffet Bar (Mon to Fri only) Snacks/Drinks
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Figure 6-2 Waterford - Kilkenny - Dublin Train Timetable. Source: Irish Rail, 2018.