Prepared by
Roughan & O'Donovan
Arena House, Arena Road, Sandyford Dublin 18, D18 V8P6
Tel +353 1 294 0800 Email info@rod.ie www.rod.ie

DUNDALK BAY TO CARLINGFORD GREENWAY

Feasibility Report

P03 A1 | May 2024

ROD
ROUGHAN & O'DONOVAN

Dundalk Bay to Carlingford Greenway

Feasibility Report

TABLE OF CONTENTS

1. INTRODUCTION AND DESCRIPTION

1.1 Background

Roughan & O'Donovan AECOM Alliance have been appointed to carry out design development from feasibility through to the statutory process for a proposed Greenway development between Dundalk and Carlingford, (herein referred to as the 'Proposed Development'), requiring input from various specialists, on behalf of Louth County Council, in conjunction with Transport Infrastructure Ireland (herein referred to as the 'Client(s)').

The project is being developed in accordance with Transport Infrastructure Ireland (TII) 'Project Manager's Manual for Greenway Projects' guidelines. These guidelines include an eight-phase process (Phase 0 to Phase 7 inclusive) for the development, management and delivery of Major National Road Schemes in Ireland as shown in Table 1.1.1.1. The feasibility study relates to Phase 1 'Concept and Feasibility' of the project management guidelines. The constraints and opportunities study forms the main deliverable of Phase 1 and is carried out to identify the nature and extent of environmental constraints within the study area of the proposed development. The second stage is the assessment of preliminary options taking into consideration the existing environmental constraints in the study area.

Note that any documents or guidelines published prior to 2015 i.e. prior to the merger of the National Roads Authority (NRA) and the Rail Procurement Agency (RPA) into TII effective from August 2015, are referenced by the published author title.

Table 1.1.1.1 Project Manager's Manual for Greenway Projects– Eight Phase Approach to the Development, Management and Delivery of Greenway Projects in Ireland

Phase		Project Management Guidelines (May, 2023)
Planning and Design	Phase 0	Scope and Strategic Assessment
	Phase 1	Concept and Feasibility
	Phase 2	Options Selection
	Phase 3	Design and Environmental Evaluation
	Phase 4	Statutory Processes
Construct / Implement	Phase 5	Enabling and Procurement
	Phase 6	Construction and Implementation
	Phase 7	Close out and Review

1.2 Report Team

Roughan & O'Donovan – AECOM Alliance has led the preparation of the Feasibility Study with the assistance of specialists who have prepared the appropriate sections of this report.

Table 1.2.1.1 overleaf identifies the contributors of this report.

Table 1.2.1.1 Specialist Contributors to the Constraints Report

Topic	Specialist Contributors	Company	Qualifications	Experience (years)
EIA Co-ordinator	Barry Corrigan	ROD - AECOM	BSc (Hons), Dip EIA & SEA, MIEMA, CEnv	21
Engineering	Richard Spencer	ROD - AECOM	B.Eng (Civil), C.Eng., MIEI	28
Biodiversity	Siofra Sealy	ROD	BA, ACIEEM	5
Land and Geology	Paul Kissane	ROD	BA, BAI, PhD, CEng, MIEI	21
Hydrology and Hydrogeology	Maryann Nwankwo	ROD	BSc, MSc, CIWEM	14
Landscape and Visual	Jamie Ball	Cunnane Stratton Reynolds	BA LA (Hons)	14
Archaeological, Architectural and Cultural Heritage	Lisa Courtney	Courtney Deery	BA, MSc (Ag) MIAI	31
Material Assets and Land (Agriculture)	Con Curtin	Curtin Agricultural Consultants	Degree in Agricultural Science, Level 6 Cert. in Land Drainage	33
Air Quality and Climate	Dr. Avril Challoner	AWN Consulting	CSci, BSc, MSc, MIAQM, MIEnvSc	9
Noise and Vibration	Alistair Maclaurin	AWN Consulting	BSc, PgDip, MIOA	9
Human Beings	Frances O'Kelly	ROD	BSc, MSc, MIPI	13

1.3 Project Description and Objectives

Louth County Council (LCC) has identified the development and promotion of cycleways, trails and walks as a means of enhancing the quality of life of both its residents and visitors to the County. Working with state agencies and local stakeholders, the Council seeks to maintain existing facilities and deliver new ones. The Council is placing an emphasis on developing Greenways throughout the County. The aim of this greenway is to link Carlingford, and the many rural settlements on the Cooley Peninsular to Dundalk Town to boost the smaller settlements with increased visitor numbers whilst greatly improving accessibility for rural dwellers.

It is envisaged the greenway will be a world class tourist attraction building on the tourism success of Carlingford enabling growth and strengthening of North-East of Ireland. The Proposed Development will be linear in nature and will form part of a larger network of greenways in the region, linking to the constructed Carlingford Greenway and the currently under construction Omeath to Newry Greenway providing cross-border links into Northern Ireland from Dundalk. In addition to the provision of a greenway the project will include, but is not restricted to, associated infrastructure such as car parks, trail heads, signage and connections to adjacent villages and attractions within close proximity.

The Strategic Assessment Report (SAR) prepared for the Dundalk Bay to Carlingford Greenway Project defined a series of Objectives. These objectives have been reviewed and updated using the Greenway Strategy and aligned with the "Transport Appraisal Framework (TAF) (Department of Transport, June 2023)" taking account of European, National and Local policy. In accordance with the Strategy for the Future Development of National and Regional Greenways (DTTAS, July 2018), the project should take cognisance of the 5S's as detailed in Figure 1.3.1.1 below.

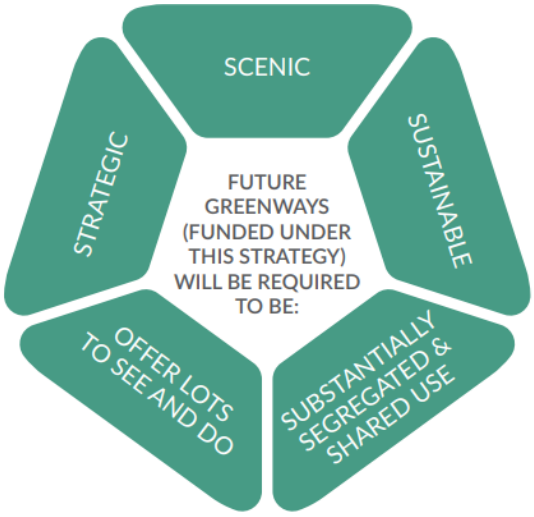

Figure 1.3.1.1 Greenway Requirements (DTTAS, 2018)

The TAF uses a multi-criteria analysis in the appraisal of transport projects and programmes under the following seven appraisal headings:

- Transport User Benefits and Other Economic Impacts;
- Accessibility Impacts;
- Social Impacts;
- Land Use Impacts;
- Safety Impacts;
- Climate Change Impacts;
- Local Environmental Impacts.

The objectives have been linked to the issues and opportunities identified and have been defined to identify the outcomes the project aims to achieve, but not to be prescriptive about the types of infrastructure or solutions that will be delivered.

The objectives for the project are set in Table 1.3.1.1 overleaf.

Table 1.3.1.1 Project Objectives

Transport Appraisal Framework Heading	Objective	Sub-Objective	Objective Reference
Transport User Benefits and Other Economic Impacts	To increase the economic contribution of tourism to the local economy.	To improve accessibility between Carlingford and Dundalk for non-motorised users and to improve access to tourism destinations.	1.1a
		Create local employment opportunities in the study area, through expanded enterprise opportunities.	1.1b
	Increase in sustainable transport usage within the study area compared to current day scenario for leisure and non-leisure journeys.	Increase in the number of people using sustainable modes for local journeys within the study area, based on subsequent census data after scheme opening	1.2a
		Increase number of people within the study area participating in outdoor activities based on subsequent census data after scheme opening	1.2b
Accessibility Impacts	Provide alternative means of access to tourism and cultural and heritage sites	Increase alternative modes of travel for access to tourism and cultural heritage sites, particularly active travel modes.	2.1a
	Encourage greater community participation in physical activity and outdoor activities.	Provide a high quality facility for recreational exercise for all age groups and abilities within the study area.	2.2a
		To be accessible to users arriving by public transport, including bus, rail and passenger boat services	2.2b
Social Impacts	Improve accessibility to/from and within the rural communities along the corridor compared to the existing scenario.	Improved accessibility of the transport network for vulnerable users, such as those with a disability.	3.1a
		To encourage a shift to active modes by connecting to places of employment, schools, community facilities and urban centres.	3.1b
	Enhance sustainable transport access to opportunities and services for disadvantaged groups.	Increase the number of residents within the study area with access to a sustainable transport facility within CLÁR region.	3.2a
Land Use Impacts	Enable Project Ireland 2040 through the delivery of a National Greenway.	To investigate links to other existing and proposed Greenways, active travel facilities and recreational trails within the study area	4.1a
		To deliver the greenway such that it can form an integral part of the proposed National Cycle Network (NCN).	4.1b
	Minimise impact on land holdings	Provide a greenway that minimises severance of landholdings and seeks to use public lands where possible	4.2a
		Adhere to code of practice for greenways and seek voluntary land acquisition where possible	4.2b

Transport Appraisal Framework Heading	Objective	Sub-Objective	Objective Reference
Safety Impacts	Protect and enhance the safety and security of the vulnerable road users.	To provide a walking and cycling route that is predominantly segregated from motorised traffic (recognising that it may not be possible to achieve full segregation over the entire route and quiet roads may be incorporated into the design).	5.1a
		To provide a high level of operational safety on the greenway of sufficient width for a shared pedestrian and cycle facility	5.1b
		To make the greenway accessible for vulnerable road users, through the provision of suitably located trail heads and access points	5.1c
Climate Change Impacts	Reduce vehicle related transport emissions in the region compared existing scenario. Reduce reliance on the private car within the study area.	Reduction in the number of single occupancy car journeys in the study area for accessing leisure or employment opportunities with a consistent decrease for 10 years after scheme opening.	6.1a
	Minimise construction related emissions	Increase in the number of people using active travel modes for local journeys within the study area, targeting an increase in active mode share based on subsequent census data after scheme	6.2a
	Reduce vehicle related transport emissions in the region compared existing scenario.	To ensure consideration of sustainable development principles and measures to minimise effects on the environment to support the Government's Climate Action Plan	6.3a
Local Environmental Impacts	To protect and enhance the natural assets and biodiversity of the local area.	Minimise impact to the natural environment, particularly in ecologically sensitive areas, such as the Natura 2000 sites	7.1a
		In the development of the project, ensure no net loss of biodiversity habitat and seek to enhance biodiversity and provide a net gain.	7.1b
	Provide a route that increases the public appreciation of the scenic nature of the area	Prioritise a scenic route	7.2a
	Increase public appreciation of the natural environment by encouraging people to experience the countryside.	Prioritise an ecologically diverse route.	7.3a

2. PROJECT NEED AND POLICY ALIGNMENT

2.1 Overview

The compatibility of the proposed scheme in terms of meeting the objectives of international, national, regional, and local planning policy context is considered in this section of the Feasibility Report. The following documents have been reviewed as part of this process:

International Policy Context

- United Nations 2030 - Agenda for Sustainable Development
- EU Sustainable and Smart Mobility Strategy 2020
- European Green Deal
- EU Biodiversity Strategy for 2030

National Policy Context

- Project Ireland 2040: National Planning Framework and the National Development Plan 2021-2030
- National Sustainable Mobility Policy (2022), including the National Sustainable Mobility Policy Action Plan 2022-2025
- Programme for Government, Our Shared Future (2020)
- National Investment Framework for Transport in Ireland (NIFTI) (2021)
- Ireland's Government Road Safety Strategy 2021-2030
- Climate Action Plan 2024
- Our Rural Future: Rural Development Policy 2021-2025
- Strategy for the Future Development of National and Regional Greenways
- National Outdoor Recreation Strategy 2023-2027
- People, Place and Policy: Growing Tourism to 2025
- The National Cycle Network Plan Report 2023
- Draft Cycle Connects: Ireland's Cycle Network

Regional Policy Context

- Regional Spatial & Economic Strategy (RSES) for the Eastern and Midland Region 2020-2032

Local Policy Context

- Louth County Development Plan 2021-2027
- Draft Louth County Council Climate Action Plan 2024-2029
- Dundalk Local Area Plan 2024-2030 (Pre-Draft Issues Paper)

2.2 International Policy Context

2.2.1 United Nations 2030 - Agenda for Sustainable Development

In September 2015, UN Member States adopted the 2030 Agenda for Sustainable Development as a plan of action for people, planet and prosperity and applies to both developed and developing countries. The focus of the 2030 Agenda is the 17 Sustainable Development Goals (SDGs) and their respective 169 sub-targets.
The SDGs cover ambitions such as:

- an end to poverty
- sustainable economic development
- protection of the environment
- access to health and education services
- gender equality
- peaceful societies
- decent work

The 2030 Agenda encourages countries to integrate the Sustainable Development Goals (SDGs) into planning and policy, on both a national and international level. The proposed development aligns with the goals listed below:

- Goal 3. Good health and well-being
- Goal 11. Sustainable cities and communities
- Goal 13. Climate action*

** Acknowledging that the United Nations Framework Convention on Climate Change is the primary international, intergovernmental forum for negotiating the global response to climate change.*

The proposed greenway development supports Goals 3. 11, and 13 by providing dedicated pedestrian and cyclist facilities that encourage the uptake of active travel modes of transport contributing to the reduction of greenhouse gas emissions, whilst having a beneficial effect on human health and well-being.

2.2.2 EU Sustainable and Smart Mobility Strategy 2020

The EU Sustainable and Smart Mobility Strategy lays the foundation for how the EU transport system can achieve its green and digital transformation and become more resilient to future crisis. The European Green Deal set a target to reduce transport-related emissions by 90% by 2050 and the Strategy outlines how this reduction will be achieved. To achieve this target, the Strategy acknowledges that *"increasing the modal shares of collective transport, walking and cycling, as well as automated, connected and multimodal mobility will significantly lower pollution and congestion from transport"*. To achieve this target, the Strategy acknowledges that multimodal transport system is required, and sustainable alternatives need to be widely available.

The proposed development supports the EU Sustainable and Smart Mobility Strategy by providing a sustainable alternative to the private car for journeys between Dundalk and Carlingford as well as exploring options to connect to towns and villages along the way, such as Ballymascanlan, Jenkinstown, Lordship, The Bush, and Greenore.

2.2.3 European Green Deal

The European Green Deal includes a target to reduce transport-related greenhouse gas emissions by 90% by 2050.

The Objectives included in the strategy to meet and ensure that the EU transport sector is fit for a clean, digital, and modern economy are highlighted below:

- increasing the uptake of zero-emission vehicles
- making sustainable alternative solutions available to the public & businesses
- supporting digitalisation & automation
- improving connectivity & access.

The proposed development supports the objectives of the European Green Deal as it would provide increased pedestrian and cyclist connectivity and access between Dundalk and Carlingford, in addition to providing a sustainable alternative to private car usage when travelling between these areas.

2.2.4 EU Biodiversity Strategy for 2030

The Biodiversity Strategy aims to stop and reverse the loss of green spaces trend by promoting the systematic integration of healthy ecosystems, green infrastructure, and nature-based solutions into all forms of urban planning.

The key commitments outlined for 2030 are highlighted below:

- Legally protect a minimum of 30% of the EU's land area and 30% of the EU's Sea area and integrate ecological corridors, as part of a true Trans-European Nature Network.
- Strictly protect at least a third of the EU's protected areas, including all remaining EU primary and old-growth forests.
- Effectively manage all protected areas, defining clear conservation objectives and measures, and monitoring them appropriately.

The provision of a greenway will enhance the management and restoration of protected areas by providing opportunities for monitoring, conservation, education and recreation activities in or close to these ecological sites, raising awareness and engagement from the public and stakeholders on the value and importance of biodiversity and ecosystems.

The greenway will also support the transition to a green economy by promoting sustainable tourism, recreation, transport, practices in the region.

2.3 National Policy Context

2.3.1 Project Ireland 2040

Project Ireland 2040 is the government's long-term overarching strategy to make Ireland a better country for all and to build a more resilient and sustainable future. Project Ireland 2040 incorporates both the National Planning Framework (NPF) and the National Development Plan (NDP).

2.3.1.1 National Planning Framework

The NPF succeeds the National Spatial Strategy and has statutory basis. It is the Government's high-level strategic plan for shaping the future growth and development of Ireland out to the year 2040. The overarching ambition of the NPF is to *"create a single vision, a shared set of goals for every community across the country"* by achieving several goals including, but not limited to the following:

- Guide the future development of Ireland, considering a projected 1 million increase in our population by 2040;
- Of the 1 million extra people, 50% of growth to occur in key regional centres, towns, villages and rural areas, to be determined in the regional plans – Regional Spatial and Economic Strategies (RSES);
- Regenerate rural Ireland by promoting environmentally sustainable growth patterns;
- Plan for and implement a better distribution of regional growth, in terms of jobs and prosperity;
- Co-ordinate delivery of infrastructure and services in tandem with growth, through joined-up NPF/National Investment Plan and consistent sectoral plans, which will help

to manage this growth and tackle congestion and quality of life issues in Dublin and elsewhere.

These goals are expressed in the Framework across *ten National Strategic Outcomes (NSOs)*, as illustrated in Figure 2.3.1 below and have considered the overarching themes of wellbeing, equality and opportunity. To deliver the desired NSOs, the Framework developed a set of National Policy Objectives (NPOs) that will set a new way forward for regional and local planning and sustainable development policy in Ireland.

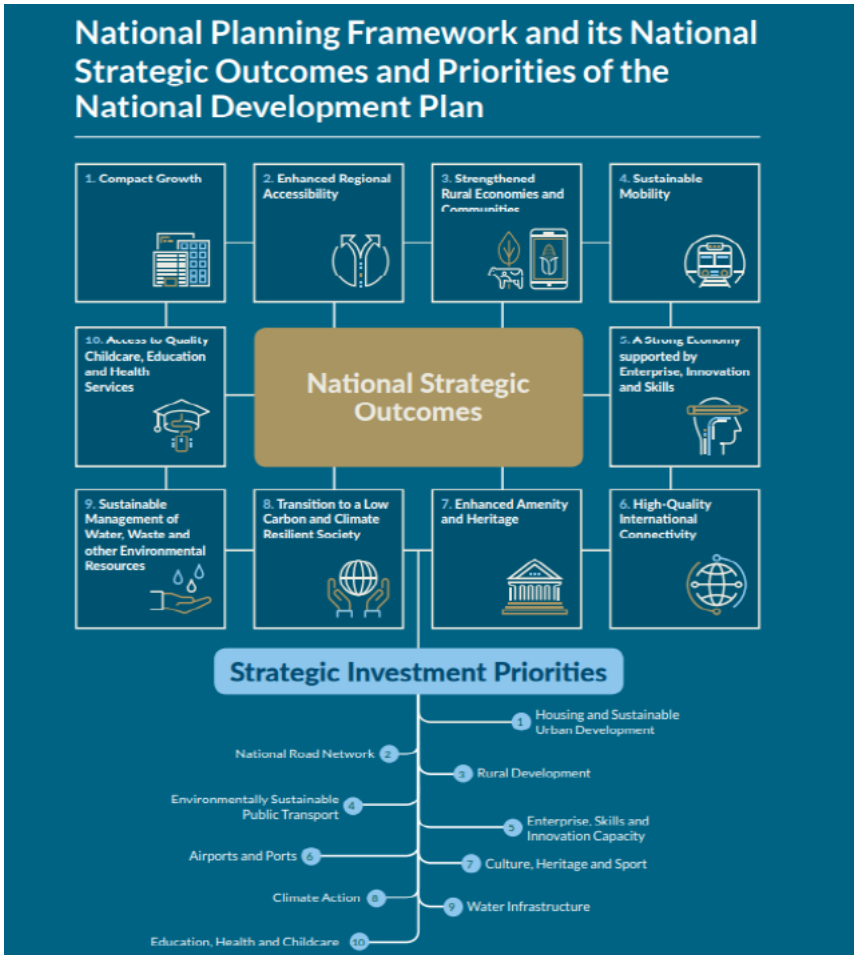

Figure 2.3.1 NSOs and Strategic Investment Priorities of the NPF (Source: Project Ireland 2040 National Planning Framework 2018)

The proposed greenway supports the objectives with the following NSOs:

- NSO 1 Compact Growth.
- NSO 3 Strengthened Rural Economies and Communities.
- NSO 4 Sustainable Mobility.
- NSO 7 Enhanced Amenity and Heritage.
- NSO 10 Access to Quality Childcare, Education and Health Services.

Compact Growth (NSO 1)

The NPF Compact Growth NSO 1 aims to promote residential development within existing built-up areas of cities, towns, and villages to discourage urban sprawl. The NPF identified two principal variables to be addressed to prevent the continued unsustainable growth in and around Dublin, and to a lesser extent, other regional cities, while enabling growth in more peripheral areas of Ireland to realise their full potential:

- Scale of concentration of activity, and
- Relative distance, or ease of accessibility, to larger centres of population and employment, i.e., 'centres of scale'.

The proposed development is in County Louth within the Eastern and Midland Regional Assembly Area of Ireland. The proposed development supports NSO 1 as it would improve connectivity and accessibility for non-motorised users between Dundalk and Carlingford and surrounding settlements of Ballymascanlan, Jenkinstown, Lordship, The Bush, and Greenore, promoting compact growth in these population centres.

Strengthened Rural Economies and Communities (NSO 3)

Ireland's rural areas have faced many challenges in the recent decades in the form of poor connectivity, emigration and loss of traditional industries and employment. Building on Government policy and the 2017 Action Plan for Rural Development, the NPF will place a major focus on rural areas in relation to, and not limited to the following:

- Planning for the future growth and development of rural areas, including addressing decline, with a special focus on activating the potential for the renewal and development of smaller towns and villages;
- Better co-ordination of existing investment programmes dealing with social inclusion, rural development and town and village renewal; and
- Addressing connectivity gaps.

The NPF emphasises that rural communities have a strong interrelationship between neighbouring towns and villages, often beyond county or regional boundaries.

The proposed greenway development will promote connectivity between rural settlements and will aim to provide linkages to critical services such as education, healthcare, community facilities and employment through active travel modes of transport.

Sustainable Mobility (NSO 4)

Urban areas in Ireland are heavily reliant on private road-based transport. As a result of this car dependence, Ireland's transport sector is a significant contributor to greenhouse gas emissions. Congestion is also a major source of emissions and is not conducive to efficient driving.

The proposed development supports this NSO as it will provide pedestrian and cyclist infrastructure between Dundalk and Carlingford, whilst also improving connectivity for the village and rural communities through which it passes, thereby encouraging a modal shift from the private car to active travel modes, providing the opportunity to reduce congestion in the towns of Dundalk and Carlingford.

Enhanced Amenities and Heritage (NSO 7)

This national strategic outcome commits to *"investment in amenities in rural areas, such as activity- based tourism and trails like greenways, as they are linked to and must integrate with our natural, built and cultural heritage"*.

The greenway will provide high quality connectivity between the towns of Dundalk and Carlingford, and provide attractions enroute, in particular giving members of the public a greater appreciation of the natural environment, biodiversity and archaeological and cultural heritage sites of the area.

Access to Quality Childcare, Education and Health Services (NSO 10)

The NPF recognises that access to quality education, health services and childcare plays an integral role in the attractiveness of towns and villages and will need to meet the implications of an additional one million people by 2040. To meet the demographic demand, the Government will provide additional investment in the schools' sector to build new and refurbish existing schools.

The proposed development will improve the connectivity for non-motorised users between the rural settlements to Dundalk and Carlingford, whilst aiming to provide linkages to critical services such as education and health services.

2.3.1.2 National Development Plan 2021 – 2030

The updated National Development Plan (NDP) 2021 – 2030, is a ten-year strategy identifying priorities for public capital investment across all sectors, including Transport. The total investment is estimated at €165 Billion over the next decade. The NDP has been designed to support the 10 National Strategic Outcomes in the National Planning Framework (NPF). The NDP outlines the governments investment into active travel infrastructure and introduces the new 'National Active Travel Programme' which will receive €360 million annually between 2021-2025.

The National Active Travel Programme aims to provide enhanced regional connection between towns and villages through the provision of active travel infrastructure for walking and cycling. Active travel infrastructure has also been designated as a 'Strategic Investment Priority' under Objective 3 Strengthened Rural Economies and Communities and National Strategic Objective 4 – Sustainable Mobility.

The proposed development is consistent with the strategic investment priorities of the National Development Plan as it will provide active travel infrastructure, connecting Dundalk with Carlingford and the surrounding rural settlements, and providing a sustainable transport alternative to private car use.

2.3.2 National Sustainable Mobility Policy (2022), including the National Sustainable Mobility Policy Action Plan 2022 - 2025

The National Sustainable Mobility Policy (NSMP) was published in April 2022 as a replacement to the Smarter Travel – A Sustainable Transport Future and National Cycle Policy Framework, considering the significant changes in legislation during the intervening period. The NSMP aligns with current policy, such as the NPF, NDP, Climate Action Plan, Road Safety Strategy 2021-2030 and National Investment Framework for Transport in Ireland (NIFTI). Its vision is *"to connect people and places with sustainable mobility that is safe, green, accessible and efficient".*

A key target of the National Sustainable Mobility Policy is to deliver a least 500,000 additional daily active travel and public transport journeys and a 10% reduction in kilometres driven by fossil fuelled cars by 2030 in line with metrics for transport set out in the Climate Action Plan.

It is acknowledged within this policy document that "*greenways have an important role, both in terms of their economic contribution to communities in attracting tourism and leisure activity, but also their potential to enable active travel within local communities as part of the overall cycle network within settlements."*

The policy sets out ten goals, including:

> *"Goal 4 aims to expand the capacity and availability of sustainable mobility in a regional and rural context. This will be done through the delivery of improved active travel infrastructure, the expansion of regional bus and rail services and local bus networks, and improved connectivity between different transport modes."* And
>
> *"Goal 5 aims to encourage modal shift to more sustainable options across all ages through behavioural change and demand management measures"*

The National Sustainable Mobility Policy is underpinned by the NSMP Action Plan 2022-2025, which sets out the goals, together with a series of actions to achieve these goals. The Action Plan then sets out the owner and support for each action, together with envisaged timelines for implementation of the actions.

The Action Plan details actions 26 to 47 which support Goals 4 and 5 of the NSMP, the most applicable actions in relation to the Dundalk to Carlingford Greenway are:

Action 28. *Develop and publish cycle network plans for all counties.*

Action 29. *Develop and publish a strategic national cycle network.*

Action 30. *expand greenway network establishing linkages with towns and villages in line with the strategic national cycle network.*

Action 45. *Conduct a study to assess incentives to encourage greater use of active travel as a mode of transport, including an assessment of international best practice.*

The proposed development supports the above policy as it will provide an active travel link between the towns of Dundalk and Carlingford and connect the rural hinterland to these town centres.

2.3.2.1 Programme for Government, Our Shared Future (2020)

The Programme for Government seeks to deliver a better life for all, seeking to implement a post COVID recovery leading as an exemplar in decarbonising the economy.

Under transport, it highlights that the Government are committed to a fundamental change in the nature of transport, highlighting the necessary improvements in climate impact, quality of life, air quality and physical and mental health, making active travel and public transport better and more accessible.

In terms of active travel, the Programme for Government commits an allocation of 10% of the total transport capital budget for cycling projects and 10% for pedestrian infrastructure to provide a step change in the number of people taking daily journeys by foot and bicycle.

Specifically in relation to greenways, it states that: "*We will lead the development of an integrated national greenways strategy. This has the potential to transform modal shift and improve air quality and public health. This commitment to cycling will enable us to achieve the huge ambition of developing an integrated national network of greenways to be used by commuters, leisure cyclists and tourists. We will continue the coordinated approach between central government, local authorities, and agencies to deliver on this ambition."*

The provision of the Dundalk Bay to Carlingford Greenway will deliver a section of the national cycle network, improving facilities for pedestrians and cyclists to access the settlements and attractions within the study area through active modes of transport.

2.3.3 National Investment Framework for Transport in Ireland (NIFTI)

The Department of Transport prepared the NIFTI in 2021. NIFTI is the Department's strategic framework to support the consideration and prioritisation of future investment in land transport. It represents the Department's contribution to Project Ireland 2040, the Government's long-term overarching strategy to make Ireland a better country for all and to build a more sustainable future. NIFTI has been developed to ensure sectoral investment is aligned with the NPF and supports the delivery of the ten NSOs.

Figure 2.3.2 Strategic Investment Priorities

NIFTI establishes a common lens through which to consider potential investment. In doing so, NIFTI sits alongside other Government priorities and policy objectives, such as the Programme for Government and Climate Action Plan.

NIFTI establishes four Strategic Investment Priorities to address the transport challenges ahead. These priorities, which have equal weighting in the framework are evident in Figure 2.3.2.

The Strategic Investment Priorities are accompanied by two principle-based hierarchies that will ensure that the most sustainable intervention or transport solution is given due consideration ahead of less sustainable options. The Modal Hierarchy will ensure future transport investments will prioritise sustainable modes of transport options where possible. Active travel will be top of the hierarchy followed by public transport and private car travel. The Intervention Hierarchy and the Modal Hierarchy are evident in Figure 2.3.3.

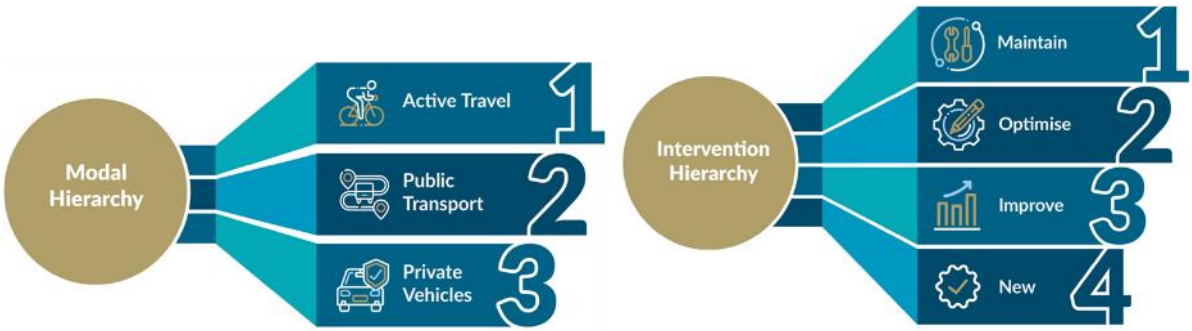

Figure 2.3.3 NIFTI Modal Hierarchy and Intervention Hierarchy

The goal of the intervention hierarchy is to prioritise transport investment decisions that make the best use of the nation's existing transport assets ahead of the construction of new infrastructure. Maintaining the existing transport network will be given priority, followed by maximising the value of the network through optimising its use. Infrastructural investments will only be considered after these two categories have been assessed as inappropriate for

the identified problem, with upgrades to existing infrastructure to be considered before new infrastructure.
The proposed development aligns with the NIFTI modal hierarchy as it will promote active travel through the provision of pedestrian and cyclist infrastructure.

2.3.4 Ireland's Government Road Safety Strategy 2021 – 2030

Ireland's Government Road Safety Strategy 2021 – 2030 sets out targets to be achieved in terms of road safety in Ireland as well as policies to achieve these targets. Guiding this strategy is Vision Zero, Ireland's long-term goal of achieving zero road deaths or serious injuries by 2050 using a Safe Systems approach. To achieve Vision Zero, the Strategy to aims to achieve *"a 50% reduction in deaths and serious injuries by 2030"*. This means reducing deaths on Ireland's roads from 144 to 72 or lower and reducing serious injuries from 1,259 to 630 or lower by 2030.

The plan sets out 50 high impact actions listed under seven Safe System Priority Intervention areas for Phase 1 covering the 2021 – 2024 period. High impact actions under the Safe Road and Roadsides Safety System priority investment area that are relevant to the proposed greenway development include:

- Over the period 2021 to 2025, 1,000 km of segregated walking and cycling facilities will be constructed or under construction on the national, regional and local road network, to provide safe cycling and walking arrangements for users of all ages.
- Develop a National Cycle Network plan for interurban rural cycling and walking, providing connections to active travel networks and Greenways. Develop an implementation plan for delivery in Phases 2 & 3 of the Road Safety Strategy.

The proposed development aligns with the aim of the Road Safety Strategy as it will provide safe pedestrian and cyclist infrastructure.

2.3.5 Climate Action Plan 2024

The Climate Action Plan 2024 (CAP24) was approved by Government in December 2023, subject to Strategic Environmental Assessment and Appropriate Assessment. CAP24 sets out a roadmap of specific actions in various sectors including road transport. A public consultation on the Plan, will commence in early in 2024.

This plan is the second to be prepared under the Climate Action and Low Carbon Development (Amendment) Act 2021, which commits Ireland to a legally binding target of net-zero greenhouse gas emissions no later than 2050 and a reduction of 51 percent by 2030 (compared to 2018 levels) and is required to be reviewed and updated annually to ensure it is responsive. Under the Climate Act 2021, Ireland's national climate objective requires the State to pursue and achieve, by no later than the end of the year 2050, the transition to a climate-resilient, biodiversity rich, environmentally sustainable and climate-neutral economy.

No change has been made to the key performance indicators and targets identified in CAP23. In relation to the transport sector, a number of targets have been identified in CAP23 which have been applied in CAP24 to reduce the emissions in relation to transport, namely:

- Increase daily active travel journeys by 50% by 2030
- Increase daily public transport journeys by 130% by 2030
- Reduce daily car journeys by 25% by 2030
- Shift 30% of all escort to education car journeys to sustainable modes
- Reduce total vehicle kms by 20%
- Reduce total car kms by 20%
- Reduce fuel usage by 50%

Avoid-Shift-Improve framework for transport sustainability was introduced in CAP23 and this approach has been applied again in CAP24 to categorise all actions. A number of actions have been developed for the transport sector under CAP24, including the following that are of relevance to the proposed development:

TR/24/8 (TF): *Support and promote a modal shift towards healthy active and sustainable mobility in the design and delivery of LDA developments. Plan to reduce travel by private car and design to optimise connectivity and access to sustainable and active travel. Promote mobility management planning and e-mobility as well as options for car sharing/clubs*.

TR/24/11 (TF): *Advance roll-out of walking/cycling infrastructure in line with National Cycle Network and CycleConnects plans*.

The planned greenway will help achieve the actions mentioned above by offering a safe and separated walking and cycling facility between Dundalk and Carlingford.

2.3.6 Our Rural Future: The Rural Development Policy 2021-2025

Our Rural Future: The Rural Development Policy 2021-2025 represents the Irish Government's blueprint for the post-COVID recovery and development of rural Ireland over the next five years. The Vision of the Policy is:

> *"for a thriving rural Ireland which is integral to our national economic, social, cultural and environmental wellbeing and development, which is built on the interdependence of urban and rural areas, and which recognises the centrality of people, the importance of vibrant and lived-in rural places, and the potential to create quality jobs and sustain our shared environment"*.

In terms of active travel, the Policy recognises that whilst cycling networks are mostly associated with urban travel, there is a huge potential for cycling within and between rural towns and villages, and particularly in the hinterland of rural towns. The Government has committed a €50 million fund in 2021 for Local Authority investment in high-quality walking and cycling infrastructure, specifically targeted at towns and villages across the country. The following actions have been included in the Policy that are relevant to the proposed greenway:

Action No. 36 Invest in greenways, blueways, walking trails and other outdoor recreation infrastructure to support the growth in outdoor recreational tourism.

Action No. 37 Develop a pilot bicycle up-cycling initiative to support employment creation, to harness the potential of investment in greenways and to support the development of the social enterprise business model.

Action No. 102 Invest in high-quality walking and cycling infrastructure specifically targeted at towns and villages across the country.

The proposed greenway will assist in implementing Actions 36, 37 and 102 of the Policy by providing a high-quality segregated walking and cycling infrastructure between Dundalk and Carlingford, including the rural settlements and villages, whilst supporting employment creation opportunities.

2.3.7 Strategy for the Future Development of National and Regional Greenways

The Strategy for the Future Development of National and Regional Greenways was published by the Department of Transport, Tourism and Sport (DTTAS, now Department of Transport) in July 2018. The objective of the Strategy is to:

> *"assist in the strategic development of nationally and regionally significant Greenways in appropriate locations constructed to an appropriate standard in order to deliver a quality experience for all Greenways users. It also aims to increase the number and geographical spread of Greenways of scale and quality around the country over the next 10 years with a consequent significant increase in the number of people using Greenways as a visitor experience and as a recreational amenity."*

To achieve these objectives, DTTAS will ensure that project promoters will work with Local Communities, Local Landowners, Local Authorities and other relevant State Bodies and organisations to deliver:

- A Strategic Greenway network of national and regional routes, with a number of high-capacity flagship routes that can be extended and/or link with local Greenways and other cycling and walking infrastructure.
- Greenways of scale and appropriate standard that have significant potential to deliver an increase in activity tourism to Ireland and are regularly used by overseas visitors, domestic visitors and locals thereby contributing to a healthier society through increased physical activity.
- Greenways that provide a substantially segregated offroad experience linking places of interest, recreation and leisure in areas with beautiful scenery of different types with plenty to see and do.
- Greenways that provide opportunities for the development of local businesses and economies.
- Greenways that are developed with all relevant stakeholders in line with an agreed code of practice.

2.3.8 National Outdoor Recreation Strategy 2023-2027

The Strategy provides a strategic, collaborative framework to facilitate the consolidation and sustainable growth of the outdoor recreation sector. This strategy will operate in an integrated manner alongside other relevant government policies and plans, including Project Ireland 2040, Our Rural Future Rural Development Policy 2021-2025 and the strategy for the Future Development of National and Regional Greenways.

The Strategy identifies the challenges facing the sector, as well as outlining the benefits that outdoor recreation can bring to the communities in the form of mental, physical health, economic and social benefits.

Some of these benefits / opportunities and challenges to the sector relevant to the proposed greenway are listed below:

Benefits / opportunities

- Growing wealth of trails, greenways, and outdoor recreation infrastructure.
- Physical and mental health benefits from participating in outdoor recreation.
- Economic impact in local communities driven by an increase in outdoor recreation participation.
- Outstanding natural landscapes and heritage.

Challenges

- Access to land for recreational use presents issues for landowners and participants.
- Protecting the natural environment, whilst meeting the rapid growth in demand for outdoor experiences.
- Responsible enjoyment of the outdoors not always practised by recreational users.
- Outdoor activities are not equally enjoyed by all sections of our community.

The proposed greenway will explore its project specific benefits and challenges.

2.3.9 People, Place and Policy: Growing Tourism to 2025

The Department of Transport, Tourism and Sport (now the Department of Transport) have developed specific tourism policy in respect of greenways. The Department recognises the benefits that can arise from the further development of greenways in Ireland, as a tourism product with significant potential to attract overseas visitors, for local communities in terms of economic benefits, and for all users as an amenity for physical activity and a contributor to health and wellbeing. The Strategy for the Future Development of National and Regional Greenways, published by The Department of Transport, Tourism and Sport in 2018, sets out the ambition to:

> "*increase the number and geographical spread of Greenways of scale and quality around the country over the next 10 years with a consequent significant increase in the number of people using Greenways as a visitor experience and as a recreational amenity*".

The Programme for Government requires Greenways to also provide connectivity to our towns and villages and to pivot to also provide for everyday journeys to work and school, as well as for leisure purposes. Nine greenway projects financed under the first call under the Strategy for the Future Development of National and Regional Greenways in 2019 and 2021 should be opened between 2022 and 2024.

2.3.10 National Cycle Network Plan Report 2023

Transport Infrastructure Ireland (TII) developed the National Cycle Network (NCN) Plan to create a cycle network that links cities and towns of over 5,000 people across Ireland. The Plan was presented to the public between May and June 2022, with the final plan published in January 2024. The Plan's proposed network spans approximately 3500 km and seeks to connect over 200 cities, towns, and villages, as well as integrating with other cycle infrastructure such as Eurovelo, greenways, regional and urban networks.

The vision of the NCN Plan is to:

> *"Develop a safe, connected, and inviting cycle network between urban areas and key destinations to achieve accessible, sustainable, and high-quality routes that will help to reduce the carbon impact of transport and promote a healthy and inclusive society".*

The majority of the objectives identified in the NCN Plan are of relevance to the proposed Dundalk to Carlingford Greenway project including the following:

- Increase the number of cycle trips by improving the provision of safe and attractive cycle infrastructure.
- Connect to strategic destinations outside of urban area as appropriate (including centres of education, centres of employment, and leisure destinations).
- Support the development of cycling and walking culture in Ireland.
- Connect identified urban areas of 5,000+ population and those urban areas listed in the NTA's urban cycle network strategy.

- Integrate with existing and proposed cycle infrastructure (including greenways, safe routes to schools, the EuroVelo network, Interreg projects), as appropriate.
- Encourage use of off-road infrastructure, where appropriate.
- Incorporate existing greenways, disused railways, canals, bypassed national roads, regional and local roads, long distance trails, as appropriate.
- Future-proof cycle route capacity, taking account of population growth and additional demand from modal shift.

The NCN proposed within the Plan is presented in Figure 2.3.4 below and includes NCN corridors. The proposed greenway development is located within a section of an NCN corridor between Dundalk and Carlingford. Therefore, the proposed development is consistent with the NCN Plan.

The routes shown in the NCN Plan are 4km wide corridors that broadly follow the route of existing infrastructure and the actual routes will be developed on a project by project basis. These will then be subject to the detail appraisal processes as set-out in the Transport Appraisal Framework, TII Project Management Guidelines and TII Project Appraisal Guidelines.

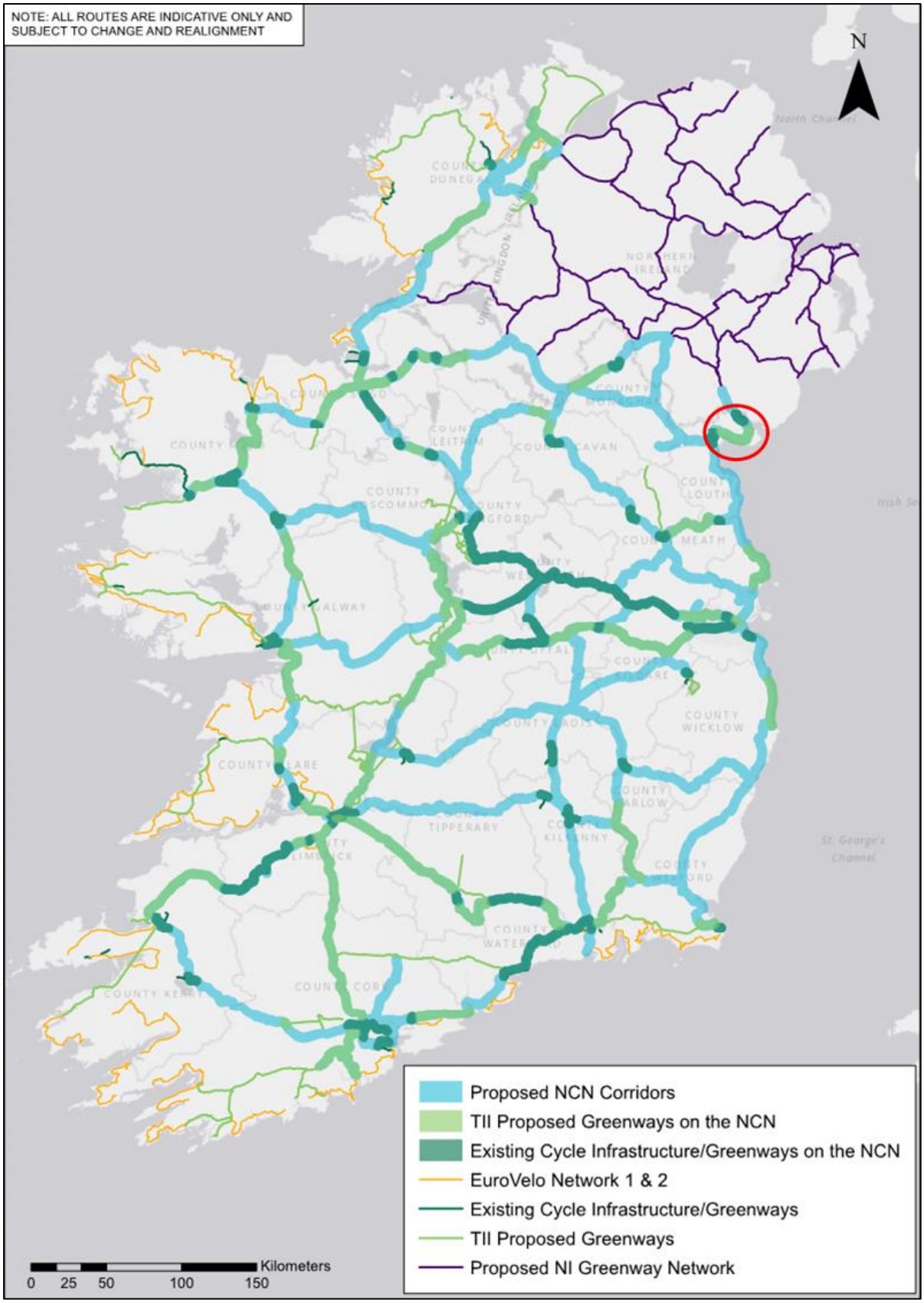

Figure 2.3.4 **Study area (in red) for the proposed Dundalk to Carlingford Greenway along the National Cycle Network**

2.3.11 Draft CycleConnects: Ireland's Cycle Network

The draft plan for CycleConnects was developed by AECOM on behalf of the National Transport Authority (NTA) and was presented at a public consultation in September 2022. The plan consists of a comprehensive national plan of 22 individual cycle networks spanning each county and 57 urban networks. These urban maps were developed for the towns with a population of over 5,000 people. The cycle networks will integrate with the existing cycle networks in the Greater Dublin Area (GDA) and Northern Ireland, creating a cohesive and extensive cycling infrastructure across Ireland.

The proposed network plan is comprised of interurban routes that connect settlements of over 1000 people. Urban Primary and Secondary routes will be confined to large urban areas with a population greater than 5,000 people. While the plan does not specify the exact cycle infrastructure for the proposed routes, it serves to highlight the potential connections between major towns and cities outside the Greater Dublin Area.

The cycle network developed for Louth under CycleConnects are of relevance to the proposed greenway and are discussed below.

Draft Louth Cycle Network

The Louth Cycle Network primarily extends the network beyond the key settlement areas of Drogheda and Dundalk. In summary, it will consist of an urban cycle network for Drogheda and Dundalk, with interurban connectors between towns such as Ardee, Carlingford, Clogherhead, Dunleer, and Termonfeckin. These then extend into adjoining counties forming a comprehensive and connecting cycle network nationally.

The Cycle Network consists of four types of cycle routes, namely urban primary, urban secondary, inter-urban and greenway as shown in Figure 2.3.5 below.

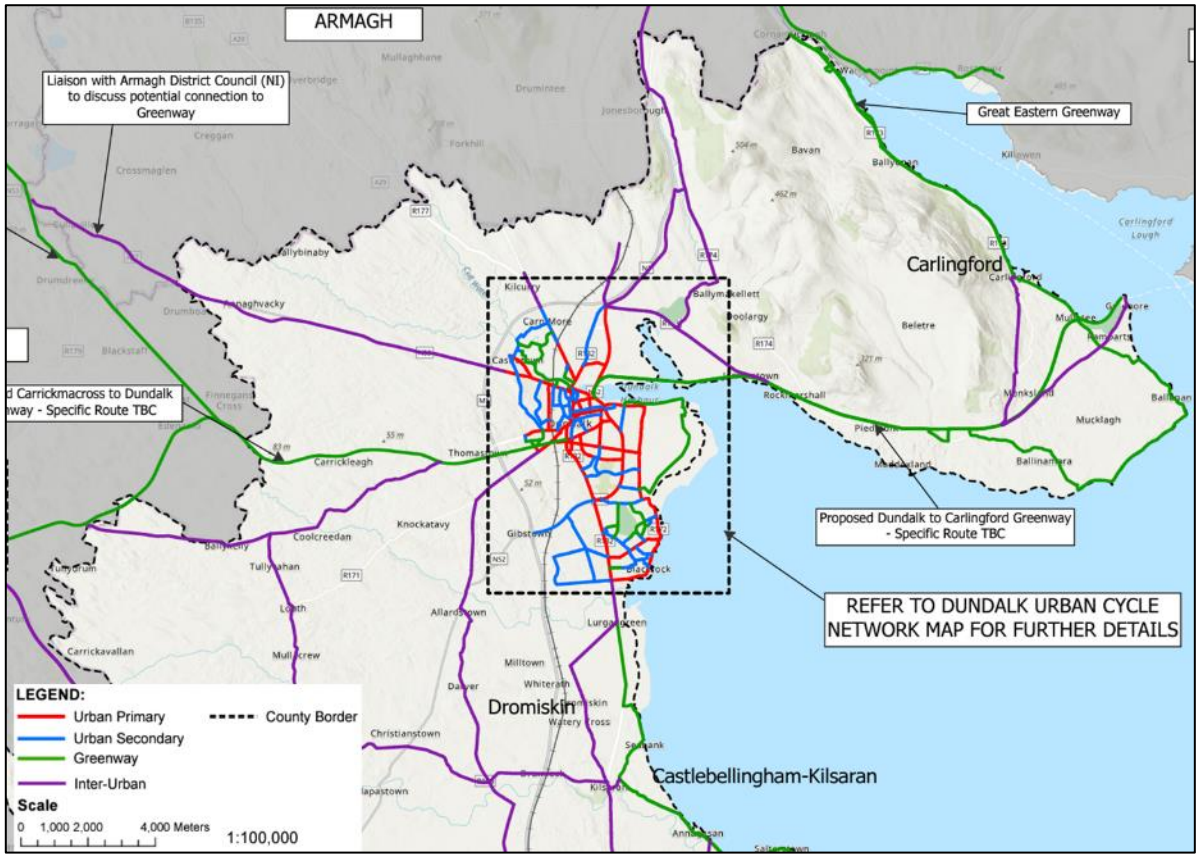

Figure 2.3.5 Extract from the Proposed County Louth Cycle Network

The Great Eastern Greenway is shown, which currently provides active travel facilities between Carlingford and Omeath. According to the Draft Louth Cycle Network, it is proposed to extend Great Eastern Greenway to Newry and Dundalk (incorporating Greenore and Templetown) to increase the length of the greenway to approx. 55 km. An indicative route for the connection of the Great Eastern Greenway between Carlingford and Dundalk is also shown.

The proposed greenway development is consistent with the proposed cycle network and will extend the Great Eastern Greenway from Carlingford to Dundalk.

2.4 Regional Policy Context

2.4.1 Regional Spatial & Economic Strategy (RSES) for the Eastern and Midland Region 2019-2031

The Regional Spatial and Economic Strategy for the Eastern and Midland Region of Ireland (RSES) outlines how the policies and objectives from the National Planning Framework (NPF) and any other relevant Government policies and objectives will be implemented.

The EMRA is one of the three Regional Assemblies in Ireland. The Region covers nearly 14,500 square kilometres, which is the smallest in terms of land area but the largest in population size, with over 2.3 million people. The main settlement is the capital city of Dublin and is supported by a network of regional and county towns and an extensive rural hinterland.

The provision of walking and cycling routes within urban centres and rural areas is targeted as they endorse a healthy lifestyle for the population and create an opportunity for attracting tourism to the area.

The Core Region is identified in the RSES as the *"per-urban 'hinterlands' in the commuter catchment around Dublin",* and encompasses counties of Louth, Meath, Kildare and Wicklow*.* A number of Growth Enablers have been identified for the region, including to:

> *"Promote the Region for tourism, leisure and recreational activities including development of an integrated greenway network while ensuring that high value assets and amenities are protected and enhanced"*.

Regional Policy Objectives (RPOs) within the Eastern and Midland Region RSES have been identified to promote the development of walking and cycling routes as well as Blueways, Greenways and Peatways in the region.

The following RPOs of the RSES support the proposed greenway development:

RPO 4.24: Support social inclusion measures including the revitalisation of areas by physical regeneration, planning, investment and community development and measures to improve educational attainment levels, up skilling in key competencies and skills acquisition.

RPO 7.24: Promote the development of a sustainable Strategic Greenway Network of national and regional routes, with a number of high-capacity flagship routes that can be extended and /or linked with local greenways and other cycling and walking infrastructure, notwithstanding that capacity of a greenway is limited to what is ecologically sustainable.

RPO 7.25: Support local authorities and state agencies in the delivery of sustainable strategic greenways, blueways, and peatways projects in the Region under the Strategy for the Future Development of National and Regional Greenways.

The provision of Dundalk to Carlingford greenway consistent with the RPOs of the Regional Economic Strategy by enhancing connectivity for non-motorised users, thereby supporting the local tourism economy, whilst also improving conditions to support a modal shift in transport to more active modes.

2.5 Local Policy Context

2.5.1 Louth County Development Plan 2021-2027

The Louth County Development Plan (CDP) 2021-2027 sets out the overall strategy and vision for the proper planning and sustainable development of County Louth. The Strategic Vision of the Plan is as follows:

> *"Promote County Louth, in particular the Regional Growth Centres of Drogheda and Dundalk, as uniquely attractive places in which to live, work, visit and do business and where the quality of employment and educational opportunities, natural and built environment, cultural experiences and provision of inclusive communities are all to the highest standards, while transitioning to a low carbon and climate resilient society."*

The following policy objectives are of particular relevance to the proposed development:

SO 5: Ensure a more sustainable and integrated concept of development with regard to land use, transportation, water services, energy supply and waste management over the lifetime of the Plan.

SO 7: Protect and enhance the built, cultural and natural heritage assets of Louth, the intrinsic value of which helps to define the character of both urban and rural areas, contributes to the attractiveness, vibrancy and sense of place for residents, tourists and visitors, including improved access to the countryside through the development of greenways, walking trails and blueways in support of and advancing sustainable communities.

SO 15: Ensure the proper integration of transportation and land use planning through the increased use of sustainable transport modes and the minimisation of travel demand to achieve a sustainable, integrated and low carbon transport system with excellent connectivity both within and beyond the County.

SC 15: To facilitate and encourage open space areas and greenway corridors to be planned for on a multi-functional basis incorporating measures to promote and protect ecosystems, climate change measures and to incorporate key landscape features including archaeological considerations into their design.

TOU 8: To promote and facilitate the development of walkways and cycleways at appropriate locations throughout the County utilising disused transport links where feasible.

TOU 11: To continue the development of a network of greenways in County Louth in accordance with the 'Strategy for Future Development of National and Regional Greenways'.

MOV 1: To work with national transport agencies in supporting the delivery of a high quality, climate resilient and sustainable transport network in the County.

MOV 2: To support the implementation of the 'National Climate Action Plan' 2019, and any subsequent plans, and in particular the measures included that will assist in achieving the target of CO_2 emissions reduction by 2030 in the transport sector as set out in Section 10.2 of the 'Climate Action Plan'.

MOV 7: To support a modal shift away from the private car to more sustainable forms of transport, such as public transport, cycling and walking and the attainment of any national targets relating to modal change published during the life of this Plan.

MOV 9: To support investment in sustainable transport infrastructure that will make walking, cycling or public transport more attractive and appealing, and facilitates accessibility for all, regardless of age, physical mobility, or social disadvantage.

MOV 14: To encourage a modal shift from use of the private car towards more sustainable modes of transport including walking, cycling, and public transport.

MOV 25: To support the retrospective provision of walking and cycling infrastructure in existing settlements, where feasible, to achieve growth in sustainable mobility and strengthen and improve the walking and cycling network.

MOV 28: To promote walking and cycling as a safe, convenient, healthy, efficient, and environmentally friendly mode of transport for all age groups.

MOV 29: To continue to work and engage with the National Transport Authority, the Department of Transport, any other agencies in developing a modern network of walking and cycling infrastructure in the County.

MOV 33: To continue the development of a network of Greenways in the County in accordance with the Strategy for the Future Development of National and Regional Greenways.

HOU 10: To continue to support the creation of sustainable communities throughout the County for people across all the life stages by facilitating the creation of attractive neighbourhoods where there are strong links and connections to local services, community facilities and employment areas and where walking, cycling, and public transport is prioritised.

NBG 55: To create an integrated and coherent green infrastructure for County Louth by ensuring compliance with the objectives listed in the Green Infrastructure Strategy outlined in Appendix 8, Volume 3, to improve pedestrian and cycle access routes within this green infrastructure network while ensuring that ecosystem functions and existing amenity uses are not compromised and existing biodiversity and heritage is protected and enhanced.

The Dundalk Bay to Carlingford Greenway will support the objectives contained within the Louth County Development Plan 2021-2027 regarding the provision of pedestrian, and cycling infrastructure, proper segregation from vehicular traffic, promotion of active travel, and development of greenways.

2.5.2 Draft Louth County Council Climate Action Plan 2024-2029

The draft Climate Action Plan (CAP) is a five-year plan has been prepared by Louth County Council (LCC) to support the national policy. The Vision of the Plan is defined as follows:

- Louth will be on target to be a net zero county by 2050.
- Louth will take advantage of opportunities which arise from this new normal.
- The people and businesses of Louth will rise to this challenge.
- No-one will be left behind.

The Plan outlines actions to be taken by LCC to support the national policy. These actions have been informed by the following:

- Development of a data driven Baseline Emissions Inventory (BEI) to establish what is being emitted and where it is coming from in Co. Louth.

- Baseline Risk Assessment, to highlight vulnerabilities in County Louth.
- Stakeholder consultation to understand what stakeholder concerns are and any ideas they would like to contribute.

The Baseline Emissions Inventory (BEI) was undertaken based on the GHG emissions produced in 2018 for Co. Louth for each sector as shown in Figure 2.5.1 below. Transport sector is the second largest emitter of GHGs at 22%, behind Agriculture which produced 29% of all GHG emissions in 2018 within Co. Louth.

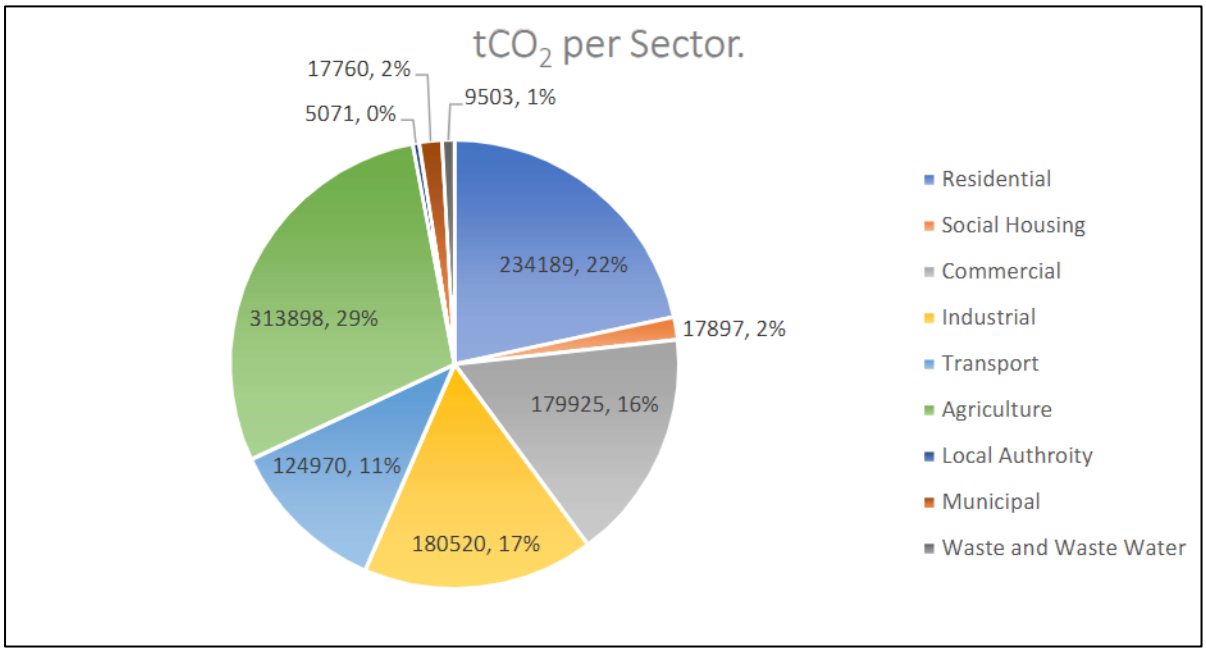

Figure 2.5.1 **A breakdown of greenhouse gas emissions in 2018 for each sector measures in Co. Louth (Source: draft LCC CAP 2024-2029)**

A Current Climate Risk Assessment (CRA) was also undertaken to inform the Plan to document predict the future impacts on Co. Louth from extreme weather events. According to the Plan, the events that are likely to increase in frequency and impact are coastal flood and erosion, extreme precipitation, river flood and drought.

Five Action Areas, including Built Environment and Transport have been developed as part of the Plan from the assessment of the impacts and risks and the total GHG emissions for County Louth. Each action area contains a list of actions to be implemented to achieve the objectives of the Plan. Under Built Environment and Transport, the proposed development will assist with the implementation of the following actions:

Action 2.4 Deliver additional active travel projects within the county to further develop walking and cycling as an alternative to private car use. Ensure supported active travel development is carried out in a manner that has due regard to environmental sensitivities such as biodiversity, European sites, water quality and hydrology.

The proposed development provides dedicated pedestrian and cyclist facilities between Dundalk and Carlingford encouraging the use of active travel modes of transport in Co. Louth.

2.5.3 Dundalk Local Area Plan 2024-2030 (Pre-Draft Issues Paper)

The Dundalk Local Area Plan 2024-2030 (LAP) will provide a framework and land use strategy for the future growth of Dundalk for the benefit of the town and its citizens. The LAP places a

strong emphasis on consolidation and urban regeneration and the promotion of sustainable patterns of development that encourages the creation of a vibrant urban core where there is a quality and attractive working and living environment.

A Local Transport Plan will be prepared for Dundalk as part of the Local Area Plan and will seek to ensure the integration of land use and transport planning. As part of the strategy of promoting active travel, the Council, in association with the National Transport Authority, are progressing a number of projects in walking and cycling infrastructure. This will include the upgrade of existing infrastructure, the widening of footpaths, and the construction of segregated cycle lanes. The LAP aims to make walking and cycling a safer and more attractive mode of transport for residents and workers in the town. It will also aim to have the town grow on a sustainable platform that will encourage residents, workers, and school children to walk, cycle, or use public transport.

The Dundalk Bay to Carlingford Greenway will support the Dundalk Local Area Plan 2024-2030, in particular the objectives related to Dundalk, enhancing the accessibility of this key tourism destination for non-motorised users.

3. IDENTIFICATION OF THE STUDY AREA

The Study Area spans across the Cooley Peninsular in County Louth, covering the town centre of Dundalk to the south and the N1/M1 motorway to the north at its western extent. The study area then follows the Cooley Mountains to form the northern boundary of the study area, broadly following the 80m contour to avoid the steep terrain to the north and covering Carlingford and the Carlingford to Omeath greenway in the north east, before returning to Dundalk following the coastline of the Cooley Peninsular as shown in Figure 2.5.1 below.

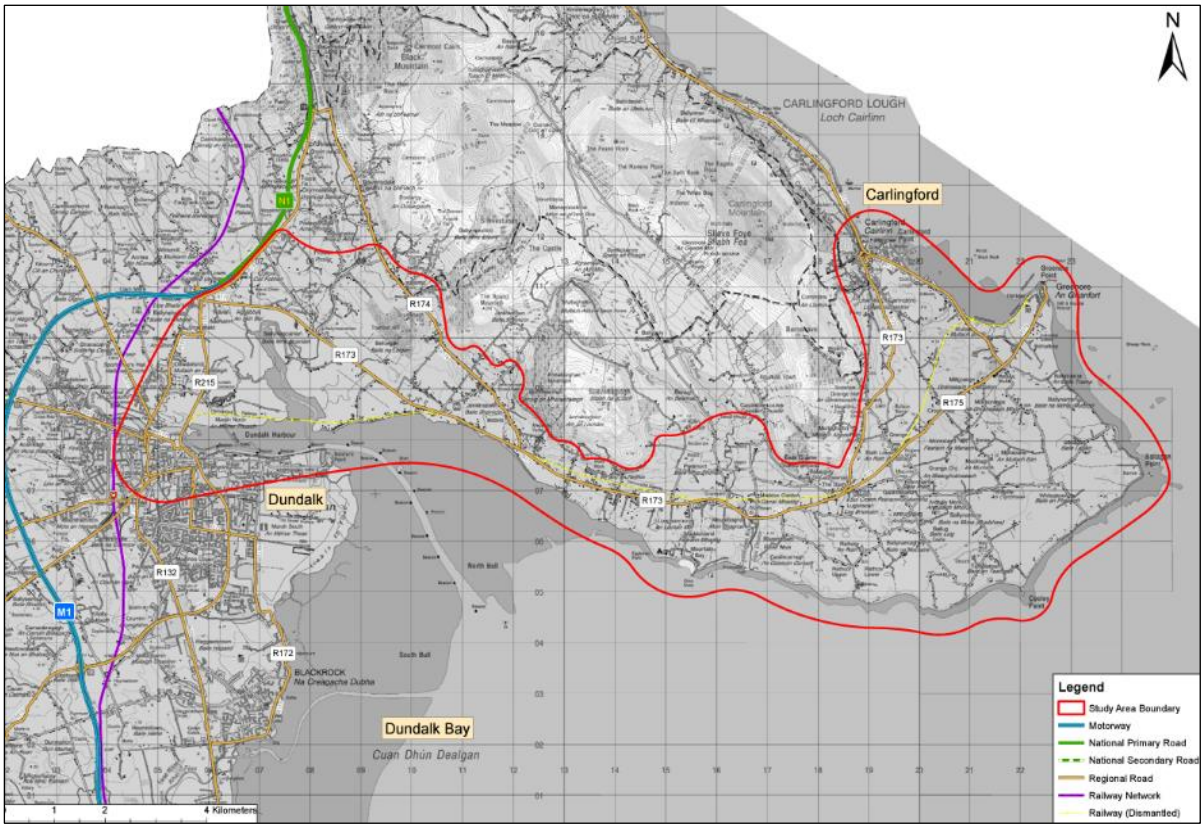

Figure 2.5.1 Study Area Boundary

The Study Area encompasses the towns and villages of Dundalk, Jenkinstown, Lordship, Ballymascanlan, The Bush, Greenore and Carlingford, together with the blue flag beach of Templetown.

Dundalk is the County Town and second largest town in County Louth after Drogheda, with a population of over 43,000 people in 2022 (CSO Town population statistics), an increase of 9.5% compared to CSO 2016 census population figures. Dundalk is the healthcare, educational and retail centre of the northern part of the County.

Carlingford by comparison had a population of 1,528 in 2022 (from CSO census 2022), compared to 1,445 in 2016, an increase of 5.4%. The CSO also provides population statistics for Jenkinstown and Rampark (Lordship), which shows an 8.6% increase at Jenkinstown to 416 people and a decrease of 4.5% at Rampark (Lordship) to 465 people.

4. EXISTING CONDITIONS

4.1 General Information on the Study Area

The Study Area as outlined in Section 3.0 above covers an area of approximately 84km^2 and extends from Dundalk through to Carlingford over approximately 25km.

The study area is bounded by the Dublin – Dundalk -Belfast Rail Line to the West in Dundalk, the Cooley Mountains to the North and then Dundalk Bay to the South and Carlingford Bay to the East.

To the west of the Study Area is the County Town of Dundalk which is the largest town in the Study Area, the with the towns of Carlingford and Greenore to the east. Connecting these towns is the Regional R173 and R175 that run thought the centre of the Study Area connecting the towns and villages along this route including Jenkinstown, Bellurgan, Lordship, The Bush and Grange. These roads further connect to the local road network along the Carlingford Peninsula. Local roads spur off this road to connect to the beaches and coastline of Bellurgan Point, Jenkinstown, Gyles Quay, Castlecarragh Bay Beach, Rathcor Bay Beach, Ballynamaghery Bay Beach, Templetown Beach, Whitestown Beach, Ballagan Bay Beach and Ballytrasna Bay Beach.

Both the ports in Dundalk and Greenore generate road traffic with results in many HGV's using the National and Regional Road network within the Study Area. Agricultural traffic is also common on all of the roads. The Carlingford Lough Ferry runs between Greenore and Greencastle over the summer and also brings traffic into the area.

North of Carlingford, the Carlingford Lough Greenway to Omeath has been developed with the Omeath to Newry greenway currently under construction which will extend the greenway network to Newry. As of March 2024, the Carlingford Lough Greenway is being extended to connect the centre of Carlingford to the greenway's current starting point in the marina to the north of the town. It is expected that the Dundalk Bay to Carlingford Greenway will tie in with this section of Greenway.

The now dismantled Dundalk, Greenore and Newry Rail line ran through the study area from Dundalk to Greenore before spurring off to, Carlingford, Omeath and Newry with further stations in Bellurgan and Bush and a bridging across of the Castletown River. The rail line was closed and dismantled in the early 1950's with the rails removed over most of its length, with only the piers of the Ballymascanlan Bridge across the Castletown River now visible at low tide. A number of other rail bridges are still in wholly or partly in existence such as those at, Lordship, Castletowncooley, The Bush and Grange. Although the line of the rail is visible at many locations much of the old line has been subsumed into neighbouring properties with developments on it near most of towns and villages.

4.2 Existing Environment

The Study Area's topography is dominated by the Cooley mountains to the north which falls the towards the scenic coastline and estuaries of Dundalk Bay and Carlingford Lough.

The northern part of the study areas is typified by steep gradients and mountainous and hilly terrain making the provision of a greenway on these slopes unfeasible. Much of this land is either forested, peatlands or used as grazing lands for sheep and other animals. A number of signed walking routes and trails are present in this area which are well utilised by the public, hill walkers and mountain bikers. The middle of the study area is typified by rolling limestone hills, many of which have been or are currently being quarried or in use as farmlands outside of urban areas. As the study area approaches the coast the land becomes flatter with wetlands

to the west and lower lands to the east with large tillage farms. The coastline has many long stretches of beach which are popular with beachgoers and tourists and is subject to coastal erosion and flooding along much of its length.

The area is rich is biodiversity with much of the area covered by Special Areas of Conservation (SAC), Special Protection Areas (SPA), Natural Heritage Areas (NHA) or proposed Natural Heritage Area (pNHA). These include the Dundalk Bay SAC, the Carlingford Shore SAC, the Carlingford Mountain SAC, the Dundalk Bay SPA and Carlingford Lough SPA. The coastal SACs and SPAs cover much of the shoreline and areas where routes running along the coast may be considered.

4.3 Existing Road Network

4.3.1 Motorways and National Primary Roads

M1/ N1

The M1 Motorway and N1 Dual Carriageway run to the north of the Study Area. The M1/N1 Dublin-Belfast Road is the primary road connection between Dublin to the south and Belfast to the north. These roads connect to the R215 (N52) at Junction 18 North of Dundalk along this road at the Faughart Roundabout to the north on the M1/N1 and south to the south to the Ballymascanlan Roundabout.

4.3.2 National Secondary Roads & Regional Roads

N53/R934 Castleblayney Road

The N53 is a National Secondary Road that runs to the west of the Study Area. The N53 extends from Castleblayney at its western end, intersecting the M1 at Junction 17, where the designation changes to R934 and extends through to the R132 in the centre of Dundalk. Between the M1 (Junction 17) and the R132 the road has a narrow single carriageway cross section with no hard shoulders over most of its length and is significantly constrained by urban development. The road provides varying widths footpaths over this length with no cycle facilities or hard shoulders that can be utilities by cyclists.

