Ballybay to Castleblayney Greenway Feasibility and Constraints Report

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INTRODUCTION

Monaghan County Council (MCC) have appointed Clandillon Civil Consulting (CCC) to carry out a constraints study and technical scoping report for the provision of a greenway between the towns of Ballybay and Castleblayney, Co. Monaghan. Figure 1 below illustrates the location of Ballybay and Castleblayney, within County Monaghan.

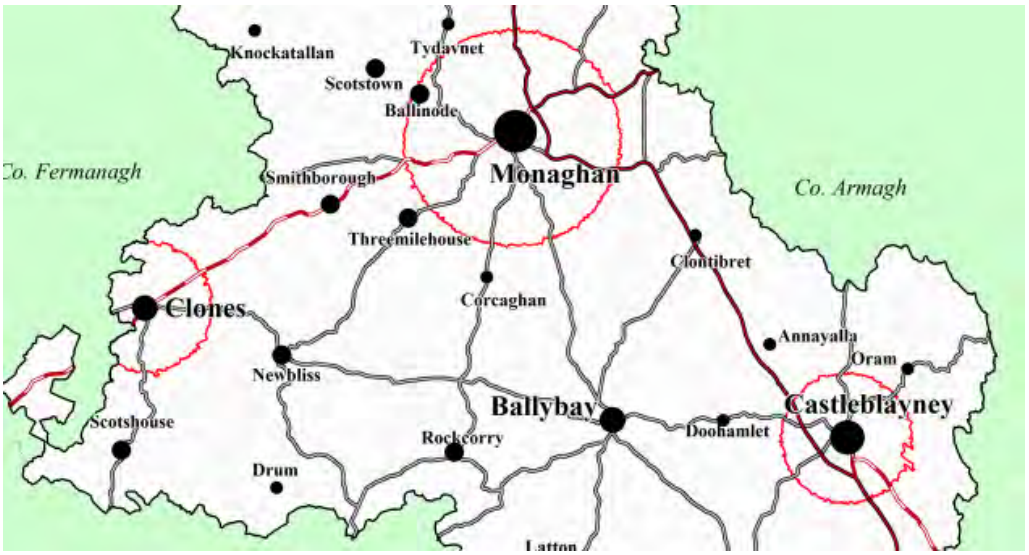


Figure 1: Prominent Towns in County Monaghan

The aim of the project is to provide a safe walking and cycling route between the 2 towns, connecting with other rural communities such as Doohamlet and the rural hinterlands of each town to:

1. Support active travel and promote sustainable transport by providing a safe and attractive option for local people to choose walking and cycling for their everyday journeys.
2. Provide a tourism amenity to connect the towns of Ballybay and Castleblayney, which would expand the greenway provision in Co. Monaghan and add to and link into the growing network of greenways in Ireland in accordance with the policies and objectives set out in Project Ireland 2040, the National Cycle Policy Framework and the Monaghan County Development Plans.
3. Provide a recreational amenity for the local population of Castleblayney and Ballybay and their rural communities, providing opportunities for fitness, recreation and community use.

In accordance with the Department of Transport, Tourism and Sport's '*Strategy for the Development of National and Regional Greenways*', the greenway should be developed to be sustainable, strategic, substantially segregated and shared use, scenic and offer lots to see and do.

In respect of the proposed route alignment, it is noted that Ballybay and Castleblayney were historically linked by a section of the Great Northern Railway. Although it is now abandoned, the remnants of the former rail line are still evident on the landscape and the potential to re-use the existing route will be given special attention in accordance with National Cycle Policy Framework policy objective 3.2 referred in Figure 2 below.

3.2	**Expansion of NCN**	**DoT and LA's**
	We will carry out further research and surveying work in order to expand the network to include rural recreational routes around urban areas and to connect major urban areas. We will pay special attention to the opportunities of using both the extensive disused rail network and canal / river tow-path networks as cycling / walking routes. In expanding the network, we will examine the recent UK experiences of the construction of their networks.	

Figure 2: Policy 3.2 of National Cycle Policy Framework

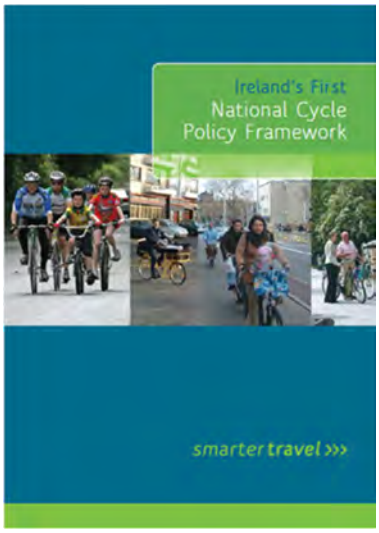
This report will set out the planning context for the scheme, determine an appropriate study area and identify engineering and environmental constraints which may prevent, impede or otherwise influence the development of the greenway. These constraints will be discussed in the chapters below and are illustrated in the Appendix B Constraints drawings. Thereafter, the report will reach conclusions on whether it will be feasible to develop the greenway to meet the project objectives.

1 PLANNING CONTEXT

On a national level, the development of greenway projects is identified as a policy objective within the National Planning Framework (Project Ireland 2040), the National Cycle Policy Framework (2009), Rural Development Policy 2021-2025 (Our Rural Future) and the National Physical Activity Plan[1] for Ireland (Get Ireland Active). The following extracts from each policy refer:

National Planning Framework Objective 21: *Facilitate tourism development and in particular a National Greenways, Blueways and Peatways Strategy, which prioritises projects on the basis of achieving maximum impact and connectivity at national and regional level.*

National Planning Framework Objective 27: *Ensure the integration of safe and convenient alternatives to the car into the design of our communities, by prioritising walking and cycling accessibility to both existing and proposed developments and integrating physical activity facilities for all ages.*



National Planning Framework Objective 64: *Improve air quality and help prevent people being exposed to unacceptable levels of pollution in our urban and rural areas through integrated land use and spatial planning that supports public transport, walking and cycling as more favourable modes of transport to the private car, the promotion of energy efficient buildings and homes, heating systems with zero local emissions, green infrastructure planning and innovative design solutions.*

[1] Note that objective1.10 of 'Healthy Ireland Strategic Action Plan 2021–2025' involves overseeing the implementation of the National Physical Activity Plan.

National Cycle Policy Framework (2009) Objective 3: *Provide designated rural cycle networks especially for visitors and recreational cycling.*

Rural Development Policy 2021-2025 Policy Measure 36: Invest in greenways, blueways, walking trails and other outdoor recreation infrastructure to support the growth in outdoor recreational tourism.

Rural Development Policy 2021-2025 Policy Measure 64: Invest in infrastructure, including water and wastewater infrastructure, to support the development of rural towns and villages.

Rural Development Policy 2021-2025 Policy Measure 102: Invest in high-quality walking and cycling infrastructure specifically targeted at towns and villages across the country.

National Physical Activity Plan for Ireland Objective 36: *Prioritise the planning and development of walking and cycling and general recreational /physical activity infrastructure.*

National Physical Activity Plan for Ireland Objective 37: *Explore opportunities to maximise physical activity and recreation amenities in the natural environment.*

Other national policy documents, which support the development of greenways include:

- The National Development Plan 2018-2027.
- The Government's Tourism Policy Statement 'People, Place and Policy Growing Tourism to 2025'
- The Action Plan for Rural Development Realising our Rural Potential

The promotion of walking and cycling and the development of greenways are also identified as policy objectives within MCC's county development plan under the headings of Community Facility Policies and Cycling and Walking Policies. Figure 3 below is an extract from the Monaghan County Development Plan 2019-2025, which sets out the objectives identified.

Cycling and Walking Policy	
CFP 11	To promote and facilitate the development of walkways, cycleways and recreational routes in appropriate locations throughout the County to deliver the objectives of the County Walking and Cycling Strategy and any subsequent strategy document.
CFP 12	To promote and encourage the development of walks and cycle ways in accordance with the Smarter Travel Policy and to protect established routes from development which would adversely impact upon them.

Figure 3: Monaghan County Development Plan 2019-2025 Greenway Objectives Extract

In addition to the Monaghan County Development Plan, MCC have developed a draft walking and cycling strategy. **Error! Reference source not found.** Figure 4 below illustrates some of the key policies identified which are pertinent to this project.

No.	Action
3.1	Develop walking and cycling facilities to and within amenity areas; e.g. Lough Muckno, Rossmore Park
3.8	Enhance existing residential developments by creating pedestrian/ cycling short cuts to improve connectivity to key amenities/ urban centres
3.10	Support communities and clubs to develop walking and cycling amenities
3.16	Support the development of off-road trails

Figure 4: Extract from Monaghan County Council Walking and Cycling Strategy

The walking and cycling strategy also identified the presence of seven walking clubs and six cycling clubs in Co. Monaghan, along with four walking/cycling events which take place in the county each year.

Based on the above review, it is evident that the development of the proposed greenway would be well aligned with local and national planning and policy objectives.

2 STUDY AREA

The selected Study Area for the route is illustrated in Appendix A. The extent of the study area was determined through the development of several preliminary route options along the length of the scheme. In developing these route options, special attention was given to the route of the former Great Northern Railway, particularly where remnants of the route remain. This approach was adopted because:

- The route of the former railway has the potential to provide a relatively direct connection that minimises length and journey times.
- The re-use of a formerly established railway corridor may have less impact on adjacent landowners.
- There are numerous interesting features associated with the abandoned railway that will increase the amenity value of the route. Figure 5 below provides one such example.
- The re-use of the former railway may present fewer engineering constraints than would otherwise be the case.

Figure 5: Remnants of Rail Bridge

Notwithstanding the special attention given to the route of the former railway, at least one alternative preliminary route option has been developed along the full length of the scheme. Where it was considered there may be particular engineering or environmental challenges associated with initial preliminary route options, or there were other options that would serve the needs of the community, further alternatives were developed, and the study area was expanded accordingly.

It should be noted that these preliminary route options were developed in order to define a study area only. Further routes options may be developed during subsequent phases of this project.

3 ENGINEERING CONSTRAINTS

This section of the report is interested in determining the engineering characteristics within the study area and the geometric, drainage, geotechnical and structural constraints and requirements that may influence the development of the greenway.

3.1 Geometry, Road Interfaces and Connectivity

Standards that are available to Designers that provide advice on the design of segregated greenways include the 'Classification and Grading for Recreational Trails', published by the National Trails Office (NTO) and 'Rural Cycleway Design (Offline)' (DN-GEO-03047), published by Transport Infrastructure Ireland (TII).

Both standards provide guidance on cross-section, geometry and catering for road interfaces as discussed below. There is further guidance on how to cater for road interfaces within the broader suite of TII publications. The Design Manual for Urban Roads (DMURs) provides guidance on the design of facilitates for non-motorised users in urban settings.

Cross-Section

The NTO's Classification and Grading for Recreations Trails document advises that greenway widths should range from 2m – 3m, with a 2.5m cross-section being desirable.[2] TII guidance advises that a 3.0m width is desirable for Low Volume (< 1500 users/day) routes, but that relaxations can be provided to allow the width to be reduced to an absolute minimum of 1.75m over short lengths where physical obstructions limit the width that may be provided.[3] TII guidance also advises of lateral clearances which need to be achieved adjacent vertical features, which can have a bearing on the overall cross-section. Typically, a lateral clearance of 1m is deemed to be desirable, which can be reduced to an absolute minimum of 0.25m where necessary.[4]

Where the greenway is located adjacent to a road, it is typically necessary to maintain a distance of 2m between the edge of the trafficked lane and the edge of the greenway in accordance with TII Publication DN-GEO-03036 Cross Sections and Headroom;

> *'4.17.3 Carriageway Separation Distances When cycle/pedestrian facilities follow the route of a road, a separation distance is to be provided between the road and the cycle track through the provision of a grassed verge. The carriageway separation distance includes any hard strips. Table 4.6 presents the minimum separation distances between the road carriageway and the cycle track. The minimum grassed verge width to be provided shall be 1m. The cycle facility should however be located as far from the edge of the carriageway as possible and share the maintenance strip if practical, as described earlier in this section.*

[2] Classification and Grading of Recreational Trails – Table 8.1
[3] Section 4.1 and Table 4.1 of DN-GEO-03047.
[4] Section 4.2 and Table 4.2 of DN-GEO-03047

Passively safe reflective vertical features shall be positioned within the grassed verge width where the cycle track runs adjacent to the road. Any values below those outlined in Table 4.6 require a Departure from Standard.

Table 4.6 Carriageway Separation Distances

Road Type	Desirable Min (m)	One Step Below Desirable Min (m)
Type 2 and Type 3 Single Carriageway	2.0	1.5
Type 2 and Type 3 Dual Carriageway	6.0	3.0

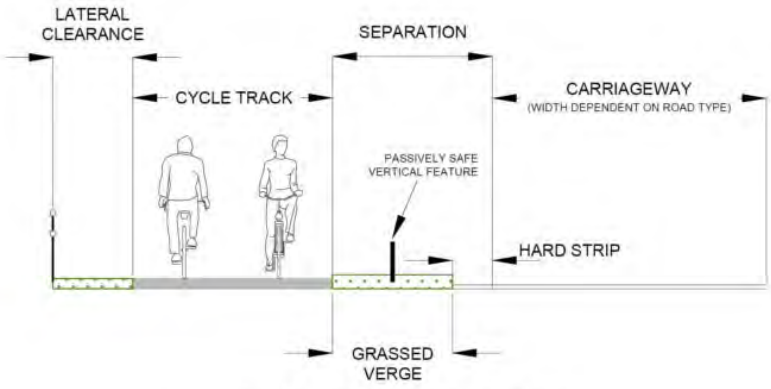


Figure 4.2 Off-Road Two-Way Cycle Track

In Instances where the greenway will cross a direct access onto the road, the offset, can be reduced to 0.5m. Figure 5 below extracted from TII Publication DN-GEO-03060 refers:

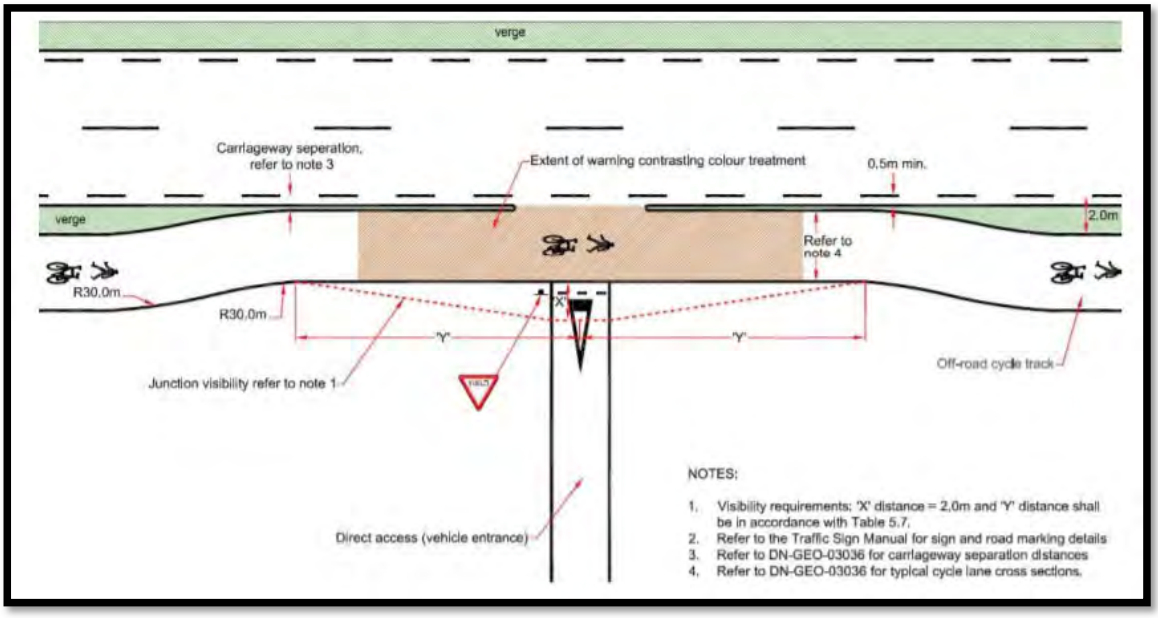


Figure 5: Direct Access Bend-In Crossing from DN-GEO-03060

While the proposed greenway will typically follow the route of the abandoned railway track, localised constraints may require the greenway to divert from the route of the railway, and the proposed greenway may include sections through rural land, along field boundaries, along the route of the former railway line or along rivers. In these instances, subject to the availability of the land, it is likely that the desirable minimum cross-section and lateral clearance widths advised within TII guidelines could be provided.

In other instances, the greenway, may run adjacent to existing roads or pass through or over existing structures. In order that the greenway meet the project objective of being substantially segregated, the provision of unsegregated lengths along existing roads should be limited to locations where substantial constraints exist, which could not be otherwise be avoided or where avoidance would have a disproportionate impact on the receiving environment. In these instances, it will be necessary to assess what measures are required to ensure that an appropriate cross-section can be provided and consider the impacts of these measures as part of the route selection and design processes.

Particular constraints of note relating to the cross-section include the available width along the R183. Figure ***6*** to Figure 7 below provide snapshots of the existing R183 road cross-section west of Ballybay, south of Tonyscallan Lake and approaching the intersection of the R183 and the L7411/L7220 junction. In each instance, it is evident that significant works would be required in order to provide a greenway with a 2m offset from the carriageway, desirable minimum widths and lateral clearances.

Figure** 6: **Cross-Section of R183 Outside Ballybay Facing East

Figure 7: Cross-Section of R183 Approaching Intersection with L7441/L7220 at Killycrum – Facing East

The road cross-section at existing structures which could take the greenway under the N2 National Primary Road also requires consideration. Two potential existing structures associated with the N2 are within the study area, the underbridge associated with the R183 and the underpass that takes the L3210 Milehill Road under the N2. These structures are illustrated in Figure 8 and Figure 9. While both structures have associated footpaths, the provision of the desirable minimum greenway cross-section, lateral clearance and road clearance may not be possible at these locations. The constraints and options associated with each structure are discussed further in the Section 4.4 below which considers structures.

Figure 8: Cross-Section of R183 underneath N2

Figure 9: Cross-Section of L3210 Milehill Road Under N2.

Horizontal Geometry

The horizontal alignment requirements associated with cycling facilities are discussed in DN-GEO-03047. Principle among the requirements is the need to provide minimum horizontal radii of 25m in locations where the design speed is 30 km/h. Minimum horizontal radii of 4m and 94m apply where the design speed is 10 km/h and 50 km/h respectively.

Given the generous horizontal geometry associated with railways, where the route follows the line of the former railway, it is likely that it will be possible to provide minimum horizontal radii.

Where it is not possible to follow the route of the former railway, the greenway may follow existing field boundaries or watercourses. In these instances, it will be necessary to develop the geometry design associated with each route option in order to ensure minimum standards can be met and to determine associated land requirements. This is particularly the case, where:

- The land boundary being followed turns through sharp angles.
- The watercourse the greenway is aligned to is meandering.

Figure 9 below provides a visualisation of how the greenway may look if it follows a river.

Figure 10: Visualisation of Greenway along River

In developing the horizontal geometry, it will also be necessary to consider the visibility associated with the design. Where small horizontal curves are used, the visibility splay can often extend well beyond the greenway footprint. This can be problematic if the visibility splay crosses hedgerows or other boundaries or crosses privately-owned lands that contain or are likely to contain vegetation, crops or structures which will impede visibility. The lands required for the development of the greenway are therefore likely to include the extent of the greenway footprint and the associated visibility splays.

Vertical Geometry

The vertical alignment requirements associated with cycling facilities are discussed in DN-GEO- 03047-02. The principle requirement is to ensure appropriate vertical gradients are used along the route. DN-GEO-03047-02 sets out that the desirable minimum gradient for cycling facilities is 3%.[5] Gradients of up to 10% are allowable as a two-step relaxation, however DN-GEO-03047advises that: *"the provision of gradients greater than 5% should be confined to short sections of the cycle route and should be preferably less than 100 metres in length."*

The likely gradients along the preliminary route options within the study area have been investigated in Google Earth, with the following results:

- Preliminary Route Option A - There are 10 locations where the gradient is higher than 5%, but no locations where the gradient is higher than 10%. There is one location where the gradient is higher than 5% for a distance of more than 100m.

