

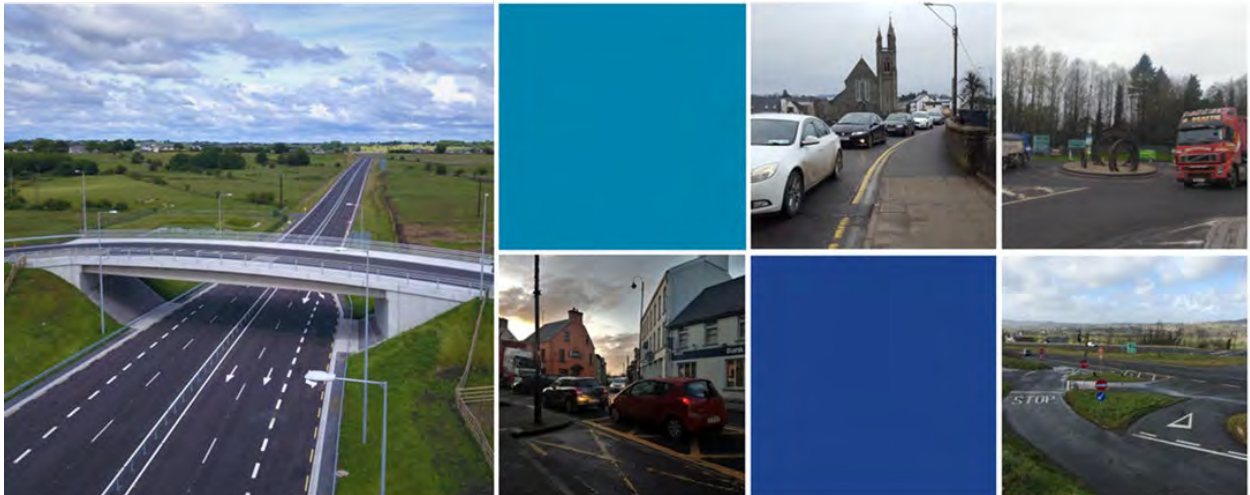


Comhairle Contae
Dhún na nGall
Donegal County Council



TEN-T Priority Route Improvement Project, Donegal

Phase 2, Option Selection Report Volume C2-Section 2 Non-Environmental Appendices



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TEN-T Priority Route Improvement Project, Donegal

Section 2: N56 / N13 Letterkenny to Manorcunningham

Option Selection Report

Appendix C2.1 – Safety Assessment

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1 INTRODUCTION

This report examines the Safety impacts as part of the Project Appraisal (Multi-Criteria Analysis) for Section 2: N56 Letterkenny to Manorcunningham and will form part of a Route Corridor Selection Report to be issued by the National Roads Design Office, Donegal County Council.

The Project Appraisal Guidelines (PAG) for National Roads Unit 7.0 - Multi Criteria Analysis (TII 2016). guidance document identifies two principal road safety criteria to be considered with respect to safety. These are as follows:

- Collision reduction
- Security of road users

This Report also includes within its appendices the following two reports:

1. Road Safety Audit (RSA) Stage F Part 1 Report; completed as a comparative assessment of the options from a road safety perspective, in accordance with the requirements of GE-STY-01024.
2. Road Safety Impact Assessment (RSIA); undertaken in accordance with PE-PMG-02001, to compare the options in terms of potential road safety implications of each option, while considering the safety benefits and dis-benefits arising from each option.

The overall objective of this Report is to establish, compile and compare the relative impacts of the options in terms of Safety and provide impact scores in accordance with the PAGs for National Roads. Each impact score is based on the seven-point scale below according to the impact level.

Table 1-1 Impact Scoring Key (TII, 2016)

7	Major or Highly Positive
6	Moderately Positive
5	Minor or Slightly Positive
4	Not Significant/Neutral
3	Minor or Minor or slightly negative
2	Moderately negative
1	Major or Highly negative

1.1 Methodology

The methodology adopted for this appraisal includes a review of all available qualitative and quantitative information available relating to collision reduction and safety and security of road as well as the potential road safety effects of each option.

1.2 Existing Environment

The N13 and N56 routes within the study area consist of three existing arms which meet at the N13/N56 (Dry Arch) Roundabout and can be described as follows:

1. N13 at Listellian (known locally as Lurgybrack) north to the N13/N56 Dry Arch Roundabout

This arm of the existing N13 is characterised by severe gradients and numerous direct access points, including St Patrick's school. This arm has three lanes; single carriageway in each direction however an additional climbing lane is present in the SB direction, south of the L1114 junction, due to the vertical gradient being over 7% for 1km (and up to 8.7% at one location). Between the Dry Arch Roundabout and the local L1114 junction the gradients are less than 4% and the additional lane SB acts as a right turning lane onto the L1114. This arm is posted at 100kph however reduced speed limit signs are located on both sides on approach to the St Patricks National School.

2. N56 at Polestar Roundabout east to the N13/N56 Dry Arch Roundabout

This arm of N56 national secondary road section is 1.5km long with multiple direct access points due to its semi-urban environment on approach to Letterkenny town. The carriageway comprises four-lanes (two lanes in each direction with no segregation) posted at 80kph. This section of the N56 is the sole main access into Letterkenny town from the east and south and suffers from particularly heavy congestion during peak hours.

This arm has a poor safety record and Donegal County Council are currently working on options to improve its safety. The options are likely to include further measures to reduce the posted speed, provide pedestrian and cycle facilities, introduce a raised central median that restricts right-turning manoeuvres to a few designated locations with on-demand signalised junctions and pedestrian crossings. However, these safety improvements are unlikely to resolve any existing capacity issues.

3. N13/N56 Dry Arch Roundabout to the N13/N14 Pluck Roundabout, near Manorcunningham

This arm of N13 from Dry Arch roundabout travels approximately 4.5km east as a segregated dual carriageway to the Pluck Roundabout. This Type 1 dual-carriageway section (2 x 7.3m carriageways with hard shoulders) has an at-grade junction at Trimnagh, situated on a severe horizontal radius bend, that accommodates all traffic movements. This dual-carriageway section has numerous other at-grade access priority junctions, many have no acceleration or deceleration lanes. The posted speed along this section is 100kph.

The existing N13 and N56 routes are a combination of sub-standard single and dual carriageway that include numerous roadside hazards, poor geometry, sub-standard junctions and insufficient cross-section. There is also a lack of continuous designated pedestrian or cycle facilities for vulnerable users.

The N13 section at Lurgybrack has no pedestrian or cycle facilities, perhaps in part due to the excessive vertical gradient along this section; two pedestrian fatalities have been recorded along this road section. Along the N56 there is currently limited pedestrian / cycle facilities however it is noted that Donegal County Council is seeking to implement safety improvements under a separate safety scheme shortly.

These factors have likely contributed to the poor safety records at some of these locations along with unreliable journey times and traffic congestion.

2 COLLISION REDUCTION

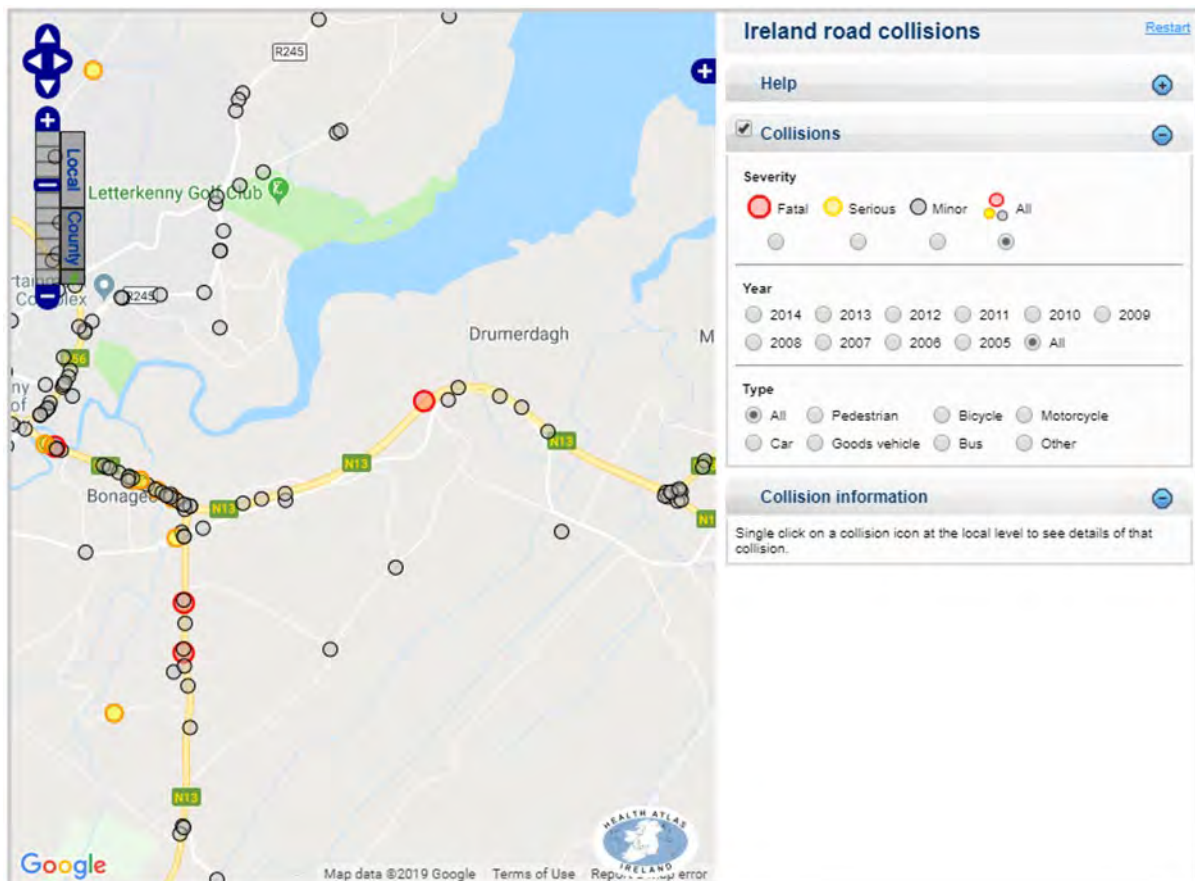
2.1 Recent Collision History

The Road Safety Authority make an interactive online mapping tool available to review collision locations and classifications across the road network. The mapping tool currently records a total of 52 collisions from 2005 – 2014 as shown in **Table 2-1** below.

Table 2-1 Current RSA collision data from 2005 - 2014

Severity of Collisions	Number of Collisions
Fatal	4
Serious	4
Minor	44
Total	52

Figure 2-1 Irish Road Collisions



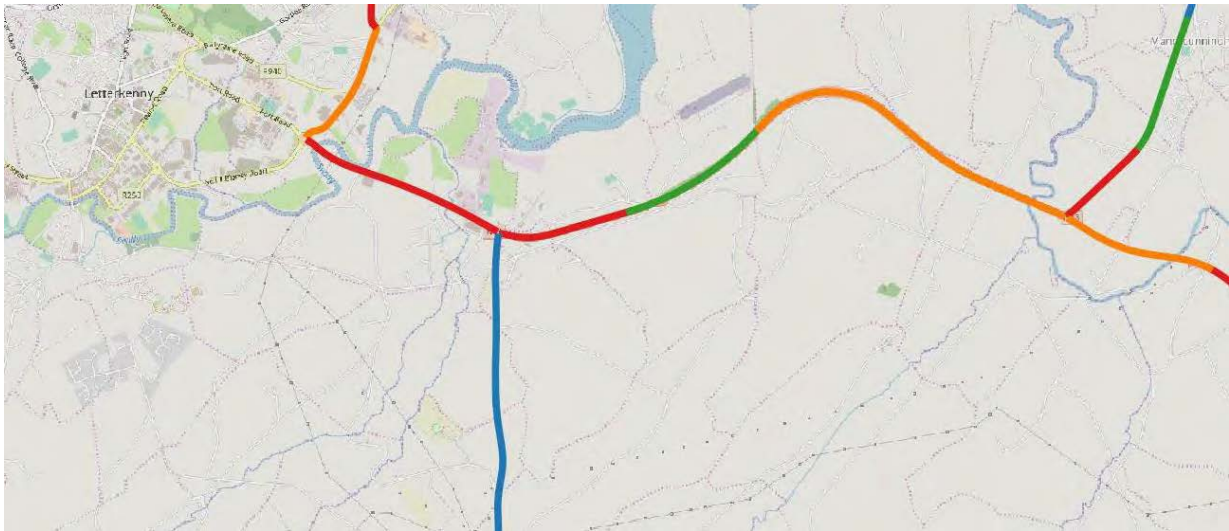
The significance of the quantity of collisions is difficult to interpret based on the number of collisions only. As such, a collision rating can be a more appropriate means to determine the road safety performance of a link. A Collision Rate is the ratio between the frequency of collisions over a length of road and an exposure measure, typically in the form of vehicle kilometres of travel over the same section. The Average

Collision Rate (R_{rp}) is the collision rate for a Reference Population (e.g. rural type 2 dual carriageway), while the site Collision Rate (R_j) is the collision rate for a specific site (GE-STY-01022). TII have provided collision rate data for the project, which is shown in **Figure 2-2**.

The colours identify areas as follows:

- Red – Collision rate is twice above the expected rate for that type of road;
- Orange - Collision rate is above the expected rate for that type of road;
- Green – Collision rate is below the expected rate for that type of road;
- Blue – Collision rate is twice below the expected rate for that type of road;

Figure 2-2 HD15 Collision Rates (2014-2016)



This illustrates that the N13 / N56 currently suffers from a very poor road safety record which needs to be addressed.

2.2 Predicted Safety Improvements

2.2.1 Qualitative Assessment

All options provide improvements to infrastructure when compared to the existing N13 / N56 routes. All options include a proposed new link crossing over the River Swilly providing improved access to Letterkenny and northwest Donegal. A summary of the options is as follows:

Options 2A and 2B are online options. Both options include online improvements to the existing N13 south of Dry Arch Roundabout such as the closure of direct accesses and the provision of a central reserve barrier to prevent right turn manoeuvres. Option 2B maintains the Dry Arch Roundabout as the principle junction where all traffic meets. However, Option 2A introduces a new junction east of Dry Arch Roundabout to allow westbound traffic from Dublin and Derry divert onto the new proposed link option over the River Swilly connecting with the existing N56 at the junction with the R245, north of Letterkenny.

Similarly, Options 2A and 2B include online improvements along the existing N13 east of the Dry Arch Roundabout such as the closure of direct accesses and the introduction of a compact grade separated junction at Trimragh to facilitate closure of the existing at grade junction.

Options 2C and 2D are online/offline options that include new offline options south of the Dry Arch Roundabout. The offline segments will divert northbound strategic and thru-traffic away from the existing N13 south of Dry Arch Roundabout providing safety benefits for these users by eliminating the existing >7% vertical gradient, multiple at-grade accesses and local school. Both options will allow the existing N13 at Lurgybrack to be downgraded to local road status providing benefits for nearby residents, business and the existing school. The new offline segments will provide a high standard dual carriageway.

Options 2C and 2D online segments include similar online improvements along the existing N13 east of the Dry Arch Roundabout to options 2A and 2B such as the closure of direct accesses and the introduction of a compact grade separated junction at Trimragh to facilitate closure of the existing at grade junction.

Options 2E is an offline option that provides a high standard dual carriageway between the N13 south of Lurgybrack and the eastern tie-in near Manorcunningham. Like options 2C and 2D option 2E will divert northbound strategic and thru-traffic away from the existing N13 south of Dry Arch Roundabout providing safety benefits for these users by eliminating the existing >7% vertical gradient, multiple at-grade accesses and local school. This option also allows the existing N13 at Lurgybrack to be downgraded to local road status providing benefits for nearby residents, business and the existing school. Option 2E turns east before meeting the existing east-west dual carriageway and runs parallel with the existing dual carriageway to the eastern tie-in near Manorcunningham.

Options 2F1 and 2F2 are offline options that provide a high standard dual carriageway between the N13 south of Lurgybrack and the eastern tie-in near Manorcunningham. These options differ only at the eastern tie-in with Option 2F2 connecting to a Section 3 offline option. Options 2F1 and 2F2 are the furthest options from Letterkenny and therefore provide no direct link to Letterkenny. Traffic figures show a poor transfer of traffic onto these options with the majority of traffic continuing to use the existing N13 segments N-S and E-W to Dry Arch Roundabout and Letterkenny.

All new offline segments and options include a segregated cycle track provision for vulnerable road users. This will ensure more vulnerable road users, such as pedestrians and cyclists, are segregated from traffic having a positive effect on road safety.

Online segments such as the existing N13 between Dry Arch and Pluck Roundabouts is dual carriageway with a hard shoulder and does not prohibit vulnerable road users. However, the L1114 local road runs parallel to and alongside this segment of the N13 and is a part of the pedestrian and cycling routes within Donegal and hence an alternate offline option for vulnerable road users who may not wish to use the dual carriageway.

2.2.2 Quantitative Assessment

The road safety benefits of each route option were quantitatively assessed using COBALT (Cost and Benefit to Accidents – Light Touch), which quantifies the change in the number of collisions and casualties as a direct result of a road project.

Collision rates for specified road types set out in PAG Unit 6.11 were utilised in COBALT. **Table 2-2** outlines the present value of benefits established for each route option in terms of collision reduction.

Table 2-2 Collision Reduction Summary

	2A	2B	2C	2D	2E	2F1	2F2
Collision reduction benefits (000's €)	€ 1,367	€ 2,569	€ 2,360	€ 2,413	€ 3,261	€ 1,794	€ 1,794
Impact Description	Slight Positive	Moderately Positive	Moderately Positive	Moderately Positive	Major Positive	Slight Positive	Slight Positive
Impact Score	5	6	6	6	7	5	5
Preference	Least Preferred	Intermediate	Intermediate	Intermediate	Preferred	Least Preferred	Least Preferred

All route options have a positive impact in terms of collision reduction.

3 SECURITY OF ROAD USERS

As outlined in 1.2 of this report the existing N13 is a combination of sub-standard single and dual carriageway that include numerous roadside hazards, poor geometry, sub-standard junctions and insufficient cross-section. As outlined in 2.2 of this report all options provide road safety benefits however some options will provide less benefits for vulnerable road users.

The N13 online section at Lurgybrack has a lack of facilities for vulnerable road users, likely due to the vertical gradient of 7% for over 1km (up to 8.7% at one location). Two pedestrian fatalities have been recorded on this section of road, Figure 2.1 refers. Options 2A, 2B, 2F1 and 2F2 require all road users travelling north-south between Letterkenny and Sligo to continue to use this online segment.

Options 2A, 2B, 2C and 2D include the N13 online section between Dry Arch and Pluck Roundabouts. This dual carriageway section with hard shoulder does not prohibit vulnerable road users. In addition, the L1114 local road runs parallel to and alongside this segment of the N13 and is a part of the pedestrian and cycling routes within Donegal and therefore a second option for vulnerable users not wanting to use the dual carriageway. Connections to the L1114 local road will be provided where Options 2C and 2D intersect with this route. This L1114 local road will also connect with the new proposed junction at Trimragh.

Options that have offline sections (Options 2C, 2D, 2E, 2F1 and 2F2) include a segregated cycle track provision. This will ensure that pedestrians and cyclists, are segregated from traffic having a positive overall impact on road safety.

Options 2E, is an offline option with a segregated cycle track. Option 2E has a high traffic transfer; due to the short time savings when compared to the existing dual carriageway.

Options 2F1 and 2F2 are offline options with a segregated cycle track. These options have a low traffic transfer; due to their distance and connectivity to/from Letterkenny (the key destination for most road users). Vulnerable road users are expected to find this option less appealing with those travelling north-south between Letterkenny and Sligo continuing to use the N13 online section at Lurgybrack.

Options 2A and 2B have a neutral impact; Options 2F1 and 2F2 a slight positive impact and Options 2C, 2D and 2E a moderately positive impact with respect to security of road users.

Table 3-1 Security Assessment

	2A	2B	2C	2D	2E	2F1	2F2
Impact Description	Neutral	Neutral	Moderately Positive	Moderately Positive	Moderately Positive	Slight Positive	Slight Positive
Impact Score	4	4	6	6	6	5	5
Preference	Least Preferred	Least Preferred	Preferred	Preferred	Preferred	Intermediate	Intermediate

4 ROAD SAFETY AUDIT

A Stage F, Part 1, Road Safety Audit (RSA) was undertaken on all options and is included as **Appendix A** to this Report. The purpose of the RSA is to examine all options with respect to road safety for all road users.

The Road Safety Audit Report clarify that all route options represent an improvement to the existing scenario in terms of safety. All routes have a positive impact on collision levels by reducing the number and proximity of junctions, improving road geometry and facilities for non-motorised users compared to the existing roads.

Considering the overall benefits of each option in terms of road safety impact and the ranking of options as part of the RSIA, an impact score has been applied to each option in accordance with the TII PAG 1 - 7 scale, as presented in **Table 4-1**.

Table 4-1 Road Safety Audit Summary

	2A	2B	2C	2D	2E	2F1	2F2
Ranking	5	4	3	2	1	6	7
Impact Description	Moderate Positive	Moderate Positive	Major Positive	Major Positive	Major Positive	Slight Positive	Slight Positive
Impact Score	6	6	7	7	7	5	5
Preference	Intermediate	Intermediate	Preferred	Preferred	Preferred	Least Preferred	Least Preferred

5 ROAD SAFETY IMPACT ASSESSMENT

A Road Safety Impact Assessment (RSIA) was undertaken on all options and is included as **Appendix B** to this Report.

