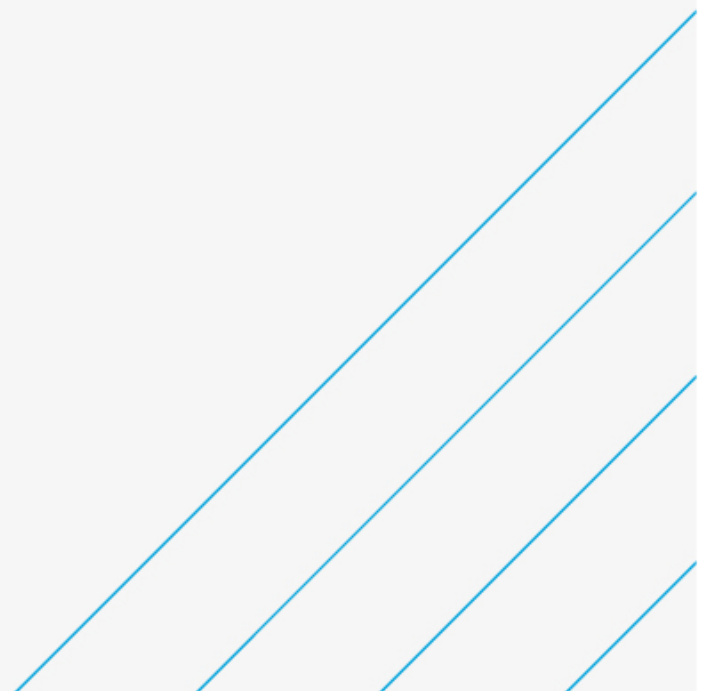


The Boyne Greenway and Navigation Restoration

Greenway Optioneering: Executive Summary
Report

Meath County Council

December 2023



Notice

This document and its contents have been prepared and are intended solely as information for Meath County Council and for use in relation to Boyne Greenway and Navigation Restoration. This document is a summary of the Boyne Greenway, Navan to Oldbridge, Feasibility Study and Option Assessment Report.

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1. Introduction

1.1. Scheme Context

Over the last number of years Meath County Council have been developing a plan to deliver the Boyne Greenway and Navigation Restoration Scheme, which aims to provide a high-quality walking and cycling route and restore the Boyne Navigation including the canal sections and associated locks which are a key feature of industrial heritage within the Boyne Valley.

The proposed Greenway Scheme will extend from Andy Brennan Park in Navan Town to the main gates at the Oldbridge Estate. The Scheme will therefore route adjacent to some of Meath's most significant visitor attractions including Slane Castle, the Battle of Boyne site and the UNESCO World Heritage site at Brú na Bóinne. The proposed Navigation Restoration Scheme of the Boyne Navigation will extend from Oldbridge Guard Lock to the canal harbour in Navan.

The proposed Greenway Scheme will be in the order of 26.5km long and incorporates a study area extending across the river valley. The proposed Greenway Scheme is generally envisaged to be a 3m wide path shared between pedestrians and cyclists. The proposed Greenway Scheme has the potential to increase tourism and recreational activity while offering an attractive alternative transport choice for commuters through its links to the large towns of Navan and Drogheda, bringing significant economic and health benefits to the wider community.

The Boyne Greenway and Navigation Restoration has the potential to be a flagship tourism scheme of regional, national and international significance which would provide access the wealth and diversity of ecological, cultural, industrial and historical heritage within the Boyne Valley.

This report outlines the study undertaken to determine the route feasibility and option assessment process of the proposed Greenway Scheme.

1.2. Vision Statement

The following statement encapsulates the ultimate vision of the completed scheme:

'To create a safe, attractive and environmentally sympathetic canal and river side walking and cycling route between Andy Brennan Park in Navan and the main gates of Oldbridge Estate, Drogheda in tandem with the sensitive restoration of the Boyne navigation route.'

The completed scheme will provide access and connectivity to the towns and villages in the Boyne Valley which will encourage and facilitate physical activity and create a sense of ownership among the adjacent communities.'

The Boyne Greenway and Navigation Restoration will be a flagship tourism scheme of regional, national and international significance which will provide access to the wealth and diversity of ecological, cultural, industrial and historical heritage within the Boyne Valley.'

1.3. Navigation Restoration

A Feasibility Study of the proposed Navigation Restoration Scheme has also been undertaken. Following the completion of this study and a review of the route options for the proposed Greenway Scheme a decision has been reached that the proposed Navigation Restoration should be considered separately from the proposed Greenway Scheme. There are three key reasons for this as follows:

- **Environmental:** Due to the nature, extent and scale of the proposed Navigation Restoration Scheme, there is potential for both direct and indirect impacts, during both the construction and operational stages, which are likely to be greater than that imposed by the proposed Greenway Scheme and which will required further consideration.
- **Management:** The further development, design, construction, operation and maintenance of a scheme of this scale and specialist nature would require a competent corporate body, beyond the capabilities of Meath County Council, to manage the further stages of delivery beyond this feasibility stage.
- **Funding:** The proposed Navigation Restoration has no funding stream that is identifiable as a likely source of funding for a project of this nature.

Further detail on the how this decision was reached can be obtained from the Executive Summary Report on the proposed Navigation Restoration Scheme (5197DG0087).

1.4. Scheme Benefits

The proposed Greenway Scheme meets all of the criteria highlighted in the Strategy for the Future Development of National and Regional Greenways published by the Department of Transport, Tourism and Sport in 2018. The Greenway Scheme will run along the River Boyne and will connect Navan, Slane and Drogheda, which will pass by some of Meath's most significant visitor attractions, including Slane Castle, the Battle of Boyne and the UNESCO World Heritage Site of Brú na Bóinne. The route will be designed to be segregated from traffic as far as is feasibly possible and will be enjoyed by a range of different users.

The following sections lists the Five 'S' Criteria as identified within the Strategy for National and Regional greenways and demonstrates that the proposed Greenway Scheme aligns with and satisfies all five criteria.

1.4.1.1. Strategic

The proposed Greenway Scheme is proposed within the National Transport Authority's Greater Dublin Area Cycle Network Plan as Corridor 13, and will link to Corridor 5 East Cost Trail at Drogheda, and Corridor 2 from Dublin to Galway & Clifden on the Royal Canal near Longwood southwest of Trim.

The proposed Greenway Scheme will also tie into the constructed Drogheda Ramparts to Oldbridge Greenway and the recently constructed R153 pedestrian and cycle bridge in Navan. The Greenway Scheme will also connect in the future with the following schemes which are either at detailed design, planning or feasibility stage:

- Drogheda to Mornington Greenway;
- Boyne Valley Lakeland Counties Greenway (Navan to Kingscourt);
- Slane Bypass;
- Trim Road to Athlumney Pedestrian and Cycle Scheme;
- Slane Village Public Realm; and
- Boyne Valley Drive.

The proposed Greenway Scheme will also provide a high quality and continuous link to several locations in a local and national scale.

1.4.1.2. Scenic

The route corridor of the Greenway Project runs through the Boyne Valley, an area of significant scenery with primary attractions being the character of the River Boyne and surrounding landscape and the industrial heritage in the form of the Boyne Navigation route adjacent to the River Boyne for the full extents of the route.

1.4.1.3. See & Do

Within the study area from Navan to Slane there are numerous built heritage features including castles and mills, the most relevant of which include Athlumney Castle, Donaghmore Round Tower, Dunmoe Castle, beaupark Castle and Church, Broadboyne Bridge, Stackallen Mill, Carrickdexter Castle, Slane Castle, Hill of Slane, Slane Mills, and Oldbridge Estate.

Brú na Bóinne, located on the bend of the River Boyne contains one of the world's most important prehistoric landscapes dating from the Neolithic period, including the large Megalithic passage tombs of Knowth, Newgrange and Dowth as well as some 90 additional monuments.

Oldbridge Estate is the scene of the Battle of the Boyne. The estate includes an 18th century house, walled garden, numerous walkways and a visitor centre.

1.4.1.4. Sustainable

The route corridor of the Greenway Scheme presents as a predominantly rural amenity location wherein people, regardless of physical or cognitive ability or social background, would have a desire to access the route corridor but there is currently a lack of dedicated high quality recreational and leisure walking and cycling routes that facilitate users of all abilities. The provision of the Greenway Scheme would encourage physical activity that could provide social benefits, such as increased social interaction that helps to build community networks, reduce isolation and exclusion and build social cohesion.

An absence of traffic free active travel routes within the study area between Navan, Slane and Drogheda results in most recreational and leisure-based cycling trips being undertaken on the national and local road network. This contributes to an impact on human beings in the form of harmful noise and emission pollutants, such as nitrogen dioxide, being breathed in by active travel patrons wishing to improve their physical wellbeing. Such pollutants are a contributing factor to health issues such as asthma, emphysema and other respiratory issues.

1.4.1.5. Segregated

The proposed greenway will be developed as a primarily segregated off-road facility (approximately 95% off-road and 5% on-road) that will be attractive for all levels of cycling and walking enthusiasts from all ranges of age and ability. Ensuring that the proposed scheme is accessible for all is a key objective of the Scheme.

1.5. Purpose of the Feasibility and Options Assessment Process

The project is being brought through the following Phases as set out by Transport Infrastructure Ireland's (TII's) Project Management Guidelines:

- **Phase 0:** Scope and Pre-Appraisal
- **Phase 1:** Concept and Feasibility
- **Phase 2:** Options Selection (Current Stage)
- **Phase 3:** Design and Environmental Evaluation
- **Phase 4:** Statutory Process
- **Phase 5:** Enabling and Procurement
- **Phase 6:** Construction and Implementation
- **Phase 7:** Close Out and Review

This report sits within Phase 2 of the project as outlined above and includes the route options assessment process.

The purpose behind the Feasibility Study and Options Assessment report is to outline the process involved in selecting the Emerging Preferred Route option. As part of identifying the Emerging Preferred Route, the following steps were undertaken:

- Confirm study area extents;
- Identify key constraints within the study area (desktop study, site inspections, mapping of identified constraints, utility information, traffic surveys, review of flood maps);
- Develop a long list of potentially viable route options;
- Undertake a high-level sifting process to identify a short list of feasible options that can potentially deliver the project objectives;
- Carry out a detailed systematic assessment of the short-listed options;
- Arrange public consultations and stakeholder engagement at the relevant stages;
- Further evaluate options following public consultations, taking feedback from the consultation process into account to determine an emerging preferred route corridor.

2. Identification of Need

The Boyne Greenway is anticipated to deliver infrastructure which supports active lifestyles and provides a sustainable and cleaner alternative to the car, alleviating congestion and therefore supporting sustainable growth.

Cycle infrastructure has the potential to deliver significant economic, health, social and environmental benefits and therefore, the development of the Boyne Greenway is anticipated to meet a variety of national, regional and local policies.

The development of the Boyne Greenway and Navigation Restoration meets the objectives of several national, regional and local policies to improve sustainable travel, increase local amenities and provide social, health and economic benefits.