[5] Table 6.2 of DN-GEO-03047.

- Preliminary Route Option B – There are 11 locations where the gradients is higher than 5%. There is one location where the gradient is higher than 10% over a short distance. There are two locations where there is a gradient greater than 5% for a distance of more than 100m.
- Preliminary Route Option C – There are 8 locations along Option C where the gradient is higher than 5%. There are no locations where the gradient is higher than 10%. There are three locations where the gradient is higher than 5% for a distance of more than 100m.
- Preliminary Route Option D – There are 3 locations unique to Option D, where the gradient is higher than 5%. There are no locations where the gradient is higher than 10%. There is one location where the gradient is higher than 5% for a distance of more than 100m.

Locations where steep gradients may be encountered are illustrated in the constraint drawings in Appendix B. A corresponding table which outlines the gradients above desirable minimum, and the lengths associate with those gradients is contained in Appendix C. It is noted that the above analysis is not based on dedicated survey information and should be treated with some caution.

Where gradients are above desirable minimum standards, mitigation options might include carrying out earthworks to amend the vertical gradient though steep sections or introduce 'S-curves' to reduce the severity of gradients. The need to undertake such measures should be considered as part of the route selection and subsequent design processes, as it may have a bearing on cost, land requirements or other environmental impacts.

Road Interfaces

The towns of Ballybay to Castleblayney are connected by road via the R183 regional road and the development of a greenway between the two towns will likely involve an interface with this road, along with a number of local roads located within the Study Area. It will also be necessary for the greenway to cross the N2 motorway, which is a national primary route. The types of road interface at crossings and junctions may include:

- At Grade Road Crossings;
- Provision of 'On-Road' Sections; Or
- Provision of Segregated Parallel Facilities

TII publication DN-GEO-03047, which considers 'Offline' greenways provides guidance on road crossings and differentiates between roads with daily traffic flows above 12,000 AADT, where it advises that grade separated junctions be provided, and roads where traffic flows are lower than 12,000 AADT, where at-grade crossing may be acceptable.

While the traffic flow on the N2 within Co. Monaghan is likely to be less than 12,000 AADT, it is considered that only a grade separated crossing would be acceptable at this location, where the road consists of a Type 3 Dual Carriageway cross-section with a wire-rope central barrier. Traffic flow along the R183 is substantially less than 12,000 vehicles AADT[6] and at-grade crossings may therefore be acceptable, although this should be confirmed by traffic counts or through consultation with the local authority. Efforts should be made to limit the number of crossings, in any case, and the design of any crossings will need to take cognisance of the associated risks to greenway users and vehicles.

While TII Publication DN-GEO-03047 caters exclusively for Offline cycleways, the National Trails Office's 'A Guide to Planning and Developing Recreational Trails in Ireland' provides a commentary on the use of local and regional roads within trails and advises:

[6] A Monaghan County Council traffic count on the R183 at Knocknamaddy, east of Ballybay, between the 3rd October 2016 and the 7th October 2016 gave an AADT of 3,612. A Monaghan County Council traffic count on the R183 at Corracloghan, west of Castleblayney between the 26th September 2016 and the 30th September 2016 gave an AADT of 4,335.

> *"The National Trails Office recommends that trail routes should avoid roads where possible….. Where roads are used on a trail, only lightly trafficked local roads, minor roads or boreens are considered appropriate for use. The use of main roads (National (N) or Regional (R)) or other busy roads should always be avoided. If a trail must come into contact with such roads, this should be limited to crossing points or very short sections to join up two parts of a trail either side of the road….*
>
> *Where possible, on a busy road, the trail should be routed off the trafficked surface on a segregated path. In some cases if there are longer sections of the route on road, which joins up two off-road sections, it may be appropriate to designate these as "link sections" on the route"*

The standard also advises that:

> *Even in these exceptional circumstances, however;*
>
> *- a loop should never use National or Regional Roads (i.e. roads with N or R in the number) unless it proceeds on a purpose-built footpath;*
>
> *- a speed limit of 50kms per hour must be in force on all roads which are included as part of the loop*

The road interfaces associated with each preliminary route option are described in the sections below and are illustrated on the constraints drawings in Appendix B.

Preliminary Route Option A

Road Interfaces associated with Preliminary Route Option A are described in Table 1 below.

Table 1: Road Interfaces Associated with Preliminary Route Option A

RI No.	Road No.	Interface Type	Length (km)
A1	R183	Segregated Path Along Regional Road	0.4
A2	L3403	'On-Road' Section along Local Road at Dunmaurice	0.2
A3	N/A	Local lane crossing at Dunmaurice	N/A
A4	N/A	Local lane crossing at Clonaneor	N/A
A5	L34302	Local Road Crossing at Coolmannan	N/A
A6	N/A	Local Lane Crossing at Devlin	N/A
A7	L7441	Local Road Crossing at Tonyglasson	N/A
A8	R183	Regional Road Crossing	N/A
A9	R183	Segregated Path Along Regional Road @ Modeece	0.1
A10	R183	Segregated Path Along Regional Road @ N2 Overbridge	0.1
A11	R181	Tie-in to Existing Infrastructure	N/A

The total length of preliminary Route Option A is 10.5km. As per Table 1 above, there are 3 road crossings associated with this route, one of which is a crossing of a regional road. There are also 3 local lane or private access crossings. While visibility and other design requirements would need to

be checked at each crossing location as part of the preliminary design, the number and type of crossings is unlikely to detract from the safety or amenity of the route.

The total length of Option A which would run adjacent to the R183 is 0.6 km. While not ideal in the context of an offline greenway, this length, which represents less than 6% of the route, is not considered to be excessive and there are alternative options available to reduce this length, which should be further considered as part of the route selection process.

Also associated with Option A is a 200m section along the L3043,[7] where it is envisaged that greenway users may share the road surface with traffic in the manner described in 'A Guide to Planning and Developing Recreational Trails in Ireland'. As illustrated in Figure 11 below, the cross-section and geometry along the length of road in question may make it suitable for use as part of a trail. The use and treatment of this road would need further consideration as part of the route corridor selection and design processes, and it is noted that there are alternative measures that could be considered to avoid the need to use this 'on-road' section.

Figure 11: Cross-Section and Visibility along the L3403 on the approach to junction with R183

Preliminary Route Option B

Road Interfaces associated with Preliminary Route Option A are described in Table 2 below.

Table 2: Road Interfaces Associated with Preliminary Route Option B

RI No.	Road Number	Interface Type	Length
B1	L31006 (Loch Mor Avenue)	Segregated or 'On-Road' Section along or adjacent Local Road at Knocknamaddy	2.5

[7] Road Interface A2

RI No.	Road Number	Interface Type	Length
B2	R183	Regional Road Crossing at Dunmaurice	N/A
B3	N/A	'Section along Private Access at Dunmaurice	0.9 km
B4	L7430	Section along or Adjacent Local Road at Tonyscallan	0.6 km
B5	L3430	Local Road Crossing at Tonyscallan	N/A
B6	N/A	Local Lane Crossing at Devlin	N/A
B7	L7411	Section along or Adjacent Local Road at Tonyglassan	0.5 km
B8	R183	Regional Road Crossing @ Tonyglassan	N/A
B9	L7220	Section along or Adjacent Local Road at Killycrum	1.5 km
B10	L3210 (Mile Hill Road)	Section along or Adjacent Local Road at Muldrummond to intersection with existing infrastructure	1.8 km

The total length of preliminary route Option B is 12.4 km. As per Table 2, there are 3 road crossings and 2 lane crossings associated with this option. Two of the road crossings relate to the crossing of the R183. As with preliminary route option A, 3 road crossings is not considered to be an excessive number over such a length, but each crossing location would need to be considered in further detail as part of the route selection and design processes.

Unlike Option A, there is a total of 7.8 km of preliminary route option B, which may consist of sections along or adjacent local roads. These sections are described below.

- Road Interface B1 – Loch Mor Avenue appears to be a lightly trafficked road with scenic views of the adjacent lake. On that basis, its incorporation into the scheme as the primary route or as part of a connected loop may be considered desirable. While the cross-section and geometry along the 2.5km length may typically lend itself to use as part of the greenway, there are sections where the available cross-section width and visibility are constrained, which would need to be considered as part of the design process. Figure 12 below provides one such example.

Figure 12: Constrained Cross-Section and Visibility along Loch Mór Avenue

- Road Interface B3 – This is a section along what is considered to be a private access with very low traffic volumes. It is anticipated that this section would mimic an offline greenway in practice and the most significant constraint would relate to the impact on the associated landowner.
- Road Interface B4 – This section is along a lightly trafficked road where geometry and visibility appear to be reasonable and where it may be possible to provide a segregated facility without impacting severely on properties.
- Road Interface B7 – This interface relates to a section along a local road. The provision of a fully segregated greenway along this local road would inevitably impact on property boundaries, albeit it is unlikely that any building would be impacted.
- Road Interface B9 – This extensive on-line section is along/adjacent to a local road. While the geometry and visibility of the route may typically lend itself to use as part of a walking or cycling route, particular cross-sections constraints exist at the junction of the local road and the R183 as illustrated in Figure 13 below and at Modesse as illustrated in Figure 14. In these locations, the provision of a fully segregated greenway would impact on the buildings illustrated.. Elsewhere along this route, the provision of a fully segregated greenway would impact on property boundaries. . Subject to traffic assessment and consultation, sections of

this road may be determined to be suitable for use as shared surface section of the greenway

Figure 13: Constrained Cross-Section at Junction of local road and R183

Figure 14: Constrained Cross-Section at Modesse

The gradient on this section is also significant. An associated positive impact of such high gradients over this length is that there are scenic views over the surrounding countryside available along the raised sections of this route.

- Road Interface B10 – This extensive on-line section is along a local road which is straight or practically straight and where visibility is likely to be sufficient. West of the crossing of the N2, the provision of a fully segregated facility would have minimal impact on property boundaries. Between the N2 crossing and the tie-in to existing facilities outside of Castleblayney, there are several properties adjacent to the road. The provision of a segregated facility which minimised impacts on property boundaries may be challenging along this length and would likely require amendments across the full road cross-section. Traffic volumes along this local road which serves as an artery into Caslteblayney may prohibit is use as on on-line section.

While Option B does have sections of segregated greenway though rural undeveloped areas, the provision of facilities along or adjacent to roads over extensive lengths would have a significant bearing on the character of the development. Such extensive use of the local road networks as part

of the route would likely result in it being characterised and designed as a road-based cycling trail, rather than an offline greenway.

Notwithstanding the above, the adoption of certain portions of preliminary route option B may serve to improve the character of the greenway and/or avoid other constraints.

Preliminary Route Option C

Road Interfaces associated with Preliminary Route Option C are described in Table 3 below.

Table 3: Road Interfaces Associated with Preliminary Route Option C

RI No.	Road Number	Interface Type	Length
C1	R183	Tie-in to Existing Infrastructure	N/A
C2	N/A	'On-Road' Section along Private Access at Knocknamaddy	0.15 km
C3	L3403	Local Road Crossing at Dunmaruice	N/A
A4 OR B4	See Details Above		0.6 km for B4
C4	N/A	'On-Road' Section along Private Access at Tonyscallon	0.1 km
C5	R183	Segregated Path Along Regional Road through Doohamlet	0.9 km
C6	L3430	Local Road Crossing at Doohamlet	N/A
C7	R183	Segregated Path Along Regional Road through Doohamlet	0.7 km
A5 or B6	See Details Above		N/A
A5 or B7	See Details Above		0.5 km for B7
C8	R183	Segregated Path Along Regional Road	1.5 km
C9	L34111	Local Road Crossing at Grig	N/A
C10	L34102	Local Road Crossing at Grig	N/A
C11	R183	Regional Road Crossing at Grig	N/A
C12	R183	Regional Road Crossing to tie into Existing Infrastructure on Monaghan Road	N/A

Route Option C consists of segments which can serve as an alternative to Route Options A or B where there are particular constraints. Were all of Option C segments to be chosen, the route would include between 8 and 10 road crossings, two of which may involve crossing a regional road. The increase in the number of crossings relative to alternative options may influence the selection of some of these segments during the route selection phase. Should the segments be preferred, the design of the associated crossings will require particular attention to ensure all necessary design parameters can be met. The nature and constraints associated with the other road interfaces described in Table 2 are discussed below.

- Road Interface C1 - This is a section along what is considered to be a private access with very low traffic volumes. It is anticipated that this section would mimic an offline greenway in practice.
- Road Interface C4 - This section is along what is considered to be a private access with very low traffic volumes. It is anticipated that this section would mimic an offline greenway in practice.

- Road Interface C5/C7 – This segment follows regional road R183 along a section where no hard shoulder or verge is currently provided and where other road infrastructure including vehicle restraints systems, culverts and utilities would need to be amended to accommodate an adjacent greenway. Figure 15 below refers. Existing footpaths between All Saints National School, west of Doohamlet village and Doohamlet GAA club east of the village, have recently been widened as part of a town enhancement scheme. As a consequence of the recent works, a generous footway is now provided. However, there is no formal segregation between the road carriageway and the footway, which is something that may need to be considered as part of the design process.

Figure 15: Constraints along the R183 West of Doohamlet

- Road Interface C8 – This segment follows the regional road R183 over a length of 1.5km. The geometry and visibility along the road through this section appears reasonable, but would need to be considered as part of the design process. In some instances, a widened verge is available, however, in other areas, the cross-section is constrained with trees on either side of the road, which has no hard shoulder or verge. Substantial works would be required to provide a greenway through these sections. Figure 16 below illustrates an example of a constrained section along this segment.

Figure 16: Constraints along the R183 West of N2 Crossing

Preliminary Route Option D

Road Option D typically consists of short segments that link other route options. It does not have any road interfaces unique to itself.

Connectivity

The study area developed for this scheme extends to the urban areas of Ballybay and Castleblayney, with Ballybay located in the centre of the study area.

Castleblayney

With a population of over 3,600 people, Castleblayney is the third largest town in County Monaghan. It is well connected with surrounding towns of Monaghan, Carrickmacross, Dundalk and Armagh all of which are located less than 30 km from Castleblayney. The town serves a wider hinterland and provides important local residential, retailing, social and leisure functions for the town and the surrounding rural community. With the improvements in transport links, the town has been identified as having potential to develop as a commuter town for the east coast areas north of Dublin and has significant potential for expansion and growth. Castleblayney has existing facilities for pedestrians that extend from the extents of the study area to the town centre. Monaghan County Council have also recently commissioned the development of a vision statement in respect of the Muckno Estate located directly to the east of Castleblayney. The vision statement identified the potential to develop the estate into a world-leading adventure destination, which could attract up to 350,000 visitors annually. The presence of a greenway directly adjacent this facility would complement such a vision, were it to be progressed.

Ballybay

Ballybay has a population of over 1,200 people. It is located in the centre of County Monaghan and is less than twenty kilometres from all the towns within the county. The town of Ballybay is located directly west of a picturesque, 23-hectare lake, Lough Major. Lough Major has an existing looped walk which commences in the town park and extends along the banks of the lake. Monaghan County Council are in the process of developing proposals to extend the existing facilities for non-motorised users in the Ballybay area. Appendix G contains a map which illustrates the existing facilities and proposed extensions to those facilities. It is considered that these extensions, were they to progress, would complement the development of the proposed Ballybay to Castleblayney greenway.

Doohamlet

The study area and associated preliminary route options also encompass or pass close to the village of Doohamlet. In 2018 the footpath through Doohamlet village was upgraded and widened, creating a walking/cycling facility connecting the GFC grounds at the eastern side of the village to the school on the west side of the village – a distance of approximately 800m. This facility also connects to the newly refurbished Community Centre and its riverside Community Garden, a Community Park with play facilities, and a recreational track and linear park currently under development at Doohamlet GFC. Connecting to such facilities can create a destination for people travelling from Castleblayney and Ballybay, and also connects the Greenway with the population centre of Doohamlet which would increase use of the Greenway. The central location of Doohamlet along the mid-point of the route of the Greenway could create an opportunity to deliver a 2 phase approach to the Ballybay-Castleblayney Greenway, with each phase serving clearly defined local population centres and accessing key local amenities.

Local Communities

In addition to the main population centres within the study area, there are a number of at-grade crossings of local roads which would service the surrounding rural area and rural communities such as Drumhowan and Cremartin. Local people may be encouraged to travel along the local road network to access the greenway at these points if they know they will join a high-quality and safe facility to complete their onward journey.

National and Regional Greenway Connections

There are also many proposals for local walking and cycling facilities in the area, including a proposal to provide walking and cycling infrastructure as part of the N2 Ardee to Castleblayney Road Scheme, walking and cycling trails proposals around Lough Muckno in Castleblayney and the proposals for Ballybay discussed above. Monaghan County Council is currently developing a 5-year Walking and Cycling Strategy[8] which documents such proposals, and it is proposed to develop a network of all existing and proposed walking and cycling infrastructure in the County. Plans such as this will highlight opportunities for this Greenway to connect to other infrastructure, which would increase the potential for a wider range of users to access the greenway.

3.2 Drainage and Flooding

The study area has been reviewed to determine if there are any drainage related constraints which would impede the development of the proposed greenway. Such constraints may include:

- Rivers and stream which may have to be crossed;
- Areas of historical flooding which may have to be avoided or catered for; and
- Areas where the topography and alignment are such that draining the walkway would be difficult.

Rivers and Stream Crossings

The study area lies within the Hydrometric Area 06 (Newry, Fane, Glyde and Dee and their tributaries) and Hydrometric Area 36 (River Erne and its tributaries). There are no major rivers within the study area, however, there are several prominent lakes as follows:

- Lough Major located east of Ballybay;

[8] In April 2021 Monaghan County Council published the Draft County Monaghan Walking & Cycling Strategy 2021-2026 for public consultation.

- Tonyscallan Lough located west of Doohamlet;
- Corrinshigo Lough located west of Castleblayney adjacent the N2.

Figure 17 below is extracted from EPA mapping and shows the main river systems within the study area (blue with flow arrows). Watercourses are also illustrated on the constraints drawings in Appendix B.

Figure 17: FRA Study Area (black outline) and main river systems (blue) (from EPA Mapping)

A number of preliminary route options have been developed to help develop the study area and consider associated constraints. For each route there are a number of streams, river or ditch crossings which are summarised in Table 4 below.

Table 4: Summary of watercourse and ditch crossings in Study Area

Route Options within Study Area	River/Minor Streams	Ditch Crossings
Red Route (Option 1)	4 no. crossings of the Major Lough Stream	15 no.
Green Route (Option 2)	6no. crossings of the Major Lough Stream 1 no. crossing of the Fane River	19 no.
Blue Route (Option C)	6no. crossings of the Major Lough Stream	12 no.
Purple Route* (Option D)	3no. crossings of the Major Lough Stream	5 no.

**Purple route only considers lengths which are not common to other routes*

As the route of the proposed greenway typically follows that of the Castleblayney to Ballybay railway line and local roads where necessary, there are existing structures in place for a number of crossings points. Details of the existing crossings will be contained in the structures assessment section of the study.

Where new stream crossings are required, Section 50 consent from the OPW will typically be required. In such instances, culvert with minimum dimensions of 900mm would be required or, alternatively, clear span pedestrian crossings could be provided. The minimum culvert diameter for new ditch crossings should be 450mm, as smaller sizes are prone to blockage.

Flooding

The OPW Flood Hazard Mapping websites (www.floodmaps.ie and www.floodinfo.ie) were consulted to determine whether there was any evidence of previous flooding within the study area. Figure 18 below illustrates that there are records of historic flooding within the study area in Ballybay and near Doohamlet.

Figure 18: Excerpt from www.floodinfo.ie showing locations of reported flooding and areas considered to be at risk of fluvial flooding

OPW flood maps illustrate that predicted high probability[9] flood extents extend across Loch Mor Avenue in 4 locations between the potential tie-in point of the Option B route and the point where this route option crosses the R183. The flood maps also illustrate that the R183 and a section of the L3403 is at high risk of flooding. This flooding would impact on the Option A route. Although the flood extents associated with the stream that passes through Doohamlet are not included in the OPW maps, there is also a record of recuring flooding north of the GAA ground in Doohamlet.