Figure 4.3.1 R934 in Dundalk looking west at Rail Bridge (Source: Google Maps)

R215 (N52) Dundalk Inner Relief Road

The R215 is a Regional Road that runs to the west of the Study Area. The R215 north of Ardee was previously the N52 and was reclassified as a Regional Road in 2012. Most road signage, maps and satellite navigation system still reference this section of road as the N52. This road is more commonly known as the Dundalk Inner Relief Road or Coes Road (over part of its length) and connects Dundalk to the M1 Motorway at Junction 16 (Dundalk South to Junction 18 (Dundalk North). The road varies in cross section between dual and single carriage and has mixed provision for pedestrians and cyclists over its length. The road also connects to the R132 north and south of Dundalk.

Figure 4.3.2 R215 (N52) Dundalk looking north

R132 Dublin - Newry Road

The R132 Dublin - Newry Road was the N1 previous to this road being bypassed by the M1 Motorway and runs north - south through Dundalk connecting to the R215/N52 north and south of the town. The Road varies in cross section throughout with pedestrian facilities provided along its entire length through Dundalk and Cycle facilities provided over some of its length.

Figure 4.3.3 R132 North of Dundalk (Source: Google Maps)

R173 Carlingford Road

The R173 Carlingford Road is the main road from Dundalk to Carlingford and Omeath extends from its western end at the Faughart Roundabout at the M1/N1, N52 (R215) junction though to The Bush, Carlingford and Omeath before changing in designation to the B95 north of the border with Northern Ireland at its eastern end. From north of Dundalk the road and runs through Ballymascanlan, Jenkinstown, Bellurgan and Lordship before turning off north from the main road towards Greenore at The Bush. This section of road is approximately 14km long and has a single carriageway cross section with wide hard shoulders and verges, other than through the villages along the route where the verges and hard shoulders drop in width and footpaths path are provided. This section of road's vertical and horizontal alignment is in keeping with a design speed of 80 km/h to 100 km/h and is signposted as such, other than through the villages where reduced speed limits are in place. This section of road carries a high percentage of HGV's that access Greenore Port.

Figure 4.3.4 R173 North of Bellurgan

From The Bush through to Carlingford over a distance of 5.3km the road has a narrow single carriageway cross section, with no hard shoulders or hard strips and limited verges. The road has a varying horizontal geometry with limited or no overtaking opportunities, significant numbers of accesses and generally poor visibility for all road users. The road has no pedestrian or cycle facilities other than narrow footpaths within Carlingford.

Figure 4.3.5 R173 *The Bush*

R174 Ravensdale Jenkintown Road

The R174 Region Road Extends from the N1/R132 Junction at Ravensdale at its northern end and tying into the R173 at Jenkinstown at its southern end. The road runs and to the north of Ballymascanlan through Ballymakellett along the elevated hills to the north of the Dundalk Bay coast. The road itself is a narrow single carriageway road, with no or limited verges with a steep vertical alignment. The road has no facilities for pedestrians or cyclists.

Figure 4.3.6 R174 through Ballymakellett (Source: Google Maps)

R175 – The Bush to Greenore

The R175 continues as the main road from The Bush through to Greenore over a length of km before meeting at the junction of Shore Road and Euston Street in Greenore. The R175 has the same cross section as the R173 up to Bush with single carriageway cross section with wide hard shoulders and verges through to the Junction with the R176. From the R176 into Greenore the cross section continues as a single carriageway with a raised footpath to the north and a varying verge to the south with no hardstrips or hard shoulders. The road has a speed limit of 100km/h up to Gateway signposts to Greenore at the Hanlon Transport access.

Figure 4.3.7 R175 Greenore

R176 Carlingford Greenore Link Road

The R176 forms a link from the R174/R175 west of Greenore at its southern end through to the R173 in Carlingford. This is a single carriageway road with hard shoulders over most of its length and verges of vary width dependant of built constraints. This road has speed limit of 100km/h up until the entrance to Carlingford where reduced speed limits are in place. The wide hard shoulders and verges are used extensively by pedestrians and cyclists.

Figure 4.3.8 R176 Carlingford

4.3.3 Local And Urban Roads

Local Roads (Rural)

The local Road between Dundalk and Carlingford are typically narrow winding roads with no hard shoulders, no verges and have no dedicated facilities for pedestrians or cyclists. Most have high levels of road frontage which limits opportunities for further development of these roads without impacting the existing properties. Local Roads towards the north of the Study Area are typically have sections of steep gradient and are on hilly ground whereas local roads along the coast are narrow and flat and subject to coastal erosion in some areas.

Figure 4.3.9 Local Road (L3085) Ballymascanlan / Bellurgan

Figure 4.3.10 Local Road (L7066) Whitestown

Urban Road Network (Dundalk)

Dundalk has network of urban roads with varying levels of provision of pedestrians and cyclists. Where space is available pedestrian and cycle facilities have been provided, however the provision of further facilities is constrained by the existing development with only green space areas parks and lengths long wider urban roads presenting opportunities for further improvement to pedestrian and cycle infrastructure.

4.4 Safety Challenges on the Existing Road Network

The existing road network as described in Section 4.3 above describes the types of roads and the provisions for pedestrians and cyclists on the existing road network. Although the types are road vary with regard to quality of alignment and capacity for vehicles almost all of the roads have limited dedicated facilities for pedestrians and cyclists other than the R132 and R215 within Dundalk which have segregated facilities for pedestrians and cyclists over part of their lengths. This lack of provision means that there is limited opportunity for vulnerable users to utilise the road network other than by car.

In the period 1996 to 2016 (the latest data available from the Road Safety Authority), there have been a significant number of collisions within the study area. The number of collisions and casualties resulting from the collisions are detailed in Table 4.4.1.1.

Table 4.4.1.1 – Collision Statistics 1996-2016

Data	Fatal	Serious	Minor
Collisions	31	82	915
Casualties	35	108	1474

As can be seen from the historic collision data, there have been a significant number of collisions, of which Table 4.4.1.2 details those involving pedestrians and cyclists.

Table 4.4.1.2 – Collisions with Vulnerable Road Users 1996-2016

Data	Fatal	Serious	Minor
Pedestrian Collisions	7	22	205
Pedal Cyclists Collisions	0	3	24

Looking at the more recent 2011 to 2016 data, Table 4.4.1.3 details the number of collisions, casualties, and the number of these with vulnerable road users.

Table 4.4.1.3 – Collision Statistics 2011-2016

Data	Fatal	Serious	Minor
Collisions	5	18	200
Casualties	5	20	287
Pedestrians	2	5	48
Pedal Cyclists Collisions	0	3	19

As can be seen from Tables 4.4.1.2 and 4.4.1.3, the majority of the collisions involving pedal cycles have occurred during the most recent six year period (2011 to 2016 inclusive), possibly due to increased cycle activity on the road network, whereas the pedestrian related collisions have reduced from approximately 10 per year to 8 per year (minor injury collisions) and 1 per year to 0.8 per year (serious injury collisions). Pedestrian related collisions however account for 24% of the minor injury collisions (2011 to 2016), increasing to 40% when only considering fatal collisions.

The majority of the pedestrian collisions are recorded within the urban portion of the Study Area within Dundalk town, with a significant reduction once outside of this urban area. Figure 4.4.1.1 shows the collisions involving pedestrians in Dundalk town. This highlights the lack of pedestrian activity in the rural areas of the Study Area. Cyclist collisions are also concentrated in the urban setting of Dundalk town, with only four collisions recorded in the wider study area outside of the urban setting of Dundalk.

Figure 4.4.1.1 – Collisions involving Pedestrians

4.5 Other Existing Facilities for Vulnerable Road Users

Existing facilities for cyclists, pedestrians and other vulnerable road users are included within Section 5.2.2.3 Pedestrians and Cyclists, within this report.

4.6 Utilities

The main utilities in the study area include:

- Electricity Transmission and Supply - ESB
- Gas Supply (within Dundalk) – Gas Networks Ireland
- Water Supply – Uisce Éireann
- Telecommunications – Eir, Fibre and mobile telecommunications
- Wastewater - Uisce Éireann
- Stormwater – Louth County Council

Crossing of these utilities is unavoidable due to the length of the scheme however it is proposed to avoid these utilities where possible particularly in the case of high voltage 38kV electricity transmission lines where it would be proposed to move the cycleway to avoid these utilities. Where roads need to be realigned to accommodate the greenway utilities will be relocated where necessary.

There are three wastewater treatment plants within the study area. These are detailed in Section 5.1.3.

5. CONSTRAINTS AND OPPORTUNITIES STUDY

5.1 Natural Constraints

5.1.1 Biodiversity

5.1.1.1 Introduction

This section of the report provides an overview of the biodiversity constraints and opportunities within the study area. The purpose of this study is to identify the areas of ecological significance within the study area of the proposed Dundalk Bay to Carlingford Greenway which may form a constraint to the proposed development, and to identify opportunities for optimising biodiversity in the study area.
This section describes:

- The methodology used in identifying the biodiversity constraints and opportunities;
- The receiving environment in the study area; and
- The biodiversity constraints and opportunities within the study area.

5.1.1.2 Methodology

This biodiversity constraints and opportunities assessment is a desktop study, which includes the review and analysis of various documentation, including mapping. A desktop study and appraisal of the ecological receptors within the study area was undertaken using the following sources of information:

- Review of Ordnance Survey maps and of orthophotography.
- Environmental Protection Agency (EPA) online interactive mapping tools (https://gis.epa.ie/EPAMaps) and (https://www.catchments.ie/maps/) for water quality data including surface and ground water bodies quality status, and river catchment boundaries.
- The National Parks and Wildlife Service (NPWS) database, consulted for the designated areas of ecological interest and sites of nature conservation importance within and adjacent to the study area (www.npws.ie).
- The Department of Agriculture, Environment and Rural Affairs was consulted for the designated areas of special scientific interest and sites of nature conservation importance within and adjacent to the study area.
- The NIEA Natural Environment Map Viewer NIEA Natural Environment Map Viewer (daera-ni.gov.uk).
- The National Biodiversity Data Centre (NBDC) database, consulted for records of rare, protected, and invasive species from the past decade for hectads J00, J01, J10, J11, J20, & J21 (www.biodiversityireland.ie) (Accessed January 2024).
- GeoHive online mapping (http://map.geohive.ie/mapviewer.html).
- ESM (Environmental Sensitivity Mapping) Webtool online mapping (GeoHive) (https://airomaps.geohive.ie/ESM/).
- Bird conservation status in Ireland (Gilbert et al., 2021).

5.1.1.3 Receiving Environment

Designated Sites

For the purpose of this review, the Zone of Influence (ZOI) for the construction and operation of the proposed development was defined as:

- A 1km buffer surrounding the study area

Designated sites fall into a number of categories based on the associated level of protection afforded:

- European Sites
  - Special Areas of Conservation (SAC)
  - Special Protection Areas (SPA)
- National Sites
  - Natural Heritage Areas (NHA)
  - Proposed National Heritage Areas (pNHA)
  - Areas of Special Scientific Interest (ASSI)
- Other designated sites
  - National Parks, Nature Reserves, Wildfowl Reserves, RAMSAR sites, OSPAR sites, Ancient and long-established woodlands etc.

A drawing showing the Zone of Influence and the relevant designated sites is presented on Drawing no. D2CG-RODA-EGN-SW_AE-DR-EN-100002 in Appendix A.

European Sites

The Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora ("the Habitats Directive") and the European Parliament and Council Directive 2009/147/EC of 30 November 2009 on the conservation of wild birds ("the Birds Directive") specify habitats and species that are important for conservation and require protection in a European context. This protection is provided in part through the designation of sites that provide notable examples of habitats or populations of species in a European context. There are three SACs, namely Dundalk Bay SAC, Carlingford Shore SAC, and Carlingford Mountain SAC, and two SPAs, namely Dundalk Bay SPA, and Carlingford Lough SPA within the Zone of Influence as shown in Drawing no. D2CG-RODA-EGN-SW_AE-DR-EN-100002 in Appendix A.

It is acknowledged that following the United Kingdom's departure from the European Union, SACs and SPAs in the UK (including NI) are no longer considered "European Sites" for the purpose of an assessment pursuant to Article 6(3) of the Habitats Directive. However, pursuant to the UK's Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019, those sites still retain the same protection under UK law as they did prior to the UK's exit from the EU. For the purposes of this report, European sites in the UK (including NI) are treated the same as European sites in Ireland.

These sites are described in Table 5.1.1.1 below. Any additional sites within 15km of the Study Area are included in Table 5.1.1.2 as these sites may be considered during Appropriate Assessment, to consider sites with mobile species which may move into the Zone of Influence.

Table 5.1.1.1 European Sites within the Zone of Influence.

Site Code	Site Name	Qualifying Interest Habitats and Species (*=Priority Habitat)	Distance from study area (km)
000455	Dundalk Bay SAC	• Estuaries [1130] • Mudflats and sandflats not covered by seawater at low tide [1140] • Perennial vegetation of stony banks [1220] • Salicornia and other annuals colonising mud and sand [1310] • Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330] • Mediterranean salt meadows (*Juncetalia maritimi*) [1410]	Within study area
004026	Dundalk Bay SPA	• Great Crested Grebe (*Podiceps cristatus*) [A005] • Greylag Goose (*Anser anser*) [A043] • Light-bellied Brent Goose (*Branta bernicla hrota*) [A046] • Shelduck (*Tadorna tadorna*) [A048] • Teal (*Anas crecca*) [A052] • Mallard (*Anas platyrhynchos*) [A053] • Pintail (*Anas acuta*) [A054] • Common Scoter (*Melanitta nigra*) [A065] • Red-breasted Merganser (*Mergus serrator*) [A069] • Oystercatcher (*Haematopus ostralegus*) [A130] • Ringed Plover (*Charadrius hiaticula*) [A137] • Golden Plover (*Pluvialis apricaria*) [A140] • Grey Plover (*Pluvialis squatarola*) [A141] • Lapwing (*Vanellus vanellus*) [A142] • Knot (*Calidris canutus*) [A143] • Dunlin (*Calidris alpina*) [A149] • Black-tailed Godwit (*Limosa limosa*) [A156] • Bar-tailed Godwit (Limosa lapponica) [A157] • Curlew (*Numenius arquata*) [A160] • Redshank (*Tringa totanus*) [A162] • Black-headed Gull (*Chroicocephalus ridibundus*) [A179] • Common Gull (*Larus canus*) [A182] • Herring Gull (*Larus argentatus*) [A184] • Wetland and Waterbirds [A999]	Within study area
002306	Carlingford Shore SAC	• Annual vegetation of drift lines [1210] • Perennial vegetation of stony banks [1220]	Within study area
004078	Carlingford Lough SPA	• Light-bellied Brent Goose (*Branta bernicla hrota*) [A046] • Wetland and Waterbirds [A999]	Within study area

Site Code	Site Name	Qualifying Interest Habitats and Species (*=Priority Habitat)	Distance from study area (km)
000453	Carlingford Mountain SAC	• Northern Atlantic wet heaths with Erica tetralix [4010] • European dry heaths [4030] • Alpine and Boreal heaths [4060] • Species-rich Nardus grasslands, on siliceous substrates in mountain areas (and submountain areas, in Continental Europe)* [6230] • Blanket bogs (* if active bog) [7130] • Transition mires and quaking bogs [7140] • Alkaline fens [7230] • Siliceous scree of the montane to snow levels (*Androsacetalia alpinae* and *Galeopsietalia ladani*) [8110] • Calcareous rocky slopes with chasmophytic vegetation [8210] • Siliceous rocky slopes with chasmophytic vegetation [8220]	300m north
UK9020160	Carlingford Lough SPA	• Light-bellied Brent Goose (*Branta bernicla hrota*) • Common Tern (*Sterna hirundo*) • Sandwich Tern *(Sterna sandvicensis)*	730m northwest

Table 5.1.1.2 European Sites within 15km of the Study Area.

Site Code	Site Name	Qualifying Interest Habitats and Species (*=Priority Habitat)	Distance from study area (km)
UK0030268	Rostrevor Wood SAC	• Old sessile oak woods with *Ilex* and *Blechnum* in the British Isle	4.3km north
UK0030277	Slieve Gullion SAC	• European dry heaths	8km northwest
UK0016615	Eastern Mournes SAC	• Blanket bogs • European dry heaths • Alpine and Boreal heaths Northern Atlantic wet heaths with *Erica tetralix* • Siliceous alpine and boreal grasslands • Siliceous rocky slopes with chasmophytic vegetation • Siliceous scree of the montane to snow levels (*Androsacetalia alpinae* and *Galeopsietalia ladani)*	11.4km northeast
UK0016620	Derrylecka gh SAC	• Transition mires and quaking bogs • Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles	12.3km north
004091	Stabannan-Braganstow n SPA	• Greylag Goose (*Anser anser*) [A043]	12.4km south

Site Code	Site Name	Qualifying Interest Habitats and Species (*=Priority Habitat)	Distance from study area (km)
004236	North-West Irish Sea SPA	• Red-throated Diver (*Gavia stellata*) [A001] • Great Northern Diver (*Gavia immer*) [A003] • Fulmar (*Fulmarus glacialis*) [A009] • Manx Shearwater (*Puffinus puffinus*) [A013] • Cormorant (*Phalacrocorax carbo*) [A017] • Shag (*Phalacrocorax aristotelis*) [A018] • Common Scoter (*Melanitta nigra*) [A065] • Little Gull (*Larus minutus*) [A177] • Black-headed Gull (*Chroicocephalus ridibundus*) [A179] • Common Gull (*Larus canus*) [A182] • Lesser Black-backed Gull (*Larus fuscus*) [A183] • Herring Gull (*Larus argentatus*) [A184] • Great Black-backed Gull (*Larus marinus*) [A187] • Kittiwake (*Rissa tridactyla*) [A188] • Roseate Tern (*Sterna dougallii*) [A192] • Common Tern (*Sterna hirundo*) [A193] • Arctic Tern (*Sterna paradisaea*) [A194] • Little Tern (*Sterna albifrons*) [A195] • Guillemot (*Uria aalge*) [A199] • Razorbill (*Alca torda*) [A200] • Puffin (*Fratercula arctica*) [A204]	13.1km south

Nationally Designated Sites

Nationally designated sites comprise Natural Heritage Areas (NHAs), proposed Natural Heritage Areas (pNHAs) and Areas of Special Scientific Interest (ASSIs).

NHAs are protected under the Wildlife Act 1976 (as amended), many of which overlap with European Sites. The pNHAs were published on a non-statutory basis in 1995, but have not since been statutorily proposed or designated, however they do have some protection under agri-environmental schemes such as ACRES and County Development Plans.

ASSIs are protected areas designated under The Environment (Northern Ireland) Order 2002. They are 'notified' for their biological interest, which include species, habitat and/or geological features. The decision to notify an ASSI is made by the Northern Ireland Environment Agency (NIEA), an executive agency within the Department of Agriculture, Environment and Rural Affairs (DAERA).

Nationally designated sites in the Zone of Influence are displayed in Table 5.1.1.3 below and are shown in Drawing no. D2CG-RODA-EGN-SW_AE-DR-EN-100003 in Appendix A. Any additional sites within 15km of the Study Area are displayed in Table 5.1.1.4 below.

Table 5.1.1.3 National Designated Sites within the Zone of Influence.

Site Code	Site Name	Qualifying Interest Habitats and Species	Distance from Study Area
000452	Carlingford Lough pNHA	Refer to Carlingford Lough SPA, and Carlingford Shore SAC.	This site is located within the study area.
000455	Dundalk Bay pNHA	Refer to Dundalk Bay SAC and SPA.	This site is located within the study area.
001451	Liscarragh Marsh pNHA	This small lake and marsh is situated about 6km south of Carlingford, Co. Louth. The terrain forms a natural basin containing the site. The wetland ranges from open water to stands of Common Reed (*Phragmites australis*) swamp with occasional willow (*Salix spp.*) trees. The plant species occurring include Bulrush (*Typha latifolia*), Meadowsweet (*Filipendula ulmaria*), Yellow Iris (*Iris pseudacorus*), Ragged-Robin (*Lychnis flos-cuculi*) and Yorkshire-fog (*Holcus lanatus*). The original area has been subject to drainage and agricultural reclamation. These are potential threats to the wetland habitats. However, since the site occupies a natural basis these threats are diminished. Liscarragh Marsh is a wetland site including open water, swamp, marsh, fen, and scrub habitats with typical floral communities. It is a good representative example of this typical habitat in a part of the country where many wetlands have been destroyed by drainage.	This site is located within the study area.
001468	Trumpet Hill (Louth) pNHA	This basalt hill stands 6km directly north-east of Dundalk. The site contains several habitats. The central hill has rocky outcrops, and where it slopes abruptly to the north, various ferns are growing. This slope is covered in mosses and liverworts with Wood Sage (*Teucrium scorodonia*), Bilberry (*Vaccinium myrtillus*), Cross-leaved Heath (*Erica tetralix*) and Great Wood-rush (*Luzula sylvatica*) also present. At the base of the hill is a fringe of scrub trees with a ground flora of Wood-sorrel (*Oxalis acetosella*) and Honeysuckle (*Lonicera periclymenum*). In a westerly direction, the hill slopes gradually, upon which grows a mixed forest dominated by Beech (*Fagus sylvatica*) interspersed with Ash (*Fraxinus excelsior*), Sycamore (*Acer pseudoplatanus).,* Elder (*Sambucus nigra*), Alder (*Alnus glutinosa*), Hazel (*Corylus avellana*) and Oak (*Quercus spp,*). Human land use of the site primarily involves the felling of mature trees. This practice, if unmanaged, is a threat to the woodland habitat. The aspect, steep slope and varied plant cover of Trumpet Hill form several habitat types and permit a wide range of microflora to grow there. The association of mixed Beech wood with the basalt outcrop adds diversity of habitat to a small area.	This site is located within the study area.

Site Code	Site Name	Qualifying Interest Habitats and Species	Distance from Study Area
000453	Carlingford Mountain pNHA	Refer to Carlingford Mountain SAC.	300m north
ASSI103	Carlingford Lough ASSI	Carlingford Lough is of special scientific interest by reason of its habitats, flora, fauna and geological interest.	730m northwest

Table 5.1.1.4 National Designated Sites within 15km of the Study Area.

Site Code	Site Name	Qualifying Interest Habitats and Species	Distance from Study Area
001805	Ravensdale Plantation pNHA	Ravensdale Plantation is situated approximately 4km north of Ravensdale in Co. Louth, close to the county border with Armagh. The site is a forest in part of which a nature trail has been established. The trees on site are largely coniferous but Sycamore (*Acer pseudoplatanus*), Beech (*Fagus sylvatica*) and Ash (*Fraxinus excelsior*) also occur. The shrub understorey is composed of Rhododendron (*Rhododendron ponticum*), Elder (*Sambucus nigra*), Ash and Bramble (*Rubus fruticosus* agg.). The ground flora is particularly rich for coniferous woodland. Species present include Bugle (*Ajuga reptans*), Bluebell (*Hyacinthoides non-scripta*), Yellow Pimpernel (*Lysimachia nemorum*), Wood Avens (*Geum urbanum*), Red Campion (*Silene dioica*), Lords-and-ladies (*Arum maculatum*), Ramsons (*Allium ursinum*), Wood-sorrel (*Oxalis acetosella*), Primrose (*Primula vulgaris*), Ground-ivy (*Glechoma hederacea*), Foxglove (*Digitalis purpurea*), Common Dog-violet (*Viola riviniana*), Enchanter'snightshade (*Circaea lutetiana*), Herb-Robert (*Geranium robertianum*), Bracken (*Pteridium aquilinum*) and Hard Fern (*Blechnum spicant*). The flora is typical for deciduous woods in Co. Louth, though not so profuse as where light penetration to the herb layer is impeded. The insect fauna of the wood is typical and Badger, squirrel, Jay and a varied passerine bird fauna occur. As the site is a nature-trail it is probably safe from alteration or destruction. Rhododendron is manageable in the vicinity of maturing trees and there is evidence that it has been cut back.	2.5km north
ASSI351	Western Mournes and Kilfeaghan Upper ASSI	• Flora, fauna, geological and physiographical features.	3.6km north
ASSI352	White Water River ASSI	• Physical features of the river and its associated riverine flora and fauna.	3.7km northeast

Site Code	Site Name	Qualifying Interest Habitats and Species	Distance from Study Area
001462	Drumcah, Toprass And Cortial Loughs pNHA	This site comprises three lakes which are situated approximately 6km west of Dundalk. The area surrounding these three lakes is drumlin country. The hills enclose basins which in three places form shallow lakes. Comparison of the existing water surface area with earlier maps indicates that a reduction in lake size has occurred. Semi-aquatic vegetation is now extensive occupying, in places, half the lake surface. As sedimentary deposition is not apparent, a reduction in lake size is attributed to an earlier drainage scheme on the lower parts of the River Fane. Cortial Lough has an extensive marginal marshland dominated by Yellow Iris (*Iris pseudacorus*), Meadowsweet (*Filipendula ulmaria*) and Bogbean (*Menyanthes trifoliata*), interspersed with grassland. More aquatic species present include Common Reed (*Phragmites australis*), Bulrush (*Typha latifolia*), Marsh-marigold (*Caltha palustris*), Yellow Water-lily (*Nuphar lutea*) and White Water-lily (*Nymphaea alba*). The marshland contains a few willows (*Salix* spp.) which suggest its drying out from open water may have been relatively recent. Coniferous trees have been planted in one part of the marshland. Toprass Lough has become almost entirely a marshland. The dominant semi-aquatic plant species is Reed Canary-grass (*Phalaris arundinacea*) and there is also some Branched Bur-reed (*Sparganium erectum*) present. Fool's Water-cress (*Apium nodiflorum*) is common. The occasional remaining pools contain Yellow Water-lily. Drumcah Lough resembles Cortial Lough in its vegetation. At Cortial Lough the marginal marshland has some willow cover but tree cover is sparse. The three lakes represent the largest areas of open water in Co. Louth. The extent of the marsh transition from open water to grassland also makes these lakes of great interest.	4.2km west
ASSI178	Rostrevor Wood ASSI	• Mature Oak *Quercus* spp. Woodland.	4.3km north
ASSI215	Carrickastickan ASSI	• Species-rich dry grassland community.	5.2km northwest
ASSI409	Clermont & Anglesey Mountain ASSI	• Heathland vegetation.	5.3km north
001803	Stephenstown Pond pNHA	Stephenstown Demesne, about 6km southwest of Dundalk, boasts two Natural Heritage Areas (NHAs), one of which is Stephenstown Pond. This is a large, artificially excavated, shallow pond with fringing emergent vegetation of Bulrush (*Typha latifolia*) and Reed Canary-grass (*Phalaris*	5.4km southwest

Site Code	Site Name	Qualifying Interest Habitats and Species	Distance from Study Area
		arundinacea) with associated species such as Bogbean (*Menyanthes trifoliata*). The aquatic component of the lake vegetation features prominent stands of water-lilies of both native species, Yellow Water-lily (*Nuphar lutea*) and White Water-lily (*Nymphaea alba*). Oak (*Quercus* spp.) and White Willow (*Salix alba*) stand on the north and south shores. There is no feature of the natural history of this artificial lake which makes it of outstanding importance. It has been designated an NHA because it is representative of open water bodies in the area, supports a thriving, typical pond wildlife. Although overall it is rather a small site, the stands of aquatic vegetation are relatively extensive and this may account for the rich invertebrate life.	
001465	Woodland At Omeath Park pNHA	The woodland at Omeath Park occurs on a low hill at the head of Carlingford Lough across the Newry River and just to the west of Warrenpoint. This wet, semi-natural, deciduous woodland is comprised mainly of birch (*Betula* spp.) and Alder (*Alnus glutinosa*) with some scrub around the margins. It is quite undisturbed and is a well preserved habitat for local wildlife. There are few serious threats to the site at present although the non-native Rhododendron (*Rhododendron ponticum*) is invading some parts of the wood. The undergrowth is dominated by Bracken (*Pteridium aquilinum*). This habitat is perhaps not unusual in Ireland but it is one of the only relatively pure stands of birch in County Louth and is thus of at least local importance.	6.8km north
ASSI293	Cloghinny ASSI	• Part of Slieve Gullion volcanic complex • Geological features	7.6km northwest
ASSI346	Kilkeel Steps ASSI	• Geological features	7.7km northeast
ASSI198	Slieve Gullion ASSI	• Flora, fauna and geological features	8km northwest
ASSI292	Glendesha ASSI	• Part of Slieve Gullion volcanic complex • Geological features	8.3km northwest
001461	Darver Castle Woods pNHA	Darver Castle Woods is located just south of Readypenny Cross, Co. Louth, in the grounds of Darver Castle. It is mixed woodland which was visited in 1993 and is unchanged from the original habitat described in the AFF report of 1972. It is described in this report as mixed wet deciduous woodland of Beech (*Fagus sylvatica*), Alder (*Alnus glutinosa*), Hawthorn (*Crataegus monogyna*) and Ash (*Fraxinus excelsior*).	9km southwest

Site Code	Site Name	Qualifying Interest Habitats and Species	Distance from Study Area
		It has a diverse understorey of orchids which includes Common Twayblade (*Listera ovata*) and Common Spotted-orchid (*Dactylorhiza fuchsii*). Plants of marshy ground such as Yellow Iris (*Iris pseudacorus*), Bulrush (*Typha latifolia*) and Marsh Horsetail (*Equisteum palustre*), and woodland plants including Lesser Celandine (*Rananculus ficaria*) and Early Dog-violet (Viola reichenbachiana) can be found here. Rhododendron (*Rhododendron ponticum*) is present in the site and this is a threat to the scientific importance of the site if it spreads. Felling of native trees and planting of conifers are also possible threats to this site. Wet deciduous woodland is an uncommon habitat in the region and this is a site worthy of conservation and possible regeneration into Ash woodland.	
ASSI367	Kilbroney River ASSI	• Geological features	9.5km north
ASSI238	Fathom Upper ASSI	• Species-rich dry grassland.	9.9km north
ASSI291	Mullaghbane ASSI	• Part of Slieve Gullion volcanic complex • Geological features	10km northwest
ASSI206	Loughaveely ASSI	• Wetland flora and fauna	10.3km northwest
ASSI158	Greenan Lough ASSI	• Wetland flora and fauna	11km north
ASSI204	Lurgan Lough ASSI	• Wetland flora and fauna	11.4km northwest
ASSI095	Eastern Mournes ASSI	• Geological and physiographical features • Heathland and upland flora and fauna	11.4km northeast
ASSI423	Carrivemaclone ASSI	• Geological features	11.4km north
000456	Stabannan-Braganstown pNHA	Site description not available.	11.5km south
ASSI231	Cam Lough ASSI	• Flora and fauna	11.9km northwest
ASSI160	Greenan ASSI	• Wetland flora and fauna	11.9km north
ASSI214	Levallymore ASSI	• Species-rich dry grassland communities.	12km northwest
ASSI189	Cashel Loughs ASSI	• Wetland flora and fauna	12km northwest
ASSI079	Derryleckagh ASSI	• Flora and fauna • Wetland • Semi-natural woodland.	12.3km north

Site Code	Site Name	Qualifying Interest Habitats and Species	Distance from Study Area
001856	Dunany Point pNHA	Dunany Point is a coastal headland comprised of loosely consolidated glacial deposits at the southern end of Dundalk Bay halfway between Annagassan and Clogher Head. These prominent low sea cliffs comprise large to medium sized rock fragments in a clay matrix. Parts of the cliffs are covered in vegetation communities which show a maritime influence. Thrift (*Armeria maritima*) and Buck's-horn Plantain (*Plantago coronopus*) are quite common. However, many of the cliff faces are experiencing rapid erosion and are devoid of vegetation. The slopes are very unstable with recent mudslides and several large collapse features. Below the cliffs, the full transition from terrestrial to marine habitats can be seen. On the southern end, the beach is comprised of sandy sediment with occasional rocky patches, while on the northern end the beach is comprised of rocky mudflats with a tall bank of shingle between the high and low water mark. The foreshore consists of small pebble to boulder sized rock fragments of siltstone, limestone and occasional sandstone. Further offshore, the extensive low tide sandflats and mudflats are frequented by waterfowl such as Curlew, Shelduck, Cormorant, Great Crested Grebes, Mallard, Redbreasted Merganser, Knot, Redshank and Oystercatchers. A number of Light-bellied Brent Geese were also recorded here while feeding on eelgrass (*Zostera* spp.) on the foreshore during an O.P.W. survey in 1994. According to An Foras Forbatha report (1972), this headland is part of a moraine which was deposited during the Pleistocene period. This deposit represents a readvance of the ice which occurred after the glacial ice had covered the Carlingford and Mourne Mountains. Stratification in these glacial deposits can be clearly seen, showing the transition from well sorted, coarse grained units to fine grained, clay-rich till. In addition to its educational value, this site also provides a good example of the variety of coastal habitats on the Irish east coast. The occurrence of shingle beach, (listed for conservation in the E.U. Habitats Directive) and the presence of Lightbellied Brent Geese, an internationally important species (listed as Annex II in the E.U. Birds Directive and legally protected in Ireland) add to the scientific importance of this site.	12.5km south
ASSI289	Camlough Quarry ASSI	• Part of Slieve Gullion volcanic complex • Geological features	13km north
ASSI368	Gruggandoo ASSI	• Geological features	13.3km north

Site Code	Site Name	Qualifying Interest Habitats and Species	Distance from Study Area
001616	Louth Hall And Ardee Woods pNHA	Louth Hall and Ardee Woods proposed Natural Heritage Area (pNHA) encompasses three areas of mixed, planted and semi-natural deciduous woodland to the north of Ardee in Co. Louth. This pNHA has diminished in size since it was first surveyed in 1974, due to tree felling, agricultural improvement and new housing development, but it still contains good examples of both dry and wet woodland habitats with a representative ground flora. The woods at Red House, 1km north of Ardee, contain a mixture of Beech (*Fagus sylvatica*), Pedunculate Oak (*Quercus robur*), and Ash (*Fraxinus excelsior*) with some Yew (*Taxus baccata*), Wych Elm (*Ulmus glabra*), Holm Oak (*Quercus ilex*) and Horse-chestnut (*Aesculus hippocastanum*). The understorey is patchy with frequent Holly (*Ilex aquifolium*) and Hawthorn (*Crataegus monogyna*). This wood is surrounded by farm buildings and pasture grazed by horses. Lodge Wood is an isolated area of deciduous woodland with a similar species composition which occurs 5km north on the Ardee to Tallanstown road. Many of the mature trees along the roadside were cleared during the erection of new bungalows and this portion of woodland is seriously invaded by the non-native Rhododendron (*Rhododendron ponticum*) but it was also retained within the site as there are few remaining woodlands in this region. To the north of the impressive ruins of Louth Hall, an area of wet woodland occurs around the margins of a small lake. This area, known as the Icehouse Plantation, is wet woodland and contains a good diversity of species. Willows (*Salix* spp.), Alder (*Alnus glutinosa*) and Downy Birch (*Betula pubescens*) are the dominant species with some Wild Cherry (*Prunus avium*). Yellow Iris (*Iris pseudacorus*) and Meadowsweet (*Filipendula ulmaria*) are common in the understorey. There are also several undisturbed islands within the lake with good species diversity. The margins of the lake are colonised by Bulrush (*Typha latifolia*). Rubbish dumping near the lake has unfortunately reduced the naturalness of the site and is threatening the water quality within the lake. The spread of Rhododendron within all these woods has inhibited the development of the ground flora and is a serious threat. Although parts of these woodlands are comprised of exotic species, they are some of the last remaining well established broadleaved woodlands in the area. They are quite close to the town of Ardee and are of value for educational purposes as well as providing habitats for local woodland flora and fauna.	13.3km southwest

Site Code	Site Name	Qualifying Interest Habitats and Species	Distance from Study Area
ASSI416	Aughnagon Quarry ASSI	• Geological features	13.4 km north
ASSI290	Lislea ASSI	• Part of Slieve Gullion volcanic complex • Geological features	13.7km northwest
ASSI389	Samuel's Port ASSI	• Geological features • Intertidal habitats	15km northeast

Other Designated Sites

Table 5.1.1.5 below details all other sites designated for the protection of biodiversity that are present within the study area. Such sites include OSPAR sites (sites protected under the OSPAR Convention to Protect the Marine Environment of the North East Atlantic), Ramsar sites (wetlands of international importance that have been designated under the criteria of the Ramsar Convention on Wetlands), wildfowl sanctuaries and ancient and long-established woodlands.

Table 5.1.1.5 Other Designated Sites within the Zone of Influence

Site Code	Site Name	Site Description/Features of Interest	Distance from Study Area
OSPAR			
O-IE-0002971	Dundalk Bay	Refer to Dundalk Bay SAC and SPA.	This site is located within the study area.
Marine Conservation Zones (MCZs)			
n/a	Carlingford Lough MCZ	• Subtidal (sublittoral) mud: *Philine aperta* and *Virgularia mirabilis* in soft stable infralittoral mud	3.6km north
Ramsar			
834	Dundalk Bay	Refer to Dundalk Bay SAC and SPA.	This site is located within the study area.
UK12004	Carlingford Lough	• Common Tern (*Sterna hirundo*) • Sandwich Tern (*Sterna sandvicensis*) • Roseate Tern (*Sterna douglii*) • Artic Tern (*Sterna paradiseae*) • Light-bellied Brent Goose (*Branta bernicla hrota*)	730m northwest
Wildfowl Sanctuary			
WFS-35	Ballymascanlan Estuary	Refer to Dundalk Bay SAC and SPA.	This site is located within the study area.
WFS-36	Lurgan Green	Refer to Dundalk Bay SAC and SPA.	This site is located within the study area.
Ancient and Long-established Woodlands			

2125	Tipping Hill	Refer to Trumpet Hill (Louth) pNHA.	This site is located within the study area.
Nature Reserves			
NR5	Rostrevor Forest	Refer to Rostrevor Wood SAC and ASSI.	4.3km north

Habitats

Fossitt Habitats

The following table lists the habitat and land use types (classified using Fossitt, 2000) that are contained within the study area, based on a review of aerial photography and using the GeoHive Environmental Sensitivity Mapping.

Table 5.1.1.6 The habitat classifications and codes that correspond to Fossitt, 2000 within the study area

Habitat Name	Fossitt Code
BC1	Arable crops
BC3	Tilled land
BC4	Flower beds and borders
BL1	Stone walls and other stonework
BL3	Buildings and artificial surfaces
CB1	Shingle and gravel banks
CC1	Sea walls, piers and jetties
CM1*	Lower salt marsh
CM2*	Upper salt marsh
CW1*	Lagoons and saline lakes
CW2*	Tidal rivers
ED1	Exposed sand, gravel or till
ED2	Spoil and bare ground
ED3	Recolonising bare ground
FW1*	Eroding/upland rivers
FW2*	Depositing/lowland rivers
FW4	Drainage ditches
GA1	Improved agricultural grassland
GA2	Amenity grassland (improved)
GS4*	Wet grassland
HD1	Dense bracken
LR1*	Exposed rocky shores
LS4*	Mud shores
LS5	Mixed sediment shores
MW1	Open marine water

Habitat Name	Fossitt Code
MW2*	Sea inlets and bays
MW4*	Estuaries
PF1*	Rich fen and flush
PF3*	Transition mire and quaking bog
WD1	(Mixed) broadleaved woodland
WD2	Mixed broadleaved/conifer woodland
WD4	Conifer plantation
WD5	Scattered trees and parkland
WL1	Hedgerows
WL2	Treelines
WN5	Riparian woodland
WS1*	Scrub
WS3	Ornamental/non-native shrub

* Indicates possible link with Annex I habitat types.

Annex I Habitats

NPWS spatial data, GeoHive's Environmental Sensitivity Mapper was utilised to identify Annex I habitats in the Zone of Influence. These habitats are presented below in Table 5.1.1.7.

Table 5.1.1.7 Potential Annex I habitats within the study area.

Habitat Code	Habitat Name (* = priority type)
1130	Estuaries
1140	Mudflats and sandflats not covered by seawater at low tide
1160	Large shallow inlets and bays
1210	Annual vegetation of drift lines
1220	Perennial vegetation on stony banks
1230	Vegetated Sea cliffs
1310	*Salicornia* and other annuals colonising mud and sand
1330	Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)
1410	Mediterranean salt meadows (*Juncetalia maritimi*)
4010	Wet heath
4030	Dry heaths
4060	Alpine and Boreal heaths
6230	Species-rich Nardus grassland*
6410	*Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*)
7130	Blanket bogs
7140	Transition mires and quaking bogs
7210	Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae**

Habitat Code	Habitat Name (* = priority type)
7230	Alkaline fens
8110	Siliceous scree
8220	Siliceous rocky slopes

Watercourses and Waterbodies

The study area is located within the Newry, Fane, Glyde & Dee catchment. There are a number of watercourses that are either present within or intersect the study area. Watercourses are of ecological significance as they provide important habitat for a range of sensitive protected species, for example, species listed on Annex II to the Habitats Directive, e.g. Otter and Atlantic Salmon, and species listed on Annex I to the Birds Directive, e.g. Kingfisher. In addition, watercourses often support a wide range of aquatic and riparian species of high conservation value. Watercourses can act as conduits for invasive alien species and both a pathway and receptor for pollutants to sensitive habitats/species located downstream of the proposed route options.

Water Quality

In accordance with WFD guidelines, water quality 'Status' is assigned using a variety of available data on aquatic flora and fauna (including fish), the availability of nutrients, and aspects like salinity, temperature and pollution by chemical pollutants. Morphological features, such as quantity, water flow, water depths and structure of the riverbeds, are also taken into account. Waterbodies are assigned a status of Poor, Moderate, Good or High based on these factors. This is determined using water monitoring data, data on the pressures faced by waterbodies, and data on the measures that have been implemented for waterbodies.

The Environmental Protection Agency (EPA) water quality classification system (Quality Rating System (Q-values)) is also used to assess water quality in Irish rivers, taking into account aquatic macrophytes, phytobenthos and hydromorphology. The Q-value system has been shown to be a robust and sensitive measure of riverine water quality and has been linked with both chemical status and land-use pressures in catchments. A review of both the Q-value status and WFD status for the watercourses was undertaken.

The online EPA Unified GIS Application provides access to information at individual waterbody level and at Water Management Unit level for all the River Basin Districts in Ireland. Table 5.1.1.8 shows the information recorded regarding water quality status at the location of the study area.

Table 5.1.1.8 EPA Water Quality Results (Rivers)

EPA Name / WFD Watercourse Name	River Waterbody WFD Status (2016-2021)	Latest River Q-Values
Ramparts_010	Poor	No data
Castletown_030	Moderate	3-4
Raskeagh_010	Moderate	3
Ballymascanlan_010	Poor	3
Flurry_030	Moderate	3-4
Rockmarshall_010	Good	No data
Big (Louth)_020	Moderate	3-4

EPA Name / WFD Watercourse Name	River Waterbody WFD Status (2016-2021)	Latest River Q-Values
Ballynamaghery_010	Moderate	No data
Greenore_010	Poor	No data
Carlingford_010	Moderate	No data

The assessment of the trophic status of estuarine and coastal waters around Ireland is mainly based on the analysis of data collected by the EPA between 2018-2020. Additional data from the Marine Institute's annual winter nutrient monitoring in the western Irish Sea and eastern Celtic Sea are also included. A Trophic Status Assessment Scheme (TSAS) for the classification of these waters was developed. Both dissolved inorganic nitrogen (DIN) and ortho-phosphate (MRP) levels are assessed in summer and winter, chlorophyll data are assessed using a median and 90 percentile approach and oxygen conditions are assessed both in respect of deoxygenation and supersaturation. The waterbodies are then assigned a status of Eutrophic, Potentially Eutrophic, Intermediate Status or Unpolluted.

The online EPA Unified GIS Application provides access to information at individual waterbody level for all the transitional waterbodies in Ireland. Table 5.1.1.9 shows the information recorded regarding water quality results and WFD status at the location of the study area.

Table 5.1.1.9 EPA Water Quality Results (Transitional Waterbodies)

EPA Name	WFD Status	Water Quality
Ballymascanlan Estuary	Moderate	Potentially Eutrophic
Castletown Estuary	Poor	Potentially Eutrophic
Inner Dundalk Bay	Moderate	Intermediate

Protected and Invasive Species

The study area lies within the Ordnance Survey 10km x 10km grid squares (hectads) J00, J01, J10, J11, J20, and J21 (the search area). Records of rare, protected and invasive species of flora and fauna from the past decade in these grid squares were obtained from the National Biodiversity Data Centre (NBDC) online database. These records are presented in Appendix B1 of Appendix B.

Birds

The study area supports a range of farmland and wetland bird species, including a number of BoCCI red-listed species. These species are assumed to be present in the study area, as breeding, wintering or resident species. However, some areas provide more favourable conditions than others. There were 12 red-listed species and 64 amber-listed in the search area. There are also records for 20 species listed under Annex I of the Birds Directive within the search area. The proposed development has the potential to impact birds through disturbance, habitat degradation and fragmentation, and habitat loss. As such the presence of birds and bird habitat in the study area is considered a constraint, and impacts to habitats such as through vegetation clearance should be minimized. Bird surveys will be required to establish the importance of the areas affected by the proposed developments for both wintering and breeding birds. These should inform the option selection phase of the proposed development. The Annex I bird species recorded within the search area are listed below:

- Arctic Tern (*Sterna paradisaea*)
- Bar-tailed Godwit (*Limosa lapponica*)
- Common Tern (*Sterna hirundo*)

- Dunlin (*Calidris alpina*)
- Golden Plover (*Pluvialis apricaria*)
- Great Northern Diver (*Gavia immer*)
- Greater White-fronted Goose (*Answer albifrons*)
- Hen Harrier (*Circus cyaneus*)
- Kingfisher (*Alcedo atthis*)
- Little Egret (*Egretta garzetta*)
- Little Gull (*Larus minutus*)
- Little Tern (*Sternula albifrons*)
- Merlin (*Falco columbarius*)
- Peregrine Falcon (*Falco peregrinus*)
- Red-throated Diver (*Gavia stellata*)
- Roseate Tern (*Sterna dougallii*)
- Ruff (*Philomachus pugnax*)
- Sandwich Tern (*Sterna sandvicensis*)
- Short-eared Owl (*Asio fammeus*)
- Whooper Swan (*Cygnus cygnus*)

Mammals

Otter: Otter (*Lutra lutra*) are listed under Annex II and IV of the EU Habitats Directive, and the Fifth Schedule of the Wildlife Act. The numerous watercourses within the study area provide potential Otter habitat. The proposed development has the potential to impact Otter directly through habitat loss and indirectly through habitat degradation and pollution of watercourses which could lead to reduced food availability in the form of fish biomass. Otter habitat in the form of watercourses and riparian habitat should be considered a constraint of the study area. Surveys will be required to assess the impact the proposed development may have on this species.

Badger: Badger (*Meles meles*) are protected under the Wildlife Acts and are common and widespread in Ireland and it is likely that Badger setts are present in the hedgerows and pockets of woodland in the study area. There is potential to for the proposed development to give rise to impacts on badger through disturbance, and habitat loss, degradation, and fragmentation. National guidelines apply for mitigating impacts for this species and reference to these guidelines should be made in this regard. A survey of the preferred route will be required to assess the impact on the species.

Bats: Daubenton's Bat (*Myotis Daubentonii*) and Soprano Pipistrelle (*Pipistrellus pygmaeus*) were recorded within the search area. All bat species are listed on Annex IV of the Habitats Directive and the Fifth Schedule of the Wildlife Act. The watercourses, pockets of woodland / scrub and hedgerows provide commuting and foraging habitat for bats. Additionally, mature and dead trees, and building and structures in the study area may provide suitable roosting habitat. The proposed development may lead to the loss of roosting habitat, habitat fragmentation and habitat degradation through vegetation clearance, disturbance, and the introduction of artificial light. Bat surveys and roost suitability assessments will be required will be required to assess the impact that the proposed development will have on the species.

Other Mammals: Red Squirrel (*Sciurus vulgaris*), Pygmy Shrew (*Sorex minutus*), Hedgehog (*Erinaceus europaeus*), Pine Marten (*Martes martes*), and Red Deer (*Cervus elaphus*) have

been recorded within the search area, and all of these species are protected under the Wildlife Acts. There is potential to impact these species through habitat loss, degradation and fragmentation as a result of the proposed. Red Squirrel and Pine Marten surveys should be undertaken within any woodlands likely to be affected by the proposed development to assess the impact on these species. Incidental records will be made for all other mammal species during any future ecological surveys.

Amphibians and Reptiles

Common Frog (*Rana temporaria*), Smooth Newt (*Lissotriton vulgaris*) and Common Lizard (*Zootoca vivipara*) are protected under the Wildlife Acts and were all recorded within the search area. Amphibians rely on standing water including ponds and drainage ditches to breed and are vulnerable to the loss of these habitats particularly during spawning season. Dedicated surveys for these species should be undertaken to assess if suitable habitat for these species is likely to be affected by the proposed development.

Invertebrates

Marsh Fritillary (*Euphydryas aurinia*) are protected under Annex II to the Habitats Directive and was recorded in the relevant hectads in 2021. The records for this species are outside of the study area. However, there are a number of recent records of Devil's-bit Scabious (*Succisa pratensis*) in the study area, which is the host-plant for this species. Furthermore, as shown in Table 5.1.1.4 and Table 5.1.1.5 above, there is suitable habitats in the study area to support this species, including grassland habitats and the Annex I habitat Molinia meadows. As such, there is potential for Marsh Fritillary to be present within the study area. Dedicated surveys for Marsh Fritillary will need to be undertaken along with habitat surveys to assess the impact the proposed development may have on this species and its habitat.

Invasive Species

An invasive species survey of the preferred route should be undertaken to identify invasive species and provide recommendations to prevent the spread of these species during construction of the proposed development. Of particular concern are plant species listed on the Third Schedule (Regulation S.I. 477) to the European Communities (Birds and Natural Habitats) Regulations, 2011 (as amended) ("the Habitats Regulations"). 10 Third Schedule invasive plant species were recorded in the search area, and are listed below:

High Impact Species:

- Common Cord-grass (*Spartina anglica*)
- Giant Hogweed (*Heracleum mantegazzianum*)
- Giant Rhubarb (*Gunnera tinctoria*)
- Himalayan Balsam (*Impatiens glandulifera*)
- Japanese Knotweed (*Fallopia japonica*)
- Rhododendron (*Rhododendron ponticum*)

Medium Impact Species:

- Salmonberry (*Rubus spectabilis*)
- Sea-buckthorn (*Hippophae rhamnoides*)
- Three-cornered Garlic (*Allium triquetrum*)
- Spanish Bluebell (*Hyacinthoides hispanica*)

As the management of some of these species can be particularly onerous, consideration should be given to avoiding any stands where possible. Where stands cannot be avoided,

reference should be made to the following documents, which provides detailed recommendations for the control of invasive species and noxious weeds:

- *The Management of Invasive Alien Plant Species on National Roads – Standard*. Transport Infrastructure Ireland (2022).
- *The Management of Invasive Alien Plant Species on National Roads – Technical Guidance*. Transport Infrastructure Ireland (2022).

5.1.1.4 Key Constraints

1. The presence of several European (SACs & SPAs), Nationally (e.g. pNHAs) and Internationally (e.g. UK SACs & SPAs, ASSIs, OSPAR & Ramsar sites) designated sites within and adjacent to the study area.
2. The presence of Annex I habitat within the study area.
3. The presence of ancient and long-established woodland.
4. The presence of watercourses within the study area.
5. The presence of semi-natural habitats that support a range of protected species within the study area.
6. The presence of bats within the study area.
7. The presence of protected mammals such as Badger and Otter within the study area.
8. The presence of wintering birds in the study area.
9. The presence of wintering birds and breeding farmland birds within the study area.
10. The potential presence of Marsh Fritillary within the study area.
11. The potential for invasive species within the study area.

5.1.1.5 Key Opportunities

1. Bird and bat box installation along the extent of the proposed development.
2. Biodiverse landscaping along the proposed development route, with native tree and wildflower planting, pond creation and biodiversity-rich grassland along verges.
3. Retention of dead trees in the study area, where possible.
4. Retention of felled trees as wildlife habitat, and other natural habitat in the study area, where possible.
5. Retention and enhancement of buffer zones around standing water.
6. Maintain connectivity for mobile species across the landscape.
7. Management/eradication of invasive species in the study area.

5.1.2 Soils and Geology

5.1.2.1 Introduction

This section of the report identifies the soils and geological constraints pertaining to the study area of the proposed Dundalk Bay to Carlingford Greenway.

5.1.2.2 Methodology

The current section outlines the geomorphology, solid geology, superficial deposits, economic geology, contaminated land and geological heritage of the study area in accordance with the Environmental Impact Assessment (EIA) Directive 2011/92/EU (as amended by Directive 2014/52/EU) and the following guidance documents:

- DN-GEO-03047, Rural Cycleway Design (Offline & Greenway) (TII, 2022).
- Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes (TII, 2008).

- Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Assessment Reports (IGI, 2013).
- Guidelines on the Information to be contained in Environmental Impact Assessment Reports (EPA, 2022).
- Draft Advice Notes for Preparing Environmental Impact Statements (EPA, 2015);
- Advice Notes on Current Practice in the Preparation of Environmental Impact Statements (EPA, 2003).

Available Information and Data Collection

Desk Study

A desk study was undertaken the context of the Constraints Study Report which was based on the publicly available online sources listed below:

- Geological Survey of Ireland (GSI) for mapping and preliminary classification of superficial deposits, solid geology, economic geology, karst features and geological heritage.
- Google Earth, Bing Maps and Ordnance Survey Ireland (OSI) for aerial imagery and large-scale identification of surficial ground features and general topographical characteristics, as well as features of the built environment within the study area.
- GeoHive's historical maps dated from 1830 until recently for mapping of the historical development in the study area in terms of land use, infrastructure and other likely changes in the existing environment;
- EPA maps to identify and assess any likely landfill sites or waste facilities within the study area.

Ground Investigations

The GSI database contains a number of historical site investigation data comprising boreholes, rotary cores, trial pits and dynamic probes at the western side of the study area, in Dundalk town and also along a section of the N52 that connects the N1 National Road with Dundalk town, north of Castletown River. It is noted that the study area has a large area relative to the amount of ground investigation information available, which only covers specific locations of it. The GSI geotechnical reports relevant to the study area and available are listed below:

- Mc.Caughey Developments (1996), Mary Street North, Dundalk County Louth – Ground Investigation Report;
- Donnelly Troy (1996), Fyffes, Dundalk - Ground Investigation Report;
- McCarthy and Partners (1991), Dundalk Urban District Council – Ground Investigation Report;
- IGSL (2008), Report on Site Investigation for Coes Road, Dundalk Pumping station. On behalf of Tobin Consulting Engineers;
- IGSL (2005), Dundalk Private Hospital. On behalf of Arup Consulting Engineers.

5.1.2.3 Receiving Environment

The ground conditions were assessed with due consideration of both the desk study and historical site investigations available as discussed above.

Geomorphology

The geomorphology across the study area generally varies from flat next to the coastline to increasingly steep towards the inland, where the mountains are. Ground levels across the study area vary from approximately 0 mOD to 10 mOD at the urban area of Dundalk and from

0 to 80 mOD at the Cooley Peninsula. The slope is particularly significant in the vicinity of Carlingford where a mountain peak of 588 mOD is reached at a distance of 1.7km from the coast. Some hills are noticeable at the Northwest of the study area.

There are a number of geomorphological features present in the study area, as shown on Drawing no. D2CG-RODA-EGN-SW_AE-DR-EN-100004 in Appendix A, and identified below:

- *Hummocky Morain* is located along the southern section of the study area, mostly delimited by the coast and the R173 Regional Road, including the townlands of Rampark, Loughanmore, Mountbagnall and Castlecarragh.
- *Delta*, namely Bush Delta, is situated immediately to the north of the Hummocky Moraine.
- *Fan*, namely Carlingford Fan, is located within the northeastern of the study area, immediately south of Carlingford town.
- *Hummocky Sand and Gravel* is scattered throughout the study area. It is mainly found to the northeast of Dundalk, immediately to the west and east of the Hummocky Moraine, and on the eastern side of the study area, near Greenore.
- Six *Drumlins* are located within the northwestern portion of the study area, namely to east of the N1 National Road that delimits part of the study area. They are easily identified due to the presence of elongated heaps. They follow in a northwest-southeast direction.
- Three *Streamline Bedrock* features have been identified at the northwestern section of the study area, following the alignment of the drumlins previously described.
- *Clusters of Subglacial Lineation Striae* are located within the centre of the study area, to the north of Hummocky Moraine and Bush Delta and also within the northeastern section of the study area, near to the coastline at Carlingford. They are shown to follow a northwest-southeast direction.
- *Meltwater Channel* is present within the Bush Delta with a southwards direction. Four other channels were also identified approximately 3km further to the east of Bush Delta, following a general trend towards the northeast.

Generally, the study area is relatively flat near the coast and becomes increasingly sloped towards the mountains, situated in the middle of Cooley Peninsula.

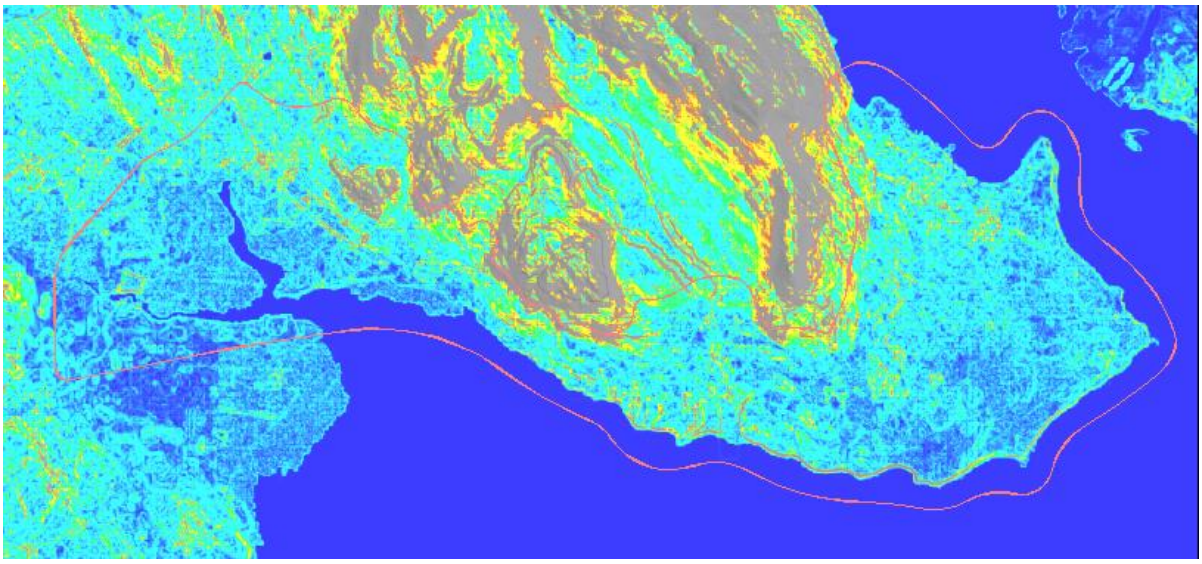

Figure 5.1.2.1 Topography of the study area (Topographic Maps)

Figure 5.1.2.2 A view of a typical landscape at the South of the Cooley Peninsula. Increasing slope towards the middle of the peninsula.

Figure 5.1.2.3 A view of the steep ground on the hillside near Carlingford (Google image)

Figure 5.1.2.4 A view of the steep ground on the hillside near Carlingford (Google image)

Overview of Solid Geology

The GSI Bedrock Geology 100k series maps (1:100,000) was reviewed and displayed on Drawing no. D2CG-RODA-EGN-SW_AE-DR-EN-100005 in Appendix A. It indicates that the study area is mainly underlain by the following geological units:

- *Dinantian Limestones* covers the majority of the study area.
- *Clontail Formation:* covers the westernmost sections of the study area, namely at Dundalk and it is described as Calcareous red-mica greywacke.

There are also a number of very minor areas underlain by the following geological units:

- *Early Gabbro* is described as Basic intrusive, mainly located to the east of Ballymascanlan.
- *Inniskeen Formation* is described as Turbidite with red mica and red shale. Its locally found within the northeastern portion of the study area, at Carlingford.
- *Layered Gabbro* found scattered across the study area.
- *Hawaiite Lave* is described as Basaltic Lava. Located to the north of a the Rampark (Louth) townland.
- *Granophyre* is described as Microgranite with granophyric texture and only found locally near the Piedmont (Louth) townland.

There are 8 no. faults identified in the study area, which are distributed throughout and mostly follow a northwest to southeast direction. Some of the faults are crossed by watercourses, such as the Flurry River.

Review of available historical ground investigations was undertaken. As identified in Section 5.1.2.2, data on historical ground investigations is only available for the western section of the study area, and showed that the bedrock can be found at shallow depths of 2m to 4m depth in high ground areas. The available data also showed that rock was not found within the upper 6m in the holes progressed lower downhill.

Rotary core logs indicate that existing rock is Limestone, typically found at 4m depth and commonly described as strong to very strong, slightly to moderately to locally highly

weathered. In some cases, Greywacke rock was noted intercalated with the Limestone with approximately 2m thickness.

The available historical ground investigation data is largely encountered at the western end of the study area, in or close to Dundalk. However, the amount of available ground investigation information is very modest in comparison with the large area of study and therefore no ground model can be derived from this information. As a consequence of that no suitable soil-rock assessments can be done without a specific project ground investigation campaign. The extent and type of ground investigation will depend on the project requirements and will be studied in later stages of the project.

Overview of Soils and Subsoil Deposits

An overview of the surficial deposits is obtained from Geological Survey of Ireland (GSI). Drawing no. D2CG-RODA-EGN-SW_AE-DR-EN-100008 in Appendix A depicts an anticipated general distribution of the superficial soils throughout the study area. The drawing shows numerous types of soils present in the area and these are listed below:

- *Till derived from Lower Palaeozoic sandstones and shales*: covers a large area situated at the eastern side of the Cooley Peninsula. It is also likely to be present at the western end of the peninsula.
- *Till derived from granite*: this is one of the soil types more frequently found within the study area and it typically runs parallel to the coast of the peninsula. It is commonly found 0.5km away from the coast.
- *Gravels derived from granite*: mostly found in the centre of the study area, at the south side facing the sea, and at both sides of Castletown River (to the east of Gyles Quay-river sub-basin called Big (Louth)_020)). It is also noted slightly to the north and east of Earls Quarter (Louth) townland and also at the northeastern side of the study area, and southeast of Carlingford;
- *Marine gravels and sands (often raised)*: they are found at the west and the east sides of the study area, including at Greenore.
- *Estuarine silts and clays*: are identified to be present at the estuarine area, to the north of Dundalk.
- *Gravels derived from Lower Palaeozoic sandstones and shales*: present within small, scattered areas throughout the study area, one of them under Greenore.
- *Urban*: encompasses Dundalk.
- *Alluvium*: these soils appear right below Castletown River and Flurry River.
- *Bedrock outcrop or subcrop*: these soils are shown to be scattered within the northern section of the study area as the ground levels increase towards the middle of the peninsula where the mountains are present.
- *Marine beach sands:* they mostly appear at the western section of the study area, near Ballymascanlan, but they are also shown at Castlecarragh Bay beach.
- *Fen Peat and Cut over raised peat:* these soils are marginally present, and are scattered throughout the study area.
- *Lacustrine sediments:* these are found very rarely and below small existing lakes.

This review of historical ground investigation data typically shows a first layer of topsoil or made ground followed by soft to firm clays up to 2 or 3m, sometimes including organic material and shells. A layer of loose to medium dense sand was frequently found underneath. In some cases, 7m thick layers of organic silts under sands with shells were noted to overlay a deeper band of peat at 15m depth and 1.5m thick.

Soft Ground

Peat

Peat is a type of organic material that is a product of decayed vegetation or animal remains, usually encountered in wetland areas, such as swamps or bogs. According to the GSI maps, this unit is only found in very small amounts and very scattered throughout the study area. It is mostly found at the eastern side of the peninsula and locally towards the west, near Jenkinstown. It is described as "Cut over raised peat" and in other locations, as "Fen peat".

This material is also found in historical ground investigation reports, at the western section of the study area, described as peaty granular and cohesive soils and also as only peat. Depending on its concentration and on its condition organic content and moisture content levels vary. Deeper peat layers are typically drier and more decomposed than shallow recent peat deposits. In a particular historical borehole (Borehole No. 3 from "Report on a Site Investigation for a Proposed Housing Development at Fyffes, Dundalk on Behalf of Donnelly Troy, Consulting Engineers") peat was found at a depth of almost 15m up to 16.5m underlying organic silts and sands with occasional shells.

In accordance with TII's Specification for Road Works Series 600, peat is classified as unacceptable (Class U1) material, which makes it unsuitable for reuse as fill. Nonetheless a floating road greenway construction over peat is a possibility so that no peat removal is needed.

Organic soil

The historical ground investigation information indicates the presence of organic matter contained within marine silts with occasional shells. They are typically encountered at shallow depths but in a particular historical borehole (Borehole No. 3 from "Report on a Site Investigation for a Proposed Housing Development at Fyffes, Dundalk on Behalf of Donnelly Troy, Consulting Engineers") they were also found below 8m and up to 15m depth.

If a soil has above certain organic matter content it is likely to yield a soft ground and therefore shall not be used as part of the fill materials during the construction works. Nonetheless a floating road greenway construction over organic soil is a possibility so that this soil may not need to be removed.

Alluvium

Alluvium represents a form of normally consolidated cohesive or granular sedimentary material that is typically deposited by flowing water from rivers or other waterbodies.

Alluvial deposits are not frequent in the study area and they appear mostly at Castletown River (at the westernmost section of the study area), at Flurry River (passing through Ballymascanlan) and along the river that ends at Castlecarragh Bay Beach. This material type is not deemed suitable for reuse and can pose additional risks to the greenway construction, and as such, it should generally be avoided or improved where possible. If the route passes over this type of soil there might not be a requirement to remove it if a suitable floating road greenway construction design is adopted.

Estuarine Silts and Clays

These cohesive soils are identified at the western portion of the study area, near Dundalk where the estuary is present. They represent normally consolidated cohesive sedimentary material deposited in the estuarine areas by both the action of the river and the sea. Due to their likely soft condition, they pose a risk for the construction and therefore it should be avoided or improved where possible. Nonetheless, the material might not need to be removed if a suitable floating road greenway construction design is adopted.

Marine Gravels and Sands – Marine Beach Sands

These are coarse soils that appear mostly at the western section of the study area, next to the coast and the estuarine area, but also they appear at the eastern coast of the peninsula, from Carlingford to Whitestown. They are presumably loose in density and therefore may need to be tested. They may be prone to settlement due to compaction when loaded.

Lacustrine Sediments

Lacustrine sediments broadly encompass clastic lake or stream deposits which are commonly encountered in the form of laminated fine-grained or coarse-grained material which may further include a certain portion of organic content. Such deposits are encountered very infrequently throughout the study area. They appear in very small and scattered areas, mostly at the eastern half of the study area. The unit may exhibit relatively variable and commonly very poor mechanical properties, and thus, is not considered appropriate for reuse. Nonetheless these soils may not need to be removed if a suitable floating road greenway construction design is undertaken.

Contaminated Land

Two licensed waste facilities are located within the study area:

- Dundalk Landfill & Civic Waste Facility - Dundalk Town Council. It is located in Dundalk, at the northern side of Castletown River, with active license number W0034-02 according to the online EPA database.
- Oxigen Environmental (Coes Road) is located in Dundalk, with active license number W0144-01 according to the online EPA database.

It was noted from the historical ground investigation reports the existence of made ground and rubble fill from ground surface up to 1.5m in several cases as per boreholes and trial pits carried out at specific locations of the western end of the study area, mainly in Dundalk. Made ground is further anticipated adjacent to areas of land or residential usage and existing infrastructure.

Some industrial sites were identified in the study area or nearby which could pose higher risks of contamination. These sites are shown below.

- Industrial Emissions Licensing facilities:
    - Greenore Port Limited. Located at Greenore, at the eastern end of the study area.
    - Diageo Ireland Limited t/a The Great Northern Brewery. Located slightly away from the area of study, at the west of Dundalk.
    - Marcadle Moore & Co. Ltd, t/a Dundalk Packaging. Also situated slightly away from the study area, to the south of the above location.
- Integrated Pollution Control sites:
    - Cooley Distillery Unlimited Company. Located to the north of R173 road, next to Castletown River.
    - O'Hanlon and Sons Contractors Limited. Situated in Dundalk, at the southern side of the estuarine, next to Dundalk Port.
    - Great Northern Distillery Ltd. Located slightly away from the study area, at the west of Dundalk.

Economic Geology

According to GSI maps a single active quarry known as Loughanmore Pit (No. LH 002) is present in the middle of the study area, near Loughanmore (Louth) townland, at the coast, approximately 1km to the west of Castlecarragh Bay Beach and Gyles Quay. It produces aggregates and fill materials, mainly sand and gravel products for the production of mortar sand, concrete flooring/pavements, concrete and drainage/hardcore fill among other products.

A significant number of scattered mineral localities is noted throughout the study area, most of them being non-metallic. They comprise clay, brick, sand, gravel, magnetite and galena. Relevant active quarry and mineral locality locations are depicted in Drawing no. D2CG-RODA-EGN-SW_AE-DR-EN-100008 in Appendix A.

Geological Heritage

The GSI geological heritage sites are shown on Drawing no. D2CG-RODA-EGN-SW_AE-DR-EN-100009 in Appendix A and are summarised below:

- Carlingford Area: It embraces much of the Cooley peninsula and most of the study area, especially at its centre and at the North side. It is found at the northern side of the road R173, which delimits this area for much of its length. Its geology is described as palaeogene volcanic and intrusive igneous rocks, minerals and metamorphosed country rocks.
- Dundalk Bay: located at the west of the study area, it is described as wide coastal embayment, incorporating wide expanses of coastal flats. It is characterized by extensive flats, associated beach, dune and slack features; beaches, salt marshes and headlands.
- Rathcor Complex: situated at Rathcor Bay Beach and its vicinity, it includes an area of hummocky topography 8x1 km in extent. It is indicated that it comprises a large accumulation of hummocky sands and gravels.
- Bush Delta: located immediately to the North of Rathcor Complex. The site comprises a raised, elevated area of sands and gravels, including a working pit. It is indicated that the delta includes a large accumulation of sands and gravels deposited between two ice lobes.
- Greenore Raised Beach: located at Greenore, it is described as a wide, flat-topped feature adjacent to the shoreline around Greenore. It is the remains of a beach deposited in the locality when sea level was 3m-5m higher than it is today.
- Templetown Raised Beach: located at Tempetown Beach, it is a wide, flat-topped feature along the shoreline west of Cooley point extending inland up to 500m. The feature Is a beach deposited when sea level was approximately 20m higher than it is today.
- Cooley Point: located just beside the previous area, it is a coastal cliff section 300m long, 6m-8m high for most of its extent. Sediments in cliff are important evidence for sea levels in this area at the end of the last Ice Age.
- Drumenagh Quarry: it is a small area located close to an area called Ballymakellett. The site is an old, partly overgrown abandoned quarry. The quarry contains extensive exposure of the early-stage gabbros of the Carlingford Complex.
- Rampark: described as a series of outcrops bordering a private unpaved road on the southern slopes of Slievanaglogh. It contains early lavas of the Carlingford Complex including unusual hawaiite lava.
- Cooley Castle Quarry: located right to the North of Bush Delta and partially included in the study area. The site is an abandoned, partly overgrown but unfenced hill-side

quarry. The site contains very good exposures of dolerite intruded by granite, showing a range of textures.