The RSIA provides an understanding of the overall impact that each option would have on the proposed and existing road network determined by reviewing the option selection alignment designs and comparing qualitative and quantitative data.

The data reviewed to complete the RSIA includes, but is not limited to:

- Collision history, frequency and location
- Geometric design of options
- Location, frequency and design of junctions
- Indicative future traffic flows and AADT data
- Potential impact on local traffic patterns
- Potential impact on vulnerable road users and provision for these users
- COBALT assessment data

Options 2A, 2B and 2F utilise the existing 2km section of the N13 N-S which has a vertical gradient of 7% for in excess of 1km (up to 8.7% at one location). By comparison, Options 2C, 2D and 2E have new offline sections designed to the required standards and therefore considered safer options.

Options 2C, 2D and 2E are highly positive in terms of road safety in comparison to the existing road network. This is demonstrated through provision of positive quantitative COBALT figures provided for each Option, while Options 2A, 2B and 2F having lower COBALT figures.

Option 2F is a new offline route but is a greater distance from Letterkenny attracting lower traffic volumes and is therefore less effective at transferring traffic from the existing road network, than other options.

Considering the overall benefits of each option in terms of road safety impact and the ranking of options as part of the RSIA, an impact score has been applied to each option in accordance with the TII PAG 1 - 7 scale, as presented in **Table 5-1**.

Table 5-1 Road Safety Impact Assessment

	2A	2B	2C	2D	2E	2F1	2F2
Ranking	4	3	1	2	2	3	3
Impact Description	Moderately Positive	Moderately Positive	Major Positive	Major Positive	Major Positive	Moderately Positive	Moderately Positive
Impact Score	6	6	7	7	7	6	6
Preference	Intermediate	Intermediate	Preferred	Preferred	Preferred	Intermediate	Intermediate

Appendix A

RPS Barry Transportation

TEN-T Priority Route
Improvement, Donegal

Section 2 – N56/N13
Letterkenny to Manorcunningham

Stage F (Part 1) Road Safety Audit

RPS Barry Transportation

TEN-T Priority Route Improvement, Donegal

Section 2 – N56/N13 Letterkenny to Manorcunningham

Stage F (Part 1) Road Safety Audit

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1 Introduction

1.1 General

This report results from the Part 1 of a Stage F Road Safety Audit carried out on Section 2 (N56/N13 Letterkenny to Manorcunningham) of the proposed TEN-T Priority Route Improvement, Donegal. The audit was carried out at the request of Ms Emma Coyle of Barry Transportation, on behalf of RPS Barry Transportation.

1.2 Audit Team

The members of the Road Safety Audit Team are independent of the design team, and include:

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Mr. Peter Morehan
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Road Safety Audit Team Member

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(BA BAI (Hons) PGCert CEng MIEI)
Trainee/Observer

1.3 Audit Information

The Road Safety Audit took place during the period August 2018 to January 2019 and comprised an examination of the documents provided by RPS Barry Transportation (see Appendix A). In addition to examining the documents supplied the Road Safety Audit Team visited the site of the proposed measures on the 15th August 2018. Weather conditions during the site visit were mainly dry & overcast with some rain showers, the road surface was dry and traffic volumes were moderate to heavy.

This Stage F (Part 1) Road Safety Audit has been carried out in accordance with the requirements of GE-STY-01024 - Road Safety Audit, dated December 2017, contained on the Transport Infrastructure Ireland (TII) Publications website.

The proposed options have been examined and this report compiled in respect of the consideration of those matters that may have an adverse effect on road safety and considers the perspective of all road users. It has not been examined or verified for compliance with any other standards or criteria.

The Audit Team understands that option alignments have been developed within a 300m wide corridor for the purposes of option assessment and selection. The alignment design itself is subject to change as the project progresses and further information becomes available, surveys are undertaken and consultation takes place.

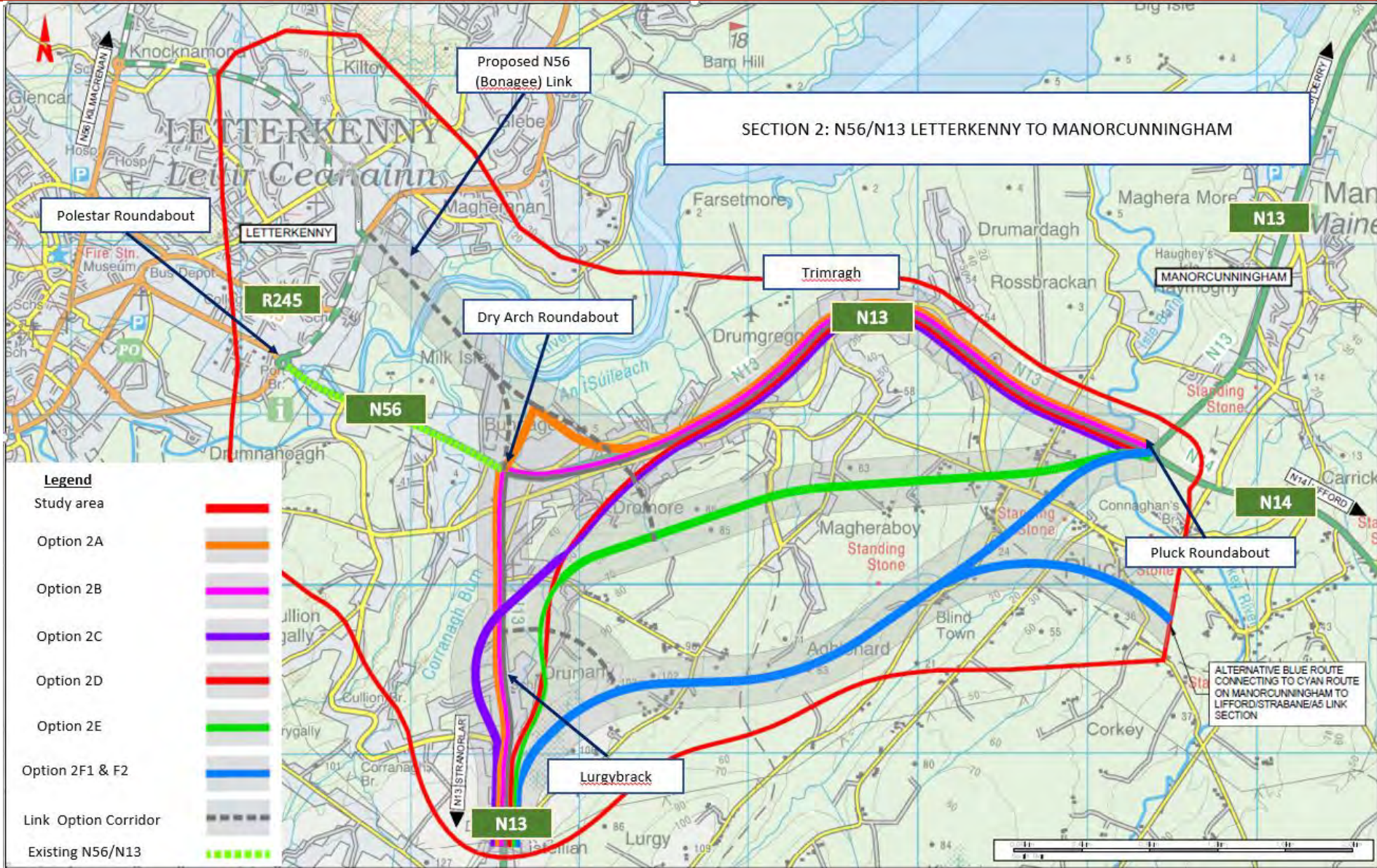


FIGURE 1.1: SECTION 2 STUDY AREA

1.4 Scheme Description

1.4.1 Overall Scheme

The overall project comprises three sections of the National Primary road network in Donegal, which also form part of the Trans-European Transport (TEN-T) road network. These sections have been prioritised for improvement to address existing safety and operational issues. The TEN-T is a selection of strategic transport corridors that have been identified to play a key role in the mobility of goods and passengers through the European Union. The TEN-T Network in Donegal consists of three National Primary Roads (N13, N14 and N15). The three sections of the TEN-T in Donegal that have been prioritised for improvement are: -

1. Section 1 – N15/N13 Ballybofey/Stranorlar Urban Region;
2. Section 2 – N56/N13 Letterkenny to Manorcunningham; and
3. Section 3 – N14 Manorcunningham to Lifford/Strabane/A5 Link.

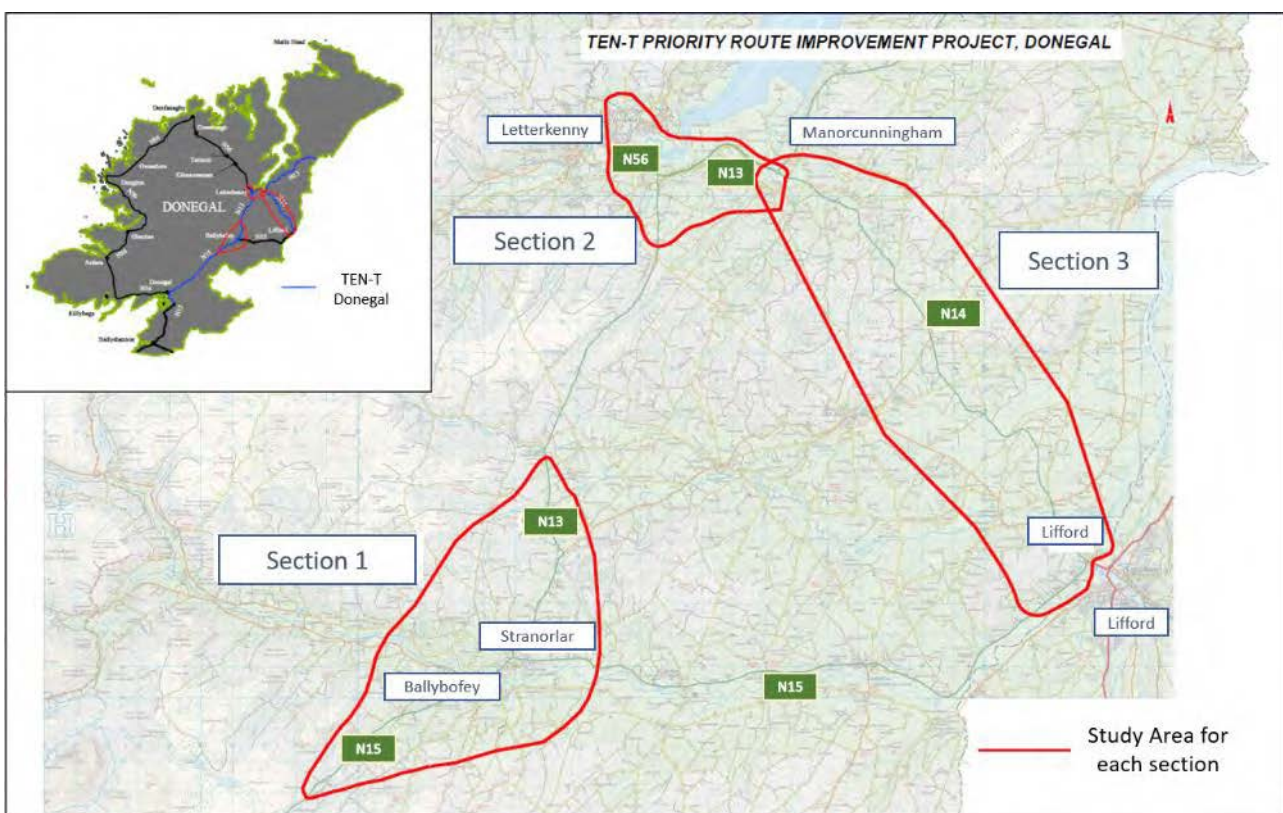


FIGURE 1.2: STUDY AREAS FOR EACH SECTION OF OVERALL SCHEME

This audit is for Section 2, N56/N13 Letterkenny to Manorcunningham, which is described in the following section of this report. Figure 1.1 shows the Study Areas for each of the three sections and Figure 1.2 shows the corridor options assessed in this Stage F (Part 1) Road Safety Audit.

1.4.2 Section 2

The Section 2 study area includes sections of the existing N56 and N13 national roads. The section of existing N56 is between the Polestar and Dry Arch (junction with N13) Roundabouts. This section of the N56 crosses the River Swilly and is currently the only connection between the National Primary road network and Letterkenny. It is also one of only two connections between the N56 National Secondary Road and the National Primary Road Network in Donegal, and there is a high dependence on this semi-urban link. It is currently a four-lane single carriageway with a posted speed of 80kph and multiple direct accesses. It suffers from operational & safety issues and has historical collision rates twice the national average for a similar type of national road.

A separate safety scheme is currently being progressed to address some of the safety issues on this section of the N56 (e.g. implementation of central median, restricting right turns, signalisation at two intermediate junctions, 60kph posted speed) however, this will not resolve the lack of network resilience in the area. The N56 safety scheme is presently at detailed design and outside the scope of this audit.

The section of the existing N13 east of the Dry Arch Roundabout consists of a Type 1 dual carriageway with a grassed median. It includes at-grade accesses/junctions and crossings, has no provisions for vulnerable road users, includes many direct accesses to adjacent lands and has historical collisions rates above & twice above the national average for a similar type of national road.

The section of the existing N13 south of the Dry Arch Roundabout (Lurgybrack) consists of a wide single carriageway with steep gradients (approximately 8%) and features numerous direct accesses including a primary school. This section has historical collisions rates below the national average for similar types of national road.

The proposed improvements consist of the realignment and/or online improvement of the N13 between the N13/N14 Pluck Roundabout near Manorcunningham and the N13 at Lurgybrack Hill and a new N56 link road from the N13 National Primary road to the existing N56 National Secondary Road in Letterkenny. Seven options have been audited: -

- Option 2A (Orange),
- Option 2B (Pink),
- Option 2C (Purple),
- Option 2D (Red),
- Option 2E (Green),
- Option 2F1 (Blue A), and
- Option 2F2 (Blue B),

all of which are located to the southeast of Letterkenny. Four of the routes (2A, 2B, 2C and 2D) have lengths of approximately 5.8 - 6.5km, while the remaining routes (2E, 2F1 & 2F2) have lengths of approximately 4.7 - 5.1km.

Six of the routes have similar start/end points on the N13 to the south of the Dry Arch Roundabout, at the N13/N14 Pluck Roundabout and on the N56 at its intersection with the R245 near Ballyrairie Industrial Estate.

The exception to this is Option 2F2 which has similar start/end points on the N13 to the south of the Dry Arch Roundabout and on the N56 at its intersection with the R245 near Ballyrairie Industrial Estate. However, its eastern tie-in is south of N13/N14 Pluck Roundabout where it would tie-in with one of the options for Section 3.

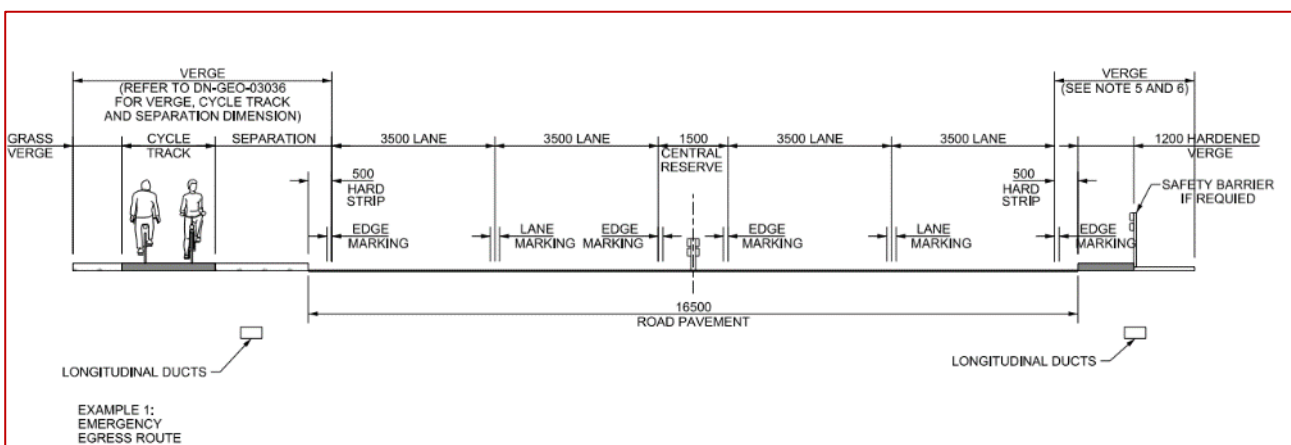


FIGURE 1.3: TYPE 2 DUAL CARRIAGEWAY

All seven options provide a mix of junction types, with at-grade roundabout junctions at intersections with the national primary and secondary roads and grade-separated junctions at intersections with some of the existing local roads. No direct access from private lands is proposed onto the mainline.

The option selection design currently proposes new offline road(s) consisting of a Type 2 Dual Carriageway (Ref: DN-GEO-03036) including a cycle track of 2.5m in width offset from the carriageway edge by 2.5m. These would include the N56 Link road for all options and the mainline on Options 2E, 2F1 and 2F2.

Where all or part of the existing N13 between the Dry Arch and N13/N14 Pluck Roundabouts forms part of an Option the existing Type 1 Dual Carriageway cross-section will be retained, with improvements (e.g. routes 2A, 2B, 2C & 2D).

Where all or part of the existing N13 south of the Dry Arch Roundabout (Lurgybrack Hill) forms part of an Option the existing single carriageway cross-section (with climbing lane) will be retained, with improvements (e.g. Routes 2A and 2B).

1.4.3 Information Provided to Audit Team

Drawings detailing the proposed route options were provided, details of which are listed in Appendix A.

National road HD15 collision rates for the period 2014 to 2016 were obtained from the Open Data Portal (data.gov.ie) which are shown in Figure 1.4.

The sections shown in red are those sections of road with collision rates twice (or more) above the average, sections shown in orange are those sections of road with collision rates above the average, sections shown in blue are those sections of road with collision rates below the average & sections shown in green are those sections of road with collision rates twice (or more) below the average.

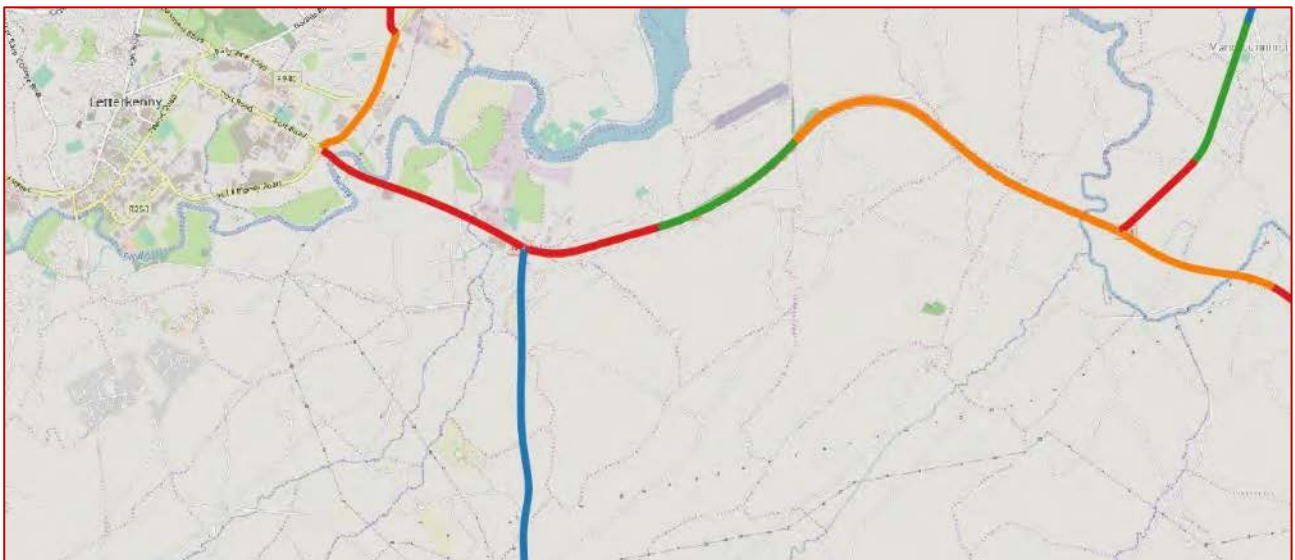


FIGURE 1.4: HD15 COLLISION RATES (2014 TO 2016)

2 Items Arising from the Audit

2.1 Overview

This audit is concerned with the safety issues that differentiate the options to permit a comparative safety ranking of the options.

All options presented would provide safety improvements. The overall number and severity of identified hazards, as well as the overall safety considerations of each option, has advised the comparative safety ranking of the options in this report.

2.2 Option 2A (Orange)

The overall mainline length of Option 2A is 6.5km, most of which consists of online improvements to the existing N13. A new 1.5km link road is also proposed across the River Swilly. One river bridge and one grade-separated road crossing is included. A total of eight roundabouts, three of which are new, three of which are upgraded/improved existing roundabouts and two of which are associated with the compact grade-separated junction are proposed.