The location of the historical flood events and the high frequency flood extents, where they are shown on OPW maps, are illustrated on Appendix B drawings. Although it is unlikely that the provision of a greenway, which is considered to be a 'water compatible' development[10] would impact on the flood extents, the likely frequency of the greenway flooding 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.

3.3 Soils and Geology

In considering potential geotechnical constraints that may influence the development of the proposed route, this report has considered the following data sets:

- OSI mapping - historical to present day; and
- Geological Survey Ireland mapping relating to topography, quaternary sediments, bedrock and aquifer classification.

Site-specific geotechnical investigations have not been carried out to date and so the potential constraints identified in this report are based only on publicly available information and the observations made during the walkover survey.

The GSI shows the bedrock geology beneath the study area is predominantly the Lough Avaghon formation comprising of massive sandstone and microconglomerate. The Castleblayney area is underlain by the Corderrybane shale formation (pyritic shale) and the Oghill formation again comprising of massive sandstone and microconglomerate. The 100k Bedrock Geology viewer shows outcrops of the pyritic shale in Muldrumman and Castleblayney. This should be considered when designing structures in these areas given the possible reaction between pyrite and concrete.

Outcrops of sandstone shown in Doohamlet, NW of Tonyscallon and NE of Killycrom.

[9] High Probability flood events have approximately a 1-in-a-10 chance of occurring or being exceeded in any given year. This is also referred to as an Annual Exceedance Probability (AEP) of 10%.
[10] Planning System and Food Risk Management Guidelines (2009) – Table 3.1

Quaternary sediments viewer shows drift geology comprises mainly of till derived from lower Palaeozoic sandstones and shales with areas of peat south of Coolmannan, Tonyglassan and surrounding Corrinshigo Lough.

Possible geotechnical constraints in the study area are as follows:

- Areas of soft ground – Peat/alluvium. Likely to result in difficult underfoot conditions which may necessitate use of geotextiles in these locations. Compressible and low strength alluvial deposits will need to be considered when designing structural foundations.
- Shallow rock outcrops – Potential physical obstructions, may require breaking or a minor diversion of the route.
- Shallow pyritic shales – interaction with concrete/structures to be considered.

The location of soft ground and potential rock outcropping locations are shown on the constraints drawings in Appendix B.

Further to the completion of the desktop study, a site walkover was carried out with to investigate ground conditions which may influence the development of the project. The site walkover identified dumping in two locations. The first location, seen in Figure 19 below, was behind the housing estate adjacent to the quarry in Castleblayney. The second location was Southeast of Tonyglasson where construction and demolition waste, wood, gas cannisters and household waste had been left either side of a gravel track as shown in Figure 20 below. The extent of dumping at these locations may need to be investigated in greater detail during subsequent phases of this project, or by others.

Figure 19: Household waste dumped at embankment behind housing estate at Castleblayney

Figure 20: Waste Dumped at Tonyglasson

3.4 Structures

Where 'greenfield' greenways are developed, structures are typically required to take users over obstacles such as roads or watercourses. In addition to the requirement for new structures, the greenway may cross over or under existing structures associated with the former great northern railway and/or local roads. Within the study area, there are two prominent existing structures associated with N2 national route, one of which may be utilised as part of the scheme and one location where the greenway may pass under what was a former rail bridge. There are also a number of small streams and ditches which will need to be bridged using either existing or purpose-built bridges and culverts. The locations of existing and proposed structures associated with each of the preliminary route options in the Study Area are shown in Appendix B constraint drawings.

Existing Structure Under N2

The N2, which is the national primary route between Dublin and Monaghan, crosses the study area and will be traversed by the proposed greenway. There are two existing bridges within the study area, which currently take vehicles under the N2, which is a Type 3 dual carriageway cross-section at the crossing points. It is likely that one of these existing structures, which are described below, will be used to facilitate greenway traffic following the route selection process.

Figure 21 below illustrates the underbridge located in the townland of Myles, which carries the N2 over the R183. The bridge is a 3-span reinforced concrete structure with footways provided on each side. The road cross-section at this location consists of a two 3.65m through lanes and a deceleration lane that accommodates west-bound traffic wishing to turn onto the N2, via a grade separated junction. There are footways currently provided on each side of the structure. The northern footway measures 5.5m wide from the edge of the bridge piers to the edge of carriageway, while the southern footway measures 3.2m. Neither option would allow the provision of a greenway that met desirable minimum standards for width (3.0m), carriageway separation distance (2.0m) and lateral clearance from the columns (1.0m). The northern footway is sufficiently wide to provide the full greenway width

of 3.0m, carriageway separation distance of 2.0m and lateral clearance of 0.5m, which is a one-step relaxation from the desirable minimum standard. The use of the northern footway would require two additional crossings of the R183, along with crossings of the two slip roads associated with the grade separated junction.

Figure 21: View of R183 Underbridge crossing of N2

On the southern side of the road, the available 3.2m is insufficient to cater for a greenway that would meet desirable minimum standards, even allowing for available relxations.[11] A departure from standard would be required to .

Figure 17 below illustrates the underbridge located in the townland of Killycard, which carries the Mile Hill Road (L3210) under the N2. The bridge consists of a single span, with pre-cast concrete beams spanning between concrete abutments. The road cross-section at this location consists of two 3.0m wide through lanes, with 2.0m wide footways provided on each side of the structure. These footways are separated from the vertical abutment walls by a paved surface which is 2.0m wide and is sloped at 1V: 3H.

[11] Greenway width can be reduced to 1.75m over short distances, lateral clearance can be reduced to 0.25m and carriageway separation can be reduced to 1.0m.

Figure 22: Mile Hill Road (L3210) Crossing under the N2

The provision of a greenway under this structure would require one of the following options to be adopted.

- Option 1 – The sloped areas between the back of the footpath and the abutment wall could be levelled. This would be sufficient to allow the provision of a 4m wide corridor which could accommodate a 2.0m wide greenway, with a 1.5m carriageway separation distance and 0.5m lateral clearance from the abutment.[12]
- Option 2 – The road could potentially be realigned over a short distance to provide a 4m corridor for pedestrians and cyclists on one side of the road, rather than 2 No. 2m corridors. This would allow the provision of a 2.0m wide greenway, with a 1.5m carriageway separation distance and 0.5m lateral clearance from the abutment.[13]
- Option 3 – Over a short distance, the use of below desirable minimum standards in respect of carriageway separation distances may be deemed acceptable, subject to the adoption of mitigation measures, such as guard rails.
- Option 4 - This section of road be treated as a shared surface.

Option 1 above would require the design of the original structure to be reviewed to determine what impact, if any, levelling this area would have on the performance of the structure and/or what works would be necessary to accommodate the change. This assessment has not been carried out as part of this study. This option may require a departure in any case due to the use of combinations of relaxations below desirable minimum standard.

Option 2 may be viable, but may require a departure due to the use of combinations of relaxations below desirable minimum standard.

[12] Greenway width of 2.0m is one-step below desirable minimum. Carriageway separation of 1.5m is one step below desirable minimum standard and lateral clearance of 0.5m is one-step below the desirable minimum standard.

[13] Greenway width of 2.0m is one-step below desirable minimum. Carriageway separation of 1.5m is one step below desirable minimum standard and lateral clearance of 0.25m is one-step below the desirable minimum standard.

Option 3 would require a reduction in desirable minimum widths over a short distance. It is considered that his option may be acceptable, subject to consultation with the appropriate authorities.

Options 4 may also be feasible, if it is consistent with the approach taken along the reminder of the route that follows the local road. As set out in Section 4.1 above, the National Trails Office's 'A Guide to Planning and Developing Recreational Trails in Ireland' makes provision for the use of lowly trafficked local roads as part of recreational routes. IT would be necessary to provide appropriate warning signage and road makings along the route to warn motorists that they encounter cyclists along the road.

***Figure 23: ST13 at* Dunmaurice (Double Span)**

Road Over Rail Bridge

The desktop study and walkover survey identified one rail bridge which is still in use to carry vehicles over the former rail line. This structure is located in the townland of Dunmaurice and consists of a 2-span reinforced concrete structure with clear spans of 5.0m and 3.0m. AS illustrated in Figure 23, the 5.0m span is backfilled with clay. This clay will need to be removed in the presence of a competent structural engineer to allow for a thorough inspection of the structure. A greenway which provided desirable minimum widths and lateral clearances could be accommodated underneath the 5m span. The use of the 3m span would require a reduction in desirable minimum cross-section and lateral clearances.

Figure 24: Remnants of Rail Structure

The remnants of former rail structures are also evident within the study area. While these structures are located along the former route of the great northern railway, their condition is such that significant works would be required to incorporate them into the greenway scheme. It is more likely that the greenway will be diverted around them and they will serve as a feature of interest for greenway users. Figure 24shows one example of an existing rail bridge. A further example is provided in Appendix D.

Watercourse Crossings

Watercourse crossings will be required at each location where the greenway crosses a stream or a ditch. In some instances, it may be possible to re-use or amend existing structures to accommodate greenway users. In other instances, new watercourse crossings are likely to be required to cross existing streams or ditches. These crossing may take the form of a pipe or box culvert of a clear span structure suitable for accommodating pedestrians. Figure 25 below provides an illustration of one such structure.

Figure 25: Example of Pedestrian Footbridge over Watercourse

The location of proposed and existing structures are illustrated in the constraints drawings in Appendix B. A description of the existing watercourse crossings is contained within Appendix D.

3.5 Utilities

A number of utilities are expected within the study area for the proposed greenway. Services mapping was not requested from utility companies as part of this feasibility study, but it is likely that the following services will be encountered:

- ESB and Eirgrid LV, MV and HV overhead and underground lines
- EIR, BT or Virgin media communication lines; and
- Irish Water potable and foul and storm water

Where the greenway route will be through rural land, the nature of the proposed works are such that the presence of the services listed are not considered to be a constraint to the construction of the route. Should route segments which follow the local or regional road network be selected as part of the route selection process, it is likely that utility diversions would be required in some instances to either underground overhead electricity or communication lines or to move the associated poles outside of the greenway footprint.

4 ENVIRONMENTAL CONSTRAINTS

4.1 Ecology

An ecological constraints study has been conducted and is included as Appendix F of this report. The ecological constraints exercise was informed by a desktop study and a walkover survey of the study area to identify key ecological features which will require further consideration during the route selection and design phases of the project.

The desktop survey determined that the study area does not pass through any designated sites or Natura 2000 sites and that, as a result, no impacts on any protected area may reasonably be predicted. Key findings from the walkover survey included:

- River Lamprey, a protected species, sensitive to impacts were found to be recorded in the Lough Major Stream close to Doohamlet;
- Evidence of badger activity was found throughout the survey area;
- Several structures within the study were deemed to have bat roosting potential; and
- Stands of invasive species were found within the study area, which will need further consideration;

Based on these findings, it is recommended that an Ecological Impact Assessment is carried out as part of an Environmental Impact Assessment screening process to determine the requirement for an EIA report.

4.2 Archaeological, Architectural and Cultural Heritage

The assessment of cultural heritage constraint for this project involved a desktop survey of archaeological, historical and cartographic sources within the identified study area. The following sources were examined to establish the archaeological, architectural, and cultural heritage potential of the proposed development:

- Record of Monuments and Places ("RMP")/ for County Monaghan;
- Monaghan County Development Plan 2019-2025;
- National Inventory of Architectural Heritage (NIAH);
- 'An Industrial Heritage Survey of Railways in Counties Monaghan and Louth' by Fred Hamond and Charles Friel, for Monaghan and Louth County Councils, 2007
- Cartographic sources, including first edition 6'' OS maps;
- Aerial photography;
- Excavation bulletins;

The preliminary desktop assessment found that there are five recorded archaeological sites located within the study area, as well as six sites of architectural heritage significance included in the NIAH, of which two are also included in the Record of Protected Structures in the Monaghan County Council Development Plan. A further thirteen sites of potential cultural heritage significance were identified from cartographic sources.

None of the recorded archaeological sites are located in close proximity to any of the proposed preliminary route options. Of the NIAH structures, four are located adjacent to public roads. It is unlikely that significant construction will be required at these locations as part of the proposed development, as the route would utilise existing infrastructure. The only NIAH site directly impacted by the proposed development is the railway bridge at Tonyglassan (NIAH 41401909), although it should be noted that it's potential use for a greenway could safeguard the bridge into the future, ensuring its protection. Site inspection will have to be conducted at this location to ascertain its condition and to mitigate against impacts on this structure by the proposed development.

A survey of the Great Northern Railway line was carried out by Fred Hamond and Charles Friel in 2007. The sites identified by the 2007 railway survey, including 21 level crossings, 15 additional bridges and two-level crossing houses are by their nature all located directly along the route of the former railway line. It was not possible to assess their condition from the survey report. Further site inspection as part of the next phase of the proposed development will have to be conducted at these locations to record potential upstanding remains in detail and assess their condition. This is also the case for the thirteen sites identified from cartographic sources, some of which may have been completely removed by modern development, especially fords, footbridges and stepping stones.

The impact of the proposed development on the cultural heritage of the study area is deemed to be low. It is recommended that any residual impacts on sites of cultural heritage significance be mitigated through avoidance of structures and detailed recording of features of cultural heritage significance identified during site visits. The proposed development will provide better access to industrial heritage features such as level crossings and railway bridges and thus enhance the amenity value of the area.

There is of course potential to uncover further unrecorded sites of archaeological significance during the construction phase, where placement of new culverts and construction of bridges over streams may take place. In order to mitigate impacts on previously unidentified archaeological sites, it is recommended that works shall be designed to minimise ground disturbance.

Further detail of the Archaeological, Architectural and Cultural Heritage assessments carried out are included in Appendix E of this report. The location of features identified in the report are illustrated on the constraints drawings in Appendix B.

4.3 Land Use and Ownership

Land Use

The area between Ballybay and Castleblayney is dominated by improved agricultural grassland, with anywhere between 30 and 60 farm holdings potentially impacted by the scheme. Many of these farm holdings are dairy farms. A number of preliminary route options have been developed as part of this constraints report in order to better understand the feasibility and potential impacts that may be associated with the scheme. The route options developed to date typically sought to use the route of the former railway, where it is still intact or other existing boundaries including rivers, roads and field boundaries. In this manner, it is envisaged that the impact on farm operations could be minimised. It is recommended that further consideration should be given to the impact on farming operations as part of the route selection process. Consultation should be undertaken with the public and potentially impacted landowners as part of this process.

In addition to the potential impact on agricultural operations, it is noted that there are a number of domestic dwellings located within the study area and adjacent to the preliminary route options developed. Consideration should be given to how these dwellings are impacted and what mitigation measures can be provided to mitigate the impact, particularly where the proposals involve overlooking dwellings or part of dwellings such that the privacy previously afforded to them is impacted.

Land Ownership

Although the study area is centred on the former route of the Great Northern Railway, it is unlikely to follow this route in its entirety and it is therefore likely that the development will require the purchase of additional lands or the permission of landowners to create a right of way on their lands. In respect of the former route of the Great Northern Railway, based on land registry maps available on landdirect.ie, the ownership of the land once associated with the railway is not clear. Efforts should be made to clarify the ownership of this land prior to undertaking, or as part of, the route selection phase of the project.

Unlike many infrastructural projects, Greenway projects and the applicable design standards can allow more flexibility for discussions with landowners to identify options that reduce impact or facilitate landowner operations, and it is recommended that local landowners are approached at an early stage to determine whether acceptable route options can be identified that can meet all of the design criteria. Notwithstanding this, it is likely that not all landowners along a route would agree to a project, and it is important that due process, including formal public consultations and appropriate surveys and investigations are undertaken to support the design process and any future statutory approvals required.

Discussions are taking place at national level to agree the best approach to land acquisition for Greenway projects, as landowner representative groups do not support the use of Compulsory Purchase Orders for Greenway land acquisition. It is likely there will be some development and guidance in relation to this matter later in 2021, and the recommended approach should be considered when planning land acquisition.

5 PHASING OF PROJECT

As part of this constraints study, MCC requested that CCC consider if there are constraints that would restrict the construction of the greenway in phases. This report considers the design, procurement and construction of the project to determine if splitting the project into distinct phases is feasible.

- Design and Planning – Subsequent phases of his project will involve route selection, preliminary design and environmental evaluation and statutory consent. For the purposes of the environmental evaluation, it is important that the project is considered together to determine the full impacts of the proposed project on the environment. Given the relatively small size of the project, there will also be a number of advantages to progressing the route selection, design and consent process simultaneously. Advantages will include relative programme improvements, costs reductions, consistency of approach and reduction in project complexity due to a reduced number of interface points.
- Procurement – Construction costs consist primarily of labour and material costs, along with the cost of preliminaries which, include site management, supervision and offices. Given the relatively small size of the project, it is considered that best value for money would be achieved if the project was procured under a single contract. This approach would typically result in lower preliminary costs, relative to the procurement of two separate contracts, and the greater economies of scale associated with one larger project may lead to lower rates for project materials. Procurement and contract administration costs are also likely to be lower on one larger project than on two smaller projects procured separately.
- Construction – Unlike large highways schemes, which may be concerned with an earthworks balance over a full scheme, greenways do not typically require significant earthworks. Cost considerations aside, there are not thought to be any significant restrictions that would prevent the proposed greenway being split into two or more phases. Nonetheless, progressing the project in its entirety is likely to be somewhat beneficial as it would allow completion at an earlier date and may improve consistency of the finished product.

6 CONCLUSIONS

Clandillon Civil Consulting has been instructed by MCC to carry out a study in relation to the proposed Ballybay to Castleblayney Greenway to determine if the development of a greenway is feasible and to determine existing constraints, which would influence the development. In accordance with the Department of Transport, Tourism and Sport's '*Strategy for the Development of National and Regional Greenways*', feasible greenways will be those which are sustainable, strategic, substantially segregated and shared use, scenic and offer lots to see and do.

- Sustainable – There is potential for this project to be developed to follow the alignment of a former railway track. The existing geometry of the decommissioned rail alignment lends itself well to re-use as a greenway and will assist in reducing the impact of the scheme on the local environment. Where is it not possible to follow the rail alignment, there are typically options to follow field boundaries, rivers or local roads which will assist in ensuring the greenway does not have significant impacts on the local environment.
- Strategic – The proposed greenway would connect Ballybay and Castleblayney, two key towns in County Monaghan and would link into existing facilities within both towns and complement future recreational proposals in both areas. The greenway would also link to the village of Doohamlet, improving its accessibility from both towns. This proposed greenway could also ultimately be linked to other greenways which have been proposed

or are in development. These include the 190km Ulster Canal Greenway which connects to Monaghan Town and Clones, and the Border Kingdoms Greenway which is proposed to connect Navan, Kingscourt, Carrickmacross and Dundalk. It could also connect to pedestrian and cycle facilities proposed as part of the N2 Ardee to Castleblayney Road Scheme, improving connectivity for sustainable transport options for the whole of the mid and south Monaghan region.

- Substantially Segregated & Shared Use – Preliminary route options have been developed which demonstrate the potential exists for the proposed greenway to be substantially segregated. The route would be developed in accordance with design standards to ensure it is of sufficient width to facilitate all non-motorised users.
- Scenic - The proposed greenway traverses the unspoilt Drumlin countryside of County Monaghan and could connect the beautiful parkland setting of Louth Muckno and the wetland and lakeland landscape of Ballybay via a number of small lakes along the route. Where the route is aligned to the former route of the great northern railway, it will traverse a landscape with a high density of industrial heritage features such as abandoned railways bridges and level crossings, which will add to the scenic value of the route.
- Lots to See and Do – Greenway users would benefit from recreational activities along the route, including facilities such as Lough Muckno and its Adventure playground, Castleblayney Outdoor Adventure Centre, various fishing lakes, Doohamlet Community Garden and Community Park, Ballybay Park and playground, and Ballybay Wetland Centre. The greenway also passes a number of archaeological sites which could be developed and waymarked to ensure all users have lots to see and do along the route.