Figure 2-1 - Relevant Policy

The proposed study area is one of immense scenic beauty and amenity value rich with historical, heritage, archaeological and ecological sites and features of local, regional, national and international significance. There is significant potential to deliver a greenway, designed to high quality user safety and comfort standards, that can deliver a tourism product with significant potential to attract additional numbers of national and overseas visitors.

The scheme will also facilitate local users with a convenient and scenic route which would benefit both physical and mental wellbeing in an accessible and socially inclusive manner. The navigation restoration element of the scheme will open up potential for new tourism markets and help to restore a key heritage feature along the River Boyne complementing the overall attraction of the greenway.

In summary, the proposed Greenway Scheme would benefit the tourism economy of the county and region and contribute significantly to the health and wellbeing of all users.

3. Constraints

A detailed Constraints Study was carried out, incorporating guidance set out in National Transport Authority (NTA) Project Appraisal Guidelines. The purpose of this study is to document and map the nature and extent of constraints within the defined study area for the scheme so that as much information as possible is available to inform the subsequent feasible option identification and selection process. The constraints are divided into three principal categories, namely: Natural Constraints, Artificial Constraints and External Parameters. These constraints form key considerations in the route options assessment process which is summarised in this report.

4. Stakeholder Consultation

4.1. Public Consultations

A Route Options Public Consultation engagement was undertaken for the project in February/March 2021. Due to Covid-19 pandemic and associated restrictions, the public consultation could not be held in person and therefore, was held online via Meath County Council Consult website.

The consultation material included a brochure, constraints map, route option maps and a frequently asked questions (FAQs) leaflet. An online survey questionnaire was live for a three-week period, also hosted on the Meath County Council Consult website. Submissions were invited from the public during the same period as the questionnaire was available, which were taken into consideration to develop the Option Development and Assessment process leading to the identification of the Emerging Preferred Route.

The Route Options Public Consultation received a total of 95no. Submissions, 56no. via email, 10no. via post and 29no. via the Meath County Council Consult website. In addition to submissions from the general public and local residents and landowners, submissions were received from the Development Applications Unit of the Department of Housing Local Government and Heritage, the Inland Waterways Association of Ireland, the Boyne Catchment Angling Association, the Department of Tourism, Culture, Arts, Sport and Media, Devenish Nutrition LTD, the Irish Cycling Advocacy Network, the Office of Public Works, the Slane Community Forum, Slane Castle, Transport Infrastructure Ireland, Navan and District Historical Society, An Taisce, the Navan Cycling Initiative, the Navan Coarse Angling Group, the Wild About Navan Group and the Bend of the Boyne Protection Group.

In general, the majority of the public submissions were positive, with most people indicating support of the Boyne Greenway. There are concerns expressed regarding the impact of the scheme on the environment. Concerns are also raised and acknowledged in terms of local impacts on landholdings. The general view was that the scheme should prioritise using existing infrastructure as much as possible to reduce the impact on the surrounding environment and to minimise the cost of the project.

The issues raised have been reviewed and considered in the progression of the option development and assessment process leading to the identification of the Emerging Preferred Route.

4.2. Key Stakeholder Consultation

As part of the general consultation associated with the scheme, numerous consultation meetings and workshops have been undertaken with key stakeholder groups in order to discuss strategic and specific elements of the scheme feasibility. Key stakeholders are indicated below:

- An Taisce;
- Inland Waterways Association of Ireland / Boyne Navigation Group;
- OPW National Historic Properties Section;
- OPW National Monuments Section;
- OPW Flood Risk Management Section;
- National Monuments Services;
- Failte Ireland;
- NPWS;
- Meath County Council (Numerous Departments).

This consultation has assisted in guiding particular technical and strategic elements of the scheme. The consultation undertaken to date will continue over the duration of the project with further parties being contacted as and when considered necessary.

4.3. Code of Best Practice for National and Regional Greenways (2021)

The Code of Best Practice for National and Regional Greenways was published by Transport Infrastructure Ireland in December 2021 and sets out the proposed process for the development of greenways of this scale in a collaborative way, taking into account the views of landowners, local communities, other stakeholders and the needs of those who will use them.

The Code of Best Practice sets out a number of public consultations to be undertaken at various stages of the project development along with recommendations for liaising directly with landowners.

Although the public consultation carried out in 2021 for the Boyne Greenway and Navigation Restoration predated the publishing of the Code of Practice, it has broadly taken place at the corresponding stage and in line with the recommended process as outlined in the document. Further consultations and liaison with landowners will be carried out in alignment with this Code of Best Practice.

5. Options Assessment Process

In order to adequately assess the many possible options for the route of the proposed Greenway Scheme, a two-stage assessment process has been undertaken. The assessment process is summarised below.

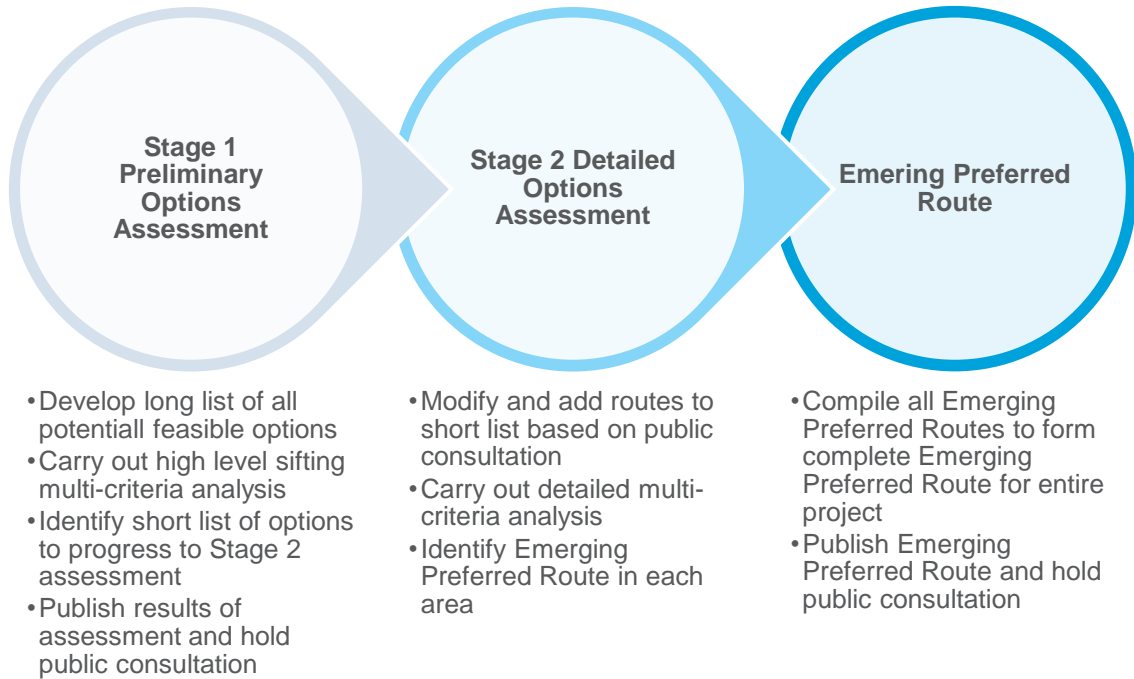


Figure 5-1 – Options Assessment Process

6. Stage 1 Preliminary Options Assessment

To arrive at the Emerging Preferred Route, a two-stage assessment process was used.

The initial stage of the Route Development and Assessment process, Stage 1, is based on the following route corridor development principles:

- Route Corridor development based on the principle of developing a route that follows the line of the original towpath avoiding, removing or reducing impacts on environmental factors where feasible. This includes considerations of routes, or sections thereof, that run adjacent to both the northern and southern river banks;
- Route Corridor development based on the principle of developing a route that follows the closest field boundary to the northern or southern bank of the river keeping outside of the flood plain where possible and avoiding, removing or reducing impacts on environmental factors where feasible;
- Route Corridor development based on the principle of developing a route that follows the closest road to the northern or southern bank of the river, providing link type appropriate to road classification, keeping outside of the flood plain where possible and avoiding, removing or reducing impacts on environmental factors where feasible;
- Route Corridor development based on the principle of do-minimum where the route essentially follows the existing line of the original towpath with no further or minimal development and maintenance only.

As noted, the above descriptions outline the principle upon which route corridor options within the study area could be developed. The exact route of each of those route corridor principles has not been defined and indeed it should be noted that each principle could result in multiple route options in themselves. It is not the specific route options that are being assessed in this stage. The purpose of this first stage of the route development process is to ascertain whether these route corridor development principles would result in reasonable route corridor option that could be considered feasible at the next stage of route option development and assessment process.

It should be noted that elements of any route corridor development principle that do not progress to the next stage of route development and assessment, can be considered at the Stage 2 process where necessary such as where local constraints or opportunities present themselves.

The Stage 1 Route Development and Assessment was undertaken on the initial route corridor options. The main assessment criteria utilised for the Stage 1 Route Corridor Development and Assessment are:

- Scheme Vision – how the route corridor option aligns with the vision statement;
- Policy Commitments – how the route corridor option achieves transport and non-transport policy and objectives of the Meath County Development Plan;
- Achievability – the feasibility of the route corridor option from a technical, funding and other deliverability point of views.

Sub criteria have been developed with particular attention given to the Scheme Vision Statement, which has been identified through a collaborative workshop with key Meath County Council Stakeholders, ensuring that the criteria can appropriately measure the achievement of these objectives by each route option principle, shown in Table 6-1.

Table 6-1 - Stage 1 - Preliminary Options Assessment Criteria

Criteria	Sub Criteria
Scheme Vision	Potential to create a safe, attractive and environmentally sensitive canal and river side walking and cycling route.
	Potential to provide access and connectivity to towns and villages within the Boyne Valley and encouraging and facilitating physical activity and creating a sense of ownership among the adjacent communities.
	Potential to create a flagship tourism scheme of regional, national and international significance which will provide access to the wealth and diversity of ecological, cultural, industrial and historical heritage within the Boyne Valley
	Ability to achieve Meath CDP (2020-2026) Walking and Cycling Objectives and Meath CDP (2013-2019) Transport Objectives.

Criteria	Sub Criteria
Policy Commitments	Ability to achieve Meath CDP (2020-2026) Industrial Heritage Policies and Meath CDP (2013-2019) Industrial Heritage Objectives.
	Ability to achieve Meath CDP Walking and Cycling and Transport Objectives in such a manner so as not to significantly negatively impact on the conservation status of the Natura 2000 site either alone or in combination with other objectives in the CDP or other plans.
Achievability	Technical feasibility, in terms of achieving accessibility and the needs of vulnerable users, walkers and cyclists.
	Public and stakeholder acceptability.
	Cost feasibility, in terms minimising construction and land acquisition costs.

Each route option principle is assessed relative to one another against the Stage 1 Sifting Criteria on a five-point ranking scale. Route option principles are to be assessed in terms 'significant advantages over other options', 'some advantages over other options', 'comparable to all other options', 'some disadvantages over other options' and 'significant disadvantages over other options', shown in Table 6-2.

Table 6-2 - Scoring Scale

Colour Coding	Rank Description
	Significant advantages to other options
	Some advantages to other options
	Comparable to all other options
	Some disadvantages to other options
	Significant disadvantages to other options

Table 6-3 outlines assessment undertaken as part of the Stage 1 Route Development and Assessment Process.