Most of these geological heritage audited sites across the study area are considered opportunities for this greenway construction to offer many distinguishing landscape factors that enriches the experience of future users.

No Geological Heritage Unaudited Sites were shown in the GSI website at the study area.

Karst Landforms

No karst features were identified by the GSI website within the study area. Historical ground investigation reports didn't show any evidence of these neither, although these investigations were carried out only in small sections of the study area. However, it is noted that a large part of the study area is underlain by limestone rock which is a type of rock typically associated with this phenomenon. Karst features can present risks in terms of collapsible and unstable ground conditions for earthworks construction. Further risks associated with hydrology and hydrogeology could also be considerable specially where cuttings are required into karstified areas. These risks are greater in the case of pure limestones as impure limestones are much less susceptible to dissolution processes related to karst. A project specific site reconnaissance and ground investigation campaign should confirm the purity of the limestone and the absence or presence of karst.

Landslides

No landslide events are indicated within the vicinity of the study area based on the publicly available sources. The landslide susceptibility classification viewer from GSI website was consulted and it showed a classification of Low susceptibility for the vast majority of the study area. A high risk was noted to the west of Carlingford, where the ground is very steeped. The viewer also showed small scattered locations where Moderately low to moderately high susceptibilities, typically in areas next to the mountains, at the north of the study area.

5.1.2.4 Identified Geological Constraints

The main constraints identified in this chapter are summarised below:

Soft/loose soils: Some of the soils present in the area of study are expected to be soft by their nature and will lead to settlements when loaded. These soils are:

- Peat;
- Organic soils;
- Estuarine soils;
- Alluvial;
- Lacustrine sediments;
- Marine sediments.

A suitable floating road greenway design will permit to mitigate the risks associated with these soils. It is noted that these soils should not be reused as fill materials, although no high volumes of them are expected to be generated during the construction due to the low amount of earthworks anticipated.

Potential for Contamination: The presence of any contaminated materials cannot be ruled out based on the industrial activity noted in some local areas and based on some of the rubble materials locally found in some historical boreholes.

Economic Geology: a quarry was noted in the middle of the study area, approximately 1km to the west of Castlecarragh Bay Beach and Gyles Quay. It produces aggregates and fill materials.

Possible Karst formations: no karst features were identified in the study area, however it is noted that a large portion of it is underlain by Limestone, which is a type of rock susceptible to suffer karstification processes and therefore a further examination of the existing geology will be necessary to confirm any karst risks.

Possible Landslides: while no landslides events have been recorded it is noted that a high landslide susceptibility classification is indicated in an area in the limit with the study area, to the west of Carlingford, where very steep soils are present.

5.1.2.5 Identified Geological Opportunities

The various geological heritage audited sites across the study area are considered opportunities for this greenway construction to offer many distinguishing landscape factors that enriches the experience of future users.

5.1.3 Hydrology and Hydrogeology

5.1.3.1 Introduction

This section provides an overview of the water environment (hydrology and hydrogeology constraints within the study area for the proposed greenway development, in accordance with the guidelines set out in Transport Infrastructure Ireland's Project Management Guidelines (TII, 2023). The purpose of this constraints study is to identify the areas of hydrological or hydrogeological significance which may form a constraint to, or an opportunity for the proposed greenway development.

5.1.3.2 Methodology

For this assessment of water environment constraints, a desktop study was conducted to gather available information on Water Framework Directive (WFD) surface and groundwater bodies, pressures, abstractions, discharge licenses, hydromorphology, water dependent terrestrial ecosystems, karst landforms and flood risk. The principal sources of guidance which were followed included:

- National Roads Authority (NRA), 2008. Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes. National Roads Authority, Dublin;
- TII, 2015. Road Drainage and the Water Environment. Transport Infrastructure Ireland, Dublin;
- TII Project Manager's Manual for Greenway Projects, PE-MG-02047;
- Environmental Protection Agency (EPA), 2008. A Framework for the Assessment of Groundwater Dependent Terrestrial Ecosystems under the Water Framework Directive. Report Series No. 12;
- Working Group on Groundwater, 2005. Guidance on the application of groundwater risk assessment sheets SWRA 1-6 and GWDTERA 1-9 to areas designated for the protection of habitats and species.

The desk study for hydrology includes the study area. Consideration is also given to the surface waterbodies that are potentially hydrologically linked to the study area. Key considerations for hydrology consisted of:

- Flood Risk – Potential flood risk in the study areas as derived from fluvial and coastal sources;

- The receiving hydrological environment within the vicinity of the study area including WFD Surface Waterbody Risk and Quality Status; and
- Water Dependant Protected Areas e.g., Natura 2000 sites.

The desk study and evaluation of the hydrological constraints within the study area was carried out using the following sources of information:

- Ordnance Survey Ireland (OSI):
  - Discovery Series Mapping (1:50,000)
  - Historic 6" Maps
- Environment Protection Agency (EPA):
  - Water Quality Monitoring Database and Reports
  - Water Framework Directive Classification
  - EPA Hydrometric Data System
  - Water Framework Directive River Basin Management Plans
- Office of Public Works (OPW):
  - OPW National Indicative Flood Mapping (NIFM)
  - OPW Catchment Flood Risk Assessment and Management Mapping (CFRAM)
  - Drainage Scheme Benefiting Land Maps
  - Review of Office of Public Works (OPW) online mapping at floodinfo.ie

The desk study for hydrogeology covered the study area and up to 1km beyond the study area, as appropriate to the hydrogeological features under consideration. The key aspects of hydrogeology and relevant to this study and stage of the project are as follows:

- Aquifers, quaternary geology and groundwater vulnerability, soil permeability and recharge; Groundwater quality and pressures;
- The type and presence of groundwater abstractions, for example boreholes, wells or springs used for public water supply, group water supply or private abstractions, and their catchment areas i.e., Source Protection Areas (SPAs) or Zone of Contributions (ZOCs);
- The type and presence of karst landforms and traced underground connections, for example karst springs, turloughs, dolines and swallow holes, and their catchment areas;
- The delineation and classification of WFD groundwater bodies and associated qualitative and quantitative status, which will indicate the broader 'state' of groundwater resources;
- The type and presence of Groundwater Dependent Terrestrial Ecosystems (GWTDEs), defined as ecosystems which use groundwater for survival either partially or completely, and which are designated for protection under Article 1 of the Water Framework Directive, and their catchment areas; and
- The location of historic groundwater flooding.

The desk study and evaluation of the hydrogeological constraints within the study area was carried out using the following sources of information:

- Geological Survey of Ireland (GSI) *Spatial Resources viewer* [accessed November 2023];
- Environmental Protection Agency (EPA) *Water map viewer* [accessed November 2023];
- National Parks and Wildlife Service (NPWS) *Designations Viewer* [accessed November 2023];

- Ordnance Survey of Ireland (OSI) *GeoHive online mapping* [accessed November 2023]; and
- Wetland Surveys Ireland online mapping [accessed November 2023].

This constraints assessment was prepared taking into consideration the requirements of the National Roads Authority's (NRA) Environmental Impact Assessment of National Road Schemes – Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes, NRA 2008[1]. The guidelines provide useful criteria for ranking the 'Importance' of the identified hydrological and hydrogeological constraints and these criteria are presented in Table 5.1.3.1, Table 5.1.3.2 and Table 5.1.3.3 presents the attribute rating and significance; Table 5.1.3.2 presents the level of importance criteria for hydrological features while Table 5.1.3.3 presents level of importance criteria for hydrogeological features.

Table 5.1.3.1 Attribute Rating and Significance

No.	Attribute Rating	Significance
1	Extremely High	International
2	Very High	National
3	High	Regional/ County
4	Medium	Locally High
5	Low	Locally Low

Table 5.1.3.2 Criteria for rating the Importance of identified features (based on NRA Guidelines (2008)); Box 4.2: Criteria for Rating Site Attributes - Hydrology

Importance	Criteria	Typical Example
Extremely High	Attribute has a high quality or value on an international scale.	River, wetland or surface water body ecosystem protected by EU legislation e.g., 'European sites' designated under the Habitats Regulations or 'Salmonid waters' designated pursuant to the European Communities (Quality of Salmonid Waters) Regulations, 1988.
Very High	Attribute has a high quality or value on a regional or national scale.	• River, wetland or surface water body ecosystem protected by national legislation – NHA status. • Regionally important potable water source supplying >2500 homes. • Quality Class A (Biotic Index Q4, Q5) • Floodplain protecting more than 50 residential or commercial properties from flooding. • Nationally important amenity site for wide range of leisure activities.

[1] National Roads Authority (NRA), 2008. Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for national Road Schemes. Available at https://www.tii.ie/technical-services/environment/planning/Guidelines-on-Procedures-for-Assessment-and-Treatment-of-Geology-Hydrology-and-Hydrogeology-for-National-Road-Schemes.pdf [Accessed on 17th November 2023]

Importance	Criteria	Typical Example
High	Attribute has a high quality or value on a local scale.	• Salmon fishery. • Locally important potable water source supplying >1000 homes. • Quality Class B (Biotic Index Q3- 4). • Floodplain protecting between 5 and 50 residential or commercial properties from flooding. • Locally important amenity site for wide range of leisure activities.
Medium	Attribute has a medium quality or value on a local scale.	• Coarse fishery. • Local potable water source supplying >50 homes. • Quality Class C (Biotic Index Q3, Q2- 3). • Floodplain protecting between 1 and 5 residential or commercial properties from flooding.
Low	Attribute has a low quality or value on a local scale.	• Locally important amenity site for small range of leisure activities. • Local potable water source supplying < 50 homes.

The watercourses intercepted by the study area are assigned their levels of importance based on Table 5.1.3.3 by their associated biotic index, importance and the habitats that it protects. The attribute importance has been assigned based on the criteria set out in Box 4.3 of the NRA 2009 Guidelines[1].

Table 5.1.3.3 Criteria for rating the importance of identified features (based on NRA Guidelines (2009); Box 4.3: Criteria for Rating Site Attributes-Hydrogeology

Importance	Criteria	Typical Example
Extremely High	Attribute has a high quality or value on an international scale.	• Groundwater that supports river, wetland or surface water body ecosystem protected by EU legislation e.g., 'European sites' either SAC or SPA status.
Very High	Attribute has a high quality or value on a regional or national scale.	• Regionally Important Aquifer with multiple Wellfields. • Groundwater that supports river, wetland or surface water body ecosystem protected by National Legislation – NHA status. • Regionally important water supply supplying > 2500 homes. • Inner source protection area for regionally important water source.
High	Attribute has a high quality or value on a local scale	• Regionally Important Aquifer. • Groundwater provides large proportion of baseflow to local rivers. • Regionally important water supply supplying > 1000 homes. • Outer Source protection area for Regionally important water source. • Inner source protection area for locally • Important water source.

Importance	Criteria	Typical Example
Medium	Attribute has a medium quality or value on a local scale	• Locally Important Aquifer. • Potable water supply > 50 homes. • Outer Source protection area for • Locally important water source
Low	Attribute has a low quality or value on a local scale	• Poor Bedrock Aquifer. Potable water source supplying < 50 homes.

Limitations

The assessment presented here has been completed solely using publicly available hydrological data with associated inherent limitations. Nonetheless, the information available for key hydrological receptors is seen as appropriate for the scale and nature of the assessment undertaken.

5.1.3.3 Hydrology

Water Framework Directive Subcatchments and Surface Water Bodies

The study area is within the Water Framework Directive (WFD) Catchment 06 Newry, Fane, Glyde and Dee as shown on Drawing no. D2CG-RODA-EGN-SW_AE-DR-EN-100013 in Appendix A. The Newry, Fane, Glyde and Dee catchment include the area drained by the Newry, Fane, Glyde and Dee rivers, and by all streams entering tidal water between Murlough Upper and The Haven, Co. Louth. This is a cross border catchment with a surface area of 2,125km², 1390km² of which is located within the Republic of Ireland. The largest urban centre within this catchment is Dundalk[2]. The study area is located fully or partially within the following subcatchments:

- WFD Subcatchments Big [Louth]_SC_010;
- WFD Subcatchments Raskeagh_SC_010; and
- WFD Subcatchments Castletown_SC_020.

The surface waterbodies and their respective subcatchments within the study area are presented in Table 5.1.3.4 and shown on shown on Drawing D2CG-RODA-EGN-SW_AE-DR-EN-100013 in Appendix A. Each waterbody has been assigned an importance score in line with their Ecological Status.

Table 5.1.3.4 Surface Waterbodies

Sub catchment	WFD Code	Category	Name	Latest Biotic Index (Q) 2016-2021	WFD Risk 3rd Cycle	Importance
Big Louth SC_010	IE_NB_06 G180630	River Waterbodies	Greenore_010	-	Review	Low
	IE_NB_06 B460680	River Waterbodies	Ballynamaghery _010	-	Review	Low
	IE_NB_06 C620800	River Waterbodies	Carlingford_010	-	Review	Low

[2] Catchment Science & Management Unit Environmental Protection Agency, 2021. 3rd Cycle Draft Newry, Fane, Glyde and Dee Catchment Report (HA 06) Accessed on 16 November 2022 available at Newry, Fane, Glyde and Dee (catchments.ie)

Sub catchment	WFD Code	Category	Name	Latest Biotic Index (Q) 2016-2021	WFD Risk 3rd Cycle	Importance
	IE_NB_06B010100	River Waterbodies	Big (Louth)_010	4	At risk	Very High
	IE_NB_06B010300	River Waterbodies	Big (Louth)_020	3	At risk	Medium
	IE_NB_06R330950	River Waterbodies	Rockmarshall_010	-	Review	Low
	IE_NB_040_0100	Transitional Waterbodies	Inner Dundalk Bay	-	At risk	Medium
	IE_NB_040_0000	Coastal Waterbodies	Outer Dundalk Bay	-	Not at risk	Low
	GBNIIE6NB020	Coastal Waterbodies	Mourne Coast	-	Review	Low
Castletown_SC_020	GBNIIE6NB030	Coastal Waterbodies	Carlingford Lough	-	Review	Low
	IE_NB_06R010300	River Waterbodies	Ramparts_010	-	Review	Low
	IE_NB_040_0200	Transitional Waterbodies	Castletown Estuary	-	At risk	Medium
	IE_NB_06C010310	River Waterbodies	Castletown_030	-	At risk	Medium
Raskeagh_SC_010	UKGBNI1NB060608251	River Waterbodies	Raskeagh_010	3	Review	Medium
	UKGBNI1NB060602038	River Waterbodies	Ballymascanlan_010	3	At risk	Medium
	IE_NB_06F020700	River Waterbodies	Flurry_030	4	Review	High
	IE_NB_040_0300	Transitional Waterbodies	Ballymascanlan Estuary	-	Review	Medium

Note: (-) not applicable

The study area intersects (nine) 9 EPA named River Waterbodies and their tributaries including three (3) Coastal waterbodies and three (3) Transitional waterbodies.

WFD Sub Catchments Big [Louth]_SC_010

The Big (Louth)_020 is the only waterbody within this sub catchment that is 'At Risk'. Industry has been identified as a significant pressure in Big (Louth)_20. These point source discharges, causing nutrient and organic issues, arise from industrial discharges and also an abstraction in Big (Louth)_020[2].

WFD Sub Catchments Raskeagh_SC_010

The Ballymascanlan_010 is the only waterbody within the sub-catchment that is 'At Risk' due to its "Poor" status. The remaining two (2) river waterbodies are under "Review" in terms of their Risk and have a "Moderate" River Waterbody WFD Status 2016-2021. Transitional Waterbody WFD Status 2016-2021 for the Ballymascanlan Estuary is "Moderate", and it is at "Review" according to Transitional Waterbody WFD Risk 3rd Cycle.

WFD Sub Catchments Castletown_SC_020

Ramparts_010 and Castletown_030 are the two only river waterbodies in this sub-catchment. Ramparts_010 is at 'Review' in terms of WFD Risk 3rd Cycle with a "Poor" River Waterbody WFD Status 2016-2021. Castletown_030 is "at Risk" in terms of WFD Risk 3rd Cycle with a "Moderate" River Waterbody WFD Status 2016-2021. Carlingford Lough is a Coastal Waterbody whilst Castletown Estuary is a Transitional Waterbody.

5.1.3.3.1 Protected Areas

The WFD register of protected areas identifies several water dependent protected areas within the study area. Each protected area has been assigned an importance score and are presented in Table 5.1.3.5.

Table 5.1.3.5 Protected Areas

Protected Areas	WFD Code	Name	Importance
Drinking Water - Rivers - Dec 2018	IEPA1_NB_06B010300	Big (Louth)_020	High
SAC with Water Dependent Habitats / Species	002306	Carlingford Shore SAC	Extremely High
SAC with Water Dependent Habitats / Species	000453	Carlingford Mountain SAC	Extremely High
SAC with Water Dependent Habitats / Species	000455	Dundalk Bay SAC	Extremely High
SPA with Water Dependent Habitats / Species - Dec 2018	004078	Carlingford Lough SPA	Extremely High
SPA with Water Dependent Habitats / Species - Dec 2018	004026	Dundalk Bay SPA	Extremely High

Dundalk Bay SPA is located approximately 0.3km west of the mouth of the Big (Louth)_020 River. The Big (Louth)_020 River is a Drinking water source with an importance rating of 'High' and receives discharge from Big (Louth)_010. There are several wetlands and woodlands within the study area listed in the biodiversity chapter classified as Natural Heritage Areas (NHAs or proposed NHAs).

5.1.3.3.2 Arterial Drainage

There are no known arterial drainage schemes (ADS) within the study area and no drainage districts (DD) embarkments. However, the study area encompasses small part of DD channels and Benefitted Land Scheme: Blackwater DD in the southwest along the plains of Ramparts _010 and Castletown _030.

5.1.3.3.3 Hydromorphology

Hydromorphology has remained a significant pressure in 16 river waterbodies within the catchment. Channelisation is the dominant hydromorphology subcategory in the catchment with several river waterbodies within the catchment subject to extensive modification due to arterial drainage.[2]

5.1.3.3.4 Pressure

The significant pressure affecting the greatest number of waterbodies is agriculture followed by hydromorphology, urban wastewater, other, urban runoff, domestic waste water, industry and forestry. Industry has been identified as a significant pressure in river waterbody, Big (Louth)_020). These point source discharges, causing nutrient and organic issues, arise from industrial discharges and also an abstraction in Big (Louth)_020.

5.1.3.4 Flood Risk

Several historical and predictive flood indicator datasets have been reviewed including floodinfo.ie, OPW Benefitting Land maps, National Indicative Fluvial Mapping (NIFM) Flood mapping and Catchment Flood Risk Assessment and Management (CFRAM) mapping.

5.1.3.4.1 River Flood Extents

CFRAM map shown on Drawing no. D2CG-RODA-EGN-SW_AE-DR-EN-100014 in Appendix A indicates that the fluvial flooding is confined to the floodplains of Grenore_10 and Carlingford_010 in the northeast of the study area. These areas are shown to be at River - Low Probability ((Low Probability flood events have approximately a 1-in-a-1000 chance of occurring or being exceeded in any given year i.e., Annual Exceedance Probability (AEP) of 0.1%)) to River - High Probability ((approximately a 1-in-a-10 chance of occurring or being exceeded in any given year i.e., Annual Exceedance Probability (AEP) of 10%)).

A significant area in Dundalk along Castletown_030 and its tributaries in the west of the study area are shown to be at locations with River - Low Probability to River - High Probability of fluvial flooding. However, some parts of these areas are currently under review as a result, data regarding their flood extents is not available.

5.1.3.4.2 Fluvial Flood Extents

NIFM Mapping -Present Day shown on Drawing no. D2CG-RODA-EGN-SW_AE-DR-EN-100014 in Appendix A indicates that the flood extent is confined to the narrow floodplains of Raskeagh_010 and Flurry_030 in the west. These areas are shown to be at River – Low Probability (i.e., Annual Exceedance Probability 0.1%) and River – Medium Probability (i.e., Annual Exceedance Probability 1%).

Flooding from other reaches of river may occur, but has not been mapped, and so areas that are not shown as being within a flood extent may therefore be at risk of flooding from unmodelled rivers (as well as from other sources).

5.1.3.4.3 Coastal Flood Extents

CFRAM Coastal Flood Extents- Present Day map shown on Drawing D2CG-RODA-EGN-SW_AE-DR-EN-100014 in Appendix A indicates that the flooding is confined to the floodplains of Grenore_10 and Carlingford_010 in the northeast of the study area. These areas are shown to be at Coastal-Low Probability (1-in-a-1000 chance of occurring or being exceeded in any given year i.e., Annual Exceedance Probability (AEP) of 0.1%)) to Coastal - High Probability (approximately a 1-in-a-10 chance of occurring or being exceeded in any given year i.e., Annual Exceedance Probability (AEP) of 10%)).

CFRAM Coastal Flood Extents - Present Day map indicates that significant areas to the north and northwest of Dundalk extending to Inner and Outer Dundalk Bay are at Coastal - Low to Coastal-High Probability.

5.1.3.4.4 Past Flood Events

All datasets indicate historic flooding emanating from watercourses within the study area as well as coastal flooding in the southwest of the study area. OPW flood records are numerous though concentrated in the urban areas of Dundalk town, Ballynamaghery, Carlingford and

Greenore as shown in Figure 5.1.3.1 below. Generally, GSI Winter 2015/2016 Surface Water flooding is found in isolated areas and limited to small areas of low surface elevation.

It had been reported by the Irish Independent on the 31st October 2023, that record rainfall brought about flooding across the Cooley Peninsula, North Louth, with Carlingford badly impacted with several homes underwater. Flooding in Dundalk was also reported on the 8th November 2023, with Cluan Enda, St Alphonsus Road, Bay Estate, Avondale, Meadow Grove, Blackwater Court, Rosewood, and the Red Barns Road among the areas worse affected. All locations are within 1km distance from the nearest study area boundary.[3]

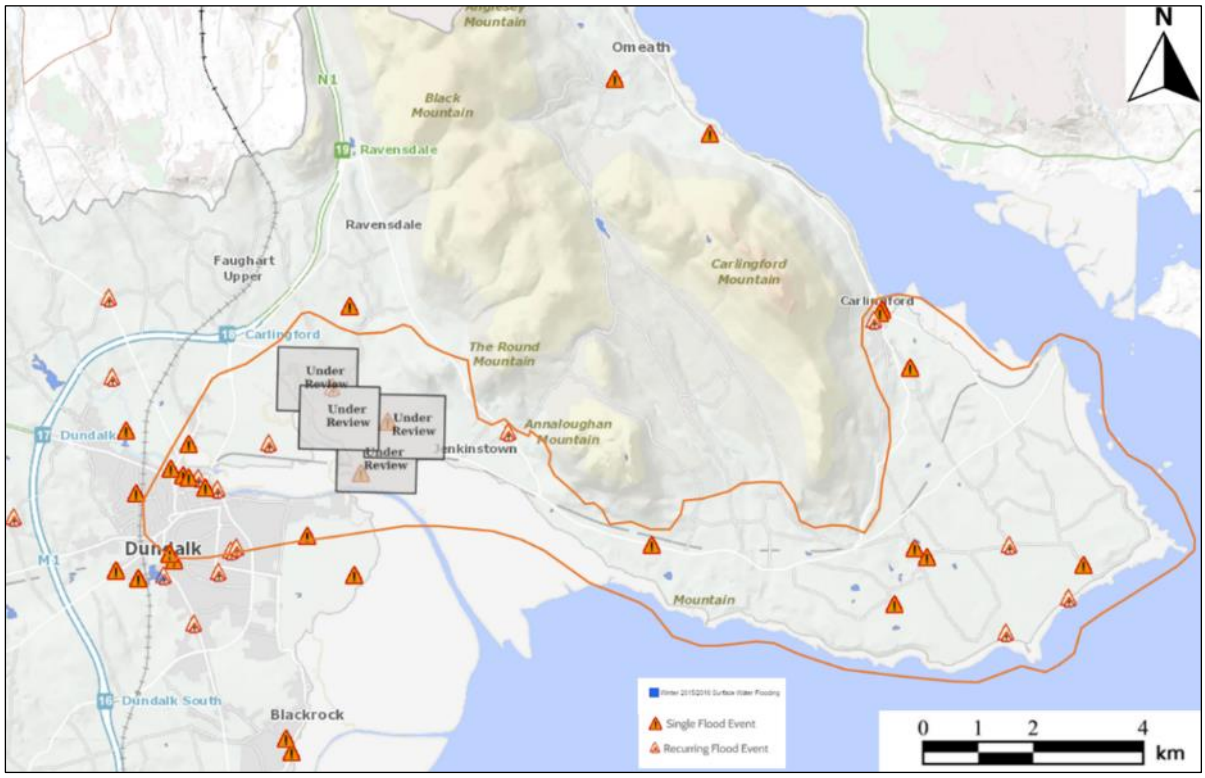

Figure 5.1.3.1 Recorded Flood Events

5.1.3.4.5 Licensed Discharges

There are only three EPA licensed activities i.e., Urban Wastewater (UWW) and emission points in the study area. These include:

- Carlingford Sewerage Scheme (D0268), 2 - Secondary Treatment Type;
- Sewage treatment facility (Greenore Sewage Scheme, A0075-01) is present in the north east; and
- Dundalk Wastewater Treatment Works (D0053, Agglomeration PE > 10,000).

There are two (2) Primary Effluent Emission Points: TPEFF2100D0268SW001 which, is located northeast of Dundalk discharging into the Castletown Estuary (E 320271, N 311878), and TPEFF2100A0075SW001 which is located south of Dundalk.

There are seven (7) storm water overflows in the study area. One (1) is located in Carlingford discharging to Carlingford Lough and the remaining are along the reaches of Castletown_030 and Castletown Estuary north and northeast of Dundalk.

[3] Irish Independent. Heavy rainfall brought worst flooding in many years to Louth housing estates accessed on 10th January 2024 Heavy rainfall brought worst flooding in many years to Louth housing estates | Independent.ie

5.1.3.4.6 Surface water Abstractions

There is an industrial abstraction (APR000018) at the Big (Louth)_020 in Castletowncooley known as a surface water abstraction in the study area. The Abstraction Point, APR000018 has licence conditions around its use. These are outlined in Integrated Pollution Prevention Control (IPPC) Licence P0826, Condition 5.4.

5.1.3.4.7 Key Hydrological Constraints and Opportunities

There are significant pressures affecting waterbodies within the study area. The main pressure is from agriculture followed by hydromorphology, urban wastewater, other, urban runoff, domestic wastewater, industry and forestry. There are three (3) WWTP in the study area discharging into the sea/estuary, and this might be impacting on the WDF Transitional Waterbodies Risk in the southern part of the study area which is 'At risk'.

It should be noted that Big (Louth)_020 is a drinking water river, which is important for abstraction and is classified as 'At Risk' in terms of the 3rd Cycle WFD Risk, therefore it is imperative to preserve its integrity. However, the nature of the scheme being a greenway means that it is not likely to have significant impacts on the quality of surface waterbodies.

Since runoff contaminants, i.e., rubber from cars, breaking tyres, debris from brake discs and toxic chemicals from exhaust fumes will be non-existent on the finished Greenway, post construction runoff with contaminants associated with vehicles will be negligible. Surface water runoff can be managed using soils and vegetation in shallow landscaped basins to remove pollutants. Treated runoff will be conveyed further through the drainage network or allowed infiltrate into the subsoil or subgrade. The protection of river corridors creates the potential for benefits to water quality and water dependant protected areas through proper management of adjacent lands and restoration (e.g., bogs, wetlands and nature-based solutions) as part of a scheme.

There are areas within the study area that are liable to fluvial, river and coastal flooding, therefore a Site-Specific Flood Risk assessment may be required, and this would depend on the selected preferred route option. Eroded soils can generate suspended solids impacting water quality. Nature based solutions (NbS) shall be implemented to treat surface water runoff prior to being discharged to the adjacent surface waterbodies and this will in turn help to manage surface water/pluvial flood risk within the study area. These networks should be designed in accordance with Ciria C753 'The SuDS Manual'). However, it is unlikely that the provision of a greenway which is a 'water compatible' development would impact significantly on the flood extents. The likelihood of the frequency of the greenway to flood and the impact that would have on the availability of the greenway to users and on maintenance requirements is something that would need to be considered as part of the route selection and design process.

5.1.3.5 Quaternary Geology and Aquifer Classification

The study area is underlain by subsoils (Quaternary Sediments) comprising Gravels derived from granite (GGr) which are present along its southern part and within isolated areas near Ballaverty, Greenore and Carlingford. Alluvium is present along the plains of the Big (Louth)_020. The remaining area is underlain by Till derived from granite and Till derived from Lower Palaeozoic sandstones and shales. Isolated area of Cut over raised peat are shown to be sparse and sporadic in the eastern part of the study area. A small strip along the northeastern part, adjacent to Carlingford Lough is underlain by Marine gravel and sands (often raised). A small strip along the edges of the study area in the east are underlain by Marine beach sands.

Gravels derived from granite is designated as GSI Gravel Aquifer i.e., Locally important gravel aquifer (Lg) by EPA, as shown on Drawing no. D2CG-RODA-EGN-SW_AE-DR-EN-100006 in Appendix A.
According to the GSI, the study area is underlain by three (3) types of aquifers:

- Locally Important Aquifer - Bedrock which is Generally Moderately Productive (Lm);
- Poor Aquifer - Bedrock which is Generally Unproductive except for Local Zones (Pl); and
- Locally Important Aquifer - Bedrock which is Moderately Productive only in Local Zones (Li)

A significant extent of the study area is underlain by Locally Important Aquifer. Whilst a small portion in the north and southwest is underlain by Poor Aquifer. The remaining small, isolated area at approximately 1.9km northwest of Ballynamaghery_010 is underlain by Locally Important Aquifer.

The Hydrostratigraphic Rock Units Groups intersected by the study area include:

- Dinantian Mixed Sandstones, Shales and Limestones;
- Granites & other Igneous Intrusive rocks; and
- Basalts & other Volcanic rocks.

5.1.3.6 Groundwater Vulnerability

In terms of groundwater vulnerability[4], the study area is underlain by areas of Moderate, High, Extreme and Rock at or near surface vulnerability categories, as shown on Drawing No D2CG-RODA-EGN-SW_AE-DR-EN-100010 in Appendix A. Majority of the study area is underlain by groundwater of Moderate and High Vulnerability. The areas underlain by groundwater of Extreme Vulnerability with rocks at or near surface are small, isolated areas along the northern part of the study area. The vulnerability category depends on subsoil depth, type and permeability as shown on Figure 5.1.3.2 .

Vulnerability Rating *	Hydrogeological Conditions				
	Subsoil Permeability (Type) and Thickness			Unsaturated Zone	Karst Features
	High Permeability (eg. sand and gravel)	Moderate Permeability (eg. sandy subsoil)	Low Permeability (eg. clayey subsoil, clay, peat)	(Sand / Gravel Aquifers only)	(<30 m radius)
Extreme (E)	0 - 3.0 m	0 - 3.0 m	0 - 3.0 m	0 - 3.0m	–
High (H)	> 3.0 m	3.0 - 10.0 m	3.0 - 5.0 m	> 3.0 m	N/A
Moderate (M)	N/A	> 10 m	5.0 - 10.0 m	N/A	N/A
Low (L)	N/A	N/A	> 10 m	N/A	N/A

Figure 5.1.3.2 Vulnerability Assessment Criteria (from NRA Guidelines)

[4] Geological Society of Ireland (2023) Groundwater Vulnerability map. Available at Geological Survey Ireland Spatial Resources (arcgis.com). Accessed on 5th December 2023

5.1.3.7 WFD Groundwater Bodies

The study area is underlain by three (3) WFD groundwater bodies. Table 5.1.3.6 details these groundwater bodies, their current status (2016-2012) and the WFD 3rd cycle risk status.

Table 5.1.3.6 WFD Groundwater Bodies, Flow Regime 3rd Cycle Risk within the Study Area

WFD Groundwater Body Name	Flow regime	Risk (WFD 3rd Cycle)	Importance
Dundalk Gravels (IE_NB_G_024)	Gravel	Not at risk	Medium
Dundalk (IE_NB_G_015)	Productive fissured bedrock	Not at risk	Medium
Louth (IEGBNI_NB_G_019)	Poorly productive bedrock	Not at risk	Medium

5.1.3.8 Geological Survey of Ireland (GSI) Groundwater Flooding Probability Maps

No groundwater flooding is predicted in the study area.

5.1.3.9 Karst Landforms

According to the GSI's karst database, there are no karst landforms shown to be present within the study area.

5.1.3.10 Groundwater Abstraction

5.1.3.10.1 Groundwater Wells, Springs and Boreholes

According to the GSI's groundwater well, borehole and spring locations dataset[5], there are approximately 135 groundwater abstractions (boreholes/ dug wells) located within the study area as presented on Drawing no D2CG-RODA-EGN-SW_AE-DR-EN-100006 in Appendix A. It is not known if these abstractions are currently in use. The GSI borehole ID, use and yield are summarised below. It should be noted that this is not a comprehensive dataset, and many wells and springs are not included. According to the EPA's Water map viewer, there are no groundwater monitoring stations located within the study area.

5.1.3.10.2 Group Water Scheme and Public Supply Source Protection Areas

GSI's dataset indicates that there is a National Federation of Group Water Scheme (Group Water Scheme Abstraction Points) known as Mountain Park in the study area. Its water source is a spring. There are two Public Supply Source Protection Areas: Source Inner (SI) and Source outer (SO) within the study area, relating to Mountain Park spring and 2929NEW022 as shown on Drawing no. D2CG-RODA-EGN-SW_AE-DR-EN-100007 in Appendix A.

5.1.3.11 Groundwater Dependent Terrestrial Ecosystems (GWDTEs)

According to the EPA's Water map viewer, there are three (3) designated SACs with water dependent habitats/species and two (2) SPAs with water dependent habitats/species located within the study area presented in Table 5.1.3.5, however these ecosystems and terrestrial ecosystems are not directly dependent on groundwater.

5.1.3.11.1 Key Hydrogeological Constraints and Opportunities

In conclusion, hydrogeological features within the study area were assessed and the potential constraints to the Dundalk Bay to Carlingford Greenway project were identified and these include:

[5] Geological Society of Ireland (2023) Groundwater wells. Available at Geological Survey Ireland Spatial Resources (arcgis.com). Accessed on 5th December 2023

- Groundwater – Locally Important Aquifer – Bedrock which is Generally Moderately Productive, Poor Aquifer – Bedrock which is Generally Unproductive except for Local Zones and, Locally Important Aquifer – Bedrock which is Moderately Productive only in Local Zones;
- Areas underlain by groundwater of Moderate, High, Extreme and Rock at or near surface vulnerability categories;
- Three (3) WFD Ground waterbodies all of which have a WFD Risk 3rd Cycle Status of 'Not at risk';
- Multiple boreholes, wells and springs are shown to be intersected by the study area with 'Low' or a 'Medium' importance rating; and
- One (1) Group Water Scheme were identified within the study area including two (2) no Public Supply Source Protection Areas.

The study area is underlain by Moderate, High, Extreme and Rock at or near surface groundwater vulnerability areas, numerous boreholes, and springs, Group Water Schemes and Public Supply Source Protection Areas. The presence of private well supplies in the vicinity of the greenway development have an increased risk of contamination of sediment from road runoff and from construction activities due to the potential flow paths that currently exist. Therefore, the associated works has the potential to impact flow regime and have a minor impact on quality due to ground disturbance. However, these constraints are unlikely to have a significant impact the groundwater regime as a result of the proposed scheme. This is because greenways can provide opportunities to create vegetated buffers to protect natural habitats, improve water quality and reduce the impacts of contaminated surface water runoff from compacted ground. Mitigation measures would allow surface water run off to infiltrate via sediment traps and oil interceptors prior to recharging aquifers, thereby minimising the impact on groundwater in terms of quality.

5.1.3.12 References

Environmental Protection Agency (2021) Catchment Science & Management Unit EPA. 3rd Cycle Draft Newry, Fane, Glyde and Dee Catchment Report (HA 06). Available at: Newry, Fane, Glyde and Dee (catchments.ie). (Accessed on 6th January 2024).

Geological Survey Ireland (2023). Geological Survey Ireland Spatial Resources Vulnerability Map. Available at: Geological Survey Ireland Spatial Resources (arcgis.com). (Accessed on 5th December 2023)

Geological Survey Ireland (2023). Geological Survey Ireland Spatial Resources Groundwater wells. Available at: Geological Survey Ireland Spatial Resources (arcgis.com). (Accessed on 5th December 2023)

Irish Independent (2023). Heavy rainfall brought worst flooding in many years to Louth housing estates. Available at: Independent.ie. (Accessed on 10th January 2024)

National Roads Authority (NRA) (2008). Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes Available at: https://www.tii.ie/technical-services/environment/planning/Guidelines-on-Procedures-for-Assessment-and-Treatment-of-Geology-Hydrology-and-Hydrogeology-for-National-Road-Schemes.pdf. (Accessed on 17th November 2023)

5.1.4 Landscape and Visual Amenity

5.1.4.1 Introduction

This section identifies the landscape and visual constraints, which will subsequently inform the option selection process, for the proposed Dundalk Bay to Carlingford Greenway Project in County Louth.

5.1.4.2 Guidance

The identification of landscape and visual constraints includes guidance from the following sources:

- Guidelines for Landscape and Visual Impact Assessment, 3rd Edition 2013, published by the UK Landscape Institute and the Institute of Environmental Management and Assessment (hereafter referred to as the GLVIA).
- The Louth County Development Plan 2021-2027 and associated relevant documents (including the Louth Landscape Character Assessment).
- Department of Tourism, Transport and Sport (2018). Strategy for the Future Development of National and Regional Greenways.
- TII (2022) Rural Cycleway Design (Offline & Greenway).
- TII (2020a) Landscape Character Assessment (LCA) and Landscape and Visual Impact Assessment (LVIA) of Specified Infrastructure Projects - Overarching Technical Document.
- TII (2020b) Landscape Character Assessment (LCA) and Landscape and Visual Impact Assessment (LVIA) of Proposed National Roads – Standard.

Greenway Characteristics and Objectives

The proposed Greenway will generally be designed in accordance with the design will be developed in compliance with the latest TII Standards, Guidance Documents and best practice guidelines, typically having a 3m wide bound or unbound with surface dressing surface , with a fully bound pavement more appropriate in the urban areas. Access will be provided at certain points along the Greenway, while ancillary facilities such as additional parking and toilets, etc. will also be provided. Road crossings will be provided, and bridges may be necessary along the route. Signage and boundary treatments will also be provided where necessary.

In terms of landscape or visual amenity, a greenway is broadly considered to be a benign development and, overall, is likely to have a lower end landscape and/or visual impacts. However, there will potentially be interfaces with private properties that may require more careful consideration.

The identification of constraints and opportunities considers the nature of this development, which is less intrusive for a greenway than many other forms of development. In this regard, this study is as much about highlighting opportunities to maximise positive impacts and enhance the receiving environment, as it is about sensitivities and constraints to that development. The design of the Greenway, as well as the opportunities to enhance access to and enjoyment of elements of natural heritage and of built heritage, are important considerations which are not relevant to many other types of development. The development of the Greenway is also an opportunity to increase access (for both locals and visitors/tourists)

to remote and previously publicly inaccessible parts of the study area, while providing new viewing points in the landscape. It also has the potential to revitalise certain parts of the study area.

Like most Greenways, the proposed development would be unlikely to change the character of an area but would result in increased pedestrians and cyclists along the route, and any effects on the landcover along the route are likely to be localised. Visual effects are not envisaged to be a major issue, as the Greenway itself will not be visually intrusive. Where the route is close to residences, sensitive design of the route can take advantage of natural screening where possible or include landscape mitigation measures. Elements along the route which are of natural or built heritage interest (e.g. bridges) can be enhanced by the presence of a Greenway.

Desk Study – Policy and Mapping

Section 5.1.4.3 includes the planning policies contained in the current Louth County Development Plan, which identify landscape protection in relation to the study area and in the immediate environs. Relevant landscape and visual policies including Landscape Character Areas (LCAs), Protected Views, Scenic Routes and other important landscape features were mapped and included throughout this section.

With guidance from the County Development Plans in terms of sensitivity, various aspects of the receiving environment are assessed to identify significant characteristics, elements and features.

Site Visit – identification of landscape features and visual qualities

Following the desktop study, a roadside survey of the study area was carried by qualified senior Landscape Architect in March 2024. Section 5.1.4.3 includes a description of the landscape character and features, visual qualities and views and cultural heritage features which were identified on the site visit.

Identification of Landscape features and values

This section identifies particular values attached to the landscape which are recommended to be conserved, and values which should be enhanced, by the proposed project. A table identifying relevant landscape elements and the recommended approach in relation to the study area is included in Section 5.1.4.3. Particular attention is given to the following aspects of the landscape character and it's relevance to the proposed project, if/where applicable:

- *Topography and drainage* – The upper slopes and crests of hills are more visible and therefore more sensitive to physical disturbance (in relation to disruption of the skyline). Valleys, being drainage channels, are sensitive to hydrological disturbance and associated effects on ecology (and possibly recreation and visual amenity).

- *Field patterns, landcover and vegetation* – Landscapes characterised by smaller fields have more field boundaries and hedgerow (by length) than areas with larger fields. Field boundaries have cultural historic value, ecological value (providing habitat and habitat connectivity) and visual amenity value (containing much of the tree cover found

in the landscape). There is more hedgerow vegetation and legibility likely to be lost in an area characterised by smaller fields than in areas with larger fields.

- *Settlement and transport patterns* – In a rural environment, more densely settled landscapes are more sensitive to the introduction of greenways than less densely populated areas as they have more receptors that are sensitive to sensory disturbance. In addition, landscapes with fewer physical obstacles (buildings, infrastructure, etc.) are more suitable for greenway construction because they require less bends and bridges in the route and/or less demolition of structures, infrastructure, etc.

- *Special features* – Certain elements and features of the landscape, notably natural and cultural heritage features, are potentially sensitive to the disturbance caused by a greenway and should be avoided/protected.

- *Land use* – Various land uses have differing sensitivity to the potential disturbance caused by the construction of a greenway.

5.1.4.3 Receiving Environment – Planning Policy Context

The study area for this project is located entirely within Co. Louth as shown in Figure 5.1.4.1, below.

Figure 5.1.4.1 Study Area Boundary (i.e. red line) comprises of Co. Louth

County Louth Development Plan

The County Louth Development Plan (CDP) 2021-2027 is the current, relevant CDP for the study area. Relevant policies to the study area are as follows:

Transport and Infrastructure

'Chapter 7 – Movement' of the CDP contains several relevant policies and strategies for transport infrastructure provision and investment in the County. Section 7.5 pertains to 'Integration of Land Use and Transport Planning', which states that it is a policy objective of Louth County Council to:

MOV 6: *"To promote and support the principles of universal design ensuring that all environments are inclusive and are accessible to and can be used to the fullest extent possible by all users regardless of age, ability or disability."*

MOV 7: *"To support a modal shift away from the private car to more sustainable forms of transport, such as public transport, cycling and walking and the attainment of any national targets relating to modal change published during the life of this Plan."*

MOV 9: *"To support investment in sustainable transport infrastructure that will make walking, cycling or public transport more attractive and appealing, and facilitates accessibility for all, regardless of age, physical mobility, or social disadvantage."*

Section 7.6.11 of the Plan pertains to 'Cycling and Walking.' According to this section, it is a policy objective of County Louth Council to:

MOV 25: *"To support the retrospective provision of walking and cycling infrastructure in existing settlements, where feasible, to achieve growth in sustainable mobility and strengthen and improve the walking and cycling network."*

MOV 26: *"To improve pedestrian and cycle connectivity to schools, third level colleges, major employment areas, bus and rail stations, and other public transport hubs."*

MOV 28: *"To promote walking and cycling as a safe, convenient, healthy, efficient, and environmentally friendly mode of transport for all age groups."*

MOV 30: *"To provide, where possible traffic free pedestrian and cyclist routes particularly where such routes would provide a more direct, safer, and more attractive alternative to the car."*

MOV 31: *''To encourage the provision of secure bicycle parking facilities in town and villages in the County.''*

MOV 32: *''To plan and develop a Louth Coastal Way along the east coast subject to appropriate environmental considerations.''*

Section 7.6.12 of the Plan pertains to 'Greenways.' According to this section, it is a policy objective of Louth County Council to:

MOV 33: *'To continue the development of a network of Greenways in the County in accordance with the Strategy for the Future Development of National and Regional Greenways.'*

Built Heritage

Built heritage policies are contained in Chapter 9 'Built Heritage and Culture' of the Plan. The former walled towns of Dundalk and Carlingford are within the study area, as well as Protected Structures and Recorded Monuments. In addition the centres of Dundalk, Greenore and Carlingford contain Architectural Conservation Areas (ACAs). Relevant policies include:

BHC 2: *"To protect the built heritage assets of the county and ensure they are managed and preserved in a manner that does not adversely impact on the intrinsic value of these assets whilst supporting economic renewal and sustainable development."*

BHC 4: *"To promote awareness and knowledge of the archaeological resources of the County and support initiatives where appropriate that provide better access to the historic built environment."*

BHC 6: *''To ensure any development, either above or below ground, adjacent to or in the immediate vicinity of a recorded monument or a Zone of Archaeological Potential (including formerly walled towns) shall not be detrimental to or detract from the character of the archaeological site or its setting and be sited and designed to protect the monument and its setting. Where upstanding remains exist, a visual impact assessment may be required.''*

BHC 9: *"To retain the surviving medieval street pattern, building lines and burgage plot widths in historic walled towns.*

BHC 35: *"To require that any development on the periphery of an Architectural Conservation Area does not detract from the existing character of the designated Architectural Conservation Area.''*

BHC 38: *"To ensure new development will not adversely affect the site, setting or views to and from historic gardens and designed landscapes of heritage significance."*

Landscape and Landscape Character

Chapter 8 'Natural Heritage, Biodiversity and Green Infrastructure' contains policies related to Landscape and Green Infrastructure and includes reference to Landscape Character. Relevant policies include:

NBG 3: *"To protect and conserve Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) designated under the EU Habitats and Birds Directives."*

NBG 10: *"To ensure that development proposals, where relevant, improve the ecological coherence of the Natura 2000 Network of European Sites and encourage the retention and management of landscape features, as per Article 10 of the Habitats Directive."*

NBG 23: *"To ensure the preservation of the uniqueness of a landscape character type by having regard to its character, value and objectives in accordance with national policy and*

guidelines and the Louth Landscape Character Assessment and by ensuring that new development meets high standards of siting and design and does not unduly damage or detract from the character of a landscape or natural environment."

NGB 24: *"To ensure development reflects and, where possible, reinforces the distinctiveness and sense of place of the landscape character types including the retention of important features or characteristics, taking into account the various elements, which contribute to their distinctiveness such as scenic quality, habitats, settlement pattern, historic heritage and land use."*

NGB 25: *"Where appropriate, require that landscape and visual impact assessments prepared by suitably qualified professionals be submitted with development applications, which may have significant impact on landscape character areas, especially in highly sensitive areas."*

Section 8.10 includes policies on Landscape Character. Reference is also made to the Louth Landscape Character Assessment, an associated document produced by Louth County Council in 2002. Section 8.10.1 states:

'In 2002 the Council, in accordance with the Government's Draft Guidelines for Landscape and Landscape Assessment (2000) prepared a Landscape Character Assessment for the County involving a 2 stage approach.

Stage 1 identified and classified nine Landscape Character Areas (LCA's) in County Louth, which represent specific geographical areas of a particular landscape type or types.

Stage 2 appraised the landscape character sensitivity and values, assigning key landscape values and corresponding objectives in addition to categorising each LCA as being of international, national, regional or local importance.'

With regards to aforementioned Stage 1 of the Landscape Character Assessment (LCA), it also appraised the landscape character sensitivity and values, assigning key landscape values objectives to each LCA, in addition to categorising each LCA as being of international, national, regional or local importance.

The study area comprises of five Landscape Character Areas (LCAs). The majority of the study area lies within the LCA's 'Cooley Lowlands & Coastal Area', situated in the eastern region of the study area, and 'Lower Faughart, Castletown & Flurry River Basins', which is located across the north-western region of the study area. Northern fringes of the study area also enter into 'Carlingford Lough and Mountains incl. West Feede Uplands' LCA. However, the southern fringe and a small area of the south-western region are covered by two other LCA's, which are 'Dundalk Bay Coast' LCA and 'Muihevna Plain' LCA, respectively. Please refer to the Figure 5.1.4.2, below.

However, it is worth noting that landscape tends to be in a continual state of evolution. Accordingly, the landscape of the study area has continued to evolve somewhat, since the county's Landscape Character Assessment was completed in 2002.

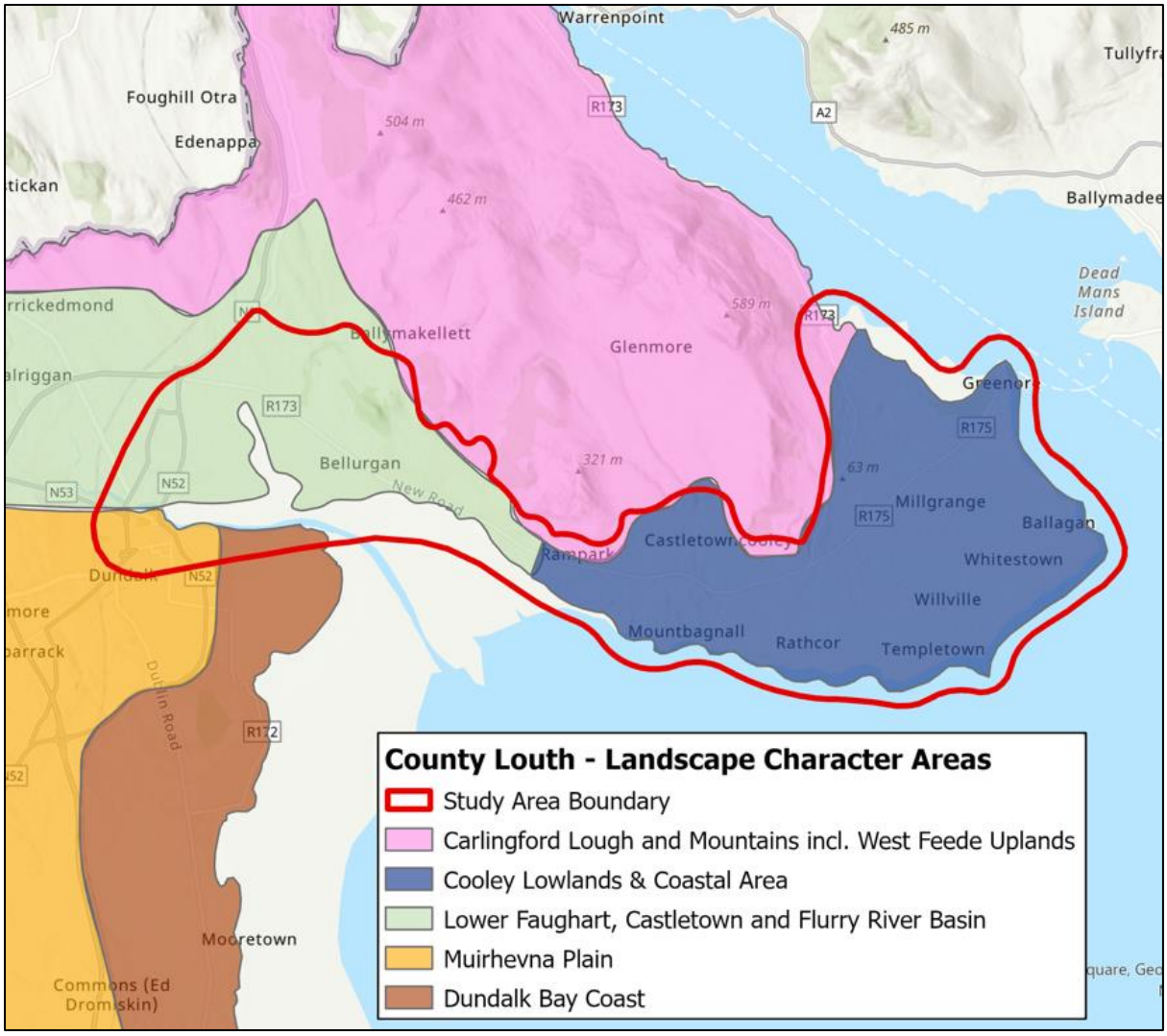

Figure 5.1.4.2 Landscape Character Areas, Louth CDP 2021- 2027

'Cooley Lowlands & Coastal Area' LCA

Key Characteristics:

- *''A dramatic gentle sloping landform from the base of the Carlingford and Slieve na Gloch mountains to the sea.*
- *Predominantly agricultural land with well-defined hedgerows and small field patterns, which sustain the biodiversity of the area.*
- *Main settlements at Greenore and Gyles Quay, with a number of very small centres.*
- *Regional route 173 links Dundalk with the peninsula, with Greenore, Carlingford, Omeath and further on to Newry.*
- *Two scenic routes are identified viz. Muchgrange to Carlingford and Grange to Greenore.*
- *Rich in archaeological items."*

Landscape Sensitivity

- *"The agricultural landscape in this area is very robust due to the presence of strong hedgerows, which help to occlude the number of isolated houses in the area. On this account, interference with the existing walls and hedgerow patterns would serve to degrade the landscape."*
- *"Parts of two Special Protection Areas (SPA) and one Special Area Of Conversation (SAC) are located in this area viz. Carlingford Lough (SPA & SAC) and Dundalk Bay (SPA). Liscarragh Marsh is listed as a proposed Natural Heritage Area (NHA)."*

Key Values

- *"High scenic quality views towards Cooley and Mourne Mountains and Dundalk Bay.*
- *Recreational opportunities are plentiful, due in the main to the maritime nature of the area.*
- *Contains the 19th century railway village of Greenore, established for its natural port facilities and fine railway viaduct at Mountbagnall.*
- *Part of Carlingford Lough (SPA & SAC) and Dundalk Bay (SPA) are included.*
- *Overall Classification: Local."*

'Lower Faughart, Castletown & Flurry River Basins' – LCA

Key Characteristics

- *"Variety of landscape types within the area, dictated by the landform and drainage areas."*
- *"Some fine examples of mature broadleaf roadside trees at Bellurgan and Aghnaskeagh."*
- *"Prominence of Trumpet Hill in the landscape and its importance in terms of biodiversity giving reason for its proposed NHA status."*
- *"The flat marshes along the Flurry estuary (Designated SPA)."*
- *"Scenic roads around the wooded Ravensdale area and from the R174 at Ballymakellet and Jenkinstown."*

Landscape Sensitivity

- *"This area is at the gateway to the Carlingford peninsula, Slieve Gullion Complex and Northern Ireland making it an attractive area for tourist and visitor accommodation."*
- *"This area will continue to be an attractive location for urban generated housing and a clear demarcation between urban and rural areas is required. Otherwise the countryside will become "urbanised" in due course. The small development centres of Bellurgan, Faughart, Kilcurry, Ravensdale and Sheelagh should be capable of meeting that demand."*
- *"To minimise the visual impact, good landscape design will be required and should form part of all new developments in the area. In particular there are some fine broadleaf tree specimens which should be retained as far as possible."*

Key Values

- *"This area enjoys the scenic quality of the surrounding landscape of the Carlingford Mountains in the east to Slieve Gullion and beyond."*
- *"Significance of Dundalk Bay as an S.P.A. around the Flurry estuary."*
- *"Open air recreational opportunities are plentiful."*
- *"Fine broadleaf tree cover in the Ravensdale, Ballymascanlan and Deer Park Road."*
- *Overall classification: Local.'*

Carlingford Lough and Mountains incl. West Feede Uplands' LCA

Key Characteristics

- *'A dramatic mountainous area where the visual impact is increased, by its location on a peninsula.*
- *The valley of Glenmore, tapering off to its enclosure at the higher level which allows for a full appreciation of the landform in the area.*
- *The open moorland of the higher areas with its variety of bracken, gorse and heathers.*
- *The imposing geological feature of the Lough itself between the Cooley and Mourne mountains.*
- *The intimate road network in the area which offers a great variety of landscapes in such a small area.*
- *The sense of isolation of tranquillity in the Moneycrockroe area.*
- *Large pockets of coniferous forests throughout the area, a few of which are poorly defined.*
- *Area is rich in archaeological items and renowned in legend folklore.*
- *Pressures for isolated housing in the scenic areas, which tend to be quite large in their mass.'*

Landscape Sensitivity

- *'Practically the total amount of sand quarrying in the county has taken place in the Bush area and further reserves remain. Due to its height above the 100 m contour, extraction has proven to be a scar on the landscape. Some restoration has taken place, but the problem is proving difficult to minimise.*
- *The land above the 200m contour is almost totally uninhabited and the only immediate threat is, that enclosure should take place. Thereby limiting access to the mountains. The areas between the 100 m and 200 m contour are extremely sensitive to all new forms of developments.*
- *[Carlingford] is now identified as a tourist resource and day-tripper area and designated as a Medieval Heritage Village. It has a widely popular marina and further pressures for tourist accommodation and facilities are likely to continue here and throughout the entire peninsula.*
- *The Forest Service have stated that planting will not take place in S.A.C.s and S.P.A.s. Proposed N.H.A.s are open to formal consultation with the Heritage Service.'*

'Muirhevna Plain' LCA

Key Characteristics

- *"Serves as a major traffic corridor between North and South."*
- *"Robust hedgerows give a sense of enclosure."*
- *"Contains a number of fine broadleaf wooded areas around country houses."*
- *"Area is rich in archaeological features."*

Landscape Sesitivity

- *"The soils and topography dictate that farming in this area is the most intensive in the county. In this open flat landscape the removal of traditional hedgerows would have a significant impact on the landscape. Where in some cases hedgerows have to be removed*

their replacement should be a similar hedgerow and not a post and wire fence, wooden fence, or brick wall."

- *"Many of the small broadleaf woodlands are at maturity stage and their regeneration and tree replacement should be encouraged."*

Key Values

- *"Extensive area of good quality agricultural land with fine traditional hedgerows."*
- *"High density of archaeological features, particularly souterrains."*
- *"Contains four proposed NHA's."*
- *"Overall Classification: Regional."*

"Dundalk Bay Coast' LCA

Key Characteristics

- *"Land is relatively flat and not higher than 20m O.D."*
- *"Seashore is mainly of marsh at the northern end, which gives way to sandy beaches in the south. Coastal erosion is evident."*
- *"Well-defined hedgerows with larger fields. Some examples of old Country house estates with broadleaf planting."*
- *"Dundalk Bay is a designated Special Protection Area (SPA) and Special Area of Conservation (SAC)."*
- *"The area is rich in archaeological features."*

Landscape Sensitivity

- *The existing farming practices are unlikely to change. Further removal of hedgerows and stonewalls, whilst extending the panoramic views available in the area, would alter the landscape character.*

Key Values

- *"Impressive coastal routes of high scenic quality."*
- *"Opportunities for recreational pursuits with particular emphasis on the river edges and coastline."*
- *"Rich in archaeological features."*
- *"Existing hedgerows and stone walls."*
- *"Overall Classification: Regional"*

With regards to aforementioned Stage 2 of the Landscape Character Assessment (LCA), the landscape classification in the county is divided into:

- International Importance
- National Importance
- Regional Importance
- Local Importance

The study area is predominantly made up of a landscape classification of 'Local Importance'. The northern fringes of the study area enter into a landscape classification of 'International

Importance,' while the southern fringes of the study area enter into a landscape classification of 'Regional Importance', shown on Figure 5.1.4.3, below.

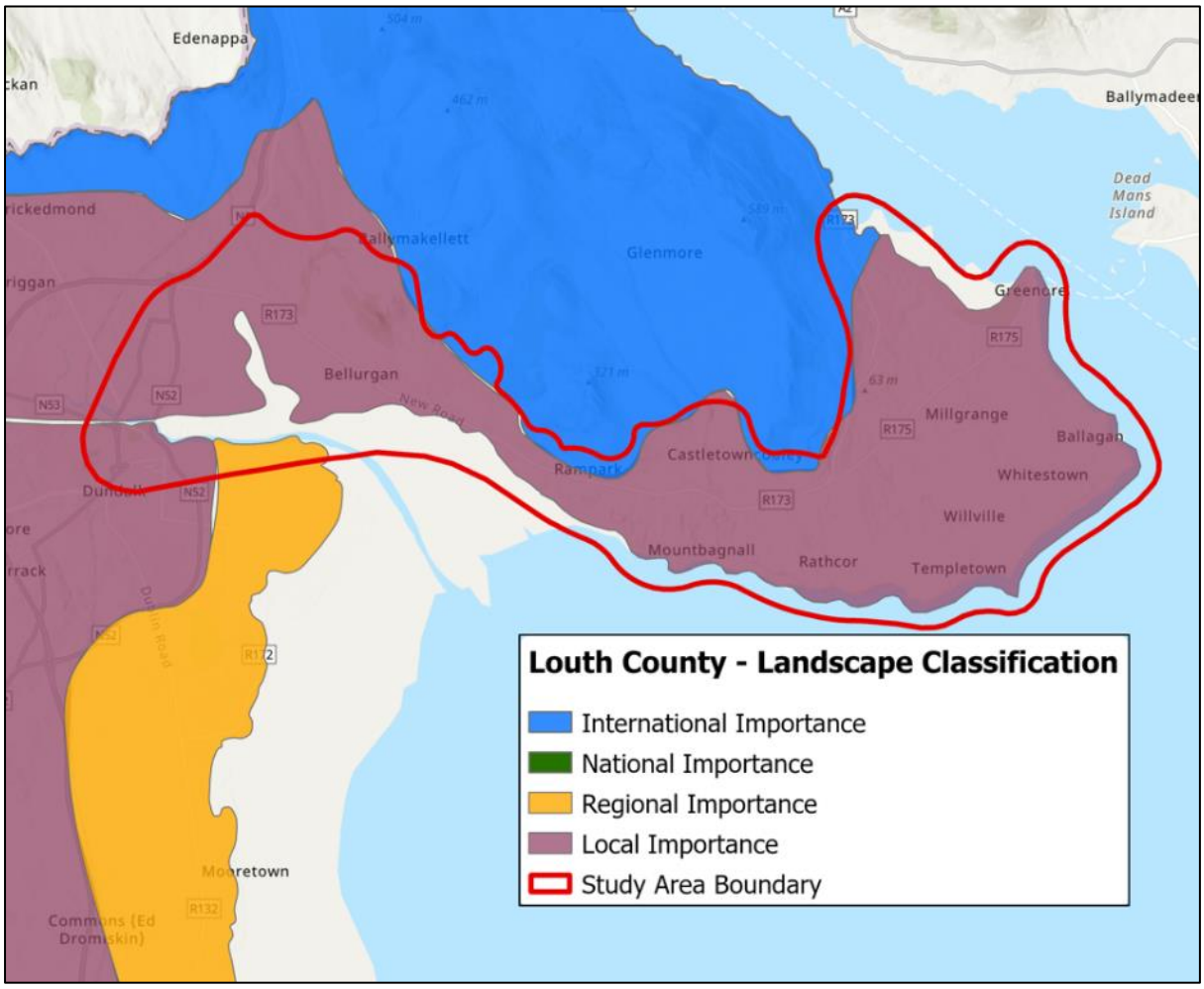

Figure 5.1.4.3 Landscape Classifications within the study area

Section 8.11 of the CDP pertains to Trees, Woodlands and Hedgerows. Relevant policies relating to trees, woodlands and hedgerows include:

NBG 29: *"To protect trees subject to Tree Preservation Orders and seek to designate additional Tree Preservations Orders (TPO), where appropriate."*

NBG 30: *"To protect trees and woodlands of special amenity value. Review and where appropriate make Tree Preservation Order(s) in relation to trees of special amenity value."*

NBG 31: *"Where in exceptional circumstances, trees and or hedgerows are required to be removed in order to facilitate development, this shall be done outside nesting season and there shall be a requirement that each tree felled is replaced at a ratio of 10:1 with native species and each hedgerow removed is to be replaced with a native species. In Drogheda and Dundalk, replacement trees will be required at a ratio of 5:1 where the removal of trees is required in order to facilitate development."*

NBG 33: *"To assess the implications of proposed development on significant trees and hedgerows located on lands that are being considered for development, seeking their*

incorporation into design proposals where appropriate and in compliance with procedures detailed in Appendix 6."

NBG 34: *"To increase native tree coverage in the County to also act as carbon sinks by promoting the planting of suitable native trees and hedgerows along public roads, residential streets, parks and other areas of open space."*

Section 8.11.1 of the CDP pertains to Tree Preservation Orders (TPOs). However, of the six TPOs listed in the CDP, none are in the study area. Section 8.11.2 of the CDP pertains to Trees and Woodland of Special Amenity Value. It states:

'Having regard to the important role that trees and woodlands fulfil, the Council has identified and recorded trees and groups of trees considered to be of Special Amenity Value within the County. As such, and in recognition of the value of the trees, their conservation as part of any grant of planning permission will be required.

'Any development permitted by the local authority which, in exceptional circumstances, permits the removal of trees or groups of trees shall contain a planning condition requiring the planting of replacement native, semi-mature trees at a ratio of ten new trees per single tree removed in the County and at a ratio of five new trees per single tree removed in Drogheda and Dundalk.'

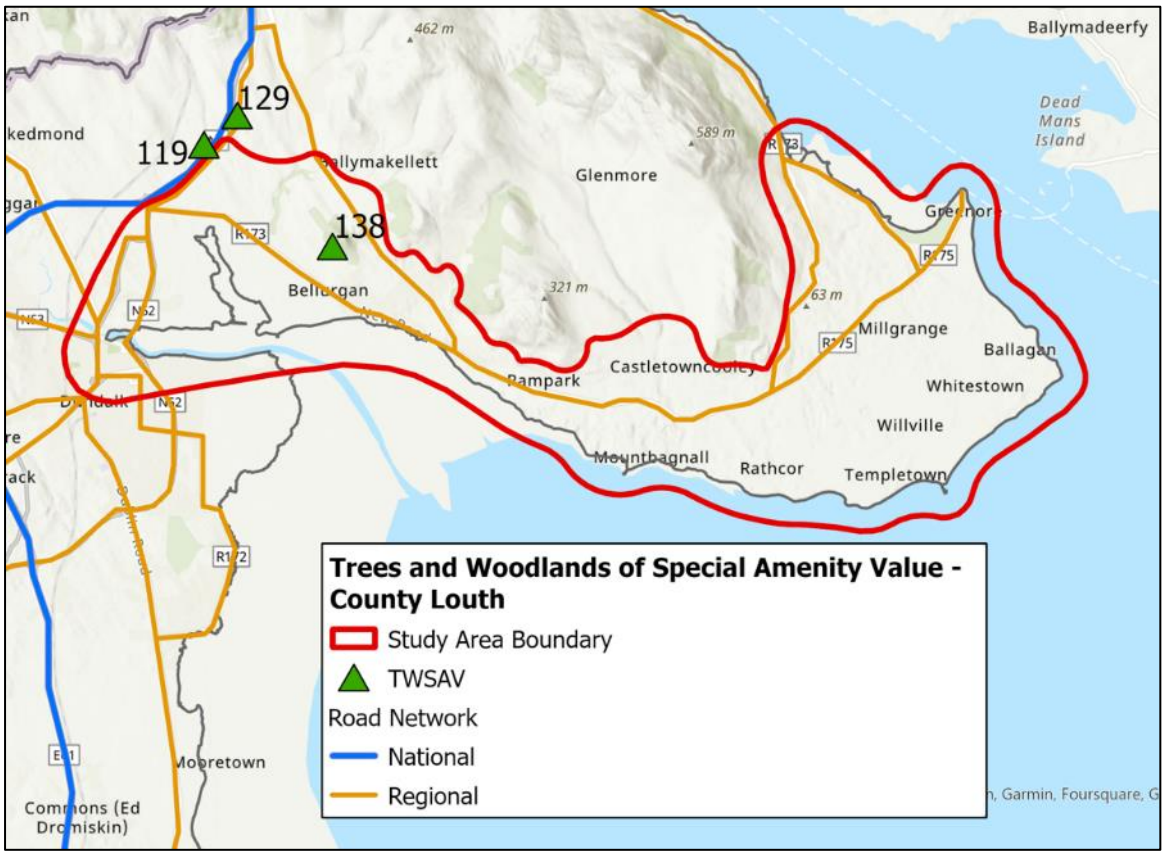

Figure 5.1.4.4 Trees and Woodlands of Special Amenity Value within the study area

There is one woodland of Special Amenity Value in the study area, TWSAV 138, which appears to relate to Trumpet Hill, in the northwest of the study area. However, TWSAV 138

does not appear to be listed within the Table 8.10 of the CDP, which covers 'Trees and Woodlands of Special Amenity Value in County Louth' but ceases/goes no further than TWSAV 130. Figure 5.1.4.4 illustrates the location of TWSAV 138 within the study area.

Section 8.12 of the CDP pertains to Environment and Amenities. It states:

'County Louth has a number of important areas of outstanding beauty and high amenity value in addition to views and prospects that require protection.'

Section 8.12.1 of the CDP pertains to Areas of Outstanding Natural Beauty (AONB). It states:

'Within County Louth, two distinct areas were identified as Areas of Outstanding Natural Beauty (AONB) by reason of their unspoiled natural landscape, special character and spectacular scenic quality. As both of these areas are extremely sensitive environments, they have been afforded a high degree of protection in the Plan to preserve their uniqueness and amenity value for the benefit and enjoyment of existing and future generations.'

One of these AONB marginally enters in the north of the study area and is 'AONB1 Carlingford and Feede Mountains.'

Section 8.12.2 of the CDP pertains to Areas of Scenic Quality (AHSQ). It states:

'The Areas of High Scenic Quality (AHSQ), whilst not quite possessing the exceptional natural beauty and landscape quality of the AONB, nevertheless add significantly to the stock of natural scenic landscapes within the County…

'All of the AHSQ are currently farmed, although the quality of the land for farming purposes varies considerably from area to area. The Council considers it important that AHSQ are protected from excessive development, particularly from inappropriate, one-off, urban-generated housing, in order to preserve their unspoiled rural landscapes.'

Again, there is one such designation within the study area 'AHSQ1 Feede Mountains and Cooley Area', which occupies northern sections of the study area, refer to Figure 5.1.4.5, below and on Drawing no. D2CG-RODA-EGN-SW_AE-DR-EN-100015 in Appendix A.