As set out above, it is considered that the proposed greenway will meet all five of the '*Strategy for the Development of National and Regional Greenways'* objectives. It is also considered that the greenway will meet MCC's specific objectives of supporting active travel and sustainable travel, providing a tourism amenity and providing recreational amenity for the local populations.

This report has been considered constraints which may influence the development following a desktop study and a site walkover. Constraints considered included engineering constraints, drainage and flooding, geotechnical features, structures, and environmental constraints including ecology, archaeological and architectural heritage and land ownership.

The constraints have been mapped on the drawings in Annex B. Potentially key constraints and considerations include:

- The presence of cross-section pinch points – particularly along sections where the greenway may follow local and regional roads
- The width available to cyclists and pedestrians at structure crossings – particularly under the N2;
- The number and treatment of road crossings.
- The availability and or ownership of land along the former railway line.

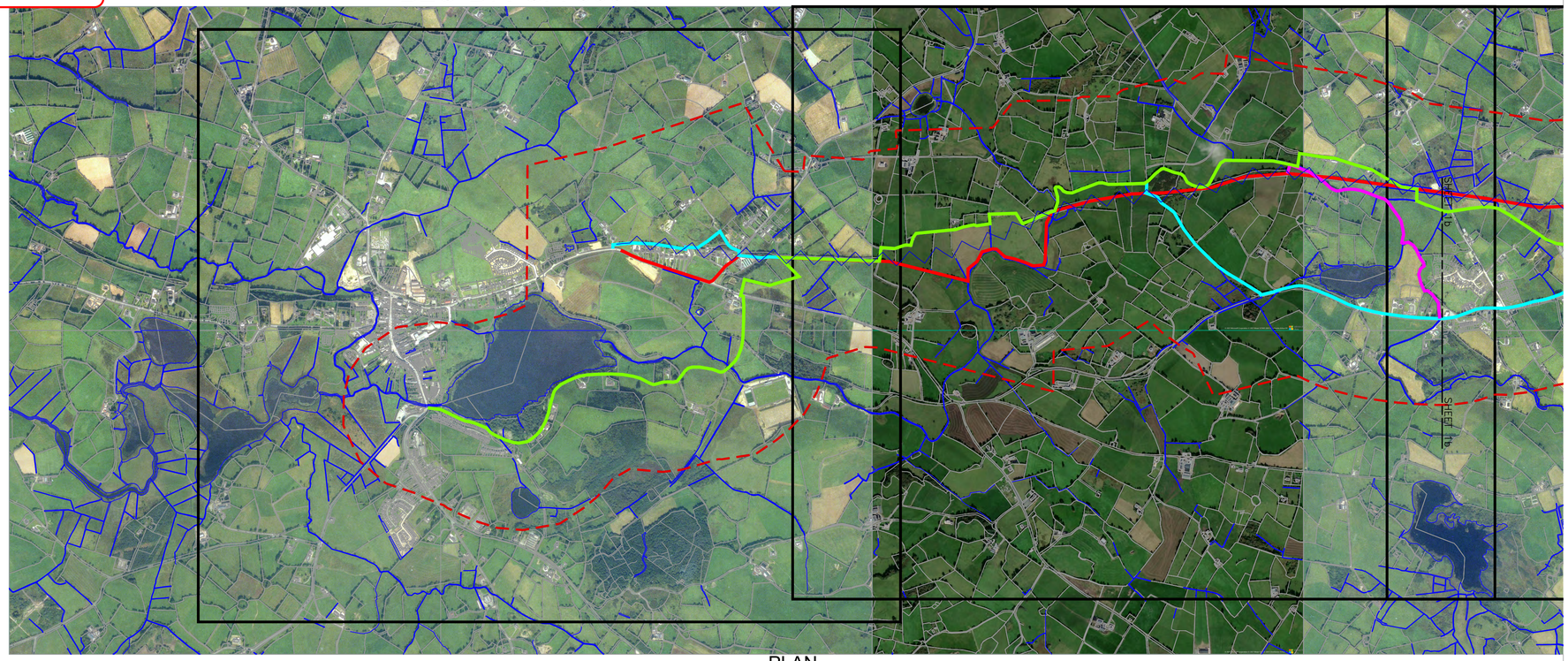
The constraints identified are considered to be typical of a project of this nature and are unlikely to prevent the development of a greenway which meets the established project objectives.

APPENDIX A – STUDY AREA

FOR INFORMATION

B2C-DR-GA-0001

B2C-DR-GA-0002

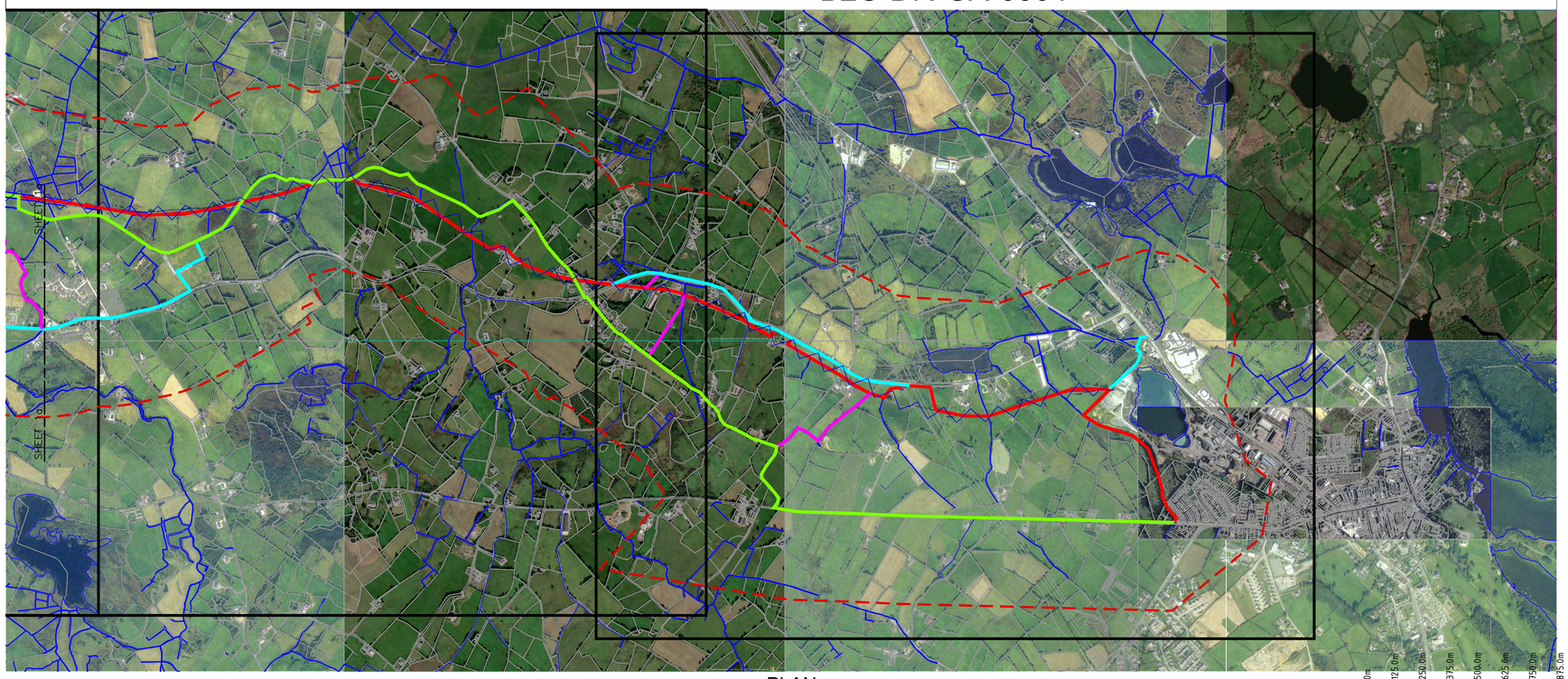


PLAN

Scale 1:12500

B2C-DR-GA-0003

B2C-DR-GA-0004



PLAN

Scale 1:12500

0m 125.0m 250.0m 375.0m 500.0m 625.0m 750.0m 875.0m 1000.0m 1125.0m 1250.0m

Scale 1:12500

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LEGEND

- STUDY AREA
- WATERCOURSES
- FORMER GREAT NORTHER RAILINE

PRELIMINARY ROUTES:

- OPTION A
- OPTION B
- OPTION C
- OPTION D

KEY PLAN

REV	DATE	DESCRIPTION	BY	CHK	APD
I02	29/03/2021	ROUTES ADDED AT DOOHAMLAT	KK	SF	SC
I01	16/03/2021	FOR INFORMATION - REVISION	KK	SF	SC
I00	15/03/2021	FOR INFORMATION	KK	SF	SC

CONSULTANT

CLANDILLON
CIVIL CONSULTING

CLIENT

PROJECT

BALLYBAY TO CASTLEBLAYNEY GREENWAY

DRAWING TITLE

STUDY AREA

DESIGNED	DRAWN	CHECKED/APPROVED
SF	KK	SC
DATE	SCALE	SHEET SIZE
10/03/2021	1:12,500	A1

DRAWING NUMBER: B2C-DR-GA-0000

REVISION: I02

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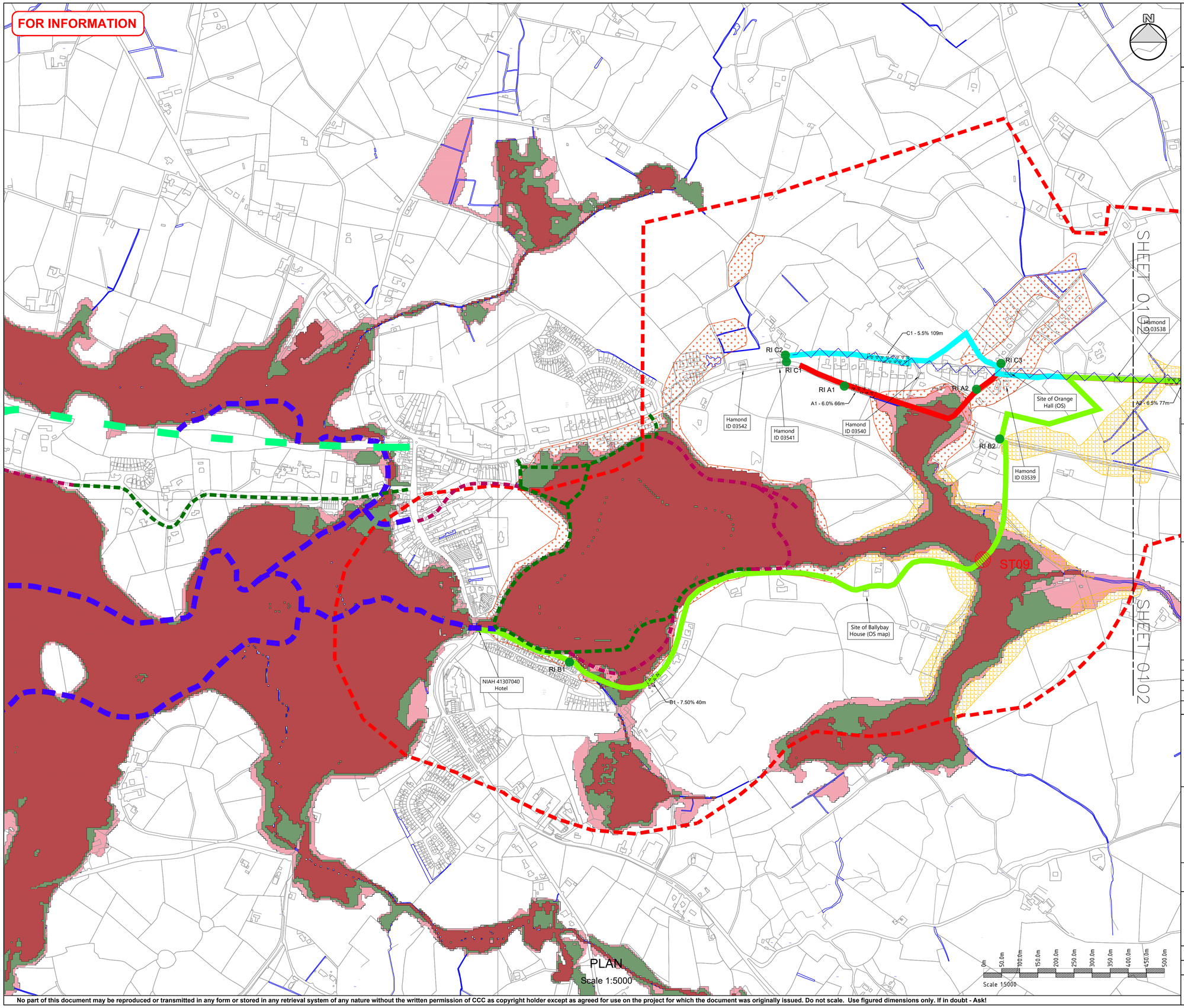
APPENDIX B – CONSTRAINT DRAWINGS

FOR INFORMATION



PLAN
Scale 1:5000

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LEGEND

- LMA
- STUDY AREA
- WATERCOURSES
- FORMER GREAT NORTHER RAILINE

PRELIMINARY ROUTES:

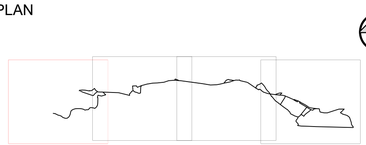
- OPTION A
- OPTION B
- OPTION C
- OPTION D

- ST01 — EXISTING STRUCTURE CROSSING
- 10yr FLOOD EXTENTS
- 100yr FLOOD EXTENTS
- 1000yr FLOOD EXTENTS
- C6 - 7.69% 26m — VERTICAL GEOMETRY CONSTRAINT
- PEAT
- ALLUVIUM
- BEDROCK OUTCROP OR SUBCROP

PROPOSED INTEGRATED PATH NETWORK:

- EXISTING PATH/FOOTWAY NETWORK
- PROPOSED BOARDWALK & PATHS (SHORT TERM)
- PROPOSED BOARDWALK & PATHS (LONG TERM)
- PROPOSED GREENWAY
- RI AXX — ROAD INTERFACE

KEY PLAN



REV	DATE	DESCRIPTION	BY	CHK	APD
I01	17/09/2021	Additonal Structures & Ground Conditions Added	GA	SF	SC
I00	13/05/2021	FOR INFORMATION	ZM	SF	SC

CONSULTANT: CLANDILLON CIVIL CONSULTING

CLIENT

PROJECT: BALLYBAY TO CASTLEBLAYNEY GREENWAY

DRAWING TITLE: ENGINEERING AND ENVIRONMENTAL CONSTRAINTS SHEET 1 OF 4

DESIGNED	DRAWN	CHECKED/APPROVED
SF	ZM	SC
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16/09/2021	1:5000	A1

DRAWING NUMBER: B2C-DR-EW-0101

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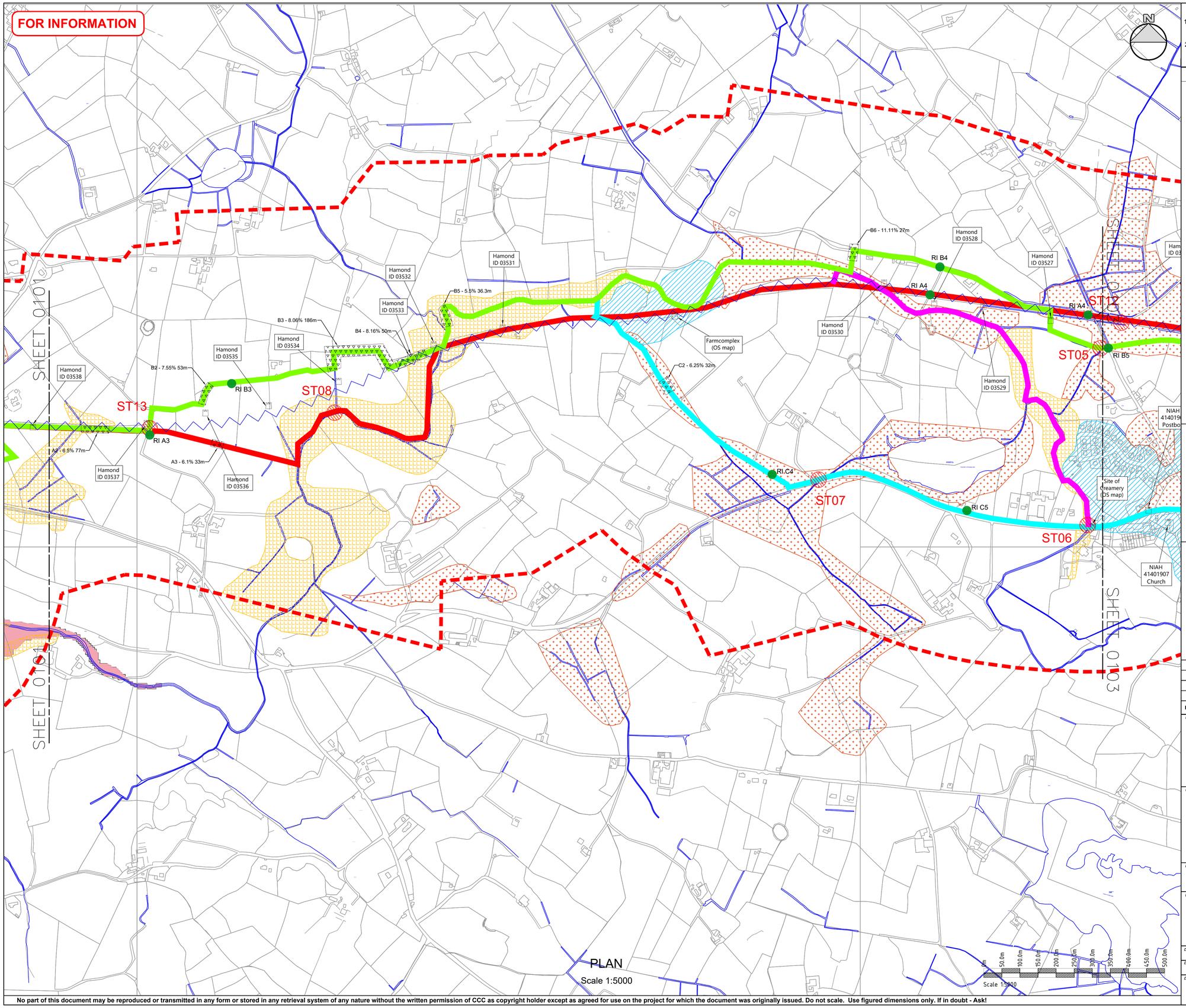
FOR INFORMATION



PLAN
Scale 1:5000

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LEGEND

- LMA
- STUDY AREA
- WATERCOURSES
- FORMER GREAT NORTHER RAILINE

PRELIMINARY ROUTES:

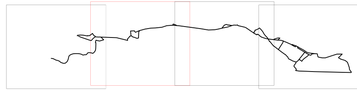
- OPTION A
- OPTION B
- OPTION C
- OPTION D

- ST01 — EXISTING STRUCTURE CROSSING
- 10yr FLOOD EXTENTS
- 100yr FLOOD EXTENTS
- 1000yr FLOOD EXTENTS
- C6 - 7.69% 26m — VERTICAL GEOMETRY CONSTRAINT
- PEAT
- ALLUVIUM
- BEDROCK OUTCROP OR SUBCROP

PROPOSED INTEGRATED PATH NETWORK:

- EXISTING PATH/FOOTWAY NETWORK
- PROPOSED BOARDWALK & PATHS (SHORT TERM)
- PROPOSED BOARDWALK & PATHS (LONG TERM)
- PROPOSED GREENWAY
- RI AXX — ROAD INTERFACE

KEY PLAN



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I01	17/09/2021	Additonal Structures & Ground Conditions Added	GA	SF	SC
I00	13/05/2021	FOR INFORMATION	ZM	SF	SC

CONSULTANT: CLANDILLON CIVIL CONSULTING

CLIENT

PROJECT: BALLYBAY TO CASTLEBLAYNEY GREENWAY

DRAWING TITLE: ENGINEERING AND ENVIRONMENTAL CONSTRAINTS SHEET 2 OF 4

DESIGNED	DRAWN	CHECKED/APPROVED
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16/09/2021	1:5000	A1