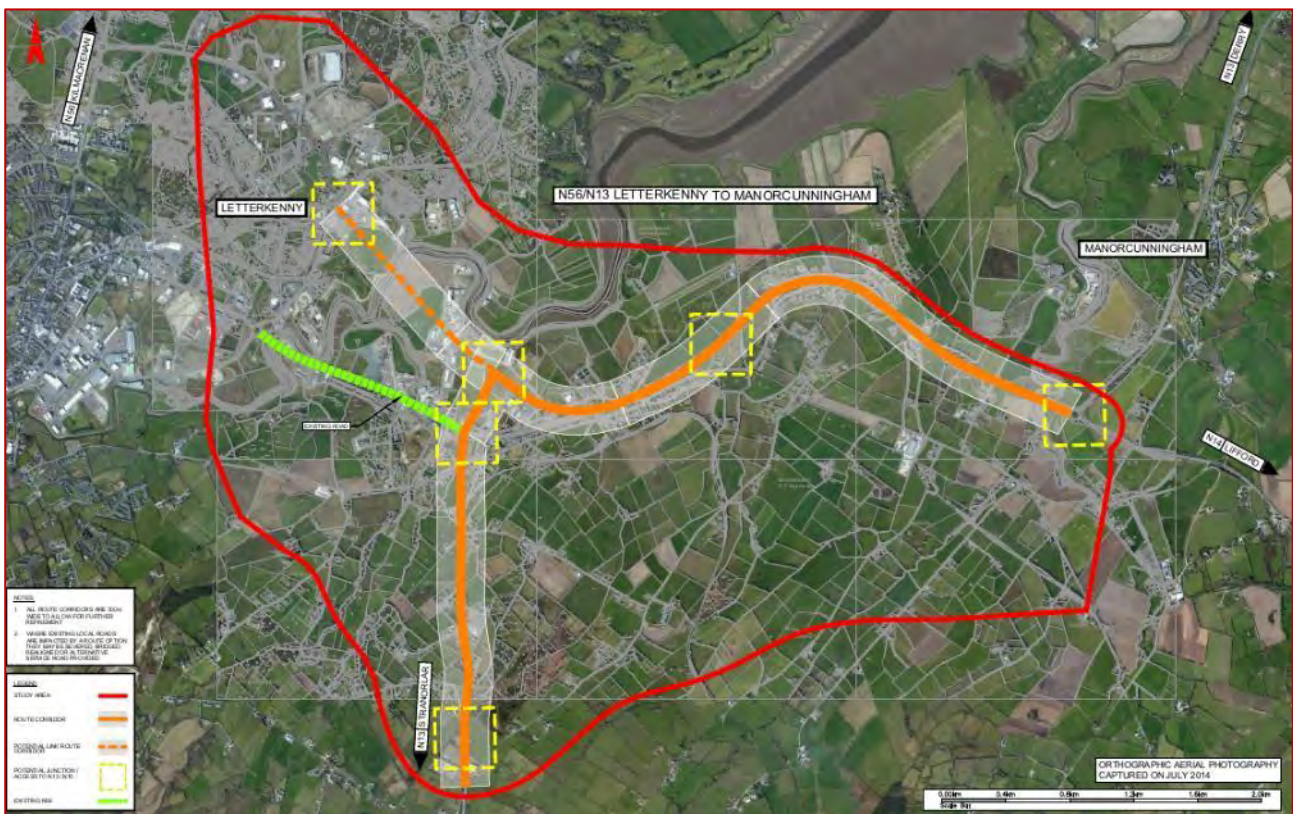


FIGURE 2.1: OPTION 2A (ORANGE)

The roundabouts are proposed at the eastern & southern tie-ins, at the compact grade-separated junction, on the new N56 Link south of the River Swilly, at the existing Dry Arch Roundabout and at the north-western tie in with the N56.

The compact grade separated junction is proposed on the section of the N13 between the Dry Arch Roundabout and Pluck Roundabout to facilitate the closure of existing at-grade left-in/left-out junctions connecting with the local road network.

2.2.1 N13 Northbound Approach to Dry Arch Roundabout - Gradient

Problem

The existing N13 south of the Dry Arch Roundabout includes a section with a steep downhill gradient (> 8%) on the immediate approach to an existing crossroads junction, which will be retained under this option.

Hazard

Excessive speeds on approach to junction due to the approach gradient will result in some drivers failing to adequately moderate their speeds on the approach leading to side-on or run off road collisions.



FIGURE 2.2: HISTORICAL COLLISIONS NEAR DRY ARCH
(SOURCE: RSA.IE)

2.2.2 N13 between Southern Tie-in and Dry Arch Roundabout – Cross Section

Problem

It is intended to maintain a single carriageway cross section (with climbing lane) for the section of the N13 south of the Dry Arch Roundabout.

It is acknowledged that several direct accesses and side road junctions are to be removed as part of this option, nevertheless a single carriageway will result in greater numbers of collisions, or increased injury severity when collisions occur, than a dual carriageway provision.

Hazard

Retaining a single carriageway cross-section on a relatively heavily trafficked section of national route will not result in the collision and injury severity reduction expected from other options.

2.2.3 N13 between Southern Tie-in and Dry Arch Roundabout – VRU Provisions

Problem

There are no measures proposed to cater for vulnerable road users (e.g. footpath) for the section of the N13 south of the Dry Arch Roundabout. The Road Safety Authority website (www.rsa.ie) shows two pedestrian fatalities have along this section of the N13 in the period 2005 to 2015, one in 2005 and the other in 2011.

Hazard

The absence of pedestrian provisions will result in vulnerable road users continuing to travel within the carriageway where they are at an increased risk of being struck.

2.2.4 Existing Crossroads on the N13 South of Dry Arch Roundabout

Problem

It is proposed to retain, unaltered, the existing crossroads on the N13 south of Dry Arch Roundabout with the L1114 local road. Crossroad junctions have a poor safety record and are discouraged on new road schemes.

The proposed closure of some of the other at-grade junctions along this section of the N13, and the provision of the local road link in the townlands of Drumany & Dromore will lead to increased traffic turning into/out-of the side roads at this crossroads junction, with a resulting increased risk of collisions.

Hazard

The retention of a crossroads junction on the national road will not yield any collision reductions.

2.2.5 St. Patrick's National School

Problem

Parents may choose to drop-off, and collect, schoolchildren on both sides of the N13 at St. Patrick's National School near the southern tie-in. It is also possible that students who live in the area to the west of the N13 may travel to/from the school by foot.

Hazard

The absence of pedestrian crossing provisions will not result in the safety improvements for vulnerable road users achieved with some of the other options.

2.2.6 Multiple Roundabouts in Close Proximity

Problem

The proposed junction configuration at the southern end of the new Link Road across the River Swilly, where two new roundabouts are proposed results in three roundabouts in close proximity, when the existing Dry Arch Roundabout is taken into account, and will result in an increased number of potential conflict points with a resulting increase in likely collisions.

Hazard

Multiple at-grade roundabouts in close proximity results in an increased number of conflicting manoeuvres.



FIGURE 2.3: N13/N56 LINK ROAD ROUNDABOUTS

2.2.7 N13/N14 Pluck Roundabout

Problem

The collision data provided to the Audit Team indicates that all existing approaches to the Pluck Roundabout have collision rates above that expected for an equivalent section of national road. This Option maintains the existing at-grade roundabout layout at this location.

Hazard

Retaining existing junction layout at Pluck Roundabout will not improve safety at this location without other measures being included in the design.

2.3 Option 2B (Pink)

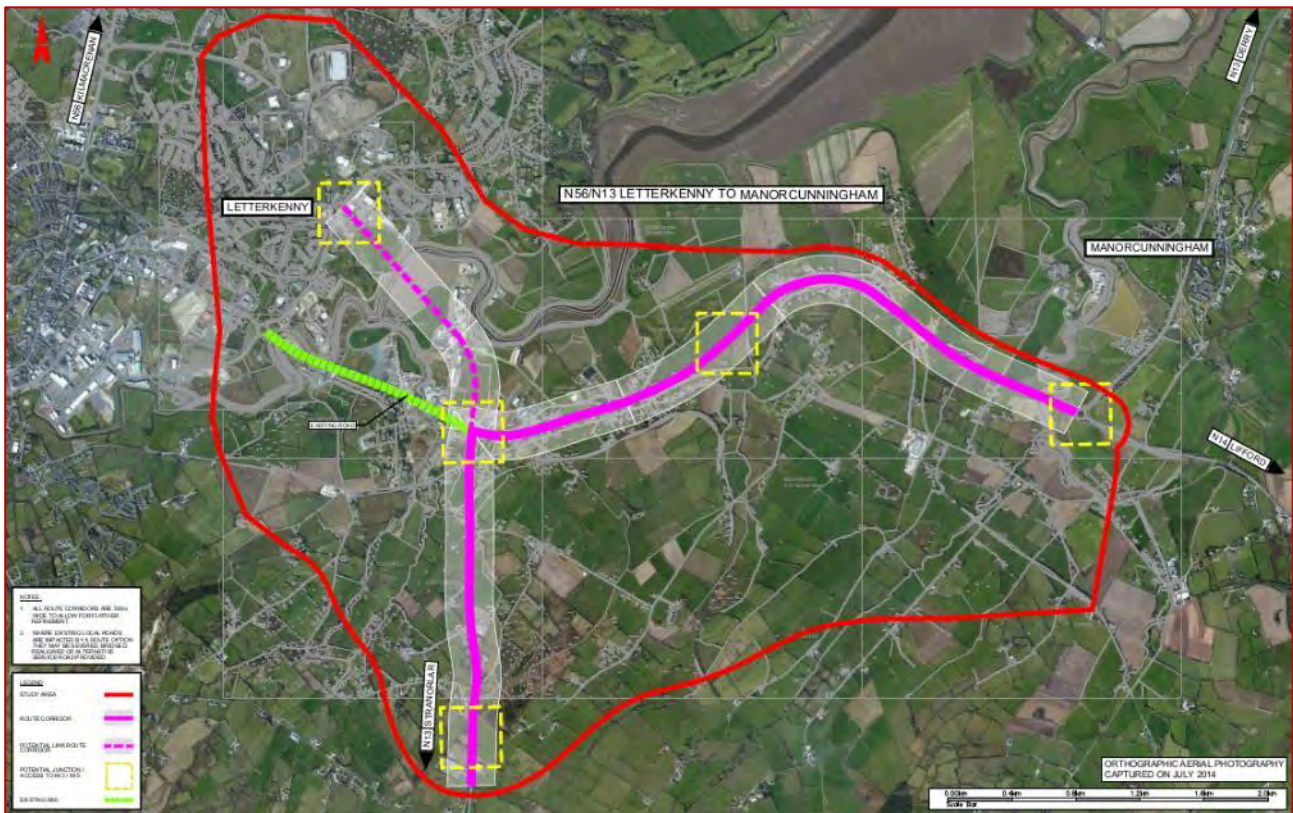


FIGURE 2.4: OPTION 2B (PINK)

The overall length of Option 2B is 6.1km, most of which consists of online improvements to the existing N13. A new 1.7km link road is also proposed across the River Swilly. One river bridge and one grade-separated road crossing is included. A total of six roundabouts, one of which is new, three of which are improvements/upgrades to existing roundabouts and two of which are associated with the compact grade-separated junction is proposed.

Roundabouts are proposed at the eastern & southern N13 tie-ins, as part of the compact grade-separated junction, at the existing Dry Arch Roundabout and at the north-western tie in with the N56.

A compact grade separated junction is proposed on the section of the N13 between the Dry Arch Roundabout and Pluck Roundabout to facilitate the closure of existing at-grade left-in/left-out junctions connecting with the local road network.

2.3.1 N13 Northbound Approach to Dry Arch Roundabout - Gradient

Problem

The existing N13 south of the Dry Arch Roundabout includes a section with a steep downhill gradient (> 8%) on the immediate approach to an existing crossroads junction, which will be retained under this option.

Hazard

Excessive speeds on approach to junction due to the approach gradient will result in some drivers failing to adequately moderate their speeds on the approach leading to side-on or run off road collisions.

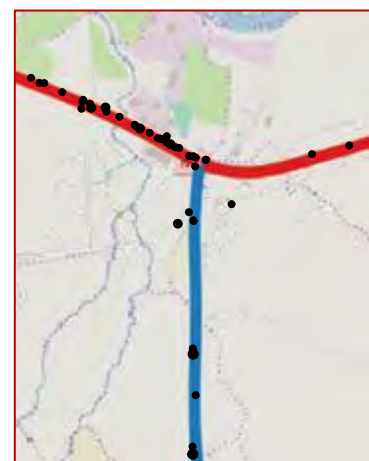


FIGURE 2.5: HISTORICAL COLLISIONS NEAR DRY ARCH (SOURCE: RSA.IE)

2.3.2 N13 between Southern Tie-in and Dry Arch Roundabout – Cross Section

Problem

It is intended to maintain a single carriageway cross section for the section of the N13 south of the Dry Arch Roundabout.

It is acknowledged that a number of the direct accesses and side road junctions are to be removed as part of this option, nevertheless a single carriageway will result in greater numbers of collisions, or increased injury severity when collisions occur, than a dual carriageway provision.

Hazard

Retaining a single carriageway cross-section on a relatively heavily trafficked section of national route will not result in the collision and injury severity reduction expected from other options.

2.3.3 N13 between Southern Tie-in and Dry Arch Roundabout – VRU Provisions

Problem

There are no measures proposed to cater for vulnerable road users (e.g. footpath) for the section of the N13 south of the Dry Arch Roundabout. The Road Safety Authority website (www.rsa.ie) shows two pedestrian fatalities have along this section of the N13 in the period 2005 to 2015, one in 2005 and the other in 2011.

Hazard

The absence of pedestrian provisions will result in vulnerable road users continuing to travel within the carriageway where they are at an increased risk of being struck.

2.3.4 Existing Crossroads on the N13 South of Dry Arch Roundabout

Problem

It is proposed to retain, unaltered, the existing crossroads on the N13 south of Dry Arch Roundabout with the L1114 local road. Crossroad junctions have a poor safety record and are discouraged on new road schemes.

The proposed closure of some of the other at-grade junctions along this section of the N13, and the provision of the local road link in the townlands of Drumany & Dromore will lead to increased traffic turning into/out-of the side roads at this crossroads junction, with a resulting increased risk of collisions.

Hazard

The retention of a crossroads junction on the national road will not yield any collision reductions.

2.3.5 St. Patrick's National School

Problem

Parents may choose to drop-off, and collect, schoolchildren on both sides of the N13 at St. Patrick's National School near the southern tie-in. It is also possible that students who live in the area to the west of the N13 may travel to/from the school by foot.

Hazard

The absence of pedestrian crossing provisions will not result in the safety improvements for vulnerable road users achieved with some of the other options.

2.3.6 N13/N14 Pluck Roundabout

Problem

The collision data provided to the Audit Team indicates that all existing approaches to the Pluck Roundabout have collision rates above that expected for an equivalent section of national road. This Option maintains the existing at-grade roundabout layout at this location.

Hazard

Retaining existing junction layout at Pluck Roundabout will not improve safety at this location without other measures being included in the design.

2.4 Option 2C (Purple)

The overall length of Option 2C is approximately 5.8km, consisting of online improvements (3.6km) to the N13 west of the N13/N14 Pluck Roundabout and new offline improvements of the N13 south of the Dry Arch Roundabout. Approximately 2.5km of new link road is also proposed across the River Swilly.



FIGURE 2.6: OPTION 2C (PURPLE)

One river bridge and one grade-separated road crossing is proposed. A total of nine roundabouts, four of which are new, three of which are improvements/upgrades to existing roundabouts and two which are associated with the compact grade-separated junction is proposed.

The roundabouts are proposed at the eastern & southern N13 tie-ins, at the north-western tie in with the N56, on the new link road south of the River Swilly, as part of the compact grade-separated junction, at the existing Dry Arch Roundabout and two along the N13 south and east of the Dry Arch Roundabout.

A compact grade separated junction is proposed on the section of the N13 between the Dry Arch Roundabout and Pluck Roundabout to facilitate the closure of existing at-grade left-in/left-out junctions connecting with the local road network.

2.4.1 Multiple Roundabouts in Close Proximity

Problem

The proposed junction configuration at the southern end of the new link road across the River Swilly, where two new roundabouts are proposed, results in three roundabouts in close proximity, when the existing Dry Arch Roundabout is taken into account, and will result in an increased number of potential conflict points with a resulting increase in likely collisions.

Hazard

Multiple at-grade roundabouts in close proximity results in an increased number of conflicting manoeuvres.

2.4.2 N13 between Southern Tie-in and Dry Arch Roundabout – Cross Section

Problem

This option will result in the section of the N13 south of the Dry Arch Roundabout being severed at the southern tie-in, resulting in a significant decrease in the likely traffic along this section of road.

Retaining the existing cross-section along this relatively lengthy straight section on road, which has a particularly wide carriageway including a climbing lane and hard-shoulder, coupled with significantly reduced traffic volumes could lead to excessive speeds or anti-social behaviour along this section of road.

Hazard

Retaining the existing cross-section on the severed section of the existing N13 south of the Dry Arch Roundabout coupled with significantly reduced traffic flows could lead to excessive speeds or anti-social behaviour.

2.4.3 N13 between Southern Tie-in and Dry Arch Roundabout – VRU Provisions

Problem

There are no measures proposed to cater for vulnerable road users (e.g. footpath) for the section of the N13 south of the Dry Arch Roundabout which will be severed under this option. The Road Safety Authority website (www.rsa.ie) shows two pedestrian fatalities have along this section of the N13 in the period 2005 to 2015, one in 2005 and the other in 2011.

The likelihood of vehicular/VRU collisions will reduce with the reduction in traffic, however increased VRU traffic may also arise.

Hazard

The absence of pedestrian provisions will result in vulnerable road users continuing to travel within the carriageway where they are at an increased risk of being struck.

2.4.4 N13/N14 Pluck Roundabout

Problem

The collision data provided to the Audit Team indicates that all existing approaches to the Pluck Roundabout have collision rates above that expected for an equivalent section of national road. This Option maintains the existing at-grade roundabout layout at this location.

Hazard

Retaining existing junction layout at Pluck Roundabout will not improve safety at this location without other measures being included in the design.

2.5 Option 2D (Red)

The overall length of Option 2D is 5.9km, consisting of an online improvement of the 3.6km of the N13 to the west of the N13/N14 Pluck Roundabout, an offline improvement of the N13 south of the Dry Arch Roundabout and a new link road across the River Swilly.



FIGURE 2.7: OPTION 2D (RED)

One river bridge and one grade-separated road crossing are proposed, and a total of eight roundabouts, three of which are new, three of which are improvements/upgrades to existing roundabouts and two which are associated with the compact grade-separated junction.

The roundabouts are proposed at the eastern & southern tie-ins, on the new link road across the River Swilly, as part of the compact grade-separated junction, at the existing Dry Arch Roundabout, on the existing N13 to the east of the Dry Arch Roundabout and at the north-western tie in with the N56.

A compact grade separated junction is proposed on the section of the N13 between the Dry Arch Roundabout and Pluck Roundabout to facilitate the closure of existing at-grade left-in/left-out junctions connecting with the local road network.

2.5.1 Multiple Roundabouts in Close Proximity

Problem

The proposed junction configuration at the southern end of the new link road across the River Swilly, where two new roundabouts are proposed, results in three roundabouts in close proximity when the existing Dry Arch Roundabout is taken into account. This will result in an increased number of potential conflict points with a resulting increase in likely collisions.

Hazard

Multiple at-grade roundabouts in close proximity results in an increased number of conflicting manoeuvres leading to an increase in likely collision occurrence.

2.5.2 N13 Southern Terminal Roundabout

Problem

The proposed road layout at the southern tie-in does not include connectivity from the realigned N13 onto the existing N13 towards the Dry Arch Roundabout. This is likely to result in an increased volume of traffic on the adjacent local road network, which may not be able to cater for these increased traffic volumes safely.

Hazard

Absence of connectivity onto the existing N13, between the southern tie-in and the Dry Arch Roundabout, could lead to increased volumes of traffic on the local road network around the southern tie-in which may not be safely accommodated.

2.5.3 N13 between Southern Tie-in and Dry Arch Roundabout – Cross Section

Problem

This option will result in the section of the N13 south of the Dry Arch Roundabout being severed at the southern tie-in, resulting in a significant decrease in the likely traffic along this section of road.

Retaining the existing cross-section along this relatively lengthy straight section on road, which has a particularly wide carriageway including a climbing lane and hard-shoulder, coupled with significantly reduced traffic volumes could lead to excessive speeds or anti-social behaviour along this section of road.

Hazard

Retaining the existing cross-section on the severed section of the existing N13 south of the Dry Arch Roundabout coupled with significantly reduced traffic flows could lead to excessive speeds or anti-social behaviour.

2.5.4 N13 between Southern Tie-in and Dry Arch Roundabout – VRU Provisions

Problem

There are no measures proposed to cater for vulnerable road users (e.g. footpath) for the section of the N13 south of the Dry Arch Roundabout which will be severed under this option. The Road Safety Authority website (www.rsa.ie) shows two pedestrian fatalities have along this section of the N13 in the period 2005 to 2015, one in 2005 and the other in 2011.

The likelihood of vehicular/VRU collisions will reduce with the reduction in traffic, however increased VRU traffic may also arise.

Hazard

The absence of pedestrian provisions will result in vulnerable road users continuing to travel within the carriageway where they are at an increased risk of being struck.

2.5.5 N13/N14 Pluck Roundabout

Problem

The collision data provided to the Audit Team indicates that all existing approaches to the Pluck Roundabout have collision rates twice above that expected for an equivalent section of national road. This Option maintains the existing at-grade roundabout layout at this location.