The assessment and accompanying narrative, concludes that policy consistently relates the development of the Boyne Greenway as being fundamentally linked to the existing transport corridor and asset that is the original Boyne Navigation Towpath, with the county policy also referencing the development of the greenway along the banks of the River Boyne.

From a technical point of view, the development of routes based off the principle of the towpath and riverbank would provide an accessible route that would provide suitable gradients and width. The key technical constraint relates to flooding. A number of route options, based on the towpath and riverside bank principle, have been developed which can avoid and or mitigate this risk.

Table 6-3 - Stage 1 Assessment Summary

Criteria	Sub-Criteria	Tow path	Field Boundary	Road Network	Do Nothing
Project Vision	Potential to create a safe, attractive and environmentally sensitive canal and river side walking and cycling route.	Green	Yellow	Orange	Orange
	Potential to provide access and connectivity to towns and villages within the Boyne Valley and encouraging and facilitating physical activity and creating a sense of ownership among the adjacent communities.	Green	Light Green	Yellow	Orange
	Potential to create a flagship tourism scheme of regional, national and international significance which will provide access to the wealth and diversity of ecological, cultural, industrial and historical heritage within the Boyne Valley.	Green	Yellow	Orange	Orange
Policy Commitments	Ability to achieve Meath CDP (2020-2026) Walking and Cycling Objectives and Meath CDP (2013-2019) Transport Objectives.	Green	Yellow	Orange	Orange
	Ability to achieve Meath CDP (2020-2026) Industrial Heritage Policies and Meath CDP (2013-2019) Industrial Heritage Objectives.	Green	Orange	Orange	Orange
	Ability to achieve Meath CDP Walking and Cycling and Transport Objectives in such a manner so as not to significantly negatively impact on the conservation status of the Natura 2000 site either alone or in combination with other objectives in the CDP or other plans.	Light Green	Yellow	Orange	Orange
Achievability	Technical feasibility, in terms of achieving accessibility and the needs of vulnerable users, walkers and cyclists.	Light Green	Yellow	Yellow	Orange
	Public and stakeholder acceptability.	Light Green	Yellow	Yellow	Orange
	Cost feasibility, in terms minimising construction and land acquisition costs.	Yellow	Yellow	Yellow	Orange
Progress to Stage 2 (Yes / No)		Yes	No	No	No

The key elements of the Vision Statement and Project objectives, such as a river / canal side route that connects communities and provides a flagship tourism scheme, would appear to have the potential to be significantly achieved by reusing the original towpath route and the utilising the river bank to develop options.

Therefore, based on policy review, the scheme vision and achievability, it is considered to be a reasonable approach to develop and assess route options of the proposed Boyne Greenway based on route corridor utilising the principle of re-using and upgrading the original towpath route in conjunction with utilizing elements of the riverside bank.

Chapter 7, following, details the development and assessment of route options developed within the route corridor of the navigation towpath, river side banks and the river corridor.

7. Stage 2 Detailed Assessment

7.1. Study Area and Sections

The study area has been divided into five sections to simplify the route option development process as follows:

- Section A – Andy Brennan Park Navan to Broadboyne Bridge
 - Contains 2 no. route options
- Section B - Broadboyne Bridge to Slane (Slane Bridge on the N2)
 - Contains 5 no. route options
- Section C - Slane (N2 Bridge) to Bru na Boinne Visitor Centre
 - Contains 4 no. route options
- Section D - Bru na Boinne Visitor Centre to Oldbridge Estate
 - Contains 3 no. routes options
- Section E - Oldbridge Estate
 - Contains 3 no. routes options

7.2. Link Types and Bridge Types

7.2.1. Link Types

The proposed link type (this is the cross-section proposed across a certain length of the greenway) would predominantly consist of an assumed new at-grade 3.0 to 4.0m wide shared pedestrian and cycle path along both new sections of proposed route and along routes that follow existing maintained and publicly used sections of towpath.

Where the construction of new greenway routes is being considered, the path would be located, where feasible, outside of the design year flood event zone.

Where feasible and necessary, consideration would be given to an elevated boardwalk type structure consisting of a 3.0 to 4.0m wide clear width between handrails.

7.2.2. Bridges

Bridges would generally be separate structures accommodating pedestrians and cyclists and capable of clearing a single span over the River Boyne. At Broadboyne Bridge and Slane Bridge, route options requiring crossing of the river would, at this route option development stage, be accommodated via 'bolt on' cantilevered structures to the existing bridges, similar to that recently constructed over the River Boyne along the R153 Athlumney Road in Navan, Co. Meath. Other proposed bridges would be separate single span bridges.

7.3. Route Options

Table 7-1 outlines a description of the proposed route options per section. Please refer to Appendix A for the Stage 2 Route Option Maps.

Table 7-1 – Route Options

Route ID	Route Description
Section A A1 (Green)	This proposed route would extend circa 6.5km along the existing towpath from Andy Brennan Park to the Broadboyne Bridge. This route option would run exclusively along the route of the existing towpath, that is being maintained and is well used by the public. The path is located on the southern side of the river and positioned between the river and the canal. The route would consist of upgraded path extending towards the Broadboyne Bridge.
Section A A2 (Magenta)	This proposed route would extend from Andy Brennan Park along the existing towpath for c.250m as far as Ruxton Lock before crossing the River Boyne on a new greenway bridge of approximately 50m span. As it lands on the north side of the river the route would then progress towards the Broadboyne Bridge as a new path adjacent the riverbank.

Route ID	Route Description
Section B B1 (Green)	<p>This route would predominantly extend along the existing historic towpath. As a result, the proposed route would switch banks across the river twice.</p> <p>Whilst it is noted that immediately east of Broadboyne Bridge there extends a short section of the canal and towpath along the south bank of the river, this proposed route would utilise the existing bridge at Broadboyne to cross the river and gain access to the towpath on the north bank of the River. A greenway bridge structure attached to the existing bridge would be required to facilitate this. However, this would require further investigation in terms of the ability of the existing bridge to support the new greenway bridge structure.</p> <p>The towpath on the north bank commences some 400m east of Broadboyne Bridge, thus this short section of route eastwards from the bridge would extend as a new path adjacent the riverbank. There is a potential that a c.400m section of boardwalk could be required at this location.</p> <p>The route would then align with the route of the historic towpath which extends towards Slane for some 3.5km commencing at Stackallen Guard Lock, and passing Deer Park, Castlefin and Cruicetown Locks before crossing back onto the south bank at Carrickdexter Lock. A new greenway bridge of some 70m span would be required. The proposed route would then continue on the south bank along the historic towpath for some 2.5km to Slane Bridge.</p> <p>Along the north bank of this proposed route the existing towpath and canals are significantly overgrown around the Deerpark, Castlefin and Cruicetown areas. Along the south bank from Carrickdexter onwards to Slane, there also exists some constrained areas that are overgrown and route directly adjacent the riverbank.</p>
Section B B2 (Magenta)	<p>This route would cross onto the north bank of the river as per S-B1 and would similarly extend along the historic towpath as far as Carrickdexter.</p> <p>The route would then continue along the north bank for approximately 1km along a farm trail adjacent the riverbank being maintained by the adjacent landowner. The route would extend through the property at Slane Castle for approximately 2km, along existing pathways and through a wooded area to the entrance to the estate adjacent Slane Bridge.</p> <p>The route would then be accommodated on a new bridge structure attached to the existing Slane Bridge to join the existing towpath on the south bank of the river. However, this would require further investigation in terms of the ability of the existing bridge to support the new greenway bridge structure.</p>
Section B B3 (Blue)	<p>This route would cross onto the north bank of the river as per S-B1 and would similarly extend along the historic towpath as far as Carrickdexter.</p> <p>The route would then continue along the north bank for approximately 1km along a farm trail adjacent the riverbank being maintained by the adjacent landowner. The route would cross the river due south of Slane Castle requiring a new greenway bridge structure of some 70m span. Exact positioning of the new bridge structure is to be determined at the next phase of design.</p> <p>The route would then progress for 1.6km initially along the historic towpath adjacent Slane Castle Lock before rising to higher ground and progressing through a number of fields adjacent hedge rows and set back from the edge of the floodplain before joining the existing local access lane in vicinity of Slane Bridge. A short structure adjacent the N2 maybe required to facilitate access over the canal and onwards to the next section of the proposed scheme.</p>
Section B B4 (Yellow)	<p>This proposed route would remain on the south bank of the river, initial via the short section of local road for approximately 700m from Broadboyne Bridge towards the mill opposite Stackallen Guard Lock. The route would then require a short span bridge to traverse a local stream before progressing along the riverbank for approximately 5.7km all the way towards Slane Bridge.</p> <p>The greenway would be routed adjacent existing field boundaries and through woodland adjacent the riverbank passing Beauparc before joining the existing towpath opposite Carrickdexter Lock and progressing towards Slane Guard Lock. At this point the route would follow route B3 to Slane Bridge.</p>

Route ID	Route Description
Section C C1 (Green)	<p>This proposed route would extend exclusively along the existing historic towpath from Slane Bridge towards the pedestrian bridge at the Bru na Boinne Visitor Centre. To do so would require two river crossings.</p> <p>This route would firstly extend to Morgan's Lock at Rosnaree along the south bank for approximately 2.5 km, on a currently maintained path that is well used by the public, before crossing onto the north bank of the River Boyne, requiring a new pedestrian and cycle bridge structure of approximately 70m span.</p> <p>The greenway would then progress along the route of the historic towpath for some 3km to Broe Lock. The towpath then crosses to the south bank where a new pedestrian and cycle bridge of approximately 50m span would be required.</p> <p>When the route lands on the south bank it would link back up again with the existing towpath, which includes a 1.6km section currently maintained and open to the public as far as the Water Works. Between this point and the bridge at the Bru na Boinne Visitor Centre the existing towpath and canal traverses through farmland for some 900m wherein the towpath and canal are located close to farm buildings and dwellings.</p>
Section C C2 (Magenta)	<p>This proposed route would extend for over half of its length along the existing historic towpath from Slane Bridge to Broe Lock as per route C1. At Broe Lock this route would then continue along the north bank of the river along a new path construction for approximately 2.5km, adjacent field boundaries at the edge of the floodplain, before tying into the existing pedestrian bridge at the Bru na Boinne Visitor Centre. A new short span pedestrian and cycle bridge structure would be required along this route to navigate a tributary to the Boyne River.</p>
Section C C3 (Blue)	<p>This proposed route would extend exclusively along the south bank of the River Boyne, initially extending along the existing historic towpath from Slane Bridge towards Morgan's Lock at Rosnaree.</p> <p>At this juncture the route would continue along the south bank of the river, on the edge of the floodplain, following field boundaries on higher ground where possible for approximately 2km.</p> <p>The proposed greenway route would then route past Rosnaree onto and adjacent the Boyne Road, albeit on the field boundary side, for 850m before diverting back onto the existing towpath adjacent the public carpark opposite Broe Lock. The route would then follow the same alignment along the existing historic towpath as per C1 to the bridge at Bru na Boinne Visitor Centre.</p>
Section C C4 (Yellow)	<p>This proposed route would also extend exclusively along the south bank of the River Boyne, initially extending along the same route as C3 to the car park at Rosnaree. The route would then route adjacent the Boyne Road, albeit on the field boundary side, for 3.3km before diverting onto the existing towpath due west of the bridge at the Bru na Boinne Visitor Centre.</p>
Section D D1 (Green)	<p>This proposed route would progress exclusively along the line of the historic towpath for approximately 4.1km, which extends entirely along the south bank of the River Boyne from the Bru na Boinne Visitor Centre, past Staleen Lock and on towards Oldbridge Estate.</p> <p>The route would be positioned adjacent the riverbank for the majority of the route albeit the 1.6km section from the Bru na Boinne to Staleen Lock is along a canal towpath that is raised above the floodplain and, for approximately 800m, set back from the river.</p> <p>Between Staleen Lock and the canal at Oldbridge the towpath is located directly adjacent the riverbank.</p> <p>A boardwalk structure or other type may be required or potentially an embankment type structure, built into the canal along its length adjacent the Local Road (L16014) section between Obelisk Bridge and the Oldbridge Main Gates.</p> <p>This route would also require either a separate new pedestrian and cycle bridge structure over the canal at the main gates to Oldbridge, or would require the reconstruction of the existing bridge with pedestrian and cycle facilities incorporated into its deck.</p>
Section D D2 (Magenta)	<p>This proposed route would progress exclusively along the north bank of the River Boyne for approximately 3.7km, on the edge of the floodplain, following field boundaries before</p>