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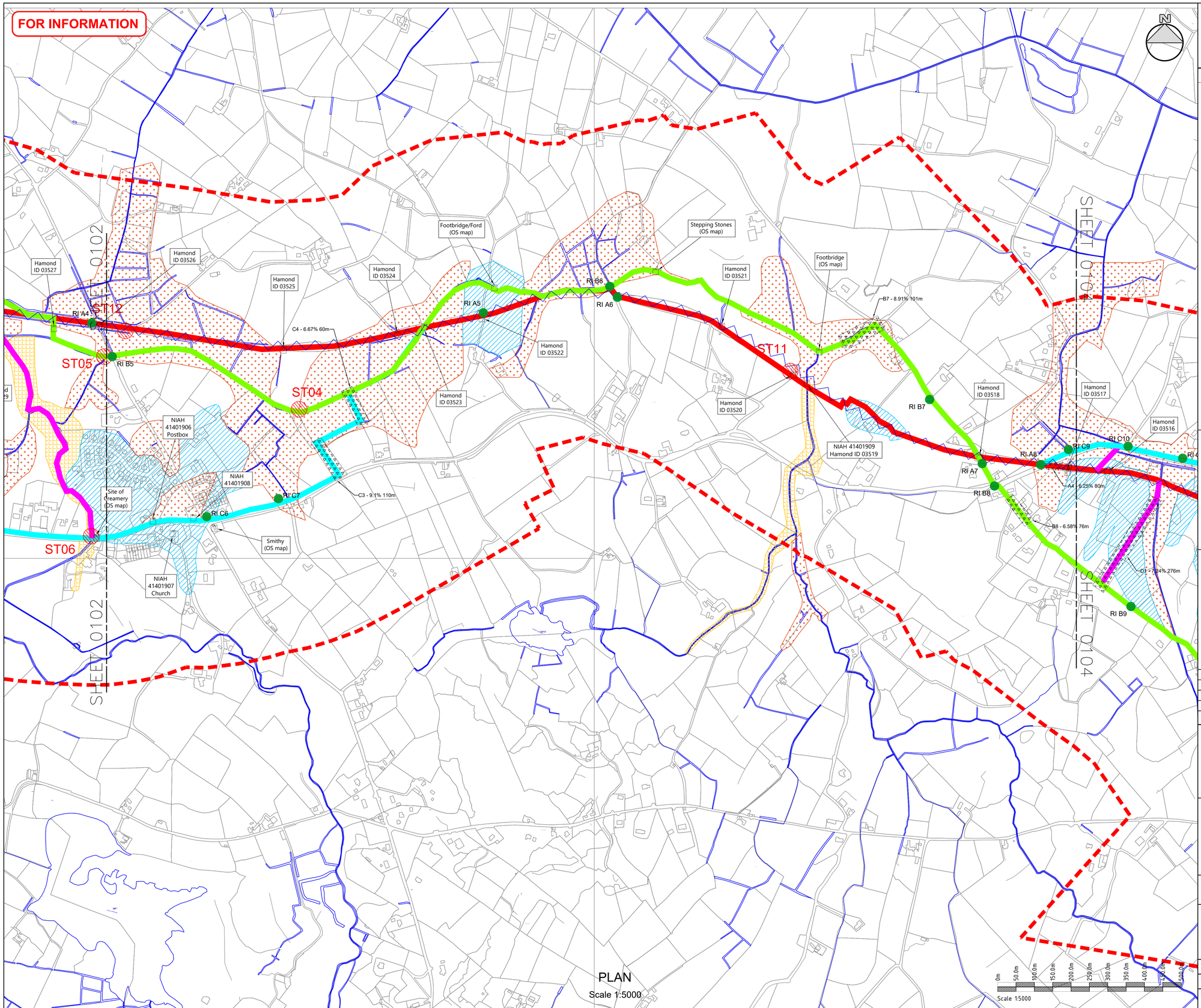

PLAN
Scale 1:5000

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LEGEND

- LMA
- STUDY AREA
- WATERCOURSES
- FORMER GREAT NORTHER RAILINE

PRELIMINARY ROUTES:

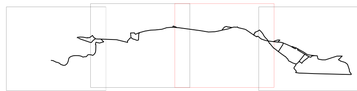
- OPTION A
- OPTION B
- OPTION C
- OPTION D

- ST01 — EXISTING STRUCTURE CROSSING
- 10yr FLOOD EXTENTS
- 100yr FLOOD EXTENTS
- 1000yr FLOOD EXTENTS
- C6 - 7.69% 26m — VERTICAL GEOMETRY CONSTRAINT
- PEAT
- ALLUVIUM
- BEDROCK OUTCROP OR SUBCROP

PROPOSED INTEGRATED PATH NETWORK:

- EXISTING PATH/FOOTWAY NETWORK
- PROPOSED BOARDWALK & PATHS (SHORT TERM)
- PROPOSED BOARDWALK & PATHS (LONG TERM)
- PROPOSED GREENWAY
- RI AXX — ROAD INTERFACE

KEY PLAN



REV	DATE	DESCRIPTION	BY	CHK	APD
I01	17/09/2021	Additonal Structures & Ground Conditions Added	GA	SF	SC
I00	13/05/2021	FOR INFORMATION	ZM	SF	SC

CONSULTANT: CLANDILLON CIVIL CONSULTING

CLIENT

PROJECT: BALLYBAY TO CASTLEBLAYNEY GREENWAY

DRAWING TITLE: ENGINEERING AND ENVIRONMENTAL CONSTRAINTS SHEET 3 OF 4

DESIGNED	DRAWN	CHECKED/APPROVED
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16/09/2021	1:5000	A1

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FOR INFORMATION

SHEET 01 OF 03

SHEET 01 OF 03

RI A8
RI C9
RI C10
RI C8
RI C11
RI A9
RI C8
RI B9
RI A10
RI C12
RI B10
RI A11

Hamond ID 03517
Hamond ID 03516
Hamond ID 03515
Hamond ID 03514
Hamond ID 03513
Hamond ID 03512
Hamond ID 03511
Hamond ID 03510
Hamond ID 03509
Hamond ID 03508
Hamond ID 03507
Hamond ID 03506

Modeese House and farmyard (OS map)

Site of Killycard Cottage (OS map), in ruins

A4 - 9.25% 80m
B8 - 6.58% 76m
C5 - 6.82% 44m
C6 - 7.69% 26m
C7 - 8% 50m
D1 - 7.24% 276m
B9 - 8.65% 104m
D3 - 6.25% 32m
D2 - 8.42% 47.5m
D4 - 10.09% 317m
A5 - 8.3% 60m
A6 - 7.0% 100m
B10 - 7% 43m
B11 - 6.00% 50m
C8 - 5.38% 130m
A7 - 8.5% 70m
A8 - 6.67% 30m
A9 - 6.67% 30m
A10 - 6.43% 140m

ST01
ST10
ST03
ST02

PLAN
Scale 1:5000

0m 50.0m 100.0m 150.0m 200.0m 250.0m 300.0m 350.0m 400.0m 450.0m 500.0m
Scale 1:5000

N

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LEGEND

- LMA
- STUDY AREA
- WATERCOURSES
- FORMER GREAT NORTHER RAILINE

PRELIMINARY ROUTES:

- OPTION A
- OPTION B
- OPTION C
- OPTION D

ST01 — EXISTING STRUCTURE CROSSING
10yr FLOOD EXTENTS
100yr FLOOD EXTENTS
1000yr FLOOD EXTENTS
C6 - 7.69% 26m — VERTICAL GEOMETRY CONSTRAINT
PEAT
ALLUVIUM
BEDROCK OUTCROP OR SUBCROP

PROPOSED INTEGRATED PATH NETWORK:

- EXISTING PATH/FOOTWAY NETWORK
- PROPOSED BOARDWALK & PATHS (SHORT TERM)
- PROPOSED BOARDWALK & PATHS (LONG TERM)
- PROPOSED GREENWAY
- RI AXX — ROAD INTERFACE

KEY PLAN

N

REV	DATE	DESCRIPTION	BY	CHK	APD
I01	17/09/2021	Additonal Structures & Ground Conditions Added	GA	SF	SC
I00	13/05/2021	FOR INFORMATION	ZM	SF	SC

CONSULTANT
CLANDILLON CIVIL CONSULTING

CLIENT

PROJECT
BALLYBAY TO CASTLEBLAYNEY GREENWAY

DRAWING TITLE
ENGINEERING AND ENVIRONMENTAL CONSTRAINTS
SHEET 4 OF 4

DESIGNED	DRAWN	CHECKED/APPROVED
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DATE	SCALE	SHEET SIZE
16/09/2021	1:5000	A1
DRAWING NUMBER		REVISION
B2C-DR-EW-0104		I01

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APPENDIX C – GRADIENT ANALYIS

Location	Maximum Gradient (%)	Length of Gradient > 5% (m)
A1	6.00	66
A2	6.50	77
A3	6.10	33
A4	6.25	80
A5	8.30	60
A6	7.00	100
A7	8.50	70
A8	6.67	30
A9	6.67	30
A10	6.43	140
B1	7.50	40
B2	7.55	53
B3	8.06	186
B4	8.16	50
B5	5.50	36
B6	11.11	27
B7	8.91	100
B8	6.58	76
B9	8.65	104
B10	7.00	43
B11	6.00	50
C1	5.50	109
C2	6.25	32
C3	9.10	110
C4	6.67	60
C5	6.82	44
C6	7.69	26
C7	8.00	50
C8	5.38	130
D1	7.24	276
D2	8.42	48
D3	6.25	32
D4	10.09	317

APPENDIX D – IMAGES OF STRUCTURES

ST01 – Picture looking East at ST01

ST02 – Picture looking East at ST02

ST03 – Aerial view of 2no. buried culverts

ST03 – Buried Masonry Stone Culvert

ST04 – Aerial View of ST04

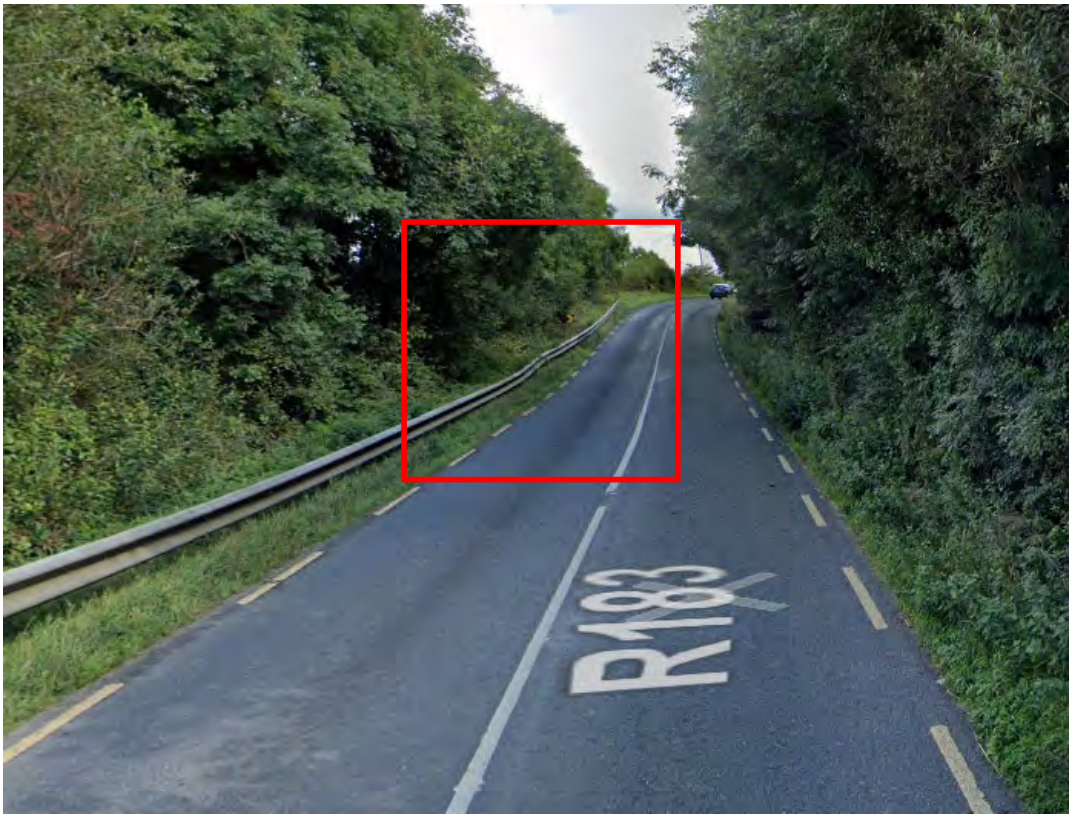
ST04 – Elevation of ST04

ST05 – Picture looking South at ST05

ST06 – Picture looking East at ST06

ST06 – Picture looking South at ST06

ST07 – Top: Parapet can be seen on right and is overgrown on left



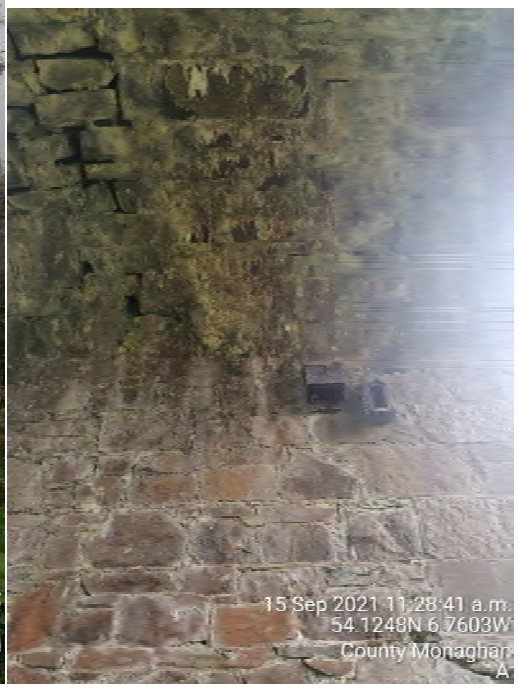
ST07 – Bottom: Damage to VRS is noted.

ST08 – Aerial view of ST08

ST09 – Picture looking South at ST09

ST09 – Picture looking West at ST09 showing overgrowth and collapsed parapet

ST09 – Picture looking West under ST09 showing scour issue in South bank



ST10 –

Left: View looking North through Masonry Arch Railway Bridge. Embankment deconstructed to the East and West.

Right: Bat boxes and missing mortar noted inside the structure

ST10 – Crack in the abutment.

ST11 – Masonry structure retained but embankment deconstructed to the East and West.

ST12 = Masonry Arch picture taken from the deck. Unprotected steep edge and overgrowth prevent access.

ST13 – Looking West at ST13, the South Span is infilled. The parapet is not suitable. The overgrowth and infill should be removed in the presence of an engineer to assess the structure fully

APPENDIX E - ARCHAEOLOGICAL, ARCHITECTURAL AND CULTURAL HERITAGE ASSESSMENTS

CULTURAL HERITAGE ASSESSMENT - BALLYBAY TO CASTLEBLAYNEY GW

Introduction

A cultural heritage assessment was carried in March/April 2021 by Kerstin Bartels-Shortt MIAI of Clandillon Civil Consulting, as part of the Technical Scoping Study Report for the Ballybay to Castleblayney Greenway Project for Monaghan County Council. The report aims to identify heritage constraints within the study area, which is aligned along a ca. 14 km stretch of the former Dundalk to Enniskillen railway line between Ballybay and Castleblayney.

The report assesses the archaeological and cultural heritage potential of the receiving environment and forms the basis for the examination of potential constraints posed by the proposed development on the archaeology, architectural heritage, industrial heritage and other cultural heritage elements.

The Receiving Environment

The proposed greenway will follow the route of the Dundalk to Enniskillen Railway section between Castleblayney and Ballybay wherever possible. The single track Dundalk to Castleblayney section of the Dundalk to Enniskillen railway line opened in February 1849. The extension to Ballybay, constructed by Moore Brothers, was opened in July 1854, with the next 16kms to Newbliss becoming operational in 1855. Despite financial difficulties, gas lighting was introduced at Ballybay station in 1872. In 1876 the Great Northern Railway (Ireland) was established as the result of the merger of four railway companies: the Drogheda & Dundalk, Dublin & Belfast Junction, the Irish North Western (originally the Dundalk & Enniskillen), and Ulster Railway. Following partition of Ireland in 1921 traffic on the route reduced significantly. The line continued to operate until the mid-20th century. Additional halts for railbuses and railcars were introduced to the north of the village of Doohamlet and at Knocknamaddy just outside Ballybay some time between 1934 and 1940.

The railway was gradually closed to passengers and goods during the 1950s. Ballybay Railway Station closed on 14 October 1957. Today, the condition of the railway varies greatly along this route, with some areas of the railway removed entirely and development having taken place along sections of the route.

Assessment Methodology

The assessment of cultural heritage constraint for this project involved a desktop survey of archaeological, historical and cartographic sources within the identified study area along the alignment of the railway line between Ballybay and Castleblayney.

The following sources were examined to establish the archaeological, architectural and cultural heritage potential of the proposed development:

- Record of Monuments and Places ("RMP")/ for County Monaghan;
- Monaghan County Development Plan 2019-2025;
- National Inventory of Architectural Heritage (NIAH);
- 'An Industrial Heritage Survey of Railways in Counties Monaghan and Louth' by Fred Hamond and Charles Friel, for Monaghan and Louth County Councils, 2007

- Cartographic sources, including first edition 6'' OS maps;
- Aerial photography;
- Excavation bulletins;

ARCHAEOLOGY

Sites/National Monuments in the Ownership of the State

There are no sites or National Monuments in the ownership of the State located within the study area.

RMP Sites

Five RMP sites were recorded within the study area, see table below. None of these sites are located within close proximity to the proposed development.

Abbreviations: Option A (red)= OA , Option B (green) = OB, Option C (blue) = OC, Option D (pink) = OD

RMP No.	Townland	Monument	Location	Distance
MO019-025-	Rausker	Megalithic tomb – wedge tomb 'Giant's Grave', 1st ed 6''OS	675267, 821370	120m OB 240m OA
M0019-026-	Tonyscallan	Ringfort - rath	675919, 821023	200m OA/ OD
MO019-029-	Coolmahan	Ringfort - rath	677224, 821270	170m OA
MO019-045-	Brackagh	Ringfort - rath	678314, 821338	125m OB, 190m OA
MO020-017-	Muldrumman	Ringfort - rath	680412, 819585	175m OB

Table 1: Recorded Archaeological Sites within the Study Area

Excavations Database (www.excavations.ie)

No sites of archaeological significance within the study area have been identified from the examination of the excavations database.

Topographical Files

The topographical files of the National Museum of Ireland provide a record of individual finds, which are recorded per townland. *All townlands impacted by the proposed development will be examined in the more detailed stages of the environmental assessment of the proposed development.*

ARCHITECTURAL HERITAGE

In 1990, the National Inventory of Architectural Heritage ("NIAH") was established to fulfil Ireland's obligations under the Granada Convention, through the establishment and maintenance of a central record, documenting and evaluating the architectural heritage of Ireland.

The National Inventory of Architectural Heritage ("NIAH") records all built heritage structures within specific counties in Ireland and the record is used to advise Local Authorities on the updating of the Record of Protected Structures ("RPS") as required by the Planning and Development Act, 2000. The Act of 2000 requires Local Authorities to establish a Record of Protected Structures to be included in the County Development Plan ("CDP"). Structures which have been attributed a rating value of international, national or regional importance in the NIAH inventory are recommended by the Minister of Culture, Heritage and the Gaeltacht (CHG) to the relevant planning authority for inclusion on the RPS. Buildings recorded in the RPS can include Recorded Monuments, structures listed in the NIAH or buildings deemed to of architectural, archaeological or artistic importance by the Minister. Once listed in the RPS the sites/areas receive statutory protection from injury or demolition under the 2000 Act. Damage to or demolition of a site registered in the RPS is an offence.