Hazard

Retaining existing junction form at Pluck Roundabout will not improve safety at this location.

2.6 Option 2E (Green)

The overall length of Option 2E is 5.1km, consisting of an offline improvement of the N13. This option includes for 3km of new link roads from the N13 / Dry Arch into Letterkenny.

One river bridge and a total of seven roundabouts is proposed, four of which are new and three of which are improvements/upgrades to existing roundabouts.

The roundabouts are proposed at the eastern and southern tie-in, on the new link road across the River Swilly south of the river, at the existing Dry Arch Roundabout, on the existing N13 to the east of the Dry Arch Roundabout, on the realigned N13 at the intersection with new link road across the River Swilly and at the north-western tie in with the N56.



FIGURE 2.8: OPTION 2E (GREEN)

2.6.1 Multiple Roundabouts in Close Proximity

Problem

The proposed junction configuration where the new link road across the River Swilly intersects with the existing N13, where three new roundabouts are proposed, results in four roundabouts in close proximity when the existing Dry Arch Roundabout is taken into account. This will result in an increased number of potential conflict points with a resulting increase in likely collisions.

Hazard

Multiple at-grade roundabouts in close proximity results in an increased number of conflicting manoeuvres leading to an increase in likely collision occurrence.

2.6.2 N13 between Southern Tie-in and Dry Arch Roundabout – Cross Section

Problem

This option will result in the section of the N13 south of the Dry Arch Roundabout being severed at the southern tie-in, resulting in a significant decrease in the likely traffic along this section of road. Retaining the existing cross-section along this relatively lengthy straight section on road, which has a particularly wide carriageway including a climbing lane and hard-shoulder, coupled with significantly reduced traffic volumes could lead to excessive speeds or anti-social behaviour along this section of road.

Hazard

Retaining the existing cross-section on the severed section of the existing N13 south of the Dry Arch Roundabout coupled with significantly reduced traffic flows could lead to excessive speeds or anti-social behaviour.

2.6.3 N13 between Southern Tie-in and Dry Arch Roundabout – VRU Provisions

Problem

There are no measures proposed to cater for vulnerable road users (e.g. footpath) for the section of the N13 south of the Dry Arch Roundabout which will be severed under this option. The Road Safety Authority website (www.rsa.ie) shows two pedestrian fatalities have along this section of the N13 in the period 2005 to 2015, one in 2005 and the other in 2011.

The likelihood of vehicular/VRU collisions will reduce with the reduction in traffic, however increased VRU traffic may also arise.

Hazard

The absence of pedestrian provisions will result in vulnerable road users continuing to travel within the carriageway where they are at an increased risk of being struck.

2.6.4 N13 Southern Terminal Roundabout

Problem

The proposed road layout at the southern tie-in does not include connectivity from the realigned N13 onto the existing N13 towards the Dry Arch Roundabout. This is likely to result in an increased volume of traffic on the adjacent local road network, which may not be able to cater for these increased traffic volumes safely.

Hazard

Absence of connectivity onto the existing N13, between the southern tie-in and the Dry Arch Roundabout, could lead to increased volumes of traffic on the local road network around the southern tie-in which may not be safely accommodated.

2.6.5 N13/N14 Pluck Roundabout

Problem

The collision data provided to the Audit Team indicates that all existing approaches to the Pluck Roundabout have collision rates above that expected for an equivalent section of national road. This Option maintains the existing at-grade roundabout layout at this location.

Hazard

Retaining existing junction layout at Pluck Roundabout will not improve safety at this location without other measures being included in the design.

2.7 Option 2F1 (Blue A)



FIGURE 2.9: OPTION 2F1 (BLUE A)

The overall length of Option 2F1 is 4.8km and consists of an offline improvement of the N13 extending between the N13/N14 Pluck Roundabout & the N13 at Lurgybrack Hill, and the new link road across the River Swilly, which ties in with the Dry Arch Roundabout and a new roundabout on the existing N13 to the east of the Dry Arch Roundabout.

One river bridge is required and a total of eight roundabouts, five of which are new and three of which are improvements/upgrades to existing roundabouts.

Three roundabouts are proposed at the southern tie-in, one at the eastern tie-in, one on the new link road across the River Swilly south of the river, one at the existing Dry Arch Roundabout, one on the existing N13 to the east of the Dry Arch Roundabout and one at the north-western tie in with the N56.

2.7.1 N13 between Southern Tie-in and Dry Arch Roundabout – VRU Provisions

Problem

There are no measures proposed to cater for vulnerable road users (e.g. footpath) for the section of the N13 south of the Dry Arch Roundabout which will be severed under this option. The Road Safety Authority website (www.rsa.ie) shows two pedestrian fatalities have along this section of the N13 in the period 2005 to 2015, one in 2005 and the other in 2011.

The likelihood of vehicular/VRU collisions will reduce with the reduction in traffic, however increased VRU traffic may also arise.

Hazard

The absence of pedestrian provisions will result in vulnerable road users continuing to travel within the carriageway where they are at an increased risk of being struck.

2.7.2 Traffic on Existing N13

Problem

The forecast traffic figures provided to the Audit Team indicate that the majority of traffic will continue to travel along the existing N13 between Manorcunningham and Letterkenny. Consequently, this option fails to improve the road environment for the majority of traffic, resulting in a lesser safety benefit accruing when compared with other options.

Hazard

Proposed alignment does not cater for the majority of traffic on this section of the N13, with a consequent reduced safety benefit accruing when compared with other options.

2.7.3 Multiple Roundabouts in Close Proximity

Problem

The proposed junction configuration at the southern end of the new link road across the River Swilly, where two new roundabouts are proposed resulting in three roundabouts in close proximity, when the existing Dry Arch Roundabout is taken into account, will result in an increased number of potential conflict points with a resulting increase in likely collisions.

Hazard

Multiple at-grade roundabouts in close proximity results in an increased number of conflicting manoeuvres leading to an increase in likely collision occurrence.

2.7.4 N13/N14 Pluck Roundabout

Problem

The collision data provided to the Audit Team indicates that all existing approaches to the Pluck Roundabout have collision rates above that expected for an equivalent section of national road. This Option maintains the existing at-grade roundabout layout at this location.

Hazard

Retaining existing junction layout at Pluck Roundabout will not improve safety at this location without other measures being included in the design.

2.8 Option 2F2 (Blue B)

The overall length of Option 2F2 is 4.7km and consists of an offline improvement of the N13, between a point south of the N13/N14 Pluck Roundabout, where it would tie in with one of the Options for Section 3, & the N13 at Lurgybrack Hill, and the new link road across the River Swilly, which ties in with the Dry Arch Roundabout and a new roundabout on the existing N13 to the east of the Dry Arch Roundabout.

One river bridge is required and a total of seven roundabouts, five of which are new and two of which are improvements/upgrades to existing roundabouts.

Three roundabouts are proposed at the southern tie-in, one on the new link road across the River Swilly south of the river, one at the existing Dry Arch Roundabout, one the existing N13 to the east of the Dry Arch Roundabout and one at the north-western tie in with the N56.

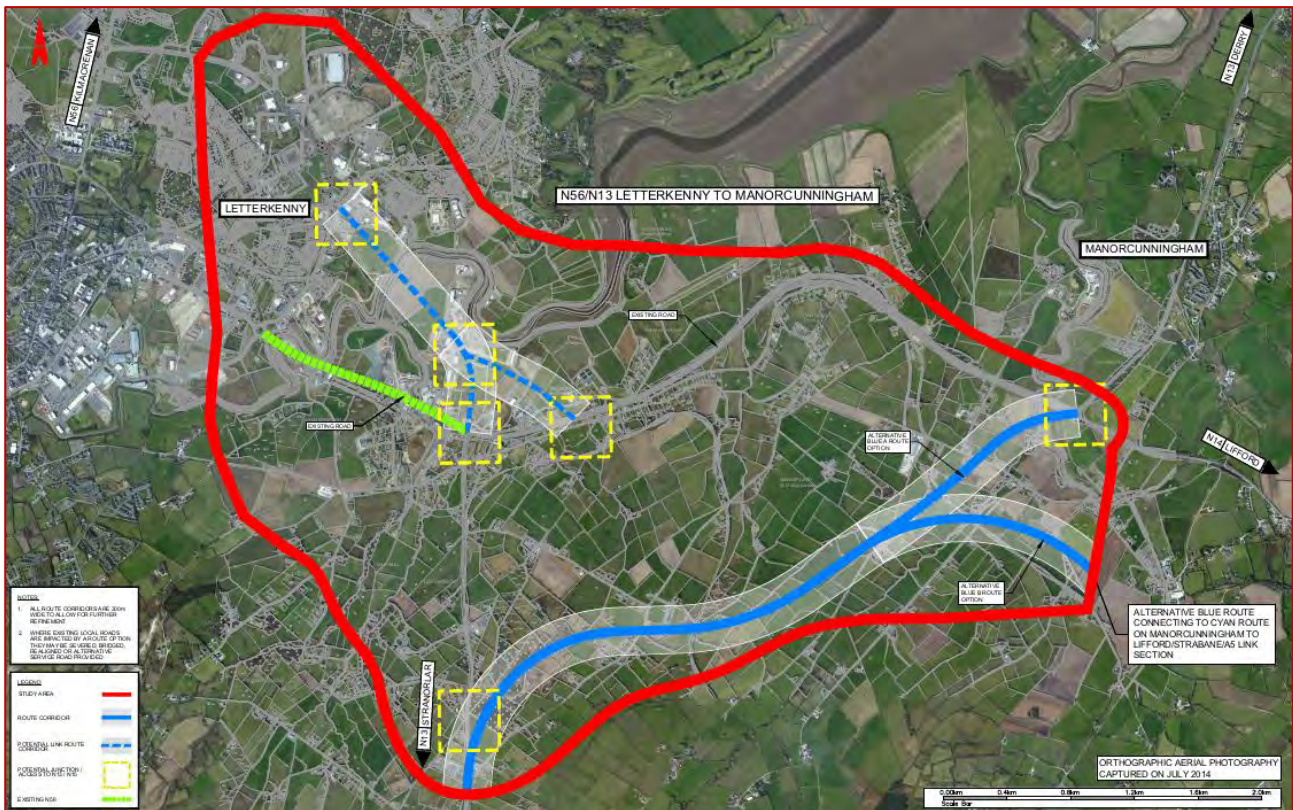


FIGURE 2.10: OPTION 2F2 (BLUE B)

2.8.1 N13 between Southern Tie-in and Dry Arch Roundabout – Cross Section

Problem

This option will result in the section of the N13 south of the Dry Arch Roundabout being severed at the southern tie-in, resulting in a significant decrease in the likely traffic along this section of road.

Retaining the existing cross-section along this relatively lengthy straight section on road, which has a particularly wide carriageway including a climbing lane and hard-shoulder, coupled with significantly reduced traffic volumes could lead to excessive speeds or anti-social behaviour along this section of road.

Hazard

Retaining the existing cross-section on the severed section of the existing N13 south of the Dry Arch Roundabout coupled with significantly reduced traffic flows could lead to excessive speeds or anti-social behaviour.

2.8.2 N13 between Southern Tie-in and Dry Arch Roundabout – VRU Provisions

Problem

There are no measures proposed to cater for vulnerable road users (e.g. footpath) for the section of the N13 south of the Dry Arch Roundabout which will be severed under this option. The Road Safety Authority website (www.rsa.ie) shows two pedestrian fatalities have along this section of the N13 in the period 2005 to 2015, one in 2005 and the other in 2011.

The likelihood of vehicular/VRU collisions will reduce with the reduction in traffic, however increased VRU traffic may also arise.

Hazard

The absence of pedestrian provisions will result in vulnerable road users continuing to travel within the carriageway where they are at an increased risk of being struck.

2.8.3 Traffic on Existing N13

Problem

The forecast traffic figures provided to the Audit Team indicate that the majority of traffic will continue to travel along the existing N13 between Manorcunningham and Letterkenny. Consequently, this option fails to improve the road environment for the majority of traffic, resulting in a lesser safety benefit accruing when compared with other options.

Hazard

Proposed alignment does not cater for the majority of traffic on this section of the N13, with a consequent reduced safety benefit accruing when compared with other options.

2.8.4 Multiple Roundabouts in Close Proximity

Problem

The proposed junction configuration at the southern end of the new link road across the River Swilly, where two new roundabouts are proposed resulting in three roundabouts in close proximity, when the existing Dry Arch Roundabout is taken into account, will result in an increased number of potential conflict points with a resulting increase in likely collisions.

Hazard

Multiple at-grade roundabouts in close proximity results in an increased number of conflicting manoeuvres.

2.8.5 N13/N14 Pluck Roundabout

Problem

The collision data provided to the Audit Team indicates that all existing approaches to the Pluck Roundabout have collision rates above that expected for an equivalent section of national road. This Option maintains the existing at-grade roundabout layout at this location.

Hazard

Retaining existing junction layout at Pluck Roundabout will not improve safety at this location without other measures being included in the design.

3 Preference of Design Options

Following on from the safety concerns outlined in the previous section, this is a summary of the main points/issues identified for each option.

3.1 Option 2A (Orange)

Option 2A retains the existing N13 south of the Dry Arch Roundabout, which is a single carriageway section of road with a steep downhill gradient on the northbound approach to an existing crossroads junction.

Option 2A retains the existing crossroads on the N13 south of the Dry Arch Roundabout.

Option 2A will not result in the safety improvements for vulnerable road users achieved with some of the other route options.

Option 2A proposes new at-grade roundabouts close to the Dry Arch Roundabout.

3.2 Option 2B (Pink)

Option 2B retains the existing N13 south of the Dry Arch Roundabout, which is a single carriageway section of road with a steep downhill gradient on the northbound approach to an existing crossroads junction.

Option 2B retains the existing crossroads on the N13 south of the Dry Arch Roundabout.

Option 2B will not result in the safety improvements for vulnerable road users achieved with some of the other route options.

3.3 Option 2C (Purple)

Option 2C provides a dual-carriageway cross-section for the full length of the improved N13 corridor.

Option 2C provides no connection for mainline traffic wishing to leave/join the section of the existing N13 between the southern tie-in and the Dry Arch Roundabout, resulting in increased traffic on the local roads at the southern tie-in.

Option 2C will result in the severing of the existing N13 south of the Dry Arch Roundabout. Retaining the cross-section could lead to excessive speeds and/or anti-social behaviour along this section of road.

Option 2C does not include any VRU provisions on the severed section of the N13 south of the Dry Arch Roundabout.

Option 2C proposes new at-grade roundabouts close to the Dry Arch Roundabout.

3.4 Option 2D (Red)

Option 2D provides a dual-carriageway cross-section for the full length of the improved N13 corridor.

Option 2D will result in the severing of the existing N13 south of the Dry Arch Roundabout, however no other changes to this section of road are indicated. This could lead to excessive speeds and anti-social behaviour along this section of road.

Option 2D does not include any VRU provisions on the severed section of the N13 south of the Dry Arch Roundabout.

Option 2D provides no connection for mainline traffic wishing to leave/join the section of the existing N13 between the southern tie-in and the Dry Arch Roundabout, resulting in increased traffic on the local roads at the southern tie-in.

Option 2D proposes new at-grade roundabouts close to the Dry Arch Roundabout.

3.5 Option 2E (Green)

Option 2E provides a dual-carriageway cross-section for the full length of the improved N13 corridor.

Option 2E provides no connection for mainline traffic wishing to leave/join the section of the existing N13 between the southern tie-in and the Dry Arch Roundabout, resulting in increased traffic on the local roads at the southern tie-in.

Option 2E will result in the severing of the existing N13 south of the Dry Arch Roundabout, however no other changes to this section of road are indicated. This could lead to excessive speeds and anti-social behaviour along this section of road.

Option 2E does not include any VRU provisions on the severed section of the N13 south of the Dry Arch Roundabout.

Option 2E proposes new at-grade roundabouts close to the Dry Arch Roundabout.

3.6 Option 2F1 (Blue A)

Option 2F1 provides a dual-carriageway cross-section for the full length of the improved N13 corridor.

Option 2F1 fails to adequately cater for traffic wishing to leave/join the section of the existing N13 between the southern tie-in and the Dry Arch Roundabout, resulting in increased traffic on the local roads at the southern tie-in.

Option 2F1 will result in the severing of the existing N13 south of the Dry Arch Roundabout, however no other changes to this section of road are indicated. This could lead to excessive speeds and anti-social behaviour along this section of road.

Option 2F1 does not include any VRU provisions on the severed section of the N13 south of the Dry Arch Roundabout.

Option 2F1 fails to attract much of the N13 traffic within the study area, which will continue to use the existing N13 which is a high collision location.

Option 2E retains the existing junction form at the intersection with the N14 while adding an additional arm to the roundabout at this location.

Option 2F1 proposes new at-grade roundabouts close to the Dry Arch Roundabout.

3.7 Option 2F2 (Blue B)

Option 2F2 provides a dual-carriageway cross-section for the full length of the improved N13 corridor.

Option 2F2 fails to adequately cater for traffic wishing to leave/join the section of the existing N13 between the southern tie-in and Dry Arch Roundabout, resulting in increased traffic on the local roads at the southern tie-in.

Option 2F2 will result in the severing of the existing N13 south of the Dry Arch Roundabout, however no other changes to this section of road are indicated. This could lead to excessive speeds and anti-social behaviour along this section of road.

Option 2F2 does not include any VRU provisions on the severed section of the N13 south of the Dry Arch Roundabout.

Option 2F2 fails to attract much of the N13 traffic within the study area, which will continue to use the existing N13 which is a high collision location.

Option 2F2 proposes new at-grade roundabouts close to the Dry Arch Roundabout.

3.8 Ranking of Route Options

The Audit Team carried out a full review of all relevant drawings and documents in relation to the proposed route options and visited the site. The main safety considerations in comparing the routes at this stage included: -

- Impact, interface and effect on existing road network;
- Cross-section Improvements (e.g. dual carriageway);
- Impact on known high collision locations;
- Type and arrangement of junctions;
- Potential design issues; and
- Potential residual risks.

A summary of some of the comparative items reviewed is given in Table 3.1. The Audit Team consider, from a road safety perspective, that: -

1. options that result in more traffic travelling on improved roads are preferred, in particular along dual carriageway sections. (Table 3.1 Ranking:- None, Low, Moderate & High, with 'High' the greatest preference);
2. Improved vulnerable road user environment - options which result in an improved road environment near vulnerable road user destinations (e.g. schools) are preferred (Ranking is 'High', 'Moderate', 'Low' – with 'High' the most preferred);
3. options that improve known high collision locations are preferred. (Table 3.1 Ranking:- None, Low, Moderate & High, with 'High' the greatest preference);
4. options that minimise road layout complexity (e.g. the number and proximity of junctions) are preferred. (Table 3.1 Ranking:- None, Low, Moderate & High, with 'High' the least preferred); and
5. options which do not result in increased traffic on local roads are preferred. (Table 3.1 Ranking:- None, Low, Moderate & High, with 'High' the least preferred).

Route Option	Mainline Length [km]	Link Roads Length [km]	New Junctions		Traffic Flows on Improved Roads	Improved VRU Environment	Effect on High Collision Locations	Road Layout Complexity	Impact on Local Road Network
			At-Grade	Grade-Separated					
2A (Orange)	6.5	1.4	3	1	Moderate	Low	Low	Low	Low
2B (Pink)	6.1	1.7	1	1	Moderate	Low	Low	Low	Low
2C (Purple)	6.0	2.4	4	1	High	Moderate	Moderate	Moderate	Moderate
2D (Red)	6.0	2.4	3	1	High	Moderate	Moderate	Moderate	Moderate
2E (Green)	4.6	2.9	4	-	High	Moderate	Moderate	Moderate	Moderate
2F1 (Blue A)	4.3	2.4	3	1	Low	Moderate	Low	Moderate	Moderate
2F2 (Blue B)	4.2	2.4	3	1	Low	Moderate	Low	Moderate	Moderate

TABLE 3.1: COMPARISONS ADVANTAGES/DISADVANTAGES (NON-EXHAUSTIVE/SELECTED)

The Audit Team have concluded that the Route Options, as provided, rank as shown in Table 3.2 in terms of road safety. The ranking is purely a relative grading of the route options with respect to each other. All of the proposed Route Options represent an improvement to the existing N13 within the Study Area.

Option	Rank
2A (Orange)	5
2B (Pink)	4
2C (Purple)	3
2D (Red)	2
2E (Green)	1
2F1 (Blue A)	6
2F2 (Blue B)	7

TABLE 3.2: OPTION RANKING

4 Road Safety Audit Team Statement

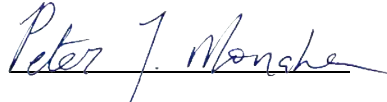
We certify that we have examined the drawings and other information referred to in this report and listed in Appendix B, and that the site during daytime on the 15th August 2018. We product certify that we are independent from the design team for the scheme. The examination has been carried out with the sole purpose of identifying any features of the design that could be removed or modified in order to improve the safety of the scheme.

The problems identified have been noted in this report, together with suggestions for a preferred route option.