Route ID	Route Description
	crossing the river to join the existing towpath upstream of the canal at Oldbridge. The new bridge would require a span of approximately 60m.
Section D D3 (Blue)	This proposed route would be routed along the local road network on the north bank of the River Boyne for approximately 5.0km, as a quiet lane typology shared between low volumes of motor vehicles and cyclists and pedestrians. The route would divert from the local roads to the proposed new pedestrian and cycle bridge crossing as described per route D2.
Section E E1 (Green)	This proposed route would progress along the line of the historic towpath and canal on the south bank of the river and along the boundary of Oldbridge Estate for approximately 1.5km. The towpath ends in vicinity of the Obelisk Bridge wherein the final 250m eastwards to the main gates at Oldbridge, currently navigated along the local roadway, would require the provision of a segregated route with a potential additional pedestrian and cycle bridge crossing of the canal into the grounds of Oldbridge.
Section E E2 (Magenta)	This proposed route would commence upstream of the canal at Oldbridge wherein the greenway would incorporate a switch back path arrangement to gain access to the higher ground within the estate, before turning back on itself south for 300m and then diverting eastwards along an existing field boundary for 560m before progressing north along another field boundary for another 550m, avoiding the historic battlefield, before intersecting with the existing Local Road (L16014) adjacent the existing Boyne Boardwalk Greenway due east of the main entrance to Oldbridge.
Section E E3 (Blue)	This proposed route would divert off the towpath and eastwards into Oldbridge Estate where the route would carefully navigate through the estate towards the main gates.

7.4. Stage 2 Assessment Criteria and Scoring

In order to identify the Emerging Preferred Route (EPR), a Stage 2 Detailed Options Assessment was undertaken on the short list of options outlined above.

The aim of this process is to further develop the feasible route option(s) that have been brought forward from Stage 1 and to undertake a detailed Multi-Criteria Analysis (MCA) of same in order to determine the most viable option to progress as the preferred route. Route options will be in the context of the entire route broken down into five sections and a do-nothing scenario will be considered.

In developing the main criteria reference has been made to the Department of Transport's 'Transport Appraisal Framework (TAF) 'Appraisal Guidelines for Capital Investments in Transport' June 2023. Therein the appraisal criteria of Safety, Accessibility and Social Inclusion, Integration, Environment, Economy and Transport User Benefits, Land Use and Climate Change are referenced. Reference is also made to TII's Project Appraisal Guidelines Unit 7.0 Multi Criteria Analysis.

Reference has also been made to the Department of Transport's 'Public Spending Code Lifecycle Greenway Projects under €20m' which includes the criteria of Scenery See and Do, Economy and Sustainability, Safety and Accessibility and Strategic.

The final criteria selected for the Boyne Greenway given the type of project and its sensitivities are as follows:

- Scenery, See and Do;
- Economy and Sustainability;
- Safety and Accessibility;
- Strategic;
- Environmental.

It should be noted that the sub-criteria developed cover a broad range of criteria that encompass and touch upon criteria relevant to the TAF, TII's PAGs, the Public Spending Code and the Strategy for National and Regional Greenways.

The route options which have progressed from Stage 1 to Stage 2 are all considered to be feasible options which minimise, where possible, impacts on constraints, present opportunities and broadly meet the requirements of the Scheme Vision Statement and Project Objectives.

As such, the focus of the Stage 2 assessment process is to compare the Stage 2 routes against each other through a detailed and rigorous assessment process of wide-ranging criteria, sub criteria, constraints, Public Consultation and associated considerations in order to identify the Emerging Preferred Route.

The Stage 2 assessment process is undertaken on a detailed quantitative basis with supporting qualitative assessment where appropriate or necessary. As such where possible information from supporting documents and data such as the desktop study, the constraints study and the digital terrain model in combination with insights gained through meetings and public consultation has been utilised to determine the quantitative and qualitative aspects of the considerations relating to the Sub-Criteria as identified in Table 7-2.

Table 7-2 - Stage 2 – Detailed Route Option Assessment Criteria and Considerations

Criteria	Sub Criteria	Considerations
Scenery and See & Do	Connections	Connectivity with key heritage, town centre and transport attractors
		Access to employment, essential services and amenities
		Opportunity for social, community and recreational activity participation
	Attractiveness	Potential for views of existing landscape and landmarks
Potential for incorporation of landscape proposals and features		
Economy and Sustainability	Capital Costs	Land Acquisition
		Construction
	Tourism Benefits	Direct and indirect tourism benefits
	Local User Benefits	Reduced health risk, ambience and absenteeism
Safety and Accessibility	User Safety	Pedestrian and cyclist safety
	Personal Security	Passive surveillance
	Accessibility and Comfort	Extent of maximum gradients
		Extent of potential flood risk
		Extent of reduced width sections
Coherence and Directness	Potential for route discontinuity and or potential for excessive or unnecessary detours	
Strategic	Compatibility	Compatibility with committed and future schemes and land uses
		Compatibility with local, county and national policy and objectives
Environment	Ecology	Conservation Sites of International Importance (Natura 2000 sites)
		Conservation Sites of National Importance (pNHA, nature reserves)
		Ecological important habitats (woodlands, wetlands, riparian corridors)
		Rare, Protected, Invasive Species
	Soils, Geology and Hydrology	Soil and bedrock constraints (e.g. stability issues, contamination)
		Geological Heritage Areas
		Surface Water Receptors
		Groundwater Receptors
	Archaeology and Cultural Heritage	Archaeology
		Cultural and Industrial Heritage
		Sites of International Importance
	Landscape and Visual	Landscape Character
		Views and Visual Obstruction

Criteria	Sub Criteria	Considerations
	Air Quality	Potential impacts to key receptors
	Noise and Vibration	Potential impacts to key receptors
	Human Health	Residential and Business properties
		Recreational Areas
		Community, Health and Educational Facilities
		Active Travel Infrastructure
		Effects on the wider population and identified vulnerable groups
	Material Assets	Agricultural (impacts on land cover, farm operations, and access)
		Non-Agricultural (impacts on utilities, road and rail networks / structures)

7.4.1. Scoring Procedure

Each route option will be assessed relative to one another against the Stage 2 MCA on a five-point ranking scale, similar to the Stage 1. Route option are to be assessed in terms 'significant advantages over other options', 'some advantages over other options', 'comparable to other options', 'some disadvantages over other options' and 'significant disadvantages over other options' The table below presents the colour coding to be used.

Table 7-3 - Stage 2 – Detailed Assessment Scoring Scale

Colour Coding	Rank Description
5	Significant advantages to other options
4	Some advantages to other options
3	Comparable to other all options
2	Some disadvantages to other options
1	Significant disadvantages to other options

7.5. Stage 2 Route Assessment Outcome

A summary of the overall comparative score attributed to each route in each section and the identification of the Emerging Preferred Route (EPR) therein is provided in Table 7-4. A map of the Emerging Preferred Route is presented in Appendix B.

Table 7-4 - Stage 2 Assessment Outcome

Criteria	Route 1 (Green)	Route 2 (Magenta)	Route 3 (Blue)	Route 4 (Yellow)	Route 5 (Red)	Do Nothing
Section A (Navan to Broadboyne Bridge)	EPR		n/a	n/a	n/a	
Section B (Broadboyne Bridge to Slane Bridge)			EPR			
Section C (Slane Bridge to Brú na Bóinne)			EPR		n/a	
Section D (Brú na Bóinne to Oldbridge)	EPR			n/a	n/a	
Section E (Oldbridge)	EPR			n/a	n/a	

8. Emerging Preferred Route

Following the Stage 2 assessment, an Emerging Preferred Route (EPR) was identified. A map of the EPR is presented in Appendix B. The description and benefits of the proposed EPR are presented below.

8.1. Route Description and Benefits of the EPR

Table 8-1 outlines a description of the proposed route options per section. Please refer to Appendix A for the Stage 2 Route Option Maps.

Table 8-1 – Emerging Preferred Route

Route ID	Route Description	Benefits / Dis-advantages
Section A (Navan to Broadboyne Bridge) A1 (Green)	<p>The EPR in this section would extend circa 6.5km along the existing towpath from Andy Brennan Park to the Broadboyne Bridge.</p> <p>This EPR would run exclusively along the route of the existing towpath, that is currently being maintained and is well used by the public. The path is located on the south bank of the river and positioned between the river and the canal.</p> <p>The EPR would consist of upgrading the existing path to a new wider resurfaced path which will either sit slightly proud of the existing levels or will be raised to minimise any local flooding issues, levels to be determined at preliminary design.</p>	<ul style="list-style-type: none"> The EPR progresses along the existing and well used canal towpath and therefore fully engages with the industrial heritage of the canal and locks in this section. The EPR offers more tangible connections to land marks such as Rowleys Lock and the potential for future connections to Ardmulchan Church. The EPR does not require private land acquisition, which would reduce the costs associated with the greenway along this section. The EPR is also more advantageous in terms of environmental impacts, as the EPR does not cross the River Boyne onto the northern bank along this section and is routed along the existing open towpath and therefore less construction works and disturbance would be required to implement the EPR
Section B (Broadboyne Bridge to Slane Bridge) B3 (Blue)	<p>This EPR would cross onto the north bank of the river at its commencement at the Broadboyne Bridge and would extend along the historic towpath as far as Carrickdexter.</p> <p>At Broadboyne Bridge a greenway bridge structure attached to the existing bridge would be required to facilitate this. However, this would require further investigation in terms of the ability of the existing bridge to support the new greenway bridge structure.</p> <p>A 400m section of boardwalk immediately downstream of the Broadboyne Bridge is also likely to be required.</p> <p>The route would then continue along the north bank for approximately 1km along a farm trail adjacent the riverbank being maintained by the adjacent landowner. The route would cross the river due south of Slane Castle requiring a new pedestrian and cycle bridge structure of some 70m span. Exact positioning of the new bridge</p>	<ul style="list-style-type: none"> The EPR, acknowledging that it is not fully aligned along the historic alignment of the canal towpath, offers sufficient engagement with the industrial heritage of the canal navigation and locks whilst also facilitating connectivity with the key landmark and attraction of Slane Castle. The connection to Slane Castle would provide impressive views as well as bring economic benefits to the area. The route is also compatible with the future Slane Village Public Realm Scheme and has the potential to provide future connections into Slane Village and Slane Hill. While this route will have some environmental impacts in terms of soils, geology and ecology, these are balanced by the benefits to the local community and economy. In terms of the landscape character and visual impacts, these are predominantly associated the location of the proposed new bridge structure at Slane Castle. However, the indicative location of this bridge is not fixed, and the proposed bridge can be