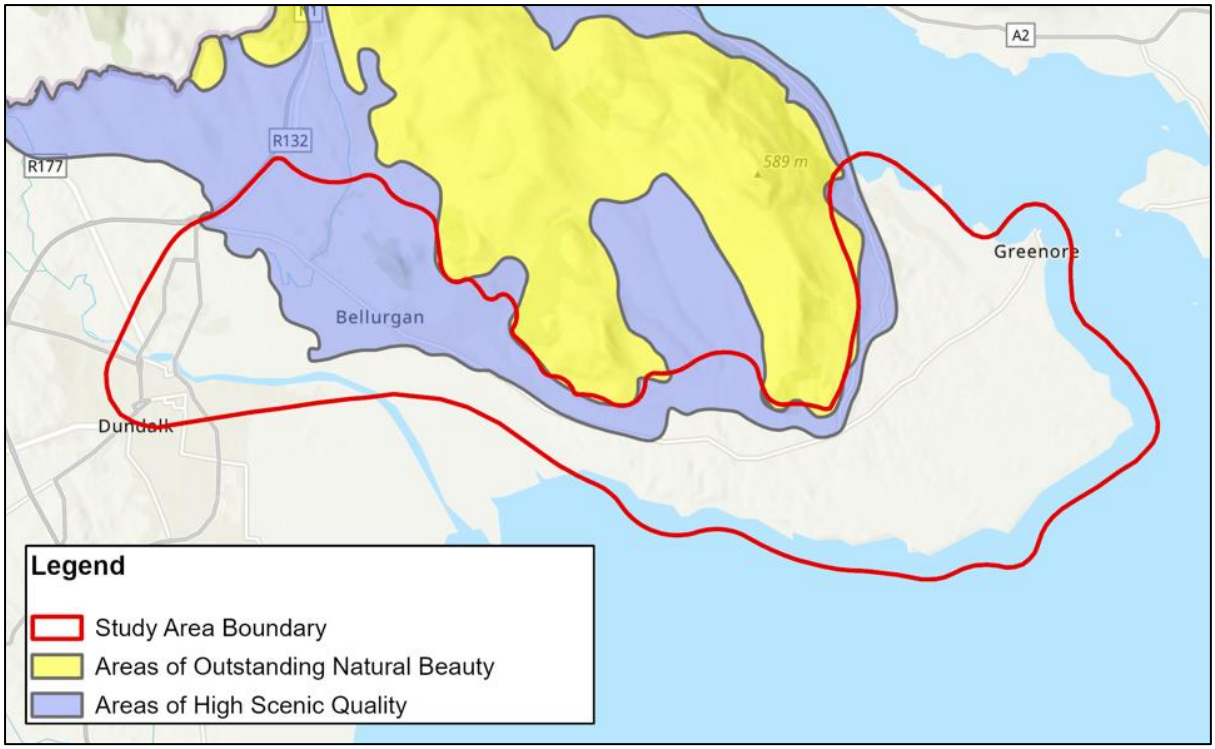

Figure 5.1.4.5 Areas of Outstanding Natural Beauty and Areas of High Scenic Quality, within the study area

Relevant Policy objectives entail:

NBG 36: *To protect the unspoiled natural environment of the Areas of Outstanding Natural Beauty (AONB) from inappropriate development and reinforce their character, distinctiveness and sense of place, for the benefit and enjoyment of current and future generations.*

NBG 37: *To protect the unspoiled rural landscapes of the Areas of High Scenic Quality (AHSQ) from inappropriate development for the benefit and enjoyment of current and future generations.*

Section 8.12.3 of the CDP pertains to Views and Prospects of Special Amenity Value. It states that:
'The scenery and landscapes of the County are of enormous amenity value to tourists and residents alike, contributing to quality of life and constituting a valuable economic asset. The protection of this asset is therefore of importance in developing the potential of the County. The challenge is to manage the landscape, so any change is positive in its effects thereby ensuring that the landscape is protected.

There is a need therefore to preserve views and prospects for the enjoyment of future generations. It is not proposed that this should prohibit development, but rather, where development is permitted that it should not hinder or obstruct these views and prospects and be designed and located to minimise impact.'

There are 11 No. designated scenic views and prospects within the study area; a large number in light of the moderate scale of the study area. These are mapped in Figure 5.4.6, below, also see Drawing no. D2CG-RODA-EGN-SW_AE-DR-EN-100015 in Appendix A.The scenic views

are clustered into two distinct areas of the study area (i.e. the western extents and the north-east extents), that largely relate to the start-end locations (i.e. Dundalk Bay and Carlingford) of the proposed Greenway.

Western extents of study area:

- VP36 - Views northward on the Point Road between the Coe's Road and Soldiers Point
- VP40 - Views north to the Cooley Mountains and south over the town from the former Dundalk-Greenore railway line
- VP41 - Views northeast and south from Soldier's Point and views of the Cooley Mountains
- VP43 - Views from lands east of the racecourse
- VP48 - Views of the Cooley Mountains from St. Mary's Road and junction with Inner Relief Road

North-eastern extents of study area:

- VP05 - Carlingford Lough
- VP61 - King John's Castle, Carlingford
- VP62 - Taaffe's Castle, Carlingford
- VP63 - Holy Trinity Church, Carlingford Heritage Centre
- VP64 - Dominican Friary, Carlingford
- VP65 - Coast and Harbour, Carlingford

Figure 5.1.4.6 Scenic Views & Prospects within the study areas

Relevant Policy objectives entail:

NBG 38 - *Protect and sustain the established appearance and character of views and prospects listed in Tables 8.14 – 8.18 of this Plan that contribute to the distinctive quality of the landscape, from inappropriate development.*

NBG 39 - *To improve, where necessary, public access to viewing points, subject to availability of resources.*

Section 8.13 of the CDP pertains to Scenic Routes. It states:

'Applications for development must carefully consider the siting, design and landscaping of the proposed development to ensure that there are no significant alterations to the character of the area. Any development proposals, which would interfere with or adversely affect these Scenic Routes, will not be permitted.'

There are 11 no. scenic routes crossing the study area. These are identified in Table 8.19 and Map 8.20 of the CDP, and entail:

- SR2 - Ravensdale Road (Rockmarshall to Drumad)
- SR3 - Deerpark Road
- SR4 - Dromad via N1, Broughattin to Doolargy
- SR6 - Doolargy
- SR7 - Jenkinstown (Minor and Hill)
- SR8 - Ballymakellett
- SR9 - Jenkinstown to Piedmont
- SR11 - Piedmont-Benagh-Spellickanee
- SR13 - Bush-Carlingford incl. Commons
- SR14 - Greenore-Carlingford-Omeath
- SR15 - Coast Road-Whitestown-Ballagan-Ballytrasna

However, the majority of the above scenic routes, in effect, only fringe the northern sections of the study area (rather than traversing/dissecting the wider study area), where land lifts towards the Cooley Mountains as shown on Figure 5.1.4.7, below, and on Drawing no. D2CG-RODA-EGN-SW_AE-DR-EN-100024 in Appendix A.

Figure 5.1.4.7 – designated scenic routes within the study area

Scenic Route Policy Objective:

NBG 40: *'To prohibit inappropriate development which would interfere with or adversely affect the Scenic Routes as identified in Table 8.19 and illustrated on Map 8.20.'*

Section 8.14 of the CDP pertains to Green Infrastructure. It states:

'Green infrastructure is an interconnected network of green spaces that help conserve natural ecosystems, in both urban and rural locations, and provide benefits to human populations through water purification, flood control, carbon capture, food production and recreation. Such spaces include woodlands, coastlines, flood plains, hedgerows, urban parks and street trees…

'Green infrastructure provision is an essential element in delivering a high quality of life for both existing and new communities and creating a high quality environment with a distinct sense of place. The protection, enhancement, creation and connection of green infrastructure is crucial to the sustainable development of the County. Green infrastructure by its nature is multi-functional in terms of uses. These include but are not limited to wildlife, recreational, cultural and heritage experiences…'

It is also worth noting the 'wider range of economic, environmental and quality of life benefits' that Green Infrastructure offers. Those that are of potential relevance to Greenways entail a Green Infrastructure that:

- Promotes recreation, tourism and culture.
- Increases outdoor physical activity, social interaction and access to nature, improving health and well-being.
- Attracts business and inward investment by creating an attractive environment.
- Creates a sense of place and local distinctiveness.

Section 8.14.2 of the CDP pertains to Planning for Green Infrastructure. It states*:*

'Green Infrastructure planning is a proactive approach to the sustainable development of natural resources and biodiversity and recognises that connectivity and multi-functionality are key concepts therein…

The Council recognises that Green Infrastructure planning involves a holistic approach, as an integral part of sustainable development, alongside other infrastructure such as utilities and transport networks in order to maximise the benefits of our natural assets, while performing key functions for our communities.'

Relevant Green Infrastructure planning policies entail:

*'***NBG 54***: To ensure the protection, enhancement, and maintenance of Green Infrastructure in recognition of its health benefits in addition to the economic, social, environmental and physical value of green spaces, through the integration of Green Infrastructure planning and development in the planning process.*

*'***NBG 55:** *To create an integrated and coherent green infrastructure for County Louth by ensuring compliance with the objectives listed in the Green Infrastructure Strategy outlined in Appendix 8, Volume 3, to improve pedestrian and cycle access routes within this green infrastructure network while ensuring that ecosystem functions and existing amenity uses are not compromised and existing biodiversity and heritage is protected and enhanced.'*

Map 8.21 of the CDP pertains to 'Green Infrastructure Network in County Louth'. Figure 5.1.4.8 is based on this map, and has been adapted in accordance with both the study area and factor / land use that may be of potential relevance to a Greenway. Sourcing Corine Land Cover 2018 data, this Figure illustrates the diversity and wide variety of land uses within the study area, which infers the scale of landscape evolution and modification across the study area (i.e. manmade change over the centuries), in comparison to the upland, less accessible and less productive mountainous areas to the north of the study area. Also of note is the high number of protected structures across the study area, but particularly in and around the settlements of Dundalk, Carlingford and Greenore.

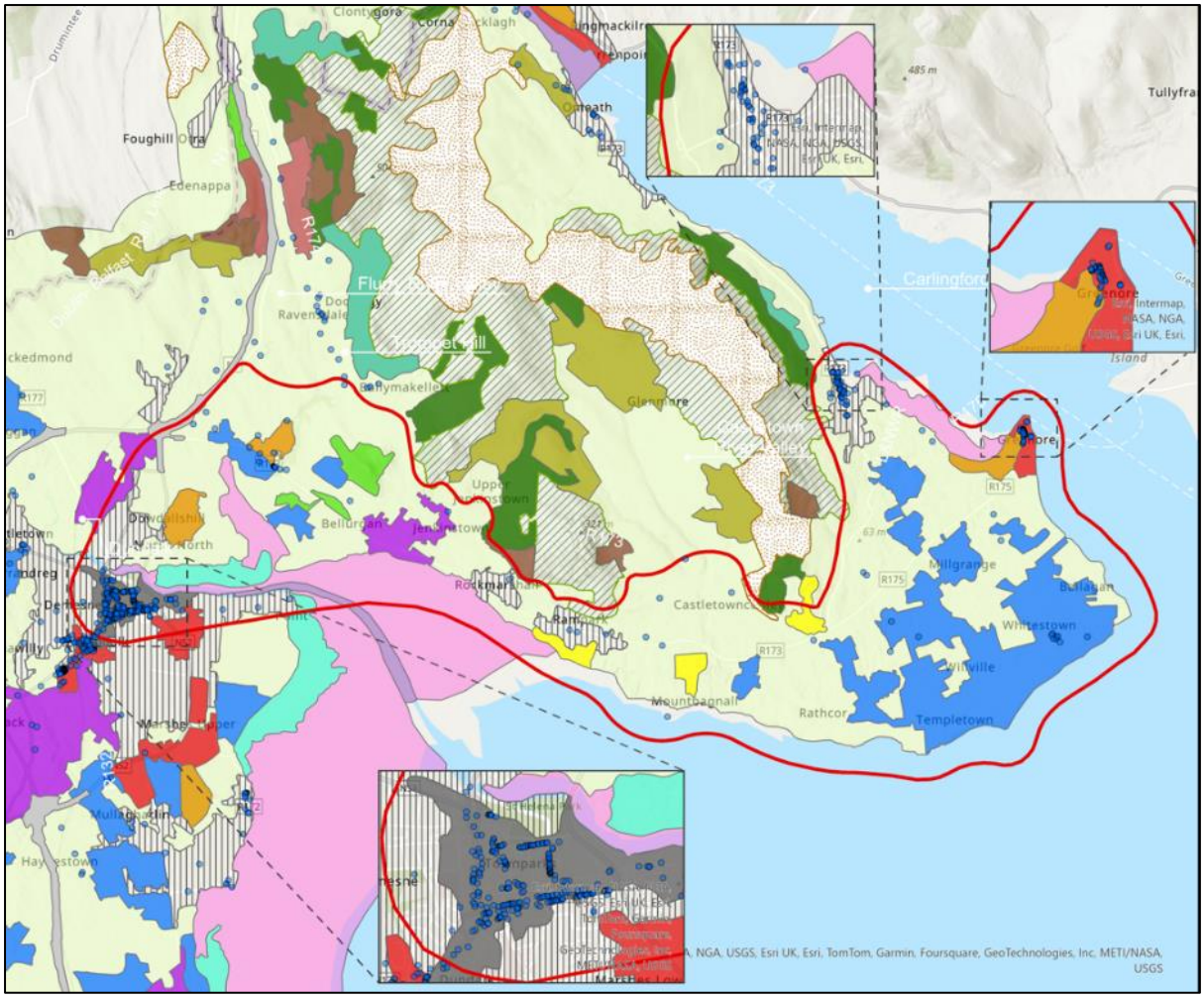

Figure 5.1.4.8 Green Infrastructure within the study area

National Parks & Wildlife Service (NPWS) designations

There are numerous NPWS designations within the study area. While there are no NHAs in the study area, there are 2 No. SPAs, 2 No. SACs and 5 No. pNHAs, refer to Figure 5.1.4.9, below.

SPAs:

- Dundalk Bay SPA (Site code 004026)
- Carlingford Lough SPA (Site code 004078)

SACs:

- Dundalk Bay SAC (Site code 000455)
- Carlingford Shore SAC (Site code 002306)

pNHAs

- Dundalk Bay pNHA (Site code 000455)
- Trumpet Hill pNHA (Site code 001468)
- Lisscaragh Marsh (Site code 001451)
- Carlingford Lough pNHA (Site code 000452)

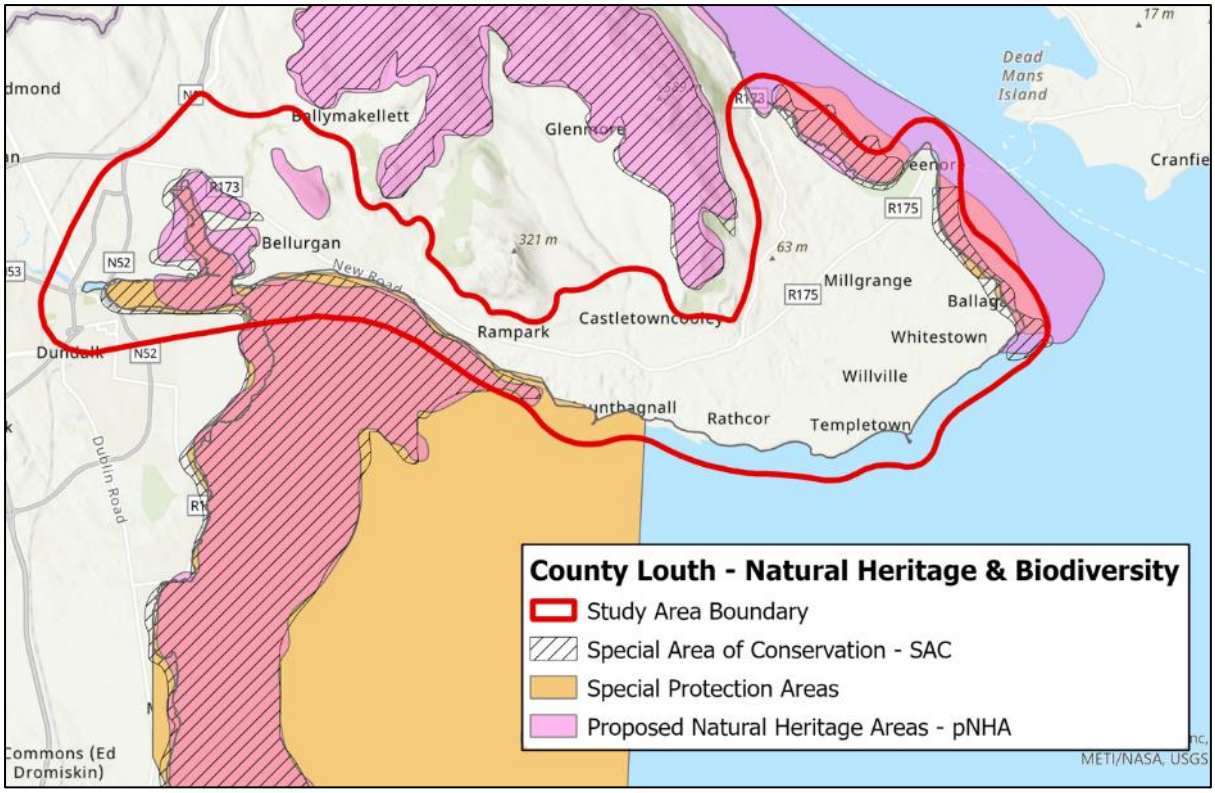

Figure 5.1.4.9 Overview of NPWS sites within the study area

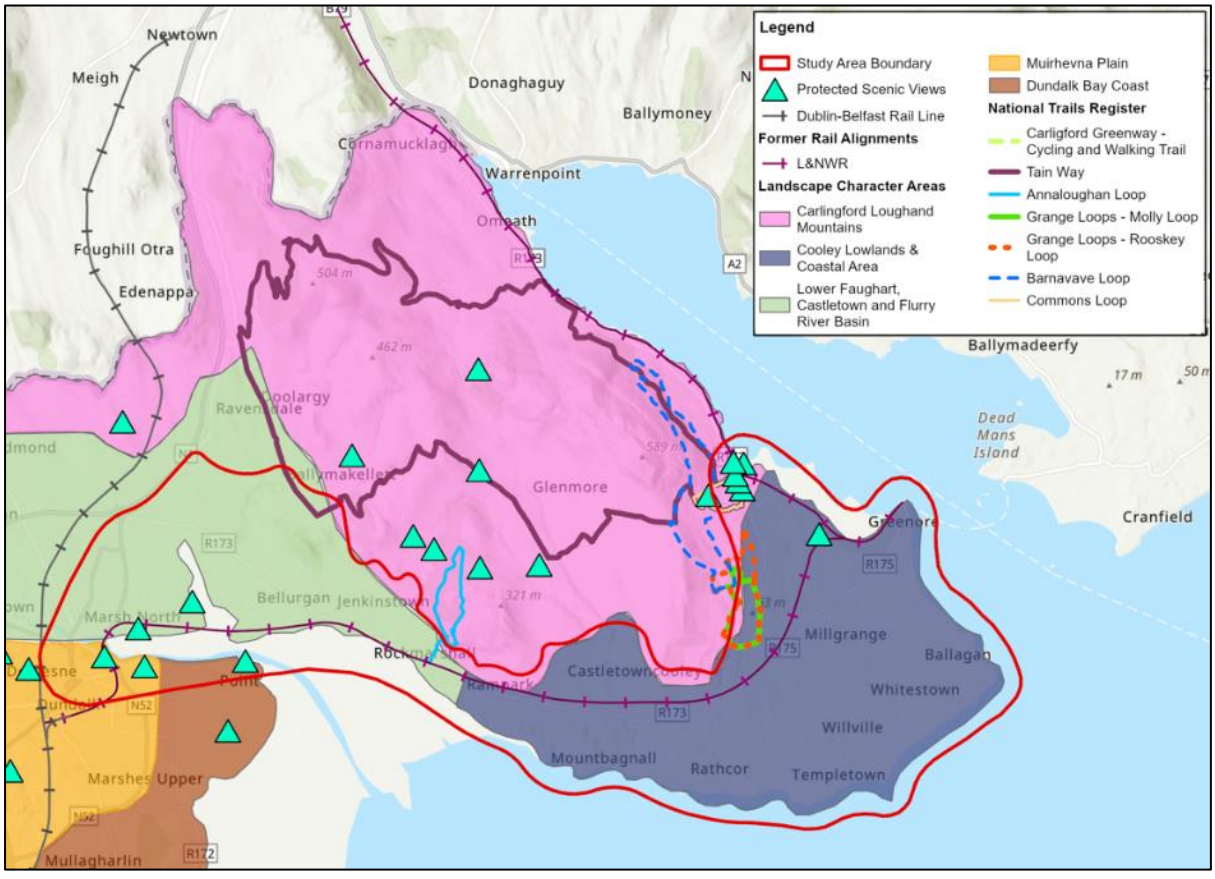

Figure 5.1.4.10 Overview of combined key planning policy constraints

Summary of key planning policy context <u>constraints</u>

- In terms of 'Cooley Lowlands & Coastal Area' LCA, interference with the existing walls and hedgerow patterns would serve to degrade the landscape.
- Trumpet Hill woodland (proposed NHA) in the 'Lower Faughart, Castletown & Flurry River Basins' LCA, as well as the estuarine marshes of Dundalk Bay and the Flurry estuary (Designated SPA) are areas where most construction and/or operational activities are likely to be deemed unacceptable.
- With regards to the 'Carlingford Lough and Mountains incl. West Feede Uplands' LCA, there is a large (Ready Mixed Concrete) quarry at The Bush; a feature that is not typically endearing to the proximity of Greenways. This LCA is also, *"a dramatic mountainous area where the visual impact is increased, by its location on a peninsula"*. However, only the northern fringes of the study area enter this LCA.
- With regards to the 'Dundalk Bay Coast' LCA, it is a designated Special Protection Area (SPA) with large sections of (estuarine) marsh. Thus, this LCA's land within the study area remains lower than 5m AOD and is prone to riverine flooding and/or spring tides.
- The northern fringes of the study area enter into a landscape classification of 'International Importance;' the highest landscape importance in the county and a designation where most construction and/or operational activities are likely to be deemed unacceptable.
- While there are no individual trees within the study area designated as having Special Amenity Value, there is one woodland of Special Amenity Value in the study area, which appears to relate to Trumpet Hill.
- In terms of NPWS designations, in summary, there are 2 No. SPAs, 2 No. SACs and 5 No. pNHAs within the study area; a high number of designations, in light of the moderate scale of the study area. These are likely to represent restrictions for construction and/or operational activities of the greenway.

Summary of relevant planning policy <u>opportunities</u>

- The study area is very rich in archaeological terms, a considerable factor in greenway attractiveness.
- In terms of 'Cooley Lowlands & Coastal Area' LCA, it offers "High scenic quality views towards Cooley and Mourne Mountains and Dundalk Bay. Recreational opportunities are plentiful..."
- In terms of the 'Lower Faughart, Charlestown & Flurry River Basins' LCA, "Open air recreational opportunities are plentiful…To minimise the visual impact, good landscape design will be required and should form part of all new developments in the area."
- In terms of the ,Dundalk Bay Coast' LCA, there are "Impressive coastal routes of high scenic quality… Opportunities for recreational pursuits with particular emphasis on the river edges and coastline."
- The study area is overwhelmingly made up of a landscape classification of 'Local Importance'. This infers that the construction of a Greenway within such classification is likely to be open to consideration. However, more complex and nuanced factors will also need to be considered.

- An Area of Outstanding Natural Beauty marginally enters the north of the study area, while an 'Area of High Scenic Quality' occupies larger sections in the north of the study area. Such a highly regarded landscape quality, with its inherent visual amenity, is a considerable incentive for a greenway's success.
- There are 11 No. scenic routes and 11 No. designated scenic views and prospects within the study area. Combined, these 22 No. scenic designations within the study area indicate the palpable degree of scenic amenity of this setting; a considerable incentive for a greenway's success.
- In terms of NPWS designations, in summary, there are 2 No. SPAs, 2 No. SACs and 5 No. pNHAs in the study area. While these present constraints in regard to potential construction and/or operational activities within these designations, they also provide opportunities for a strong naturalistic and/or biodiversity appeal to the area, a value that is highly conducive to the success of a greenway.

5.1.4.4 Receiving Environment: Landscape Characteristics

Former L&NWR Alignment in Study Area

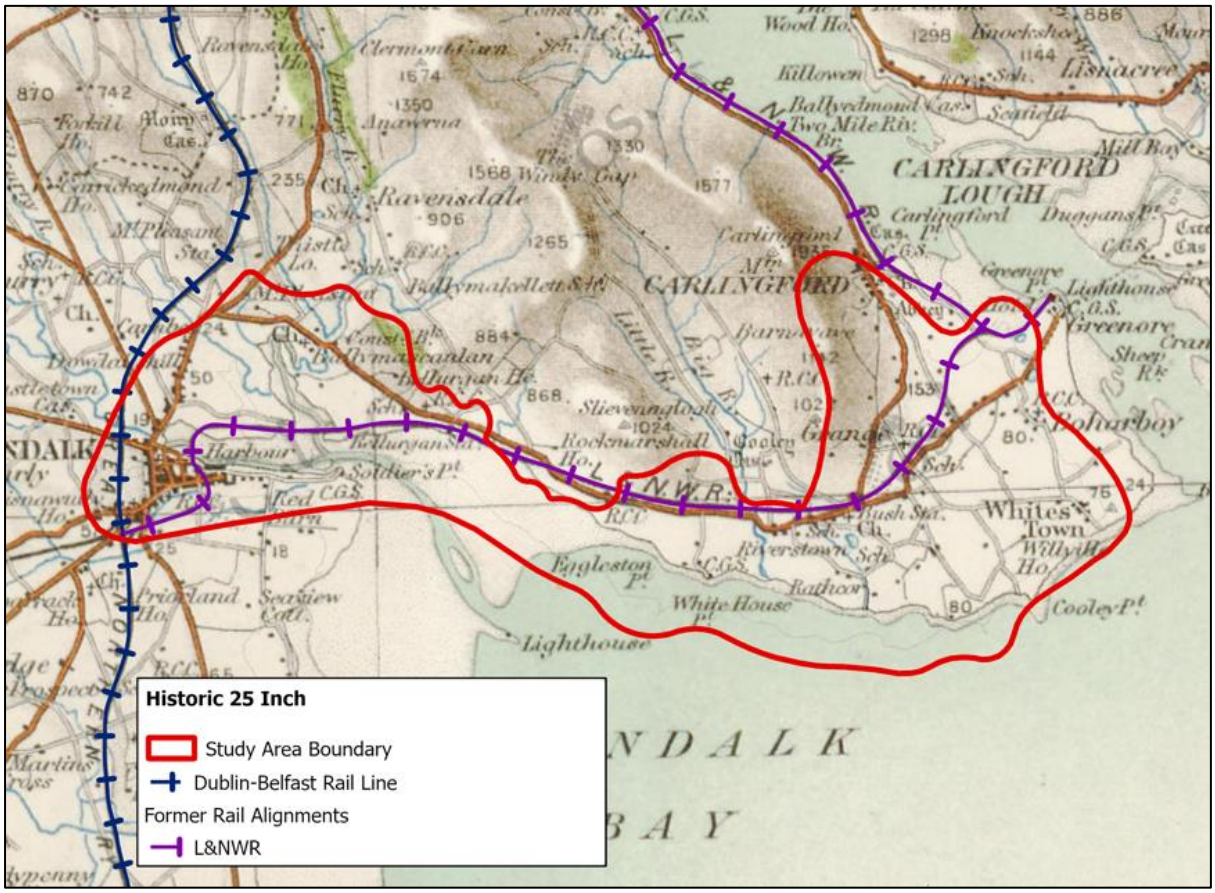

Figure 5.1.4.11a **Alignment of the L&NWR's Dundalk, Newry and Greenore Railway (Source: heritagemaps.ie - Historic 25" OSI mapping from late 19th Century)**

Figure 5.1.4.11a & b. The line was permanently closed on 31 December 1951. However, sections of the former rail corridor remain visible within the study area, in the form of bridges, embankments and parallel, mature treelines that once flanked the rail lines.

Figure 5.1.4.11b **Alignment of the L&NWR's Dundalk, Newry and Greenore Railway, overlaid on to contemporary Google Earth capture.**

Establishment of Landscape Units and Sub-Units

The Louth Landscape Character Assessment described in Section 5.1.4.3, above, provides an overview of the characteristics and sensitivities of the landscape, and the key features of each of the LCAs within which the study area lies. A site visit and further desktop review provided a more detailed understanding of these characteristics. This process established the considerable diversity within the study area; one which can be conducive to the presence of Greenways.

The depth of this diversity lead to the subsequent creation, mapping and analysis of Landscape Units and Sub-Units within the study: the most effective way, in this instance, to identify likely landscape and visual constraints and opportunities. These are as follows:

Landscape Units:

- Urban
- Dundalk Bay
- Elevated Agricultural
- Lowland Agricultural
- Coastal Agricultural
- Lordship - Gyles Quay

However, it's worth noting that there are shared characteristics between some of the landscape units, as well as typical graduations between one unit and the next. In that regard, the unit boundaries are not prescriptive, but with transitional zones between each. However, the decisive factor for these units is that of the prevalent 'sense of place' and/or landscape character found in these areas.

Across the study area, more localised and concentrated landscape subunits were identified. These tend to be relatively contained areas that present a different, distinct land use and/or localised landscape character than the wider landscape unit in which they are set. While these sub-units have a distinctive 'sense of place' they are confined in their scale and tend to not be representative of the wider landscape units in which they're located.

Landscape Sub-Units:

- River Valley
- Ready Mixed Quarry
- Trumpet Hill Woodland
- Demesne Hertiage Landscape

These landscape units and sub-units are addressed in more detail below, and are illustrated in Figure 5.1.4.12, below and on Drawing no. D2CG-RODA-EGN-SW_AE-DR-EN-100015 in in Appendix A.

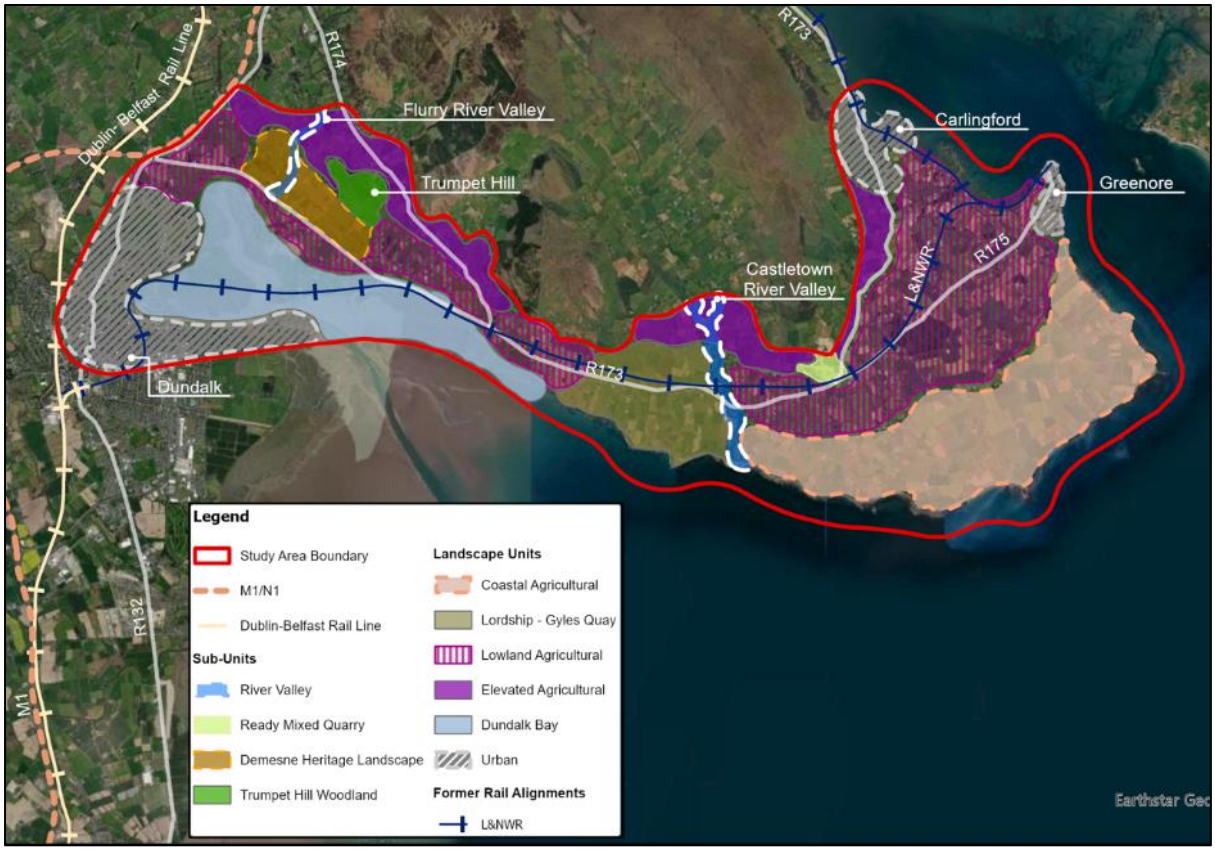

Figure 5.1.4.12 Landscape Units and Sub-units within the study area

Landscape Units

Urban Landscape Unit

There are three urban grains within the study area: Dundalk, Greenore and Carlingford, see Figure 5.1,4.13. These are located at either end of the study area, and all three contain Architectural Conservation Areas (ACAs) at their centres.

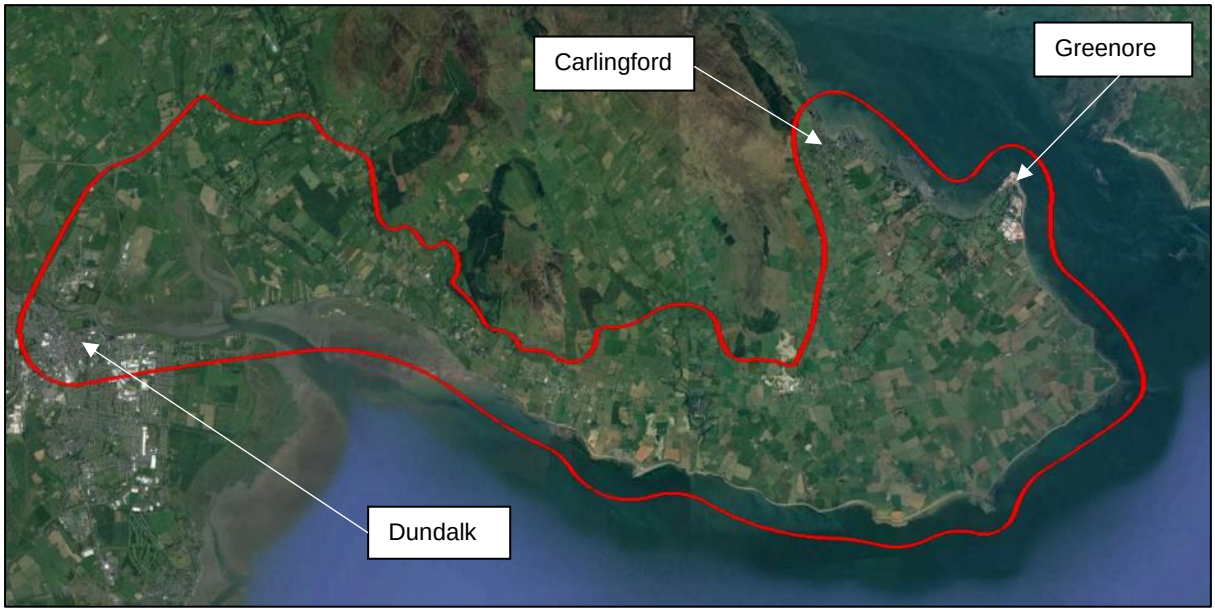

Figure 5.1.4.13 Urban Landscape Units in Study Area

Notably, all three urban areas offer distinct variety in their setting, scale, identity and sense of place, to one another. Dundalk is by far the largest settlement in the study area, with a population of 43,112 according to the 2022 Census, having been established as a Norman stronghold in the 12th Century. It is centred close to the estuary of the Castletown River, where it enters Dundalk Bay. However, only one-third to one-half of the town is within the study area. The town extends eastwards from its centre, along the southern coast of Dundalk Bay for approx. 2.5km to Soldiers' Point, overlooking Dundalk Bay and the Irish Sea. Dundalk racecourse is located approx. 2km north of the town, as shown on Figures 5.1.4.14a – 5.1.4.14d, below.

Figure 5.1.4.14a **The Tain Bridge (N52) crossing Castletown River, north of Dundalk Town Centre**

Figure 5.1.4.14b **Public pathway alongside Dundalk Bay, connecting Dundalk town with Soldiers' Point. The Cooley peninsula is visible across the Bay.**

Figure 5.1.4.14c **Soldiers' Point, overlooking Dundalk Bay and the Irish Sea, with the Cooley peninsula visible across the Bay.**

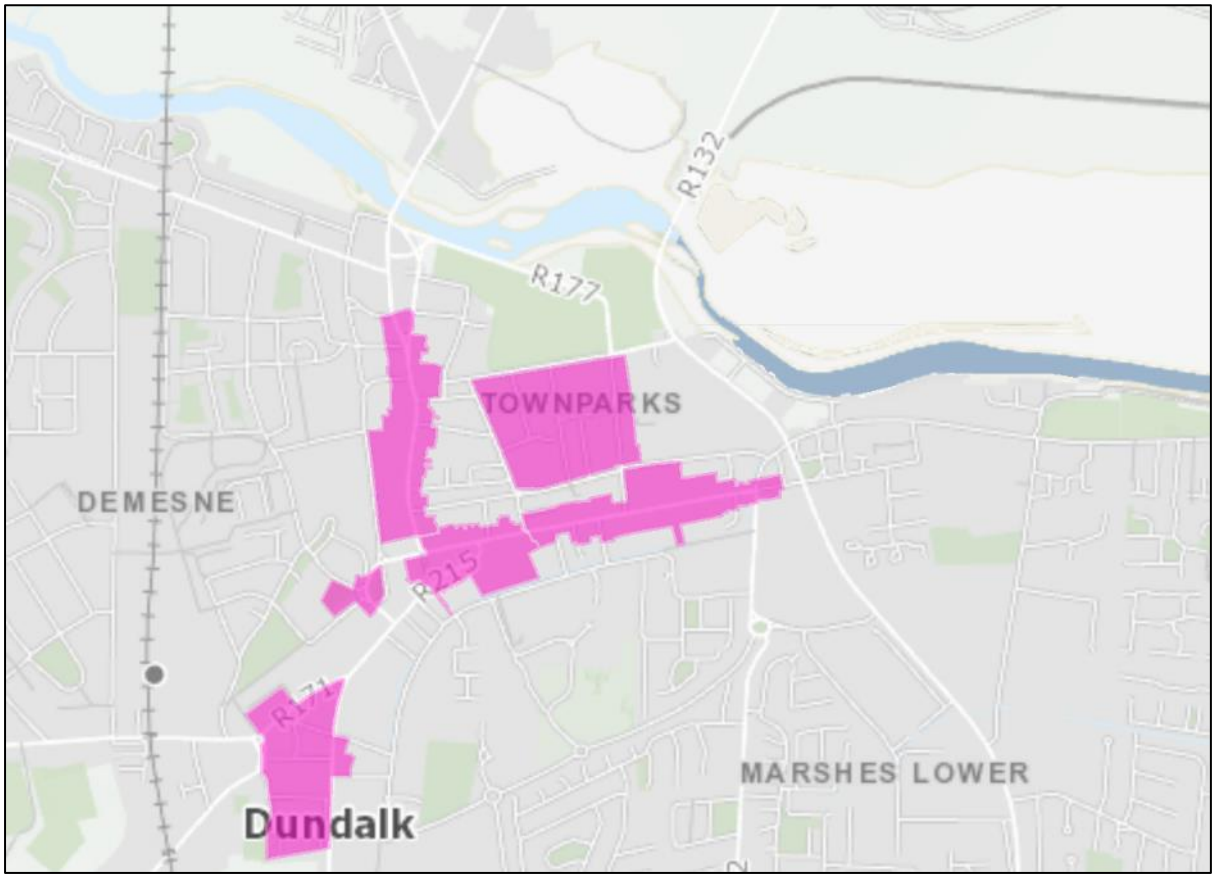

Figure 5.1.4.14d **Dundalk Architectural Conservation Area (ACA) (Source: OSI Public on heritagemaps.ie)**

The second most populous urban unit in the study area is that of Carlingford, in the far northeast, with a population of 1,528 according to the 2022 Census. This small town dates to the 9th Century and its Medieval layout is perceptible along its narrow, crooked lanes, in tandem with numerous historic buildings of notable heritage significance. These include King John's Castle, Taffe's Castle, Holy Trinity Church and the Dominican Friary. Owing to its 'old world' sense of place, alongside it's attractive setting on the edge of Carlingford Lough, it is a town that is long-established as a popular visitor/tourist destination, see Figure 5.1.4.15a & b, below.

Figure 5.1.4.15a The historic Carlingford Town, on the picturesque shores of Carlingford Lough

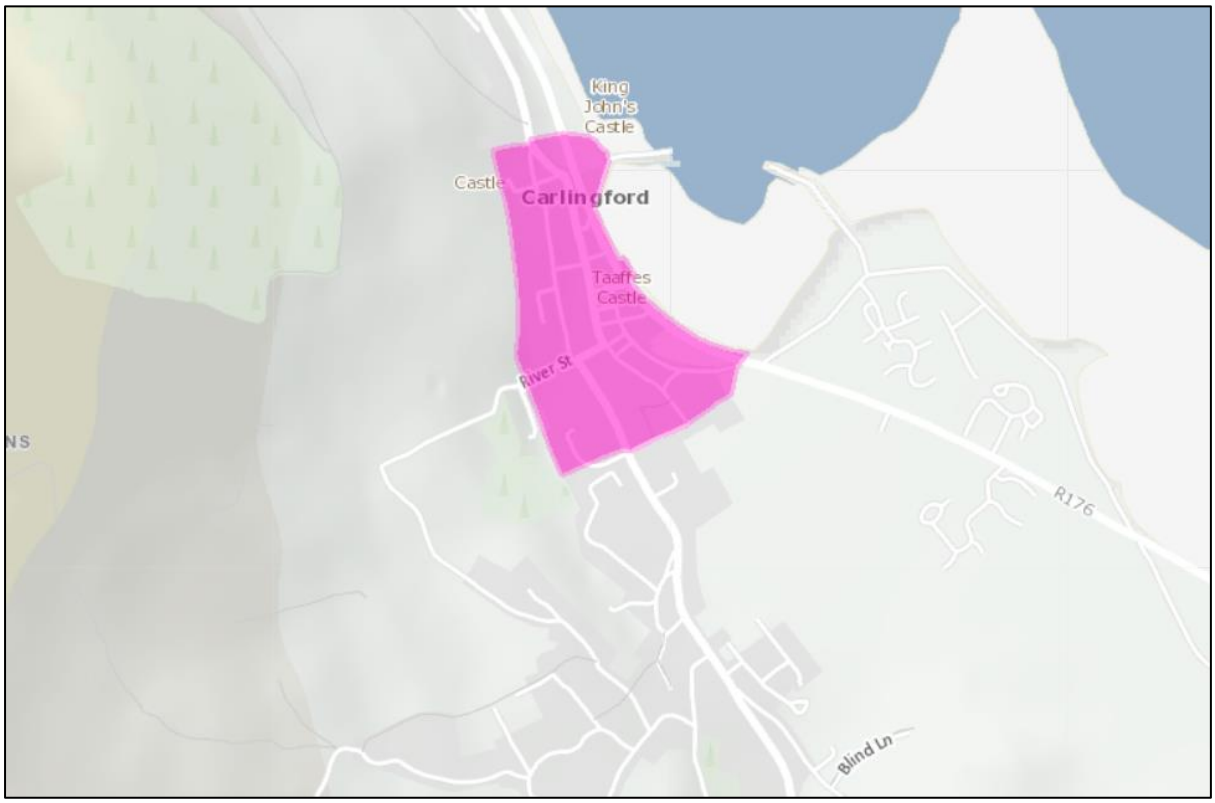

Figure 5.1.4.15b Carlingford Architectural Conservation Area (ACA) (Source: OSI Public on heritagemaps.ie)

Although a village, Greenore contains a highly localised urban grain, in keeping with its late 19th Century planning and its Port-setting. Constructed from 1863 to 1873, the village was established with the aforementioned former L&NWR line. The village was chiefly constructed to house employees (and their families) working at Greenore Port or the then Dundalk, Newry & Greenore Railway. Notably, prior to the 1860s, there was no known settlement at this location, of any size. Untypical for an Irish village, the village is laid out across two straight, parallel streets, with near-uniform, Victorian two-storey stone terraces present, which constitute the Greenore Architectural Conservation Area, see Figure 5.1.4.16a & b, below. The (private) Greenore Port lies to the immediate north of the village, beside which is the popular Greenore-Greencastle car & pedestrian ferry. The original rail line ran southwest from the Port, along the southern shore of Carlingford Lough, with the rail line embankment still evident. Greenore Golf Club is to the immediate east/south east of, and overlooked by, the Greenore Architectural Conservation Area. The village and its immediate locality have a population of 306, according to the 2022 Census.

Figure 5.1.4.16a **The Greenore Architectural Conservation Area, with cranes within Greenore Port visible in the distance.**

Figure 5.1.4.16b **The Greenore Architectural Conservation Area. (Source: OSI Public on hertiagemaps.ie)**

There are several areas within the study area that constitute other villages and/or built-up linear development along local roads. These areas include Bellurgan (population 350), Lordship (362), Gyles Quay (200) and Grange (225). However, there is little evidence of any extensive or long-established urban grain within these settlements, and, hence, do not constitute a recognisable urban grain

Dundalk Bay Landscape Unit

In its western extent, this landscape unit includes the Castletown River and Flurry River estuaries, which meet in Dundalk Bay. However, several smaller watercourses also feed into the bay. The inner bay is sandy, shallow and intertidal. The outer bay extends further east by upwards of 5km (i.e. past Jenkinstown and within 1km of Lordship), and southwards by almost 15km. Much of this unit is under water at or near high tide, while sand bars, mud flats and marsh are exposed at or near low tide. Indeed, the area of sand, gravel and mud exposed at low tide is understood to amount to over 4,000 ha, with vast tracts of salt marsh along the western shore of the bay. Several dozen different bird species are known to visit and/or nest at or near this landscape unit, at different times of the year, making it a popular resource for birders.

Thus, this substantial bay is the defining influence on the landscape character of the bay's periphery, which includes ostensibly flat, low-lying fields that are prone to flooding and/or waterlogged soils. There are numerous residences set out along the northern shore of the bay, enjoying southern sea views. It is worth noting that the original L&NWR rail line aligned the northern shore of the bay, for almost 7km, as set out in Figure 5.1.4.17a below. This alignment runs to the immediate south of the present-day R173 for almost 2km distance.

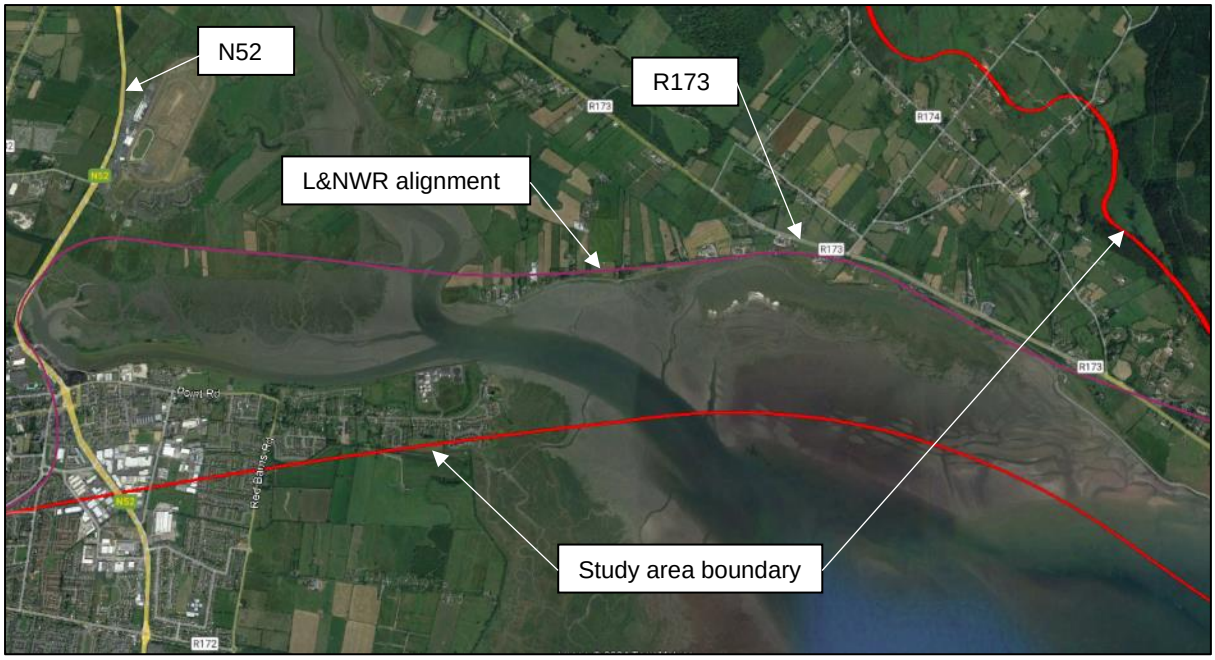

Figure 5.1.4.17a Original L&NWR alignment along the northern shore of Dundalk Bay

The following Figures (i.e. Figure 5.1.4.17b-g) further illustrate the landscape character of the Dundalk Bay Landscape Unit.

Figure 5.1.4.17b Low-lying agricultural land, approx. 1km north of Dundalk, within the Dundalk Bay Landscape Unit.

Figure 5.1.4.17c **South-facing residents along the northern shoreline of Dundalk Bay**

Figure 5.1.4.17d **Overgrown stone bridge constructed for the former L&NWR rail line, which align the northern shore of Dundalk Bay.**

Figure 5.1.4.17e **Embankment and bridge ruins of the former L&NWR rail line, which align the northern shore of Dundalk Bay.**

Figure 5.1.4.17f **View of low-tide Dundalk Bay, from its northern shoreline.**

Figure 5.1.4.17g **View of Soldier's Point, and wider Dundalk development, from the shoreline on the northern shoreline of Dundalk Bay.**

Elevated Agricultural Landscape Unit

This landscape unit tends to align the northern boundary of the study area. It is primarily made up of pastoral agriculture, followed by linear residential development along local roads. Terrain is generally higher than 40-50m AOD and is elevated only in relation to other terrain within the study area, with the exception of the more localised Trumpet Hill landscape sub-unit. Residents along these south-facing slopes (looking over Dundalk Bay and the Irish Sea) and east facing slopes (looking over Carlingford Lough) enjoy aesthetic views. Along with the general proximity to Dundalk and the M1, this helps account for the extent of rural residences in this unit, many of which appear to have been built in the last 20-30 years, and populate mostly narrow, winding local roads.

Field sizes tend to be small or modest sized in this landscape unit, with narrow, rectangular field patterns, often running in the direction of the shore, with mature vegetation with field boundaries. However, in the Riverstown/ Piedmont/ Earls Quarter area of this unit, field sizes appear to be larger, less aslant, and more productive, with less mature vegetation within field boundaries. Overall, this unit serves as the foothills to the higher Cooley Mountains, north of the study area. The backdrop of these mountains influences this unit's rich sense of place, as does the more distant, picturesque, seaward views. In addition, stonewalls become more of a feature within field boundaries as terrain ascends towards the Cooley Mountains. It is worth noting that the alignment of the former L&NWR did not/does not enter into this landscape unit, see Figure 5.1.4.18a – b, below.

Figure 5.1.4.18a – roadside stonewalls within the Elevated Agricultural Landscape Unit

Figure 5.1.4.18b – distant seaward views within the Elevated Agricultural Landscape Unit

The Tain Trail/Tain Way is the only known waymarked trail in the study area and runs along roads in this landscape unit. It is a 40km, two-day looped walk circling the Cooley Mountains. However, while not waymarked, there are other (road based) trails in this Elevated Agricultural Landscape Unit that are part of the National Trail Register. These are shorter trails that are primarily used by the local community and include the Annaloughan Loop, Grange Loop, Molly Loop and Rooskey Loop, as per Figure 5.1.4.10.

Lowland Agricultural Landscape Unit

This unit is the largest landscape unit in the study area and tends to fluctuate between sea level and 40-50m AOD, but mostly along gently sloping/ non-steep terrain. However, this area does not occupy more exposed, coastal lowland landscapes that front the Irish Sea, in the southeast of the study area. In this Lowland Agricultural Landscape Unit, terrain is gently sloping, and field sizes tend to be small-medium sized, and appear to be intensively managed, in places. It is predominantly occupied by agricultural land with well-defined hedgerows that help support biodiversity and partially screen the number of residences in the area.

In the western areas of this landscape unit, the general proximity to Dundalk and the M1 help account for the extent of rural residences in this unit, many of which appear to have been built in the last 20-30 years. In the northeastern areas of this landscape unit, residences appear to be older, and often set within more traditional farmstead/ farm yard settings. Several roads and residences have views of the Irish Sea and/or Carlingford Lough. In the far northeast of this landscape unit, the R176 aligns the shores of Carlingford Lough, providing compelling views over the Lough, which is backdropped by the picturesque Mourne Mountains. This generates considerable visual amenity from the periphery of this landscape unit.

Notably, this landscape unit is bordered, in locations, by the urban grain of Dundalk, Greenore and Carlingford, as well as the highly developed Lordship-Gyles Quay landscape unit. The busy R173 also traverses large sections of this unit, with treelines to either side, in several places. It is worth noting that the original L&NWR rail line traverses more than 8.5km of this unit, in total, with c. 4km of the line formerly adjoining Carlingford Lough, connecting Greenore and Carlingford.

It is also worth noting that the narrowest section of the study area occurs in this landscape unit. At this location, the distance between the coastline and the northern boundary of the study area is approx. 800m, refer to Figure 5.1.4.19a - e, below.

Figure 5.1.4.19a **The R173 traverses large sections of the Lowland Agricultural Landscape Unit**

Figure 5.1.4.19b **Some roads and residences in this Unit benefit from views of Carlingford Lough, with the Mourne Mountains beyond.**

Figure 5.1.4.19c **Medium-sized, intensively-managed fields within this landscape unit**

Figure 5.1.4.19d **Former bridge along the previous L&NWR rail line**

Figure 5.1.4.19e **In the far northeast of this landscape unit, the R176 aligns the shores of Carlingford Lough, providing compelling Lough views, backdropped by the Mourne Mountains.**

Coastal Agricultural Landscape Unit

This landscape unit shares some characteristics of the Lowland Agricultural Unit, that being a low-lying (between sea level and 30m AOD, in this instance), gently-sloping, productive agricultural realm. However, for this Coastal Agricultural Landscape Unit, field sizes tend to be larger and with a high degree of cropping/arable land use, with trees or other tall vegetation being less apparent. This is, in part, because this unit's landscape character is its coastal/semi-coastal setting, which engenders a more windswept and rugged sense of place. Owing partly to the nature of the exposed coastline, there are no quays, piers or harbours present in this unit.

The various stony shorelines/beaches provide the main recreational amenity for locals in this area. While there are mostly winding, narrow local roads in this unit (i.e. no regional roads), nonetheless, there are a handful of more populous locales that are without any centralised village. These include Templetown, Willville and Ballagan, with many of these detached rural residences appearing to have been built in the last 20-30 years. In terms of cultural heritage, like several locations on the Cooley peninsula, this unit has plentiful archaeological remains. These include early Christian remnants (e.g. Kilwirra Church ruins and graveyard; Our Lady's Well), while the small hamlet of Whitestown possesses its own Architectural Conservation Area (ACA). It is worth noting that the former L&NWR alignment does not enter into this landscape unit. refer to Figure 5.1.4.20a - d, below.

Figure 5.1.4.20a **Field boundaries near the coastline in this Landscape Unit tend to have low or non-existent vegetative screening, with field sizes marginally larger than further inland.**

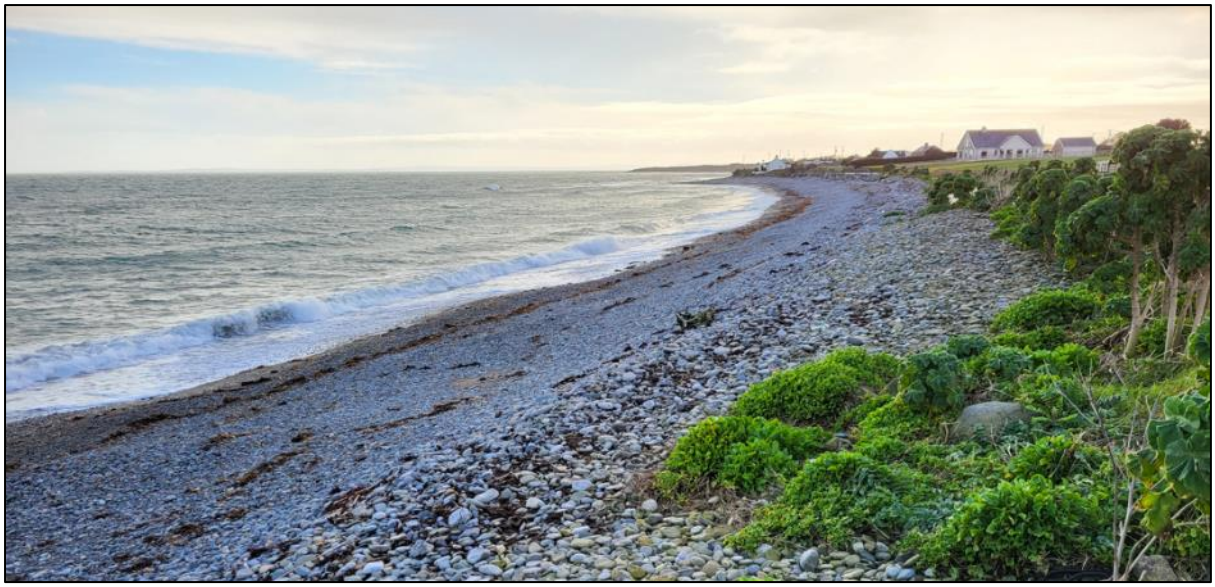

Figure 5.1.4.20b Whitestown beach

Figure 5.1.4.20c Ballagan Bay beach

Figure 5.1.4.20d Kilwirra Church ruins and graveyard

Lordship-Gyles Quay Landscape Unit

This landscape unit shares certain crossovers and characteristics with the Elevated and Lowland Agricultural Landscape Units. However, its sense of place is characterised by a notable intensity of residential development, followed by open-cast quarrying, low-level industrial development (i.e. Cooley Distillery, Carlingford Brewing Company, O'Connor roofing supplies), as well as Gyles Quay and its associated caravan park. According to the 2022 Census, Lordship has a population of 465.

Neither settlement possesses any quantifiable urban grain and/or village centre, though ribbon development is palpable throughout. Accordingly, the visual amenity in this high modified landscape unit is less palpable than most other landscape units in the study area.

However, the exception to this is the coastline (e.g. Gyles Quay or Gyles Quay Bay beach). These areas provide a recreational amenity for locals and visitors alike, as evidenced from the adjacent, sizeable caravan park. Bridges of the former L&NWR line are apparent in several location within the Landscape Unit, as the former rail line occupies the full width of the unit (i.e. c. 3.2km).

It is also worth noting that the second narrowest section of the study area occurs in this landscape unit. At this location, the distance between the coastline and the northern boundary of the study area is approx. 900m, refer to Figures 5.1.4.21 a-d, below.

Figure 5.1.4.21a – development within the Lordship-Gyles Quay Landscape Unit (Source: Google Earth capture July 2021)

Figure 5.1.4.21b – Railway Village (housing development) at Lordship

Figure 5.1.4.21c – stone bridge crossing over the former L&NWR line, within Railway Village (housing development) at Lordship

Figure 5.1.4.21d Stone bridge that carried the former L&NWR line over a local road

Landscape Sub-Units

River Valley Landscape Sub-Unit

These localised river valleys tend to run in a meandering north-south direction. This landscape sub-unit is not representative of the more pastoral, open landscape units in which they're located. However, they're highly scenic by nature, and present strong recreational opportunities and a picturesque resource among less aesthetic landscape units.

In the west of the study area, the Flurry River flows through an often steep-sided wooded glen, generating a high degree of visual amenity. Near the centre of the study area, the Castletown River Valley enters the sea near Gyles Quay. Owing to the mature trees to either side of these rivers, the nature of visibility along these corridors tends to be highly enclosed, refer to Figure 5.1.4.22 a-b, below.

Figure 5.1.4.22a – The Flurry River landscape sub-unit

Figure 5.1.4.22b – The Castletown River Valley landscape sub-unit

Ready Mixed Concrete Landscape Sub-Unit

This sub-unit is unrepresentative of the Elevated Agricultural Landscape Unit that flanks either side of it, or the Lowland Agricultural Landscape Unit to its south. This sub-unit is a large, open-cast quarry on elevated terrain, aligning the northern boundary of the study area. While quarrying is also present in the Lordship-Gyles Quay Landscape Unit, it is within the context of a considerably more developed, low-lying locale, where the quarries are not always discernible from surrounding receptors.

However, the Ready Mixed Concrete quarry is on more elevated, exposed terrain and larger in scale than other quarries in the study area. Along with its ancillary structures and tracks, it measures over 700m east-west, and over 500m north-south (within the boundaries of the study area). However, the quarry extends for a further c. 700m north of the study area (i.e. extending c.1.2km north-south, in total), up increasingly higher terrain. Thus, as with most quarries, this sub-unit is an area of notably low landscape and visual value.

The original L&NWR line aligned to the immediate south of the quarry, on the opposite side of a local road to the quarry's main entrance. This was the original location of Bush Railway Station, along the L&NWR line. Beside the station, a bridge was constructed for the local road to cross over the rail line. This bridge was decommissioned in 1965 with the construction of a new road alignment, refer to Figure 5.1.4.23a-c, below.

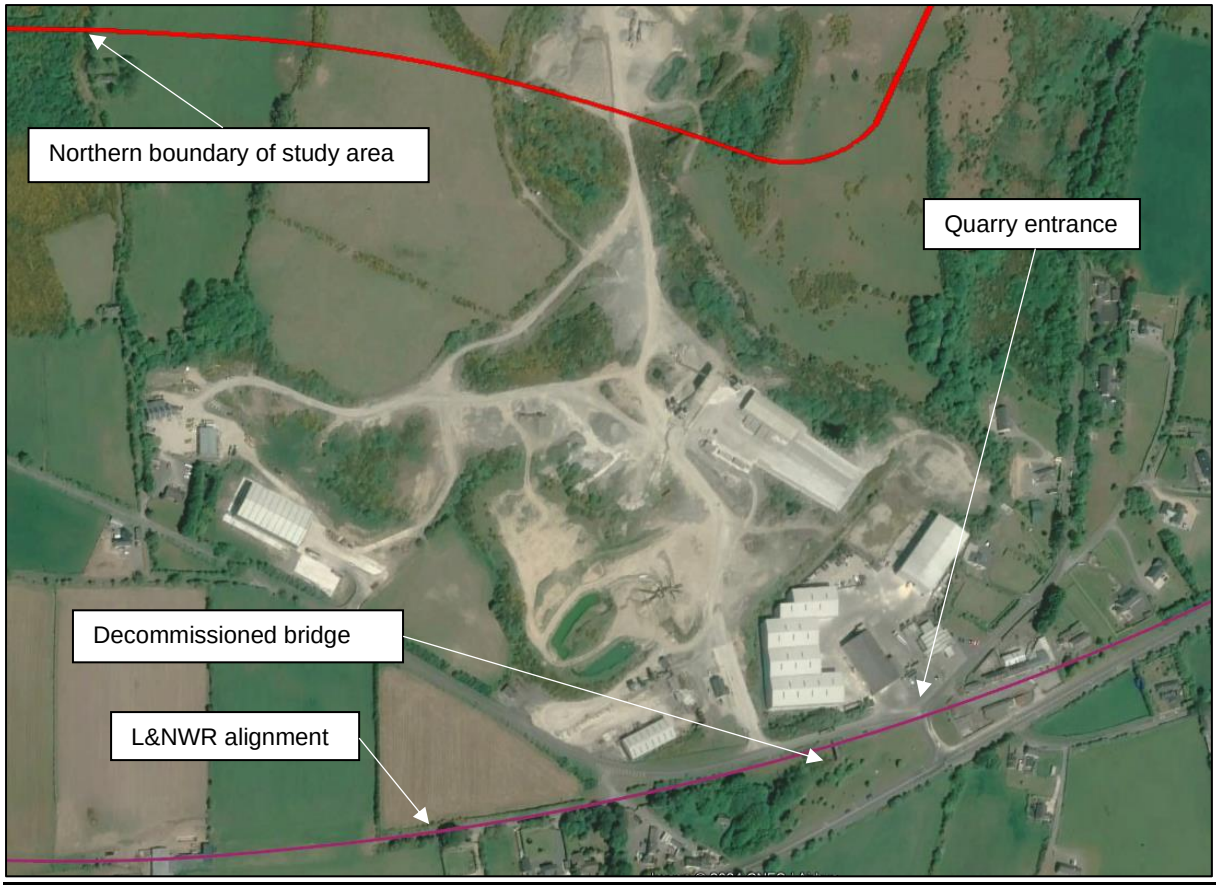

Figure 5.1.4.23a **Google Earth capture (May 2020) of the Ready Mixed Concrete Landscape Sub-Unit**

Figure 5.1.4.23a **As with most quarries, the Ready Mixed Concrete Landscape Sub-Unit is an area of notably low landscape and visual value.**

Figure 5.1.4.23b Decommissioned stone bridge crossing over the former L&NWR rail line, located in the direct vicinity of the quarry entrance

Trumpet Hill Landscape Sub-Unit

The woodland of Trumpet Hill is a proposed Natural Hertiage Area and extends for over 1.3km in a northwest-southeast direction. Owing to its more dramatic landform and its tree cover, it is not representative of the Elevated Agricultural Landscape Unit that adjoins it.

Trumpet Hill rises to 142m AOD in an area of sloping terrain that is generally lower than 60m AOD. The hill is covered in woodland – as it appears to have been for at least the last 200 hundred years (according to historical maps). While there is no known public access to this landscape unit, Trumpet Hill is an extension of Bellurgan Park (private property), a venue that offers airsoft, horse riding and mountain bike riding facilities/trails within Trumpet Hill. Overall, the hill is a rich source of ecological and recreational value and provides strong ecological value and visual amenity for the area.

This landscape unit also incorporates Drumenagh Hill, which is within 200m north of Trumpet Hill. Drumenagh Hill is 108m AOD, contains mature coniferous forestry, and is not part of the Trumpet Hill proposed Natural Hertiage Area, or the Bellurgan Park property.

Figure 5.1.4.24 Drumenagh Hill located in the distance, with Trumpet Hill to its south (i.e. right).

Demesne Heritage Landscape Sub-Unit

This sub-unit is not characteristic of the prevailing landscape character of the surrounding landscape units, in that it is centred on the 18th Century and 19th Century demesnes of Bellurgan Park and Ballymascanlon House, respectively (both protected structures). These houses are located within 1.5km of one another, along the R173, and the primary land use of this sub-unit is recreational in nature.

There is a richness of archaeological remnants and mature broadleaf trees in this sub-unit, including thickets of trees that align the R173. Field patterns are not representative of the more intensively managed agricultural landscape units in the study area but are tree-dotted in the 'parkland style,' with robust thickets of broadleaf trees bordering the property. It is worth noting that the alignment of the former L&NWR is located more than 600m south of this sub-unit.

Bellurgan Park is a wedding and events venue, as well as providing outdoor activities across 250 acres of private land, which extend into the Trumpet Hill landscape sub-unit. Ballymascanlon House serves as a hotel, restaurant and 18-hole golf course set across 130 acres of mature parkland containing thickets of broadleaf and Scot's Pine trees. However, since the establishment of the golf course in 1991, the original parkland has been considerably modified, including the considerable amounts of planting of (now mostly mature) trees between greens/fairways.

The northern fringes of the parkland also contain the Proleek Dolmen and the Proleek Wedge tomb. Both of these protected monuments are understood to be 4000-5000 years old and are publicly accessible through local roads to the northeast of the golf course. Both are fenced off from the golf course with pathways connecting them to a public road. Overall, this landscape sub-unit is a source of considerable ecological, heritage, recreational and aesthetic value, refer to Figure 5.1.4.25a-c, below.

Figure 5.1.4.25a **Scot's Pine trees within the 'parkland style' landscape of Ballymascanlon.**

Figure 5.1.4.25b The Proleek Dolmen within the Ballymascanlon parkland.

Figure 5.1.4.25c The Proleek wedge tomb within the Ballymascanlon parkland.

Visual Amenity and Visual Receptors

Visual Amenity:

Overall, the study area is a source of rich and varied visual amenity, for the multiple reasons set out above. The most influential factors that contribute to this largely picturesque setting include the aforementioned Cooley Mountains (and its foothills in the northern section of the study area); Dundalk Bay, the Irish Sea and Carlingford Lough (backdropped by the Mourne Mountains), followed by the more localised, aforementioned River Valley, Trumpet Hill and Demesne Hertiage Landscape sub-units, including their rich megalithic/ archaeological legacies.

This rich visual amenity is partially tempered by the presence of more localised areas within Dundalk, Lordship and the numerous quarries within the study area. However, over, the visual amenity of the study area remains rich and robust, and highly conducive to greenways.

Visual Receptors:

There is a considerable degree of residential receptors in the study area, such as within the aforementioned Urban landscape unit, followed by the Lordship-Gyles Quay landscape unit. However, in several locales there are numerous residences along local roads, many of which are on elevated/partially elevated terrain with longer-distance views out over Dundalk Bay, the Irish Sea and/or Carlingford Lough. These residential receptors are highly susceptible to changes in views and in visual amenity.

Also highly susceptible to visual change would be viewers at:

- The 22 No. scenic designations.
- Bellurgan Park and Ballymascanlon House.
- Publicly accessible archaeological sites, such as Proleek Dolmen and Proleek wedge tomb.
- Holiday makers, including those visiting Gyles Quay Caravan Park, Ballymascanlon House or Carlingford's medieval town centre.
- Those indulged in outdoor activities, such as receptors walking/ trekking any of the aforementioned trails on the national trail register, or golfers using either Ballymascanlon or Greenore Golf Course.

However, in each case, a subsequent Visual Impact Assessment should consider the nature of that visual change and how it may or may not impact the inherent visual amenity of the scene. Such an Assessment should also consider the distance of the proposed development from visual receptors, as well as how it may or may not change the visual character of the setting.

5.1.4.5 Landscape & Visual Value and Character: Constraints and Opportunities

Valued elements of the landscape can be inferred from designations, such as the Heritage Landscape designations, or designations relating to cultural historical interest. However, in addition to formal designations at international, national and local level, the *Guidelines for Landscape and Visual Impact Assessment* (2013), recommend the use of a number of criteria

which can help to assess landscape values. These are listed below and include, but are not limited to:

- Landscape Quality/Condition
- Heritage/Conservation interests
- Scenic Quality
- Rarity
- Perceptual aspects
- Recreation Value

Landscape Values are determined by reference to the landscape designations, as well as the above criteria. The important and valued elements and characteristics of the landscape and visual amenity identified above have, in some cases, the potential to be seen as opportunities rather than constraints. In these cases, the potential for a landscape element to be an opportunity, rather than a constraint, depends on the route design and treatment of particular areas where potentially sensitive receptors are located.