Records examined for the purpose of this assessment included:

- National Inventory of Architectural Heritage: County Monaghan;
- Monaghan County Council Development Plan 2019-2025, Record of Protected Structures
- Ordnance Survey of Ireland- historical and Ordnance Survey Maps;

NIAH Sites / Record of Protected Structures

Six structures of architectural heritage significance included in the NIAH are located within the study area. Two of these sites at Doohamlet are also included in the Record of Protected Structures (RPS) of the Monaghan County Council 2019-2025 Development Plan, as shown in the table below.

The single arch railway bridge at Tonyglassan lies directly on the Option A route as it carried the Dundalk & Enniskillen Branch over a local access road. It is now located within pasture. The post box, church and water pump at Doohamlet are all located alongside the R183 running through the village, which the Option C route may use at this location.

Abbreviations: Option A (red)= OA , Option B (green) = OB, Option C (blue) = OC, Option D (pink) = OD

NIAH No.	Townland	Description	Rating	Location	Date	Distance
41307040	Ballybay (Main Street Lower)	Hotel	Regional	271898, 320140	c. 1870	20m OA
41401910	Knocknamaddy	Walled Garden (Ballybay House - house destroyed)	Regional	273184, 320066	c. 1840	200m OA
41401906	Doohamlet	Postbox (RPS 41101949)	Regional	276799, 320596	c. 1905	0m OC
41401907	Doohamlet	Church/chapel (All Saint's RC Church); (RPS 41401920)	Regional	276860, 320561	1857, rebuilt 1882	0m OC (boundary, gate), 15m OC (church)
41401908	Doohamlet	Water pump	Regional	276878, 320586	c. 1870	0m OC

41401909	Tonyglassan	Single arch Railway bridge	Regional	278577, 320979	1850	0m OA, 90m OB

Table 2: NIAH sites / RPS sites within the Study Area

The Louth/Monaghan Railway Network Publication 'Industrial Heritage Survey of Railways in Counties Monaghan and Louth'

A survey of the Great Northern Railway line was carried out by Fred Hamond and Charles Friel in 2007, which recorded associated structures such as station buildings, station houses, platforms, footbridges, waiting sheds, toilets, goods sheds, weighbridges, engine and carriage sheds, signal boxes, water tanks, as well as all over- and underbridges. Culverts were excluded. In total eight stations and 206 other sites were recorded by Hamond along the 67 kms length of the Dundalk to Enniskillen railway line located within Counties Louth and Monaghan.

On the Castleblayney to Ballybay section the survey identified only two sites of regional or national significance, both of them being the relevant train stations and associated features. Neither Castleblayney railway station (03501) nor Ballybay railway station (03601) are located within the study area. No other sites along the Castleblayney to Ballybay section of the Dundalk to Enniskillen railway line were recommended for inclusion in the Record of Protected Structures.

A good example of a level crossing gate was recorded in the townland of Muldrumm (035011, see Fig 1 below). The survey found that between Dundalk and Ballybay all the gates were hung from locally sourced random rubble pillars of square or circular cross-section, while beyond Ballybay they were hung from mass-produced stone posts. All the surviving gates along the line are of sunburst design and appear to have been fabricated to a standardized size of 3.1m long by 1.5m high (10ft x 5ft).

Fig 1: Cylindrical rubble stone pillars and sunburst gate on Castleblayney-Ballybay section (03511)

Within the study area there are 21 Level Crossings as recorded by the survey, 19 of which are labelled 'Level Crossing' on the 25'' Ordnance Survey map. The survey also identified 16 bridges within the study area. No detailed description of these structures was provided in the survey. Of the bridges recorded in 2007, only one is included in the NIAH (03519 at Tonyglassan). The Level Crossing House at the Doohamlet Halt is depicted on the 25'' OS map but not labelled. It is now a private residence located on the western side of the L3430. The Level Crossing House at the Knocknamaddy Halt appears to have been replaced by a modern bungalow. This is located at a distance ca. 30m from the proposed

route (Options A and B). A full list of sites located within the study area, which were identified by the Hamond survey can be found in the table below:

Identifier	Townland	Site Type	Irish Grid E/N	25'' OS map Label
03506	Moraghy	Level Crossing	2814/3202	Level Crossing
03507	Killycard	Bridge (rail/road)	2811/3202	-
03508	Killycard	Bridge (rail/road)	2810/3202	-
03509	Muldrumman	Level Crossing	2808/3201	-
03510	Muldrumman	Level Crossing	2807/3201	Level Crossing
03511	Muldrumman	Level Crossing	2805/3201	-
03512	Modeese	Level Crossing	2803/3202	Level Crossing
03513	Modeese	Bridge (road/rail)	2802/3203	-
03514	Modeese	Bridge (road/rail)	2800/3204	-
03515	Modeese	Level Crossing	2796/3206	Level Crossing
03516	Killycrom	Level Crossing	2793/3207	Level Crossing
03517	Killycrom	Bridge (rail/road)	2792/3207	-
03518	Tonyglassan	Bridge (road/rail)	2790/3207	-
03519 (NIAH 41401909)	Tonyglassan	Bridge (rail/river)	2785/3207	-
03520	Tattyreagh South	Bridge (rail/road)	2785/3210	-
03521	Tattyreagh South	Level Crossing	2783/3211	Level Crossing
03522	Corryloan	Bridge (road/rail)	2776/3211	-
03523	Corryloan/ Coolmannan	Bridge (rail/river)	2775/3211	-
03524	Coolmannan	Level Crossing	2774/3211	Level Crossing
03525	Coolmannan	Level Crossing	2771/3210	Level Crossing
03526	Tonyscallan	Doohamlet halt	2766/3211	-
03526.01	Tonyscallan	Level Crossing	2766/3211	Level Crossing
03526.02	Tonyscallan (on L3430)	Level Crossing House	2766/3211	Depicted on map / extant
03527	Tonyscallan	Level Crossing	2765/3211	Level Crossing
03528	Tonyscallan	Level Crossing	2761/3211	Level Crossing
03529	Tonyscallan	Bridge (rail/river)	2760/3212	-
03530	Tonyscallan	Bridge (rail/road)	2755/3211	-
03531	Terrygreghan	Level Crossing	2750/3211	Level Crossing
03532	Dunmaurice/ Terrygreghan	Bridge (rail/river)	2748/3210	-
03533	Dunmaurice	Level Crossing	2747/3210	Level Crossing
03534	Dunmaurice	Level Crossing	2745/3209	Level Crossing
03535	Dunmaurice	Level Crossing	2743/3208	Level Crossing
03536	Dunmaurice	Level Crossing	2741/3208	Level Crossing
03537	Dunmaurice	Bridge (road/rail)	2740/3208	-
03538	Dunmaurice	Level Crossing	2736/3208	Level Crossing
03539	Dunmaurice/ Knocknamaddy	Bridge (rail/road)	2733/3208	-
03540	Knocknamaddy	Bridge (rail/road)	2731/3208	-
03541	Knocknamaddy	Level Crossing	2727/3208	Level Crossing
03542	Knocknamaddy	Knocknamaddy halt	2726/3208	-

03542.01	Knocknamaddy	Level Crossing	2726/3208	Level Crossing
03542.02	Knocknamaddy	Level Crossing House	2726/3208	- Not extant
03542.03	Knocknamaddy	Hardstand	2726/3208	-

Table 3: Sites identified from Hamond survey

Additional Sites of Cultural Heritage Potential identified from Cartographic Sources

Thirteen further sites of potential cultural heritage significance were identified from cartographic sources. Some of these sites may have been removed by modern development.

Abbreviations: Option A (red)= OA , Option B (green) = OB, Option C (blue) = OC, Option D (pink) = OD

Townland	**Site Type**	**Source**	**Location**	**Distance**
Knocknamaddy	House (Ballybay House and ornamental garden), see also NIAH 41401910 Walled Garden Now site of a modern structure	1st ed OS 6''/ 25'' OS	672953, 820306	30m OB
Dunmaurice	Orange Hall Overgrown ruined remains of a building visible to north of railway line	1st ed OS 6''/ 25'' OS (ca. 1900)	673339, 820876	5-10m OA
Tonyscallan	Farm complex (in ruins) and spring	25'' OS map	675444, 821144	5m OA, OB
Doohamlet	Site of Creamery, No visible trace of building to north of R183	1st ed OS 6'' 25'' OS	676589, 820576	5m OC
Doohamlet	Corn Mill and mill race, ruined	1st ed OS 6''	676410, 820430	120m OC
Doohamlet	Smithy Roadside cottage (Doohamlet Foodmarket)	1st ed OS 6''/ 25'' OS	676906 820596	0m OC
Devlin	Footbridge/ Ford	25'' OS (ca. 1900)	677643, 821250	0m OB
Devlin/ Corryloan	Ford	1st ed OS 6''	677634, 821249	0m OB
Brackagh/ Tattyreagh South	Stepping Stones	1st ed OS 6''	678088, 821292	0m OB
Tattyreagh South/ Tonyglassan	Footbridge	25'' OS	678543, 821064	0m OB
Modeese	Modeese House and farmyard (extant)	1st ed OS 6'' 25'' OS	680211, 820274	10m OA, 40m OB (road), 70m OD

Moraghy Quarry	Moraghy Quarry (submerged in lake)	1st ed OS 6''	681836, 820024	200m OA
Killycard	Killycard Cottage (now derelict)	1st ed OS 6'' 25'' OS	681663, 819692	0m OB, 10m OA

Table 4: Sites identified from Cartographic Sources

CONCLUSION

The preliminary desktop assessment found that there are five recorded archaeological sites located within the study area, as well as six sites of architectural heritage significance included in the NIAH, of which two are also included in the Record of Protected Structures in the Monaghan County Council Development Plan. Twenty-one level crossings, fifteen additional bridges and two level crossing houses were recorded by the 2007 'Industrial Heritage Survey of Railways in Counties Monaghan and Louth'. A further thirteen sites of potential cultural heritage significance were identified from cartographic sources.

None of the recorded archaeological sites are located in close proximity to any of the proposed route options. Of the NIAH structures, four are located adjacent to public roads. It is unlikely that significant construction will be required at these locations as part of the proposed development, as the route would utilise existing infrastructure. The only NIAH site directly impacted by the proposed development is the railway bridge at Tonyglassan (NIAH 41401909). Site inspection will have to be conducted at this location to ascertain its condition and to mitigate against impacts on this structure by the proposed development.

The sites identified by the 2007 railway survey, including 21 level crossings, 15 additional bridges and two level crossing houses are by their nature all located directly along the route of the former railway line. It was not possible to assess their condition from the survey report. Further site inspection as part of the next phase of the proposed development will have to be conducted at these locations to record potential upstanding remains in detail and assess their condition. This is also the case for the thirteen sites identified from cartographic sources, some of which may have been completely removed by modern development, especially fords, footbridges and stepping stones.

The impact of the proposed development on the cultural heritage of the study area is deemed to be low. It is recommended that any residual impacts on sites of cultural heritage significance be mitigated through avoidance of structures and detailed recording of features of cultural heritage significance identified during site visits. The proposed development will provide better access to industrial heritage features such as level crossings and railway bridges and thus enhance the amenity value of the area.

There is of course potential to uncover further unrecorded sites of archaeological significance during the construction phase, where placement of new culverts and construction of bridges over streams may take place. In order to mitigate impacts on previously unidentified archaeological sites, it is recommended that works shall be designed to minimise ground disturbance.

APPENDIX F – ECOLOGICAL CONSTRAINTS STUDY

FLYNN FURNEY
ENVIRONMENTAL CONSULTANTS

Ballybay to Castleblayney Greenway: Ecological Constraints Report

By: Flynn, Furney Environmental Consultants

For: CLANDILLON CIVIL CONSULTING

Date: March 2021

1 Introduction

Flynn, Furney Environmental Consultants have been commissioned by Clandillon Civil Consulting to carry out an ecological constraints identification exercise on a number of potential route options along the proposed Ballybay to Castleblayney Greenway. A Greenway is a cycleway that caters for both pedestrians and cyclists in a recreational environment (TII, 2017). The proposed Greenway generally follows the route of the former Great Northern Railway Route between Ballybay and Castleblayney. A number of alternative routes options were also explored to provide alternatives if the route of the former railway is unfeasible or impractical for any reason.

The route is generally located within agricultural lands in a rolling drumlin landscape characteristic of this part of Co. Monaghan. A number of small woodlands, wetlands and lakes were also encountered along the route. Regeneration of scrub and woodland habitat types was also common within the railway embankments along the proposed route.

The ecological constraints exercise is informed by a complete a walkover survey of the proposed route in order to identify key ecological features for further consideration for the selection of the Greenway route. These include habitats within the survey corridor, key species therein and a consideration of possible effects thereon. It should be noted that this scoping process is not an impact assessment. Rather, its purpose is to identify the key areas for consideration and also to assess the requirements for future survey work and the level of detail indicated for these.

2 Desktop Study

Prior to the main fieldwork contributing to this assessment, a desktop survey of available information sources was carried out. These included:

- The National Biodiversity Data Centre Online Database
- The National Biodiversity Network Online Atlas
- The NPWS Protected Species Database and Online Mapping
- The Environmental Protection Agency Database

2.1 Results

Designated sites were identified using the current boundary shapefiles downloaded from the NWPS website. Records of species from within the relevant Km squares were also obtained. Habitat mapping also reviewed included the Irish Semi-Natural Grassland Surveys (ISGS), the National Survey of Native Woodland (NSNW) and Ancient Woodland Inventory.

2.1.1 Protected/Designated Sites: Designated sites were identified using the current boundary shapefiles downloaded from the NWPS website. Records of species from within the relevant Km squares were also obtained. Habitat mapping also reviewed included the Irish Semi-Natural Grassland Surveys (ISGS), the National Survey of Native Woodland (NSNW) and Ancient Woodland Inventory.

The route will not pass through any such sites. The nearest designated site to the proposed route is Lough Smiley proposed Natural Heritage Area c. 1km to east of start of route. No potential impacts on this site may reasonably be predicted.

2.1.2 Watercourses: The existing derelict railway line crosses Lough Major Stream (EPA Watercourse Code 36M08) four times. These are crossings are in the townlands of:

- Tattyreagh South
- Corryloon
- Tonyscallan
- Terrygreaghan

Fig. 1. Existing derelict railway route and area under study. Watercourses and monitoring stations shown

This watercourse is in the North-western River Basin District. The nearest EPA monitoring station for this stream is at the Bridge at Corryloan. This is c.200m to the south of the derelict railway line. In 2019, the water quality here was recorded as Q4 or *Good*. This watercourse has one other EPA monitoring station before entering Lough Major at Ballybay. The water quality here on 2019 sampling was also Q4, or *Good*.

2.1.3 Habitats Crossed by Existing Route: Almost the entirety of the habitat type found within the zone of influence of the proposed development is *improved agricultural grassland*. The route crosses some 30 no. field boundaries. Of these the greater majority appear to be mature hedgerows, typical of this part of Co. Monaghan. It should be noted that this number is likely to be an overestimate given that the existing derelict railway line does not 'cross' the field boundaries but generally appears (where extant) to be contiguous scrub or other woody vegetation. There appears to be some limited amount of wet grassland within the wider area, most occurring to the south of the proposed route. There does not appear to be any woodland within the area under study.

2.1.4 Existing Information: There are not believed to be any recorded habitats of anything greater than local significance recorded within the survey area.

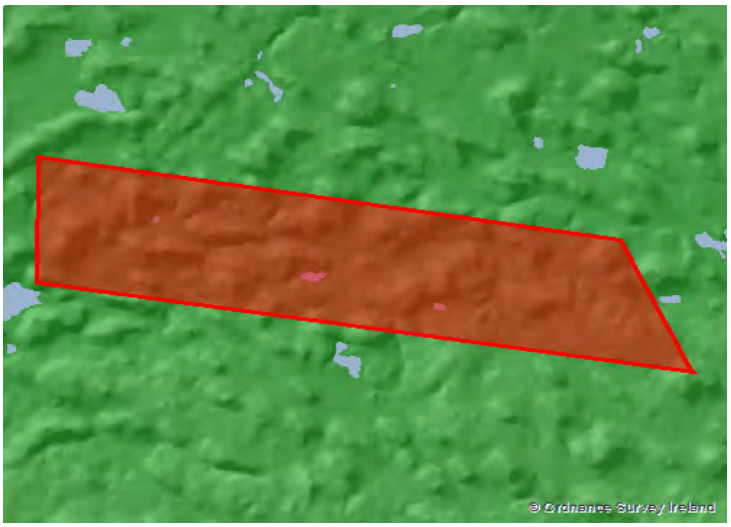


Fig. 2. The National Biodiversity Data Centre database 'user-defined polygon' area. Resulting protected species given below.

The NBDC database returned 13 no. species records from a polygon search. Of these, 5 are protected by Irish/European law. These are:

Mammals
Pine Marten
Badger

Amphibia
Common Frog

Birds
Snipe

Crustacea
White-Clawed Crayfish

All of these are common and widespread in this part of Co. Monaghan. However, the White-Clawed Crayfish is notable as this is a good quality freshwater-dependant species that is likely to occur in L. Major Stream. It is an Annex II and Annex V (Habitats Directive) listed species. Old railway lines (and even operational ones) represent favourable habitat for the location of badger setts and it should be noted that occurrence of setts is possible or even probable on such a route.

The database also recorded Japanese Knotweed as occurring within the polygon. This species is subject to control under S.I. 477.

It should be noted that the NBDC database results are likely to be a significant under-representation of the biota here. Co. Monaghan is one of the least 'recorded' of all counties (NBDC database user statistics, accessed April 2021). It is therefore likely that several protected species will occur here and be found during field surveys. Given the habitat types likely to be crossed by the route, it is however unlikely that any protected flora will be present.

2.3. Desktop Survey Conclusion

With no designated sites crossed by or immediately adjacent the route, no impacts on any protected area may reasonably be predicted.

The route crosses a watercourse of good water quality and an important habitat for a protected species.

Habitat types crossed by the route appear to be overwhelmingly of only local significance in terms of conservation value. Hedgerows and wet grassland are likely to be of highest significance. One caveat given here is that the derelict route itself may be of higher conservation value than most of the surrounding lands, given its more 'complex' nature and lack of disturbance over many decades.

A number of protected species have been recorded within the zone of influence of the proposed route. Almost all of these are common and widespread in Co. Monaghan. No significant impacts on any of these may be expected. An exception to this would be the occurrence of Badger setts within the proposed route where they could not be avoided.

Measures to protect the watercourse crossed by the stream should be considered from the outset.

3 Field Surveys

Field surveys were carried out between the 22nd and the 26th of March 2021. The primary purpose of these surveys was to:

- Identify any possible rare and vulnerable habitat types along the proposed route
- Assess for the presence of protected species of flora and fauna
- Identify ecological and environmental constraints to the construction of this Greenway
- Identify further ecological surveys work that will be required for this project.

The walkover survey considered a broad survey corridor to ensure all other important features that could be impacted by the development were considered (e.g. significant treelines and hedgerows, mammal habitat and watercourses). This fieldwork provided guidance for further, more detailed surveys including further mammal surveys, habitat surveys and floral surveys.

3.1.1 Un-surveyed Areas

Due to the density of regrowth encountered, some sections of the proposed route could not be surveyed in entireity. Preconstruction surveys will be required and to allow access to these areas some clearance operations will be required. Clearance in these areas should be carried out under the supervision of an ecologist.

3.1.2 Survey Limitations

The survey was carried out in March 2021 which is suboptimal for floral surveys therefore some flowering plant species/groups may be underrepresented in this survey's findings. Areas of less intensive agricultural management where rare flora are more likely to occur have been identified and further detailed assessment is recommended for these. However, the survey period was suitable for the identification of broad habitat types. The survey period was close to optimal for terrestrial mammals. Bat detector surveys were not carried out but an identification of bat roosting habitat was completed. This will inform any further survey work. Dedicated bird surveys could not be carried out at this time of year but bird nesting and foraging/feeding habitat was identified and recorded.