Route ID	Route Description	Benefits / Dis-advantages
	<p>structure is to be determined at the next phase of design.</p> <p>The route would then progress for 1.6km on the south bank of the river initially along the historic towpath adjacent Slane Castle Lock before rising to higher ground and progressing through a number of fields adjacent hedge rows and set back from the edge of the floodplain before joining the existing local access lane in vicinity of Slane Bridge. A short structure adjacent the N2 may be required to facilitate access over the canal and onwards to the next section of the scheme.</p> <p>The EPR would consist of new path construction which will either sit slightly proud of the existing levels or will be raised to minimise any local flooding issues, levels to be determined at preliminary design.</p>	<p>relocated to the south and coupled with a sensitive design, therefore, it is considered that impacts on landscape character and views can be adequately mitigated.</p>
<p>Section C (Slane Bridge to Brú na Bóinne) C3 (Blue)</p>	<p>The EPR would extend exclusively along the south bank of the River Boyne, initially extending along the existing historic towpath from Slane Bridge towards Morgan's Lock at Rosnaree.</p> <p>At this juncture the route would continue along the southern bank of the river, on the edge of the floodplain, following field boundaries on higher ground where possible for approximately 2km.</p> <p>The proposed greenway route would then route past Rosnaree onto and adjacent the Boyne Road, albeit on the field boundary side, for 850m before diverting back onto the existing towpath adjacent the public carpark opposite Broe Lock. The route would then follow the alignment along the existing historic towpath, route adjacent to a number of farm properties, to the bridge at Bru na Boinne Visitor Centre.</p> <p>The EPR would consist of both upgrading the existing paths to standardised widths and pavement surfacing quality and new path construction which will either sit slightly proud of the existing levels or will be raised to minimise any local flooding issues, levels to be determined at preliminary design.</p>	<ul style="list-style-type: none"> • The EPR provides accessibility to the cultural and industrial heritage of the canal navigation and locks, in particular the double lock at Morgans Lock and Staleen Guard Lock. • Allows for connection with the Brú na Bóinne Visitor Centre. • Does not require any additional bridges. • Sections of the EPR do not require private land acquisition, which would reduce the costs associated with the greenway along this section. • Does not encroach into the core area of the UNESCO World Heritage Site. As such the EPR poses less impacts and risks to the delivery of the project. • Provides views across the Boyne River corridor and onwards to Newgrange.
<p>Section D (Brú na Bóinne to Oldbridge) D1 (Green)</p>	<p>This proposed route would progress exclusively along the line of the historic towpath for approximately 4.1km, which extends entirely along the south bank of the River Boyne from the Bru na Boinne Visitor Centre, past Staleen Lock and on towards Oldbridge Estate.</p> <p>The route would be positioned adjacent the riverbank for the majority of the route albeit</p>	<ul style="list-style-type: none"> • The EPR provides accessibility to the cultural and industrial heritage of the canal navigation and locks, in particular Staleen Lock. • Allows for connection with the Brú na Bóinne Visitor Centre. • Does not require any additional bridges.

Route ID	Route Description	Benefits / Dis-advantages
	<p>the 1.6km section from the Bru na Boinne to Staleen Lock is along a canal towpath that is raised above the floodplain and, for approximately 800m, set back from the river.</p> <p>Between Staleen Lock and the canal at Oldbridge the towpath is located directly adjacent the riverbank.</p> <p>The EPR would consist of both upgrading the existing paths to standardised widths and pavement surfacing quality and new path construction which will either sit slightly proud of the existing levels or will be raised to minimise any local flooding issues, levels to be determined at preliminary design.</p>	<ul style="list-style-type: none"> • Sections of the EPR do not require private land acquisition, which would reduce the costs associated with the greenway along this section. • Does not encroach into the core area of the UNESCO World Heritage Site. As such the EPR poses less impacts and risks to the delivery of the project.
<p>Section E (Oldbridge) E1 (Green)</p>	<p>This EPR would progress along the line of the historic towpath and canal on the south bank of the river and along the boundary of Oldbridge Estate for approximately 1.5km. The towpath ends in vicinity of the Obelisk Bridge wherein the final 250m eastwards to the main gates at Oldbridge, currently navigated along the local roadway, would require the provision of a segregated route, potentially along a boardwalk, with a potential additional bridge crossing of the canal.</p> <p>The EPR will allow access to Oldbridge Estate via its south west boundary, and it would be envisaged that appropriate bicycle parking facilities and ancillary features would be accommodated to allow users to park up whilst proceeding on foot to enter the Battle of the Boyne visitor centre at Oldbridge.</p> <p>A boardwalk structure or other type may be required along the Local Road (L16014) section or potentially an embankment type structure, built into the canal along its section adjacent the public road between Obelisk Bridge and the Oldbridge Main Gates.</p> <p>The EPR would also require either a separate new bridge structure over the canal at the main gates to Oldbridge, or would require the reconstruction of the existing bridge with pedestrian and cycle facilities incorporated into its deck. It is envisaged that discussions on the exact route and type of route will be progressed with the Office of Public Works during the Phase 3 Preliminary Design Phase.</p> <p>The EPR would consist of both upgrading the existing paths to standardised widths and pavement surfacing quality and new path construction which will either sit</p>	<ul style="list-style-type: none"> • The EPR removes potential landscape & visual and heritage & archaeological impacts on Oldbridge Estate as it does not route into and through the grounds of the estate, instead continuing along the towpath and along the Local Road (L16014) towards the main gates at Oldbridge. • The EPR does not require private land acquisition, which would reduce the costs associated with the greenway along this section. • As noted the EPR, will route along the existing open canal towpath for a significant portion of its length. It is noted that sections of this towpath are subject to flooding and further detailed flood modelling work building on the work undertaken at this feasibility stage will need to be undertaken at preliminary design stage to mitigate this issue.

Route ID	Route Description	Benefits / Dis-advantages
	slightly proud of the existing levels or will be raised to minimise any local flooding issues, levels to be determined at preliminary design.	

9. Project Appraisal

Following the identification of the Emerging Preferred Route and the associated public consultation, further stakeholder consultation will take place during the next stage of the project, and this will lead to the identification of the Preferred Route. The Preferred Route will then be subject to preliminary design and to a Project Appraisal process. The purpose of the appraisal will be to ascertain the merits of the scheme to ensure that it represents sound investment and thus warrants the allocation of public funds.

The Project Appraisal process will be used throughout the various project phases to inform the following:

- Support the decision-making process;
- Assess the ‘worth’ of the project;
- Identify if the project will yield benefits and to whom;
- Understand if the project is meeting the set objectives.

The Boyne Greenway and Navigation restoration is a major project and will be appraised as such. However, the level of appraisal should be proportionate to the scale and complexity of a greenway. The main output of the Project Appraisal process will be the Preliminary Business Case. This is essentially a condensed Business Case Report, appropriate for the subject scheme and will present and report on the Cost Benefit Analysis (CBA) and Multi Criteria Analysis (MCA).

9.1. Qualitative Appraisal

The appraisal will be carried out in accordance with TII’s Appraisal of Active Modes (PE-PAG-02036). Reference will also be made to the Department of Transport TAF guidance (June 2023). It will include a qualitative appraisal of the Emerging Preferred Route against the objectives previously identified with a score attributed to each criterion ranging from Major Negative to Major Positive impacts as outlined below. This assessment differs from the multi-criteria analysis carried in the Stage 1 and Stage 2 assessments as it is not comparing options to one another but instead assesses the impacts of the Emerging Preferred Route on the existing area.

Table 9-1 - Qualitative Appraisal Scoring

Score	1	2	3	4	5	6	7
Impact	Major Negative	Moderate Negative	Minor Negative	Neutral	Minor Positive	Moderate Positive	Major Positive

9.2. Demand Forecasting

Demand forecasting for user number on the greenway will be developed using a variety of sources including:

- Historic Count Surveys along the existing Boyne walkways and other relevant schemes;
- Census data (population and commuting data);
- User intercept surveys (e.g. for the Waterford Greenway);
- Fáilte Ireland data and predictions.

9.3. Cost/Benefit Analysis

A Cost/Benefit Analysis will be carried out using TII’s TEAM tool which has been specifically designed to assess active travel schemes and greenways. This takes account of a number of economic benefits of these types of schemes including:

- Mode Shift;
 - Vehicle Operating & Ownership Costs;
 - Carbon;
 - Air Quality;
 - Noise;
 - Congestion;

- Health;
 - Reduced Mortality;
 - Workplace Absenteeism;
- Journey Time;
- Journey Quality;
- Recreation.

Tourism benefits will also be included in the assessment based on data of projected visitors to the scheme. Information on visitor numbers etc will be sourced from Failte Ireland documentation and reports.

The benefits accrued from all of the above will then be compared to the projected costs including capital and maintenance costs which will be calculated based on similar schemes and costs of materials. A Benefit/Cost Ratio (BCR) will be the ultimate outcome of this assessment, where a BCR greater than one indicates that the benefits outweigh the costs.

9.4. Sensitivity analysis

Sensitivity testing will be carried out in accordance with TII PAG Unit 6.1 from Project Phase (II) onwards.

- **Costing Sensitivity:** The cost-benefit analysis of the emerging preferred route will be undertaken at preliminary design stage, based on Target Cost and Total Scheme budget. The standard sensitivity test will be carried out on the Shadow Price of Labour in accordance with PAG Unit 6.2.
- **Demand Sensitivity:** Scheme appraisal will be carried out using low, central and high demand scenarios which will be developed in due course.
- **Benefits Sensitivity:** The quantification of benefits is not expected to vary given the nature and context of the scheme as a coastal greenway. No further sensitivity testing required.

Complementary / Substitute Proposals Sensitivity: Within the study area there are no other related schemes committed that could complement or substitute the proposed scheme. Therefore, no further sensitivity testing is required.