However, the very purpose of a Greenway project is to introduce and allow users enjoy and interact with the landscape resource in a way that is appropriate and sensitive. Therefore, some landscape characteristics can be listed both as an opportunity and a constraint. In fact, less sensitive, less aesthetic, more robust areas in a landscape may not be a suitable location for a Greenway, due to lack of interest.

The characteristics of the relevant planning context constraints and opportunities were set out in Section 5.1.4.3. In some cases, characteristics were listed as both an opportunity and a constraint. In addition, several of these characteristics are also understandably present as inherent elements of the landscape and visual characteristics of the study area, as identified and described in Section 5.1.4.4, above, and set out in Table 5.1.4.1 and 5.1.4.2, below.

Table 5.1.4.1 Landscape characteristics of the study area: constraints & opportunities (To be read in conjunction with Section 5.1.4.3 and 5.1.4.4, above)

Landscape characteristics	Constraints	Opportunities
Landscape Units		
Urban Landscape Unit	• Centuries-old centres of Dundalk and Carlingford have a distinct sense of place that a Greenway must respect and enrich, without detracting from the townscape character and anthropocentric visual amenity. • The Architectural Conservation Areas (ACAs) of Dundalk, Carlingford and Greenore are likely to constrain Greenway	• In the context of the study area, Dundalk and Carlingford present a 'natural' start-finish point for a Greenway, and the associated/ancillary services supporting it. • A Greenway starting/ ending in Carlingford will be experienced as a 'natural' extension of the existing Omeath-Carlingford Greenway. • A Greenway starting/ ending in Dundalk will be supported by the town's multiple bus and train

Landscape characteristics	Constraints	Opportunities
	development in those areas of these town/village centres. • Dundalk's riverside and bay side setting may present potential water access and/or safety issues (e.g. accidentally falling in).	services, as well as its vicinity to the M1 and wider active travel infrastructure. • Picturesque qualities of the historic urban centres are likely to incentivise Greenway users. • Carlingford's setting upon Carlingford Lough and its numerous historic buildings of notable heritage significance are likely to prove an additional draw to Greenway users. • The existing riverside and bay side infrastructure at and near Dundalk (e.g. bridges, quays, and waterside footpath extending to Soldiers' Point) and Carlingford allow for potential Greenway ancillary features. • The presence of the former L&NWR line at Dundalk, Greenore and Carlingford is likely to encourage the planning and construction of the Greenway along sections of the former rail corridor.
Dundalk Bay	• This bay will present sizeable obstacles to the Greenway that may require the construction of bridges and/or elevated waterside infrastructure and/or the widening of bridges. • The multiple NPWS designations (including an SAC & SPA) within and adjoining the bay, may be problematic. • Lowland fields adjoining the Bay can be prone to flooding during spring tides, as well as often being marshy underfoot at other times of year. This is likely to inhibit development at these locations. • Potential water access and/or safety issues (e.g. accidentally falling in).	• The estuarine setting of the Bay generates a palpable degree of scenic amenity and a desirable sense of place for a Greenway. • Variety between the Castletown and Flurry River estuaries of the inner bay and the more typically 'coastal' outer bay, adds to the scenic draw, and range of compatible outdoor activities (e.g. boating, fishing, kayaking etc). • The abundant birdlife (i.e. several dozen bird species) across the bay are likely to provide an additional draw for Greenway users. • The precedent of the former L&NWR line (including remaining rail line embankments and bridges) over almost 7km of this landscape unit is likely to

Landscape characteristics	Constraints	Opportunities
		incentivise the planning and construction of the Greenway along sections of the former rail corridor.
Elevated Agricultural Landscape Unit	• Likely challenging or steep terrain (in a greenway context). • As the alignment of the former L&NWR did not/does not enter into this landscape unit, there are no sections of any such pre-existing, off-road corridor that could further incentivise the planning and construction of the Greenway in this unit. • The high incidence of narrow, winding local roads, in tandem with linear residential development, is likely to impact on Greenway planning. • Most areas of this unit are likely to be, comparatively a little more distant or indirect, for a Greenway route between Dundalk Bay and Carlingford. When comparing to other landscape units. it may encourage Greenway users onto the existing road network to take a quicker, more direct, less safe, alternative route.	• Roads in this unit often experience aesthetic, south-facing slopes (looking over Dundalk Bay and the Irish Sea) and east facing slopes (looking over Carlingford Lough, backdropped by the Mourne Mountains). • No sensitive ecological designations present. • Relative proximity of Cooley Mountains helps generate further aesthetic and recreational draw for Greenway users. • The presence of multiple trails adds to the range of compatible outdoor activities (e.g. walking/ hiking).
Lowland Agricultural Landscape Unit	• The narrowest section of the study area (i.e. between coastline and northern study area), curtailing the variety or distinctiveness of potential Greenway route options available. • The M1 adjoins the far northwest of this unit, while the busy R173 traverses large sections. These are heavily used transport corridors that are unlikely to encourage the	• Mostly gentle, low-lying and unchallenging terrain (for Greenway users). • Several areas within the unit have views of the Irish Sea and/or Carlingford Lough, generating considerable visual amenity. • The precedent of the former L&NWR line (including remaining rail line embankments and bridges) for over 8.5km of this landscape unit is likely to incentivise the planning and

Landscape characteristics	Constraints	Opportunities
	presence of Greenway users in the vicinity.	construction of the Greenway along sections of the former rail corridor. • This unit is bordered by the population centres of Dundalk, Greenore and Carlingford. This is more likely to ensure daily use of and 'buy in' from local communities of the Greenway.
Coastal Agricultural Landscape Unit	• As the alignment of the former L&NWR did not/does not enter into this landscape unit, there are no sections of any such pre-existing, off-road corridor that could additionally incentivise the planning and construction of the Greenway in this unit. • As a potential Greenway route, most areas of this unit are likely to be, comparatively, a little more distant or indirect, for a Greenway route between Dundalk Bay and Carlingford, in comparison to most other landscape units (i.e. it may incentivise Greenway users to take a quicker, more direct, less safe alternative route along roads outside this unit). • Trees and other tall vegetation are less apparent in this unit, meaning there is likely to be less shelter for Greenway users. • The Whitestown ACA is likely to constrain Greenway development at this small hamlet.	• Mostly gentle, low-lying and unchallenging terrain (for Greenway users). • Most areas within the unit have aesthetic views of the Irish Sea, while public roads adjoin Ballagan Bay and Whitestown Beach. • The coastal, (often) windswept and rugged sense of place is likely to incentivise many Greenway users. • Presence of publicly accessible archaeological remains, including early-Christian remnants.
Lordship-Gyles Quay Landscape Unit	• This unit is characterised by an intensity of residential development, followed by open-cast quarrying and low-level industrial development. These are factors that are not typically supportive of a Greenway's success.	• The relatively high population base in this unit is more likely to ensure daily use of and 'buy in' from local communities of the Greenway. • Gyles Quay and its associated caravan park and adjacent beach are likely to attract Greenway users.

Landscape characteristics	Constraints	Opportunities
	• The second narrowest section of the study area is present (i.e. c. 900m, between the coastline and the northern study area), curtailing the variety or distinctiveness of potential Greenway route options available.	• Mostly gentle, low-lying and unchallenging terrain (for Greenway users). • The precedent of the former L&NWR line (including remaining rail line embankments and bridges) across the full width of this landscape unit is likely to make this corridor an attractive location for the Greenway utilising sections of the former rail corridor.
Landscape Sub-Units		
River Valley Landscape Sub-Unit	• New bridges are likely to be needed to cross these rivers and their highly localised, often steep-sided glens. • Felling of trees to accommodate greenway should be avoided if feasible alternatives can be sought. • Dead or dying trees (i.e. Category U trees) may present a risk to Greenway users, particularly in high winds.	• Rivers and trees are high quality visual elements in the landscape. They strongly contribute to visual amenity value in the landscape as well as of immense ecological value. • Potential to link in with forest interests and activities, and their ecological and human health value. • Allows for shelter and shade for users of Greenway during more extreme weather.
Ready Mixed Concrete Landscape Sub-unit	• Challenging terrain. • Notably low landscape and visual value is not conducive to Greenway users. • Greenway will need to divert, where possible, away from this sub-unit.	• No opportunities identified
Trumpet Hill Landscape Sub-Unit	• Felling of any trees to accommodate greenway should be avoided if feasible alternatives can be sought (e.g. a Greenway could fringe the woodland, rather than dissecting through it). • Dead or dying trees (i.e. Category U trees) may present a risk to Greenway users, particularly in high winds.	• Such woodland engenders the diversity and richness of experience that is conducive to users. • Potential to link in with current recreational activities in the woodland, and their ecological and human health value. • Allows for shelter and shade for users of Greenway during more extreme weather.

Landscape characteristics	Constraints	Opportunities
Demesne Heritage Landscape Sub-Unit	• Felling of any trees to accommodate greenway should be avoided if feasible alternatives can be sought (e.g. a Greenway could fringe theses demesnes, rather than dissecting through it). • Dead or dying trees (i.e. Category U trees) may present a risk to Greenway users, particularly in high winds. • Multiple heritage buildings and megalithic structures should not be deleteriously affected by presence of Greenway. Effects on views to these elements would need to be considered.	• Built heritage provides a sense of identity and distinctiveness and provide historic character, creating a further draw for Greenway users. • Inclusion of items in the Record of Protected Structures indicates that they are recognised and valued at a national level. This could provide a further draw to Greenway users. • Potential to link in with current recreational interests and activities, as well as the restaurant or accommodation options, within Bellurgan Park and/or Ballymascanlon House. • Proleek Dolmen and the Proleek Wedge tomb are likely to incentivise Greenway users to visit this sub-unit.

Table 5.1.4.2 Visual characteristics of the study area: constraints & opportunities (To be read in conjunction with Section 5.4.4.2 and 5.4.4.3, above)

Visual characteristics	Constraints	Opportunities
Visual Amenity and Visual Receptors		
Views and visual amenity enjoyed by Residential Receptors	• Avoid causing disturbance to the existing visual amenity of residential dwellings and those using the existing road network. • Existing views of Dundalk Bay and/or Irish Sea and/or Carlingford Lough should not be obscured or degraded by views of the Greenway.	• One lower-lying terrain within the study area, the residents (and other viewers) along the local roads tend to experience more enclosed, intimate views due to screening by trees and hedgerows. • A Greenway may be visible by residential receptors, but it does not, by default, necessarily result in any discernible reduction or degradation of the inherent visual amenity of these scenic designations (i.e. it will depend on proximity, context, scale and setting, among other factors).

Visual characteristics	Constraints	Opportunities
		• The proposed greenway benefits from the same beauty and diversity of the visual features that residential receptors within the study area enjoy. This adds to the attractiveness of the greenway and will contribute to its success.
Protected Views/Scenic Routes (see Section 5.4.4.1)	• There are 22 No. protected views and scenic routes within the study area. The inherent visual amenity of these locations should not be reduced or degraded. • The Greenway should avoid large scale and inappropriate landscape changes which may be visible from these protected views.	• Because a Greenway may be visible from such a scenic designation, it does not, by default, necessarily result in any discernible reduction or degradation of the inherent visual amenity of these scenic designations (i.e. it will depend on proximity, context, scale and setting, among other factors). • Multiple scenic designations within the study area underline the aesthetic setting of the proposed Greenway; This is underscored within the project objectives, which seek to promote scenic route options.

5.2 Artificial Constraints

5.2.1 Land Use and Planning

The study area of the proposed development is contained within the administrative area of Louth County Council. Land use zonings identified within the planning policy documents for Co. Louth, namely the Louth County Development Plan 2021-2027 were reviewed.

The land use designations within Dundalk and Carlingford are typical of those found in urban areas, such as town or village centre, community facilities, residential tourism, public infrastructure, and open space land uses. Dundalk is a larger town and includes additional land use zonings such as general employment, business and technology, regeneration and mixed use.

The study area outside these towns is dominated by pasture and non-irrigated lands. The site also includes forests, cultivation lands, and discontinuous urban fabric. The Code of Practice for National and Regional Greenways requires that state-owned lands are mapped at Constraints Study phase to maximise their use in the development of options. There is however minimal state-owned lands within the study area, all of which are at the northern extremity of the study area as shown in Figure 5.2.1.1 below.

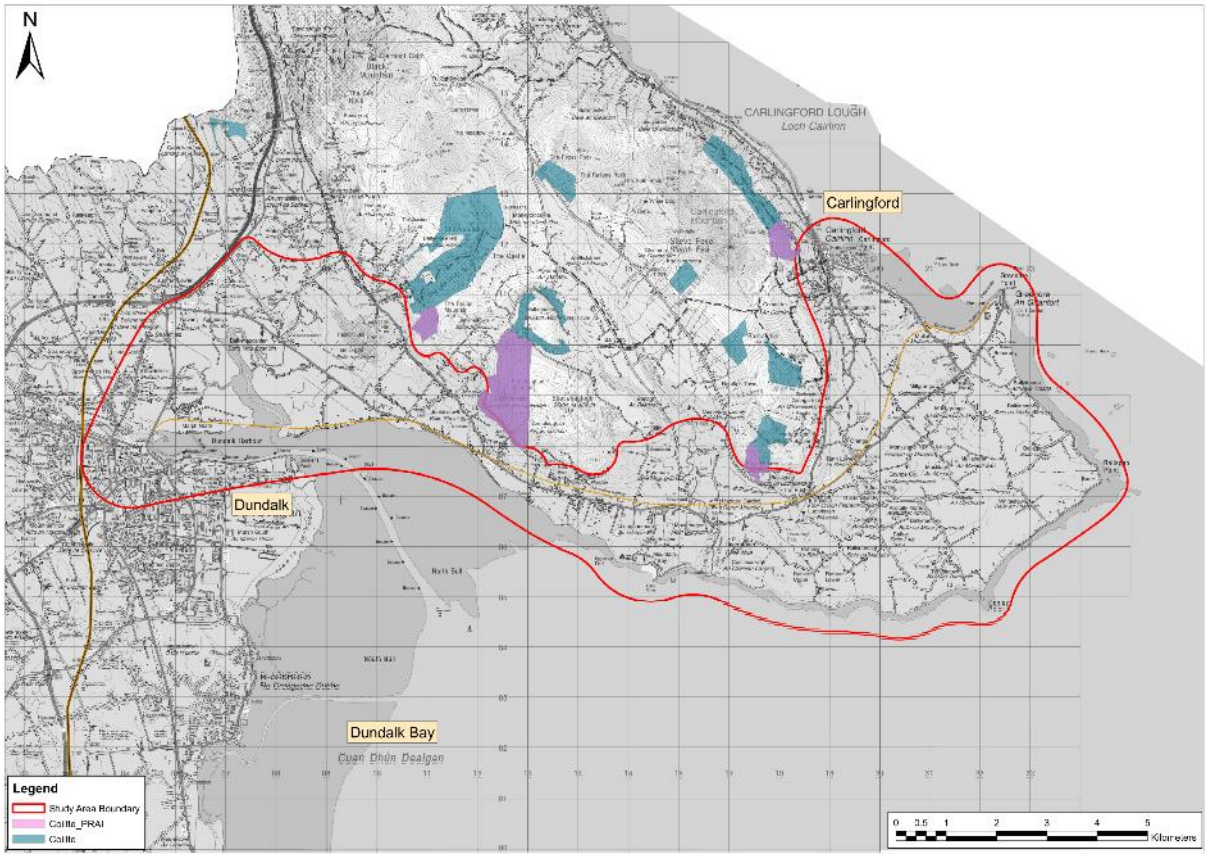

Figure 5.2.1.1 State-Owned Lands

The discontinuous urban fabric lands are located in areas namely Jenkinstown, Lordship, and Riverstown. The land use of Greenore townland located within the study area consists of industrial and commercial units along with sport and leisure facilities.

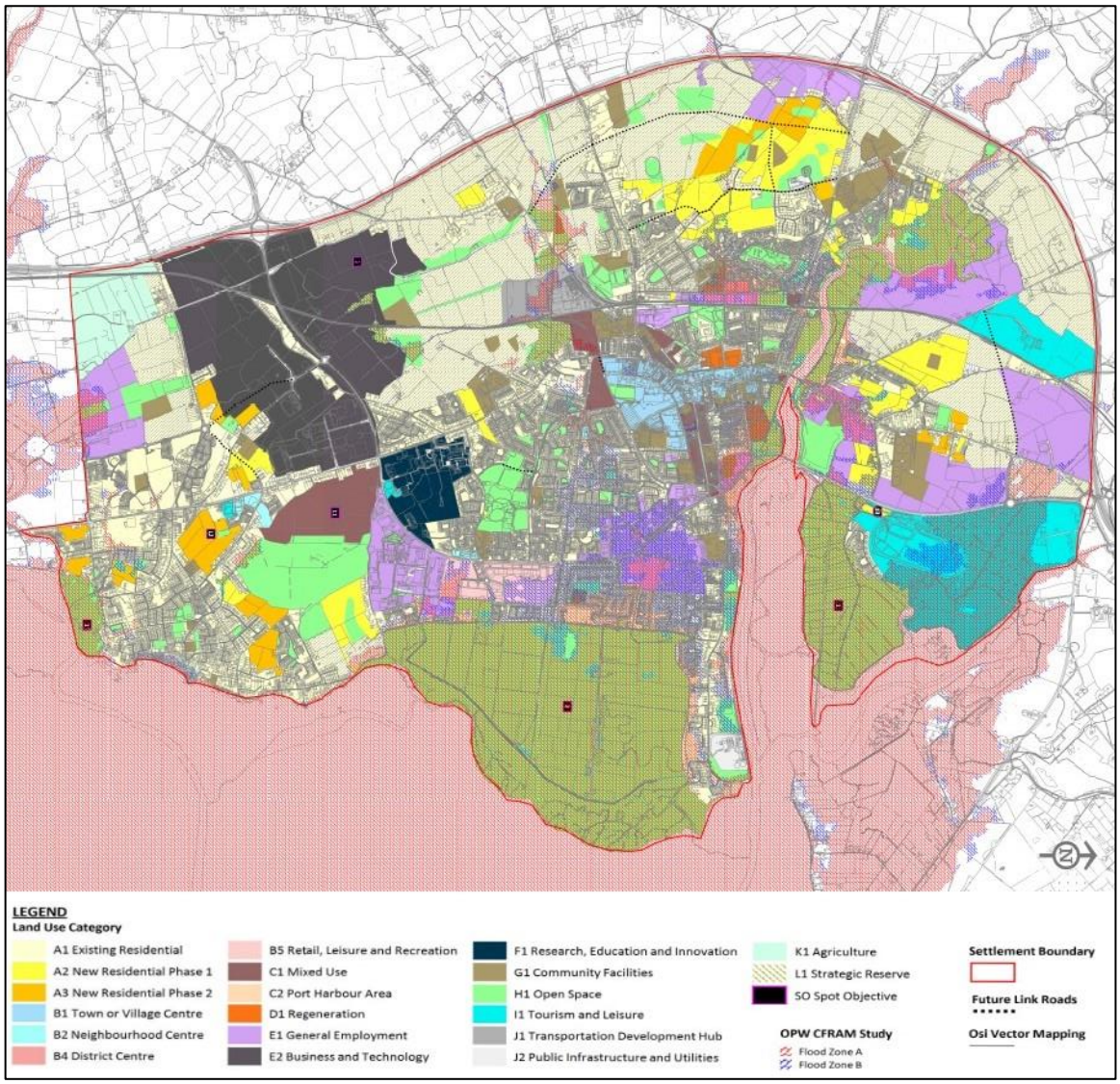

Figure 5.2.1.2 Land Zone Mapping from Louth County Development Plan 2021-2027- Dundalk

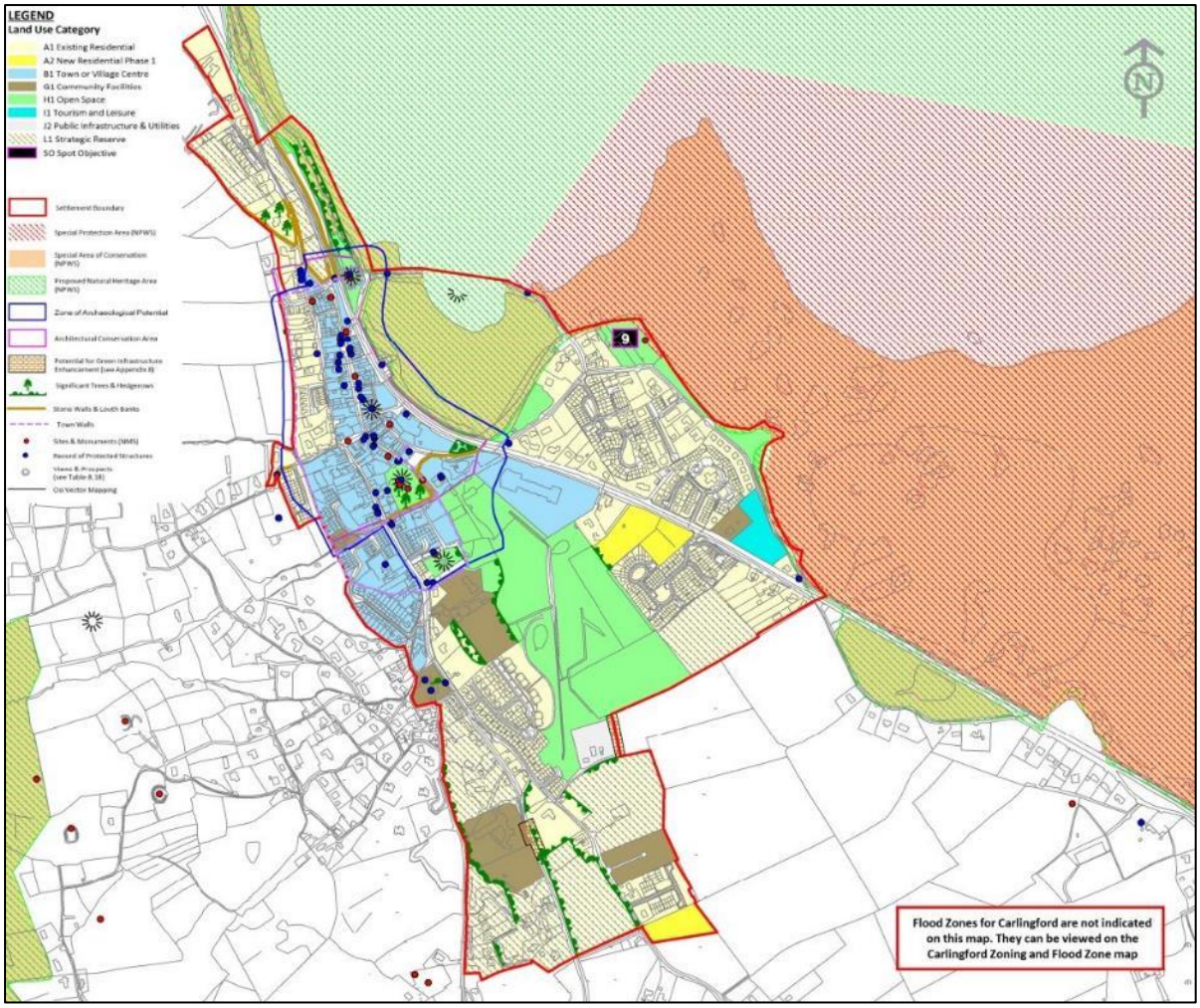

Figure 5.2.1.3 Land Zone Mapping from Louth County Development Plan 2021-2027-Carlingford

5.2.2 Engineering

5.2.2.1 Introduction

As part of the Constraints study for the proposed Dundalk to Carlingford Greenway project, a thorough desktop study has been carried out for the study area.

5.2.2.2 Watercourses

A comprehensive desktop study has been conducted across the entirety of the study area with the purpose of identifying watercourses and water crossing infrastructure. The study area encompasses three prominent rivers, River Castletown, River Little and River Flurry. Moreover, the study area is located alongside Carlingford Lough, Castletown Estuary and Dundalk Bay.

The primary rivers flow near settlement areas, encompassing Dundalk and Ravensdale, while coursing between the mountains of the Cooley Peninsula.

Given that the settlements and local road network are situated along these rivers, there are some established watercourses crossing points to ensure connectivity. Such watercourse crossing infrastructure includes modern bridges and culverts, pedestrian bridges, and stone arch bridges, along the local and regional roads.

5.2.2.3 Pedestrians and Cyclists

As a part of the constraints study, this section includes the study of current and proposed pedestrian and cycle facilities that requires consideration for the proposed Dundalk to Carlingford Greenway project.

Apart from the towns of Dundalk and Carlingford, which have footpaths and some cycle facilities, and limited footpaths within villages and other urban areas, there is a general lack of pedestrian and cycle infrastructure in the study area. The regional roads R173, R174, and R175, as well as the local road network, have limited or intermittent designated facilities for pedestrians or cyclists, such as footpath, cycle lanes, or shared paths. This poses a challenge for the safety and comfort of non-motorised road users, especially along the busy Regional Roads and narrow Local roads, where they have to share the space with fast-moving vehicles.

There are however several walking and cycling trails located partially or wholly within the study area mentioned below:

- **Slieve Foye Loop walk-** The Slieve Foye Loop is a scenic walking trail takes up to the mountains slopes above Carlingford. This 9km stretch loop starts and ends in Carlingford and encompasses Slieve Foye, a mountain on the Cooley Peninsula, offering stunning views of Carlingford Lough and the Mourne Mountains. The loop is known for its diverse landscapes, including forests, heathland, and rocky terrain. The Carlingford sections of the loop are located within the study area.
- **Táin Way:** Táin Way is a 40km long circular walking route that loops around Carlingford Mountain and its western outliners. The route starts and ends in one of the three locations; Carlingford, Omeath, and Ravensdale. The trail meanders through diverse landscapes, including coastal paths, rural farmland, and historic sites associated with the story tale. A few sections of the route, including Carlingford and R174 are located within the study area.
- **Carlingford Lough Greenway:** The first section of this greenway was developed from Carlingford Marina to Omeath in the year 2013. The 7km long greenway is suitable for both walkers and cyclists. The second section of the project comprises the creation of 10.1km of new cross-border Greenway, linking Newry City in Northern Ireland to Carlingford in Ireland. A section of the Carlingford to Omeath part of the greenway is located within the study area.
- **Barnevave Loop Walk:** Barnevave loop walk is a 14 kilometres long loop walk that begins and ends in Carlingford and takes to Barnevave, a peak in the Cooley Mountains in County Louth. The Carlingford section of the loop is located within the study area.
- **Annaloughan Loop Walk:** This route is located near Jenkinstown, County Louth. The loop walk spans approximately 8km and leads to the Annaloughan Mountain, offering rural landscapes and coastal views. The loop walk section around Jenkinstown is located within the study area.
- **Grange Loop walk:** The Grange loop walk is approximately 7km long and is located near the Grange village in County Louth. This is a well signposted countryside loop that showcases views of Carlingford Lough. The loop walk section around Grange village is located within the study area.

5.2.2.4 Public Transport

Rail Network

The Rosslare Europort to Dundalk (A605) train service, provided by Iarnrod Eireann, operates along the route from Dublin to Dundalk. Other rail service that connects Dublin to Dundalk is Dublin Connolly to Belfast (A124). There is no rail service to Carlingford.

There are 16 train services per day between Dublin and Dundalk in both directions, with a journey time of around one hour. The trains depart from Dublin Connolly and stop at Drogheda, Dunleer, Castlebellingham and Dundalk Clarke stations. The first train leaves Dublin at 6:15 am and the last train leaves at 11:30 pm. The first train leaves Dundalk at 5:25 am and the last train leaves at 10:40 pm.

According to the NTA National Rail Census 2022, Dundalk station had an average daily footfall of 3,456 passengers, making it the sixth busiest station in the country. The majority of the passengers (2,738) travelled to and from Dublin, while the rest (718) travelled to and from other destinations, such as Drogheda, Belfast, or Newry. The peak hours were between 7 am and 9 am, and between 4 pm and 6 pm, when the trains were almost at full capacity. The data indicated that the mean daily footfall on Saturdays was 2,184 passengers, while on Sundays it was 1,938 passengers. This is a reduction of approximately 37% and 44%, respectively, compared to the weekdays. The most frequented destinations on the weekends were Dublin, Drogheda, and Belfast. The peak hours on the weekends were between 10 am and 12 pm, and between 6 pm and 8 pm.

Bus network

The bus network within the study provides local and intertown connectivity. The bus services are available through public and private transport service providers such including TFI, Bus Eireann, Halpenny Travel.

- **Local network**- Bus Eireann Routes 174, 174A and 174B provides daily local connectivity within Dundalk.
- **Inter town network**- Bus Eireann Route 161 provides local connectivity services every two hours between Dundalk to Carlingford, and other towns including Jenkinstown, and Lordship, located within the study area.
- TFI provides Sunday and Friday weekly bus services between Dundalk and Carlingford.
- Bus Eireann Routes 160 and 161 provides daily connectivity between Dundalk and Newry. Bus route 161 also connects Dundalk to Newry via Carlingford.
- **Town-city network**- Bus service provide direct routes including 100X, and 900 by Bus Eireann and Mathew Coach connecting Dundalk to Dublin.

There is no direct connectivity between Dublin and Carlingford.

Marine Transport

The Carlingford Lough Ferry is a vehicle and passenger ferry service across Carlingford Lough connecting Cooley Peninsula in the Republic of Ireland to Mountains of Mourne in Northern Ireland. This weekend service operates from Greenore, County Louth, to Greencastle, County Down, Northern Ireland.

The Greenore ferry operates on a seasonal basis, with more frequent sailings during the summer months from 9 am to 6:00/7:00 pm (last sailing). In October the ferry service only operates at weekends, with no service from November to March.

5.2.2.5 Existing built infrastructure

Settlement Study

Four settlements, namely Dundalk, Jenkinstown, Rampark and Carlingford located wholly or partially within the study area.

There are eleven Electoral Divisions (EDs) located wholly or partially within the study area which also encompass these settlements, namely-

- Carlingford ED
- Greenore ED
- Rathcor ED
- Jenkinstown ED
- Ballymascanlan ED
- Dublin Rural (North) ED
- Dundalk Rural (South) ED
- Dundalk No. 1 Urban ED
- Dundalk No. 2 Urban ED
- Dundalk No. 3 Urban ED
- Dundalk No. 4 Urban ED

Existing bridges

Dundalk has a total of four bridge crossings over the Castletown River, one of which is a railway bridge. The three road bridges connect the town by passing over the river Castletown, include the Dundalk bridge (ref no. 13701005) and St. Johns bridge (ref no. 13900741) which are protected structures and the Tain bridge.

5.2.2.6 Planning

Several planning applications have been lodged within the study area between the year 2013-2023. These are shown on Drawing no. D2CG-RODA-EGN-SW_AE-DR-EN-100023 in Appendix A.

5.2.2.7 Utilities

There are utilities provided throughout the study area. These consist of:

- Electricity Transmission and Supply - ESB
- Gas Supply (within Dundalk) – Gas Networks Ireland
- Water Supply – Uisce Éireann
- Telecommunications – Eir, Fibre and mobile telecommunications
- Wastewater - Uisce Éireann
- Stormwater – Louth County Council

Crossing of these utilities is unavoidable due to the length of the scheme however it is proposed to avoid these utilities where possible particularly in the case of high voltage 38kV electricity transmission lines where it would be proposed to move the cycleway to avoid these utilities. Where roads need to be realigned to accommodate the greenway utilities will be relocated where necessary.

There is a ESB sub-station located north of Grange, which has a high proportion of overhead low voltage and high voltage supplies.

There are three waste water treatment plants located within the study area at Dundalk, Carlingford and Greenore. It should be expected that there will be pumping stations for rising mains to connect the foul sewers to these treatment plants at some locations, however in the more rural areas, septic tank drainage solutions are expected.

5.2.2.8 Topography

The study area is dominated by the undulating terrain of Cooley Peninsula to the north and bordered by a coastline to the south. The design guidelines for greenways restrict the longitudinal gradient to 3%, with a relaxation permitted to 5% for lengths of 150m or less. The study area contains mountainous and hilly landscape within and to the north of the study area, where it is restrictive for the development of greenway routes to achieve compliance with design standards.

The existing soil condition of the study area showcases large areas with salt marshes in Dundalk and Carlingford coastlines. The site also includes small patches of peat bogs. Both salt marshes and peat bogs have delicate soil structures which are unfit for construction. Designing structures like boardwalk or elevated pathways might be required if the greenway passes through these soil conditions.

The study area includes rivers, lakes, estuary, and coastlines, which makes it vulnerable to flooding especially in Dundalk, Greenore and Carlingford. To ensure safety and durability of the greenway, measures such as bridges, culverts and elevated pathways, erosion control, and avoiding construction in high-flood risk areas will be needed. These will ensure that the greenway does not exacerbate any existing flooding experienced.

5.2.2.9 Coastal Erosion

This section examines the coastal divisions within the study area, based on previous coastal erosion studies that have been undertaken on behalf of Louth County Council.

The coastline at Greenore is approximately 3km in length running from the southern end of the Carlingford Lough to the Greenore Point. The area is characterised by a low-lying coastal plain that is protected from the sea by a series of engineered defences, including seawalls, groynes, revetments, and embankments. The main assets at risk in the area are the residential and commercial properties, the Greenore Port and Ferry Terminal, the disused railway line and the road network.

The study found that the existing defences in Greenore are in poor condition and have a high probability of failure under the present-day conditions. The failure of the defences could result in widespread flooding and erosion of the coastal plain. The study also projects that the risks will increase in the future due to the effects of climate change, such as sea level rise, increased storminess, and wave height.

Considering the coastline at Templetown, which covers approximately 4 km from the Whitestown Stream to the eastern end of the Carlingford Lough. The area is characterised by a high cliff line that is composed of glacial till and sandstone, and a narrow strip of beach that is backed by a low-lying hinterland. The main assets at risk in the area are the residential and agricultural properties, the Templetown Church and Graveyard and the road network.

The previous studies found that the existing cliff line in Templetown is highly susceptible to erosion and instability, due to the presence of weak and erodible materials, groundwater seepage, and wave undercutting. The erosion and instability of the cliff could result in landslides, rockfalls, and debris flows. The study also projected that the risks will increase in

the future due to the effects of climate change, such as sea level rise, increased storminess, and wave height.

The European Union track based on satellite data erosion of the coastline. Figure 5.2.2.1 below shows where coastal erosion, accretion or where the coastline is stable. The red dots indicate erosion, with the green accretion, with the yellow dots indicating a stable coastline. As can be seen from Figure 5.2.2.1, the majority of the coastline is subject to erosion.

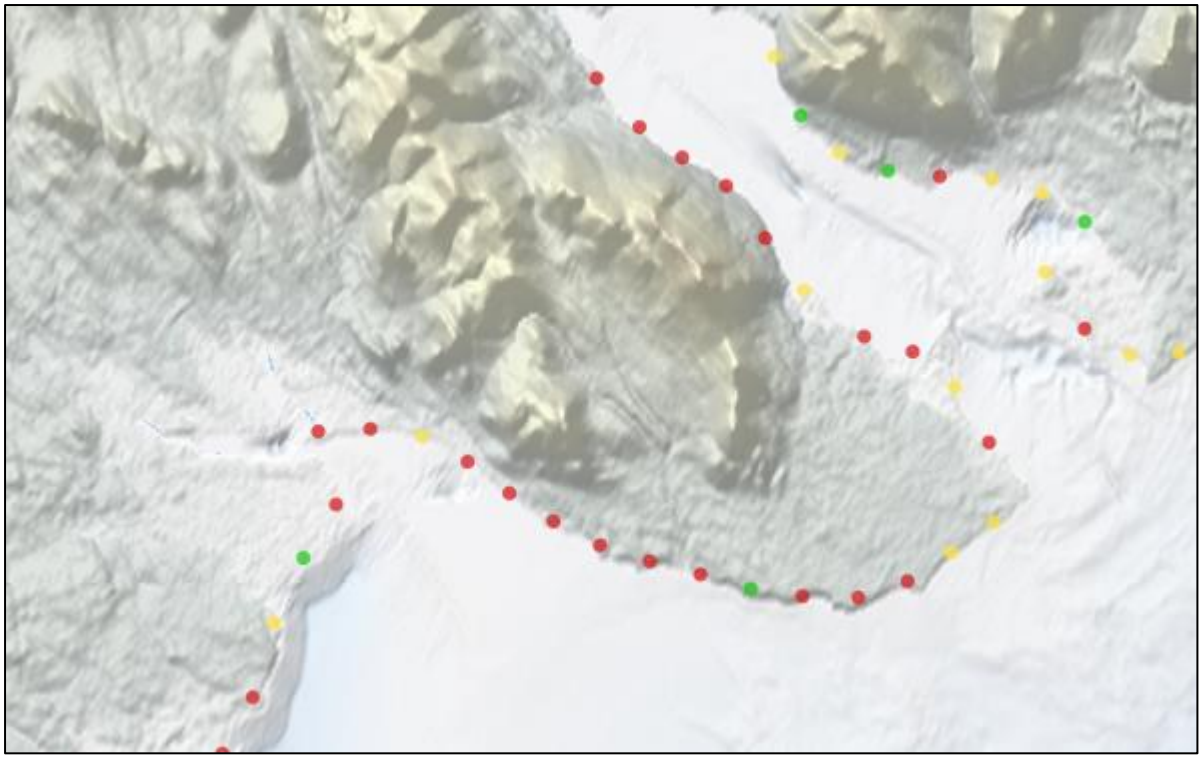

Figure 5.2.2.1 Coastal Erosion Mapping from EU

Louth County Council are progressing two coastal protection schemes, namely the Bellurgan Point Coastal Protection Works and Ballynamony Coastal Protection Works. The planning application for these works have been submitted to An Bord Pleanála under a Section 177AE of the Planning and Development Act 2000 (as amended).

These schemes consist of areas of stabilisation of the existing shoreline through the provision of rock armour over a 450m length (Bellurgan) and repairs/replacement of the existing sea wall over a 600m length (Ballynamony) and will address some of the coastal erosion that has been occurring at these locations.

5.2.3 Archaeological, Architectural and Cultural Heritage

5.2.3.1 Introduction

This archaeological, architectural and cultural heritage study examines the possible constraints to be considered by the proposed Dundalk Bay to Carlingford Greenway project. The purpose of this section is to provide an overview of the cultural heritage potential of the constraints study area by examining the available sources and to identify the issues this potentially presents for the development of the scheme. The information provided will allow the design team to make informed route selection decisions based on cultural heritage information at the earliest stages of the scheme development.

The objective for the cultural heritage constraints study is to provide a high-level understanding of the key constraints within the study area. It is a tool to ensure that all recorded cultural heritage sites are considered alongside other environmental constraints at the earliest possible stage of the greenway planning process and that consideration is given to all alternatives.

This report will provide an archaeological and historical background to the area and will highlight the designated archaeological sites and sites of architectural heritage significance within the defined constraints area. It aims to establish as far as the records allow the archaeological and cultural / built heritage potential of the study area and to highlight if there are any implications for the development of the greenway. The information contained within the constraint study will be used to assist the decision-making process and inform the design and planning of the scheme.

The study will also take account of the opportunities for the enhancement of the cultural heritage environment through the provision of a greenway. This may occur through the use of heritage signage, increased visibility and awareness of heritage sites, and the development of a sense of place that is integral to the cultural heritage of an area.

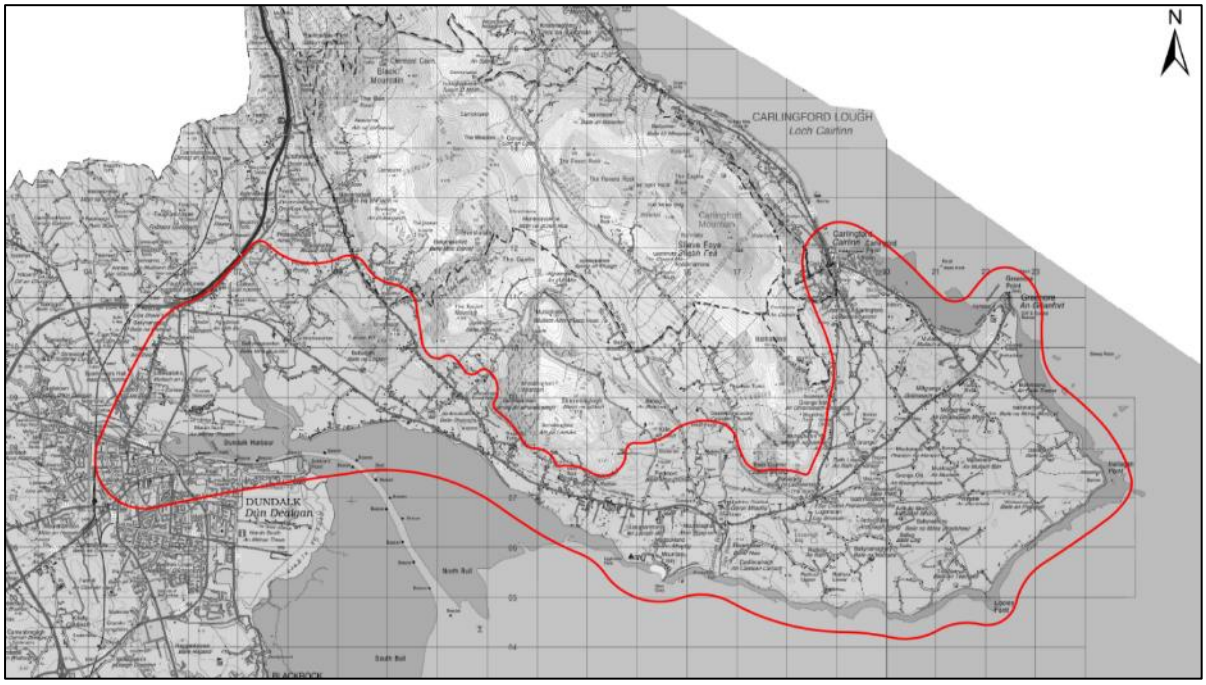

Figure 5.2.3.1 Map of Constraints Area

The study area (see Figure 5.2.3.1) comprises a large swath of land that runs from Dundalk town in the west and follows the coast eastward to encompass all of Carlingford. More detailed assessment will be provided at the options assessment stage. This study should be read in conjunction with Drawing no. D2CG-RODA-EGN-SW_AE-DR-EN-100016 to 100019 in Appendix A in order to understand individual feature's locations within the study area.

5.2.3.2 Methodology

The constraints study involved the compilation and mapping of available cultural heritage sources to create an inventory of cultural heritage features which will form the basis for the Cultural Heritage Dataset (CHD) in future phases of the assessment. The outputs of the project included GIS layers and the creation of a database for archaeology, architectural heritage and, as far as possible, for cultural heritage, as well as associated mapping. This

forms a permanent renewable database that can be utilised by multiple specialist users to provide information for the project design and EIA process.

The constraints study is primarily desk-based but was augmented by a windshield survey (or drive-by inspection). This involved a visit to accessible archaeological sites and architectural / cultural heritage features of note within the study area. The inspection also enabled a broad examination of the landscape and general locality within the study area.

Future phases of assessment will include field walkover survey and consultation with statutory and non-statutory bodies. All relevant designated heritage assets will be mapped in preparation for the field assessment stage and inventories of all relevant heritage constraints will be prepared. The ongoing evaluation process ensures that all designations relating to heritage assets as well as cultural heritage features that are revealed through research, field assessment and consultation are clearly articulated.

A review of the following information took place in order to inform the cultural heritage report:

- UNESCO World Heritage Sites (WHS) and Tentative World Heritage Sites and those monuments on the tentative list;
- National Monuments in State care, as listed by the National Monuments Service (NMS) of the Department of Housing, Local Government and Heritage (DHLGH);
- Sites with Preservation Orders;
- Sites listed in the Register of Historic Monuments;
- Record of Monuments and Places (RMP) and the Sites and Monuments Record (SMR) from the Archaeological Survey of Ireland; The statutory RMP records known upstanding archaeological monuments, their original location (in cases of destroyed monuments) and the position of possible sites identified as cropmarks on vertical aerial photographs. Archaeological sites identified since 1994 have been added to the non-statutory SMR database of the Archaeological Survey of Ireland (National Monuments Service, DHLGH), which is available online at www.archaeology.ie and includes both RMP and SMR sites. Archaeological sites identified since 1994 are placed on the SMR and are scheduled for inclusion on the next revision of the RMP;
- Record of Protected Structures (RPS) in the Louth County Development Plan (2021-2027) (Louth County Council 2021);
- County Councils Architectural Conservation Areas (ACAs) and their statements of character;
- National Inventory of Architectural Heritage (NIAH) Building Survey (NIAH ratings are international, national, regional, local and record, and those of regional and above are recommended for inclusion in the RPS);
- National Inventory of Architectural Heritage (NIAH) Garden Survey (paper survey only);
- A review of the Topographical Files held in the National Museum of Ireland;
- Cartographical Sources, OSi Historic Mapping Archive, including early editions of the Ordnance Survey including historical mapping (such as Down Survey 1656 Map);
- The Irish archaeological excavations catalogue i.e., Excavations bulletin and Excavations Database;
- Place names; Townland names and toponomy (loganim.ie);
- National Folklore Collection (Duchas.ie);
- The Ship Wrecks Database available on the National Monuments Service 'Wreck Viewer';
- Louth County Development Plan (2021-2027) (Louth County Council 2021);

- Carlingford Local Area Plan 2021-2027 (Louth County Council 2021);
- Carlingford Town Walls Conservation Management Plan (Louth County Council 2008)
- A review and interpretation of aerial imagery (OSI Aerial Imagery 1995, 2000, 2005, Aerial Premium 2013-2018, Digital Globe 2011-2013, Google Earth 2001–2023, Bing 2023) to be used in combination with historic mapping to map potential cultural heritage assets.
- A review of existing guidelines and best practice approaches.
- A bibliography of sources used is provided in the References section.

Legislation, Standards, Guidelines and Policy

The cultural heritage impact assessment for the project will be guided by the methodologies outlined in the 'Guidelines for Cultural Heritage Impact Assessment of TII National Road and Greenway Projects' (TII 2024), and 'Code of Practice for Archaeology agreed between the Minister for Arts, Heritage, Regional, Rural and Gaeltacht Affairs and Transport Infrastructure Ireland' (2017).

The Historic and Archaeological Heritage and Miscellaneous Provisions Act 2023 was enacted in October 2023 and while this Act is now law, most of its provisions will not enter into force until the Minister for Housing, Local Government and Heritage has made one or more Commencement Orders. This means that the National Monuments Acts have therefore not yet been repealed and remain in force.

5.2.3.3 Receiving Environment

Archaeological and Historical Background

Prehistoric

County Louth is a long-settled place, with evidence of at least intermittent human occupation since the Mesolithic. The earliest evidence dates from circa 3500±110 BC, with shell middens in Rockmarshall, within the study area near Jenkinstown, testifying to the Mesolithic harvesting of molluscs (cockle, limpet, mussel and periwinkle), crabs, and fish. Several flint tools, including later Mesolithic cores and blades, were also recovered from the same site (Frazer 2003). In Haggardstown, another midden (LO012:056) may be of a similar date. Further prehistoric evidence within the study area includes the discovery of flint artifacts and waste materials found near north of Jenkinstown (NMI ref: 1978:282) as well as in Ballagan (NMI Ref: 1980:17). Thus far, Mesolithic activity is most readily visible along coasts, riversides and lake edges, and it is likely that much evidence from this period in Dundalk has disappeared beneath post-glacial estuarine and alluvial silts (Gosling 1991).

The landscape of this period was remarkably different to the well-kept farmlands seen today. At the time the landscape was almost completely clad with mixed forests, the climate was also warmer and dryer with average summer temperatures up to two degrees higher than present. Furthermore, the sea is known to have lapped as far inland as Balmer's Bog on the Dublin Road, well into the centre of what is now Dundalk town.

There are indications that the area was not densely settled until the beginning of the Bronze Age (2500 BC). The vast majority of the archaeological evidence for this period is to be found at the 4-5m (25ft) contour, which reflects the coastline during the maximum post-glacial marine transgression, and it has been suggested that this would have facilitated the exploitation of the higher ground for farming and the lower ground for summer grazing (Gosling 1993, 242). With this introduction of agriculture came an increased sense of monumentality in the landscape, indicated by the several megalithic tombs present within the study area (RMP Nos: LH004-074, LH004-075, LH004-091, LH008-033).

Our understanding of this period has been improved in recent decades by excavations conducted as part of the M1 Dundalk Western Bypass Road Scheme which took place throughout the early 2000s. Numerous sites were uncovered from this period, including six unenclosed Late Neolithic / Early Bronze Age domestic settlement sites, two polished stone axes, around 2000 sherds of Neolithic and Early Bronze Age pottery, more than 450 struck flints, nine metal items and seven worked or decorated stone objects. Many of these finds were uncovered within or directly adjacent to the western boundary of the study area, with a particular focus near Balregan henge Northwest of Dundalk (Roycroft 2004).

Early Medieval

What is now County Louth was formed from three minor kingdoms of Ard Ciannachta in the south, Crích Rois in the centre, and Maighe Muirtheimne in the north (Thornton 1997). These kingdoms roughly correspond with what became the baronies of Ferrard, Ardee and Dundalk following the Anglo-Norman invasion. The southern territory was reputedly granted to Tadhg Mac Céin in the 3rd century AD by the High King Cormac Mac Airt (Mac Iomhair 1964). The people who inhabited it became known as the Fir Árda Ciannachta. They ruled the region until the end of the 7th century, when the Uí Néill, who dominated much of Ulster and Meath, succeeded in displacing them (Thornton 1997). Crích Rois was the territory of the Fir Rois, who controlled other territories in Counties Monaghan and Meath.

The arrival of the Vikings in the late 8th century to Ireland had significant implications for Louth. It is generally accepted that the Vikings established their first permanent bases at two locations around 841, at Duiblinn (Dublin) and Linn Dúachaill (Louth) – the latter location generally being identified as Annagassen, on the south side of Dundalk Bay. The importance of Dundalk Bay as a defendable port made it ideal for short term habitation, but it seems to have been abandoned in favour of Dublin at some stage. The discovery of the earliest dated hoard of Hiberno-Norse coins at Dundalk would indicate that the area was of importance from an early date (Delaney 2010).

This period is also where the first evidence for occupation at Carlingford originates from. The name Carlingford can be attributed to the Vikings who first arrived in the area in the 9th century and called it 'Cairlinn Fjord', or 'the ford of the old woman'. The natural harbour located on the southern shore is sheltered by a rocky promontory to the north and by Slieve Foy to the west. The protection afforded by the natural harbour may have attracted transitory settlement in the form of hunting and fishing from earlier periods, however no evidence has been uncovered.

It is yet to be seen if these settlements were continually inhabited in this period, growing into the modern towns, or were abandoned following the Vikings focusing on Dublin. The prevalence of ringforts in the area, single farmstead defensive features ubiquitous across the Irish landscape, would indicate a rural agricultural landscape.

This perspective is supported by the presence of the most abundant archaeological feature in the study area, the souterrain, that can date from the early medieval era. This is an artificial underground structure built of either drystone walling and covered with large stone lintels, or cut into bedrock or hard boulder clay. The predominant type of souterrain in County Louth is the drystone build, in some cases incorporating natural bedrock for the floor or lower sections of the walls, as at Marshes Upper (Gowen 1992). They can comprise various combinations of passages and chambers with creeps connecting them and can vary from large and complex to very simple. Most Irish souterrains date from the second half of the first millennium AD and are often found in association with other sites of the early historical period, such as ringforts and early ecclesiastical sites, although a high proportion of the Co. Louth souterrains are found in isolation. It may be that the enclosure around them has been subsequently levelled or that they were deliberately built that way to escape detection (O'Riordain 1979). Their primary use

may have been for refuge, but they may also have been for storage of foodstuffs and valuables.

County Louth contains some 151 known souterrains; of which 28 are located within the study area, most seeming to date to the second half of the first millennium AD, and many of them not associated with a known enclosure (Buckley 1986, 1989; Buckley and Sweetman 1991). It may be that the enclosure around them has been subsequently levelled or that they were deliberately built that way to escape detection (Ó Ríordáin 1979). Their primary use may have been for refuge, but they may also have been used for storage of foodstuffs and valuables (Clinton 2001). The distribution of souterrains in the county demonstrates the main concentration is between the Castletown and Fane Rivers, particularly around Dundalk.

Medieval Period

Until the end of the 12th century the area that is now County Louth was part of the Lordship of Orgail of the O'Carroll's – a large territory extending over Armagh, Louth, Monaghan, and parts of Meath. However, this state of affairs would be ever changed by the conquest of Ireland by the Anglo-Normans which commenced in 1169, and which had a fundamental impact on the Irish landscape.

This is most evident in the landscape through the introduction of the large earthwork called mottes, the predecessors of stone castles. These and the Anglo-Norman masonry castles that followed were imposing structures that had not been seen before in Ireland. The earliest evidence for Anglo-Norman activity in the area is the motte erected by Bertram de Verdun at Castletown after being awarded the land by Prince John in 1185. The original text of that grant is as follows:

> *"John, Earl of Normandy, and lord of Ireland, to all his men, French, English, and Irish, greetings. Be known that I have given and granted and by this my present charter have confirmed to Bertram de Verdun, for his homage and service, four cantreds of land in Uriel (Meath) and one half cantred of land in Luna (Louth), that namely is towards the sea" (Gosling 1991).*

These lands covered most of the study area including the land of Dundalk and the Cooley Peninsula and correspond approximately with the present-day Baronies of Upper and Lower Dundalk. De Verdun attempted to solidify his claim to the region by building about a dozen mottes in the area. There are the remains of two within the study area: the first in Castlecarragh (RMP No. LH008-079) which has been largely destroyed due to quarrying in 1979; and the second at Mountbagnall (RMP No. LH008-072) which was similarly quarried in 1968.

Tangentially, as Anglo-Norman control was solidified, there was the establishment of some of Ireland's earliest urban centres at the walled towns of Dundalk and Carlingford. The location of Dundalk, and its advantageous proximity to the sea, made it a natural centre for trade from its establishment onwards. In 1275, it is listed among the ports of Ulster, and its trade appears to have been based on the importation of wine and the export of grain and fish (Gosling 1991). The town sat originally on the south bank of the river at a fording point along a gravel ridge. To the east and west of the ridge were poorly drained alluvial flats which acted to restrain expansion. As a result, the town expanded linearly south and eventually northwards across the river. The earliest evidence for a town wall at Dundalk is from 1315, but it is likely that work had already commenced sometime before, as the Murage (deed granting permission to build a wall) is dated to 1305. It encloses an area of about 19 hectares, however the exact plan of the wall has yet to be definitively identified.

Carlingford developed over the same period. The lands of the eastern Cooley Peninsula were granted to Hugh de Lacy by Bertram de Verdun in 1195 as part of a marriage arrangement.

Soon after, de Lacy would build King John Castle on the protruding rock overlooking Carlingford Lough and commanding a strong position over the surrounding landscape (Delaney 2010). Carlingford would rise as an important ferry point for Ulster, due to the defensibility of the shallow harbour which provided shelter for passing trade ships. The 1326 murage grant may mark the beginning of the stone wall or a continuation of work already begun at an earlier date. It came towards the end of an apparent peak period of funding for town walling in Ireland and illustrates the importance of medieval Carlingford. In a sense the walled area was effectively an outer bailey to the castle, adding to the defence of the ferry point. The town defences appear to have enclosed a roughly rectangular area of about 8 hectares, but the precise course of the wall is still unknown. The suggested line of the wall is based on the remaining fragments and the position of the Tholsel Gate. A large section of the wall exists at the northwest side of the town at Back Lane and to the southeast of the Tholsel.

The Dowdall Deeds, which contain taxation and landownership information for the Dundalk area from the 13th to 17th centuries, show that the town was surviving at a time when others were disappearing, and was even flourishing. Another market was granted in 1450, and in 1467 the rights of mintage were extended to Carlingford, though coins of the latter mint have yet to be found.

Post-medieval period

With the ending of the Williamite Wars in the late 17th century, Ireland entered a new era of relative political calm; from 1691 until the Rebellion of 1798 there were few dramatic events and a century of peace. Without concern for defence, landowners commenced the building of new mansions, and an era of experimentation of new architectural styles and larger, more comfortable houses became the norm.

There are several demesne landscapes within the study area, comprising parkland with features such as lakes, woodland, pathways, ornate mansions with ancillary buildings, gate lodges and gateways. These estates started to emerge in the 17th century, when new ideas of architecture and land use were emerging, and some are depicted on the Down Survey. Examples include the 17th century Ghan House in Carlingford, or the 18th century Bellurgan Park (NIAH Reg. No. 13900746). Continually occupied by the Tipping Family since the 17th century, and Mount St Francis which now acts as a convent, but was originally the home of the railway engineer Sir John MacNeill (NIAH Reg. No. 13900414).

From the 18th century onwards the landscape of County Louth developed a rich and varied heritage of historic buildings ranging from grand estate houses to more common mid-sized country houses and vernacular architecture (McCullough & Mulvin 1987). They include ranges of stone farm outbuildings with grounds and settings that form an intrinsic element of their character. These country houses of the middle size would have been occupied by prosperous farmers, manufacturers (e.g. millers) and traders. The majority developed in the 19th century as the dwellings of strong farmers or successful traders. Castletown House and Grange House, both near the coast south of Carlingford, are such residences (NIAH Reg. No. 13900904 & 13900809).

There are several middle-sized farmhouses dating to the 19th century within the study area. They lie somewhere between vernacular structures and larger country houses. It was common in the second half of the 19th century that prosperous farmers replaced earlier, often thatched, houses with more substantial farmhouses, whilst retaining the original outbuildings. They were influenced by the larger Georgian style country houses and consequently the new farmhouses were formal in style containing two storeys, with slated hipped roofs and the front door centrally placed in the façade with the windows and chimneys symmetrically arranged. Examples include the beautiful but derelict Loughnamore House, in the townland of the same name (NIAH Reg. No. 13900807).

Many vernacular dwellings of 18th century date survive within the study area, comprising simple cottages with features such as stone or mud walls, thatch roofs, lime washing etc. Several such cottages are located within the small coastal community of Whitestown (NIAH Reg. No. 13900908, 13900912, 13900906).

Topographical Files, National Museum of Ireland

The National Museum of Ireland Finds Database (2010) was consulted on www.heritagemaps.ie to identify stray finds which have been found within the townlands of the study area (Table 5.2.3.1). The finds are comprised primarily of flint flakes of likely prehistoric origin, and medieval and post-medieval pottery shards.

Table 5.2.3.1 Stray finds from the Study Area

NMI Reg. No.	Description	Type
IA/91/1982	Upper Stone of Beehive Shaped	Quern
1979:133-5	Thirty-Six Potsherds, Medieval	Pottery
1948:9-54	Medieval Pottery Sherds	Pottery
1983:31:00	Medieval Potsherd	Pottery
1977:2189-91	Post Medieval Potsherds	Pottery
1978:124-126	Tile Fragment (post medieval)	Tile
1978:317 A,B	Two Potsherds, Medieval	Pottery
1980:17-8	Flint Scraper & 34 Waste Flake Fragments	flint
1979:127	Four Medieval Potsherds	pottery
1973:53,4	Two Worked Flints	flint
E972:	Various Finds	N/A
1978:282	Burnt Flint	Flint
1978:268-270	268-9) Two Coarse Potsherds; (:270) Potsherds, Unglazed	Pottery
1935:167	Rectangular Monumental Slab	stone
1978:284-299	12 Flints (:284-295); Vitreous Matter (:296); 3 Potsherds, Post Medieval (:297-299)	Various
IA/175/2004	Hammer stone	stone
2004:140	Triangular shaped quartz pebble	stone
1978:271	Flint Fragment	Flint

Townlands

Townlands are land divisions that form a unique feature in the Irish landscape; their origins can be of great antiquity, and many are of pre-Norman date. They existed well before the establishment of parishes or counties. Townland boundaries can take the form of natural boundaries or routeways, as well as artificially constructed earthen banks and ditch divisions. They are predominantly formed of substantial boundaries which are usually distinguishable from standard field division boundaries.

There are 71 whole or partial townlands within the study area (see Appendix B2.4). The names are a mix of Gaelic Irish and English, which is an indication of both the survival of the Gaelic language well into the medieval period in an area and the heavy Anglo-Norman

influence beginning in the 12th century. They illustrate a landscape of marshes, hillocks, mountain streams, and shrub land. Structures such as ringforts and castles are also noted in placenames, and land use is evidenced by references to pasture, a booley place (summer pasture), granges and glebes.

Cartographical Sources

Down Survey

The Down Survey was undertaken from 1656 to 1658 and was at the time the most detailed survey undertaken anywhere in the world. While the scale of the map of County Louth allows only very significant features to be depicted, it shows many of the townland names within the study area (See Figure 5.2.3.2).

Figure 5.2.3.2 Down Survey Map of North County Louth indicating the Study Area

More detail including placenames and significant structures are shown on the barony maps. The map of the Barony of Dundalk provides greater detail for the layout of the town walls of Carlingford and Dundalk, as well as the locations of landownership boundaries. The largest estate visible is located between Carlingford and Dundalk and is noted as the possession of 'The Lord Mallifont'. This is likely in reference to Sir Garrett Moore, First Viscount of Moore who inherited significant estates in Louth and Meath in 1602 and is remembered for his facilitation of the Treaty of Mallefont which brought an end to hostilities between The Crown and Hugh O'Neill which ended the 9 Years War in 1603. The map also provides greater clarity on the route of the original road which connected Dundalk to Carlingford, which mirrors much of the present-day road as it bends eastward from Dundalk and then climbs northward after passing the high hills around Castletowncooley.

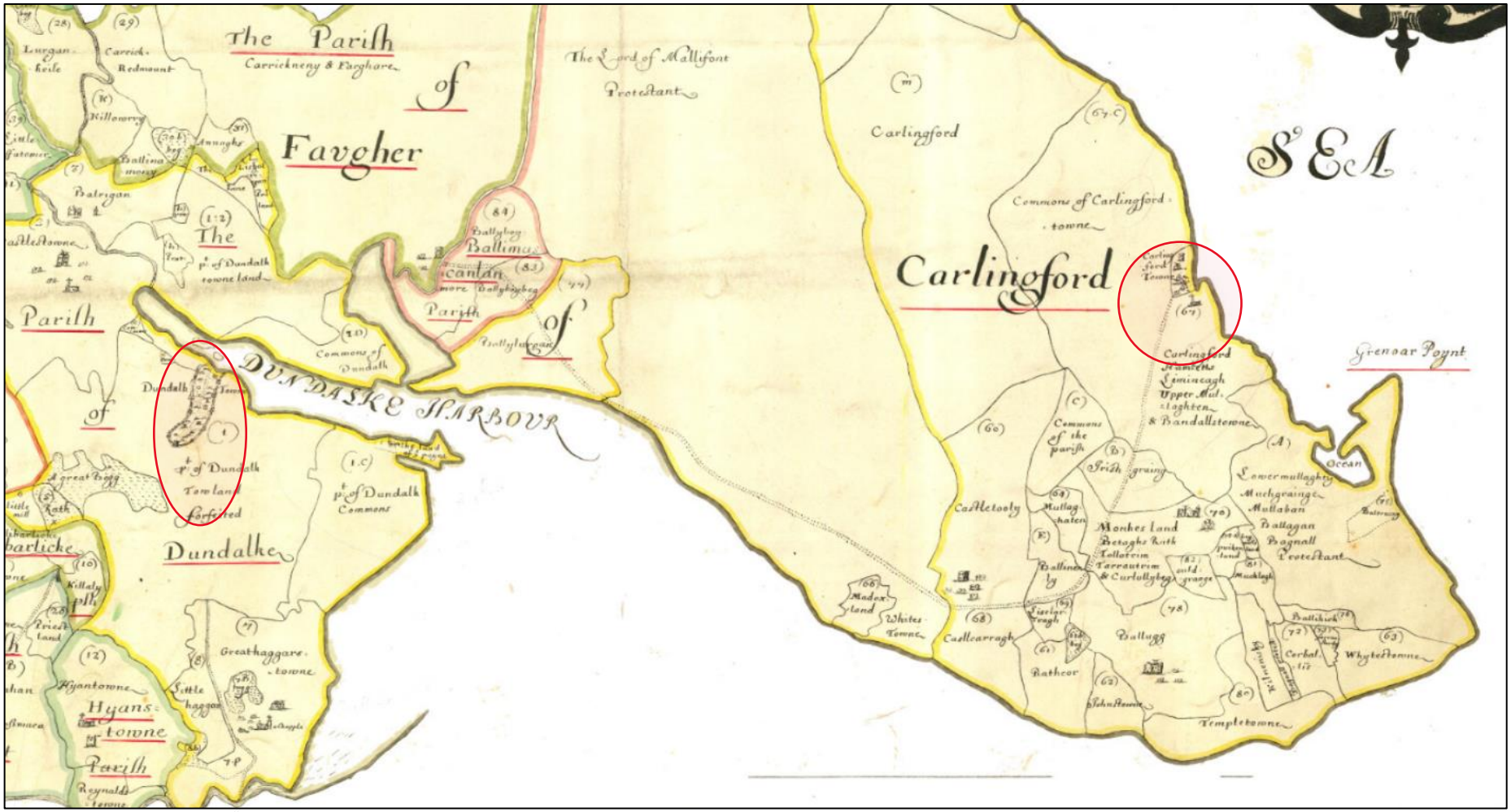

Figure 5.2.3.3 Down Survey Map indicating the Barony of Dundalk and the town walls of Dundalk town (left) and Carlingford (right)

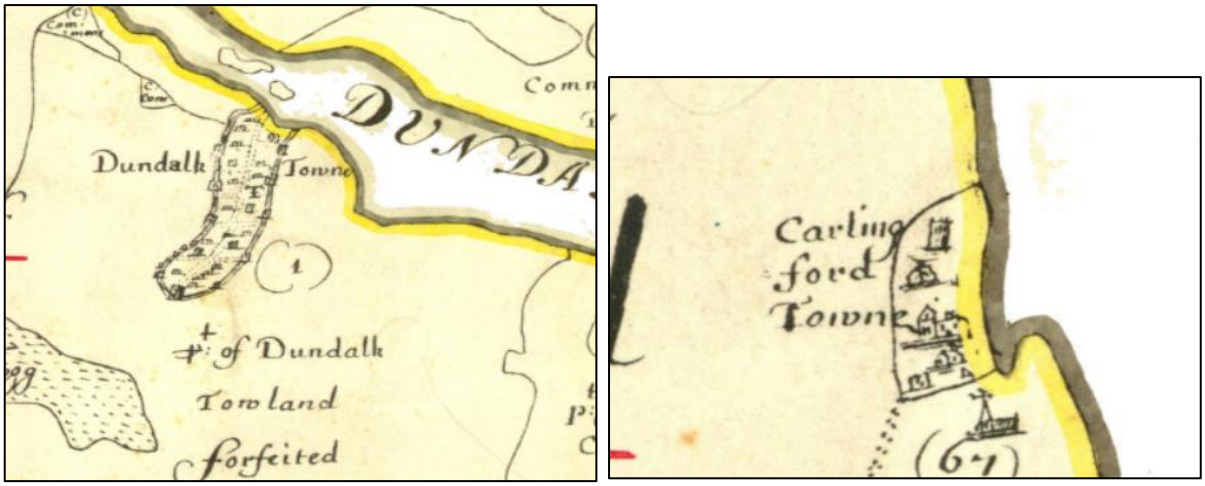

Figure 5.2.3.4 Town walls of Dundalk town (left) and Carlingford (right)

Ordnance Survey Maps

The first edition six-Inch Ordnance Survey (OS) produced high quality maps on a national scale, recording natural features, topographical conditions, built structures and archaeological features. The majority of the roads in the study area were present at the time of the first edition survey of Louth in 1835. The maps present a landscape that has become increasingly industrialized with numerous mills, storehouses, and kilns scattered across the landscape. New settlements built around these mills, such as Rathcore (Figure 5.2.3.5), are also evident.

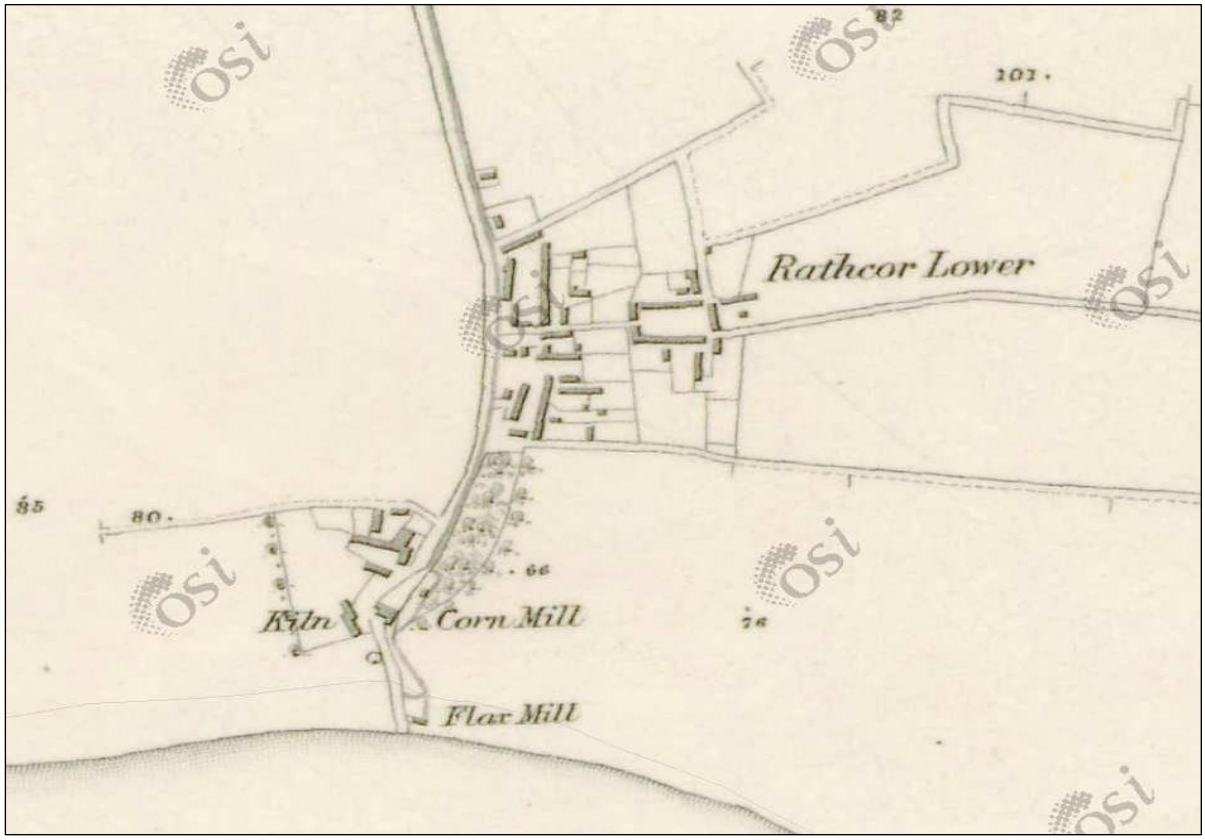

Figure 5.2.3.5 Ordnance Survey six-inch map, of Rathcor Lower

This is indicative of the major changes to the area beginning in the 19th century. This period was marked by economic expansion as the economy prospered during the Napoleonic Wars, at which time Britain relied on Ireland for agricultural and grain supplies. Wheat became a

significant cash crop in Ireland from the 1750s onwards and to capitalise on it, many landowners and entrepreneurial businessmen around the country erected flour mills in the later 1700s and early 1800s. This led to a boom in the milling industry in Ireland in the 18th and 19th centuries, aided by the new transport links opened by the coast, roads and railway. This is further exemplified on the OS maps by the increased military presence in the area. Military Barracks are marked within the towns of Carlingford and Dundalk, and numerous Signal Towers and fortifications are visible along the coast. These fortifications were built to address the growing threat of a French invasion of Ireland. One such fortified location can be seen in the townland of Greenore (see Figure 5.2.3.6), directly south of Carlingford, where the map indicated the location of coastal defence stations and ramparts.