ROAD SAFETY AUDIT TEAM LEADER

Peter Monahan

Signed:



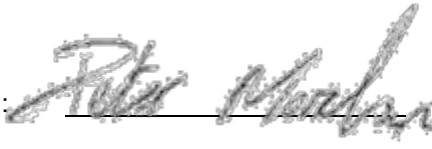
Dated:

2nd October 2019

ROAD SAFETY AUDIT TEAM MEMBER

Peter Morehan

Signed:



Dated:

2nd October 2019

ROAD SAFETY AUDIT TEAM MEMBER

Gerard Claffey

Signed:



Dated:

2nd October 2019

OTHERS INVOLVED

Ms. Laura Woodbyrne, Trainee/Observer

Appendix A – Documents Submitted to the Road Safety Audit Team

DOCUMENT/DRAWING TITLE	DOCUMENT/DRAWING NO.	REVISION
	Collision Rate Data (Jan 2014 to Sep 2016)	-
TT_MGT0337-RPS-00-ZZ-DR-D-DG0011-02	SECTION 2 - STAGE 2 ROUTE CORRIDORS	P01
TT_MGT0337-RPS-00-ZZ-DR-D-DG0006-01	SECTION 2 ORANGE ROUTE CORRIDOR	P05
TT_MGT0337-RPS-00-ZZ-DR-D-DG0006-02	SECTION 2 PINK ROUTE CORRIDOR	P05
TT_MGT0337-RPS-00-ZZ-DR-D-DG0006-03	SECTION 2 EXISTING ROUTE - "DO NOTHING"	P05
TT_MGT0337-RPS-00-ZZ-DR-D-DG0006-04	SECTION 2 PURPLE ROUTE CORRIDOR	P05
TT_MGT0337-RPS-00-ZZ-DR-D-DG0006-05	SECTION 2 RED ROUTE CORRIDOR	P05
TT_MGT0337-RPS-00-ZZ-DR-D-DG0006-06	SECTION 2 GREEN ROUTE CORRIDOR	P05
TT_MGT0337-RPS-00-ZZ-DR-D-DG0006-07	SECTION 2 CORRIDOR 2F1 (Blue A) & 2F2 (Blue B)	P07
TT_MGT0337-RPS-00-ZZ-DR-D-GE0007	LONGPLOT PLAN & PROFILE SECTION 2 - CORRIDOR 2A (ORANGE)	P03
TT_MGT0337-RPS-00-ZZ-DR-D-GE0008	LONGPLOT PLAN & PROFILE SECTION 2 - CORRIDOR 2B (PINK)	P03
TT_MGT0337-RPS-00-ZZ-DR-D-GE0009	LONGPLOT PLAN & PROFILE SECTION 2 - CORRIDOR 2C (PURPLE)	P03
TT_MGT0337-RPS-00-ZZ-DR-D-GE0010	LONGPLOT PLAN & PROFILE SECTION 2 - CORRIDOR 2D (RED)	P03
TT_MGT0337-RPS-00-ZZ-DR-D-GE0011	LONGPLOT PLAN & PROFILE SECTION 2 - CORRIDOR 2E (GREEN)	P03
TT_MGT0337-RPS-00-ZZ-DR-D-GE0012	LONGPLOT PLAN & PROFILE SECTION 2 - CORRIDOR 2F1 (BLUE A)	P04
TT_MGT0337-RPS-00-ZZ-DR-D-GE0013	LONGPLOT PLAN & PROFILE SECTION 2 – CORRIDOR 2F2 (BLUE B)	P04

Appendix B – Audit Team Approval

*Emma Coyle
Classon House
Dundrum Business Park
Dublin 14*

Date: 13/08/2018

Our Ref: 1335546/5352/Stage F

**re: N13 N56/N13 Letterkenny to Manorcunningham TEN-T
APPROVAL OF ROAD SAFETY AUDIT TEAM, Stage F**

Dear Emma Coyle,

The following members of the proposed road safety audit team are approved to carry out the Stage F road safety audit of N13 N56/N13 Letterkenny to Manorcunningham TEN-T.

1. Peter Monahan - PMCE Ltd. - Leader
2. Peter Morehan - J.B. Barry & Partners Ltd. (Dublin) - Leader
3. Gerard Claffey - J.B. Barry & Partners Ltd. (Dublin) - Member

A copy of all audit reports, design team response and exception reports must be uploaded through RSAAS. Successful upload of these reports and completion of the audit approval process is necessary for any further audit approval on this scheme.

Yours sincerely,

Lucy Curtis

Regional Road Safety Engineer
roadsafetyaudits@mra.ie

Appendix B



TEN-T Priority Route Improvement Project, Donegal

Section 2: N13/N56 Letterkenny to Manorcunningham

Option Selection Report

Phase 2 – Road Safety Impact Assessment

Document Control Sheet

Client:	Donegal County Council
Project Title:	TEN-T Priority Route Improvement Project, Donegal – Section 2: N13 Letterkenny to Manorcunningham
Document Title:	Road Safety Impact Assessment
Document No. :	TT_Y16112-BT-RS-GEN-S2-RP-C-00001

Rev. No.	Suitability	Effective Date	Revision Description	Checked	Approved
P01	S4	December 2019	Issue for publication	TD/GD	ED

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1 SECTION 2 PHASE 2 IMPACT ASSESSMENT REPORT

1.1 Introduction

This report is for a Phase 2 Road Safety Impact Assessment and considers the shortlisted “Do Something” options for Section 2 of the TEN-T Priority Route Improvement Project, Donegal.

An assessment of the “Do Nothing” concluded that the “Do Nothing” option will not achieve the desired road safety objectives. A Do-minimum option was explored at the beginning of the option selection process but was discounted prior to Stage 1 assessment as the solution would not provide adequate level of service, nor bring infrastructure to current standards and would not meet the scheme objectives.

The objective of this assessment is to consider the proposed project from a road safety point of view and by carrying out a comparative analysis of the road safety implications of each alternative option identified during Phase 2. Consequently, a determination of which scheme would give the best road safety outcome can be made.

The assessment has been carried out on the shortlisted options that are being assessed during Stage 2 of the Option Selection Process. The assessment reviews the alignment designs prepared at the time of writing, which are option selection designs only, and are not developed to preliminary design level.

1.2 Problem definition

1.2.1 The project

The scope of the project is to provide a high-quality road network on three prioritised sections of the Trans-European Transport Network (TEN-T) in Donegal. The scope of the improvement aligns with the National Development Plan, the National Planning Framework (Ireland 2040) and the County Donegal Development Plan.

The project has emerged from a recent study, the Trans-European Transport Network Corridor Needs Study, conducted by CH2M Barry in 2015, which reviewed the existing condition of the whole TEN-T network in the county. For the purposes of the study, the TEN-T network was split into 7 sections as shown in Figure 1-1.

This report assesses the current condition of each section through a site visit, journey time surveys and a desktop study for all sections. The only section omitted from the study was the N15 from south of Ballybofey to the county boundary (Section 1), as numerous upgrades of this section have been completed in recent times.

The investigation assessed each section with respect to:

- Cross-section characteristics
- Full Overtaking Sight Distance
- Accesses
- Drainage
- Pavement Condition
- Traffic/Level of Service
- Travel Speed
- Collision Rates

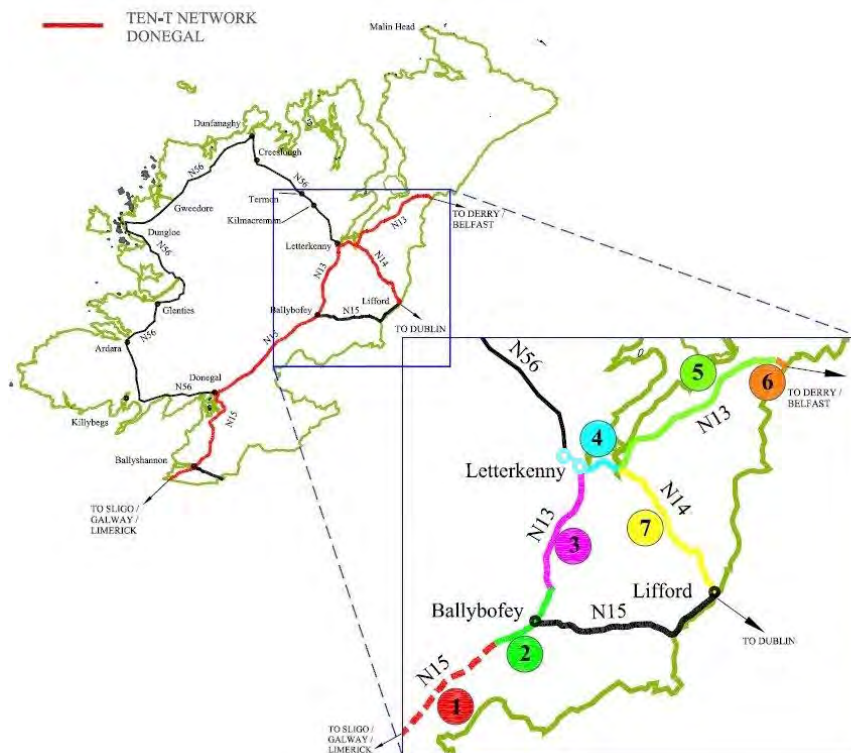


Figure 1-1 Sections of the TEN-T Network in County Donegal

Each section was scored in a consistent manner, which highlighted that much of the TEN-T network in the county falls below the standard expected, with all sections performing poorly on collision rates, future estimated capacity and number of accesses. The overall scores provided a means to prioritise the sections that require imminent intervention, to begin the phased development of the full TEN-T network. These prioritised sections identified as the worst performing overall, are the three sections comprising the TEN-T Priority Route Improvement Project, Donegal as follows:

1. The N15/N13 Ballybofey/Stranorlar Urban Region (Section 2)
2. The N56/N13 Letterkenny to Manorcunningham (Section 4)
3. The N14 Manorcunningham to Lifford/Strabane/A5 Link (Section 7)

The EU Regulation No. 1315 (2013) of the European Parliament and of the Council on Union guidelines for the development of the TEN-T network aims to tackle key issues on the network. The development of the TEN-T network in County Donegal will require a phased approach in order to meet the objectives set out in the TEN-T Regulations.

Section 2 of the project, the N56/N13 route, is the subject of this report. At the outset of Phase 2, a study area was developed which also included the N13 south of Letterkenny (Lurgybrack). This

ensured that all feasible options could be fully explored. As such, Section 2 includes strategic links from Letterkenny to the national primary road network in a southerly direction (via Lurgybrack) to Ballybofey/Stranorlar, Sligo, Galway etc. and in an easterly direction to Manorcunningham, and onto Derry, Belfast and Dublin.

1.2.2 Project objectives

The objectives of this project are to address current road infrastructure deficits and improve the Level of Service (LOS) provided. In so doing, traffic congestion in urban areas will be relieved and road safety improved (current collision rates are above the expected rate for the nature of the road). A key objective for this scheme is the improvement in journey times for strategic traffic on the N56/N13 by provision of a high standard carriageways aimed to attract strategic journeys. Furthermore, this will improve the safety of the residual road network and improve connectivity between the N56/Letterkenny and the N13 which leads to the Northern and Southern primary road network.

1.3 List of existing road safety problems

The existing problems fall into three key categories:

- Infrastructure deficits: existing infrastructure is currently below the current design standards with respect to alignment, overtaking distances and cross-sectional width;
- Higher Personal Injury Collision (PIC) rates than expected as set out in Project Appraisal Guideline (PAG) Unit 6.11;
- Inadequate LOS: the AADT required for the minimum LOS of D has been exceeded.

Each of the above items are largely interdependent, with LOS being influenced by cross-section, and collision numbers being influenced by alignment. The breakdown of collision statistics for each link within Section 2 is available in Appendix A.

Table 1-1 Summary of collision types from 2005 to 2014 according to RSA.ie database

	Fatal	Serious	Minor	Total
N13 Lurgybrack * (N13 north-south link)	2	0	6	8
Dry Arch Roundabout	0	0	5	5
N56 4-Lane Road (between Dry Arch and Polestar Roundabouts)**	1	4	22	27
N56 Ramelton road approach to Polestar Roundabout	0	0	4	4
N13 Dual Carriageway	1	0	7	8
Total:	4	4	44	52

*Statistics taken from just north of the National school, which is included within the study area and option assessments undertaken.

** N56 4-Lane road is to undergo safety improvements as part of a separate project. However, the safety improvements will not address the inadequate LOS along this section of the N56.

The statistics highlight the severity of the existing safety issues on the N56 4-lane road, with over 50% of all collisions in this study area occurring on this link including one fatal collision. This existing link is a 4-lane single carriageway with numerous direct, all-movement accesses onto the national road which has a speed limit of 80kph.

Two other fatal collisions in the study area occurred on the N13 north-south Lurgybrack link. The existing geometry at this location consists of a single carriageway with two lanes in the southbound direction (up gradient) and one in the northbound direction (down gradient). The existing gradient is approximately 8% at this location, and there are direct accesses, including a primary school, on the link. The two fatal collisions on this link both involved pedestrians.

The other fatal collision occurred on the N13 dual carriageway on the eastbound approach to Trimragh at-grade junction. This collision also involved a pedestrian.

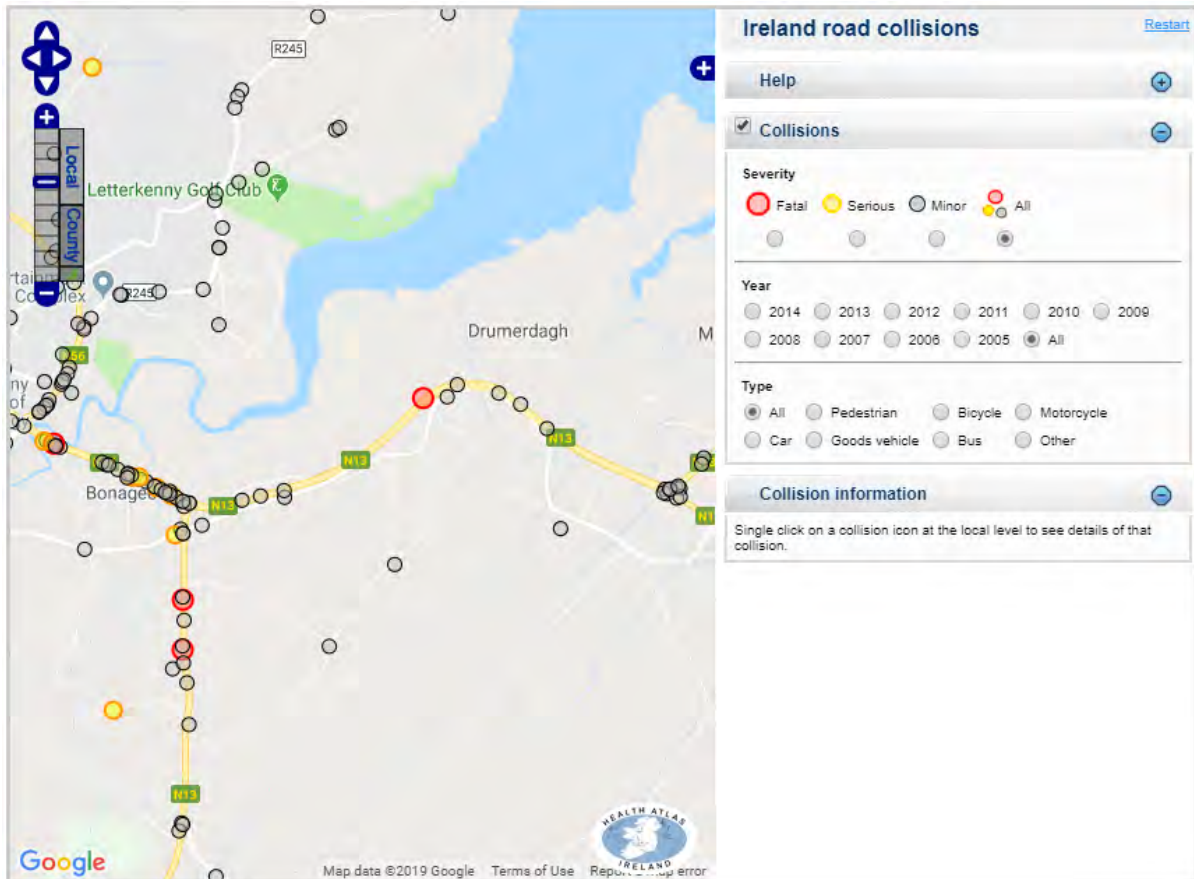


Figure 1-2 Collision Information on N56/N13 from Letterkenny to Manorcunningham

1.4 The area of influence

In general, minor road connectivity is being retained with alternate options provided where route severance is proposed, which minimises impact on local traffic patterns. Therefore, drivers' route choice, mode of travel or travel time on the local road network will not be significantly impacted.

All other options involve the upgrade of the existing N13 east-west dual carriageway link. The provision of an intermediate grade separated junction and associated link roads will provide safe access for local traffic onto the strategic road network. This will result in trip reassignment on some local journeys, but this is unlikely to have a significant impact on safety. There will be an over-riding safety gain in removing local traffic access from the N13 east-west dual carriageway link.

All options will involve the removal of national route traffic on the N13 – N56 route from the existing N56 east approach to Letterkenny with the provision of a new N56 link with a new bridge over the River Swilly. This will have a positive impact on operation of this part of the network in terms of congestion and road safety as a significant amount of national route traffic is displaced to the new

roadway. Additionally, it will result in a redistribution of local traffic on the east side of Letterkenny and relieve pressure on the local road network here.

Options 2A (Orange) and 2B (Pink) involve an inline upgrade of the N13 south link. This will involve some severance of, and provision of alternative local access and these options will have a much wider area of influence compared to the other options. Changes to local traffic patterns and drivers' route choice could be more significant here, however it anticipated that the number of trips affected would be low. The resultant trip changes are unlikely to raise any safety concerns. The other four options involve removing national route traffic from the N13 south link to a new link, with the current N13 south link retained as-is, thus not affecting existing travel patterns.

Table 1-1 Impacts of Options on Area of Influence

Option	Positive Impact on Area of Influence	Negative Impact on Area of Influence
Option 2A (Orange)		Scheme will involve a higher impact on local travel patterns throughout and a wide area of influence.
Option 2B (Pink)		Scheme will involve a higher impact on local travel patterns throughout and a wide area of influence.
Option 2C (Purple)	Most existing local travel routes are retained on the N13 south link.	Scheme will involve an impact on local travel patterns on the N13 east link and a wide area of influence on that link. Some local affect on travel patterns caused by road severance for the new road connection between N13 south and east.
Option 2D (Red)	Most existing local travel routes are retained on the N13 south link.	Scheme will involve an impact on local travel patterns on the N13 east link and a wide area of influence on that link.
Option 2E (Green)	Most existing local travel routes are retained throughout.	Some local effect on travel patterns caused by road severance for the new road.
Option 2F1/2F2 (Blue)	Most existing local travel routes are retained throughout.	Some local effect on travel patterns caused by road severance for the new road.

1.5 Road safety objectives

The 2016 national fatality statistics are at 40 per million (4.7 million population and 187 fatalities), almost twice the target set in the Road Safety Authority aim of “25 per million population or less by 2020”. Correspondingly, the existing safety record for TEN-T comprehensive network in Donegal is poorer than should be expected from that of National Primary Routes.

These poor collision records are likely to be correlated to the substandard alignment and cross-section of the routes which are insufficient to accommodate current traffic volumes. Additionally, much of the TEN-T network in Donegal has numerous agricultural and residential accesses directly onto the national road network, increasing the variety of vehicles and speeds using the network. These along with inappropriate junction types and substandard designs result in a significant number of conflict points along the TEN-T route.

An objective of the project is to reduce the frequency and severity of collisions that occur on the three sections of the TEN-T network, and subsequently making the infrastructure more attractive for vehicular and non-vehicular traffic.

The road safety objectives of this scheme are to:

- Decrease collision frequency on the N13. This can be achieved by:

- Reducing junction numbers, direct accesses and conflict points;
- Providing improved infrastructure, alignments and cross-section widths to accommodate existing and future traffic flows;

- Provide a standardised road layout with no substandard features;
- Reduce collision frequency and severity on the N56 east of Letterkenny;
- Improve safety for vulnerable road users;
- To support the Government’s Road Safety Strategy 2013-2020.

2 OPTION COMPARISON

Each route option has been reviewed in terms of fundamental horizontal and vertical alignment as prepared for the option selection phase. At this phase the design is not finalised but is indicative of the typical characteristics that could be expected of a route. For example, the extent of areas in cut or fill, the positioning of junctions, proximity to local road networks etc.

The RSIA aims to consider the wider road safety impact of each route option on the residual network, as well as the route itself.

2.1 Analysis of Impacts on Road Safety

Each route option will influence various aspects of the operation of the road network in the locality which in turn have an impact on road safety. The road safety impacts of each route option have been reviewed with cognisance of the requirements and criteria set out in PE-PMG-02001. These are outlined in Table 2-1.

Tying in of the N56 ring road northeast of Letterkenny, creates a new link across the Swilly between to the N13, and is a feature of all options under consideration. This will have the benefit of removing a certain proportion of traffic from the existing N56 four-lane road serving Letterkenny, as a new link is provided from the existing N13 to the N56, resulting in a safer road environment especially for vulnerable road users, as well as reduced congestion. As the existing N56 has a poor collision record, this will provide a safety benefit across all options.

Additionally, the existing N56 4-Lane road between Dry Arch roundabout and Pole Star roundabout is being improved as part of a separate scheme. The scheme will involve online safety improvements including reduction of speed limit to 65kph, implementation of 3.2m lanes, the addition of a central reserve and cycleway/footway on both sides of the route. It is acknowledged this will address some of the safety issues present on the link, however, the only safety effects considered for each route option as part of this RSIA is a result of the route options only. The direct safety impact of these improvements does not form part of this assessment.