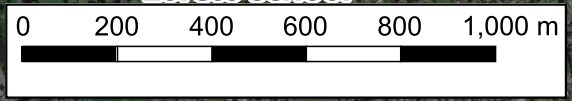
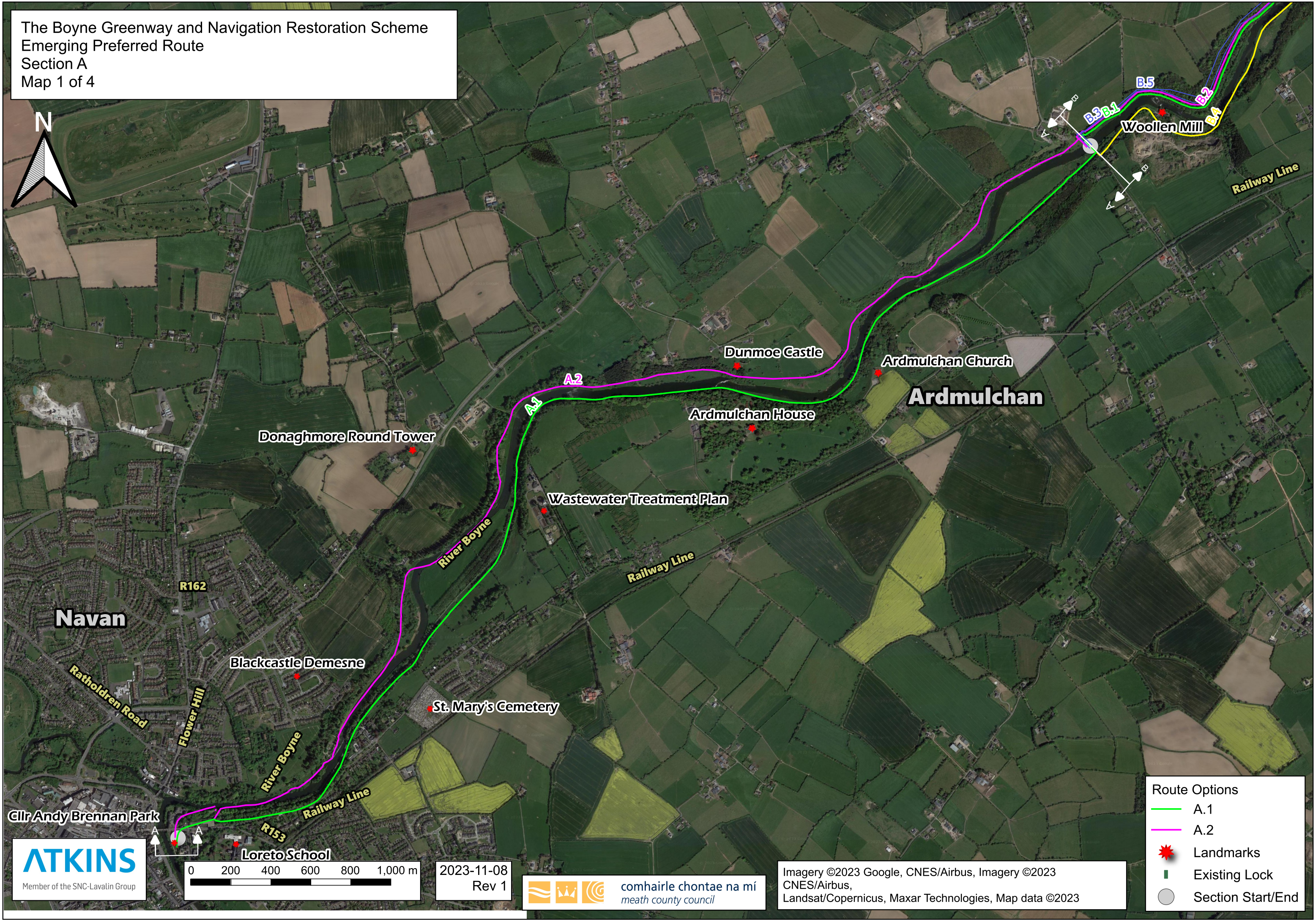
9.5. Summary

The appraisal process considers both the qualitative impacts, both positive and negative, associated with a project along with the Benefit to Cost Ratio. This will determine whether the scheme is desirable for investment based on the wider benefits and impacts on society rather than just financial matters.

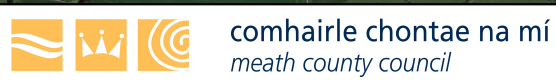
Appendices



Appendix A. Stage 2 Route Option Maps

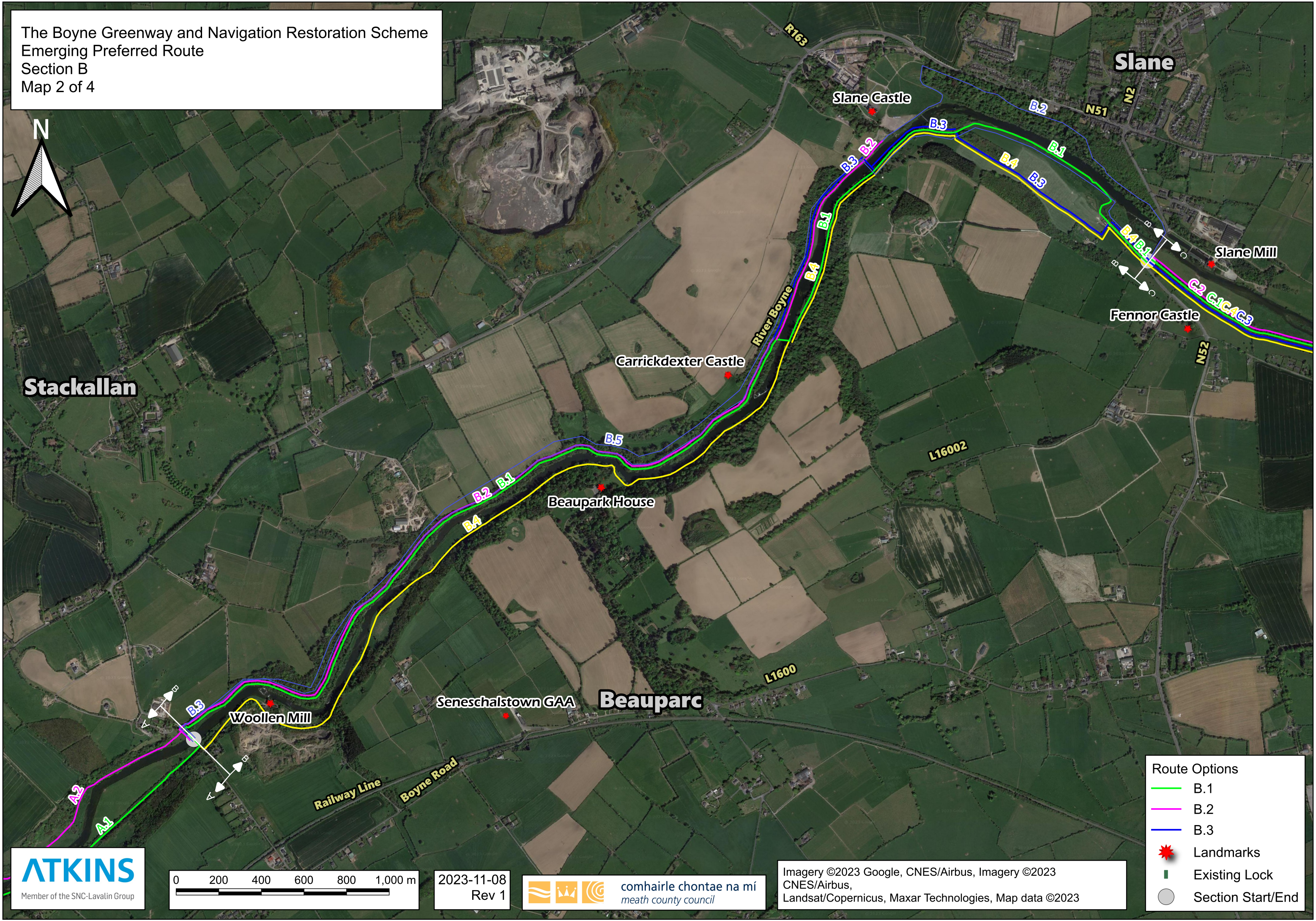


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- Route Options
- A.1
 - A.2
 - ★ Landmarks
 - █ Existing Lock
 - Section Start/End