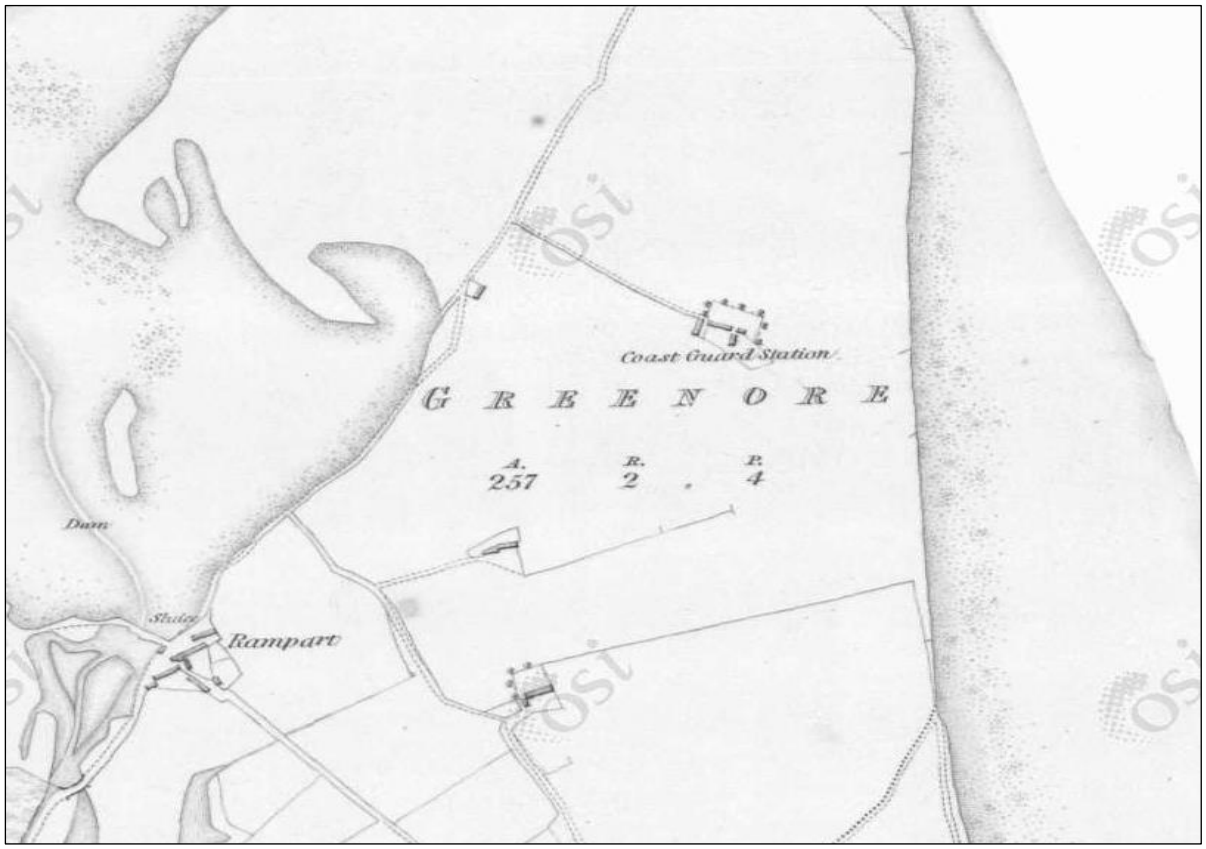

Figure 5.2.3.6 Ordnance Survey six-inch map of military installations at Greenore

Also notable on the OS maps is the removal of the medieval town walls at Carlingford and Dundalk. As in many walled towns in Ireland, it appears that as the towns continued to grow the walls became cumbersome to development. Some aspects of the walls are still visible on the OS map at Carlingford, however the town had by this stage outgrown its original medieval layout and expanded south and west. At Dundalk, the town had begun to expand northward across the river as well as further south (See Figure 5.2.3.7).

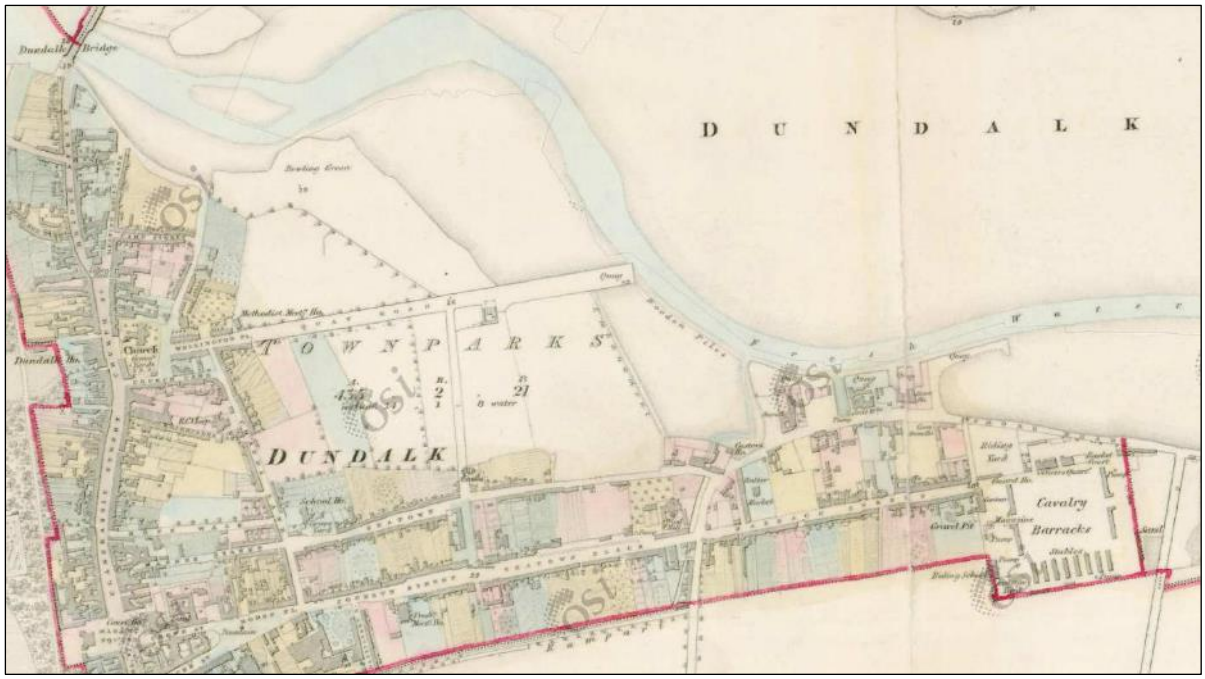

Figure 5.2.3.7 Ordnance Survey six-inch map of North Dundalk Town

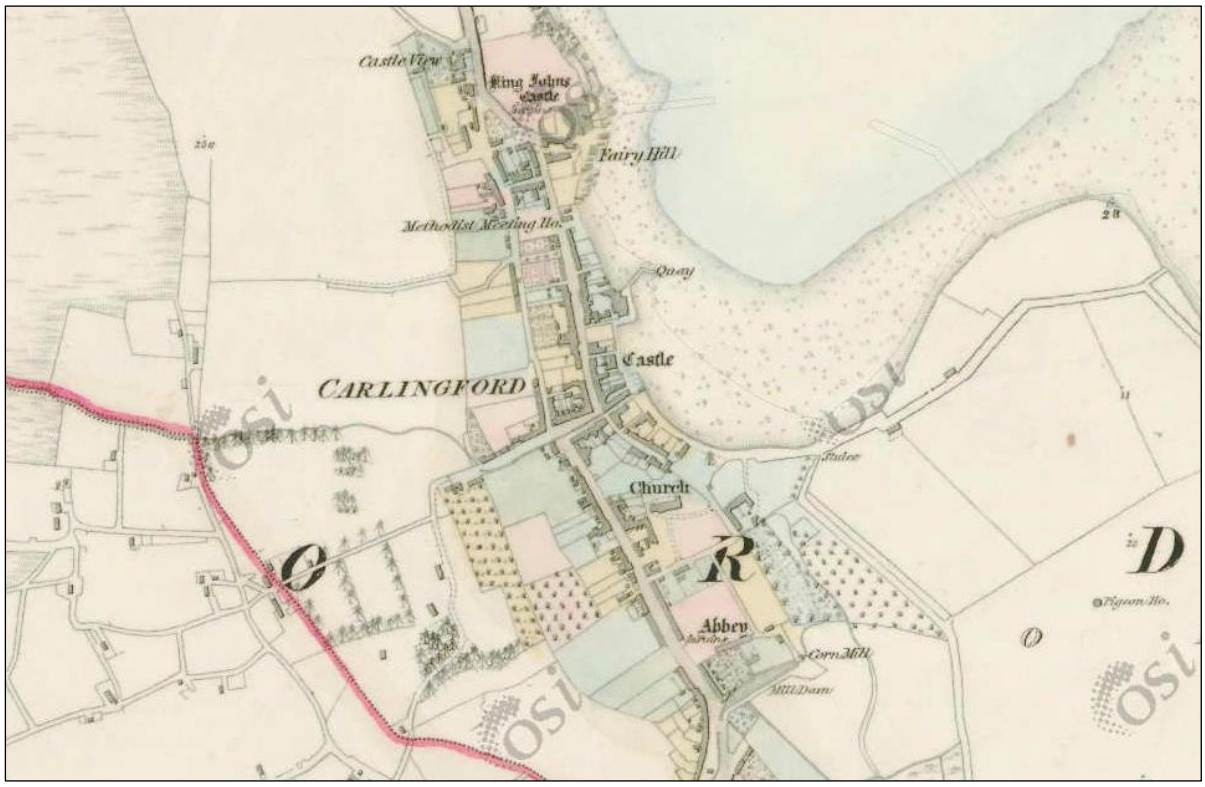

Figure 5.2.3.8 6-Inch Ordinance Survey Map of Carlingford

Previous Archaeological Investigations

There have been numerous archaeological investigations conducted within the study area. Many investigations were undertaken in advance of the M1 Dundalk Western Bypass. These investigations have revealed numerous archaeological sites within the study area, many of which have subsequently been added to the SMR. Such sites are typically excavated (although some have been preserved in-situ), and as such their presence in the SMR does not constitute constraints, but they should rather be seen as indicators of the archaeological potential of the wider landscape and the likelihood of revealing further subsurface archaeological features in the area. Most of the features in the area are of early medieval and medieval dates with significant concentrations around Dundalk and Carlingford. There have also been several prehistoric assemblages excavated on the coast of the Cooley Peninsula and around Dundalk Bay.

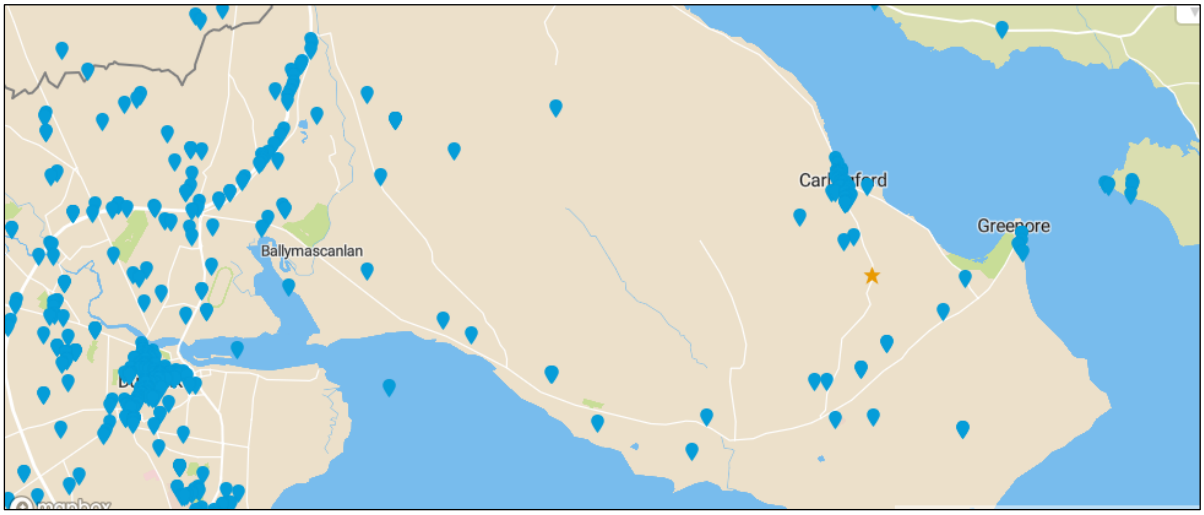

Figure 5.2.3.9 Map of archaeological investigations in the study area

5.2.3.4 Designated Cultural Heritage Sites

Archaeological Heritage

National Monuments

There are seven national monuments (NM) located within the study area (See Table 5.2.3.2). Three are centred around Carlingford (Carlingford Castle, The Mint, and Carlingford Abbey); two are prehistoric tombs (Proleek & Rockmarshall); and the final two are the medieval town walls of Carlingford and Dundalk. There is some debate about the exact layout of the town walls at Dundalk, as no aboveground elements remain. Two slightly varying descriptions by Thomas (2006) and Gosling (1978) are the primary sources used to inform this study. The largest difference in the wall circuits as described occurs at the south-eastern boundary, whereby Thomas believes there was no wall separating the town from the marshland, instead leaving an opening between what is now the Dublin and Rampart Roads. The town walls at Carlingford on the other hand have been well documented and are still occasionally visible above the surface.

Table 5.2.3.2 National Monuments within the Study Area

CH Number	Name	Description	Townland	Legal Status	RMP No.	NM No.
685	Carlingford Castle	Castle	Carlingford	Guardianship	LH005-042002	249
686	The Mint (Carlingford)	Urban Tower House	Carlingford	Guardianship	LH005-042008	242
687	Carlingford Abbey	Friary (Dominican)	Liberties	Ownership	LH005-042013	623
688	Proleek	Portal Tomb & wedge Tomb	Proleek	Guardianship	LH004-074, LH004-075	476
689	Rockmarshall	Court Tomb	Rockmarshall	Ownership	LH008-033	562
690	Carlingford Town Defences	Town Walls	Carlingford	Ownership	LH005-042001-	N/A
691	Dundalk Town Defences	Town Wall	North Dundalk	Ownership	LH007-119027-	N/A

There are a further three sites subject to preservation orders (PO) within the study area, all of which are early medieval in date (RMP Nos. LH008-051001--03, LH008-054001/02, LH008-070001/02) (See Table 5.2.3.3).

Table 5.2.3.3 Sites subject to Preservation Orders within the Study Area

CH Number	PO No.	Description	Townland	RMP No.
123	008/1985	Souterrain	Benagh	LH008-051001; LH008-051002; LH008-051003
119	011/1973	Ringfort & Annexe	Castletowncooley	LH008-054001; LH008-054002
37	001/2002	Ringfort	Rampark	LH008-070001; LH008-070002

Recorded Monuments (RMP/SMR sites)

There are 231 RMP / SMR sites located within the study area. They are distributed throughout the area, with large clusters around Dundalk, Carlingford, and along the southern coast of the Cooley Peninsula (See Appendix B2.1-Table 6 for full listings).

Prehistoric activity in the area is well represented along the coast through shell middens (e.g. at Rockmarshall, RMP no. LH008-034), fulachta fia (e.g. at Dowdallshill, RMP no LH007-128), and megalithic tombs (e.g. at Proleek, RMP no. LH004-074 & LH004-075, and Ballymakellett, RMP no. LH004-091).

The early medieval period is the most widely represented in the area with numerous souterrains and ringforts scattered across the landscape. In total, 52 ringforts and souterrains are known within this area. The medieval period is also well represented, with a concentration of castles and other stone fortifications present in the area. This includes 12 tower houses, largely located on the outskirts of Dundalk and Carlingford.

Wreck Sites

There are four shipwrecks within the study area, all of which are located in Dundalk Bay. Two are unnamed wrecks, likely of 19th or early 20th century date. The Night Watch, a 19th century

cargo ship carrying pitch pine also sunk within the harbour and is visible at low tide. Lastly, the Alsopp, a 19th century crane ship is also wrecked in the harbour and is visible at low tide.

Table 5.2.3.4 Known Shipwrecks within the Study Area

CH Number	Ship Name	Wreck Number	Ship Type	Wreck Date	Description
681	Alsopp	W00118	Crane Vessel	Unknown	Dublin vessel bought by Dundalk Harbour Commissioners. Crane mounted on vessel for work in the docks. Sold to Mr Heraty for drying nets. Later towed to the far side of the river beyond the walls, sunk. A vessel is still visible at this location.
682	Night Watch	W00221	Barquentine	17/02/1886	En route to Dundalk, cargo of pitch pine for Messrs Williamson. Captain was Carter. Entered river leaky on 8th February 1886, grounded close to beacon No. 5, east side of channel. Wreck still visible.
683	Unknown	W00274	Unknown	Unknown	UKHO wreck no. 007600021. Two wrecks lie alongside old slip 1038, 345ft from end of training wall.
684	unknown	W00275	Unknown	Unknown	UKHO wreck no. 007600021. Two wrecks lie alongside old slip 1038, 345ft from end of training wall.

5.2.3.5 Architectural Heritage

Architectural Conservation Areas

An Architectural Conservation Area (ACA) can include any group of buildings, which together provide a special / distinctive character to a specific area. Protection generally relates to the external appearance of structures, views and vistas, and features of the streetscape. The aim of ACA designation is to guide sensitive, good quality development, which will enhance both the historical character of the area and the amenity of those who enjoy it, but not to prevent development. Any development within an ACA must take into account of the material effect that the proposed development would be likely to have on the character of the ACA.

There are four ACAs located within the study area: Dundalk, Carlingford, Whitestown, and Greenore. The Dundalk ACA is divided into eight zones, seven of which are within the study area: St. Marys Road, Roden Place, The Cresent, Clanbrassil Street, Seatown Place, Soldiers Point, and Magnet Road.

Record of Protected Structures & National Inventory of Architectural Heritage sites

There are 422 National Inventory of Architectural Heritage (NIAH) properties within the development site (see Appendix B2.2 & B2.3). Most of these structures are also protected structure, of which there are 416 within the study area. (See Appendix B2.2). Many of these structures are located within Dundalk and Carlingford, as well as several of the smaller settlements in the study area, such as Whitestown, Greenore, and Ballymascanlan.

NIAH Garden Survey

Louth has a rich heritage of historic gardens and designed landscape gardens consisting of public parks, private gardens, and landscapes associated with country estates and demesnes. These landscapes often include tree-lined avenues, formal ornamental woods, water-features,

planned gardens, terraces and other formal features. There are six NIAH Garden Survey sites within the study area as shown on Drawings D2CG-RODA-EGN-SW_AE-DR-EN-100016 to 100020 in Appendix A. Most of the sites are located within the Cooley Peninsula and are associated with 17th and 18th century estates.

Table 5.2.3.5 NIAH Garden Survey Sites within the Study Area

CH Number	Site Name	Reference #	EAST_ITM	NORTH_ITM
692	Dundalk Park	LH-36-J-043075	704228	807510
693	Mount Pleasant	LH-36-J-068108	706728	810809
694	Ballymascanlon House	LH-36-J-081105	708028	810509
695	Bellurgan House	LH-36-J-095096	709427	809610
696	Catherines Grove	LH-36-J-200104	719925	810409
697	Nootka Lodge	LH-36-J-205106	720425	810609

Undesignated Cultural Heritage Sites

Undesignated sites will be discussed at later stages of the assessment, following further desk-based research and fieldwork. This may include sites identified from aerial photography, field walking, geophysical survey or test excavations.

5.2.3.6 Key Constraints

Key Cultural Heritage Considerations

The effects of a proposed greenway project on the historic environment can relate to the potential for ground excavation and construction activities to lead to the interference, damage or destruction of recorded and / or previously unknown archaeological monuments and of upstanding built heritage remains.

While change within the setting of an historic site or landscape may be acceptable, in certain instances development may be considered intrusive and inappropriate. This effect on the setting of archaeological and architectural heritage sites requires an assessment to be made on a case by case basis according to the type of development, its location and landscape setting by means of objective analysis based on a set of predefined criteria and professional judgement, supported by appropriate descriptive material. There is the potential for a greenway and associated public realm works to create a positive impact when designed sensitively.

The unique archaeological and natural landscape of the Cooley Peninsula has particular potential for providing the public with an interesting perspective on Ireland's cultural heritage from the mesolithic period onwards. The importance of the sea to the history of the study area cannot be overstated and it is indicative throughout the archaeological record from the earliest shell middens on the coast, to the establishment of the medieval settlements at Dundalk and Carlingford within its natural bays. There is an opportunity in further phases to highlight this history with minimal interference to the archaeology if undertaken with care.

All archaeological and historic sites / features and properties with statutory designation in the study area are the key considerations in the constraints study in relation to cultural heritage. These sites have been identified and mapped for the constraints study to inform the development of route option corridors.

The objective through the subsequent phases of assessment and detailed survey will be to avoid and / or minimise any potential negative impacts on cultural heritage.

Archaeological Heritage

The following archaeological constraints and potential should be considered in the development of the Dundalk Bay to Carlingford Greenway:

- There are seven National Monuments within the study area including the remnants of the town walls at Carlingford and Dundalk, the prehistoric complexes at Proleek and Rockmarshall, Carlingford Castle, and Carlingford Mint. This assemblage reflects the diverse and multifaceted nature of heritage within the study area.
- There are 231 RMP / SMR sites within the study area. The preferred option for RMP / SMR sites is always avoidance;
- The geographic conditions of the Cooley Peninsula have made living conditions suitable for habitation since the Mesolithic period. This long history of settlement means the archaeological potential of the area, particularly near the coast, is relatively high. Thus there is the potential for new discoveries;
- While fewer sites are recorded in the hinterland between Carlingford and Dundalk, this should be seen as a reflection of the lack of archaeological investigations in this area compared to the more closely examined towns;
- The presence of an existing road does not preclude the potential for archaeological features to survive beneath the road surface. While roads have often created a disturbance to the underlying ground, there is precedence for features to survive in these areas.

Architectural Heritage

The following architectural heritage constraints should be considered in the development of the Dundalk to Carlingford Greenway:

- There are four ACAs in the study area: Dundalk, Carlingford, Whitestown, and Greenore. They comprise the built settlements of those areas. Dundalk is further divided into eight ACAs of which seven are within the study area. Any development within an ACA must take into account the material effect that the proposed development would be likely to have on the character of the ACA;
- There are 422 NIAH sites within the study area of which 416 are Protected Structures. The obligation to preserve a Protected Structure extends to its interior, all the land around it, and any structure on land within its curtilage (this means any land or outbuildings which are/were used for the purposes of the structure);
- It is the policy of the Louth County Development Plan (2021-2027) that all development in proximity to protected structures must ensure that any development, modification, alteration, or extension affecting a protected structure 'is compatible with the special character and is appropriate in terms of the proposed scale, mass, density, layout, and materials of the protected structure';
- There are six NIAH Garden Survey sites within the study area. Where these grounds are extant, every effort should be made to retain their integrity.

5.2.3.7 Key Opportunities

Given the type of development proposed, a greenway, it should be possible to avoid direct negative effects on designated heritage receptors and to protect their settings with sympathetic design. Therefore, future phases of assessment should also take account of the opportunities for the enhancement of the cultural heritage environment through the provision of a greenway. This may occur through the use of heritage signage, increased visibility and awareness of heritage sites, and the development of a sense of place that is integral to the cultural heritage of an area.

5.2.3.8 References

Delaney, S. (2020). *Around the Bay of Dundalk*. TII Heritage Series.

Geraldine Stout, Rolf Loeber and Kevin O'Brien (2016). Mellifont Abbey, Co. Louth: a study of its post-dissolution architecture 1540–1727. *Proceedings of the Royal Irish Academy. Section C: Archaeology, Celtic Studies, History, Linguistics, Literature*, 1(2), p.1. doi:https://doi.org/10.3318/priac.2016.116.6.

Gosling, P. (1991). From Dún Delca to Dundalk: The Topography and Archaeology of a Medieval Frontier Town A.D. c. 1187-1700. *Journal of the County Louth Archaeological and Historical Society*, 22(3), p.221. doi:https://doi.org/10.2307/27729714.
IAC (2009). *M1 Dundalk Western Bypass Site 128: Faughart Lower 1, 2 & 3 Chainage 25,415 – 25,570 NGR 305326/310851 Final Report*.

Louth County Council (2002). *Louth County Council Landscape Character Assessment*.

Louth County Council (2008). *Carlingford Town Walls County Louth Conservation Management Plan*.

Louth County Council (2021). *Louth County Development Plan 2021-2027*.

McLoughlin, G. (2014). *Final Archaeological Excavation Report Haynestown, County Louth*.

Minogue, A. (2020). *Regional Seascape Character Assessment for Ireland*. European Maritime and Fisheries Fund.
The Heritage Council (2011). *The Irish Walled Towns Network:Three Year Action Plan 2011-2013 plus a review of activities 2006-2010*.

Thomas, A. (1992). *The walled towns of Ireland. Vol. 2*. Dublin Irish Academic Press.

Wright, J. and Wright, T. (1749). *Louthiana*.

5.2.4 Material Assets: Agricultural Property

5.2.4.1 Introduction

This section describes the material assets - agricultural constraints identified within the study area for the Dundalk Bay to Carlingford Greenway Project. Section 5.2.4.2 describes the methodologies and sources of information that were used to carry out the study. Section 5.2.4.3 describes the existing agricultural environment (land use, soil types, and types and sizes of farms within the study area). Section 5.2.4.4 describes the agricultural constraints within the study area. A summary is presented in Section 5.2.4.5.

5.2.4.2 Methodology

The following guidelines and legislation were referred to when writing this report:

- Environmental Protection Agency (EPA) (May 2022) Guidelines on the Information to be contained in Environmental Impact Assessment Reports[6].
- Code of Best Practice for National and Regional Greenways (TII) (Dec 2021)[7].

In line with these TII and EPA guidelines, the constraints study seeks to identify the issues that are likely to be important at this stage of the environmental assessment process and to inform the design team so that preventative action can be pursued. This constraints study has comprised of a desktop collation and interpretation of published data, on-line resources such as aerial photography. The constraints study identifies features which reflect the agricultural potential and agricultural sensitivity of the study area. The desktop study has considered the following sources of information;

- Data from the Central Statistics Office (CSO);
  - The 2020 Census of Agriculture[8] was referred to for enterprise types and this data is presented in Table 5.2.4.1 of this document.
- Soil mapping data from the Teagasc Irish Soil Information System[9] was used to identify the soil types within the study area. For example, peat soils and low-lying alluvial soils are generaly poor quality. The soil quality and type varies within a small area and the mapping data used is consistent over large areas - thus the information is indicative only.
- 2018 Corine Land Use Data for Ireland[10] was examined for the study area.
- Google[11] aerial maps were used to identify yards, farm facilities, forestry, scrub and rough boggy land.

The following features have been identified from desktop information sources:

- Yards and farm facilities - farm yards and other yards and facilities such as sand arenas and training facilities used by horses and farm paddocks and roadways typical of dairy farms have been identified from aerial photography;
- Dairy and equine farms are generally high sensitivity and equine enterprises are within the high to very high range of enterprise sensitivity (see Table 5.2.4.1 of this document). Pig farms and horticultural farms are also high or very high sensitivity. Goggle Earth

[6] Environmental Protection Agency (May 2022) Guidelines on the Information to be contained in Environmental Impact Assessment Reports. Available from: https://www.epa.ie/publications/monitoring--assessment/assessment/EIAR_Guidelines_2022_Web.pdf
[7] Transport Infrastructure Ireland (December 2021) Code of Best Practice for National and Regional Greenways. Available from: https://www.tii.ie/news/press-releases/code-best-practice-greenways/
[8] Central Statistics Office, 2020, https://www.cso.ie/en/statistics/agriculture/censusofagriculture/
[9] Teagasc (2022), Irish Soil Information System. Available from http://gis.teagasc.ie/soils/ [Accessed in October 2022]
[10] Corine 2018 ITM. Available from: http://gis.epa.ie/geonetwork/srv/eng/catalog.search#/metadata/e09739bf-abd1-4408-9fa5-510a156673ba [Accessed in January 2023]
[11] Google Aerial Mapping (2022). Available from: https://www.google.com/maps [Accessed January 2023]

aerial imagery was examined to identify herds of dairy cows and equine facilities and the PRAI[12] open database has been used to identify folios and land parcels;

- Areas with good quality soils generally have a higher agricultural potential than poor quality land. Good quality land was initially identified by using the Teagasc Irish Soils Information System and aerial photography; and,
- Areas of woodland, forestry and scrub have been identified from aerial photography ad Corine mapping data.

The sensitivity of farms is described using the criteria outlined in Table 5.2.4.1.

Table 5.2.4.1 Farm Sensitivity

Farm enterprise type	Intensity / Scale	Sensitivity
Stud-farms / equestrian centres, are generally high or very high sensitivity. Intensive horticulture is generally high or very high sensitivity. Intensive agriculture (pigs) is very high sensitivity.	High	Very High
	Medium	High
	Low	Medium
Dairy farms and equine enterprises. Small horticultural enterprises.	High	High
	Medium	High
	Low	Medium
Non-dairy grazing livestock enterprises (including beef, sheep and small non intensive equine) and grass cropping enterprise.	High	Medium
	Medium	Low
	Low	Very Low
Tillage	High	Medium
	Medium	Low
	Low	Very low
Rough Grazing, Bog, Forestry, Woodland	Low	Low or Very Low

Where farm enterprises are identified, the information in Table 5.2.5.1 is used to categorise the sensitivity. This table provides an indication of the range of sensitivity for common enterprise types in Ireland and has been adopted based on the professional judgement of the author. For example, horses can be highly sensitive to construction activity such as noise and traffic movement and this is a consideration where horses are being trained and rode by jockeys. The economic value and importance of individual horses increases the sensitivity of stud farm and racehorse enterprises. The range of sensitivity for equine enterprises will generally vary from high to very high depending on the degree of specialisation, scale and intensity of the enterprise. Dairy farms are categorised as high sensitivity because dairy cows have to access the milking parlour twice daily and therefore are sensitive to the severance impact of a new greenway. The movement of livestock is less frequent in beef and sheep farms where livestock can graze severed land parcels without the necessity of frequent access to the farmyard and these enterprises are generally categorised as medium sensitivity. Tillage farms can operate in severed land parcels provided there is adequate access for machinery and this enterprise is also generally categorised as medium sensitivity. Land quality is a factor that affects the intensity of an enterprise and is considered in the assessment of sensitivity. Enterprises such as pigs and poultry have very high livestock numbers in relatively small sites and are generally very high sensitivity. These enterprises are capital and labour intensive, the

[12] Property Registration Authority of Ireland available @ https://www.landdirect.ie/index

building layout is often critical to the successful operation of the enterprise. Also it may be very difficult to replace a site for a pig and/or poultry farm where the existing site offers separation distance from adjoining properties which mitigates odour impacts. Horticultural sites are generally labour intensive and have high output from small areas (e.g. glasshouses and nurseries) and therefore are high and very high sensitivity.

5.2.4.3 Receiving Environment

The study area of the project is approximately 8,267 hectares. It extends from Dundalk in the western edge to Greenore port at the eastern edge; a distance of approximately 19km from east to west. On its north south axis, the narrowest length is 1.3km and widest length is approximately 8km.

Land Use

The land use within the study area, as illustrated in Drawing no. D2CG-RODA-EGN-SW_AE-DR-EN-100020 in Appendix A, is summarised in Table 5.2.4.2 from mapping data derived from Corine 2018 database and examination of aerial photography.

Approximately 43.5% of the study area is non-agricultural (including sea/ocean) and 56.5% is used for agriculture. Approximately 41% of the study area is pastures.

Table 5.2.4.2 Land Use within the Study Area (2018 Corine Data and examination of Aerial Photography)

Land use category	Hectares / % of study area
Total area (ha)	8,267
Agricultural (%)	56.5% (41% is pasture)
Forestry / woodland / scrub (%) *	1%
Moors, heathland and bogs	0.5%
Urban / industrial / mining / sports grounds / other	19%
Estuary / salt marsh / intertidal flats	9%
Sea and Ocean	14%

Soil type

In addition to the site survey, Teagasc soil data[9] aerial photography (Google Earth) was examined to determine soil types and land quality in the study area. The main soil types are shown in Table 5.2.4.3 and Drawing no. D2CG-RODA-EGN-SW_AE-DR-EN-100011 in Appendix A.

Table 5.2.4.3 Soil Types within the Study Area

General Soil Type (Teagasc Code)	% of study area
Brown Earths (1100)	85%
Tidal Marsh	7%
Lithosols (0410a)	6%
Alluvial (05RIV)	1%
Peats (01XX), Rock, (Rk)	1%

The dominant soil type is Brown Earth (85% of the study area). This indicates good quality soil throughout the study area. These soils are generally fertile and free draining. They are

associated with the lower and undulating parts of the landscape. These support arable and intensive grassland enterprises and within the study area are good quality.

Tidal Marshes (7% of the study area) occur in the low lying coastal areas around Dundalk and are generally poor quality from an agricultural perspective.

Lithosols (6% of the study area) are shallow rocky soils which are generally poor quality from an agricultural perspective. These occur east of Dundalk.

The remaining soils are Peats, Rock and Alluvials (2% of the study area). These are generally poor quality from an agricultural perspective.

Farm Enterprise Types (CSO Data)

There are seven electoral divisions which intersect with the study area. Table 5.2.4.4 provides a summary of the agricultural statistics for the Electoral Divisions (EDs) that intersect with the study area, County Louth and the Irish State.

Table 5.2.4.4 Agricultural Statistics for the Study Area, County Louth and the Irish State (Census, 2020)

Electoral Area*	Average Farm Size	Livestock Units / farm	Dairy Cows / farm	% Arable Area
Dundalk Rural (10027)	36	84	8	12
Greenore (10029)	37	24	0	47
Jenkinstown (10031)	28	35	0	0
Rathcor (10035)	20	27	0	9
Ravensdale (10036)	18	27	0	0
Ballymascanlan (10019)	25	25	0	14
Carlingford (10021)	18	20	0	14
Average for EDs that represent the study area	26	34	1	14
County Louth	38	N / A	12	33
State	33.4	47	12	8
* Only includes Electoral Divisions for which there are agricultural statistics				

The average size of farms in Co. Louth is larger than the state average – 37.7ha versus 33.4ha. However, the average size of farms in the study area EDs is 26ha which is smaller than the County and State averages. The national average for specialist dairy farmers in the Irish State is 11% and this is similar to County Louth (9%). However within the study area there is a low number of dairy cows (only present in Dundalk Rural ED 10027). There are on average 34 livestock units (LUs) per farm in the study area EDs compared to 47 (LUs) for the state (County LUs are not available). 33% of County Louth is arable cropping compared to 14% for the study area EDs and 8% for the State.

From this analysis of the agricultural statistics it can be determined that the average farm size within the study area is smaller than the State and County Louth. There are less livestock on farms within the study area (compared to the State) and less dairy cows (compared to the State and County). There is more arable cropping in the study area than the state and less

than in the County. Therefore it can be concluded that agriculture within the study area is predominantly medium sensitivity (arable cropping and non-dairy farm enterprises).

Goggle Earth aerial imagery was examined to identify herds of dairy cows and equine facilities and the PRAI open database has been used to identify folios and land parcels. The location of these high sensitivity land parcels is shown on Drawing no. D2CG-RODA-EGN-SW_AE-DR-EN-100020 in Appendix A.

5.2.4.4 Key Constraints

Agricultural Land

56.5% of the study area is agricultural land and the majority of this land is a good quality Brown Earth soil. Where possible the proposed development should be confined to non-agricultural land or poorer quality soils (Lithosols, Alluvials, Marshes and Peats).

Farm yards

There are 128 farmyards / farm buildings within the study area (see Drawing no. D2CG-RODA-EGN-SW_AE-DR-EN-100020 in Appendix A) – these should be avoided where possible.

High Sensitivity Enterprises

Seven equine and two horticultural enterprises were identified by examining aerial photography – these should be avoided where possible.

5.2.4.5 Key Opportunities

44% percent of the study area is non-agricultural land, however this includes 23% which is classed as sea/ocean and estuary / salt marsh / intertidal flats, resulting in 21% of the study area that is non-agricultural land. This provides the opportunity to minimise the use of agricultural land. Where agricultural land is required, the proposed development should be aligned with existing roads and railway lines. Where crossing agricultural land the effects from severance can be minimised by following the alignment of hedgerows.

Survey Limitations

All information sources are on-line and desk-top which is adequate at this stage of the environmental impact assessment.

5.2.5 Material Assets: Non-Agricultural Property

5.2.5.1 Introduction

This section describes the material assets – non-agricultural constraints identified within the study area for the Dundalk Bay to Carlingford Greenway Project. Section 5.2.5.2 describes the methodologies and sources of information that were used to carry out the study. Section 5.2.5.3 describes the existing non- agricultural environment. Section 5.2.5.5 describes the non-agricultural constraints within the study area.

5.2.5.2 Methodology

The methodology for the preparation of this section is based on a desktop review of the study area. The preparation of this section has considered the following guidance:

- Directive 2011/92/EU on the assessment of the effects of certain public and
- private projects on the environment.
- Directive 2014/52/EU amending Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment.
- Project Manager's Manual for Greenway Projects (TII, 2022).
- Code of Best Practice National and Regional Greenways (TII, 2021).

The desktop study and evaluation of the non-agricultural constraints within the study area was carried out using the following sources of information:

- Review of online orthophotography
- Environmental Protection Agency (EPA) online interactive mapping tools for land cover data.

This section of the report identifies key non-agricultural property constraints which include commercial properties, community properties and clusters of residential properties within the study area. The identification of these properties may highlight opportunities for the proposed greenway development which are also explored in this section.

5.2.5.3 Receiving Environment

The study area of the proposed greenway development is approximately 8,267 hectares. It extends from Dundalk in the western edge to Carlingford and Greenore port at the eastern edge; a distance of approximately 19km from east to west. On its north south axis, the narrowest length of the study area is 1.3km and widest length is approximately 8km.

Dundalk, Jenkinstown, Rampark, and Carlingford are the four settlements located wholly or partially within the study area. According to the 2022 Census, the population of the settlements is 43,112 in Dundalk, 416 in Jenkinstown, 465 in Rampark, and 1,528 in Carlingford. The study area outside these towns is dominated by pasture and non-irrigated lands. The site also includes forests, cultivation lands, and discontinuous urban fabric. The discontinuous urban fabric lands are located in areas namely Jenkinstown, Lordship, and Riverstown. The land use of Greenore townland located within the study area consists of industrial and commercial units along with sport and leisure facilities.

Non-Agriculture Property

The receiving environment for non-agricultural property within the study area primarily consists of residential properties with low numbers of commercial and community properties.

Residential property within the rural part of the study area is generally detached residential properties along the local road network. Within the settlements of Dundalk, Jenkinstown, Rampark, and Carlingford towns, there are also cul-de-sac developments, ribbon developments and other residential developments patterns along the road network. This category may also include guesthouses and residential / public houses.

Commercial property is primarily located within, and in the environs of Dundalk, Carlingford, and Greenore. There are commercial properties in rural areas that includes warehouses and the Cooley Distillery.

Community facilities are dispersed throughout the study area and include schools, sports clubs nursing homes, churches, graveyards, community centres and marina properties.

5.2.5.4 Non-agricultural impacts

The proposed greenway can have various impacts, both positive and negative on community, commercial and residential properties. The proposed greenway may have a direct negative impact on properties if it requires landtake, loss of curtilage, or has a negative effect on property access.

Positive indirect impacts are also likely where the greenway is in the vicinity of the property through improved connection to a pedestrian and cycle network, or local access to the property from the greenway.

5.2.5.5 Key Non- Agricultural Constraints

The non-agricultural property constraints within the study area primarily consist of residential property along the local road network and may include local guesthouses and residential / public houses as shown on Drawing no. D2CG-RODA-EGN-SW_AE-DR-EN-100021 in Appendix A.

The methodology for the identification of key non-agricultural property constraints focused on community properties and commercial properties that could be of a sensitive nature to significant impacts associated with a greenway project which are mapped on Drawing no. D2CG-RODA-EGN-SW_AE-DR-EN-100024 in Appendix A.

There are approximately 42 key community constraints identified within the study area. These include the following:

Schools:

- Castletown Girls' School
- St. Nicholas' National School
- St. Nicholas Monastery National School
- CBS Secondary School
- Scoil na mBraithre CBS Primary School
- Dun Dealgan National School
- Bellurgan National School
- Mullaghbuoy National School
- Bush Post Primary School
- Monksland National School
- Rampark National School
- St. Oliver's National School
- St. Mary's College

Sports properties:

- Dundalk Rugby Club
- Dundalk Stadium
- Greenore Golf Club
- Ballymascanlon Hotel Golf Course
- St. Patricks GAA Club

Nursing homes:

- Homecare Independent Living
- St. Frances Nursing Home
- Carlingford Nursing Home

Parks:

- Siochain Peace Garden
- Ice House Hill Park
- Public Green Demesne
- Lordship Playground Ireland
- Irish Folkfore Park, Carlingford
- Carlingford Playground

Community Centres:

- Somali Irish Community Development Association
- Saint Joseph's Development Group and Community Centre
- Wellington Hall Dundalk
- Culture Connect CLG- Dundalk Louth Intercultural Organisation
- The Foy Centre

Churches/Graveyards:

- St. Patrick's Cemetery Dowdallshill
- Castletown Cemetery
- Newtown Cemetery
- Grange Cemetery
- St. Michael's Cemetery
- Dundalk Community Church
- St. Patrick's Church
- Emmanuel Community Church
- St. Joseph's Redemptorists Church Shrine to St Gerard Majella
- St. Michael's Church

Commercial Properties

Commercial properties within the study area can be categorised as Industrial/manufacturing, employment centres, warehouses, business and retail park. The proposed greenway project can have positive and negative impacts on these commercial properties. Negative impacts include direct landtake impacts over property and parking spaces. Positive impacts include increased foot traffic and improved amenities.

There are approximately 16 no. commercial properties identified within the study area. These include the following:

Industrial/manufacturing

- Logicon, Dundalk
- Coes Road Industrial Estate, Dundalk
- Iratron Hygiene Supplies, Dundalk
- GM Steel Limited, Dundalk
- McCann Packaging Ltd., Dundalk
- Anord Mardix Ltd., Dundalk

- Cooley Distillery, Castletowncooley, Dundalk
- Bellugran Precision Engineering Limited, Bellugran, Dundalk
- Bleach Green- Project Engineering, Fabrication, Machining, Coating in Louth, Jenkinstown, Dundalk

Business/ retail parks

- Jenkinstown Business Park
- Blackthorn Business Park
- MrPRICE Dundalk- North Link Retail Park

Warehouses

- Mc Courts, Mountbagnall, Louth
- Deluxe Warehouse, Dundalk
- Roaring Water Bay Wines and Spirits, Dundalk
- Teelings warehouse, Greenore, Louth

5.2.5.6 Key Opportunities

The proposed Dundalk Bay to Carlingford greenway presents several key opportunities for the non-agricultural properties including:

- The greenway can enhance the connectivity for local residents to community facilities by providing safe and accessible routes for pedestrians and cyclists, and other non-motorized users.
- It can link neighbourhoods, parks, schools, commercial areas and other locations of interest, promoting easier and sustainable modes of transportation.
- The greenway can create opportunities for tourism related businesses such as restaurants, hotels, and shops, while also boost the promotion of existing businesses.

5.2.6 Air Quality

5.2.6.1 Introduction

This section describes the air quality constraints identified within the study area for the proposed Dundalk Bay to Carlingford Greenway project. The specific objectives of the air quality constraints study are to determine the prevailing ambient air quality, the main existing sources of air pollution, and the most sensitive receptor locations within the study area.

5.2.6.2 Methodology

The principal guidance and best practice documents that will be used to inform the constraints study and the assessment of potential impacts on air quality are summarised below. The assessment has made reference to national guidelines where available, in addition to international standards and guidelines relating to the assessment of air quality impacts:

- Guidance on the Assessment of Dust from Demolition and Construction V1. (Institute of Air Quality Management (IAQM) (hereafter referred to as the IAQM Guidelines) (IAQM, 2016);
- A Guide to the Assessment of Air Quality Impacts on Designated Nature Conservation Sites (Version 1.1) (IAQM, 2020);
- Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment (EC, 2013);
- PE-ENV-01106: Air Quality Assessment of Specified Infrastructure Projects (Transport Infrastructure Ireland (TII), 2022a); and

- TII Road Emissions Model (REM): Model Development Report – GE-ENV-01107 (TII, 2022a).

In addition to specific air quality guidance documents, the following guidelines will be considered and consulted in the preparation of the EIA:

- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (hereafter referred to as the Environmental Protection Agency (EPA) Guidelines) (EPA, 2022);
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of Environment, Community and Local Government, August, 2018);
- Advice Notes on Current Practice in the Preparation of Environmental Impact Statements (EPA, 2003); and
- Environmental Impact Assessment of Projects – Guidance on the preparation of the Environmental Impact Assessment Report (European Commission, 2017).

The constraints assessment was carried out by means of a desktop review of available information on the study area and a review of existing air quality data from the EPA. The following information was reviewed as part of this study:

- OS Mapping;
- Satellite Mapping (Google Earth);
- EPA Air Quality Monitoring Data (EPA, 2023); and
- EPA Maps of Licenced Facilities (EPA, 2023).

Ambient Air Quality Standards

In order to reduce the risk to health from poor air quality, national and European statutory bodies have set limit values in ambient air for a range of air pollutants. These limit values or "Air Quality Standards" are health or environmental-based levels for which additional factors may be considered. For example, natural background levels, environmental conditions and socio-economic factors may all play a part in the limit value which is set.

Air quality significance criteria are assessed on the basis of compliance with the appropriate standards or limit values. The applicable standards in Ireland include the Air Quality Standards Regulations 2022 (S.I. No. 739 of 2022), which incorporate EU Directive 2008/50/EC, which has set limit values for a number of pollutants. The limit values for NO_2, PM_{10} and $PM_{2.5}$, are relevant to this assessment (see Table 5.2.6.1).

Table 5.2.6.1 Air Quality Standards Regulations 2022

Pollutant	Regulation [Note 1]	Limit Type	Value
Dust Deposition	TA Luft (German VDI 2002)	Annual average limit for nuisance dust	350 mg/m^2/day
NOx	2008/50/EC	Annual limit value for the protection of vegetation	30 µg/m^3 NO + NO_2
Nitrogen Dioxide (NO_2)	2008/50/EC	Hourly limit for protection of human health - not to be exceeded more than 18 times/year	200 µg/m^3
		Annual limit for protection of human health	40 µg/m^3

Pollutant	Regulation [Note 1]	Limit Type	Value
Particulate Matter (as PM_{10})	2008/50/EC	24-hour limit for protection of human health - not to be exceeded more than 35 times/year	50 µg/m^3 PM_{10}
		Annual limit for protection of human health	40 µg/m^3 PM_{10}
Particulate Matter (as $PM_{2.5}$) Stage 1	2008/50/EC	Annual limit for protection of human health	25 µg/m^3 $PM_{2.5}$
Particulate Matter (as $PM_{2.5}$) Stage 2	2008/50/EC	Annual limit for protection of human health	20 µg/m^3 $PM_{2.5}$

Note 1 EU 2008/50/EC – Clean Air For Europe (CAFÉ) Directive replaces the previous Air Framework Directive (1996/30/EC) and daughter directives 1999/30/EC and 2000/69/EC

In April 2023, the Government of Ireland published the Clean Air Strategy for Ireland (Government of Ireland, 2023), which provides a high-level strategic policy framework needed to reduce air pollution. The strategy commits Ireland to achieving the 2021 WHO Air Quality Guidelines Interim Target 3 (IT3) by 2026 (shown in Table 5.2.6.2), the IT4 targets by 2030 and the final targets by 2040 (shown in Table 5.2.6.2). The strategy notes that a significant number of EPA monitoring stations observed air pollution levels in 2021 above the WHO targets; 80% of these stations would fail to meet the final $PM_{2.5}$ target of 5 µg/m^3. The strategy also acknowledges that *"meeting the WHO targets will be challenging and will require legislative and societal change, especially with regard to both $PM_{2.5}$ and NO_2"*. Ireland will revise its air quality legislation in line with the proposed EU revisions to the CAFE Directive, which will set interim 2030 air quality standards and align the EU more closely with the WHO targets.

Table 5.2.6.2 WHO Air Quality Guidelines 2021

Pollutant	Regulation	Limit Type	IT3 (2026)	IT4 (2030)	Final Target (2040)
NO_2	WHO Air Quality Guidelines	24-hour limit for protection of human health	50 µg/m^3 NO_2	50 µg/m^3 NO_2	25 µg/m^3 NO_2
		Annual limit for protection of human health	30 µg/m^3 NO_2	20 µg/m^3 NO_2	10 µg/m^3 NO_2
PM (as PM_{10})		24-hour limit for protection of human health	75 µg/m^3 PM_{10}	50 µg/m^3 PM_{10}	45 µg/m^3 PM_{10}
		Annual limit for protection of human health	30 µg/m^3 PM_{10}	20 µg/m^3 PM_{10}	15 µg/m^3 PM_{10}
PM (as $PM_{2.5}$)		24-hour limit for protection of human health	37.5 µg/m^3 $PM_{2.5}$	25 µg/m^3 $PM_{2.5}$	15 µg/m^3 $PM_{2.5}$
		Annual limit for protection of human health	15 µg/m^3 $PM_{2.5}$	10 µg/m^3 $PM_{2.5}$	5 µg/m^3 $PM_{2.5}$

Dust Deposition Guidelines

The concern from a health perspective is focused on particles of dust that are less than 10 microns (PM_{10}) and less than 2.5 microns ($PM_{2.5}$). The EU ambient air quality standards outlined in Table 5.2.6.1 have set ambient air quality limit values for PM_{10} and $PM_{2.5}$.

With regards to larger dust particles that can give rise to nuisance dust, there are no statutory guidelines regarding the maximum dust deposition levels that may be generated during the construction phase of a development in Ireland. Furthermore, no specific criteria have been stipulated for nuisance dust in respect of this development.

With regard to dust deposition, the German TA-Luft standard for dust deposition (non-hazardous dust) (German VDI, 2002) sets a maximum permissible emission level for dust deposition of 350 mg/m^2/day averaged over a one-year period at any receptors outside the site boundary. Recommendations from the Department of the Environment, Heritage & Local Government (DEHLG, 2004) apply the TA Luft limit of 350 mg/m^2/day to the site boundary of quarries. This limit value can also be implemented with regard to dust impacts from construction of the proposed development.

5.2.6.3 Receiving Environment

Air Quality Sensitive Receptors

The TII guidelines PE-ENV-01106 (TII, 2022b) specifically define what types of receptors can be deemed sensitive with respect to air quality impacts "*sensitive receptor locations include: residential housing, schools, hospitals, places of worship, community centres and shopping areas, i.e. locations where members of the public are likely to be regularly present"*. In addition, the impact of air quality on ecologically sensitive receptors must also be considered. As stated within the TII guidelines "*designated habitats are also potentially sensitive receptors. Such sites include, Natural Heritage Areas (NHA), Special Areas of Conservation (SAC), Special Protection Areas (SPA), National Parks, Nature Reserves, Refuges for Fauna, Refuges for Flora, Wildfowl Sanctuaries, Ramsar Sites, Biogenetic Reserves and UNESCO Biosphere Reserves*".

The existing environment of the study area bounds on Dundalk to the southwest, and Carlingford to the northeast. The study area is predominantly rural in nature. The land use is predominately agricultural lands, with a small number of residential properties. Residential properties are typically once off properties. Dundalk and Carlingford are the two highest population centres.

There are five designated ecology sites within the study area:

- Dundalk Bay SAC/SPA/pNHA
- Trumpet Hill pNHA
- Liscarragh Marsh pNHA
- Carlingford Shore SAC/pNHA
- Carlingford Lough SPA/SAC/pNHA

These sites have the potential to be impacted by construction dust impacts; however, such impacts have a high potential for mitigation and, therefore, it is unlikely to result in significant impacts.

Air Quality Baseline

Air quality monitoring programs have been undertaken in recent years by the EPA. The most recent annual report on air quality in Ireland is "*Air Quality In Ireland 2022*" (EPA, 2023). The

EPA website details the range and scope of monitoring undertaken throughout Ireland and provides both monitoring data and the results of previous air quality assessments.

As part of the implementation of the Air Quality Standards Regulations 2022 (S.I. No. 739 of 2022) four air quality zones have been defined in Ireland for air quality management and assessment purposes (EPA, 2024). Dublin is defined as Zone A and Cork as Zone B. Zone C is composed of 23 towns with a population of greater than 15,000. The remainder of the country, which represents rural Ireland but also includes all towns with a population of less than 15,000, is defined as Zone D.

In terms of air monitoring and assessment, the study area of the proposed development is primarily within Zone D, and partially within Zone C (EPA, 2024). The long-term monitoring data has been used to determine background concentrations for the key pollutants in the region of the proposed development. The background concentration accounts for all non-traffic derived emissions (e.g. natural sources, industry, home heating etc.).

The EPA *Air Quality in Ireland 2020* report details the effect that the Covid-19 restrictions had on air monitoring stations, which included reductions of up to 50% of pollutant concentrations at some monitoring stations which have traffic as a dominant source. 2020 air pollutant concentrations are, therefore, predicted to be an exceptional year and not consistent with long-term trends.

Continuous monitoring of NO_2 was conducted at Zone D locations in Kilkit, Emo Court, Birr and Edenderry, as well as one Zone C location in Dundalk (EPA, 2024). The results show that current levels of NO_2 are below both the annual and 1-hour limit values, with annual average levels ranging from 2 – 12 µg/m^3 in 2022.

Sufficient data is available for all stations to observe the long-term trend since 2018 with average results ranging from 3.5 – 12.6 µg/m^3 and two exceedances of the one-hour limit value in Dundalk, one exceedance in 2020 and one exceedance in 2022 (EPA, 2023).

Continuous PM_{10} monitoring carried out at the Zone D locations of Castlebar, Kilkit, Claremorris and Carrick-on-Shannon and Zone C location of Dundalk. The annual mean concentrations range from 11 – 18 µg/m^3 in 2022, with 14 exceedances of the daily limit value of 50 µg/m^3 (35 exceedances are permitted per year) at Enniscorthy in 2019. Sufficient data is available for all stations to observe trends over the 2018 - 2022 period. Average annual mean PM_{10} concentrations suggest an average concentration range of 10.8 to 17.8 µg/m^3.

Continuous $PM_{2.5}$ monitoring carried out at the Zone D location of Edenderry, Enniscorthy, Birr and Cavan Town and Zone C location of Dundalk. The annual mean concentrations ranging from 7.4 – 19.8 µg/m^3 over the 2018 - 2022 period. Average concentrations in 2021 ranged from 7.3 to 19.8 µg/m^3. The maximum of 19.8 µg/m^3 was recorded at the Dundalk monitoring site. A summary of the estimated air quality background concentrations are shown in Table 5.2.6.3.

Table 5.2.6.3 Estimated Current Air Quality Background Concentrations in Study Area

NO_2	PM_{10}	$PM_{2.5}$
8 µg/m^3	14 µg/m^3	13 µg/m^3

Sources of Air Quality Emissions

The major source of air pollution within the study area is road traffic, predominantly that from the existing M1, N1, N52, R173, R174, R175 and R176. Air quality is variable and subject to significant spatial variation, with concentrations generally falling significantly with distance from major road sources. The higher levels of air pollution are experienced within 50m of the existing national roads in the study area, with the remainder of the study area generally experiencing rural background concentrations of pollutants. Burning of fossil fuels in residential properties is a source of air pollution in villages and towns, which can significantly contribute to NO_2 but also PM_{10} and $PM_{2.5}$ emissions. This often occurs during winter nights when residential properties burn fires.

A review of IPPC / IED licences issued by the EPA (EPA, 2023) for the region show that there is one IE licenced site, and three IPPC licensed sites within the study area. The are two 'Emissions to Atmosphere' licenced facility within 2km of the study area; Great Northern Distillery Limited (P0996) and Cooley Distillery Unlimited Company (P0826). The Great Northern Distillery Limited facility is 300m southwest of the study area. The Cooley Distillery Unlimited Company facility is within the study area. The emissions from the facilities must comply with the emission limit values specified within the IPPC licence which are set for the protection of human health and the environment. Therefore, the emissions are unlikely to contribute significantly to background concentrations within the study area.

There are no other significant sources of air quality emissions within the study area.

5.2.6.4 Key Constraints / Opportunities

Based on the review of the study area for the proposed development, and the existing ambient air quality environment, no significant constraints have been identified in relation to air quality.

The greenway has the potential to provide an opportunity for modal shift from private vehicles to active travel for local communities. The design should encourage and facilitate this alongside its use for leisure trips.

5.2.6.5 References

Department of the Environment Heritage and Local Government (DEHLG) (2004) Quarries and Ancillary Activities, Guidelines for Planning Authorities

Environmental Protection Agency (2022) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports

Environmental Protection Agency (2023a) Air Quality Monitoring Report 2022 (& previous annual reports)

Environmental Protection Agency GIS Mapping (2023b) Accessed 19/12/2023

German VDI (2002) Technical Guidelines on Air Quality Control – TA Luft

Institute of Air Quality Management (IAQM) (2014) Guidance on the Assessment of Dust from Demolition and Construction Version 1.1

Met Éireann (2023) Met Éireann website: https://www.met.ie/.

Transport Infrastructure Ireland (2022a) TII Road Emissions Model (REM): Model Development Report – GE-ENV-01107

Transport Infrastructure Ireland (2022b) Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106

World Health Organisation (2021) Air Quality Guidelines - Global Update 2021 (and previous Air Quality Guideline Reports 1999, 2000 & 2005)

5.2.7 Climate

5.2.7.1 Introduction

This section describes the climate constraints identified within the study area for the proposed Dundalk Bay to Carlingford Greenway project. The specific objectives of the climate constraints study are to determine the baseline climate, the main existing sources of greenhouse gases, and the potential vulnerability of the area to climate change.

This section considers the following two elements with respect to climate:

- Greenhouse Gas Emissions Assessment (GHGA) – Considers the quantification of the GHG emissions from a project over its lifetime. The assessment compares these emissions to relevant carbon budgets, targets and policy to contextualise magnitude; and
- Climate Change Risk assessment (CCRA) – Identifies the impact of a changing climate on a project and receiving environment. The assessment considers a projects vulnerability to climate change and identifies adaptation measures to increase project resilience.

Climate Agreements

In 2015, the Climate Action and Low Carbon Development Act 2015 (No. 46 of 2015) (Government of Ireland, 2015) was enacted (the Act). The purpose of the Act was to enable Ireland '*to pursue, and achieve, the transition to a low carbon, climate resilient and environmentally sustainable economy by the end of the year 2050'* (3.(1) of No. 46 of 2015). This is referred to in the Act as the 'national transition objective'. The Act made provision for a national mitigation plan, and a national adaptation framework. In addition, the Act provided for the establishment of the Climate Change Advisory Council with the function to advise and make recommendations on the preparation of the national mitigation and adaptation plans and compliance with existing climate obligations.

The first Climate Action Plan (CAP) was published by the Irish Government in June 2019 (Government of Ireland, 2019). The Climate Action Plan 2019 outlined the current status across key sectors including Electricity, Transport, Built Environment, Industry and Agriculture and outlined the various broadscale measures required for each sector to achieve ambitious decarbonisation targets. The 2019 CAP also detailed the required governance arrangements for implementation including carbon-proofing of policies, establishment of carbon budgets, a strengthened Climate Change Advisory Council and greater accountability to the Oireachtas. The Government published the second Climate Action Plan in November 2021 (Government of Ireland, 2021a) and a third update in December 2022 (Government of Ireland, 2022).

Following on from Ireland declaring a climate and biodiversity emergency in May 2019, and the European Parliament approving a resolution declaring a climate and environment emergency in Europe in November 2019, the Government approved the publication of the General Scheme in December 2019, followed by the publication of the Climate Action and Low Carbon Development (Amendment) Act 2021 (hereafter referred to as the 2021 Climate Act) in March 2021. The Climate Act was signed into Law on the 23rd July 2021, giving statutory effect to the core objectives stated within the CAP.

The purpose of the 2021 Climate Act (Government of Ireland, 2021b) is to provide for the approval of plans *"for the purpose of pursuing the transition to a climate resilient, biodiversity rich and climate neutral economy by no later than the end of the year 2050"*. The 2021 Climate Act will also *"provide for carbon budgets and a decarbonisation target range for certain sectors of the economy"*. The 2021 Climate Act defines the carbon budget as *"the total amount of greenhouse gas emissions that are permitted during the budget period"*.

In relation to carbon budgets, the 2021 Climate Action and Low Carbon Development (Amendment) Act states that *'a carbon budget, consistent with furthering the achievement of the national climate objective, shall be proposed by the Climate Change Advisory Council, finalised by the Minister and approved by the Government for the period of 5 years commencing on the 1 January 2021 and ending on 31 December 2025 and for each subsequent period of 5 years (in this Act referred to as a 'budget period')'*. The carbon budget is to be produced for 3 sequential budget periods, as shown in Table 5.2.7.1. The carbon budget can be revised where new obligations are imposed under the law of the European Union or international agreements or where there are significant developments in scientific knowledge in relation to climate change. In relation to the sectoral emissions ceiling, the Minister for the Environment, Climate and Communications (the Minister for the Environment) shall prepare and submit to government the maximum amount of Greenhouse Gas (GHG) emissions that are permitted in different sectors of the economy during a budget period and different ceilings may apply to different sectors. The sectorial emission ceilings for 2030 were published in July 2022 and are shown in Table 5.2.7.2. Transport has a 50% reduction requirement and a 2030 emission ceiling of 6 Mt CO_2e.

Table 5.2.7.1 5-Year Carbon Budgets 2021-2025, 2026-2030 and 2031-2025

Sector	Reduction Required	2018 Emissions ($MtCO_2eq$)
2021-2025	295 Mt CO2eq	Reduction in emissions of 4.8% per annum for the first budget period.
2026-2030	200 Mt CO2eq	Reduction in emissions of 8.3% per annum for the second budget period.
2031-2035	151 Mt CO2eq	Reduction in emissions of 3.5% per annum for the third provisional budget.

Table 5.2.7.2 Sectoral Emission Ceilings 2030 [Note 1]

Sector	Baseline ($MtCO_2e$)	Carbon Budgets		2030 Emissions ($MtCO_2eq$)	Indicative Emissions % Reduction in Final Year of 2025-2030 Period (Compared to 2018)
	2018	2021-2025	2026-2030		
Transport	12	54	37	6	50
Electricity	10	40	20	3	75
Buildings (Residential)	7	29	23	4	40
Buildings (Commercial)	2	7	5	1	45
Agriculture	23	106	96	17.25	25
Land Use, Land-use Change and Forestry (LULUCF)	5	TBC [Note 2]	TBC	TBC	TBC
Industry	7	30	24	4	35
Other (F-gases, waste, petroleum refining)	2	9	8	1	50
Unallocated Savings	-	7	5	-5.25	-

Sector	Baseline ($MtCO_2e$)	Carbon Budgets		2030 Emissions ($MtCO_2eq$)	Indicative Emissions % Reduction in Final Year of 2025-2030 Period (Compared to 2018)
	2018	2021-2025	2026-2030		
Total	68	TBC	TBC	-	-
Legally Binding Carbon Budgets and 2030 Emission Reduction Targets	-	295	200	-	51

Note 1 Table derived from CAP23

Note 2 TBC – these values were not populated in the Government of Ireland report

In December 2023, CAP24 was published (Government of Ireland, 2023). This is the second CAP since the publication of the carbon budgets and sectoral emissions ceilings and builds on the progress of CAP23, and it aims to implement the required changes to achieve a 51% reduction in carbon emissions by 2030 and 2050 net zero goal. The CAP has six vital high impact sectors where the biggest savings can be made: renewable energy, energy efficiency of buildings, transport, sustainable farming, sustainable business and change of land-use. CAP24 states that the decarbonisation of Ireland's manufacturing industry is key for Ireland's economy and future competitiveness. There is a target to reduce the embodied carbon in construction materials by 10% for materials produced and used in Ireland by 2025 and by at least 30% for materials produced and used in Ireland by 2030. CAP24 states that these reductions can be brought about by product substitution for construction materials and reduction of clinker content in cement. Cement and other high embodied carbon construction elements can be reduced by the adoption of the methods set out in the Construction Industry Federation 2021 report Modern Methods of Construction. In order to ensure economic growth can continue alongside a reduction in emissions, the IDA Ireland will also seek to attract businesses to invest in decarbonisation technologies.

In April 2023 the Government published a draft Long-term Strategy on Greenhouse Gas Emissions Reductions (Government of Ireland, 2023). This strategy provides a long-term plan on how Ireland will transition towards net carbon zero by 2050, achieving the interim targets set out in the Climate Action Plan. The strategy will be updated on the basis of a second round of public consultation throughout 2023 with an updated strategy published after this is complete.

The Louth County Council Climate Action Plan published in 2024-2029 (LCC, 2023) outlines a number of goals and plans to prepare for and adapt to climate change. There are five key action areas within the plan: Governance & Leadership, Built Environment & Transport, Natural Environment & Green Infrastructure, Communities: Resilience & Transition and Sustainability & Resource Management. Some of the measures promoted within the Action Plan under the key areas involve building retrofits, energy master-planning, development of segregated cycle routes, development of flood resilient designs, promotion of the use of green infrastructure and water conservation initiatives. The implementation of these measures will enable the Louth County Council area to adapt to climate change and will assist in bringing Ireland closer to achieving its climate related targets in future years. New developments need to be cognisant of the Climate Adaptation Strategy and incorporate climate friendly designs and measures where possible.

5.2.7.2 Methodology

The principal guidance and best practice documents used to inform the constraints assessment and EIA are summarised below. In addition to specific climate guidance documents, the following guidelines were considered and consulted in the preparation of this section:

- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (hereafter referred to as the Environmental Protection Agency (EPA) Guidelines) (EPA, 2022); and
- Environmental Impact Assessment of Projects – Guidance on the preparation of the Environmental Impact Assessment Report (European Commission, 2017).

The EIA and constraints will be informed by national guidelines where available, in addition to international standards and guidelines relating to the assessment of climate impacts. These are summarised below:

- Transport Infrastructure Ireland (TII) PE-ENV-01104: Climate Guidance for National Roads, Light Rail and Rural Cycleways (Offline & Greenways) – Overarching Technical Document (TII, 2022a);
- Transport Infrastructure Ireland (TII) PE-ENV-01105: Climate Assessment Standard for Proposed National Roads (TII, 2022b);
- Transport Infrastructure Ireland (TII) GE-ENV-01106: TII Carbon Assessment Tool for Road and Light Rail Projects and User Guidance Document (TII, 2022c);
- Transport Infrastructure Ireland (TII) GE-GEN-01101: Guide to the Implementation of Sustainability for TII Projects (TII, 2023a);
- Transport Infrastructure Ireland Climate Action Roadmap (TII, 2023b)
- Institute of Environmental Management & Assessment (IEMA) Environmental Impact Assessment Guide to: Assessing GHG Emissions and Evaluating their Significance (hereafter referred to as the IEMA 2022 GHG Guidance) (IEMA, 2022);
- IEMA Environmental Impact Assessment Guide to: Climate Change Resilience and Adaptation (hereafter referred to as the IEMA 2020 EIA Guide) (IEMA, 2020a);
- IEMA GHG Management Hierarchy (hereafter referred to as the IEMA 2020 GHG Management Hierarchy) (IEMA, 2020b);
- IEMA Principles Series: Climate Change Mitigation & EIA (IEMA, 2010);
- Publicly Available Specification (PAS) 2080:2023 on Carbon Management of Buildings and Infrastructure (BSI, 2023); and
- Technical guidance on the Climate Proofing of Infrastructure in the Period 2021-2027 (European Commission, 2021).

Significance Criteria for GHGA

The Transport Infrastructure Ireland (TII) guidance document entitled PE-ENV-01104 Climate Guidance for National Roads, Light Rail and Rural Cycleways (Offline & Greenways) – Overarching Technical Document (TII, 2022a) outlines a recommended approach for determining the significance of both the construction and operational phases of a development. During the EIA process significance will be determined with consideration of the following two factors and they should be considered as a constraint if not achievable:

- The extent to which the trajectory of GHG emissions from the project aligns with Ireland's GHG trajectory to net zero by 2050; and
- The level of mitigation taking place.

Significance Criteria for CCRA

The CCRA involves an initial screening assessment to determine the vulnerability of the proposed development to various climate hazards. The vulnerability is determined by combining the sensitivity and the exposure of the proposed development to various climate hazards.

Vulnerability = Sensitivity x Exposure

The vulnerability assessment takes any proposed mitigation into account.

5.2.7.3 Receiving Environment

Sensitivity of Receptor

The IEMA 2022 GHG Guidelines state that GHG emissions are not geographically limited due to the global nature of impacts, rather than directly affecting any specific local receptor.

Ireland declared a climate and biodiversity emergency in May 2019 and in November 2019 there was European Parliament approval of a resolution declaring a climate and environment emergency in Europe. This, in addition to Ireland's current failure to meet its EU binding targets under Regulation 2018/842 results in changes in GHG emissions either beneficial or adverse being of more significance than previously considered prior to these declarations. This ties in with the IEMA 2022 GHG Guidelines which state that the sensitive receptor for GHG emissions is the global atmosphere.

The receptor of climate is considered high vulnerability and sensitivity with respect to the CCRA, given the severe consequences of global climate change and the cumulative contributions of all GHG emission sources.

Current GHGA Baseline

PE-ENV-01104 (TII, 2022a) states that a baseline climate scenario should identify, consistent with the study area for the project, GHG emissions without the project for both the current and future baseline.

Ireland declared a climate and biodiversity emergency in May 2019 and in November 2019 there was European Parliament approval of a resolution declaring a climate and environment emergency in Europe. This, in addition to Ireland's current failure to meet its EU binding targets under Regulation 2018/842 (European Union, 2018) results in changes in GHG emissions either beneficial or adverse being of more significance than previously considered prior to these declarations.

Data published in 2022 states that Ireland's GHG emissions are estimated to be 60.76 million tonnes carbon dioxide equivalent (Mt CO2eq), which is 1.9% lower (or 1.19 Mt CO2 eq) than emissions in 2021 (61.95 Mt CO2 eq) and follows a 5.1% increase in emissions reported for 2021 (EPA, 2023). In 2022 emissions in the stationary ETS sector decreased by 4.3% and emissions under the ESR (Effort Sharing Regulation) decreased by 1.1%. When LULUCF is included, total national emissions decreased by 1.8%. The sector with the highest emissions in 2022 (excluding LULUCF) was agriculture at 38.4% of the total, followed by transport at 19.1%. Decreased emissions in 2022 compared to 2021 were observed in the largest sectors except for transport, waste and commercial services. These 3 sectors showed increases in emissions (6.0%, 4.9% and 0.2% respectively). For 2022, the total national emissions (excluding LULUCF) were estimated to be 68,069 kt CO_2eq as shown in Table 5.2.7.3 (EPA, 2023).