As all route options provide comparable improvements/characteristics, a review of the engineering designs was undertaken in further understanding of the differences between route options and assist in deriving a route ranking. As options 2F1 and 2F2 are similar for much of their length, for this assessment they are assessed on the same basis, as summarised in Table 2-1.

Table 2-1 Road Safety Impacts of route options

	Option 2A (Orange)	Option 2B (Pink)	Option 2C (Purple)	Option 2D (Red)	Option 2E (Green)	Option 2F1/2F2 (Blue)
Effect on Traffic Flow and Traffic Patterns	The closure of direct access onto the N13 east-west link segregate local traffic from strategic traffic.		The provision of a new offline dual carriageway replacing the existing N13 north-south Lurgybrack link will have minimal impact on local traffic and any displaced local traffic will not give rise to a safety concern.		The provision of an offline road solutions will accommodate total separation of local traffic from national route traffic on the N13, meaning local traffic flows and patterns are unlikely to change.	
	The closure of direct access on the N13 east-west link will displace local traffic to a local road network incorporating a combination of existing and new links. The volume of displaced traffic is likely to be low and therefore it is unlikely to generate new hazards.				Three local roads are bridged and two are closed with a small amount of severance affecting a small number of properties.	As the existing N13 north-south and east-west links can remain as-is, all local traffic retains the access they currently have. Two local roads are bridged and two are closed with minimal severance.
	As this displaced traffic is anticipated to be low in volume, the effect of the displacement is unlikely to generate new hazards. The separation out of local traffic from national route traffic and the removal of direct access onto the N13, will have positive safety benefits.					
	Predicted traffic volumes for an opening year of 2028 indicate that implementing any of the route options would have the effect of better distributing traffic across the road network within the study area. All route options would reduce predicted traffic flows on the existing N56 4-lane road by almost 50% as a result of re-distribution of traffic utilising the new Lough Swilly crossing.					
			These routes would result in predicted AADTs on the N13 Lurgybrack approach to the Dry Arch roundabout reducing by approximately 35%.			Route 2F attracts the least volume of traffic (approx. 4000 vehicles) to the new mainline, resulting in most traffic remaining on the existing N13 east-west dual carriageway.
Impact on Non-Motorised User Travel	The Donegal Cycle Network aligns parallel to the existing N13 dual carriageway and as such, the closing off of direct access to the N13 and the provision of a grade separated junction on could involve a short detour. The closing off of the direct access at Ch. 3+100 on the N13 east-west link will unlikely affect patterns of pedestrian and cycle travel.				No change to NMU travel patterns is anticipated, however safety conditions are likely to improve as a result of traffic transfer from the existing road network to the new route.	The location of the route is unlikely to attract a significant number of vehicles. Therefore, the safety of NMUs on the residual road network will not be significantly improved by the scheme.

	Option 2A (Orange)	Option 2B (Pink)	Option 2C (Purple)	Option 2D (Red)	Option 2E (Green)	Option 2F1/2F2 (Blue)
			The downgrading of the existing N13 north-south link to regional road should see its use revert to local traffic only and thus will become a safer environment for residents along this route.			
Seasonal Conditions	Likelihood of increased seasonal summer traffic due to tourism. No impacts on road safety anticipated due to seasonal conditions.					
Climatic Conditions	Adoption of 8+% road gradient as per the existing N13 north-south link, could contribute to loss of control type collisions during adverse weather conditions.		The proposed road geometry is unlikely to contribute to loss of control type collisions during adverse weather conditions.			
Safe Parking Areas	The proposed road provision is considered of insufficient length to warrant parking areas.					
Effect on existing Collision Clusters	The proposal on-line upgrading of the N13 north-south Lurgybrack Hill link over 1.8km is unlikely to address the existing and historic safety issues on this link, which has witnessed two fatal collisions involving pedestrians occurred in 2005 and 2011 on this stretch of road.		The proposed alternative N13 north-south link should result in an improved safety record as it includes provision of a new, national strategic route of a shallower gradient and less accesses than the existing Lurgybrack Hill.		The retention of the N13 north-south Lurgybrack Hill link over 1.8km is unlikely to address the existing and historic safety issues on this link, which has witnessed two fatal collisions involving pedestrians occurred in 2005 and 2011 on this stretch of road.	
Road Geometry	No significant improvement of road geometry for the existing N13 north-south Lurgybrack link: existing steep gradient retained. The existing N13 east-west dual carriageway is of a sufficient standard geometric design, which these routes propose to retain.		An improvement of road geometry for the existing N13 north-south link involves the provision of gentler road gradients and offer a level of service consistent with the existing N13 dual carriageway.		An improvement of road geometry for the existing N13 north-south link involves the provision of gentler road gradients. The existing wide single carriageway will be replaced by a four-lane dual carriageway.	
	Retention of 9.6% road gradient on the Lurgybrack link could contribute to loss of control and potentially present problems for drivers of HGVs attempting to slow down while travelling downhill.				Retention of the existing N13 north-south link as the connection to Letterkenny/N56 is considered a safety disbenefit by virtue of gradient. Location of Intermediate Junctions. No intermediate junction is proposed.	

	Option 2A (Orange)	Option 2B (Pink)	Option 2C (Purple)	Option 2D (Red)	Option 2E (Green)	Option 2F1/2F2 (Blue)
Junction Frequency	Proposed grade separated junction on N13 dual carriageway will replace four T-junctions and a crossroad junction, which is likely to have a positive effect in terms of road safety. Direct access Retention of existing direct accesses on the N13 north-south link will have a negative effect on road safety. Direct access will be eliminated along the N13 east-west link and this will be a road safety gain.		Direct access will be eliminated along the N13 north-south and east-west links and this will be a road safety gain.		Direct access will be retained along the current N13 however as these links will carry a reduced volume of traffic and generally local traffic, the safety performance of these links should improve.	Direct access will be retained along the current N13. As the existing N13 will still be used for traffic between the N13 and Letterkenny/N56, current safety issues with direct accesses will still be prevalent for this scheme.
Junction Locations	Proposed separated junction on the N13 east-west link is centrally located and an optimum location for facilitating local traffic.				A new grade separated junction is proposed on the N13. The junction is centrally located on the link and its primary role is for connection to the N56 to the north.	
Tie-ins	No safety issues with tie-in locations. Roundabouts (existing and proposed) will be used at all tie-ins.					
Forgiving Roadside	For the N13 north-south link, the existing roadway has roadside hazards. For the N13 east-west link, existing N13 carriageway has 41% (eastbound) and 60% (westbound) of the roadway with verge-side safety barriers. The proportion for the westbound carriageway is high and not in keeping with design approach of providing forgiving roadsides.		For the N13 north-south link, 34% of the link is on embankments requiring safety barrier. For the N13 east-west link, with an in-line upgrade the proposed vertical alignment will also be constructed at-grade. The existing N13 carriageway has 41% (eastbound) and 60% (westbound) of the roadway with verge-side safety barriers. The proportion for the westbound carriageway is high and not in keeping with design approach of providing forgiving roadsides.		60% of the route is on embankments requiring safety barrier.	27% of the route is on embankments requiring safety barrier.

2.2 Engineering Design Review

To further understand the differences between the route options proposed, the Phase 2 mainline alignment designs were reviewed. Although all route options fall within the permissible design criteria set out in DN-GEO-03031, there are elements of the design which are close to the limiting value of the design standards. This results in a lesser degree of comfort for road users over the minimum standard and limits the future flexibility to amend the design.

The assessment considered horizontal radii, vertical crest and sag curves and gradients. Limiting criteria for a design speed of 100kph are:

Table 2-2 Criteria reviewed to determine designs approaching limiting values

	Desirable Minimum	Desirable Maximum
Horizontal Radii	720m	
Vertical Crest	100	
Vertical Sag	37	
Vertical Gradient		4% or 5% in hilly terrain

As Section 2 study area includes hilly terrain with existing gradients of approximately 8%, the desirable maximum gradient applicable here is 5%. As such, the engineering review also considers gradients of 5% or over for comparative purposes.

Table 2-3 Review of Engineering Designs with respect to Limiting values

	2A (Orange)	2B (Pink)	2C (Purple)	2D (Red)	2E (Green)	2F1/2F2 (Blue)
Use of limiting horizontal radius (no. of instances)	4	4	3	5	4	1
Length of use of limiting radius (m)	1,029	1,029	1,015	1,887	1,609	425
Large changes in horizontal bearing (no. of instances)	1	1	2	1	1	0
Length of use of 4% gradient or less (m)	5234	4649	3978	3891	3209	4249
Length of use of gradient between 4% -5% (m)	340	560	1905	2124	1459	0
Length of use of 5% gradient or greater (m)	1030*	1030*	0	0	0	0
Use of limiting vertical crest curvature (no. of instances)	2	2	2	3	1	2

*Online N13 upgrade at Lurgybrack provides gradients of approximately 8%.

In terms of limiting geometry, Option 2D (Red) has the most instances where the option selection alignment design is on limiting values when 4% gradients are considered, however if the maximum gradient considered is 5% Options 2A and 2B perform worst. due to the existing gradient which is inherited on the online N13 Lurgybrack Hill. This would result in a more perceivable and significant impact in terms of driver comfort with increased potential to contribute to loss of control collisions. Therefore, Options 2A and 2B are the least preferred options in terms of geometric design followed by Option 2D. Options 2F1 and 2F2 have the least instances of utilising limiting geometry and therefore are most preferred.

2.3 Comparison of the alternatives

This section compares options by considering information outlined to date in a qualitative and quantitative manner.

2.3.1 Qualitative description

Table 2-4 Qualitative Summary of options

Option	Benefits	Disbenefits
2A (Orange)	<p>Closure of direct access on the N13 east-west link.</p> <p>Reduction of access to N13 Lurgybrack north-south link.</p> <p>Removal of school access on Lurgybrack Hill.</p>	<p>N13 north-south link online upgrade over 1.8km with retention of existing gradient of approximately 8% interface with N13/N56 involves three no. roundabouts.</p> <p>Inheritance of existing roadside hazards on the N13 north-south link and high proportion of existing barriered carriageway on the eastbound N13 east-west dual carriageway link (60%). These are contrary to the design approach of providing forgiving roadsides.</p>
2B (Pink)	<p>Closure of direct access on the N13 east-west link.</p> <p>Reduction of access to N13 Lurgybrack north-south link.</p> <p>Removal of school access on Lurgybrack Hill.</p>	<p>N13 north-south link involves inline upgrade over 1.8km but will still be single carriageway. Retention of existing direct accesses on the above link.</p> <p>Inheritance of existing roadside hazards that are contrary to the design approach of providing forgiving roadsides, for the N13 north-south link. Inheritance of a high proportion of existing barriered carriageway on the eastbound N13 east-west link (60%).</p>
2C (Purple)	<p>Provision of high standard dual carriageway on N13 north-south link with no direct access and a level of service consistent with the N13 east-west route.</p> <p>For the N13 north-south link, 34% of the link is on embankments requiring safety barrier:</p>	<p>Inheritance of a high proportion of existing barriered carriageway on the eastbound N13 east-west link (60%) that is contrary to the design approach of providing forgiving roadsides.</p>
2D (Red)	<p>Provision of high standard dual carriageway on N13 north-south link with no direct access and a level of service consistent with the N13 east-west route.</p> <p>For the N13 north-south link, 0% of the link is on embankments requiring safety barrier:</p>	<p>Inheritance of a high proportion of existing barriered carriageway on the eastbound N13 east-west link (60%) that is contrary to the design approach of providing forgiving roadsides.</p>
2E (Green)	<p>Provision of high standard dual carriageway on N13. Total separation of local traffic from N13 traffic.</p>	<p>Provision of intermediate junction as an at-grade roundabout.</p> <p>60% of the link is on embankments requiring safety barrier and that is contrary to the design approach of providing forgiving roadsides.</p> <p>No safety improvements to existing N13 east-west route which will could still be used for Letterkenny/N56 traffic.</p>
2F1/2F2 (Blue)	<p>No intermediate junction.</p> <p>27% of the link is on embankments requiring safety barrier:</p>	<p>No safety improvements to existing N13 north-south and east-west routes which will be retained for Letterkenny/N56 traffic.</p>

2.3.2 Quantitative cost benefit analysis of the road safety aspects

The economic assessment of options also estimated predicted benefits as a result of collision reduction on each route options. This was derived using COBALT (Cost and Benefits to Accidents – Light Touch). All options provide collision benefits, with Option 2E giving the highest benefit overall, followed by Option 2B, while Options 2A provides the least benefit, followed closely by Options 2F1/2F2.

Table 2-5 Quantitative summary of options

	2A (Orange)	2B (Pink)	2C (Purple)	2D (Red)	2E (Green)	2F1/2F2 (Blue)
Monetary Value of Collision Reduction Savings	€ 1,367,000	€ 2,569,000	€2,360,000	€ 2,413,000	€ 3,261,000	€ 1.794.000
Preference Rank	6	2	4	3	1	5

3 CONCLUSION

An understanding of the overall impact that each option would have on the proposed and existing road network was determined by reviewing the option selection alignment designs and comparing qualitative and quantitative data.

All options considered as part of this RSIA Phase 2 report are beneficial in terms of road safety in comparison to the existing road network. This is demonstrated through provision of positive quantitative COBALT figures provided for each option.

Based on the information available at the time of the assessment, and the status of the drawings at this point, Table 3-1 sets out the ranking of options. It should be highlighted that all options provide a significant road safety benefit compared to the existing scenario, and ranking is based on marginal differences between the options. As such, there is not a significant benefit of one option over another in terms of road safety, considering the items reviewed.

Options 2A is predominantly online, retaining the approximately 8% existing gradient on the N13 north-south Lurgybrack Hill and N13 east-west dual carriageway. Option 2A includes multi-roundabout arrangement at the N13/N56 interface, which may cause confusion. Option 2A also has the poorest performance in terms of COBALT collision saving estimate and therefore is ranked last.

Option 2B has a similar alignment to 2A, but has less earthworks embankments and has better potential for providing forgiving roadsides. Option 2B also ranks second on the COBALT collision saving estimate.

Option 2F1/2F2 provides a direct dual carriageway link for N13 to the N14. This option ranks best on the Engineering design review but does not attract significant volumes of traffic. Therefore, this option is unlikely to successfully segregate strategic and local traffic. Furthermore, the option does not provide an upgrade to the existing N13 north-south Lurgybrack which is still likely to be used to satisfy road user desire-lines.

Option 2D provides offline alignment to replace the existing N13 Lurgybrack link, resulting in gradients approaching limiting values, but in accordance with current TII guidance. The option also achieves traffic transfer and therefore is preferred over Options 2A, 2B and 2F1/2F2.

Option 2E is predominantly offline and provides an intermediate at-grade roundabout with the new N56 link. This option has the highest COBALT value of collision savings and is effective at distracting traffic in future year growth. However, this is the only option that does not provide upgrades to the existing N13 east-west dual carriageway by removing direct accesses, resulting in residual safety issues. However, the traffic volumes on this part of the network are predicted to be low in future years.

Option 2C provides an offline alignment similar to Option 2D to replace the existing N13 Lurgybrack link aligning north-eastward to tie-into the existing N13 east-west dual carriageway. The alignment is characterised by parameters approaching limiting values, but with less occurrence than Option 2D and still remains in accordance with current TII guidance. In terms of COBALT collision savings estimate, Option 2C is the fourth best performing.

Overall, it can be established that Options 2C, 2D and 2E have a higher preference than the other options, considering all data reviewed. Option 2C is marginally preferred over 2D due less occurrence of alignment approaching limiting values based on the design at the time of writing, while Option 2E has higher potential to result in safety issues on the residual network in future years.

Table 3-1 Ranking of options in terms of road safety impact

Option	Ranking
Option 2C (Purple)	1
Option 2E (Green)	2
Option 2D (Red)	2
Option 2F (Blue)	3
Option 2B (Pink)	3
Option 2A (Orange)	4

Appendix A – Collision Information

Collision No.	Severity	Year	Location	Vehicle	Circumstances	Day	Time	Casualties
1	Fatal	2005	N13 Lurgybrack	Car	Pedestrian	Saturday	2300-0300	1
2	Fatal	2006	N56 4-Lane Road	Motorcycle	Head-on right turn	Friday	2300-0300	1
3	Fatal	2011	N13 Lurgybrack	Undefined	Pedestrian	Thursday	0300-0700	1
4	Fatal	2007	N13 Dual Carriageway	Car	Pedestrian	Tuesday	2300-0300	1
5	Serious	2009	N56 4-Lane Road	Car	Head-on-Conflict	Sunday	1900-2300	2
6	Serious	2007	N56 4-Lane Road	Car	Other	Saturday	1900-2300	3
7	Serious	2005	N56 4-Lane Road	Bus	Pedestrian	Sunday	1000-1600	2
8	Serious	2013	N56 4-Lane Road	Goods Vehicle	Angle, both straight	Wednesday	0300-0700	3
9	Minor	2013	N56 Ramelton link to Polestar	Bicycle	Other	Wednesday	1600-1900	1
10	Minor	2008	N56 Ramelton link to Polestar	Car	Pedestrian	Saturday	0300-0700	1
11	Minor	2008	N56 Ramelton link to Polestar	Car	Head-on-Conflict	Sunday	1000-1600	1
12	Minor	2008	N56 Ramelton link to Polestar	Car	Pedestrian	Sunday	0300-0700	1
13	Minor	2005	N56 Ramelton link to Polestar	Goods Vehicle	Head-on-Conflict	Monday	2300-0300	1
14	Minor	2010	N56 4-Lane Road	Car	Angle, right turn	Wednesday	1000-1600	1
15	Minor	2006	N56 4-Lane Road	Car	Rear end, straight	Sunday	1600-1900	1
16	Minor	2006	N56 4-Lane Road	Goods Vehicle	Angle, right turn	Tuesday	1000-1600	2
17	Minor	2014	N56 4-Lane Road	Car	Pedestrian	Monday	1000-1600	1
18	Minor	2014	N56 4-Lane Road	Car	Single Vehicle	Sunday	1900-2300	1
19	Minor	2014	N56 4-Lane Road	Car	Rear end, straight	Monday	1000-1600	3
20	Minor	2013	N56 4-Lane Road	Goods Vehicle	Rear end, straight	Thursday	1000-1600	1
21	Minor	2012	N56 4-Lane Road	Car	Rear end, straight	Friday	1600-1900	2
22	Minor	2012	N56 4-Lane Road	Car	Other	Wednesday	1600-1900	1

Collision No.	Severity	Year	Location	Vehicle	Circumstances	Day	Time	Casualties
23	Minor	2010	N56 4-Lane Road	Car	Single Vehicle	Monday	2300-0300	3
24	Minor	2013	N56 4-Lane Road	Car	Rear end, straight	Tuesday	0700-1000	2
25	Minor	2010	N56 4-Lane Road	Car	Single Vehicle	Thursday	1900-2300	2
26	Minor	2012	N56 4-Lane Road	Car	Head-on, right turn	Saturday	1000-1600	2
27	Minor	2010	N56 4-Lane Road	Car	Single Vehicle	Monday	1900-2300	1
28	Minor	2011	N56 4-Lane Road	Car	Rear end, straight	Monday	0700-1000	1
29	Minor	2005	N56 4-Lane Road	Car	Rear end, straight	Friday	1600-1900	-
30	Minor	2010	N56 4-Lane Road	Car	Other	Monday	1000-1600	1
31	Minor	2013	N56 4-Lane Road	Car	Rear end, straight	Wednesday	1000-1600	2
32	Minor	2011	N56 4-Lane Road	Bus	Other	Tuesday	0700-1000	1
33	Minor	2012	N56 4-Lane Road	Car	Rear end, straight	Sunday	1600-1900	3
34	Minor	2006	N56 4-Lane Road	Car	Other	Tuesday	2300-0300	1
35	Minor	2011	N56 4-Lane Road	Car	Single Vehicle	Monday	0300-0700	1
36	Minor	2013	Dry Arch Roundabout	Car	Single Vehicle	Monday	0300-0700	4
37	Minor	2007	Dry Arch Roundabout	Bicycle	Other	Friday	1000-1600	1
38	Minor	2013	Dry Arch Roundabout	Goods Vehicle	Other	Friday	1000-1600	1
39	Minor	2012	Dry Arch Roundabout	Car	Other	Monday	1000-1600	1
40	Minor	2014	Dry Arch Roundabout	Car	Angle, both straight	Thursday	1600-1900	1
41	Minor	2008	N13 Lurgybrack	Goods Vehicle	Rear end, right turn	Tuesday	1000-1600	1
42	Minor	2013	N13 Lurgybrack	Car	Other	Friday	1600-1900	2
43	Minor	2007	N13 Lurgybrack	Car	Single Vehicle	Wednesday	2300-0300	2
44	Minor	2007	N13 Lurgybrack	Goods Vehicle	Other	Thursday	0700-1000	1
45	Minor	2008	N13 Lurgybrack	Bus	Angle, right turn	Tuesday	1900-2300	2