Stackallan

Slane

Carrickdexter Castle

Beaupark House

Beauparc

Woollen Mill

Seneschalstown GAA

Slane Castle

Slane Mill

Fennor Castle

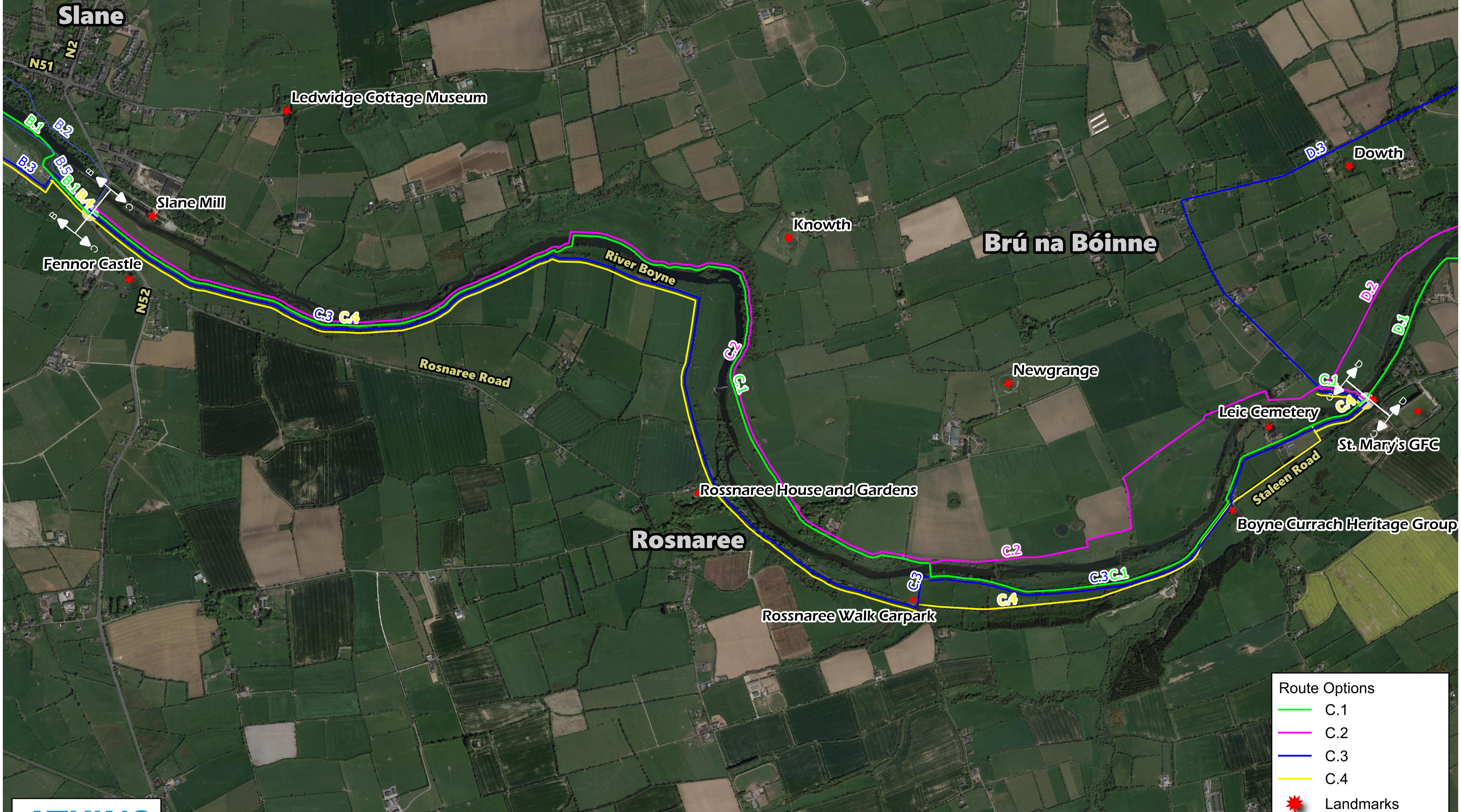
River Boyne

Railway Line

Boyne Road

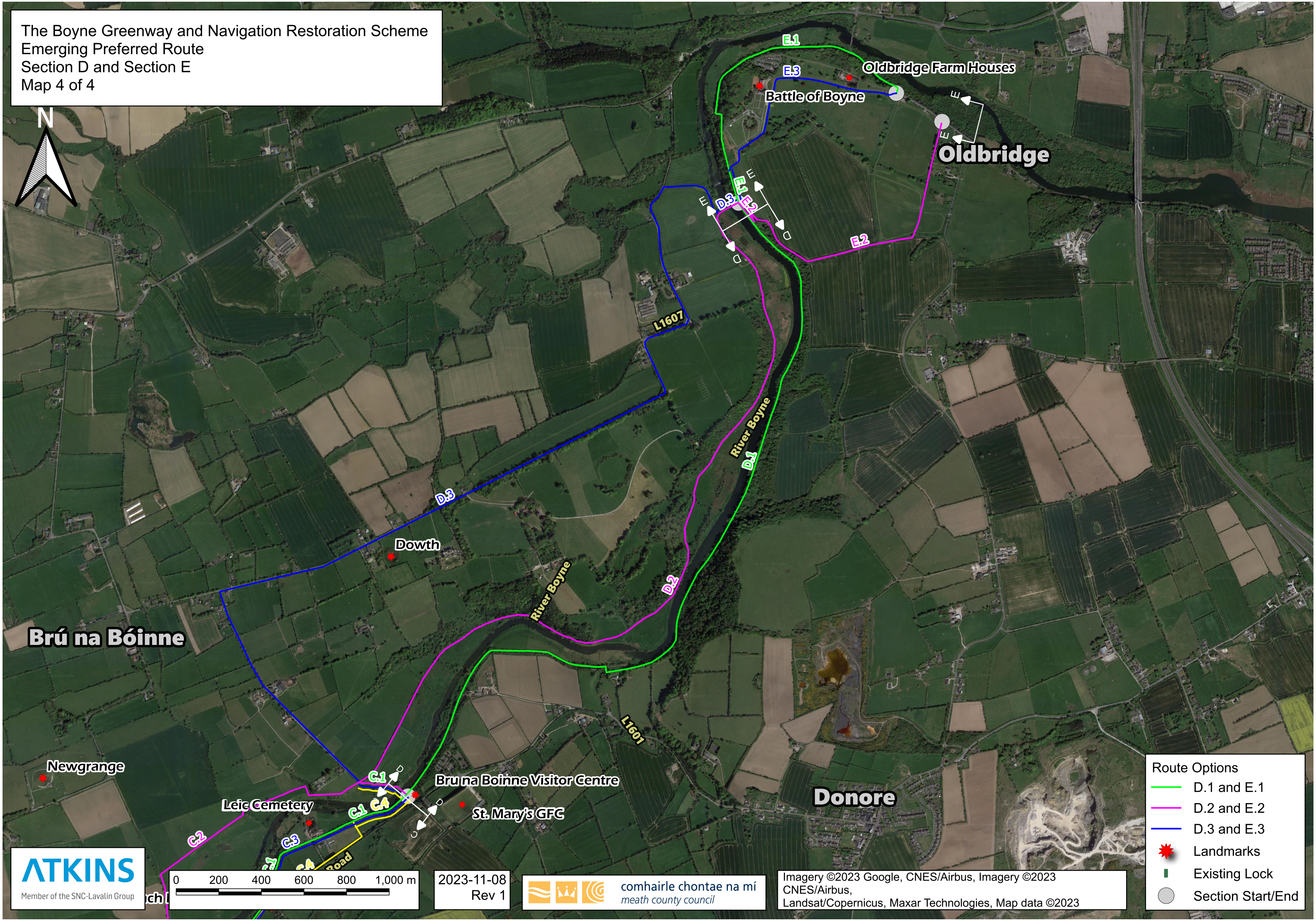
Route Options

- B.1
- B.2
- B.3
- ★ Landmarks
- Existing Lock
- Section Start/End



Route Options

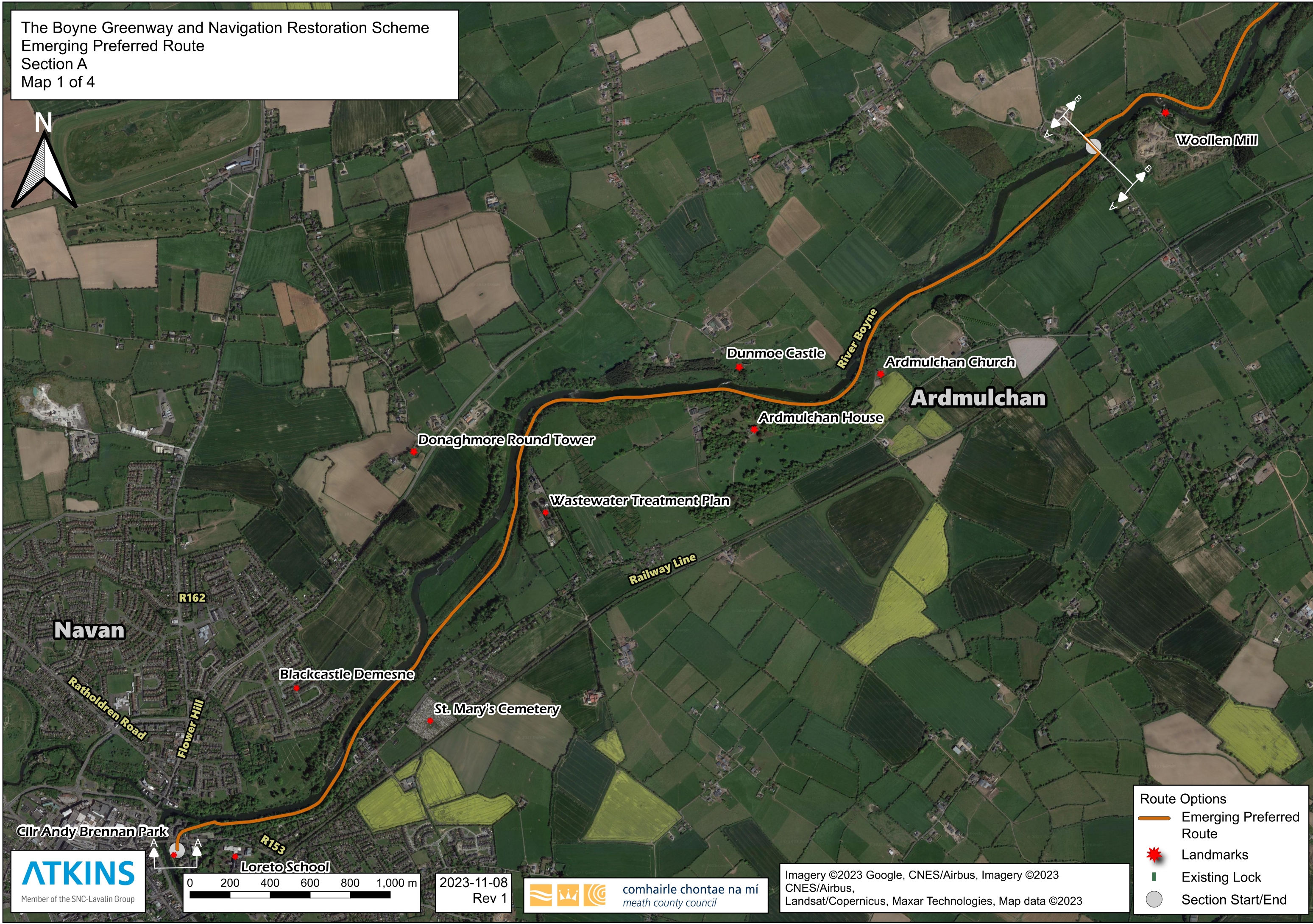
- C.1
- C.2
- C.3
- C.4
- ★ Landmarks
- Existing Lock
- Section Start/End







Route Options

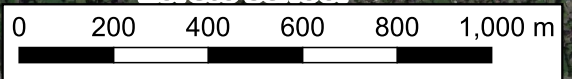
- D.1 and E.1
- D.2 and E.2
- D.3 and E.3
- ★ Landmarks
- Existing Lock
- Section Start/End