Table 5.2.7.3 Total National GHG Emissions Change 2021-2022 [Note 1]

Category	2021 Emissions (Mt CO_2e)	2022 Emissions (Mt CO_2e)	% Total 2022 (Excluding LULUCF)	% Change 2021-2022
Agriculture	23.626	23.337	34%	-2.1
Transport	10.978	11.634	17%	6.0
Energy Industries	10.262	10.076	15%	-1.8
Residential	6.992	6.105	9%	-12.7
Manufacturing Combustion	4.614	4.288	6%	-7.1
Industrial Processes	2.475	2.289	3%	-7.5
F-Gases	0.745	0.741	1%	-0.5
Commercial Services	0.765	0.767	1%	0.2
Public Services	0.672	0.659	1%	-1.9
Waste [Note 2]	0.826	0.867	1%	4.9
Land Use, Land-use Change and Forestry (LULUFC)	7.338	7.305	11%	-0.5
National Total excluding LULUFC	61.955	60.764	89%	-1.9
National Total including LULUFC	62.293	68.069	100%	-1.8

Note 1 Reproduced from Latest emissions data on the EPA website (EPA, 2023)

Note 2 Waste includes emissions from solid waste disposal on land, solid waste treatment (composting and anaerobic digestion), wastewater treatment, waste incineration and open burning of waste

Future GHGA Baseline

The future baseline with respect to the GHGA can be considered in relation to the future climate targets which the assessment results will be compared against. In line with TII (TII, 2022a) and IEMA Guidance (IEMA, 2022) the future baseline is a trajectory towards net zero by 2050, "*whether it* [the project] *contributes to reducing GHG emissions relative to a comparable baseline consistent with a trajectory towards net zero by 2050*".

The future baseline will be determined by Ireland meeting its targets set out in the CAP24, and future CAPs, alongside binding 2030 EU targets. In order to meet the commitments under the Paris Agreement, the European Union (EU) enacted '*Regulation (EU) 2018/842 on binding annual GHG emission reductions by Member States from 2021 to 2030 contributing to climate action to meet commitments under the Paris Agreement and amending Regulation (EU) No. 525/2013'* (hereafter referred to as the Regulation) (European Union, 2018). The Regulation aims to deliver, collectively by the EU in the most cost-effective manner possible, reductions in GHG emissions from the Emission Trading Scheme (ETS) and non-ETS sectors amounting to 62% (previously 43%) and 42%, respectively, by 2030 compared to 2005. The ETS is an EU-wide scheme which regulates the GHG emissions of larger industrial emitters including electricity generation, cement manufacturing and heavy industry. The non-ETS sector includes all domestic GHG emitters which do not fall under the ETS scheme and thus includes GHG emissions from transport, residential and commercial buildings, and agriculture.

Current CCRA Baseline

The region of the constraints area has a temperate, oceanic climate, resulting in mild winters and cool summers. The Met Éireann weather station at Dublin Airport Metrological station is the nearest weather and climate monitoring station to the study area with meteorological data recorded for the 30-year period from 1991 to 2020. The historical regional weather data for

Dublin Airport Metrological station which is representative of the current climate in the region of the constraints study area is shown in Tale 5.2.7.4. The data for the 30-year period from 1991 to 2020 indicates that the wettest months at Dublin Airport Metrological station were November and December, and the driest month on average was June. July was the warmest month with a mean temperature of 15.4 Celsius. January was the coldest month with a mean temperature of 5.2 Celsius.

Met Éireann's 2023 Climate Statement (Met Éireann 2024) states 2023's average shaded air temperature in Ireland is provisionally 11.20 °C, which is 1.65°C above the 1961-1990 long-term average. Previous to this, 2022 was the warmest year on record, however 2023 was 0.38 °C warmer (see Figure 5.2.7.5).

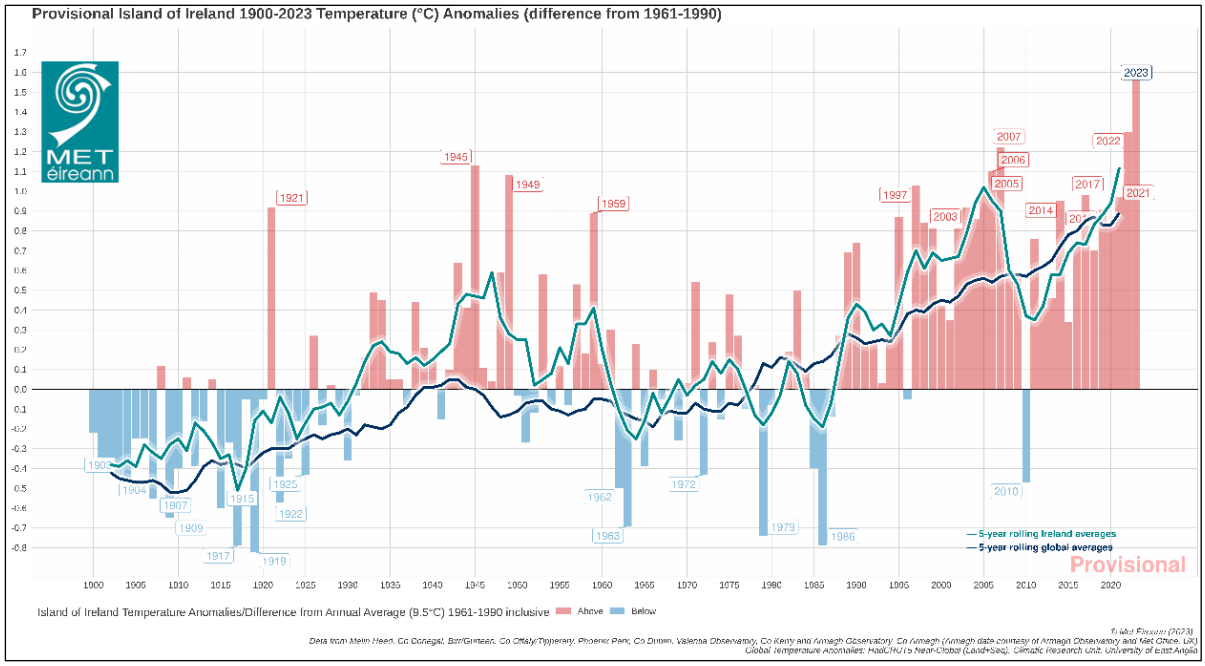

Figure 5.2.7.5 1900-2023 Temperature (°C) Temperature Anomalies (differences from 1961-1990)

2023 also had above average rainfall, this included the warmest June on record and the wettest March and July on record. Record high sea surface temperatures (SST) across the were recorded since April 2023 which included a severe marine heatwave to the west of Ireland during the June 2023. This marine heatwave contributed to the record rainfall in July.

Recent weather patterns and records of extreme weather events recorded by Met Éireann have been reviewed. Considering the extraordinary 2023 data, Met Éireann states that the latest Irish climate change projections indicate further warming in the future, including warmer winters. The record temperatures means the likelihood of extreme weather events occurring has increased. This will result in longer dry periods and heavy rainfall events. Storm surges and coastal flooding due to sea level rise. Compound events, where coastal surges and extreme rainfall events occur simultaneously will also increase. Met Éireann has high confidence in maximum rainfall rates increasing but not in how the frequency or intensity of storms will change with climate change.

The Louth Climate Change Adaptation Strategy 2019 – 2024 (Louth County Council 2019) discuss major past climate events in its Climate Change Action Plan. Events that have occurred since 1986 include heavy rainfall, flooding, strong winds, periods of extreme heat, and extreme cold, and heavy snowfall. Storm Darwin in February 2014 and Storm Ophelia in

October 2017 and Emma in 2018. Table 5.2.7.5 details historical severe weather events in County Louth (Met Éireann, 2024).

Table 5.2.7.4 30-Year Historical Weather Data for Dublin Airport 1991 to 2020 (Met Éireann, 2022)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Temperature (ºC)													
mean daily max	8	8.5	10.1	12.3	14.8	17.7	19.5	19.1	16.9	13.6	10.3	8.3	13.3
mean daily min	2.3	2.2	3	4	6.6	9	11.3	11.2	9.5	7.1	4.3	2.6	6.1
mean temperature	5.2	5.3	6.6	8.2	10.7	13.3	15.4	15.1	13.2	10.4	7.3	5.5	9.7
absolute max.	16.4	16.2	18.6	21.7	23.2	26.4	27.1	27.2	25	20.9	17.5	15.4	27.2
min. maximum	-3.2	-0.6	-0.6	4.2	6.3	10.3	11.8	13.8	9.6	5.2	-1.9	-4.8	-4.8
max. minimum	11.8	11.9	11.9	12.5	14.6	15.8	17.6	18.1	19.1	15.9	12.8	12.9	19.1
absolute min.	-9.5	-7.9	-7.9	-5.6	-3	0.7	3.9	2.4	0.4	-4.7	-8.4	-12.2	-12.2
mean num. of days with air frost	7.1	7.2	5.5	3.9	0.5	0	0	0	0	0.8	3.3	6.7	35
mean num. of days with ground frost	15.2	14.3	13.3	10.4	4.2	0.4	0	0.2	0.7	4.9	9.5	13.9	87
mean 5cm soil	4	4	5.4	8.5	12.4	15.5	16.7	15.7	13.2	9.6	6.4	4.5	9.7
mean 10cm soil	4.2	4.3	5.4	7.9	11.4	14.6	15.9	15.2	12.9	9.7	6.7	4.8	9.4
mean 20cm soil	4.8	4.9	6	8.4	11.6	14.7	16.1	15.6	13.5	10.5	7.5	5.5	9.9
Relative Humidity (%)													
mean at 0900UTC	87.9	87.9	84.7	79.8	77	76.2	78.6	81.1	84.1	86.5	89.4	88.8	83.5
mean at 1500UTC	81.6	76.9	71.6	68.7	67.8	67.7	69	69.8	71.9	75.8	81.6	83.9	73.9
Sunshine (hours)													
mean daily duration	1.9	2.9	3.7	5.4	6.4	6	5	5	4.4	3.4	2.4	1.7	4
Rainfall (mm)													
mean monthly total	61.8	52.4	51.4	55	57	64	61	73.4	63.3	78.4	82.7	72.1	772.5
greatest daily total	27.1	28.1	35.8	37	42.1	73.9	39.2	68.3	42.1	71.3	62.8	42.4	73.9
mean num. of days with >= 0.2mm	17.7	16.1	16.5	15.8	15.3	14.8	16.9	17.1	15.5	17	18.3	18.6	199.6
mean num. of days with >= 1.0mm	12.5	11	10.7	11.1	10.5	9.8	11.6	11.8	10.7	11.6	12.5	13.3	137.1
mean num. of days with >= 5.0mm	3.8	3.2	3.5	3.5	3.6	3.9	3.8	4.4	4.1	5	5.2	4.8	48.8
Wind (knots)													
mean monthly speed	12.3	12	11.4	10.3	9.9	9.2	9.1	9.2	9.6	10.5	11.2	11.7	10.5

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
max. gust	80	67	66	54	57	53	49	44	56	69	66	76	80
max. mean 10-minute speed	53	48	45	37	39	38	36	32	39	51	42	55	55
mean num. of days with gales	2.3	1.4	1	0.2	0.1	0.1	0.1	0	0.2	0.5	0.8	1.2	7.8

Table 5.2.7.5 Extreme Weather Events – Louth (reproduced from Louth County Council, 2019)

Type	Date	Description
Hurricane Charley	August 1986	Pluvial – Worst flooding in Dublin in 100 years.
Pluvial & Strong Winds	February 1990	Heavy rain and consequently flooding, with long periods of strong winds. All weather stations reported gale gusts.
Pluvial/Fluvial	June 1993	100 mm of rain fell in Dublin and Kildare (more than three times the normal amount).
Extreme Temperatures	June – August 1995	Warmest summer on record, with mean air temperatures over two degrees above normal in most places. Temperatures rose to around 30°C on a number of days and night time minimum temperature remained above 15°C for many weeks.
Windstorm	December 1997	Conditions were severe in much of Leinster, especially the south and east. In the Dublin area, there were record gusts of 150 km/h, with maximum 10-minute winds of storm force.
Fluvial	November 2000	250 properties flooded in Dublin, 90.8 mm of rain fell. Significant disruption and damage, especially in the area of the Lower Tolka catchment.
Coastal	February 2002	Second highest tide ever recorded. This caused sea defences to be overtopped. 1,250 properties flooded in Dublin, €60M worth of damage
Fluvial	November 2002	Similar to the 2000 flood, 80 mm of rain fell in Dublin. This led to high river levels in the River Tolka, which caused extensive flooding along the catchment.
Extreme Temperatures	Summer 2006	Warmest summer on record since 1995.
Pluvial	August – September 2008	76 mm of rain fell at Dublin Airport. Severe flooding in areas, many of which had no previous history of such flooding. Over 150 residential properties were inundated, as well as commercial premises, public buildings, major roadways, etc.
Pluvial	July 2009	This was a 1-in-50-year event. Several areas within the Dublin Region were severely affected.
Extreme Cold	December 2010	It was the coldest of any month at Dublin Airport in 50 years. Casement Aerodrome's temperature plummeted to -15.7°C on Christmas Day, the lowest temperature ever recorded in the Dublin Region.
Pluvial/Fluvial	October 2011	This was between a 1-in-50 and 1-in-100-year event across the majority of Dublin. Properties and roads were flooded, some electricity customers had no power supply in the County.
Coastal	January 2014	The highest tide ever recorded, at 3.014 metres ODM recorded at Alexandra Basin.
Storm Darwin	February 2014	1-in-20-year event, with gusts of 100-110 km/h in Dublin. Considerable damage to housing and other buildings. 8,000 ha of forests damaged. Status: Yellow.

Type	Date	Description
Storm Ophelia	October 2017	First storm to come from a southerly direction, with damaging gusts of 120 to 150 km/h. 100 large trees blown over in the Dublin Region and significant damage to buildings throughout the country. Status: Red.
The Beast from the East & Storm Emma	February – March 2018	Met Éireann issued its first Status Red warning for snow on record. Closure of all schools in the country, many businesses affected, water and power restrictions or outages. Status: Red.
Extreme Temperatures	Summer 2018	Drier and warmer weather than normal throughout Ireland, with drought conditions in many areas, including Dublin. Temperatures reached 28°C with above average sunshine and heat wave conditions. Water restrictions were in place for the country for the majority of the summer. Status: Yellow.
Storm Ali & Storm Bronagh	September 2018	Storm Ali brought widespread, disruptive wind, which led to the delay or cancellation of most flights to and from Dublin Airport. Storm Bronagh passed over the east of Ireland bringing heavy rain. Mean wind speeds between 65-80 km/h and gusts between 110-130 km/h. Status: Orange.

Future CCRA Baseline

Impacts as a result of climate change will evolve with a changing future baseline, changes have the potential to include increases in global temperatures and increases in the number of rainfall days per year. Therefore, it is expected that the baseline climate will evolve over time and consideration is needed with respect to this within the design of the proposed development.

Ireland has seen increases in the annual rainfall in the north and west of the country, with small increases or decreases in the south and east including in the region where the proposed development will be located (EPA, 2021b). The EPA have compiled a list of potential adverse impacts as a result of climate change including the following which may be of relevance to the proposed project (EPA, 2021a):

- More intense storms and rainfall events;
- Increased likelihood and magnitude of river;
- Adverse impacts on water quality; and
- Changes in distribution of plant and animal species.

The EPA's State of the Irish Environment Report (Chapter 2: Climate Change) (EPA, 2020b) notes that projections show that full implementation of additional policies and measures, outlined in the 2019 Climate Action Plan, will result in a reduction in Ireland's total GHG emissions by up to 25% by 2030 compared with 2020 levels. Climate change is not only a future issue in Ireland, as a warming of approximately 0.8°C since 1900 has already occurred. The EPA state that it is critically important for the public sector to show leadership and decarbonise all public transport across bus and rail networks to the lowest carbon alternatives. The report (EPA, 2020b) underlines that the next decade needs to be one of major developments and advances in relation to Ireland's response to climate change in order to achieve these targets. Ireland must accelerate the rate at which it implements GHG emission reductions. The report states that mid-century mean annual temperatures in Ireland are projected to increase by between 1.0°C and 1.6°C (subject to the emissions trajectory). In addition, heat events are expected to increase by mid-century (EPA, 2020b). While individual storms are predicted to have more severe winds, the average wind speed has the potential to decrease (EPA, 2020b).

TII's Guidance document PE-ENV-01104 (TII, 2022a) states that for future climate change a moderate to high Representative Concentration Pathways (RCP) should be adopted. RPC4.5 is considered moderate while RPC8.5 is considered high. Representative Concentration Pathways (RCPs) describe different 21st century pathways of GHG emissions depending on the level of climate mitigation action undertaken.

Future climate predictions undertaken by the EPA have been published in 'Research 339: High-resolution Climate Projections for Ireland – A Multi-model Ensemble Approach (EPA, 2020a). The future climate was simulated under both Representative Concentration Pathway 4.5 (RCP4.5) (medium-low) and RCP8.5 (high) scenarios. This study indicates that by the middle of this century (2041–2060), mid-century mean annual temperatures are projected to increase by 1 to 1.2°C and 1.3 to 1.6°C for the RCP4.5 and RCP8.5 scenarios, respectively, with the largest increases in the east. Warming will be enhanced at the extremes (i.e. hot days and cold nights), with summer daytime and winter night-time temperatures projected to increase by 1 to 2.4°C. There is a projected substantial decrease of approximately 50%, for the number of frost and ice days. Summer heatwave events are expected to occur more frequently, with the largest increases in the south. In addition, precipitation is expected to become more variable, with substantial projected increases in the occurrence of both dry periods and heavy precipitation events. Climate change also has the potential to impact future energy supply which will rely on renewables such as wind and hydroelectric power. More

frequent storms have the potential to damage the communication networks requiring additional investment to create resilience within the network.

The EPA's Critical Infrastructure Vulnerability to Climate Change report (EPA, 2021b) assesses the future performance of Irelands critical infrastructure when climate is considered. With respect to road infrastructure, fluvial flooding and coastal inundation/coastal flooding are considered the key climate change risks with snowstorm and landslides being medium risks. Extreme winds and heatwaves/droughts are considered low risk to road infrastructure. One of the key outputs of the research was a framework that will provide quantitative risk-based decision support for climate change impacts and climate change adaptation analysis for infrastructure.

National Framework for Climate Services (NFCS) was founded in June 2022 to streamline the provision of climate services in Ireland and will be led by Met Éireann. The aim of the NFCS is to enable the co-production, delivery and use of accurate, actionable, and accessible climate information and tools to support climate resilience planning and decision making. In addition to the NFCS, further work has been ongoing into climate projects in Ireland through research under the TRANSLATE project. TRANSLATE (Met Éireann, 2023b) has been led by climate researchers from University of Galway – Irish Centre for High End Computing (ICHEC), and University College Cork – SFI Research Centre for Energy, Climate and Marine (MaREI), supported by Met Éireann climatologists. TRANSLATE's outputs are produced using a selection of internationally reviewed and accepted models from both CORDEX and CMIP5. Representative Concentration Pathways (RCPs) provide a broad range of possible futures based on assumptions of human activity. The modelled scenarios include for "least" (RCP2.6), "more" (RCP4.5) or "most" (RCP8.5) climate change, see Figure 5.2.7.8.

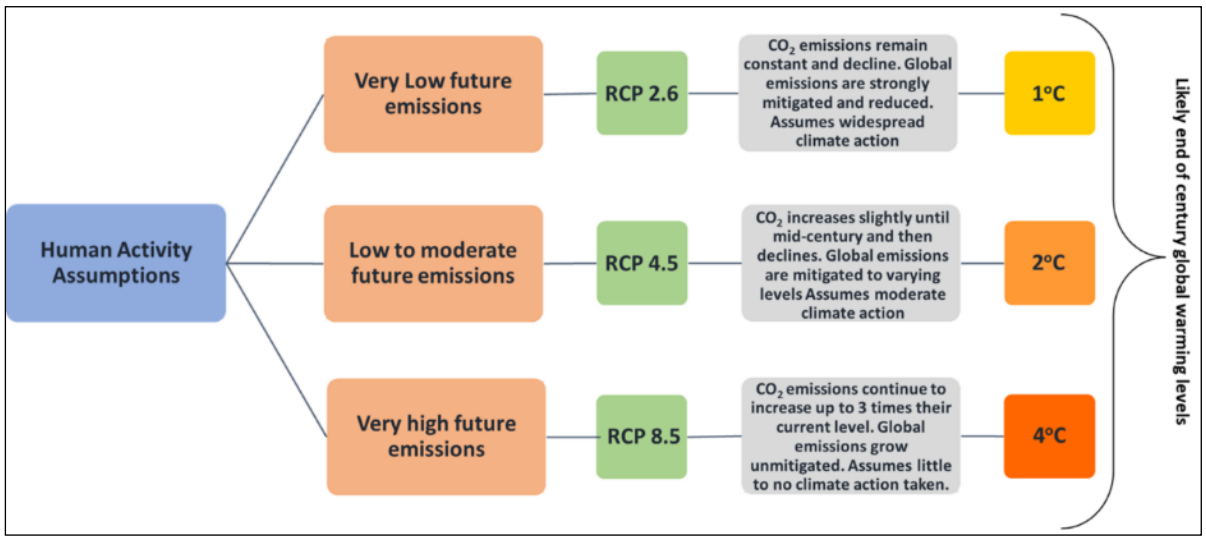

Figure 5.2.7.8 Representative Concentration Pathways Associated Emission Levels Source TRANSLATE Project Story Map (Met Éireann, 2023b)

TRANSLATE (Met Éireann, 2023b) provides the first standardised and bias-corrected national climate projections for Ireland to aid climate risk decision making across multiple sectors (for example, transport, energy, water), by providing information on how Ireland's climate could change as global temperatures increase to 1.5˚C ,2˚C, 2.5˚C, 3˚C or 4˚C (see Figure 5.2.7.9). Projections broadly agree with previous projections for Ireland. Ireland's climate is dominated by the Atlantic Meridional Overturning Circulation (AMOC), a large system of ocean currents – including the Gulf Stream – characterised by a northward flow of warm water and a southward flow of cold water. Due to the AMOC, Ireland does not suffer from the extremes of temperature experienced by other countries at a similar latitude. Recent studies have projected that the AMOC could decline by 30 – 40 % by 2100, resulting in cooler North Atlantic

Sea surface temperatures (SST)s (Met Éireann, 2023b). Met Éireann projects that Ireland will nevertheless continue to warm, although the AMOC cooling influence may lead to reduced warming compared with continental Europe. AMOC weakening is also expected to lead to additional sea level rise around Ireland. With climate change Ireland's temperature and rainfall will undergo more and more significant changes e.g. on average summer temperature could increase by more than 2°C, summer rainfall could decrease by 9% while winter rainfall could increase by 24%. Future projects also include a 10-fold increase in the frequency of summer nights (values > 15°C) by the end of the century, a decrease in the frequency of cold winter nights and an increase in the number of heatwaves. A heatwave in Ireland is defined as a period of 5 consecutive days where the daily maximum temperature is greater than 25°C.

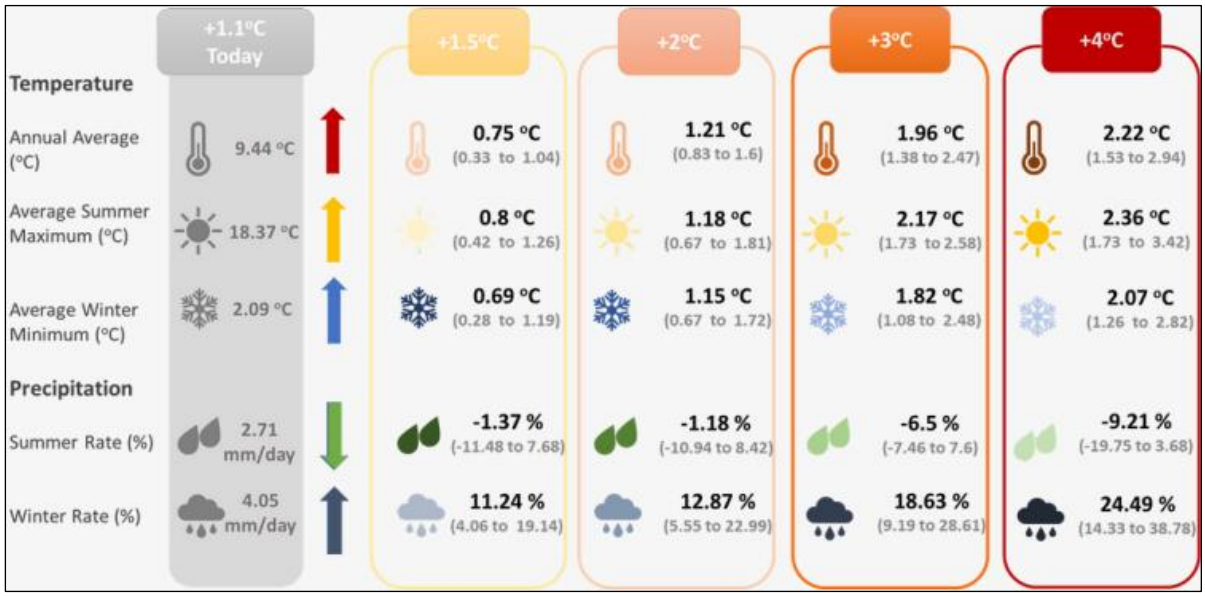

Figure 5.2.7.9 Change of Climate Variables for Ireland for Different Global Warming Thresholds Source TRANSLATE Project Story Map (Met Éireann, 2023b)

5.2.7.4 Key Constraints / Opportunities

Given Ireland's declaration of a climate and biodiversity emergency the impact of the proposed project on climate and climate on the proposed project can be considered a constraint as the baseline is highly sensitive. Ireland is exceeding its climate targets and requires significant reductions in our emissions in order to meet future climate targets. Therefore, the receiving environment is highly sensitive to any increases in emissions. However, there are no specific constraints provided the proposed project, at minimum, complies with existing and emerging policy requirements including the Climate Action Plan.

Opportunities to mitigate GHG emissions and minimise vulnerabilities to future climate change are best put in place during early design stage. Early engagement of the design team is key and, therefore, mitigation will be considered from the outset of the project and continue throughout the project's design. Publicly Available Specification (PAS) 2080:2023 on Carbon Management in Buildings and Infrastructure (BSI, 2023) and PE-ENV-01104 Climate Guidance for National Roads, Light Rail and Rural Cycleways (Offline & Greenways) – Overarching Technical Document (TII, 2022a) will assist in informing the opportunities for mitigation of GHG emissions.

Case studies included in Guide to the Implementation of Sustainability for TII Projects (GE-GEN-01101) provide examples of sustainability initiatives that are either currently implementable in TII Projects, or may be implementable once certain industry advancements are achieved in Ireland (TII, 2023a).

The Climate Action Roadmap 2023 ('Roadmap') sets out Transport Infrastructure Ireland's (TII) plans to reduce emissions and meet decarbonisation and energy efficiency targets. This Roadmap demonstrates how TII will achieve emissions reductions to 2030. TII has two targets under CAP23 focused on energy: decarbonisation and energy efficiency. This Roadmap sets out twenty-seven projects to be delivered between 2023 and 2030, the success of which is dependent on the accuracy of the model predictions, and all the projects being implemented as planned (TII, 2023b).

The proposed project has the opportunity to further action TR/23/30 of CAP23 which involves the advancing the rollout of greenways. In addition to a leisure facility, the greenway provides the potential to enhance active travel opportunities within the local communities.

In accordance with the Public Sector Climate Action Mandate, the project has constraints regarding procurement which means they must specify low carbon construction methods and low carbon cement material as far as practicable for directly procured or supported construction projects. In addition, public sector procurement contracts for delivery and haulage should specify zero-emissions vehicles where possible (CAP24).

5.2.7.5 References

BSI (2016) Publicly Available Specification (PAS) 2080:2023 on Carbon Management in Buildings and Infrastructure

Civil Engineering Standard Method of Measurement (CESSM) (2013) Carbon and Price Book database.

Construction Industry Federation (2021) Modern Methods of Construction.

Department of the Taoiseach (2022) Carbon Budgets Available at https://www.gov.ie/en/publication/9af1b-carbon-budgets/

Environmental Protection Agency (EPA) (2020a) Research 339: High-resolution Climate Projections for Ireland – A Multi-model Ensemble Approach.

Environmental Protection Agency (2020b) State of the Irish Environment Report (Chapter 2: Climate Change)

Environmental Protection Agency (EPA) (2021a) What impact will climate change have for Ireland? [Online] Available at https://www.epa.ie/environment-and-you/climate-change/what-impact-will-climate-change-have-for-ireland/

Environmental Protection Agency (EPA) (2021b) Critical Infrastructure Vulnerability to Climate Change Report no. 369

Environmental Protection Agency (2022) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports

Environmental Protection Agency (EPA) (2023) Ireland's Final Greenhouse Gas Emissions 1990-2021

European Commission (2017) Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report

European Commission (2021) Technical guidance on the climate proofing of infrastructure in the period 2021-2027.

Government of Ireland (2015) Climate Action and Low Carbon Development Act

Government of Ireland (2019) Climate Action Plan 2019

Government of Ireland (2021a) Climate Action Plan 2021

Government of Ireland (2021b) Climate Action and Low Carbon Development (Amendment) Act 2021 (No. 32 of 2021)

Government of Ireland (2022) Climate Action Plan 2023

Government of Ireland (2023) Long-term Strategy on Greenhouse Gas Emissions Reductions

Louth County Council (2019) Louth Climate Change Adaptation Strategy 2019 - 2024

Louth County Council Draft Climate Action Plan 2024-2029

Institute of Environmental Management & Assessment (IEMA) (2010). IEMA Principles Series on Climate Change Mitigation & EIA

Institute of Environmental Management & Assessment (IEMA) (2020a) EIA Guide to: Climate Change Resilience and Adaptation.

Institute of Environmental Management & Assessment (IEMA) (2020b) GHG Management Hierarchy. Assessing Greenhouse Gas Emissions and Evaluating their Significance

Institute of Environmental Management & Assessment (IEMA) (2022) Assessing Greenhouse Gas Emissions and Evaluating their Significance

Met Éireann (2024) Annual Climate Statement for 2023. Available at: https://www.met.ie/annual-climate-statement-for-2023 Accessed 05/01/2024

Transport Infrastructure Ireland (TII) (2022a) PE-ENV-01104: Climate Guidance for National Roads, Light Rail and Rural Cycleways (Offline & Greenways) – Overarching Technical Document

Transport Infrastructure Ireland (TII) (2022b) PE-ENV-01105: Climate Assessment Standard for Proposed National Roads (PE-ENV-01105)

Transport Infrastructure Ireland (TII) (2022c) GE-ENV-01106: TII Carbon Assessment Tool for Road and Light Rail Projects and User Guidance Document

Transport Infrastructure Ireland (TII) (2023a) GE-GEN-01101: Guide to the Implementation of Sustainability for TII Projects

Transport Infrastructure Ireland (TII) (2023b) TII Climate Action Roadmap

5.2.8 Noise and Vibration

5.2.8.1 Introduction

This section describes the noise and vibration constraints identified within the study area for the Dundalk Bay to Carlingford Greenway project. The specific purpose of the noise and vibration constraints study is to identify any receptors that may be deemed to be particularly sensitive to noise and/or vibration, and the noise environment within the constraint area where the proposed greenway may be developed.

Examples of noise sensitive receptors (NSRs) include schools, hospitals, places of worship, heritage buildings, special habitats, amenity areas in common use and designated quiet areas. Residential buildings including houses, hotels, hostels etc. are also noise sensitive[13]. Some commercial or industrial uses can also be noise sensitive, for example noise recording studios and research or manufacturing facilities using noise or vibration-sensitive equipment. However, it should be noted that noise and vibration impact from the operation of the greenway will typically be low or imperceptible and the presence of NSRs in the study area are not considered constraints to the development of greenway route options. During the construction phase, there will be noise with the potential to cause the greatest effect to the identified NSRs. However, given that the construction phase will be brief to temporary along the route, the overall impacts during this phase will not be significant.

5.2.8.2 Methodology

In the absence of relevant guidance document on constraint studies for greenway projects, reference has been made to the TII Guidelines for the Treatment of Noise & Vibration in National Road Schemes (2004) due to the linear nature of the project.

The document notes the specific objective of the noise input to the Constraints Study is to identify any receptors that may be deemed to be particularly sensitive to noise and/or vibration.

The TII document defines a noise sensitive receptor as:

> *"Any dwelling house, hotel or hostel, health building, educational establishment, place of worship or entertainment, or any other facility or other area of high amenity which affords proper enjoyment requires the absence of noise at nuisance levels."*

There is a mix of built-up urban areas and smaller groups of houses in the Constraints Study area, however these potential NSRs have been excluded from the listing of specific noise constraints as outlined below.

The presence of NSRs such as residences will not necessarily experience any long-term noise impacts as a result of the proposed project. Any potential noise impact at NSRs, such as houses as well as hotels / hostels, can typically be mitigated against if necessary, through the use of noise barriers or other mitigation. Such noise mitigation measures will be designed as appropriate at a later stage in the proposed scheme planning process, should this be required.

Therefore, the noise constraints report has focused on identifying the following NSRs;

- health buildings,
- educational establishments,
- places of worship,
- heritage buildings,
- special habitats,

[13] TII Good Practice Guidance for the Treatment of Noise during the Planning of National Road Schemes and Guidelines for the Treatment of Noise and Vibration in National Road Schemes.

- amenity areas in common use and designated quiet areas or any other facility or other area of high amenity which affords proper enjoyment and requires the absence of noise at nuisance levels.

5.2.8.3 Receiving Environment

The study area is typically rural in nature the western end encapsulating urban areas of north Dundalk, as well as the east sector taking in Carlingford Town. Outside of the aforementioned towns the land use is predominately a mixture of agricultural lands, and scattered pockets of residential properties.

The existing noise environment is expected to be dominated by road traffic in particular for areas close to the M1 Motorway, N1 National Road and regional roads. Other noise sources are expected to be local traffic along minor roads, agricultural activities and general environmental sources including bird song and rustling foliage.

5.2.8.4 Key Constraints / Opportunities

Initial review of the study area indicates it includes, but is not necessarily limited to, the following receptors:

- 21 no. Educational Establishments
- 7 no. Places of Worship
- Medical Facilities

As previously noted, the operational phase of the proposed greenway is not expected to have the potential to create significant outward effects. Locations of car parking facilities or other potential support facilities for the route have the highest potential to cause an effect on the identified receptors, however, this effect is likely to remain not significant along with the proposed greenway itself.

In terms of construction noise and vibration, it is preferable to locate the route and support facilities away from noise sensitive receptors where feasible, but given the brief or temporary nature of these effects it should not be considered a major constraint on the project.

Review of Published Noise Data

The prevailing noise environment in the vicinity of the proposed greenway should be given consideration as a potential noise constraint, specifically areas of high noise from highly trafficked roads with the potential to impacting on the amenity of the greenway itself.

The Round 4 road traffic noise maps published by the EPA as part of the Environmental Noise Regulations have been reviewed to determine the range of mapped traffic noise in the vicinity of the constraint area. As part of the noise mapping requirements, all roads with traffic flows greater than 3 million vehicle trips per annum (approximately 8,000 Annual Average Daily Traffic (AADT)) were required to be mapped.

A review of the EPA noise maps of the area indicates that noise levels due to road traffic sources in the area have typically not been modelled due to historic AADTs of lower than 8,000. Figure 5.2.8.1 provides an overview of the EPA mapping of the area. It is recommended that where possible, the greenway would be kept away from major roads such as the M1/N1 due to the potential for noise effects on the greenway itself.

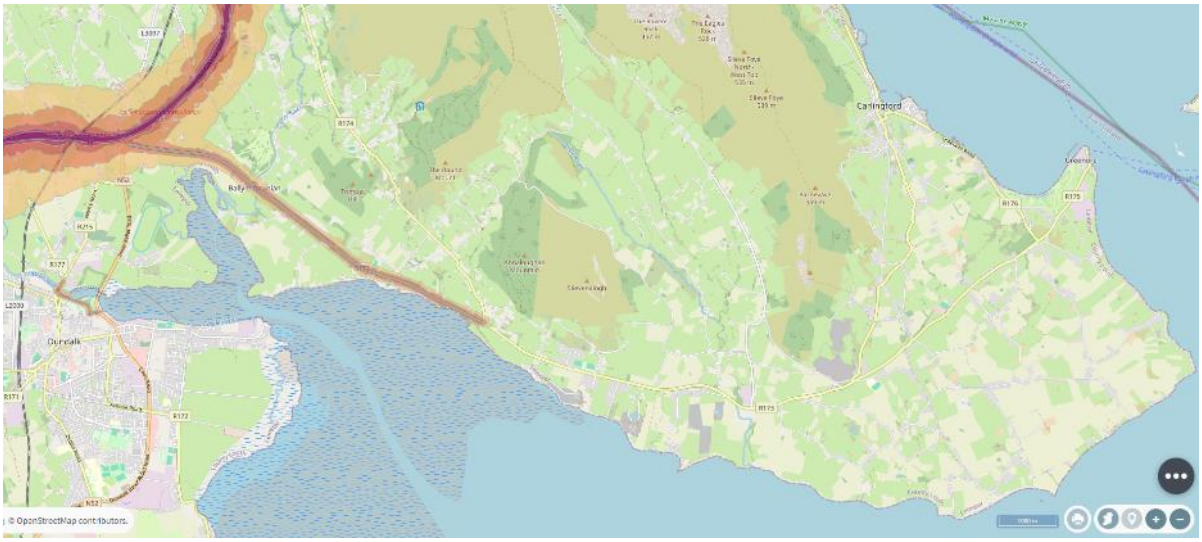

Figure 5.2.8.1 Noise map of the area indicating that roads are typically lightly trafficked (source: https://gis.epa.ie/EPAMaps)

5.2.9 Human Beings

5.2.9.1 Introduction

This section identifies the socio-economic forces in operation within the study area of the Dundalk Bay to Carlingford Greenway. This includes a review of the existing environment, population, commuting patterns, and key economic, community and tourism features, and outlines the human health profile of the study area.

5.2.9.2 Methodology

This section has been prepared with regards to the following guidelines:

- EPA Guidelines on information to be contained in the Preparation of Environmental Impact Statements / Environmental Impact Assessments (2022);
- Draft Advice Notes for Preparing Environmental Impact Statements (EPA, 2015);
- EPA Advice note on Current Practice in the Preparation of the Environmental Impact Statements / Environmental Impact Assessments (2003); and
- TII Environmental Impact Assessment of National Road Schemes – A Practical Guide (2008).

The following data sources and policy documents were also consulted:

- CSO Census 2016, and 2022 Population Distribution and Movements.
- Louth County Development Plan 2021-2027
- Pobal HP Deprivation Indices 2022

5.2.9.3 Receiving Environment

Population

There are eleven Electoral Divisions (EDs) located wholly or partially within the study area. According to the 2022 Census, the population within the study area increased by 7.2% between 2016 and 2022, from 38,661 persons to 41,694 persons.

Table 5.2.9.1 Electoral Divisions Population Data within Study Area (Census 2016 and 2022)

Electoral Division	Population (Census 2016)	Population (Census 2022)	% Change in Population
Carlingford	2,185	2,022	8%
Greenore	1,200	1,250	4%
Rathcor	1,374	1,484	7.4%
Jenkinstown	1,281	1,321	3%
Ballymascanlan	2,200	2,272	3.1%
Dublin Rural (North)	19,265	6,830	9.5%
Dundalk Rural (South)		14,463	
Dundalk No. 1 Urban	2,176	2,380	8.5%
Dundalk No. 2 Urban	1,140	1,258	9.3%
Dundalk No. 3 Urban	1,710	1,712	0.1%
Dundalk No. 4 Urban	6,130	6,702	8.5%
Total	**38,661**	**41,694**	**7.2%**

Dundalk, Jenkinstown, Rampark, and Carlingford are the four settlements located wholly or partially within the study area. Over the 2016-2022 Census period, the total population of all four towns increased by 9.3%. Jenkinstown, compared to the other three settlements, experienced the greatest increase in population of 13.4% as shown in Table 5.2.9.2 below.

Table 5.2.9.2 Towns Population Data within Study Area (Census 2016 and 2022)

Town/Settlement	Population (Census 2016)	Population (Census 2022)	% Change in Population
Dundalk	39,004	43,112	9.5%
Jenkinstown	360	416	13.4%
Lordship	465	486	4.3%
Carlingford	1,445	1,528	5.4%
Total	**41,274**	**45,539**	**9.3%**

Statistics on the Commuting Patterns

The 2022 CSO Census Data provides information on the means of travel to work, school, or college. Figure 5.2.9.1 and Figure 5.2.9.2 below shows a combined data for Bus / minibus / coach and Train / DART / LUAS under Public Transport category whereas Motorcycle/Car Driver/Car Passenger/Van under Private Vehicles category respectively.

The figures below show 2022 CSO Census data on journey types including travel to work and school / college, for the 11 Electoral Divisions, as mentioned in Table 5.2.9.1, located wholly, or partially within the study area, reinforcing the lack of pedestrian and cycle facilities within the area.
As can be seen from Figure 5.2.9.3 below 15.8% of the total commuting trips are undertaken on foot, with 3.3% undertaken by bicycle, and 8% by public transport. Private Vehicle is the dominant means of travel for 56.4% of the population in Electoral Divisions.

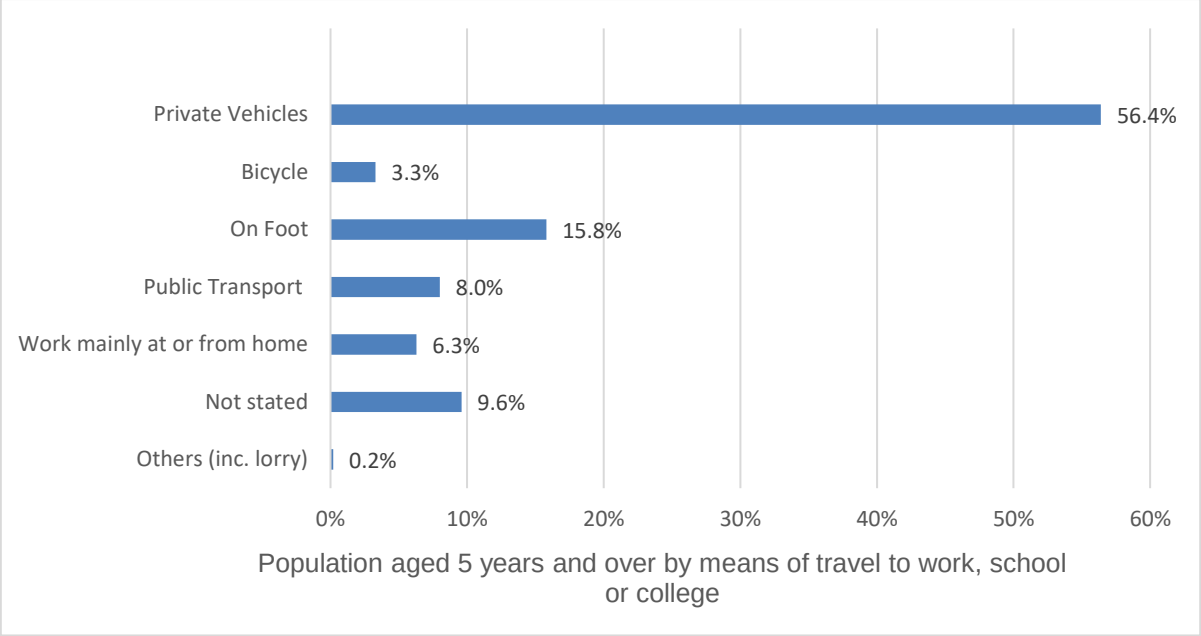

Figure 5.2.9.3 Population aged 5 year and over by means of travel to work, school or college within the study area.

Figure 5.2.9.4 below shows the breakdown of means of travel to work and school/college for the four towns as mentioned in Figure 5.2.9.3 above. As can be seen from Figure 5.2.9.4 below, 16.3% of the population travels on foot, 3.4% by bicycle and 8.5% by public transport. Private Vehicle is the dominant means of travel for 55.2% of the population in towns.

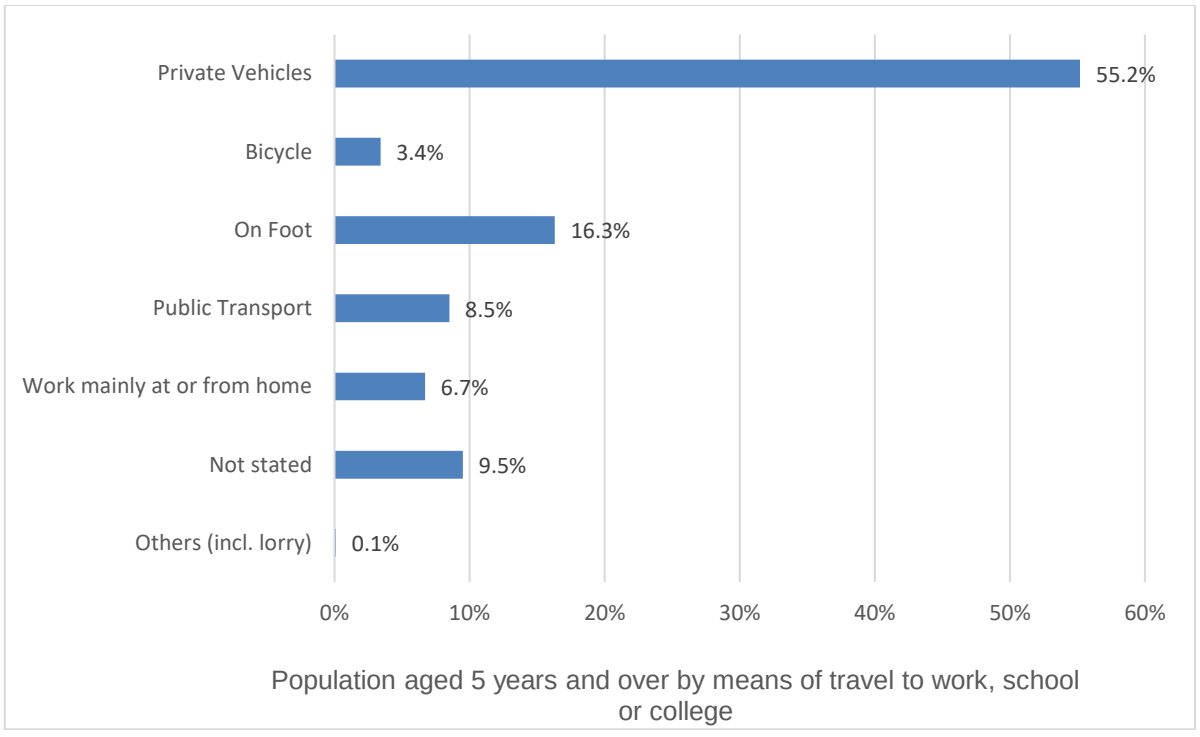

Figure 5.2.9.4 Population Aged 5 years and over by means of travel to work, school or college within the study area.

Economic, Business, and Tourism Facilities

The study area is urban, semi-urban and agricultural in character. It encompasses four towns which have several economic, business and tourism facilities which are identified in sections below.

Economic and Business Facilities

Table 5.2.9.3 below lists the economic and business facilities located within the study area.

Table 5.2.9.3 Economic and Business Facilities

Zoning (Fingal Development Plan 2023-2029)	Category	Name
General Employment	Business Park	Jenkinstown Business Park
		Blackthorn Business Park
	Warehouse	Mc Courts
		Deluxe Warehouse
		Roaring Water Bay Wines and Spirits
		Teelings warehouse
	Industrial Estate	Coes Road Industrial Estate
	Gas Station	Top Oil Newry Road Service Station
		Go Petrol Station
		Emo Oil- Dundalk Truckstop (HGV)
		Circle K

Tourism Facilities

Table 5.2.9.4 below shows the tourism attractions located within the study area.

Table 5.2.9.4 Tourism Facilities within the study area

Type of Facility	Name
Tourism businesses	Louth Adventures
	Skypark of Carlingford
Museum	County Museum Dundalk
	Greenore Co-op
Golf Course	Ballymascanlon Hotel Golf Course
	Greenore Golf Club
Attractions	Cu Chulainn's Castle
	Carlingford Castle
	Carlingford to Omeath Greenway

Existing Walking and Cycling Trails

This section describes the existing walking and cycling trails located partially or wholly within the study area.

Slieve Foye Loop walk- The Slieve Foye Loop is a scenic walking trail near Carlingford, County Louth, Ireland. This 9km stretch loop starts and ends in Carlingford and encompasses Slieve Foye, a mountain on the Cooley Peninsula, offering stunning views of Carlingford Lough and the Mourne Mountains. The loop is known for its diverse landscapes, including forests, heathland, and rocky terrain. The Carlingford sections of the loop are located within the study area.

Táin Way: Táin Way is a long-distance walking route near Carlingford that spans approximately 40km, tracing the Táin Bó Cúalinge story. The trail meanders through diverse landscapes, including coastal paths, rural farmland, and historic sites associated with the story tale. A few sections of the route, including Carlingford and R174 are located within the study area.

Carlingford Lough Greenway: The Carlingford Omeath Greenway is a scenic route built on old Dundalk Newry and Greenore Railway alignment along the shore of Carlingford Lough. The 7km long greenway is suitable for both walkers and cyclists. The Carlingford section of the greenway is located within the study area.

Barnevave Southern Loop walk: Barnevave loop walk spans approximately 8.7km near Carlingford. The route begins and ends in Carlingford and takes to Barnevave, a peak in the Cooley Mountains in county Louth. The Carlingford section of the loop is located within the study area. The Carlingford sections of the loop are located within the study area.

Annaloughan Loop walk: This route is located near Jenkinstown, County Louth. The loop walk spans approximately 8km and leads to the Annaloughan Mountain, offering rural landscapes and coastal views. The loop walk section around Jenkinstown is located within the study area.

Grange Loop walk: The Grange loop walk is approximately 7km long and is located near the Grange village in County Louth. This is a well signposted countryside loop that showcases views of Carlingford Lough. The loop walk section around Grange village is located within the study area.

5.2.9.4 Community Facilities and Amenities

Community facilities, consisting of educational, medical, recreational, and sporting nature, as well as places of worship located within the study area are listed in Table 5.2.9.5 below.

Table 5.2.9.5 Community Facilities and Amenities

Type of Community Facility	Name
Community Facility	Louth County Library
	Carlingford Library
Recreational facility	Ice House Hill Park
	Irish Folklore Park
	Proleek Dolmen
	St. Helena's Playground
	Lordship Playground Ireland
	Carlingford Playground

Type of Community Facility	Name
Sports Facility	Dundalk Rugby Club
	Dundalk Stadium
	Greenore Golf Club
	Ballymascanlon Hotel Golf Course
Cemetery	St. Patrick's Cemetery Dowdallshill
	Castletown Cemetery
	Newtown Cemetery
	Grange Cemetery
	St. Michael's Cemetery
Hospitals	Louth County Hospital (outside study area)
Pharmacy	Village Pharmacy Carlingford
	Jenkinstown Pharmacy
	Townparks Pharmacy
	Castletown Pharmacy
	Magee's Pharmacy
	McGuinness Pharmacy
	Cogaslann Pharmacy
	McCabes Pharmacy
	Byrnes Late Night Pharmacy
	Leavy's Pharmacy
	Pure Pharmacy
Church	Dundalk Community Church
	St. Patrick's Church
	Emmanuel Community Church
	St. Joseph's Redemptorists Church Shrine to St Gerard Majella
	St. Michael's Church
School	Castletown Girls' School
	St. Nicholas' National School
	St. Nicholas Monastery National School
	CBS Secondary School
	Scoil na mBraithre CBS Primary School
	Dun Dealgan National School
	Bellurgan National School
	Mullaghbuoy National School
	Bush Post Primary School
	Monksland National School
	Rampark National School

Type of Community Facility	Name
	St. Oliver's National School
College	St. Mary's College

County

The study area for the proposed Dundalk to Carlingford Greenway is located within the functional area of Louth County Council.

The Pobal HP Deprivation Data of year 2022 for county Louth is mentioned below:

- The population of county Louth is Marginally Below Average with a deprivation index score of -3.59,
- Has a low dependency ratio of 35.0 (i.e., those aged 0-14 and 65 years and over as a proportion of those aged 15-64), which is much lower than the national rate of 49.3%.
- Unemployment rate of Male and Female is 11.2% and 10.5% respectively.
- Lone Parent Ratio is 23.3%

Electoral Divisions

As per HP Deprivation Indices, all eleven EDs mentioned in Table 5.2.9.1, lie under the following categories as mentioned below.

Pobal HP Deprivation Indices 2022 identifies deprivation profile of all EDs below:

- The population of ED Carlingford is Marginally Below Average with a Pobal HP Index score of -1.4.
- The population of ED Greenore is Marginally Above Average with a Pobal HP Index score of 1.5.
- The population of ED Rathcor is Marginally Below Average with a Pobal HP Index score of -1.4.
- The population of ED Jenkinstown is Marginally Above Average with a Pobal HP Index score of 2.5.
- The population of ED Ballymascanlan is Marginally Below Average with a Pobal HP Index score of -0.46.
- The population of ED Dundalk Rural (North) is Marginally Below Average with a Pobal HP Index score of -7.5.
- The population of ED Dundalk Rural (South) is Marginally Below Average with a Pobal HP Index score of -7.5.
- The population of ED Dundalk No. 1 Urban is Disadvantaged with a Pobal HP Index score of -12.5.
- The population of ED Dundalk No. 2 Urban is Disadvantaged with a Pobal HP Index score of -13.2.
- The population of ED Dundalk No. 3 Urban is Marginally Below Average with a Pobal HP Index score of -4.1.
- The population of ED Dundalk No. 4 Urban is Marginally Below Average with a Pobal HP Index score of -6.5.

Shellfish Areas

Shellfish Areas are aquaculture sites or wild shellfish harvesting sites supporting a population of bivalve and gastropod molluscs. These areas are protected under the EU Shellfish Waters Directive [2006/113/EC] which aims to protect and improve shellfish waters in order to support shellfish life and growth. This is achieved by developing Pollution Reduction Programmes (PRPs) for each designated area[14]. There are 38 licensed Aquaculture sites located on Carlingford Lough in County Louth. Table 5.2.9.6 shows details regarding the Aquaculture areas below:

Table 5.2.9.6 Licensed Aquaculture Areas within the study area

Aquaculture Site ID	Species	Area (Hectares)
T01-090A	Blue Mussel	13.2 ha
T01-074A2	Blue Mussel	16.7 ha
T01-070A1	Blue Mussel	57.7 ha
T01-061A1	Blue Mussel	15.8 ha
T01-066A	Blue Mussel	31.7 ha
T01-050C	Blue Mussel	64.2 ha
T01-029B	Blue Mussel	13.3 ha
T01-103A	Blue Mussel	95 ha
T01-105A	Blue Mussel	49.2 ha
T01-050A1	Blue Mussel	61 ha
T01-071A	Blue Mussel	65 ha
T01-072B1	Blue Mussel	27 ha
T01-060A1	Blue Mussel	48.8 ha
T01-012	Pacific Oyster	1.6 ha
T01-009	Pacific Oyster	1.5 ha
T01-004	Pacific Oyster	2.4 ha
T01-023A	Pacific Oyster	6.2 ha
T01-008A	Pacific Oyster	4.1 ha
T01-044B	Pacific Oyster	1.6 ha
T01-043B	Pacific Oyster	1.8 ha
T01-024	Pacific Oyster	6.4 ha
T01-120A	Pacific Oyster	0.9 ha
T01-019	Pacific Oyster	11.3 ha
T01-020	Pacific Oyster	6.1 ha
T01-043C	Pacific Oyster	1.8 ha
T01-025A	Pacific Oyster	2.1 ha
T01-043A	Pacific Oyster	3.2 ha
T01-044A	Pacific Oyster	2.9 ha

[14] Directive 2006/113/EC of the European Parliament and of the Council

Aquaculture Site ID	Species	Area (Hectares)
T01-026A	Pacific Oyster	13.1 ha
T01-089A	Pacific Oyster	2 ha
T01-117A	Pacific Oyster	1 ha
T01-018B	Pacific Oyster	2 ha
T01-021	Pacific Oyster	12.2 ha
T01-121A	Pacific Oyster	1.6 ha
T01-018A	Pacific Oyster	10 ha
T01-102A	Pacific Oyster	1.5 ha
T01-100A	Pacific Oyster	0.2 ha
T01-101A	Pacific Oyster	6.1 ha

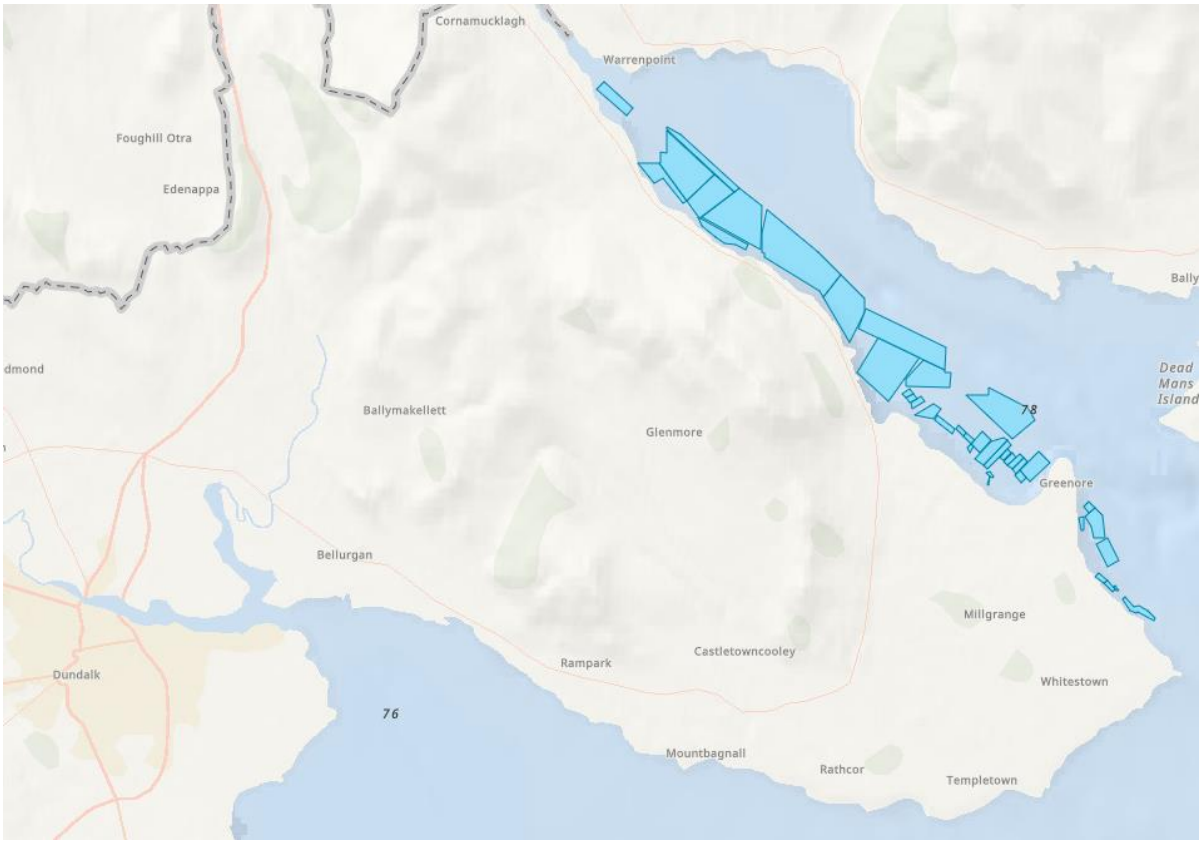

Figure 5.2.9.5 Licensed Aquaculture Areas within the study area

5.3 External Parameters

5.3.1 Funding and Scope

Louth County Council will be seeking funding from sponsoring agency for the project through the various phases and ultimately, subject to all necessary approvals, funding for construction of the project.

The current project scope includes the four relevant planning and design phases which are to be delivered in accordance with the TII Project Management Guidelines (Project Manager's Manual for Greenway Projects - July 2022) as outlined below:

- Phase 1 – Concept and Feasibility
- Phase 2 – Options Selection
- Phase 3 - Design and Environmental Evaluation
- Phase 4 – Statutory Processes

5.3.2 Construction Phasing

There is no plan at this stage of the project development to phase any section of the construction, but this will be reviewed as the project progresses. In any case, construction will look to minimise impacts where possible. Maintaining access and movement for road users during the construction phase will help to minimise impacts in for users of the existing road network.

Further options for construction methodology will be assessed as part of Phase 3 – Design and Environmental Evaluation as construction methods can be assessed, evaluated and impacts mitigated against. The exact processes will be finalised by the Contractor and will be based on the Statutory requirements.

Any construction works that may potentially encroach on the existing road network will require Temporary Traffic Management, including temporary road closures if required. However, it is noted that this will be considered through the options development with an aim to minimise the need for such works.

5.3.3 Technical Standards

The design will be developed in compliance with the latest TII Standards, Guidance Documents and best practice guidelines.

The project will also be progressed in accordance with the Code of Best Practice for National and Regional Greenways, which was published in December 2021 and provides comprehensive information in relation to the processes involved in planning, designing and constructing National and Regional Greenways.

5.3.4 Access Control

As the project develops access control and junction strategies will be developed in accordance with TII Standards and Guidance.

5.3.5 Policy Documents

For details on Policy Documents refer to Section 2 of this report.

5.3.6 Procedural and Legal Requirements

As part of the constraints study, consideration of procedural and legal issues, which may arise during the design and construction process, must be taken into account at as early a stage as possible so as not to delay the timely completion of the project.

On this basis the following should be noted at the appropriate stages.

- European and Irish environmental legislation;
- Amendments to Local Authority Development Plans;
- Guidelines on Process and Codes of Practice relating to environmental and legal aspects of Greenway design and construction;
- Land Acquisition (Code of Best Practice);
- EIA and CPO format and procedures;
- Rights of statutory undertakers;
- Wayleaves, Public and private Rights of Way; and
- Site Investigation Notices.

5.4 Interrelationships

TII Publications Project Manager's Manual for Greenway Project states that "*whilst undertaking the constraints study it is necessary to consider the divisions above* [i.e. the Natural, Artificial and External parameters/constraints] *in parallel. This is necessary as constraints in the divisions above are interrelated and indeed dependent on one another*". During the constraints study, the interrelationships between the divisions have been considered.

An example of an interrelationship is the considering the provision of fence screening along localised sections of the greenway to minimise the impacts on disturbance to birds. Whilst this will reduce the potential impacts on biodiversity, this could have a negative impact in terms of landscape and visual impact.

5.5 Opportunities

To better identify the best corridor option, an Opportunity Study has also been undertaken, whereby key Locations/features, and areas of interest within the Study area were identified and mapped.

The Dundalk Bay to Carlingford Greenway Study Area offers a wide range of destinations and attractions, including attractive scenery and a rich cultural landscape. This study involved the identification of such attractions utilising various sources, such as:

- Information received as part of the consultation process;
- Local knowledge of the area; and
- Tourism Websites, including tourism data available from Fáilte Ireland.

This study supports the 'Five S' criteria, as set out in the Strategy for the future development of National and Regional Greenways (July 2018), as listed below:

- Things to See and Do;
- Scenic;
- Sustainable;
- Substantially Segregated; and
- Strategic.

In developing the options, due consideration was given to providing accessibility to such locations. Simultaneously, constraints identified during this Phase 1 are also taken account of. The key opportunities within the study area are noted in the Table 5.5.1.1. It is noted that these lists are not exhaustive but provide indication into the key opportunities and constraints that have been considered.

Table 5.5.1.1 Key Locations / Features and Areas of Interest within the study area

Types of Amenities	Key Locations / Features and Areas of Interest
Walking Trails & Recreational Areas	Slieve Foye Loop walk
	Táin Way and Táin Trail cycling route
	Carlingford Lough Greenway
	Barnevave Loop Walk
	Annaloughan Loop Walk
	Grange Loop walk
	Whitestown Coastal Route
	Numerous Playgrounds
Points of Interest	Places for refreshment, such as the Strandfield, Ballymascanlon Hotel, Blue Anchor, Lumpers Bar, Fitzpatricks, Lily Finnegans, John Longs Bar,
	Archaeological Sites, such as the Dolman at Ballymascanlon, the old Coastguard Station
	Areas of Ecological Interest, such as Flurry River Estuary, the coastline and Carlingford Lough
	Areas of Architectural Interest, such as Disused Railway Bridges, Churches, mills, Euston Street Greenore and other buildings of architectural heritage
Sports Clubs and Facilities	Dundalk Stadium
	Ballymascanlon Hotel and Golf Resort
	Bellurgan Football Club
	St Patricks GFC
	Cooley Kickhams GFC
	Greenore Golf Club
Scenic	Templetown Beach – Blue Flag
	Whitestown Beach
	Dundalk Bay
	Trumpet Hill
	Colley Mountains, including Round Mountain, Annaloughan Mountain, Slievenaglogh, Barnevave, Slieve Foye

Types of Amenities	Key Locations / Features and Areas of Interest
Failte Ireland Registered Accommodation	Gyles Quay Caravan and Camping Park
	Ballymascanlon Hotel
	Hotel Imperial
	Ghan House
	Mourneview
	Grove House
	Harwood Heights
	The Oystercatcher Lodge
	Lynolan House
	Krakow
	Beachcombers Cottage
	Shalom B&B
	Crowne Plaza Dundalk
	Granvue House Hotel
	Glen Gat House
	Carlingford Adventure Centre
	McKevitts Village Hotel
	Four Seasons Hotel (Carlingford)
	Lismar Guesthouse
	The Fairway's Hotel
	Carlingford House
	Carrickdale Hotel
	Innisfree House
	Ardrose B&B
	McEvoy Cottage
	Carnbeg Hotel & Spa
	Stella Maria Hotel
	Carlingford Self Catering
	Highlands B&B
	Long Acre Lodge
	The Courtyard Carlingford
	Nellie's Farmhouse
	GlenVale Self-Catering
	Mountain View
	Tranquility Houses, Carlingford
	Annesley House Carlingford

Types of Amenities	Key Locations / Features and Areas of Interest
	Wildwood Lodge
	Carlingford Marina Apartments
	Other Accommodation not registered on Failte Ireland Database, such as AirBnB's, Camping sites
Residential Areas	Dundalk
	Carlingford
	Greenore
	Jenkinstown
	Lordship
	Grange
	The Bush
Public Transport	Dundalk Train Station
	Bus Routes, including the 174, 174A and 174B, the Bus Eireann 161 and 160 routes
	Carlingford Lough Ferry
Connectivity	Carlingford Lough Greenway
	Active Travel Facilities in Dundalk
	Omeath to Newry Greenway

6. FINDINGS FROM THE FIRST NON-STATUTORY PUBLIC CONSULTATION

6.1 Introduction

A public consultation feedback report has been prepared to summarise and assess the feedback received from Public Consultation No. 1 on Study Area, Constraints and Opportunities, held on 7th December 2023 in Carlingford Heritage Centre, Carlingford, Co. Louth.

The purpose of the non-statutory public consultation event was to:

- Inform the public of the project.
- Present the study area to the public.
- Present the constraints study to the public.
- Invite the public to submit comments and observations regarding constraints or barriers in their area, and any locations, attractions or facilities in their localities beneficial for the project and its users.
- Take feedback regarding any concerns or issues with the project at this stage.
- Gather relevant local information which may not have been previously known to the Project Team.

6.2 Methodology

A submission feedback form was provided during the public consultation. A downloadable version of the form was also available on the project website. This contained a number of specific questions regarding the greenway and a general comment section to give feedback. The responses were collated and analysed and will be taken into consideration when developing the route corridor options. Members of the public were notified in advance of the event by Louth County Council (LCC) via the following means and a presentation was also given to the Elected Members in advance of the event to brief them on the proposed development.

- **Newspaper**

  Notices publicising the event were published in the Dundalk Democrat, Dundalk Leader (local newspapers serving Co. Dundalk), and Independent, in their edition published on the week commencing 28th November 2023.

- **Louth County Council Website**

  A notice publicising the event (with the same content as the newspaper notice) was posted on the 'Consultations' page of the LCC website (www.consult.louthcoco.ie).

- **Dundalk Bay to Carlingford Greenway Website**

  A dedicated project website (https://www.dundalkcarlingfordgreenway.ie/) was set up by Roughan and O'Donovan – AECOM Alliance to provide online links to the public consultation material and comment form.

- **Radio**

  The public consultation event was advertised on LMFM radio, by broadcasting over the radio station between 1st and 6th of December (inclusive) multiple times a day.

6.3 Public Consultation Evening

The Public Consultation event was held at Carlingford Heritage Centre, Old Church Road, Carlingford, Co. Louth, between 3pm – 8pm on the 7th of December 2023.

Approximately 50 individuals attended the public consultation event, with 30 persons entering their names on the sign-in sheet at the welcome desk.

6.4 Submission of Feedback

Comment submission forms were made available to attendees of the event, where interested parties were given the options of:

- Submitting comments/feedback at the Public Consultation event via feedback forms available at the welcome desk, or posting the feedback form to the project team;
- Sending comments/feedback directly to LCC or ROD via email, or
- Completing the online feedback form available on the Dundalk Bay to Carlingford Greenway official website.

In addition to the written submissions, opinions, comments, and observations on the proposed development which was expressed by members of the public at the Public Consultation Event were noted by Project Team representatives.

6.5 Analysis Of Submissions and Additional Feedback

A total of 12 submissions were received and below is a summary of the submissions made.

The following conclusions were drawn from the analysis of the submissions:

- 12 submissions support the proposal and / or will use the greenway;
- Three (3 no.) submissions prefer a coastal route option selection;
- Seven (7 no.) submissions discussed potential route options;
- Two (2 no.) submissions discuss the information displayed in the public consultation material;
- Five (5 no.) submissions highlight the potential impacts on residential properties;
- Five (5 no.) submissions highlight the flood risk associated with areas along the route options;
- Three (3 no.) submissions query the potential impacts on SACs and SPAs and/or biodiversity;
- Three (3 no.) submissions highlight the potential impacts on businesses; and
- Nine (9 no.) submissions suggest how the greenway can support local businesses, tourism, schools and other services as well as any other recommendations.