4 Results

4.1 Designated Sites

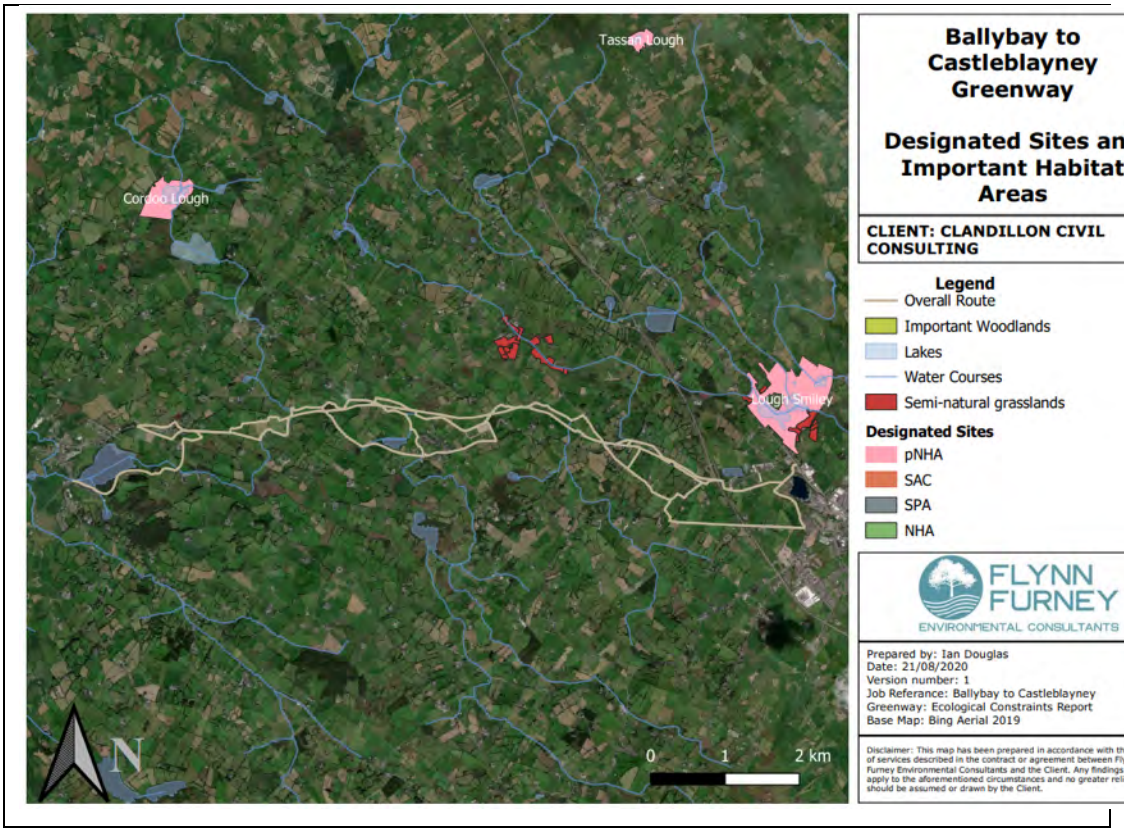
All sites designated for the conservation of nature in Ireland within 15km of the of the proposed route options were investigated as part of this assessment. There are no designated sites within the area under study. There are also no Natura 2000 designated sites with 15km of the proposed route. The nearest designated sites to the proposed route is Lough Smiley pNHA and Lough Muckno pNHA 0.5km and 1.3km from the Castleblayney end of the proposed route, respectively.

Table 1: Designated sites with 15km of the Proposed Route

Site Code	Sites	Designation	Distances
1607	Lough Smiley	pNHA	0.5km
563	Muckno Lake	pNHA	1.3km
1	Dromore Lakes	pNHA	2.8km
1268	Cordoo Lough	pNHA	3.7km
1600	Drumakill Lough	pNHA	4.7km
1666	Tassan Lough	pNHA	5.0km
1605	Lough Egish	pNHA	6.3km
1495	Lough Ross	pNHA	7.0km
1604	Gibson's Lough	pNHA	8.6km
1595	Loughbawn House Loughs	pNHA	8.6km
1596	Black And Derrygoony Loughs	pNHA	9.3km
1612	Wright's Wood	pNHA	9.3km
1596	Black And Derrygoony Loughs	pNHA	9.3km
1601	Drumgole Lough	pNHA	12.1km
1606	Rafinny Lough	pNHA	12.2km
3	Cootehill Church	pNHA	12.9km
1599	Creevy Lough	pNHA	13km
988	Madabawn Marsh	pNHA	13.3km
1783	Corcreeghy Lake And Woodland	pNHA	14.6km
1611	Ulster Canal (Aghalisk)	pNHA	14.7km

No areas of woodland recorded on the inventory of ancient Irish woodlands were recorded within the route. No areas of grassland recorded within the semi-natural grasslands register occur within the route.

Figure 4.1: Habitat areas and designated sites within and surrounding the proposed route options



4.2 Overview of habitats and classification

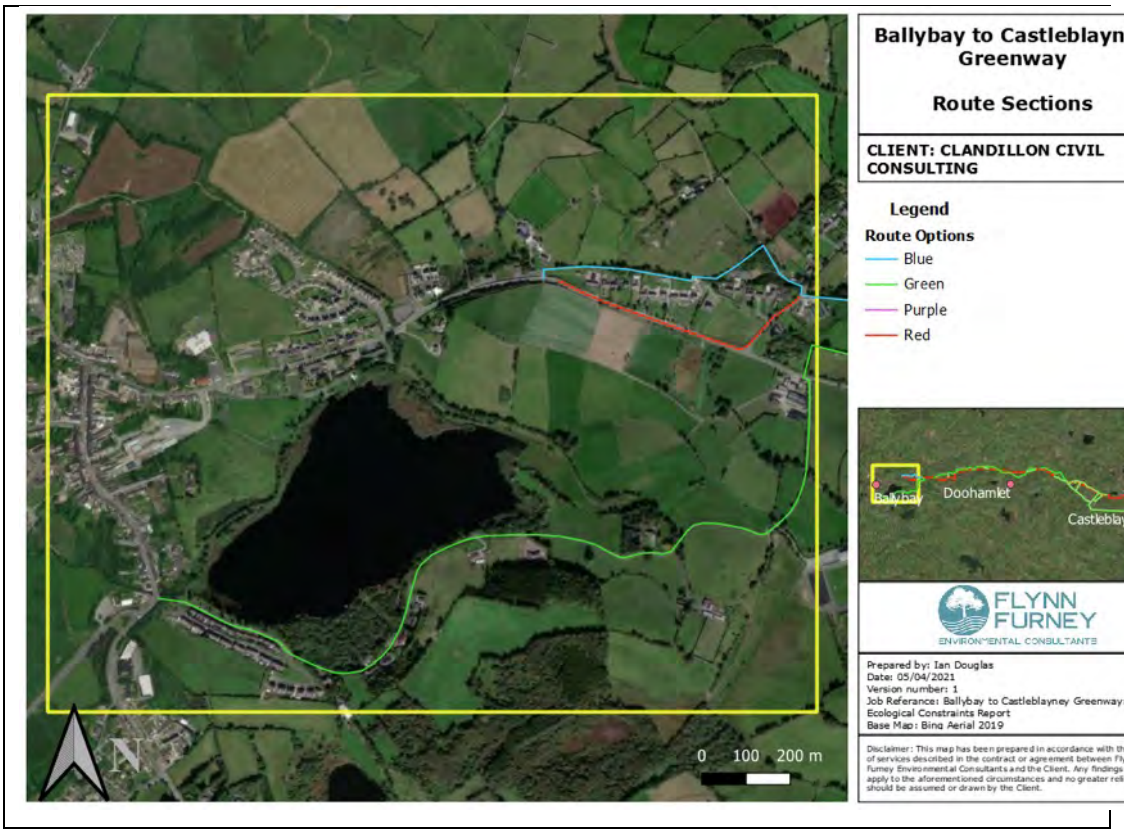
The area under survey extends from Ballybay to Castleblayney in a generally west-east direction. For ease of management of data, the route has been subdivided by the authors into sections with the main ecological constraints encountered in each section detailed in the heading tables. A graphic showing each route section is also provided.

4.1 Ballybay to L3403 Junction

Table 2: Ballybay to l3403 Junction

Map Sections	**Ballybay to L3403 Junction**			
General Habitat types	Scrub WS1 Mixed Broadleaved woodland WD1 Wet willow-Alder-ash woodland WN6 Reed and large sedge swamps FS1 Improved Grassland GS2 Wet Grassland GS4 Scrub WS1 Drainage Ditch FW4 Hedgerows WL1 Treelines WL2 Upland Eroding River FL1 Buildings and artificial surfaces BL3 Amenity Grassland GA2			
Ecological Constraints		Red	Blue	Green
	Mature Trees	✔		✔
	River Crossings			✔
	Salmonid water courses			✔
	Structures with bat potential			✔
	Wetland areas around lake			✔
	Small wetlands		✔	
	Giant Knotweed Stand (7x4m)			✔
	Rhododendron Stand			✔

Figure 2.2: Ballybay to l3403 Junction



4.1.1 Green route section

This followed the existing minor road which is a popular walking route commencing Lough Major Avenue that connects Ballybay to the Ballybay Pearse Brothers GAA Club. Here the route is on existing roadway fringed by lake shore habitats, amenity grassland, woodland and agricultural grassland. A number of bridge crossings with bat potential were recorded. Stands of the third schedule invasive species Giant Knotweed (*Fallopia sachalinensis*) and Rhododendron (*Rhododendron ponticum*) were recorded adjacent to this roadway.

4.1.2 Blue Route Section

This route section followed the former railway line which has been mostly substantially removed or altered. The route passes behind a number of residential properties through agricultural grassland. A small area of Willow-dominated wetland was noted that should be avoided where possible.

4.1.3 Red Route Section

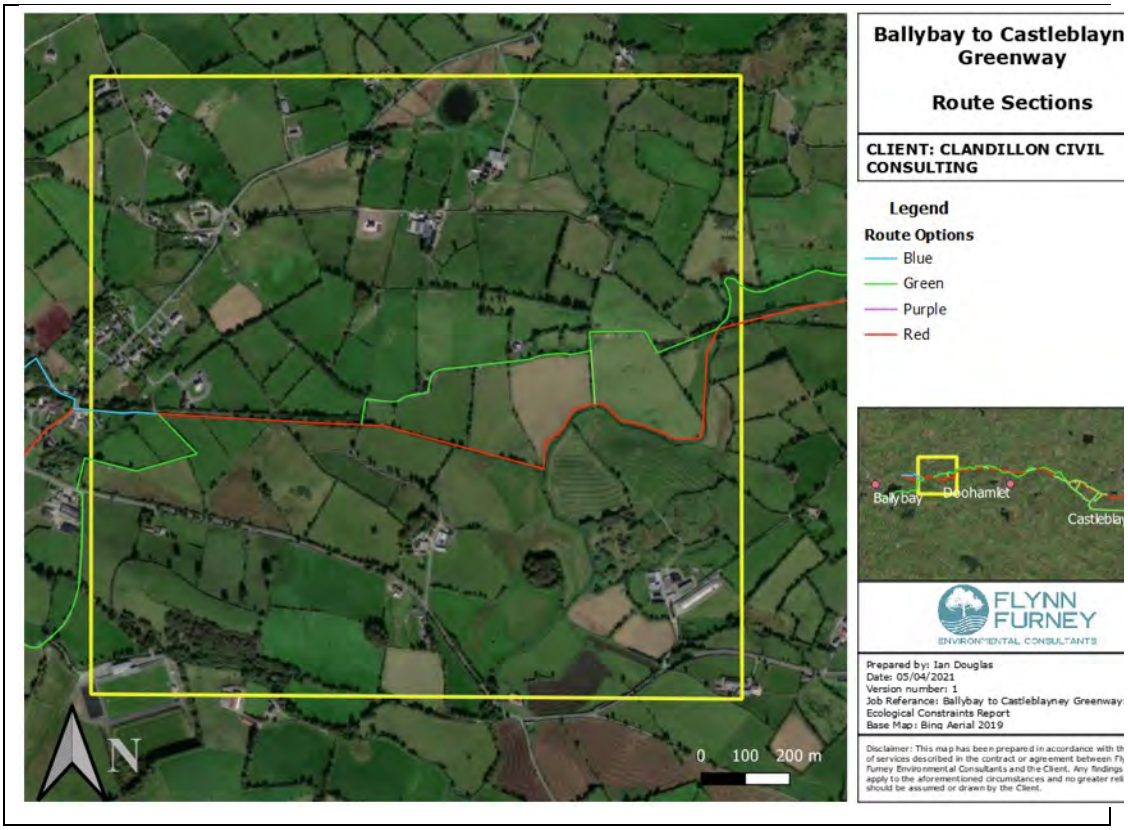
This followed the existing R183 Castleblayney Road. No significant ecological constraints were noted along this route section.

4.2 L3403 Junction to Red and Green route intersection

Table 3: L3403 Junction to Red and Green route intersection

Map Sections	L3403 Junction to Red and Green route intersection			
General Habitat types	Scrub WS1 Improved Grassland GS2 Drainage Ditch FW4 Hedgerows WL1 Treelines WL2 Buildings and artificial surfaces (BL3) Upland Eroding River FL1 Amenity Grassland (GA2) Stone walls and other stonework (BL1) Dry calcareous and neutral grassland (GS1)			
Ecological Constraints		Red	Green	Blue
	Mature trees	✔	✔	✔
	River crossings and culverts	✔		✔
	Badger sett		✔	
	Semi-natural neutral grassland		✔	
	Structures with bat potential		✔	
	Rookery			✔
	Invasive Snowberry	✔	✔	
	Clear under supervision areas	✔	✔	✔
	Rubbish dumping	✔		
	Gravel bank with Sand Martin habitat		✔	

Figure 4.3: L3403 Junction to Red and Green route intersection



4.2.1 Blue Route Section

This route section joins the old rail line embankment. Here high sided banks have revegetated with Bramble, Hazel, Hawthorn and Ash primarily. A number of areas of dense scrub occurred that could not be adequately surveyed. River crossings, bridges and old stone culverts were noted. No high bat potential was recorded within any of these structures. A rookery was noted in mature trees through this section. Cattle have been outwintered along this portion of the route

4.2.2 Red Route Section

This section continues on from the blue section along the old train line. Initially, the route is open and has evidently been used for machinery storage and possibility holding and feeding cattle. The banks on either side presented thick Bramble, Gorse and Hawthorn dominated hedgerows. The railway line embankments begin to ascend and the route sits within a cut area flanked by banks up to 4 metres high. The centre of the route was wet with habitat similar to wet willow woodland emerging. The banks contained typical hedgerow species detailed above. Mammal tracks were common. No Badger setts were identified but dense growth prevented a detailed survey of these areas. The invasive species Snowberry was also abundant

though this section. The red route emerges from this thick regrowth at a road bridge on a cul de sac off the R183. Rubbish dumping was noted under this bridge.

From here, the red route continues along a ditch before joining the Lough Major Stream and following its northern bank for approximately 800 metres. Bankside vegetation was sparce along this section. No significant ecological constraints were identified through this section.

4.2.3 Green route section

This followed a cul de sac off the R183. Snowberry was dominant in many of the ditches along this section of the route. An old shed with significant Ivy cover was recorded as having high potential as a bat roost. The road section then becomes an old disused farm laneway that is overgrown with snowberry and bramble scrub. A Badger Sett was recorded on a hilltop approximately 50 metres north of this section. This long linear main sett had at least 10 entrances with signs of recent activity including bedding and fresh spoil heaps. The steep hill slope between the route and the sett was also noted as being a good example of semi-natural neutral grassland.

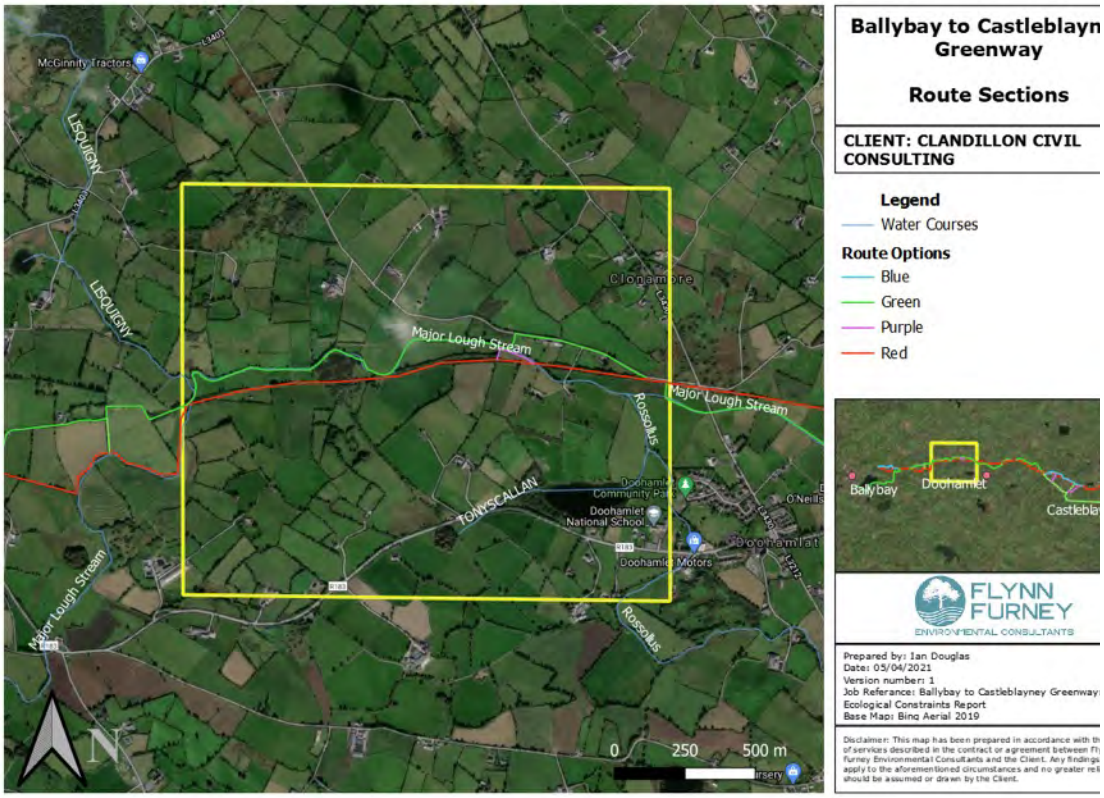
After this section, the route follows along a formerly quarried hill slope. Here exposed sands and gravels were noted that could provide suitable nesting habitat for Sand Martins. Gorse and Broom-dominated scrub was common on this hill slope. The route then joins the old rail line through thick high sided banks of scrub. The base of the route was wet with wet willow woodland type habitat emerging. A bridge over the Lough Minor stream was noted as having moderate bat potential.

4.3 Red and Green route intersection to Doohamlet

Table 4: L3403 Junction to Red and Green route intersection

Map Sections	Red and Green route intersection to Doohamlet			
General Habitat types	Scrub WS1 Improved Grassland GS2 Wet Grassland GS4 Drainage Ditch FW4 Hedgerows WL1 Treelines WL2 Buildings and artificial surfaces (BL3) Upland Eroding River FL1 Stone walls and other stonework (BL1) Recolonising Bare Ground (ED3)			
Ecological Constraints		Red	Green	Purple
	Mature trees	✔	✔	
	River crossings	✔	✔	
	Badger sett	✔		
	Bridges	✔	✔	
	Structures with bat roosting potential	✔	✔	
	Japanese Knotweed		✔	
	Invasive Snowberry	✔	✔	
	Possible Otter holt		✔	
Ecological Sensitivities	Small wetland areas	✔	✔	
	Clear under supervision areas	✔	✔	
	Think scrub	✔	✔	

Figure 4.4: Red and Green route intersection to Doohamlet



4.3.1 Red Route Section

This section begins after it emerges from an area of dense regrowth along the old trainline. This section has been extensivity cleared and is used as a farm track. One small area of scrubby growth remains close to the lough major stream. A number of Badger sett entrances were recorded on the high sided banks along the north bank of the old trainline embankment. These were found along a 150 metre extent. An old stone house and farm building was also recorded through this section that could provide bat roosting potential.

The old trainline returns to thick scrub and regrowth 500 metres after the Lough Major stream. Rocky outcrops were recorded through here along with scrub, hazel dominated woodland and emerging wetland habitat types. This continued for 200 metres before emerging in an area cleared for agriculture. Another extremely dense section was then noted extending for 500 metres. This could not be fully surveyed due to the density of scrub. A number of possible sett entrances were also noted. Clearance under supervision is advised.