Appendix B. Emerging Preferred Route Maps



Route Options

-  Emerging Preferred Route
-  Landmarks
-  Existing Lock
-  Section Start/End



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Clr Andy Brennan Park

R153
 Loreto School

Navan

R162

Blackcastle Demesne

St. Mary's Cemetery

Wastewater Treatment Plan

Railway Line

Dunmoe Castle

Ardmulchan House

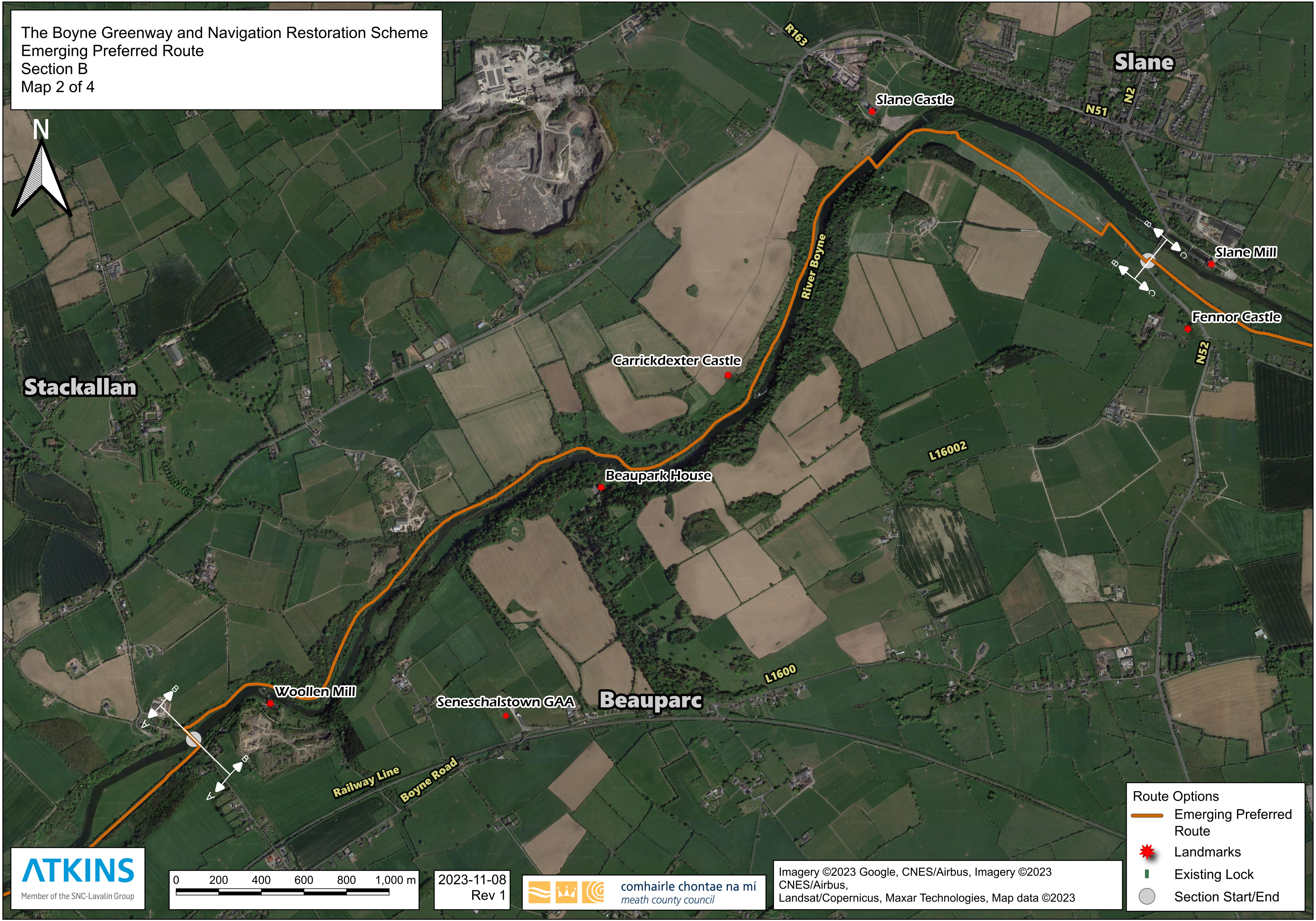
Ardmulchan Church

Ardmulchan

River Boyne

Donaghmore Round Tower

Woollen Mill



Stackallan

Slane

Slane Castle

Slane Mill

Fennor Castle

Carrickdexter Castle

Beaupark House

Woollen Mill

Seneschalstown GAA

Beauparc

Railway Line

Boyne Road

Route Options

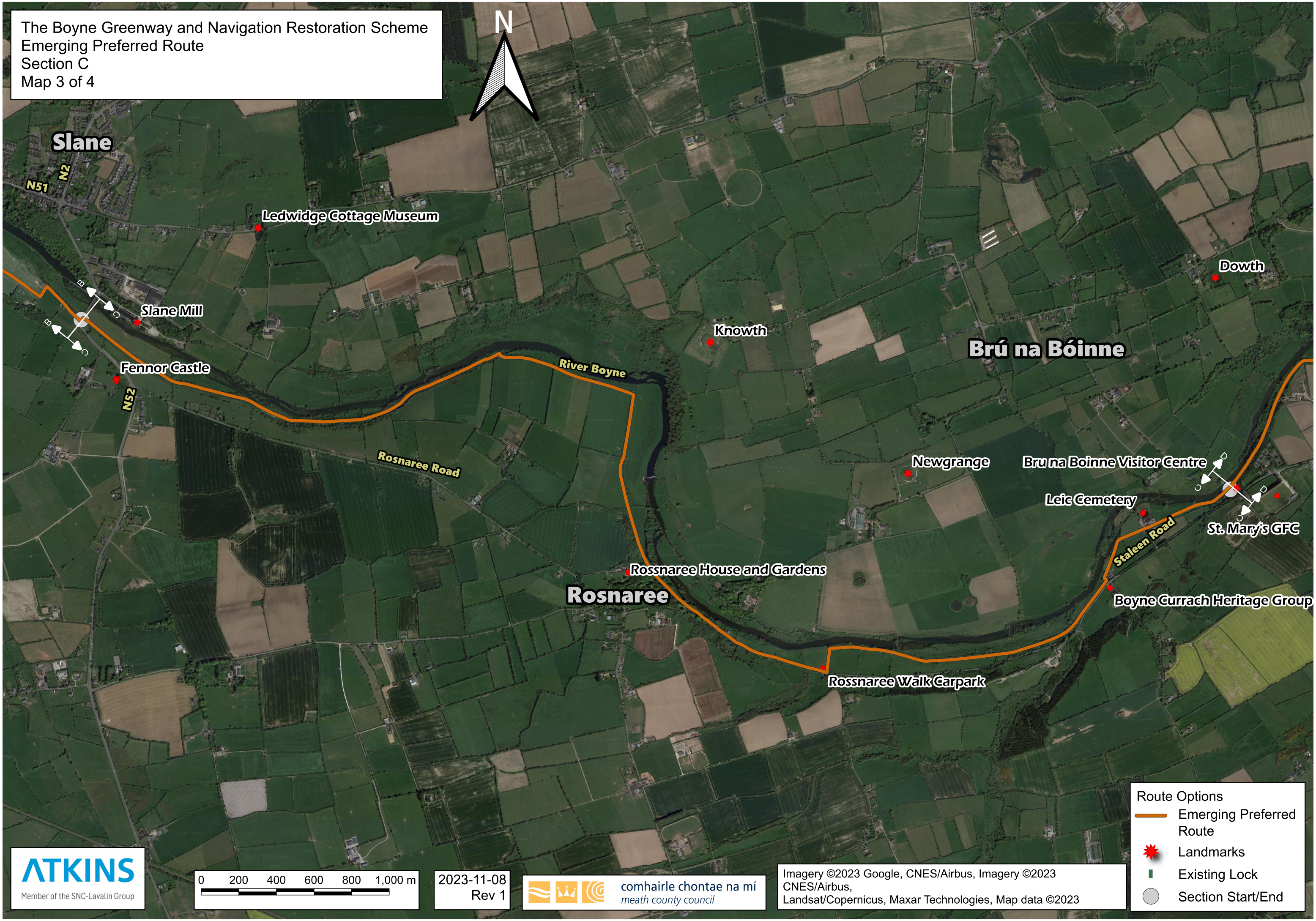
- Emerging Preferred Route
- Landmarks
- Existing Lock
- Section Start/End



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Slane

Ledwidge Cottage Museum

Slane Mill

Fennor Castle

Knowth

Brú na Bóinne

Dowth

Rosnaree Road

Newgrange

Bru na Boinne Visitor Centre

Leic Cemetery

St. Mary's GFC





Rosnaree

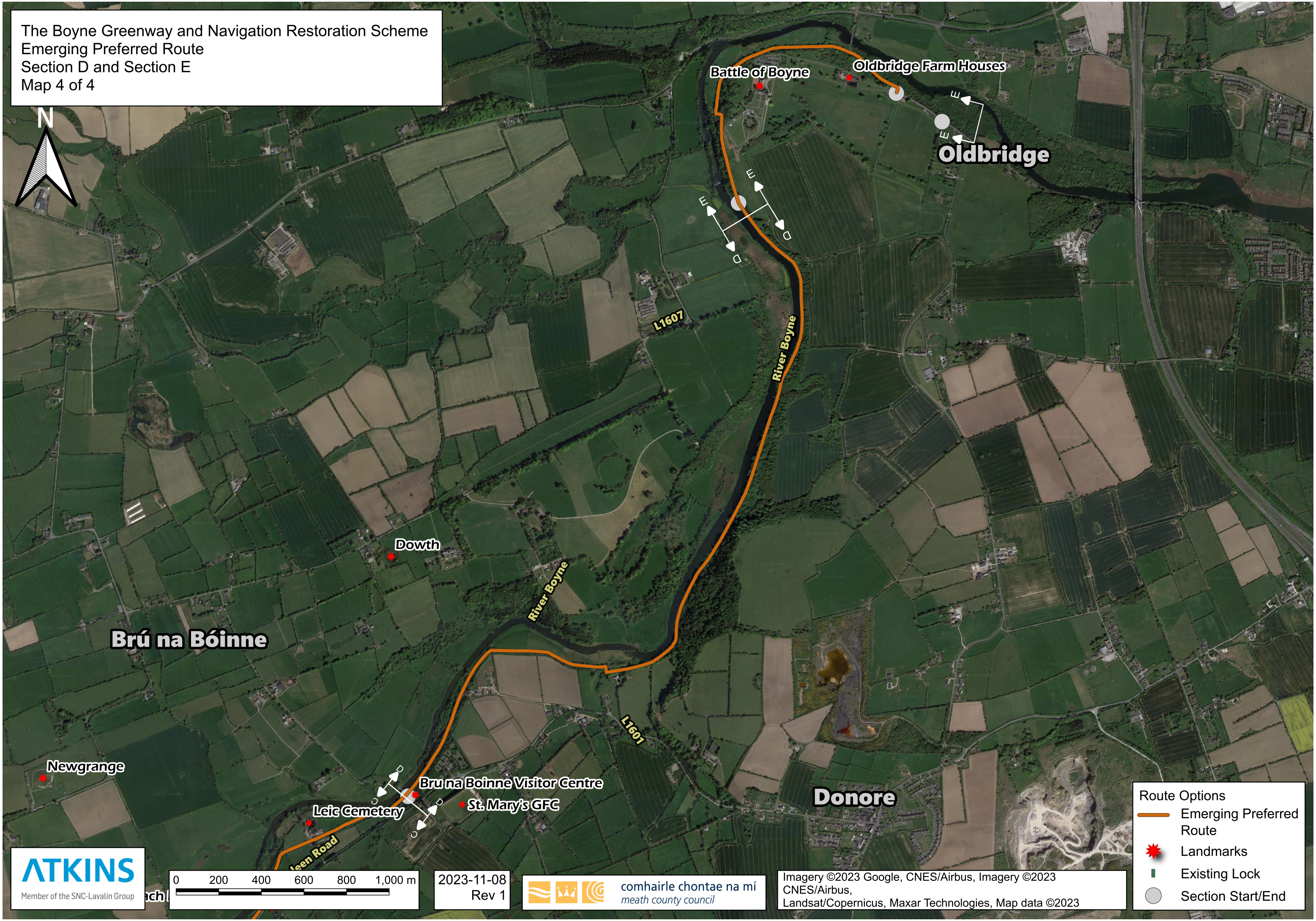
Rosnaree House and Gardens

Boyne Currach Heritage Group





Rosnaree Walk Carpark

Route Options

-  Emerging Preferred Route
-  Landmarks
-  Existing Lock
-  Section Start/End



Route Options

-  Emerging Preferred Route
-  Landmarks
-  Existing Lock
-  Section Start/End

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