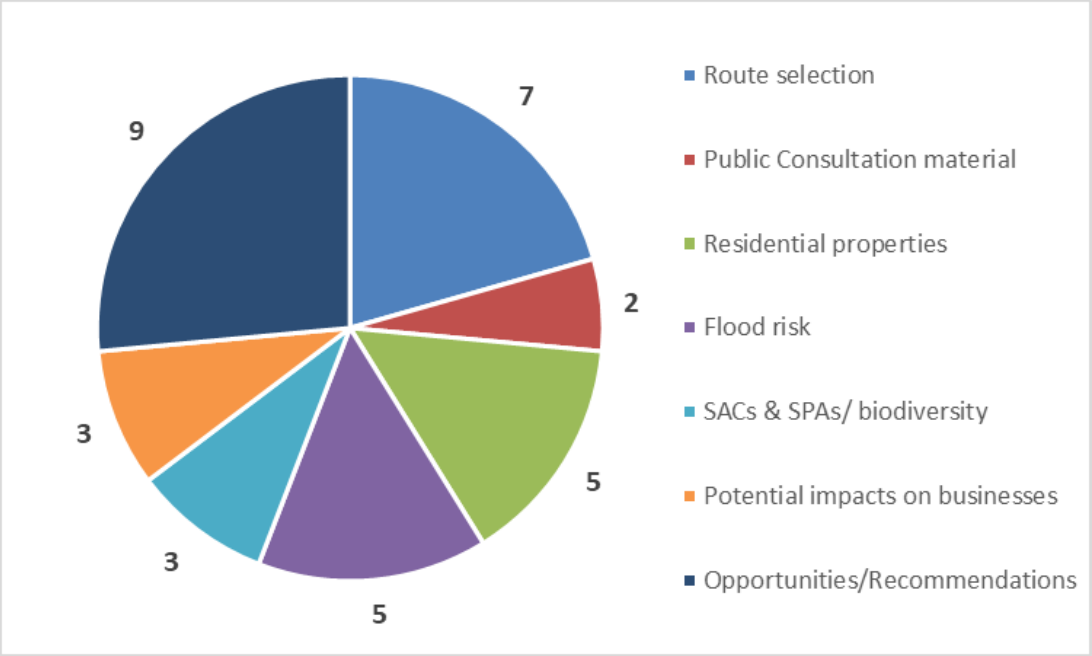

Figure 6.5.1 Number of submissions based on main themes

Seven (7 no.) submissions proposed route options for the greenway which can broadly be categorised under four categories below. Three (3 no.) of these submissions proposed two route option preferences each within their submission (for example, following a coastal route and aligning with the existing disused railway line), with the remaining four (4 no.) submissions proposing one (1 no.) preferred route option each.

The main categories for the proposed route options:

- Three (3 no.) submissions supported following the coastline;
- Three (3 no.) submissions supported an inland route;
- One (1 no.) submission supported following the alignment of the existing disused railway line; and
- Three (3 no.) submissions were against following the line of the existing disused railway line.

Five (5 no.) submissions raised concerns regarding the proposed greenway in relation to its potential proximity to residential properties and the subsequent impacts on the residences, such as a lack of privacy, the noise and visual impact, security and safety, and restricting access to residences. Three (3 no.) submissions also raised concerns about route options potentially affecting nearby businesses, particularly related to restricting access and heavy traffic.

There were five (5 no.) submissions that raised flood risk as a potential constraint to the proposed development, referring to the pluvial flood event that occurred at the end of October 2023 in Carlingford, Greenore, and Grange areas, and the observed impact of heavy rainfall and flooding on existing greenways, making them unusable and requiring maintenance.

Three (3 no.) submissions raised concerns regarding the potential impacts of the proposed greenway on biodiversity, particularly in relation to the Special Areas of Conservation (SACs) and Special Protection Areas (SPAs), recommending to consult with the Wetlands and Geological Heritage Surveys for protected natural heritage sites and to undertake detailed ecological surveys by specialists.

6.6 Opportunities

The opportunities and recommendations that were contained in the submissions received included:

- Connect the greenway to essential services (toilets, dustbins, food/drink, bicycle parking).
- Link the proposed development to other existing greenways.
- Establish access points along the entire route to facilities and areas of high population.
- Ensure safety with traffic segregation.
- Ensure user-friendliness with multiple entry/exit points.
- Integrate into a greater national cycling network for increased active travel growth.

6.7 Next Steps

The feedback from the non-statutory public consultation has been, and will continue to be, considered in the next phases of the project, particularly when developing route options for the greenway.

7. CONSIDERATION OF OPTIONS AND ALTERNATIVES

7.1 Do-Nothing Option

The Do-Nothing option does not propose any additional investment into the road network. No pedestrian and cyclist infrastructure would be provided as part of this option.

This option will not facilitate or promote the uptake of active travel modes of transport and therefore will not meet any of the project objectives.

Although this option will not have any construction and operational impacts on the environment, it will not support Ireland's transition to zero-carbon society by 2050. By not providing greenway/active travel infrastructure, this option will not contribute to the reduction of carbon emissions from single occupancy car journeys, nor will it provide an alternative to the use of private cars for local trips.

The Do-Nothing Option is not likely to contribute to economic growth of the study area as with no intervention provided, the tourism visitor numbers in the area are likely to remain largely static. Furthermore, by not providing linkages to existing walking and cycle route within the area, this option will not improve connectivity and accessibility between Dundalk and Carlingford for non-vehicular road users.

The existing National and Regional roads network between Dundalk and Carlingford only have intermittent pedestrian facilities. The N52 has a posted speed limit of 80km/h from the racecourse heading north while the R173 to Bush, R175 to Greenore and R176 to Carlingford have a posted speed limits of 80 and 100km/h outside of the settlements and urban areas along their lengths, creating undesirable conditions for walkers and cyclists. The remainder of the regional and local network within the study area have lower traffic volumes and speeds compared to these roads. However due to the narrow cross sections with no dedicated pedestrian and cyclist facilities, these roads are also not likely to be desirable for non-motorised road users. Taking into consideration the conditions on the existing road network, the Do-Nothing Option will not achieve the safety objectives for the project, namely in relation to improving accessibility to / from and within rural communities and improving accessibility for vulnerable groups.

The Do-Nothing Option fails to meet the project objectives as detailed in Section 1.3 and is therefore not considered to be a feasible option. As a result, the Do-Nothing Option has not been assessed further.

7.2 Do-Minimum Option

This option is similar to the Do-Nothing Option whereby it does not propose further engineering interventions other than the existing operational and maintenance costs required to maintain the existing road infrastructure. Although parts of the road network could be adapted for active travel infrastructure for pedestrian and cyclists no continuous route could be developed between Dundalk and Carlingford as a Do-Minimum Option. This option would also involve removing the hard shoulder from a route with significant HGV's traffic that could cause its own safety issues, while engineering interventions through the towns and villages along the route would be required.

Like the Do-Nothing Option it will not meet the project objectives set out in Section 1.3 of this report. As a result, the Do-Minimum Option has not been assessed further.

7.3 Do-Something Option

The Do-Something Option considered for this project is the provision of greenway infrastructure between Dundalk and Carlingford in accordance with the current standards and best practice guidelines. Under this option, interventions can be a mixture of:

- reallocation of road space within the existing road network to incorporate a segregated greenway, where feasible;
- Fully offline segregated greenway; or
- A combination of online and offline segregated greenway.

These options are likely to meet the majority, if not all project objectives. The description of all do-something options considered as part of the preliminary options assessment is provided in Section 8.2 of this report.

7.4 Consideration of NIFTI

The National Investment Framework for Transport in Ireland (NIFTI) (2021) sets out a hierarchy of objectives with regard to travel modes with active travel being the first consideration (see Section 2.3.3). As the aim of the project is the delivery of a greenway all of the proposed options are considered feasible and would meet the policy objectives. The policy further provides an intervention hierarchy as follows, 1st - Maintain, 2nd - Optimize, 3rd, Improve and 4th - New. In the case of this project there are limited existing cycle facilities within the study area, other than the existing cycle paths within Dundalk, which would need to be maintained at least and most likely Optimised to meet the project objectives. Other than this all other feasible options are either Improvements to, or New infrastructure. The improvements would involve the installation of cycleways parallel to existing roads – online or offline - and where significantly constrained by both development and environmental considerations, short lengths of shared spaces where traffic volumes and speeds are low. The New infrastructure would consist of segregated greenway routes again utilising existing or former transportation corridors where feasible.

7.5 Conclusions

The Do-Nothing and the Do-Minimum options have been discounted from further assessment as they fail to meet the majority of the project objectives set out in Section 1.3 of this Report. These options are therefore considered not to be feasible.

All Do-Something options have been brought forwards to preliminary options assessment as they provide active travel infrastructure.

8. PRELIMINARY OPTIONS ASSESSMENT

8.1 Introduction

The study area for the proposed Dundalk Bay to Carlingford Greenway project has been divided into three sections to assist in the development of route options.
These sections are broadly split between the following areas as follows:

- Section A: Dundalk to Rockmarshall (West of Fitzpatrick's Bar & Restaurant)
- Section B: Rockmarshall to The Bush
- Section C: The Bush to Carlingford

A number of route options and associated sub-route options were developed within each section as described below and as shown on the drawings contained in Appendix C.

8.2 Description of Do-Something Options

8.2.1 Section A Route Options

Route A1 - Nodes 1,2,9,13,14
Route A1 is approximately 6.9 km in length, starting from Node 1 and terminating at Node 14. It commences just north of Tain Bridge at the intersection of N52 National Road and the Riverside Walk trail. Between Nodes 1, 2 and 9, the route follows the alignment of the disused Dundalk to Greenore railway line in an eastward direction. To cross the Flurry River Estuary, Route A1 follows the alignment of the dismantled railway bridge. A new bridge of approximately 320 metres in length will need to be constructed as part of this option, potentially utilising the foundations of the dismantled Ballymascanlan railway bridge. From Node 9 at Bellurgan Point, the route continues in an eastward direction, following the coastline through to Node 13, following the R173 before terminating at Node 14 on the R173 Regional Road just west of Fitzpatrick's Bar and Restaurant.

Route A2 - Nodes 1,9
Route A2 is approximately 3.8 km in length, starting from Node 1 and terminating at Node 9. It commences just north of Tain Bridge at the intersection of N52 National Road and the Riverside Walk trail. The route travels south towards Dundalk and after passing through the junction of Quay Street and N52, the corridor then heads eastward along the Point Road. The route heads north though the Mountain View Estate and following the Navvy Bank Walk Trail, which runs alongside Castletown Estuary to Soldiers Point. The route would then bridge over the estuary and proceed north towards Bellurgan Point to Node 9. To achieve this, the option will require the construction of a bridge across the estuary at Soldiers Point crossing the Castletown Estuary to Bellurgan Point over a length of approximately 400 meters. As the bridge would be downstream of the Dundalk Harbour the bridge would either need to be at a significant height on raised approach embankments and constructed with sufficient clearance to accommodate the passage of shipping or be an opening bridge, however the regular use of the harbour may preclude an opening bridge.

Route A3 - Nodes 1,3,4,7,8,11,13
Route A3 is approximately 7.7 km in length and runs parallel to the N52 and R173, starting from Node 1 and terminating at Node 13. It commences at the intersection of N52 and the Riverside Walk trail, then continues northwards following the N52. The route travels eastwards following R173 passing through Nodes 3, and 4. Following R173, the route heads southeast approaching the coastline, after passing south of Ballymascanlon Hotel and Nodes 7, 8, and 11, terminating at Node 13 situated at R173 in Bellurgan.

Route A4 - Nodes 2,3,4,9
Route A4 is approximately 6 km in length, following route A1 from Node 1 to 2, before turning northwards at Node 2 and terminating at Node 9. The route follows the eastern and western banks of the Flurry River Estuary. It begins from along the dismantled Dundalk – Carlingford rail line in the of townland Marsh North, near the junction of N52 and The Riverside Walk trail, leading to Racecourse Road. Following Racecourse Road, the route partially encircles the river Flurry by following the flood defence embankments. After passing Node 3 near Strandfield Cafe and Node 4 near the Ballymascanlon Hotel, it turns and heads south along the eastern flood defence berm of the Flurry towards Node 9, located at Bellurgan Point.

Route A5 - Nodes 5,6,12,14
Route A5 is approximately 8.6 km in length, starting from Node 4 and terminating at Node 14. It begins at R173 to the west of the Ballymascanlon Hotel and Golf Resort. It follows the outer edge of the Ballymascanlon Hotel to Node 5 to north of the golf course before following the Flurry and then turning southeast towards the Townland of Ballymakellet. The corridor expands in width approaching Trumpet Hill with the nearly 300-meter-wide corridor encompassing a small residential area in the townland Ballymakellett, which includes Lumpers' Bar and the football grounds. The corridor narrows east of the woodlands and proceeds southeast, passing Node 12 before terminating at Node 14 in townland Rockmarshall.

Route A6 - Nodes 6,12,13
Route A6 is approximately 4.2 km, starting at Node 6 and terminating at Node 13. It starts from a local road in the Bellurgan townland, heading southeast. The route travels through the Bellurgan House demesne by following the southern edge of a woodland which forms part of the Trumpet Hill pNHA. The route then passes through Node 12 and follows the local road in a southerly direction to connect to the R173.

Route A7 - Nodes 9, 10,11
Route A7 is approximately 1.7 km in length and runs to the north of the Estuary and properties fronting Bellurgan Point. Starting from Node 9 and terminating at Node 11. The route begins at Bellurgan Point, proceeding eastward through grasslands and intersecting Lower Point Road. Continuing eastward it crosses more fields before concluding at Node 11 on R173 in the Bellurgan townland.

8.2.1.1 Sub Routes

A4-1 Nodes 2, 3
Route A4-1 is a sub-route of the A4 option and is approximately 1.7 km in length. It starts from the intersection at Racecourse Road and heads northward, skirting around the Ath Lethan estate before heading west to run parallel to Dundalk Racecourse. It continues northward past the racecourse ending near the embankment of the Flurry River in the townland Aghaboys at Node 3 near Strandfield Cafe. Construction of water crossings will be necessary to traverse the river and streams along this route.

A4-2 - Nodes 2, 3
Route A4-2, is another sub-route of the A4 Route, is approximately 1.3 km in length and lies between Option A4 and A4.1. It follows the same route as Option 4-1 till north of the Ath Lethan residential estate, before heading northward across agricultural lands and along the edge of the Dundalk Bay SAC on the inside of the flood defence berms to the east. The Options also ends in the townland Aghaboys at Node 3 near Strandfield Cafe. Similar to A4-1, water crossings will be required to cross the streams along this route.

8.2.1.2 Sub Links

L1 - Nodes 5,7

Route L1 serves as a connecting link between routes A5 and A3, is approximately 1.3 km in length. It originates from Node 5 and terminates at Node 7. Starting at the northeastern intersection of local roads surrounding Ballymascanlon Hotel Golf Course, it travels southeast along the course's perimeter before heading eastward before connecting with R173 and Route A3.

L2 - Nodes 8,10

Route L2 serves as a connecting link between routes A3 and A7, is approximately 1 km in length. It originates from Node 8 and terminates at Node 10. Starting from R173, the route travels southwest, traversing agricultural lands before terminating at Node 10, situated east of Bellurgan Point.

8.2.2 Section B Route Options

Route B1 – Nodes 14,15,17,20,21,23

Route B1 is approximately 6.9 km in length, commencing from Node 14 and terminating at Node 23. Commencing approximately 100 meters west of Fitzpatrick's Bar & Restaurant in the Rockmarshall townland, it follows the alignment of R173 throughout its journey, passing through the village of Lordship. The route passes through several townlands, including Annaloughan, Rampark, Loughanmore, Piedmont, Mountbagnall, Castletowncooley, Castlecarragh, Earls Quarter, Ballaverty, and Rathcor, via Nodes 15, 17, 20, 21, and 23, the route terminates at the junction of R173 and R175 at Bush.

Route B2 - Nodes 14, 15,16,18,19,20,22,23

Route B2 is approximately 6.6 km in length, following Route B1 from Node 14 to 15 before deviating from route B1 at Node 15 and terminating at Node 23. It commences from a local path branching off R173 in the Rockmarshall townland, traversing agricultural lands and running parallel to the R173, broadly following the line of the disused railway. Along its course, it passes near the historical railway bridge within the Railway Village residential development in Lordship. Progressing eastward through Lordship, it passes to the north of St Patricks GAA club, passing through Piedmont, and Mountbagnall townlands via Nodes 16, 18, 19, and 20, the route passes to the south of warehousing and to the north of the Cooley Distillery, again broadly following the line of the disused railway. before turning north to connect to the local road network at Node 22, which it follows until Node 23 at the junction of the R173 an R175 at Bush.

Route B3 - Nodes 14,16,18,19,22

Route B3 is approximately 7.4 km in length, starting from Node 14 and terminating at Node 22. The route commences west of the R174, which it crosses, following a local road serving a number of properties before traversing agricultural land west of Lordship. The route then crosses a local road before passing to the north of Railway Village housing development connecting to Node 16 to the east of this development. The route continues eastwards through node 18 and 19 before turning in a northerly direction and swinging eastwards to follow the local road network, where a crossing of the Castletown River is required before connecting to option B2 at Node 22 in the Ballaverty townland.

Route B4 – Nodes 14,17,21,25

Route B4 is approximately 7.6 km in length, starting from Node 14 and concluding at Node 25. It originates from a local road branching off R173, opposite Fitzpatrick's Bar in the Rockmarshall townland, and proceeds southeasterly towards the coastline. Following the coastline, the route corridor widens to link with R173 at Node 17. Continuing eastward, it primarily follows the coastline through Loughanmore and Maddoxland townlands, passing to the north of Gyles Quay caravan and camping park, before connecting to Gyle Quay pier and

beach. The corridor proceeds eastwards following the coastline before the corridor widens to permit option from the high fields behind the coast to ramp to sea-level in the townland of Mountbagnall, where a link if provided to Node 21. The route then continues eastward, crossing agricultural lands along the coastline of Castlecarragh townland before reaching its termination point at Node 25.

8.2.2.1 Sub Routes

B2-1 – Nodes 20, 22

B2-1, a subsidiary route of Route B2, extends approximately 1.6 km in length. It begins from the existing local road, intersecting with Route B2 near the warehousing facility. Initially heading north, the route then travels northeast, crossing the Castletown River before proceeding east across agricultural lands of Castletowncooley townland, passing to the north of the properties off the L7080 local road. Continuing southeast, it terminates at Route B2.

8.2.3 Section C Route Options

Route C1 - Nodes 23,44

Route C1 is approximately 6 km in length, starting from Node 23 and terminating at Node 44. It starts at the R173 / R175 junction in Bush before joining Rath Abbey road, leading to a residential cul-de-sac development area. Moving north from the cul-de-sac, the route crosses into the agricultural lands of Rath Lower townland, intersecting roads such as the local road network east and north of Grange. It then broadly follows the L30611 local road, before crossing the R173 where it continues north, traversing agricultural lands in the townland of Liberties of Carlingford. The route crosses the R173 again and Grove Road, between the St Michaels Cemetery and the wastewater treatment following existing field boundaries where it connects to the R176 adjacent to the Four Seasons Hotel in Carlingford.

Route C2 - Nodes 23,30,31,43

Route C2 is approximately 4.8 km in length, starting from Node 23 and terminating at Node 43, where it follows Option C10 to Node 44. It begins at the intersection of R173 and R175 at Bush, proceeding along R175 and passing through Nodes 30 and 31 before deviating from the regional road to follow the line of the disused railway, crossing the L3061 south of Grange village close to the R175. The corridor then turns northwards to pass to the north of Cooley Kickhams GAA club, before turning eastwards to rejoin the line of the disused railway corridor. The route continues in a northeasterly direction, following the disused railway corridor to the termination point at Node 43 of the R176, at which point it will follow Route C10 to Carlingford and Node 44.

Route C3 - Nodes 23,24,27,26

Route C3 is approximately 2.4 km in length, starting from Node 23 and terminating at Node 26 on Option C5. It starts at the intersection of R173 and R175 at Bush and proceeds southwards through the agricultural lands of Rathcor townland via Node 24. Continuing south, it merges onto an existing local road, passing through Node 27 before terminating near the edge of Rathcor Bay Beach at node 26 on Option C5 corridor.

Route C4- 27,29,30

Route C4 is approximately 3 km in length, starting from Node 30 and terminating at Node 27. It originates on the R175 in Rath Lower townland, proceeding southward towards the coastline, crossing the local road east of the Bush Post Primary School. The corridor then traverses agricultural lands, broadly following field boundaries through the townland of Galtrimsland, before following an existing local road and re-entering agricultural lands in the townland of Rathcor. The corridor expands in width to allow alternative options at it's termination with the local road the provides access to Rathcor Bay Beach, where it connects to Option C5.

Route C5 - Nodes 25,26,28,35,36,37,38,42
Route C5 is 11km in length, starting from Node 25, and terminating at Node 42. It starts from Options B4 and C3-1 at Node 25 and follows the coastline through the townland of Rathcor., The corridor then proceeds eastward along the coastline, to Templetown beach, crossing the local road to continue to follow the coastline to Whitestown beach. The corridor widens locally in areas to facilitate options which may have to pass to the north of properties close to the coast. From Whitestown beach, the corridor continues to follow the local coast road, again with local widening of the corridor to allow routes to pass behind properties, passing through nodes 36, 37 and 38. North of Node 38, the route passes to the west of Cooley Oysters, following a local access road to connect to the R175 and Option C9 at Node 42.

Route C6 - Nodes 31,32,33,34,35
Route C6 is approximately 3.4 km in length, starting from Node 31 and terminating at Node 35 on Option C5. It begins on the R175 at the crossroads junction with the L3061 and heads in a southerly direction through the townland of Monksland, broadly following the local road passing through Node 32. South of Node 32, the route turns to run through agricultural lands to avoid impacts on an area with significant residential development at Willville, before rejoining the road south of these dwellings and continuing south towards Templetown Beach and Option C5 at Node 35.

Route C7 - Node 33, 40
Route C7 is approximately 4.4 km in length, starting from Node 40 and terminating by merging with route C6 adjacent to Node 33. Route C7 follows field boundaries from the R175 and intersects a number of local roads, largely crossing these roads before continuing southwards through agricultural lands. The route passes through the townlands of Muchgrange, Mullabane, Mucklagh and Willville

Route C8 - Nodes 34,36
Route C8 is approximately 3.6 km in length, commencing at Node 34 and terminating at Node 36. From Node 34, the route follows field boundaries setback from the coastline to access the settlement of Whitestown, where access to Whitestown Beach is possible via the local road and access to Lilly Finnegans bar. From Whitestown, the route travels eastwards, following existing farm tracks to connect to the lookout post, before following field boundaries to access the coast at Node 36 and Route C5.

Route C9 – Nodes 31,40,41,42. 45
Route C9 is approximately 4.2 km in length, starting from Node 31 and terminating at Node 45. It begins at the Crossroads junction between the R175 and L3061 and proceeds eastward along R175, traversing through townlands such as Monksland, Millgrange, and Greenore via Nodes 40, 41, 42 and 45, where it terminates at the connection with Option C12 at Node 45. From Node 45 a link providing cycle and pedestrian access between this option and the ferry terminal at the Port will be provided.

Route C10 - Nodes 38,39,41,43,44
Route C10 is approximately 5.1 km in length, commencing at Node 38 on Option C5 and terminating at Node 44 in Carlingford. It commences on Ballytrasna road and proceeds along the road, traversing through Ballytrasna and Muchgrange townlands, eventually reaching the intersection of R175 and R176 at Node 41. Continuing on R176, it passes through Node 43, running alongside the coastline and entering Liberties of Carlingford townland. The route ends at the junction of R176, R173, and Ghan road, close to Four Seasons Hotel.

Route C11 - Nodes 37,39
Route C11 is approximately 2.5km in length, starting from Node 37 and terminating at Node 39. It starts from a local road in Ballagan townland before proceeding northwest, following the field boundaries through agricultural lands in Ballynamony, Ballytrasna, and Muchgrange

townlands. The route ends after intersecting with Ballytrasna road at Node 39 and joining Option C10.

Route C12 - Nodes 43,45
Route C12 is approximately 1.9km in length, commencing at Node 45 connecting with Option C9 at the junction of the R175 and Euston Street before turning on to Anglesey Terrace. At this point the route enters Greenore Golf Club, utilising the car-park and buggy parking area to the north of the club house, before accessing and following the line of the disused railway which is utilised by the golf club for a number of T boxes. The route then rejoins the R176 south of Carlingford at Node 43, where it will follow Route C10 into Carlingford. From Node 45 a link providing cycle and pedestrian access between this option and the ferry terminal at the Port will be provided.

8.2.3.1 Sub Routes

C3-1 – Nodes 24,25
Route C3-1, a sub-route of C3, and is approximately 1 km in length. It begins at Node 24 on route C3, situated at the edge of agricultural lands in Rathcor townland. Proceeding towards a local road to the south, it terminates at Node 25 on Option C5, adjacent to the coastline of Rathcor.

C4-1 – Nodes 28,29
Route C4-1, a sub-route of C4, and is approximately 2.3 km in length. It originates from Node 29 on route C4 and follows field boundaries through the townland of Galtrimsland. Continuing southwards, it passes through agricultural lands and adjacent to waterbodies within the townland of Rathcor before continuing south to the coast and Node 28 on Option C5 north of Balynamaghery Beach.

C6-1 – Nodes 32,35
Route C6-1, a sub-route of C6, and is approximately 2 km in length. It commences from Node 32 on route C6, branching off from Grange Old Road and running parallel to route C6 following field boundaries through the agricultural lands to the west of Option C6 and avoiding the settlement of Willville. The route continues running parallel and to the west of Option C6 past nodes 33 and 34 and extending to join at Node 35 west of the access road and parking area at Templetown Beach.

8.3 Assessment Methodology

The preliminary options were assessed in accordance with the methodology set out in 'Module 4 – Preliminary Business Cases' of the Transport Appraisal Framework (June, 2023) and the TII Project Managers Manual for Greenways (TII PE-PMG-02047).

The assessment consisted of the following:

- The ability of options to meet the project objectives;
- The engineering feasibility and likelihood of compliance with design standards;
- The potential of each option to maximise benefits whilst minimising costs (Economy);
- The potential impacts of each option on the environment.

Each sub-variant route option within sections A to C underwent a detailed evaluation against the project objectives (as per TAF and PMM) to determine which options met the project objectives. These options were further assessed to ensure the options were feasible based on Engineering, Environment and Economic criteria, with only viable routes advancing to Phase 2 for option selection process.

8.4 Project Objectives Assessment

Each of the options have been assessed against the project objectives detailed in Section 1.3, which are aligned to the Transport Appraisal Framework seven criteria. This is a Pass/Fail assessment in accordance with the TII Project Management Guidelines for Greenways.

Table 8.4.1.1 Preliminary Options Assessment – Do Nothing, Do-Minimum and Options under Section A

Project Objectives based on TAF	Sub-objective	Route A1	Route A2	Route A3	Route A4	Route A4-1	Route A4-2	Route A5	Route A6	Route A7	Link 1	Link 2
Transport User Benefits and Other Economic Impacts	1.1a	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective
	1.1b	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective
	1.2a	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective
	1.2b	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective
Accessibility Impacts	2.1a	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective
	2.2a	Meets objective	Does not meet objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective
	2.2b	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective
Social Impacts	3.1a	Meets objective	Does not meet objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective
	3.1b	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective
	3.2a	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective
Land Use Impacts	4.1a	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective
	4.1b	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective
	4.2a	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective
	4.2b	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective
Safety Impacts	5.1a	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective
	5.1b	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective
	5.1c	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective
Climate Change Impacts	6.1a	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective

Project Objectives based on TAF	Sub-objective	Route A1	Route A2	Route A3	Route A4	Route A4-1	Route A4-2	Route A5	Route A6	Route A7	Link 1	Link 2
	6.2a	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective
	6.3a	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective
Local Environmental Impacts	7.1a	Does not meet objective	Does not meet objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective
	7.1b	Does not meet objective	Does not meet objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective
	7.2a	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective
	7.3a	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective

Table 8.4.1.2 Preliminary Options Assessment under Section B

Project Objectives based on TAF	Sub-objective	Route B1	Route B2	Route 2-1	Route B3	Route B4
Transport User Benefits and Other Economic Impacts	1.1a	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective
	1.1b	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective
	1.2a	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective
	1.2b	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective
Accessibility Impacts	2.1a	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective
	2.2a	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective
	2.2b	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective
Social Impacts	3.1a	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective
	3.1b	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective
	3.2a	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective
Land Use Impacts	4.1a	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective
	4.1b	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective
	4.2a	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective
	4.2b	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective
Safety Impacts	5.1a	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective
	5.1b	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective
	5.1c	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective
Climate Change Impacts	6.1a	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective
	6.2a	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective
	6.3a	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective
Local Environmental Impacts	7.1a	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective
	7.1b	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective
	7.2a	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective
	7.3a	Does not meet objective	Meets objective	Meets objective	Meets objective	Meets objective

Table 8.4.1.3 Preliminary Options Assessment under Section C – part 1 of 2

Project Objectives based on TAF	Sub-objective	Route C1	Route C2	Route C3	Route C3-1	Route C4	Route C4-1	Route C5	Route C6
Transport User Benefits and Other Economic Impacts	1.1a	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective
	1.1b	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective
	1.2a	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective
	1.2b	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective
Accessibility Impacts	2.1a	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective
	2.2a	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective
	2.2b	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective
Social Impacts	3.1a	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective
	3.1b	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective
	3.2a	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective
Land Use Impacts	4.1a	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective
	4.1b	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective
	4.2a	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective
	4.2b	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective
Safety Impacts	5.1a	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective
	5.1b	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective
	5.1c	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective
Climate Change Impacts	6.1a	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective
	6.2a	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective

Project Objectives based on TAF	Sub-objective	Route C1	Route C2	Route C3	Route C3-1	Route C4	Route C4-1	Route C5	Route C6
	6.3a	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective
Local Environmental Impacts	7.1a	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective
	7.1b	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective
	7.2a	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective
	7.3a	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective

Table 8.4.1.4 Preliminary Options Assessment under Section C – part 2 of 2

Project Objectives based on TAF	Sub-objective	Route C6-1	Route C7	Route C8	Route C9	Route C10	Route C11	Route C12
Transport User Benefits and Other Economic Impacts	1.1a	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective
	1.1b	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective
	1.2a	Meets objective	Does not meet objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective
	1.2b	Meets objective	Does not meet objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective
Accessibility Impacts	2.1a	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective
	2.2a	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective
	2.2b	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective
Social Impacts	3.1a	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective
	3.1b	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective
	3.2a	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective
Land Use Impacts	4.1a	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective

Project Objectives based on TAF	Sub-objective	Route C6-1	Route C7	Route C8	Route C9	Route C10	Route C11	Route C12
	4.1b	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective
	4.2a	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective
	4.2b	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective
Safety Impacts	5.1a	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective
	5.1b	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective
	5.1c	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective
Climate Change Impacts	6.1a	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective
	6.2a	Meets objective	Does not meet objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective
	6.3a	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective
Local Environmental Impacts	7.1a	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective
	7.1b	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective
	7.2a	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective
	7.3a	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective	Meets objective

Table 8.4.1.5 below highlights each criterion and whether each option and sub-option meets the objective.

Table 8.4.1.5 Project Objectives Assessment

Route Options	Project Objectives Assessment	Description
Section A		
A1	Feasible	A section of this option, between Nodes 2 and 9, did not meet objectives 7.1a and 7.1b as it would require construction works within the boundaries of European designated sites which would result in negative impacts to Qualifying Interests, such as disturbance, pollution, habitat degradation and permanent habitat loss, etc. Therefore, the section of the route between Nodes 2 and 9 has been omitted, with the other sections of the route meeting all of the objectives retained.
A2	Not Feasible	This option, between Nodes 1 and 9, does not meet objectives 7.1a and 7.1b as it would require construction works within the boundaries of European designated sites which would result in negative impacts to Qualifying Interests, such as disturbance, pollution, habitat degradation and permanent habitat loss, etc. This option also does not meet objectives 2.2a and 3.1a as it will require the construction of a very high bridge which will not be attractive for use by vulnerable groups and persons with disabilities.
A3	Feasible	This route meets all project objectives.
A4	Feasible	This route meets all project objectives.
A4-1	Feasible	This route meets all project objectives.
A4-2	Feasible	This route meets all project objectives.
A5	Feasible	This route meets all project objectives.
A6	Feasible	This route meets all project objectives.
A7	Feasible	This route meets all project objectives.
L1	Feasible	This route meets all project objectives.
L2	Feasible	This route meets all project objectives.
Section B		
B1	Feasible	This option meets all project objectives with the exception of objective 7.3a which states that the project should prioritise an ecologically diverse route. This option mainly follows the R173 through the town of Lordship which is not ecologically diverse. However, this option will connect with options within Sections A and C which may be ecologically diverse. As this route travels through many residential areas and the settlement of Lordship, it increases the potential of the greenway to be used by the local population which is and therefore, this option is considered to be feasible under this assessment.
B2	Feasible	This route meets all project objectives.
B2-1	Feasible	This route meets all project objectives.
B3	Feasible	This route meets all project objectives.
B4	Feasible	This route meets all project objectives.
Section C		
C1	Feasible	This route meets all project objectives.
C2	Feasible	This route meets all project objectives.
C3	Feasible	This route meets all project objectives.
C3-1	Feasible	This route meets all project objectives.
C4	Feasible	This route meets all project objectives.

Route Options	Project Objectives Assessment	Description
C4-1	Feasible	This route meets all project objectives.
C5	Feasible	This route meets all project objectives.
C6	Feasible	This route meets all project objectives.
C6-1	Feasible	This route meets all project objectives.
C7	Feasible	This route does not meet objectives 1.2a, 1.2b and 6.2a which all broadly relate to the increase of active travel usage within the area for local journeys and outdoor activities. However, although this option mainly travels through agricultural lands that have low population density and lack community facilities, it does provide a more direct route from Greenore and Carlingford to Templetown Beach. As such, as part of wider options it could provide connectivity to community facilities and a more direct route for users from Carlingford to Templetown Beach.
C8	Feasible	This route meets all project objectives.
C9	Feasible	This route meets all project objectives.
C10	Feasible	This route meets all project objectives.
C11	Feasible	This route meets all project objectives.
C12	Feasible	This route meets all project objectives.

8.5 Feasibility Assessment

8.5.1 Engineering

8.5.1.1 Introduction

In this section the route options have been assessed based on general engineering constraints such as existing infrastructure, land topography, soil, and flood conditions respectively. Table below shows a description of engineering constraints of each route option from sections A to C.

Table 8.5.1.1 Engineering Feasibility Assessment

Route Options	Engineering Constraints	Option Feasible?
Section A		
A1	This route passes over Marine/Estuarine sediments, which makes the soil type unsuitable for construction of greenway and require improvement, replacement, or an elevated boardwalk structure. The route requires construction of a new bridge approximately 320 metres in length crossing the Flurry River/estuary. This route will aim to utilise the foundations of the dismantled railway bridge. The route passes through and area of coastal flooding.	Yes
A2	A section of this route passes over Marine/Estuarine sediments, which makes the soil type unsuitable for construction of greenway and require improvement, replacement, or an elevated boardwalk structure. The route requires construction of a bridge over the estuary, which also serves as the entrance to Dundalk Harbour. This would therefore necessitate a bridge of sufficient height to allow these vessels to pass under the bridge, or for the bridge to open to allow these vessels to navigate to the harbour. This structure will be a significant bridge approximately 380m in length. The route passes along the coastline and may require construction techniques to avoid coastal erosion. The route passes through Coastal flooding areas.	No
A3	The route passes along the N52 and R173 which can lead to safety and traffic related issues. The route passes through Coastal flooding areas.	Yes
A4	This route passes broadly follows the line of the existing flood protection embankment, which is envisaged to be utilised where possible. This may require the provision of an elevated boardwalk structure at some locations, including a bridge (approximately 25m span) over the Flurry River.	Yes
A5	The route passes through areas where gradients are steep, with gradients of up to 25% identified. These steep gradients are located between nodes 6 and 12, as such this section of Option A5 has been deemed as not possible to comply with design standards, with the sections outside of this considered feasible in terms of engineering. The route passes through pFRA Fluvial (1 in 100 year) area.	No
A6	No engineering constraints	Yes
A7	A section of this route passes over Marine/Estuarine sediments, which makes the soil type unsuitable for construction of greenway and may require improvement, replacement, or an elevated boardwalk structure. The route passes through Coastal flooding areas.	Yes
A4-1, A4-2	This route passes over Marine/Estuarine sediments, which makes the soil type unsuitable for construction of greenway	Yes

Route Options	Engineering Constraints	Option Feasible?
	and may require improvement, replacement, or an elevated boardwalk structure.	
L1	The route follows the line of an existing local road. The route passes through pFRA Fluvial (1 in 100 year) area.	Yes
L2	The route passes through Coastal flooding areas.	Yes
Section B		
B1	The route follows the R173 which can lead to safety and traffic related issues, particularly at intersections with the local road network that connects to the R173. The route passes through pFRA Fluvial (1 in 100 year) area.	Yes
B2	This route broadly follows the line of the disused railway corridor and requires construction of a new short span bridges for river crossings. The route passes through pFRA Fluvial (1 in 100 year) area.	Yes
B3	The route passes through areas of topography with steeper gradients of up to 7%, however at this stage, it is envisaged that the route would be able to be developed such that longitudinal gradients will be to be provided in compliance with design standards. The route passes through pFRA Fluvial (1 in 100 year) area.	Yes
B4	The route passes through coastal flood areas. The route passes along the coastline and may require construction techniques to avoid coastal erosion. The route passes through pFRA Fluvial (1 in 100 year) area.	Yes
B2-1	The route requires construction of a short new span bridge for river crossings. The route passes through pFRA Fluvial (1 in 100 year) area.	Yes
Section C		
C1	This option broadly follows the R173 corridor which is subject to steep topography, with gradients in excess of 10% throughout. It is expected that the gradients required to follow this topography would exceed those permitted by design standards.	No
C2	This route largely follows the line of the disused railway and is not expected to result in engineering constraints that would preclude this option.	Yes
C3	The route passes through pFRA Fluvial (1 in 100 year) area.	Yes
C4	The route passes nearby pluvial surface water flooding area.	Yes
C5	The route passes through coastal flood areas. The route passes along the coastline and may require construction techniques to avoid coastal erosion.	Yes
C6	The route mostly follows the line of an existing local road. The route passes through pFRA Fluvial (1 in 100 year) area.	Yes
C7	No engineering constraints	Yes
C8	No engineering constraints	Yes
C9	The route passes along the R175 which can lead to safety and traffic related issues.	Yes
C10	The route passes along the R176 which can lead to safety and traffic related issues. The route passes through coastal flood areas. The route passes along the coastline and may require construction techniques to avoid coastal erosion.	Yes
C11	No engineering constraints	Yes
C12	The route passes along Euston Street which can lead to safety and traffic related issues before entering the golf course. The route then follows the railway embankment adjacent to Carlingford Lough passing through coastal flood areas and	Yes

Route Options	Engineering Constraints	Option Feasible?
	sections which may require construction techniques to avoid coastal erosion.	
C3-1	No engineering constraints	Yes
C4-1	The route passes nearby pluvial surface water flooding area.	Yes
C6-1	No engineering constraints	Yes

8.5.2 Environmental

8.5.2.1 Introduction

The feasibility of the proposed route options has been reviewed using desktop sources of information under the following environmental factors:

- Biodiversity
- Soils and Geology
- Hydrology and Hydrogeology
- Landscape and Visual Amenity
- Archaeological, Architectural and Cultural Heritage
- Material Assets: Agricultural and Non-Agricultural Property
- Air Quality and Climate
- Noise and Vibration

8.5.2.2 Biodiversity

This section aims to assess the feasibility of the route options with respect to their potential impacts on biodiversity. The Constraints and Opportunities Study (Section 5.1.1) informed this assessment.

Section A

Routes A1 and A2 cross the Dundalk Bay SAC and SPA. Routes A1 and A2 will require the construction of a new bridge over the estuary and it is envisaged that works to construct this bridge will require the permanent loss of mudflats, a Qualifying Interest of the Dundalk Bay SAC and may also cause significant impacts to wintering bird species which are the qualifying interests of Dundalk Bay SPA. As such, Routes A1 ad A2 are not feasible under biodiversity.

Route A4 borders Dundalk Bay SPA. Route A4 is also located within the boundary of the Dundalk Bay SAC but may not result in direct impacts on qualifying interests of the SAC, as the route broadly follows the flood defence berm where qualifying interests are less likely to be present. However, this route may also result in disturbance to bird species of the SPA. Sub-Routes A4-1 and A4-2 are alternatives to A4 which are further inland and may also result in disturbance to bird species of the SPA. Routes A1, A2, A4, A4-1 and A4-2 also have the potential to result in habitat degradation, pollution and disturbance from construction works and result in disturbance during the operational phase.

Route A3 follows the existing N52 and R173 roads, and therefore, is less likely to result in negative impacts such as habitat loss. As it comes in close proximity to Dundalk Bay SAC and SPA along several points of the R173, there is potential for the construction phase to result in disturbance to Qualifying Interest species during the construction phase of the proposed development.

Routes A5 and A6 follow existing roadways at some points. Both routes cross through various fields, hedgerows and treelines, and come in close proximity to a mature broadleaved woodland on Trumpet Hill, which is also a proposed National Heritage Area (pNHA). As such, the construction of these routes may result in negative impacts to biodiversity, such as through disturbance to wildlife, and habitat degradation and loss. At their easternmost extents, Route

A5 comes within 200m of Dundalk Bay SAC and SPA, and Route A6 within 400m. This may result in disturbance to Qualifying Interest species during the construction phase of the proposed development.

Link Routes L1 and L2 both largely follow existing roadways. Link L1 is in close proximity to the Flurry River. Link L2 is in close proximity to Dundalk Bay SAC and SPA.

Summary Section A
Routes A1 and A2 are not feasible route options for biodiversity as they would result in permanent loss of Annex I Qualifying Interest habitat. The other route options within Section A are considered feasible, though they also have potential to result in impacts to European Sites. Impacts to the QIs of the European Sites may be avoided through design of the route or mitigation.

Section B
All of the route options in Section B cross watercourses which are hydrologically connected to European designated sites, and therefore, may lead to negative impacts to water quality at these sites via pollution. Routes B1, B2, B2-1, and B3 would likely have comparable impacts on biodiversity. All of the routes pass through various fields, hedgerows and treelines, and pass through pockets of woodland at their easternmost extents. Route B1 follows an existing roadway, and therefore, may result in less negative impacts on biodiversity.

Route B4 runs parallel and directly adjacent to Dundalk Bay SAC and SPA, and overlaps with the boundaries of these designated sites in places. The construction of this route could result in negative impacts to Qualifying Interests, pollution, habitat degradation and loss, etc. Route B4 also creates a high risk of disturbance to Qualifying Interest species, particularly during the construction phase of the proposed development, as it runs along the coastline for approximately 6.6km. Within the corridor of B4 there is potential for the proposed development to direct impacts to the Qualifying Interest habitats of the SAC. Furthermore, the Annex I habitat Transition mires (7140) is within the corridor of route B4.

Summary Section B
All route options in Section B are considered feasible, though they also have potential to result in impacts to European Sites. Impacts to QIs the of the European Sites may be avoided through design of the route or mitigation.

Section C
All of the routes in Section C pass through various fields, hedgerows, treelines, and watercourses which are hydrologically connected to European designated sites. Routes C1, C2, C4, C8 and C11 avoid coastal areas with European sites. Routes C3, C3-1, C4, C4-1 are located primarily in agricultural land. Additionally, route C3 is in close proximity to Liscarragh Marsh Area pNHA. Alkaline fens (7230), an Annex I habitat, is within the corridor of route C6-1. The Annex I habitat Transition mires (7140) is within the corridor of route C4. The Annex I habitats Cladium fen (7210) and Alkaline fens (7230) are within the corridor of route C7. Route C8 comes in close proximity with Cladium fen (7210) and Alkaline fens (7230). Routes C4, C6-1, C7 and C8 have the potential to cause negative impacts to the Annex I habitats through pollution, habitat degradation, and habitat loss during the construction phase of the proposed development.
Route C5 almost entirely follows the coast, overlapping with Carlingford Shore SAC and Carlingford Lough SPA and pNHA, and runs adjacent to these sites for most of its length. Route C5 is also adjacent to the Annex I habitats Large shallow inlets and bays (1160) and Tidal mudflats (1140), which are within Carlingford Shore SAC. This creates the potential for negative impacts to Annex I habitats through pollution, habitat degradation, and habitat loss during the construction phase of the proposed development. More specifically, this route creates the risk of impacting protected habitats such as mudflats, Qualifying Interests of the

Dundalk Bay SAC. The construction of this route may also cause significant impacts to wintering bird species, the Qualifying Interests of Dundalk Bay SPA.

Route C9 follows the R175 and comes in close proximity to several pockets of woodland and comes in close proximity to the Annex I habitats Cladium fen (7210) and Alkaline fens (7230), and Transition mires (7140). Route C12 runs adjacent to Carlingford Shore SAC and Carlingford Lough SPA and pNHA, and the Annex I habitats Large shallow inlets and bays (1160), Tidal mudflats (1140), and Lagoons (1150). Route C10 largely follows the R176, and overlaps with various pockets of woodland and the Annex I habitats Cladium fen (7210) and Alkaline fens (7230), Large shallow inlets and bays (1160), Atlantic salt meadows (1330) and Tidal mudflats (1140). This route is also adjacent to the boundary of Carlingford Shore SAC and Carlingford Lough SPA and pNHA. Route C11 comes in close proximity to Annex I habitats Cladium fen (7210) and Alkaline fens (7230). Route C12 is adjacent to the boundary of Carlingford Shore SAC and Carlingford Lough SPA and pNHA.

Summary Section C
All route options in Section C are considered feasible, though they also have potential to result in impacts to European Sites. Impacts to the QIs of the European Sites may be avoided through design of the route or mitigation.

Biodiversity Summary
Routes which would require construction works within the boundaries of European designated sites could result in negative impacts to Qualifying Interests, including disturbance, pollution, habitat degradation and habitat loss. Any routes resulting in loss of Qualifying Interest habitats of an SAC are not feasible options in this Biodiversity Assessment. Other routes in close proximity to EU sites should be avoided to minimise potential impacts to Qualifying Interests of European sites. Routes which avoid European sites, Annex I habitats and which follow existing roads would generally have the least impacts on ecological receptors are considered more feasible in terms of biodiversity. Route options A1 and A2 are not feasible under this assessment. All other route options are feasible in terms of biodiversity, though some have potential to result in impacts to European Sites. Potential impacts of route options on biodiversity will be assessed in more detail at Phase 2 Option Selection.

8.5.2.3 Soils and Geology

Some of the soils present along route corridors, especially near watercourses are expected to be soft, such as peat, organic soils, estuarine soils, and alluvial are expected to be soft by their nature and will lead to settlements when loaded. No karst features were identified along any of the proposed route options. However, it is noted that a large portion of the study area, and sections of some of the route options it is underlain by Limestone, which is a type of rock susceptible to suffer karstification processes. The majority of the options are also routed through geological heritage sites. Due to the nature of the proposed greenway development, geological heritage sites are considered opportunities for this greenway construction to offer many distinguishing landscape factors that enriches the experience of future users.

Overall, all options are considered to be feasible under soils and geology.

8.5.2.4 Hydrology and Hydrogeology

As discussed in Section 5.1.3 of this Report, the CFRAM flood extents shows an extensive flood plain area in vicinity of the Ballymascanlan Estuary and Castletown Estuary within the study area. The majority of the route options within Section A skirt around Ballymascanlan Estuary and Castletown Estuary, with Options A1 and A2 requiring a bridge crossing. Within Section B and C, route options cross several watercourses, such as Rockmarshall_010, Big (Louth)_020, Ballynamaghery_010, and Greenore_010. Works within or adjacent to watercourses present water quality risks, however at this stage of the assessment, these

options are considered to be feasible. Potential impacts of route options on watercourses will be assessed in more detail at Phase 2 Option Selection.

These routes are likely to encounter flood risk areas associated with these waterbodies. According to the Planning System and Flood Risk Management Guidelines (2009), greenways are 'water compatible' developments and therefore are not likely to significant impact on the flood extents. Engineering solutions can be employed where sections of the routes are located in flood risk areas, such as the construction of boardwalks to elevate the greenway. Therefore, all routes are considered to be feasible.

In relation to groundwater, all options, are likely to cross bedrock which is a Locally Important Aquifer, with some options within Section A also crossing bedrock that is a Poor Aquifer. Ground Waterbodies with the study area, and with route corridors is of Good WFD status and 'not at risk'. The nature of the greenway is such that construction and operation impacts on groundwater resources are typically low. Therefore, the proposed options are not likely to significantly alter the groundwater regime.

There are no karst landforms found within corridors of route options. Two Public Supply Source Protection Areas (PSSPAs), namely Ardtullybeg PSSPA and Cooley-Carlingford PSSPA which are located within Section C. Sections of routes C4, C4-1 and C1 are located within the PSSPAs. Due to the nature of the proposed greenway development, these routes are not likely to impact the water quality of the PSSPAs.

8.5.2.5 Landscape and Visual Amenity

The majority of the proposed route options within Sections A to C, are routed through a landscape area that is rural in nature. The options either follow the alignment of the existing road network, or divert offline to travel through lands with agricultural landscape character. Where feasible, the majority of the options follow the alignment of existing field boundaries and hedgerows to reduce the potential landscape and visual impacts on agricultural areas.

Options within sections A and C commence / terminate within urban areas of Dundalk and Carlingford respectively, which have an established townscape character and anthropocentric visual amenity. Options within Section B are largely located within rural areas, but pass either through, or in the vicinity of the settlements of Jenkinstown and Rampark (Lordship). Routes within these urban areas and rural settlements are likely to utilise the existing road network. Therefore, these routes are not likely to introduce new features which are inconsistent with the existing landscape character and visual amenity.

Louth County Development Plan 2021-2027 identifies the Views & Prospects (VPs) for County Louth, some of which are located within the study area in vicinity of routes options. For instance, within Section A, Route A2 travels along Point Road / Navvy Bank Walk which contains VP 36, VP 41 and VP 48. Additionally, Option A1 which travels along the alignment of the dismantled railway line, is likely to be visible from VP 40. Due to the nature of the proposed development, these routes are not likely to reduce or degrade the view.

Overall, all options are considered to be feasible under landscape and visual amenity.

8.5.2.6 Archaeological, Architectural and Cultural Heritage

There are a large number of built heritage sites located within the study area, some of which feature on the Record of Protected Structures (RPS) (416 no.) and the National Inventory of Architectural Heritage (NIAH) (422 no.). The majority of the routes travel in the vicinity of these sites. There is also a vast number of archaeological heritage sites featuring on the Sites and Monuments Record (SMR) located within the study area in vicinity of the proposed routes. There are four ACAs in the study area: Dundalk, Carlingford, Whitestown, and Greenore. They comprise the built settlements of those areas. Given the type of development proposed, a

greenway, it should be possible for all route options to avoid direct negative effects on designated heritage receptors through local diversions, and to protect their settings with sympathetic design.

Overall, all options are considered to be feasible under archaeological, architectural and cultural heritage.

8.5.2.7 Material Assets: Agricultural and Non-Agricultural Property

The route options follow a mixture of existing road network, hedgerow boundaries, whilst some are routed through agricultural lands. The feasibility of proposed routes on agriculture was reviewed in relation to the location of farmhouses and farmyards where the essential farm buildings and facilities are located for the operation of on-farm activities. There are a number of farm types, namely equine, dairy, and poultry located within the study area. The majority of the routes do not encounter farms, however those that are located in the immediate vicinity of farms are identified below.

Equine farms are considered to be the most sensitive to construction related activities. Routes A6 and B1 located are located in the vicinity of an equine farm. Equine farms are deemed sensitive to impacts associated with greenway development, where the proximity of the greenway or proposed construction works, may potentially lead to significant indirect impacts on operational activities. However, as Routes A6 and B1 follow the alignment of an existing road network, construction or operation related activities are not likely to impact on this equine farm holding. However, options B4 and C2 are offline and also run in vicinity of equine farms. Due to the nature of the greenway, local diversions will need to be explored to reduce impacts on equine farms.

In relation to non-agricultural properties, there are a number of residential, commercial and community properties located in the vicinity of the routes. In general, due to the nature of the proposed greenway development, direct impacts on properties are not anticipated as the routes can be locally diverted, if required. However, it may not be possible to avoid direct impacts on non-agricultural properties along Link L1 option. This route is constrained by residential properties to the east, and the Ballymascanlon Golf Course to the west. As Link L1 option is likely to significantly impact on residential properties, or the golf course, it is not considered feasible in relation to impacts on non-agricultural property. Similarly, direct impacts on non-agricultural properties will not be avoided for Option C12 which would require acquisition of parts of the Greenore Golf Club lands to accommodate the greenway. This would result in significant impacts on the current course layout and impacts on either the Greenore Port facilities or the golf club's facilities. Option C12 is therefore not considered feasible with regard to impacts on non-agricultural property.

8.5.2.8 Air Quality and Climate

There are a number of residential, commercial and community properties located in the vicinity of the proposed routes. Due to the nature of the proposed greenway development, which will attract non-motorised users only, all routes are considered to be feasible in relation to air quality. In relation to climate, all routes will facilitate the uptake of active travel mode of transport, supporting Ireland's transition to zero-emissions society. Therefore, all options are considered to be feasible under air quality and climate.

8.5.2.9 Noise and Vibration

There are a number of residential, commercial and community properties located in the vicinity of the proposed routes. Although some properties may be subjected to noise related impacts during construction, these impacts will be temporary due to the linear nature of the development. During operation, which will attract non-motorised users only, all routes are considered to be feasible in relation to noise and vibration.

Table 8.5.2.1 Feasibility Assessment under Environment

Route Options	Biodiversity	Soils and Geology	Hydrology and Hydrogeology	Landscape and Visual Amenity	Archaeological, Architectural and Cultural Heritage	Material Assets: Agricultural and Non-Agricultural Properties	Air Quality and Climate	Noise and Vibration
Section A								
A1	Not Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible
A2	Not Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible
A3	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible
A4	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible
A4-1	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible
A4-2	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible
A5	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible
A6	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible
A7	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible
L1	Feasible	Feasible	Feasible	Feasible	Feasible	Not Feasible	Feasible	Feasible
L2	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible
Section B								
B1	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible
B2	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible
B2-1	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible
B3	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible
B4	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible
Section C								
C1	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible
C2	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible
C3	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible
C3-1	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible
C4	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible
C4-1	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible
C5	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible

Route Options	Biodiversity	Soils and Geology	Hydrology and Hydrogeology	Landscape and Visual Amenity	Archaeological, Architectural and Cultural Heritage	Material Assets: Agricultural and Non-Agricultural Properties	Air Quality and Climate	Noise and Vibration
C6	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible
C6-1	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible
C7	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible
C8	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible
C9	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible
C10	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible
C11	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible
C12	Feasible	Feasible	Feasible	Feasible	Feasible	Not Feasible	Feasible	Feasible

8.5.3 Economic

An economic assessment was undertaken for all of the options within the study area with costs developed for each type of construction anticipated for a particular section of the route and then combined to develop the full route option costs.

Costs were developed for each option taking into account the following:

- Online or offline of existing road or dismantled rail line;
- Land cost based on land use and extent of land being acquired;
- Cost of bridges and culverts;
- Cost of retaining walls and erosion protection;
- Where exceptional earthworks are required; and
- Exceptional land costs where significant impacts on gardens or property acquisitions.

Costs were developed for each route and link section and are compared in Figure 8.5.1.1 below.

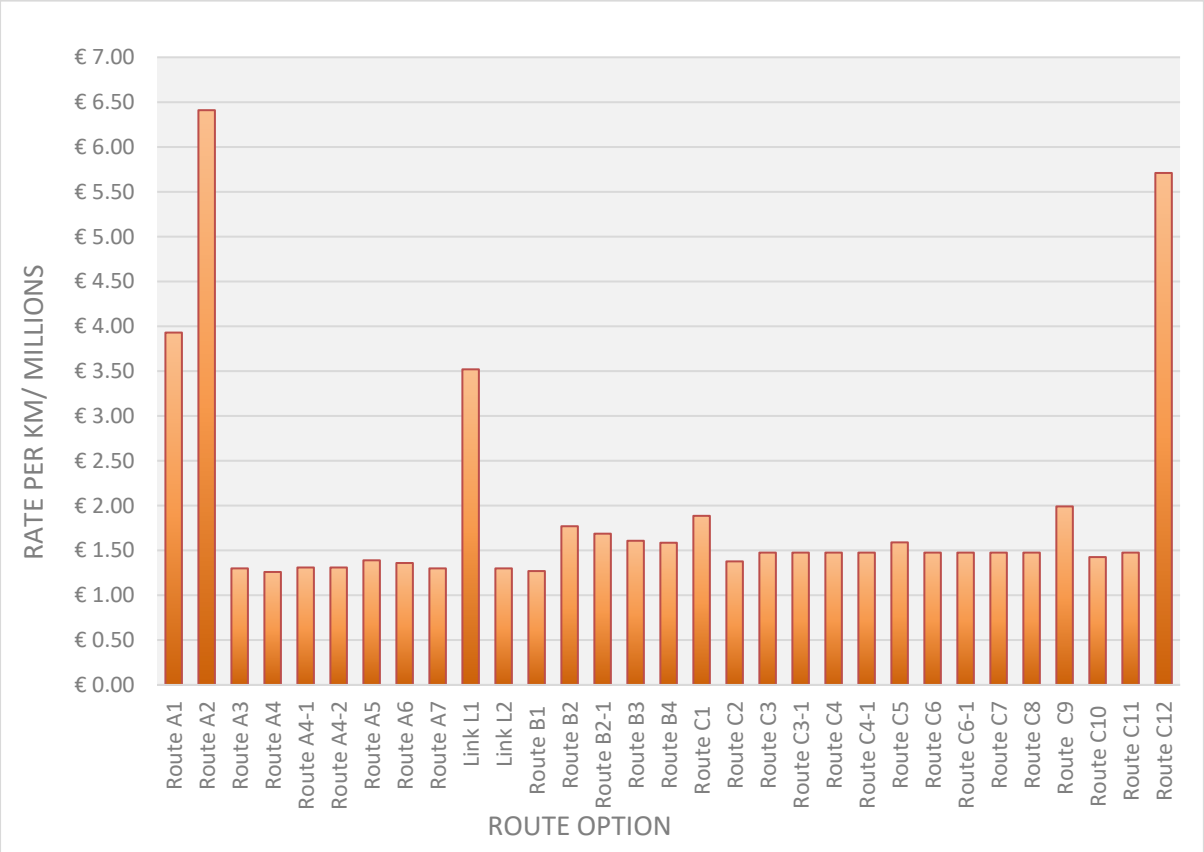

Figure 8.5.1.1 Route Option Costs Per Kilometre

Based on the economic assessment of the route options it can be seen that most of the options cost range between €1.2m to €2.0m per kilometre, with only four of the options falling outside of this range which are detailed below.

Route A1 - the higher than average cost of €3.9m per kilometre relates to the cost of the construction of the bridge that would be required for this option to cross the Flurry River section of the estuary which would need to span over 320 metres. Although the existing bridge

foundations could potentially be utilised the significant span of the bridge and difficulty with construction of the bridge within an SAC all contribute to the cost of this section of Option A1 while the reminder of Option A1 would be similar in costs to the other route options. Option A1 has therefore been determined as not economically feasible for the section of Option A1 between nodes 2 and 9 (i.e. the crossing of the River Flurry estuary).

Route A2 – the high average cost of €6.4 million per kilometre for this option relates mostly to the to the cost of the construction of the bridge that would be required to span over the estuary from Soldiers Point to Bellurgan Point over 400 metres. As this option is dependent on the bridge crossing of the estuary and does not form any potential linkage for other options, this option has been determined as not feasible from an economic perspective from node 1 to 9.

Link L1 - This option is located to between the Ballymascanlon Hotel and Golf Resort and the Flurry River to the west of it and the L3085 Ravensdale Road and a number of residential houses to the east. Although this construction of this route is feasible it would require the acquisition of a private number of gardens, road realignment and construction of retaining walls over large sections of its length to accommodate the greenway resulting in a cost of €3.5m per kilometre. Therefore Link L1 has been determined to not be economically viable from Node 5 to 7.

Route C12 - This option skirts the coastal periphery of Greenore Golf Club, with the route mostly within the golf course or Port warehousing facilities. It follows Euston Street before entering Greenore Golf Club and Greenore Port, including warehousing facilities before following the line of the disused railway line with Carlingford Estuary located on the west and north side and the golf course to the east and south running to connect towards the R173 road to Carlingford. Due to these constraints' considerable impacts on the golf club cannot be avoided without significant alteration to the golf course or alternatively the Port and warehousing which increase the costs for this option to €5.7m per kilometre.

Based on this assessment Route A1 Between Nodes 2 and 9, Route A2, Link L1 and Route C12 are not considered economically feasible.

8.6 Discounted Options

Following from the assessment, the options, as highlighted in Section 8.7 Conclusion, which have not progressed to next phase are discussed below:

- Route A1 Between Nodes 2 and 9,
- Route A2,
- Route A5, Between Nodes 6 and 12
- Link L1
- Route C1
- Route C12

Route A1 between Nodes 2 and 9 – The section of Route A1 has been discounted from further consideration due to the economic cost of this option and the environmental impacts of this option. This option spans the Flurry River estuary and would require the construction of a new bridge spanning approximately 320 metres along the alignment of the dismantled Dundalk – Greenore rail line. The length of the bridge and associated cost is one of the main reasons for not considering this options further. The other difficulties would be the construction of the bridge on the existing bridge pier foundations or alternatively if this could not be achieved, providing a single span bridge to span over the Dundalk Bay SAC and SPA. Although the existing bridge piers are still visible at times in the estuary, ground investigation and testing of these would be required in advance of obtaining planning for the scheme. It is

also not clear at this phase of the project if this testing would be permitted due to the difficulty in doing this work without impacting the Qualifying Interests of the Dundalk Bay SAC.

Furthermore, it is envisaged that works to construct this bridge, regardless of the bridge type will require the permanent loss of mudflats, a Qualifying Interest of the Dundalk Bay SAC and may also cause significant impacts to wintering bird species which are the Qualifying Interests of Dundalk Bay SPA.

Route A2 – would be required to span over the Castletown Estuary from Soldiers Point to Bellurgan Point which is economically not viable and has a number of other environmental, social and accessibility impacts related to it. Not only is the span of the bridge significantly long at approximately 400 meters to achieve the clearance required for shipping to pass to access Dundalk Harbour beneath, the bridge would also need to be significantly elevated over the shipping channel. This would need to allow for existing and future shipping to pass beneath it while being elevated. The bridge would also require buffers and other protection measures to be constructed on the supporting structure of the bridge to protect it against potential impact from vessels. All of this construction would impact the Dundalk Bay SAC and may also cause significant impacts to wintering bird species which are the qualifying interests of Dundalk Bay SPA.

Option A2 south of the Soldiers Point and running to the west would have a number of impacts on properties. Impacts immediately west of Soldiers Point would be limited. However, from Mountain View / Coes Road East through to the Tain Bridge along Point Road, significant impacts on residential, industrial and business properties would result from the installation of the required pedestrian and cycle facilities through this section.

Furthermore this option does not meet objectives 7.1a and 7.1b - *To protect and enhance the natural assets and biodiversity of the local area* - as it would require construction works within the boundaries of European designated sites which would result in negative impacts to Qualifying Interests, such as disturbance, pollution, habitat degradation and permanent habitat loss, etc. This option also does not meet objectives 2.2a – '*Provide a high-quality facility for recreational exercise for all age groups and abilities within the study area' and* 3.1a – '*Improved accessibility of the transport network for vulnerable users, such as those with a disability*' as it will require the construction of a very high bridge which will not be attractive for use by vulnerable groups and persons with disabilities.

Route A5 - between Nodes 6 and 12 – The overall route loops from west of the Ballymascanlon Hotel and Golf Resort on the R173 (Node 4) and extends north of here towards Ballymakellett to link back to the R173 in Jenkinstown (Node 14). In assessing the option the section of the route between Nodes 6 and 12 was identified as passing through areas where gradients are steep; up to 25%. The steepest sections are located north of Trumpet Hill and Drumenagh Hill. Although short sections of a greenway at steeper gradients could be considered, this would require extensive earthworks and switch back arrangements in the greenway to achieve flatter gradients. Even with these measures the route would still not meet the design standards for greenways (TII DN GEO 03047 Rural Cycleway Design (Offline & Greenway)) which limit gradients to 5% for short lengths up to 150m which would not be feasible over this section of the route. As this section of Option A5 cannot practically comply with the required design standards, it is not considered feasible in terms of engineering. The section of A5 between nodes 4 to 6 and 12 to14 are however considered feasible and will be considered in the next phase of the scheme development.

Link L1 - This option is located between the Ballymascanlon Hotel and Golf Resort and the Flurry River to the west of it and the L3085 Ravensdale Road and a number of residential houses to the east. The construction of this route, although feasible, would require the acquisition of a number of private gardens, road realignment and construction of retaining

walls over large sections of its length to accommodate the greenway. Even with new retaining walls, screen planting and garden acquisition, the impacts of regrading the accesses and driveways to the properties would potentially be so significant in some cases that outright acquisition of properties would need to be considered. Due to constraints of the Ballymascanlon Golf Course and the Flurry River to the west of the route, realignment of the river to provide room for the greenway and required road is not feasible either, due to impacts on the river and the associated visual impacts related to the loss of the mature tree line and impacts on the golf course. Placing the route west of the Flurry River or realigning the Flurry River west into in the golf course would impact at least two holes on the golf course, along with the associated impacts and costs of reconfiguring the course.

On the basis of the cost of providing this option and property impacts, or the potential for environmental impacts if an option to minimise the impacts on the adjacent properties is progressed, this option is not considered feasible.

Option C1- this option runs from Node 23 along R173/R175 at the Bush through to the Node 44 along the quay side in Carlingford broadly following the corridor of the R173. This option is not considered feasible due to the steep topography, with gradients in excess of 10% at locations throughout. Although short sections of greenway at steeper gradients could be considered, this would require extensive earthworks and switch back arrangements in the greenway to achieve flatter gradients. Even with these measures the route would still not meet the design standards for greenways (TII DN GEO 03047 Rural Cycleway Design (Offline & Greenway)) which limit gradients to 5% for short lengths up to 150m which would not be feasible on this route. This option also requires two crossings of the R173 and at least four crossings of local roads which is not desirable either. As this option cannot practically comply with the required design standards, this route is not considered feasible in terms of engineering.

Option C12 - runs from Greenore at the junction of the R175, Euston Street and the Shore Road at Node 43 to tie in with the R176 Greenore Road at Node 45. The route generally follows the old Greenore – Carlingford Railway embankment along the edge of the Carlingford Lough in Greenore Golf Club. The option is not considered feasible primarily due to the cost of the option, property impacts and environmental impacts.

To facilitate this option running along the existing embankment, acquisition of parts of the golf club lands would be required to accommodate the greenway which would result in significant impacts on the current course layout and impacts on either the Greenore Port facilities or the golf club's facilities. To accommodate the greenway, a segregated access route would need to be provided adjacent to the current access road to the golf club from Euston Street/ Anglesey Terrace in Greenore. This would require moving the current access road over to facilitate the greenway which would impact on the green and the surrounding area of the 18th hole. This would also impact the parking area to the rear of the port buildings on the right side of the entrance to the clubhouse, potentially removing or needing to relocate up to 15 parking spaces. It would also involve the acquisition of part of the buggy storage and other storage to the right of the club house entrance. Impacts on the course to accommodate the greenway through this section would involve modifications to at least the 5th, 6th, 7th, 8th, 12th and 18th holes, as well as realignment of some of the access tracks along the railway embankment section and to the access tracks near the green of the 5th hole.

In addition to any modification to the embankment to accommodate the greenway, safety netting would likely be required at the top of the embankment to shield users of the greenway from golf balls as this would be a new public route. Although the netting would be desirable in terms of user safety, the environmental impact on birds would be significant due to the barrier this would create for birds in the adjacent SPA and NHA. The need for this could however be reduced or removed if the holes adjacent to the section were reorientated to limit balls being

driven parallel or in the direction of the greenway route, however the cost related to this would not be considered economically feasible either.

The existing railway embankment is also subject to overtopping during combination events with high onshore winds and high tides, which would also require mitigation measures to be considered in the design of the greenway.

Due to these factors, this route is not considered feasible for the proposed Greenway.

8.7 Conclusion

As detailed in Section 8, a number of options have been discounted at the feasibility stage due to not fulfilling the project objectives. Of the thirty-one options (routes, sub-options and links), twenty five options have been assessed as progressing to the Phase 2 Option Selection Studies, in addition to options where part of the route has been discounted. Where a section of an option has been discounted, the sections of this option not discounted have been retained. An example of this is Option A5 has been discounted between nodes 6 and 12, with the sections from Node 4 to 6 and Node 12 to 14 retained as Option A5.

When considering whether the options should progress to the more detailed project appraisal matrix, they have been assessed for compliance with the project objectives, and in terms of feasibility under the headings of Engineering, Environment or Economy.

The Options detailed in Table 8.6.1.1 overleaf are therefore recommended to proceed to Phase 2 Option Selection assessment, where additional surveys and assessments will be undertaken to determine the potential impacts and benefits of each option. The report concludes that there are feasible options for the Dundalk Bay to Carlingford Greenway project and recommends that the project proceeds to the next Phase.

These route options can be seen on Drawing D2CG-RODA-HGN-SW_AE-DR-EN-100110 to 100114 in Appendix D.

Table 8.6.1.1 Options to Progress to Phase 2 Option Selection

Option	Project Objectives Assessment	Engineering Appraisal	Environment Appraisal	Economy Appraisal	Progress to Stage 2
Option A1	No*	Yes	No*	No*	No*
Option A2	No	No	No	No	No
Option A3	Yes	Yes	Yes	Yes	Yes
Option A4	Yes	Yes	Yes	Yes	Yes
Option A5	Yes	No*	Yes	Yes	No*
Option A6	Yes	Yes	Yes	Yes	Yes
Option A7	Yes	Yes	Yes	Yes	Yes
Option A4-1	Yes	Yes	Yes	Yes	Yes
Option A4-2	Yes	Yes	Yes	Yes	Yes
Option L1	Yes	Yes	Yes	No	No
Option L2	Yes	Yes	Yes	Yes	Yes
Option B1	Yes	Yes	Yes	Yes	Yes
Option B2	Yes	Yes	Yes	Yes	Yes
Option B3	Yes	Yes	Yes	Yes	Yes
Option B4	Yes	Yes	Yes	Yes	Yes
Option B2-1	Yes	Yes	Yes	Yes	Yes
Option C1	Yes	No	Yes	Yes	No
Option C2	Yes	Yes	Yes	Yes	Yes
Option C3	Yes	Yes	Yes	Yes	Yes
Option C4	Yes	Yes	Yes	Yes	Yes
Option C5	Yes	Yes	Yes	Yes	Yes
Option C6	Yes	Yes	Yes	Yes	Yes
Option C7	Yes	Yes	Yes	Yes	Yes
Option C8	Yes	Yes	Yes	Yes	Yes
Option C9	Yes	Yes	Yes	Yes	Yes
Option C10	Yes	Yes	Yes	Yes	Yes
Option C11	Yes	Yes	Yes	Yes	Yes
Option C12	Yes	Yes	Yes	No	No
Option C3-1	Yes	Yes	Yes	Yes	Yes
Option C4-1	Yes	Yes	Yes	Yes	Yes
Option C6-1	Yes	Yes	Yes	Yes	Yes

Note * relates to only a portion of the option being discounted.