Collision No.	Severity	Year	Location	Vehicle	Circumstances	Day	Time	Casualties
46	Minor	2009	N13 Lurgybrack	Car	Other	Monday	1600-1900	2
47	Minor	2005	N13 Dual Carriageway	Car	Rear end, straight	Friday	1600-1900	1
48	Minor	2009	N13 Dual Carriageway	Goods vehicle	Angle, right turn	Sunday	0300-0700	2
49	Minor	2005	N13 Dual Carriageway	Car	Single vehicle only	Sunday	1000-1600	1
50	Minor	2014	N13 Dual Carriageway	Car	Other	Tuesday	0700-1000	1
51	Minor	2013	N13 Dual Carriageway	Car	Single vehicle only	Sunday	1000-1600	1
52	Minor	2010	N13 Dual Carriageway	Car	Rear end, straight	Friday	1000-1600	1
53	Minor	2007	N13 Dual Carriageway	Car	Rear end, straight	Friday	1600-1900	1
54	Minor	2014	N13 Dual Carriageway	undefined	Other	Sunday	0600-0700	2
55	Minor	2006	N13 Dual Carriageway	Car	Single vehicle only	Saturday	1600-1900	1
56	Minor	2013	N13/N14 Pluck Roundabout	Car	Rear end, straight	Sunday	1600-1900	1
57	Minor	2013	N13/N14 Pluck Roundabout	Car	Single vehicle only	Sunday	1000-1600	1
57	Minor	2014	N13/N14 Pluck Roundabout	Car	Rear end, straight	Saturday	1600-1900	3

Appendix B – Trip Generators

Key traffic generators consist of the following:

Type	Name
School	St Patricks National School, Lurgybrack, Sligo Road, Letterkenny, Co. Donegal – 600 students attending this school.
College	Letterkenny Institute of Technology, Port Rd, Gortlee, Letterkenny, Co. Donegal
Businesses along Lurgybrack	Lurgybrack Open Farm, Lurgybrack, Dunfanaghy, Co. Donegal. Open seasonally from 10 to 5 pm. Turnoff to this farm is at the top pf the Lurgybrack hill. Donegal Animal Hospital, Drumany, Letterkenny, Co. Donegal Open six days a week from 9 to 6 pm.
Filling Station	Circle K Filling Station, Bunnagee, Co. Donegal. Busy petrol station that has a lot of traffic turning in / out of this premises. Apple Green, Derry Road, Bunnagee, Letterkenny, Co. Donegal, F92 KWX4. Open 24/7.
Hotel	Clanree Hotel, Derry Road, Bunnagee, Letterkenny, Co. Donegal. Busy hotel with traffic going in / out at all hours of the day. Mount Errigal, Ballyraine, Letterkenny, Co. Donegal.
Sports Facilities	Astro Pitch - Bonagee United F.C., Bunnagee, Bonagee, Co. Donegal. Turning is just after the Circle K petrol station. Across from the Clanree. Opening Hours 8 am to 11 pm. Boals Goals Astro Turf Pitch, Dromore, Letterkenny, Co. Donegal. There are four astro pitches here at this site.
Businesses	Johnston's Caravans Ltd, Dromore, Letterkenny, Co. Donegal. Letterkenny Glass Co, Dromore House, Dromore, Letterkenny, Co. Donegal. Marley's Coach Hire Ltd. They also have an funeral director at the same location. Both businesses are based at: Dromore, Letterkenny, Co. Donegal. One Stop Motor Shop, Dry Arch Business Park, Bunnagee, Letterkenny, Co. Donegal. Open 8 am to 9 pm Tinney's Coal & Oil, Bonagee, Letterkenny, Co. Donegal, F92 H2AH Open 7 am to 7 pm. Lk Autofactors, Bonagee House, Bunnagee, Letterkenny, Co. Donegal. Open 9am to 6 pm Green Vehicle Recycling Ltd, Bonagee, Letterkenny, Co. Donegal. Open 8am to 6 pm Dry Arch Inn, Dry Arch Complex, Bunnagee, Letterkenny, Co. Donegal, F92 A30X LK Bikes Donegal, John Crossan Bus Pk, Bonagee, Bunnagee, Letterkenny, Co. Donegal. Open 9.30 am to 5.30. WERS Donegal, waste management, Bunnagee, Letterkenny, Co. Donegal, F92 FN35. Open 24hrs Monday to Friday Cassidy Brothers Paving Centre, Magheraboy, Letterkenny, Co Donegal, F92 DK38. Open 9 am to 5 pm, Monday to Friday
Entertainment	Arena 7, 1 - 4, Ballyraine Industrial Estate, 4 Iona Rd, Ballyboe Lisnenan, Letterkenny, Co. Donegal, F92 VRC8. Open from 10.30 am to either 11.30 pm or 12.30am
Driving Centre	NCT Centre, Dry Arch Business Park, Dromore, Letterkenny, Co. Donegal, F92 CTH6. Open 8 am to 6 pm.



TEN-T Priority Route Improvement Project, Donegal

Section 2: N56 / N13 Letterkenny to Manorcunningham

Option Selection Report

Appendix C2.2 – Physical Activity

Document Control Sheet

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1 INTRODUCTION

This report is concerned with assessing each shortlisted route option with respect to impact on physical activity within Section 2. The Physical Activity appraisal has been conducted in accordance with the Project Appraisal Guidelines Unit 7: Multi-Criteria Analysis, with guidance taken from Unit 13.0: Pedestrian and Cyclist Facilities. The basis of the appraisal covers the nature of physical activity impacts of the proposed scheme, including the provision of new shared pedestrian/cyclist facilities or enhancement to existing pedestrian/cyclist facilities.

1.1 Methodology

For the purposes of options assessment, each option is appraised based on new shared pedestrian / cyclist facilities, segregated from the carriageway, being provided as part of the project, or any new linkages to existing pedestrian/cyclist facilities as part of the scheme. PAG Unit 13.0 (PE-PAG-02036) - Pedestrian and Cyclist Facilities outlines sub-criteria to be considered as part of the Physical Activity which are:

- Health Benefits
- Absenteeism Benefits
- Journey Ambience Benefits
- Changes in the number of incidents or journey times
- Other possible impacts

The exact number and frequency of pedestrians and cyclists using the N13 and N56 routes is unclear and therefore a prediction of use for new facilities has not been established, nor could the associated benefits (relating to health or absenteeism) be quantitatively assessed.

Therefore, the physical activity appraisal is based solely on qualitative information across:

- Health Benefits
- Journey Ambience Benefits
- Other Possible impacts

2 EXISTING FACILITIES

2.1 Walking Facilities

Several walking groups are active in the Letterkenny area. These include

- **Swilly Hiking Club:**
Formed in May 2012 and based in Letterkenny.
<http://www.swillyhiking.ie/>
- **Donegal Sport Partnership:**
'Step on it' programme – A programme designed to encourage people to become active/more active through walking. It supports local people to set up and sustain a community walking group.
<http://www.activedonegal.com/>
- **Operation Transformation:**
National walks day in January. Operation Transformation's Nationwide Walks, in conjunction with Sport Ireland and the Local Sports Partnerships, took place in over 80 venues across 26 counties in January 2018.
<https://ot.rte.ie/>
- **Sli Na Slainte Walk Letterkenny:**
This route was developed by the Irish Heart Foundation to promote healthy living. The route begins at the Station Roundabout and loops around Port Road, Ramelton Road and Ballyraine Road back to the Station Road Roundabout.
<http://letswalkdonegal.com/pdf/maps/letterkenny.pdf>
- **Donegal Trails Office:**
Based in Letterkenny Public Service Centre, the Office works through Donegal County Council, to provide assistance and support to community groups and the general public, on the provision of sustainable paths and trails infrastructure.
<http://www.donegalcoco.ie/business/developingourtourismsector/donegaltrailsoffice/>
- **Let's Walk Donegal**
Walking Donegal is a consortium of several key agencies throughout Co. Donegal with general interest in the promotion of active and healthy lifestyles for our local population and visitors alike.
www.letswalkdonegal.com/
- **Walking Routes Ireland**
A website created for hillclimbers / outdoor enthusiasts to map routes in Ireland. Due to the many unofficial trails in Ireland and lack of information on these trails this website assists the community to share routes with each other.
www.walkingroutes.ie
- **Map my walk**
Map my Walk is a US based website which allows walkers around the world to record their trips and upload to a global portal via a smartphone. Users from around the world have access to maps and trails.
www.mapmywalk.com
- Not all people are involved in a club. Several byroads in the study area are utilised by local people for walking, cycling, and running. These include the L1114, L5794, L5454, L1154 and the old decommissioned rail track.

There are several walking routes in Letterkenny; a number of these are identified in the mapping below.

Walking Route 1: This is a short route of approximately 7km which begins at the Ballyrairie Park Health Centre on the N56, loops around the town, joins the N56 and heads towards the Dry Arch Roundabout.



Figure 2-1 Walking Route 1 – Letterkenny Town

Walking Route 2: one of the longer walking trails at 40km long from Letterkenny to Derry. From the town to the N56 and Dry Arch Roundabout the route then goes off the highway and onto road L1114 and heads in a easterly direction until the route changes to a north easterly direction crossing the N14 east of Pluck. From this point the route heads north to Derry via the Blanket Nook Walkway west of Newtown Cunningham. The route uses the L1114 local road in the vicinity of Section 2.



Figure 2-2 Walking Route 2 Letterkenny to Derry

Walking Route 3: The Letterkenny to Lifford and Strabane Railway opened on 1 January 1909 and closed on 1 January 1960. This narrow-gauge rail line was run by the CDR (County Donegal Railways Joint Committee). This line also stopped at Ballindrait, Raphoe and Convoys on route to Letterkenny. This route is approximately 35km and passes through Convoys and Raphoe. The route begins at the Station Roundabout and goes on to the Dry Arch Roundabout on the N56 where it comes off the national route and joins the disused rail line. The route heads in a southerly direction to Convoys and then east to Raphoe before reaching the town of Lifford.



Figure 2-3 Walking Route 3 – Letterkenny to Lifford

Walking Route 4: This is a loop walk, passing the Mount Errigal Hotel.



Figure 2-4 Walking Route 4 - Sli Na Slainte Letterkenny

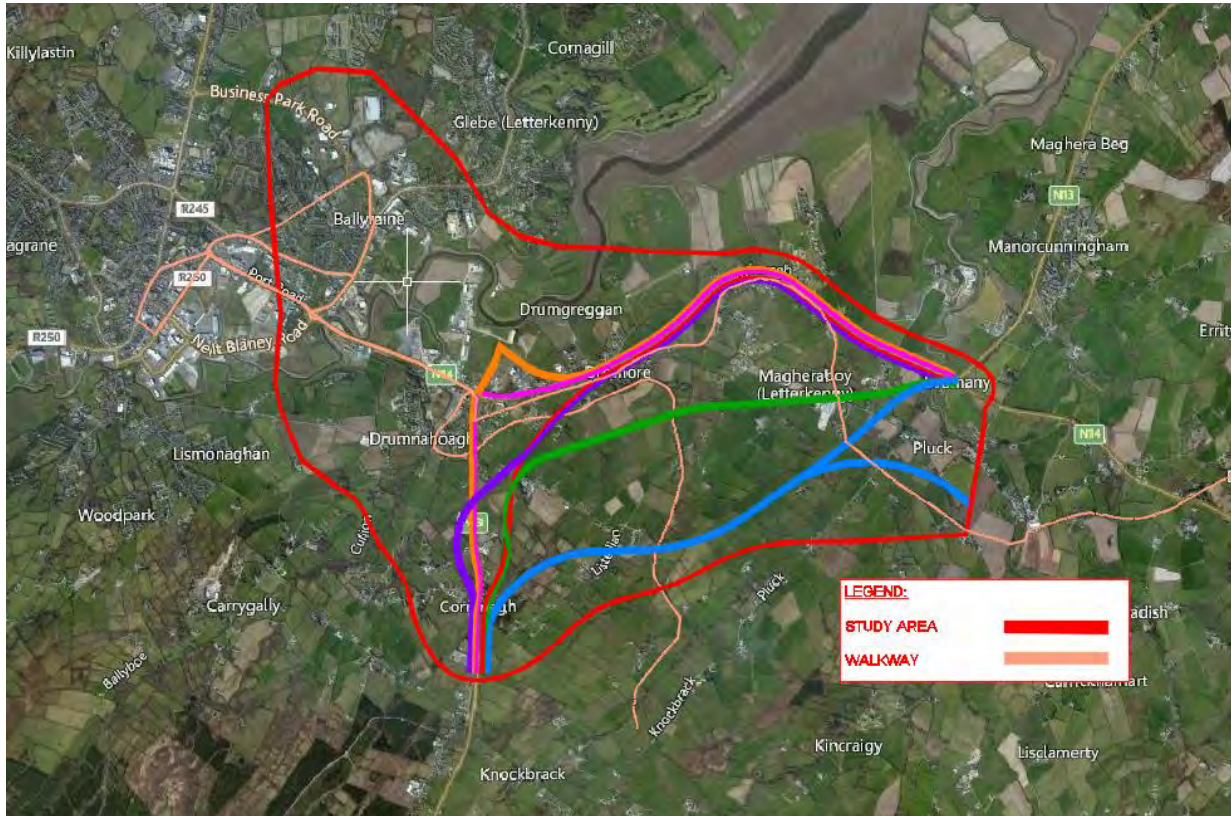


Figure 2-5 Combined Walking Routes and Shortlisted Options

Figure 2-5 shows walking routes identified and shortlisted options for Section 2, N56 / N13 Letterkenny to Manorcunningham. The longer walking routes from Letterkenny to Lifford and Letterkenny to Derry interact with the proposed options as follows:

- All new link options to Letterkenny crossing the River Swilly terminate at the existing N56/R245 junction; a direct connection can be provided to the current walking routes to enable access to the new shared facility crossing over the River Swilly.
- Options 2A and 2B are online N13 options. These options will continue to require that pedestrians cross the N13 carriageway south of the Dry Arch roundabout.
- Options 2C and 2D are offline N13 options with a new shared pedestrian/cycle facility between the southern N13 tie-in and a new junction at Dromore. These options propose a bridge structure at the L1114 local road which will maintain continuity of the existing walking route. These options cross the old disused Letterkenny to Lifford and Strabane rail line. West of the old rail crossing much of the old railway right-of-way has been developed however east of the crossing point much of the old railway right-of-way still exists and has future Greenway potential; this can be investigated further at preliminary design.
- East of the Dry Arch roundabout Options 2A, 2B, 2C and 2D are online options that include a new grade separated junction at Trimragh. These online segments do not impact on existing walking routes however the new junction will connect with the existing L1114 walking route and offer pedestrians an opportunity to access the local roads north of the N13.
- Options 2E, 2F1 and 2F2 are entirely offline options with new shared pedestrian/cyclist facilities between the southern N13 tie-in and the eastern tie-in at the existing Pluck roundabout. These options include a bridge structure at the L1114 local road to maintain continuity of the existing walking route. These options also cross the old disused rail line which has Greenway potential and would need investigated further at preliminary design.

Options 2C, 2D and 2E will facilitate closure of the existing N13 national road at a point south of the existing St. Patrick's national school where a new junction is proposed. This will result in minimal traffic at the school and a significant reduction in traffic between the school and the existing L1114. This closure may also facilitate greater opportunities to provide walking facilities that would benefit the school.

2.2 Running Facilities

The following running routes, events and organisations can be found in Letterkenny:

- **Letterkenny Athletics Club:**
This club is based at Aura Letterkenny Leisure Complex, Sallaghagrane. The club was founded in 1972 and is still an active club in the town.
<http://www.lac.ie/>
- **Letterkenny Park Run:**
The run takes place every Saturday at 9.30am and is a 5km run. It is held at St Conal's Hospital Campus, Kilmacrennan Rd. The run/walk follows a circuit around the campus as well as the circular green park area. <http://www.parkrun.ie/letterkenny/>
- **Letterkenny 24/7 Triathlon Club:**
The club was set-up in 2009. They have a number of routes they use on their Thursday night 'Long Runs' in Letterkenny, some of these routes are included in the figures that follow.
<http://letterkenny247.com/>
- **Run for Fun:**
A group of outdoors enthusiasts who meet three times a week at 7.10pm. They run on Monday, Tuesday, and Thursday.
<https://www.facebook.com/runforfunletterkenny>
- **Map my Run:**
Map my Run is a US based website which allows runners around the world to record their trips and upload to a global portal via a smartphone. Users from around the world have access to maps and trails. Some routes as found on other organisations official webpages may be duplicated here.
www.mapmyrun.com

Several running routes in the vicinity of the project are identified in the mapping that follows.

Running Route 1: a 10.2km route beginning at Letterkenny Athletic Club (LAC) heading north east towards the Middle Road/Business Park Road roundabout and back to the LAC. The route uses the R250, N56 and R245.



Figure 2-6 Running Route 1 (Letterkenny 24/7 Triathlon Club)

Running Route 2: a 10.4km route beginning at Letterkenny Athletic Club (LAC) heading east along the N56 to Dry Arch roundabout and back to the LAC via Neil T Blaney Road, R245 and R250.



Figure 2-7 Running Route 2 (Letterkenny 24/7 Triathlon Club)

Running Route 3: a 10km route beginning at Letterkenny Athletic Club (LAC) heading north east into town and back to the LAC.



Figure 2-8 Running Route 3 (Letterkenny 24/07 Triathlon Club)

Running Route 4: a 10.3km route beginning at Letterkenny Athletic Club (LAC).



Figure 2-9 Running Route 4 (Letterkenny 24/7 Triathlon Club)

Running Route 5: a 10.6km route beginning at Letterkenny Athletic Club (LAC) heading north east into town. The route travels along Neil T Blaney road to the N56 and R245 and then returns along Kiltroy Road.



Figure 2-10 Running Route 5 (Letterkenny 24/7 Triathlon Club)

Running Route 6: a 11.6km route beginning at Letterkenny Athletic Club (LAC) heading north east into town. The route travels along Pearse Road to the N14 and N56 and through residential areas before returning on Upper and Lower Main Streets.



Figure 2-11 Running Route 6 (Letterkenny 24/7 Triathlon Club)

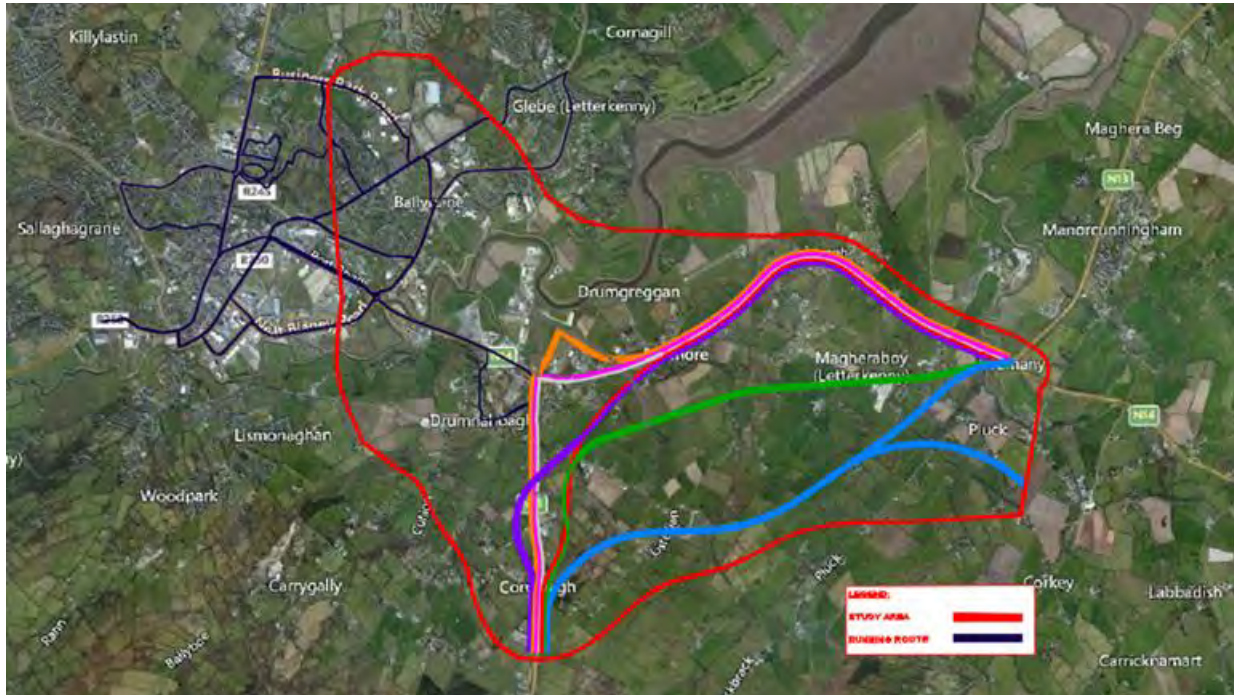


Figure 2-12 Combined Running Routes and Shortlisted Options

Figure 2-12 shows the running routes identified and shortlisted options for Section 2. Two locations where these running routes interact with the proposed options include:

- N56/R245 junction; all new link options to Letterkenny crossing the River Swilly terminate at this junction interacting with existing running facilities. The impacts are minor and localised and likely to result in direct connections to the proposed new shared facility crossing the River Swilly and hence providing additional long-term benefits for athletic clubs and runners.
- Dry Arch and L1114 junctions; the online options 2A and 2B will interact with existing running routes at and between the Dry Arch roundabout and the L1114, local road. The impacts are minor and localised and likely to result in direct connections to the new shared facility crossing the River Swilly and hence providing additional benefits for athletic clubs and runners.

Options 2C, 2D and 2E offline segments propose additional shared facilities segregated from the carriageway that connect to their proposed link options over the River Swilly.

Options 2F1 and 2F2 offline options propose additional shared facilities segregated from the carriageway however these facilities are not connected to any identified running routes or the new shared facility on the link options over the River Swilly

The route between Polestar and Dry Arch Roundabouts is more likely to be positively impacted resulting from a separate safety improvements scheme along N56 Four Lane Road, currently being prepared by Donegal County Council.