The route emerges into a small field before passing over a large masonry bridge that crosses Lough Major Stream. Here moderate bat potential was noted. The route then continues onto a flat sided section of rail line. This appears to have been lightly grazed and had pathways through the scrub. Drainage ditches flanked the rail line with pond and wetland species recorded along their extents. A small masonry bridge was recorded and this was noted as having moderate bat potential. Snowberry scrub was also dominant along much of this section.

4.3.2 Green route section

The Green route followed the Lough Major Stream for much of this route section. Riparian vegetation was generally absent for the first 500 metres of this section, with improved agricultural grassland forming the major habitat type through here. The stream then moved through an area of abandoned or extensively managed farmland dominated by Blackthorn. Excellent breeding bird habitat was common through this area.

Badger Latrines (up to 50) were recorded east of the area of blackthorn along the river bank but no obvious sett was noted. Otter activity was also recorded, including a scat, slide and possible holt entrances on the river's southern bank.

This route section continued along the bank for another 500 metres before turning north towards a cul de sac. There, an abandoned house was noted with an extensive stand of Japanese knotweed surrounding the old property. This stand was approximately 70m^2. The roof was mostly intact in the building and could likely provide bat roosting potential. This route section then continued along this small road before crossing the L3430 and continuing east towards Castleblayney.

4.3.3 Purple Route

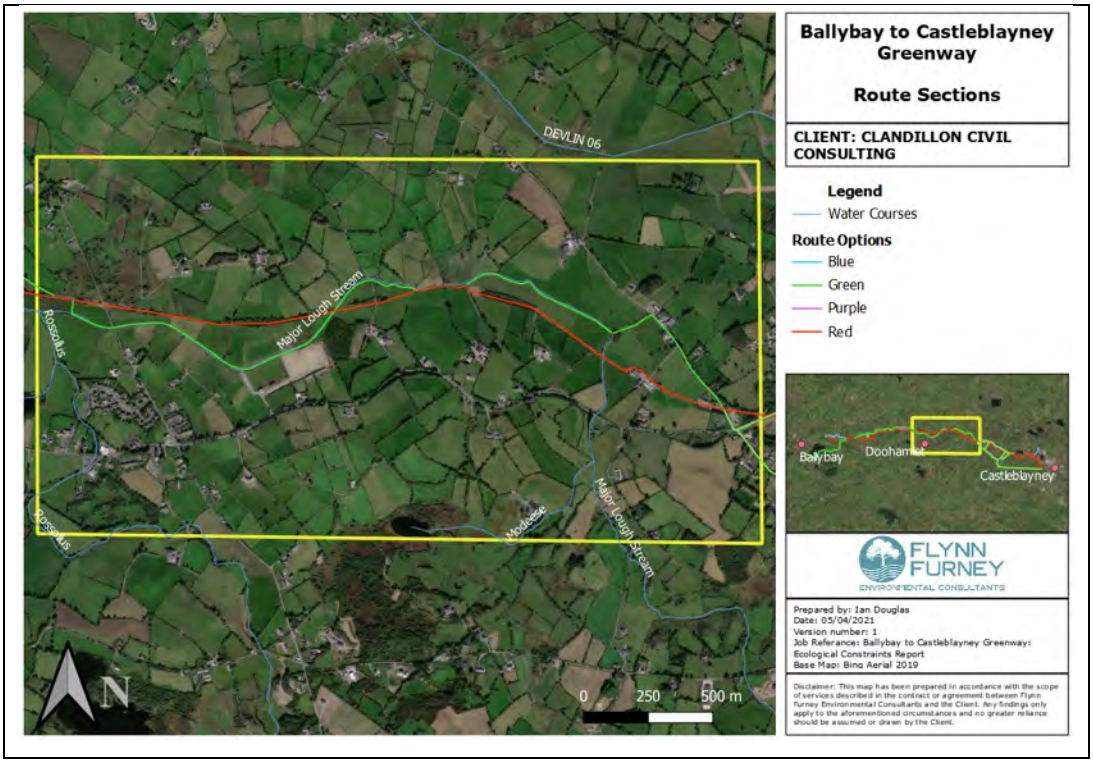
This short route section connects the red route to the green route around a small field of improved grassland. No ecological constraints were noted in this section.

4.4 Doohamlet to R183 L7441 Crossroads

Table 5: L3403 Junction to Red and Green route intersection

Map Sections	Doohamlet to R183 L7441 Crossroads		
General Habitat types	Scrub WS1 Improved Grassland GS2 Drainage Ditch FW4 Upland Eroding River FL1 Hedgerows WL1 Buildings and artificial surfaces (BL3) Stone walls and other stonework (BL1)		
Ecological Constraints		Red	Green
	River crossings and culverts	✔	✔
	Bridges		✔
	Structures with bat roosting potential	✔	
	Clear under supervision areas	✔	
	Think scrub	✔	
	Small wetland areas	✔	✔

Figure 5: Doohamlet to R183 L7441 Crossroads



4.4.1 Red Route Section

The Red route continues along the old trainline through this section. Here the route is raised and flanked by reed fringe habitat on both sides. Two stone-arched culverts were recorded. No bat roosting potential was noted here. Evidence of badger was common including prints and latrines however no refugia were recorded. Scrub and Marsh habitat was also common.

Approximately 500 metres from the L3430, the route become dense with scrub and immature woodland surrounding and filling much of the old rail line. Continued signs of recent badger activity but no refugia noted. After approximately 200 metres this section enters open agricultural landscapes with some encroaching scrub. A number of drains and a large railway bridge were noted here. This bridge was noted as having moderate bat potential.

Much of the train line has since been cleared through the next section and has been converted to improved agricultural grassland. A small section has been retained and contains a treeline of mature ash, hazel and hawthorn.

The red route then joins the Lough Major Steam for approximately 200 metres. Much of the stream bankside vegetation has been cleared through this section. The route then returned

to the footprint of the old trainline where it moved through a broadsided section of old railway embankments. The route has been cleared and appears to be used as a farm access road. The embankments were well-vegetated but have had much of their vegetation cut back with a hedge cutters. A number of large holes were noted along these embankments. These were likely Fox burrows.

Limited evidence of the old rail line remained through this section as most has been removed to be replaced with improved agricultural grassland. A solitary railway bridge remained in this section of cut masonry construction. No bat potential was noted here. The red route became a farm track with a steep ditch with a tightly cut hawthorn hedge. The Lough Major Stream begins to flow south and was crossed here. The bridge was not noted as having bat potential. The route continues along a farm track that leads around a farm yard before passing through further agricultural grassland. The route then moves through another yard and emerges at the R183 L7441 Crossroads

4.4.2 Green route section

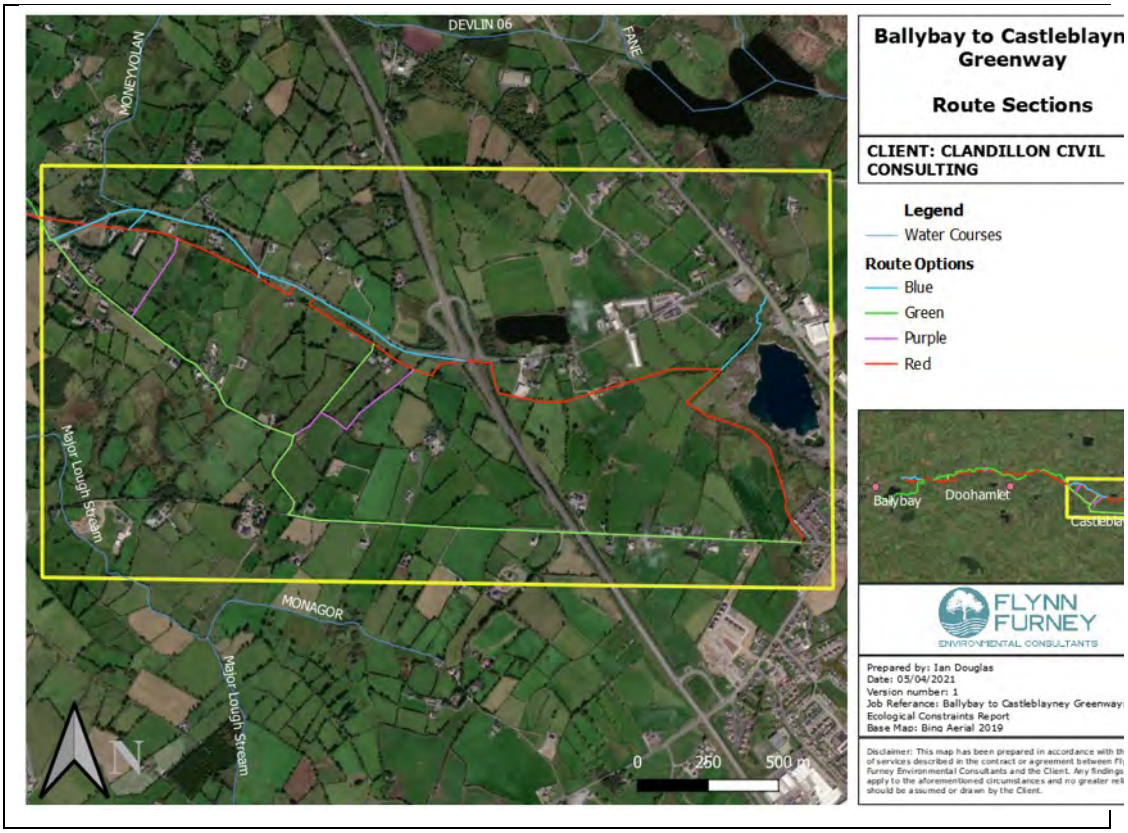
The green route continues to follow the course of the Lough Major Stream through generally open agricultural grassland separated by treelines and hedgerows. Riparian vegetation was generally absent. A small bridge was noted to allow access to a GAA Pitch. A small area of wet grassland was recorded towards the end of the route section north of the stream. The green route joins with the red route along the stream as detailed in the above section. The route then continues along the Lough Major Stream. As before most of the bankside vegetation has been removed with limited habitat opportunities for wildlife through this section. This route then turned sharply north eastwards and continued along a farm lane for a portion before joining the L7441 for 400 metres. This section of roadway is flanked by tightly cut hedgerows with some mature trees.

4.5 R183 L7441 Crossroads to Castleblayney

Table 6: L3403 Junction to Red and Green route intersection

Map Section	R183 L7441 Crossroads to Castleblayney				
General Habitat types	Scrub WS1 Improved Grassland GS2 Wet Grassland GS4 Drainage Ditch FW4 Reed and large sedge swamps FS1 Upland Eroding River FL1 Hedgerows WL1 Treelines WL2 Buildings and artificial surfaces (BL3) Upland Eroding River FL1 Amenity Grassland (GA2) Stone walls and other stonework (BL1)				
Ecological Constraints		Red	Blue	Green	Purple
	Mature Trees	✔		✔	✔
	River Crossings and culverts	✔			
	Possible badger setts	✔			
	Bridges	✔			
	Structures with bat roosting potential	✔			
	Japanese Knotweed			✔	
	Invasive Snowberry	✔		✔	
	Wetland habitats	✔	✔		
	Clear under Supervision Areas	✔			
	Think Scrub	✔			

Figure 6: Red and Green route intersection to Doohamlet



4.5.1 Red Route Section

This section continues after the crossroads through an area of thick bramble dominated scrub. A drain was noted here. An area of wet grassland and reed swamp was noted north of the blue and red route intersection.

After the intersection the route continues to follow the track of the old railway line. A large bank of exposed gravels was recorded with mature deciduous trees and thick bramble scrub. Entrances were recorded that could possibly be a Badger sett but this could not be confirmed at the time. Much of the old trainline remained open through this section and was flanked with thick Bramble and Gorse scrub. This section emerged onto the road briefly to avoid a house before returning to the old railway line. The route again was relatively open before returning to deciduous trees and scrub. This section continued along a hedgerow before turning north to join the blue route at the proposed crossing point for the N2.

On the eastern edge of the N3 the route moves south for 100 metres along an access road and past a mammal underpass for the N2 which was noted as being in use. Here the route turns eastward to re-join the old railway line as it passes through agricultural grassland and hedgerows. A stone culvert was noted here. Approximately 400 metres from the N2 a large former railway bridge was recorded as having high bat potential. This occurred along side a thick area of scrub with high badger potential. This area could not be surveyed in detail given the density of scrub. The route then skirts south and east around a quarry site. Here areas of open water, scrub, wet grassland, reed swamp were recorded. The route continues south passed an abandoned farm building with moderate bat potential. The section ends as it joins the Killycard Manor Road.

4.5.2 Blue route section

The green route followed the R183 to Castleblayney. The proposed route moves along the road verge which was primarily flanked by hedgerows, improved agricultural grasslands and residential developments. No significant ecological constraints were noted through this section. A small final section of Blue route spurred north off the red route around the old quarry. This followed a dense scrubby hedgerow through agricultural grassland and across an area of recolonising bare ground before emerging again on the R183.

4.5.3 Green route section

The blue route followed the L7441 local road to where it joined the Killycard Manor Road. This typical county road was flanked by hedgerows with occasional mature trees. Areas of wet grassland were noted in the surrounding fields. The route then turned east onto the Killycard Manor Road which crosses the N2 before reaching Castleblayney. A stand of Japanese Knotweed was recorded on the edge of the town. This has been recently treated and signage was present.

4.5.4 Purple route section

Two small section of purple route were surveyed that connect the red route and the green route. The westerly section moves south through an area of wet grassland along a hedgerow before joining the green route on the L7441. The other section spurred off the L7441 north easterly along a hedgerow and mature treeline north before connecting with the red route west of the N2 crossing point.

5 Recommendations and Further Survey Requirements

Based on this initial ecological constraints report and site walkover survey a number of further ecological surveys are recommended in advance of any works on this proposed development.

5.1 Water Courses

- River Habitat Survey
- Salmonid (fish) Surveys
- Crayfish Survey

The proposed route will cross the Lough Major Stream in a number of locations. Subsequent to this constraints survey, River Lamprey have been recorded in this stream close to Doohamlet (within Green Route – see Section 4.4, above) . This protected species is sensitive to impacts. Further surveys of this watercourse as per the above bullet-point list are recommended.

5.2 Mammals

Evidence of badger including setts, latrines and prints were found throughout the area under survey. A number of areas where Badger actively was suspected were also found but could not be surveyed due to the density of vegetation. A mammal survey within or close to optimal survey period is therefore recommended to ensure route development does not impact upon any protected mammal species.

5.3 Bats

Bat roosting potential was identified in several structures. These are former dwellings/farm buildings, bridges and stone culverts across the survey area. A full dawn and duck bat survey using bat detectors is recommended for any structures where repairs or alterations may take place. In addition, structures close to or within the zone of influence of works including deep excavation, sheet piling or night time work should also be surveyed.

5.4 Otter Surveys

A survey of otter holt sites 50 metres upstream and downstream of all river crossing points is recommended. This should also include for any stretch of waterway along which the proposed greenway will run adjacent within 50m.

5.5 Invasive Species

A number of stands of invasive Species were identified along the proposed route options. To ensure compliance with the regulations around invasive species and to ensure further spread does not occur due to works, an invasive species management plan should be created. This would include a detailed survey of all stands of invasive species along the route along with the devising of a treatment and eradiation plans for each stand.

5.6 Biodiversity Enhancement potential Study

A number of areas of excellent semi-natural habitat was encountered during this survey including areas of wetlands, woodlands and grasslands. In addition, areas of highly degraded semi-natural habitat was also encountered including river banks denuded of natural vegetation and hedgerows severely cut back. How to ensure that this development leads to a net positive impact on the local ecology should be a priority for the local authority. Opportunities should be explored to improve habitat quality along the route wherever possible. This will help offset habitat lost due to the proposed development and to help to ensure the project benefits Monaghan's biodiversity overall.

5.7 Further Assessment Requirements

It is recommended that that an Ecological Impact Assessment of the selected route is carried out prior to development. This should be carried out according to guidelines given by CIEEM (2018). A screening for Environmental Impact Assessment should also be carried out. It is not considered that an Appropriate Assessment Screening will be required given the absence of Natura 2000 sites within the area under survey and the potential zone of influence of the project.

6 References and Supporting Documents

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APPENDIX G – PROPOSED INTEGRATED PATH NETWORK IN BALLYBAY

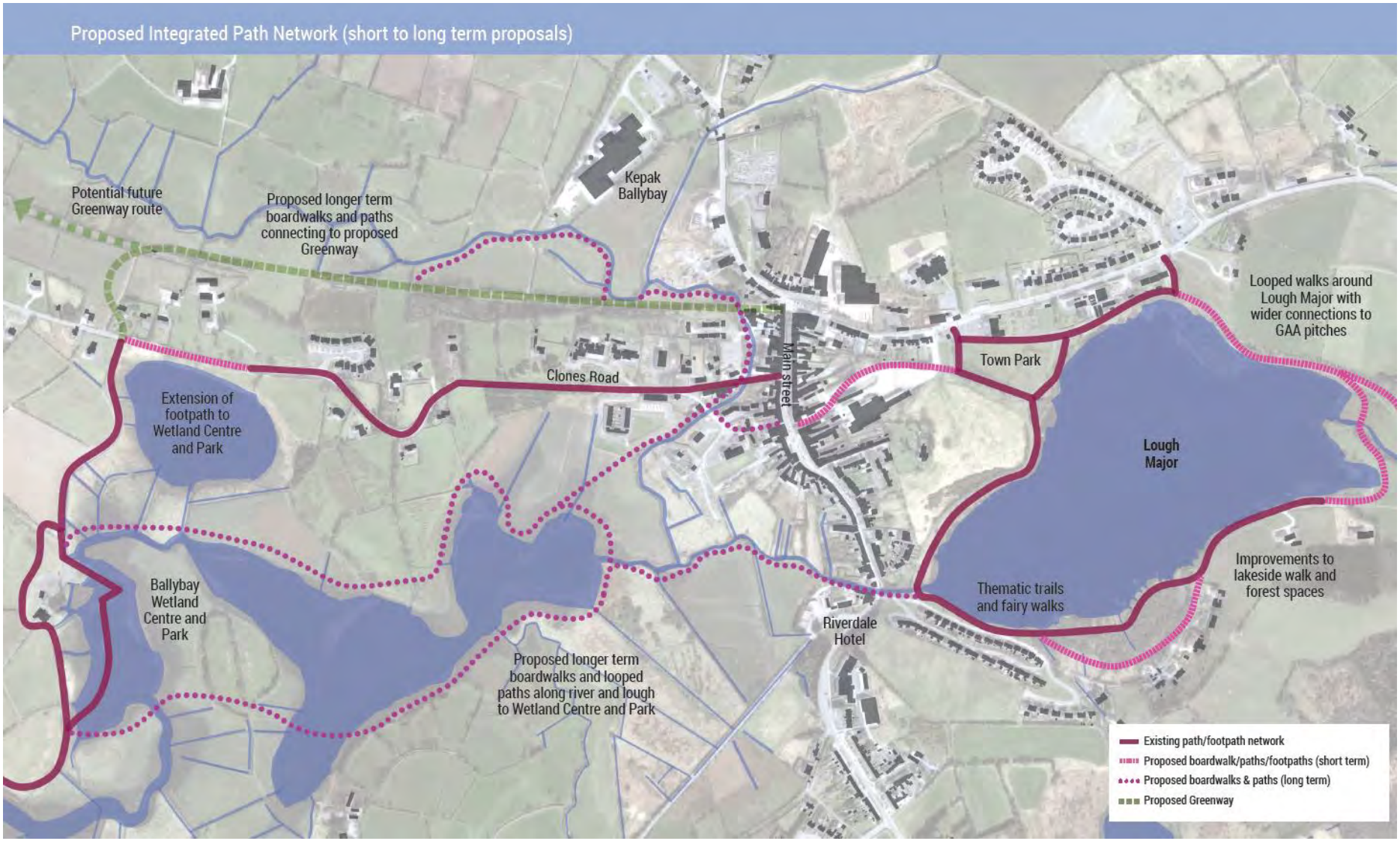

Figure 4 Proposed Integrated Path Network