2.3 Cycling Facilities

The following clubs, events and cycle routes are relevant to Section 2:

- **Letterkenny Cycling Club:**
This club was founded in 2012. Letterkenny Cycling Club is a Developing club promoting the sport for beginners, intermediate and advanced cyclists. The club meets three times a week at Aura Leisure Centre car park.
- **Donegal Garda Cycling:**
This club was set up for members of An Garda Síochána, their family and friends.
- **Four Masters Cycling Club:**
This Donegal Cycling Club and was founded in 1987. Four Masters CC caters for all levels of cyclists, from beginners to the novice racer. They organise and feature many events through the year. All details can be found on their webpage. <http://fourmasterscycling.com/>
- **Donegal Atlantic-way Ultra Race:**
This is an ultra-cycling event along 555km of rugged Donegal coastline. The Donegal Atlantic Way Ultra Race route follows the Wild Atlantic Way around the coastline of Donegal. Competitors depart from Letterkenny and the route takes in Malin head, Mamore Gap, Knockalla, Atlantic Drive, Horn Head, Carrickfin, Glengesh Pass, Sliabh League and Barnesmore Gap. <http://donegalultra555.ie/>
- **Donegal Greenway – Burton port to Letterkenny:**
A feasibility study for this Greenway was carried out in 2017.
- **European Mobility Week:**
A European initiative encouraging towns and cities to introduce and promote sustainable transport measures and to invite people to try out alternatives to car use; takes place yearly mid-September and culminates in the 'Car Free Day' event, when one or several areas are set aside solely for pedestrians, cyclists and public transport for a whole day. <http://www.mobilityweek.eu/>
- **Green Schools:**
Promoting long-term, whole-school action for the environment Green-Schools is a student-led programme with involvement from the wider community. The programme is operated and coordinated by the Environmental Education Unit of An Taisce (FEE member for Ireland). Green-Schools is operated in partnership with Local Authorities. Travel is one of the themes of the Green-Schools programme. The Travel theme is funded by the Department of Transport, Tourism and Sport and supported by the National Transport Authority. The aim of the theme is to increase the number of students walking, cycling, scooting, and using public transport or carpooling on the way to school. <https://greenschoolsireland.org/>
- **Active School Flag (ASF):**
A Department of Education and Skills initiative (DES) supported by Healthy Ireland which aims to get more schools, more active, more often. Awarded to schools that strive to achieve a physically educated and physical active school community. ASF forms part of the National Physical Activity Plan and the Healthy Ireland vision where everyone can enjoy physical and mental and well-being to their full potential, and where well-being is valued and supported at every level of society and is everyone's responsibility. Schools who wish to receive the ASF status are required to have an active school week which is needed to form part of the school calendar. Schools which meet all the criteria i.e. Physical Education, Physical Activity and Partnerships, are awarded the ASF which is valid for 3 years.
- **Donegal Cycle Route**
The Donegal Cycle Route is approximately 200km long and forms part of the National Cycle Network. The route links the National Cycle Network North West Trail in Donegal Town to the National Cycle Network Sustrans Route 92 in Newtown Cunningham. The route also forms part of the Eurovelo European Cycling Network, Route 1. <http://www.donegalcyclerroute.ie/>

In developing this route Donegal County Council worked with the National Sustainable Transport Office (NSTO) and the Department of Transport, Tourism and Sport to try and bring cyclists along quiet, safe and scenic local roads. The Route follows Class 2 & 3 county roads as much as possible but there are occasions where the Route has no alternative but to use sections of major roads. From Letterkenny the Donegal Cycle Route travels east and north as follows:

Donegal Cycle Route (Letterkenny - Newtown Cunningham section):

The Donegal Cycle route leaves the town of Letterkenny travelling east towards the L1114 (Leck Road) crossing the existing N13 national road south of the existing Dry Arch roundabout. The route continues along the L1114 local road, (as an on-road cycle route) to the south of the existing N13 dual carriageway where it continues to the village of Pluck. At this point, the route crosses the existing N14, east of the Pluck roundabout, before continuing in a north west direction towards Manorcunningham and Newtown Cunningham. The Donegal Cycle Route is shown in **Figure 2-13**.

Donegal Cycle Route (Letterkenny – Milford section):

The Donegal Cycle route also leaves the town of Letterkenny travelling north along the N56 national road passing through the junction of the N56 and R245 and continuing northwest along the N56 towards Kiltroy roundabout where it turns northeast along Kiltroy Road towards Ramelton and heading towards Milford.



Figure 2-13 Donegal Cycle Route

Four Masters Cycling Routes

Three cycling routes shown in **Figures 2-14** are training routes used by the Four Masters Cycling Club. These routes begin at the Aura Letterkenny Leisure Centre and head west and then far north completely away from the town. These routes do not cross any of the proposed options in this project.



Figure 2-14 Cycling Routes (Four Masters Cycling Club)

Northern Ireland Greenways – Derry to Buncrana and Letterkenny former Railway

<http://nigreenways.com/derry-to-buncrana-and-letterkenny-greenway/>

A cross-border greenway project being supported by EU funding to run a greenway along the line of the old Londonderry and Lough Swilly Railway from Derry City up to Buncrana through Fahan, and another branch from Tooban Junction through Manorcunningham to Letterkenny. This will incorporate the existing Donegal Cycle Route.

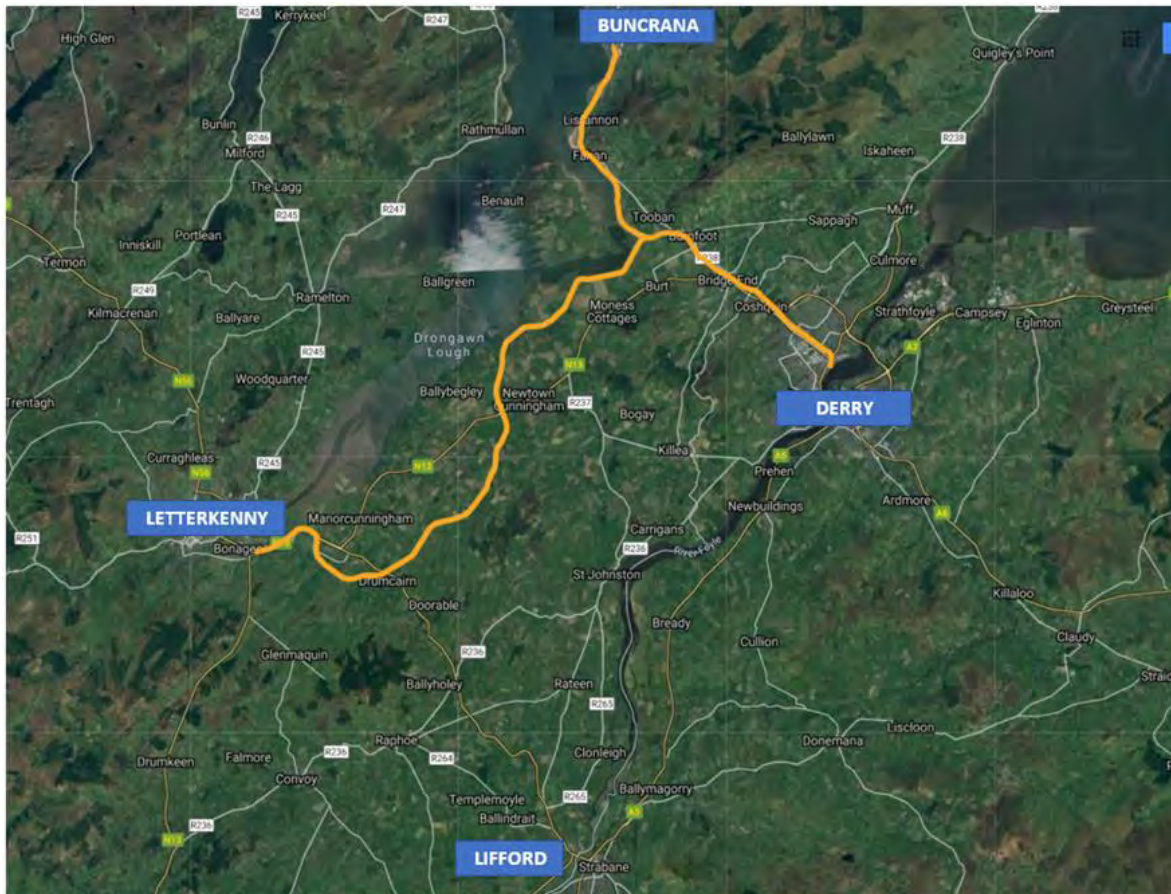


Figure 2-15 Proposed Northern Ireland Greenway

EuroVelo Cycle Route

<http://www.eurovelo.com/en>

In the Republic of Ireland, the Atlantic Coast Route starts at the village of Newtown Cunningham in County Donegal. From here the route is signposted for almost 200km on quiet rural roads, to Donegal town. The route then joins the North West Cycle Trail which is signposted as far as Sligo town. After that much of the route is not yet developed or signposted. However, there are some notable exceptions to this in Co Mayo and Co Limerick where the route joins the Great Western Greenway for almost 42km and the Great Southern Trail for 37.5km respectively. Both sections are constructed on former railway lines and are mostly traffic free. After this there are some further signposted road sections which are part of existing regional and local routes in Counties Clare, Cork and Waterford. However, much of the route in the southern part of the country is yet to be developed. Eventually the route arrives at Rosslare on the East coast, where cyclists can catch a ferry to Wales and continue their journey through the United Kingdom.



Figure 2-16 EuroVelo1 Atlantic Coast Route

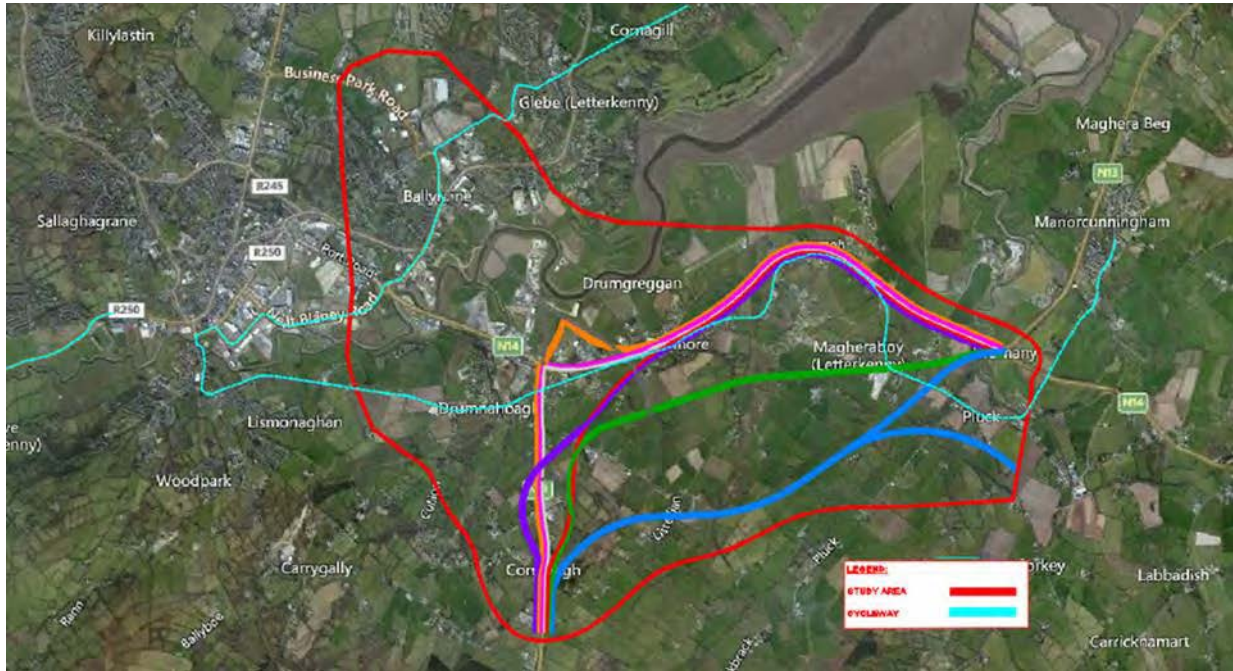


Figure 2-17 Combined Cycle Routes and Shortlisted Options

Figure 2-17 shows cycle routes identified, namely the Donegal Cycle Route and shortlisted options for Section 2. The cycle route interacts with the proposed options as follows:

- All new link options crossing the River Swilly terminate at the existing N56/R245 junction; a direct connection can be provided to the Donegal Cycle Route to enable access to the new shared pedestrian/cyclist facility crossing over the River Swilly.
- Options 2A and 2B are online N13 options. These options cross the N13 carriageway south of the Dry Arch roundabout at-grade.
- Options 2C and 2D are offline options with a new shared pedestrian/cyclist facility between the southern N13 tie-in and a new proposed junction at Dromore. These options propose a bridge structure over the L1114 local road which will maintain continuity of the L1114 cycle route and facilitate a connection to it. These options also cross the old disused Letterkenny to Lifford and Strabane rail line. West of the old rail crossing much of the old railway right-of-way has been developed however east of the crossing point much of the old railway right-of-way still exists and has future Greenway potential; this can be investigated further at preliminary design.
- East of the Dry Arch roundabout Options 2A, 2B, 2C and 2D are online options that include a new grade separated junction at Trimragh. These online segments do not impact on existing cycle routes however the new junction at Trimragh will connect with the existing L1114 cycle route and offer opportunities for cyclists to access the local roads north of the N13.
- Options 2E, 2F1 and 2F2 are entirely offline options with new shared pedestrian/cyclist facility between the southern N13 tie-in and the eastern tie-in at the existing Pluck roundabout. These options include a bridge structure at the L1114 local road to maintain continuity of the existing cycle route. These options also cross the old disused rail line which has Greenway potential and would need investigated further at preliminary design.

2.4 Other Facilities

Figure 2-17 identifies existing sportsgrounds in Letterkenny close to the shortlisted options.

Letterkenny Gaels is accessed from Thorn Road and is located north of the River Swilly beside Letterkenny Rugby Club and Donegal Canoe Club. and is on the opposite side of the River Swilly. These facilities fall outside the corridors of the shortlisted options therefore no direct impacts are envisaged.

Boals Goals Astro Turf pitches are located off the local road network north of the N13 near to Letterkenny Glass. This sports facility falls outside the corridors of the shortlisted options therefore no direct impacts are envisaged.

Bonagee United Football Club is located off the Bonagee road near the Dry Arch roundabout. This football facility lies within the 300m wide corridor of the proposed link options crossing the River Swilly. Currently the grounds are accessed from Bonagee road which connects to the N56 Four Lane Road. Current N56 and N13 geometry suggest a direct impact to the football grounds is unlikely however this will need to be reviewed further at preliminary design. This link to Letterkenny is included in all options.



Figure 2-18 Sportsground Facilities close to Section 2 Options

3 PROPOSED INFRASTRUCTURE

All new offline infrastructure includes a Type 2 dual carriageway with shared pedestrian/cyclist provision segregated from the carriageway by a grass verge. All options include a new Letterkenny link with shared pedestrian/cyclist facility. As the design develops, there will be opportunities to investigate and develop further connectivity from the new shared facilities to existing walking and cycle facilities.

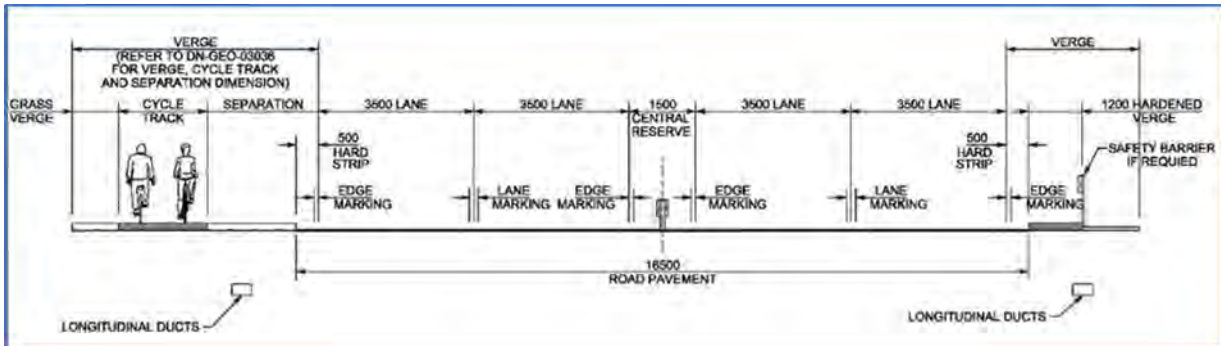


Figure 3-1 Typical Cross Section – Type 2 Carriageway

Several options consider segments of the existing N13 for improvement and re-use.

N13 online options south of the Dry Arch roundabout at Lurgybrack have a lack of vulnerable user facilities; most likely due to the existing vertical gradient of 7% for over 1km (up to 8.7% at one location) and cross-section constraints. The vertical gradient means a vulnerable user facility meeting design standard would require a zig-zag alignment with numerous ramps and landings; an arrangement most likely undesirable to users. Options 2A, 2B, 2F1 and 2F2 will not improve the N13 vertical gradient and therefore these options require all road users travelling north-south between Letterkenny and Sligo to continue to use these existing gradients.

The N13 online options (Options 2A, 2B, 2C and 2D) east of the Dry Arch roundabout to Pluck roundabout use the existing Type 1 dual carriageway hard shoulder. Pedestrians and cyclists not wishing to use the hard shoulder have the alternate option to use the existing L1114 local road (runs parallel to the N13) which is part of the Donegal Cycle Route. Connections for vulnerable users from new offline shared facility to the L1114 local road will be provided where options intersect this route. The L1114 local road also connects with the new proposed junction at Trimragh, enabling pedestrians and cyclists to cross the dual carriageway.

Options that have offline sections (Options 2C, 2D, 2E, 2F1 and 2F2) include a shared pedestrian/cyclist facility that are segregated from the carriageway.

Options 2F1 and 2F2 are offline options with a shared pedestrian/cyclist facility segregated from the carriageway. However, low traffic transfer has been identified on these options due to their distance and connectivity to/from Letterkenny (a primary destination for road users). In a similar manner, the shared pedestrian/cyclist facility on these routes, will likely be less attractive. Vulnerable road users travelling north-south between Letterkenny and Sligo continue to use the N13 online section at Lurgybrack.

4 PHYSICAL ACTIVITY IMPACTS

All Section 2 options have positive impacts for physical activity. All options include a new crossing of the River Swilly with a shared pedestrian/cyclist facility that offers connections to the existing Letterkenny walking, running and cycle network.

Offline segments also include the provision of a shared pedestrian/cyclist facility. These options are considered to have a positive impact in terms of physical activity. Some offline options will result in reduced traffic volumes and lower speed limits on the existing road network which is likely to also have a positive impact in terms of health benefits for non-motorised users on the residual road network. The benefits are outlined qualitatively below.

4.1 Health Benefits

Any increase in cycling trips is likely to result in increased health benefits. All options score positively however some options will clearly provide better facilities leading to more health benefits, as follows:

All options include a Letterkenny link with shared pedestrian/cyclist facility that will connect with the existing Donegal cycle network, at the N56/R245 junction, providing the opportunity for expansion of the network itself. The connectivity of the N13 shared facility to the Donegal Cycle Network is not yet determined and will be established at preliminary design stage. However, it will be necessary to ensure safe connectivity of the facilities, which has the potential to increase the number of strategic cycling trips in the area.

The Letterkenny links for Options 2C, 2D and 2E connect to offline N13 shared facilities which have further potential links to the L1114 local road (Donegal Cycle Route) and the old rail line should this be developed as Greenway in the future. These options have the added benefit of taking significant traffic volumes away from St. Patrick's school and residences along the existing N13 (south of Dry Arch roundabout) facilitating safer more attractive travel modes. These options provide facilities that encourage walking and cycling to a greater extent and will therefore offer greater health benefits.

Options 2F1 and 2F2 provide a shared pedestrian/cyclist facility however the connection from this facility to Letterkenny is less preferred. At its eastern end option 2F1 crosses the Donegal Cycle Route and a connection can be provided however these options are considered less beneficial.

Options 2A and 2B do not offer a shared pedestrian/cyclist facility along the N13 apart from the new Letterkenny link and therefore these options, while positive, do not offer the same benefits for physical activity.

4.2 Journey Ambience Benefits

Journey Ambience benefits are increased when facilities are segregated from motorised traffic as there is a perception of reduced danger. The provision of a pedestrian/cyclist facility that is segregated reduces conflict points between these vulnerable users and vehicular traffic and therefore improves safety and subsequently increases the attractiveness of the routes for walking and cycling.

All link options to Letterkenny include a shared pedestrian/cyclist facility that is segregated from traffic and will provide these users with a perception of safety. Along the N13, some options provide more pedestrian/cyclist facilities than others and are therefore more likely to attract more users as follows:

Except for the new link to Letterkenny Options 2A and 2B are mostly online. South of Dry Arch Roundabout these options use the existing N13 online section. These options, while improved, will

continue to have excessive gradients and a climbing lane for vehicles. These options will continue to carry heavy volumes of traffic along this section of the N13 resulting in poor air quality and vehicular noise and making physical activity in the vicinity unpleasant. Also, due to the significant traffic volumes there is little crossing opportunities in this section for vulnerable users.

Options 2F1 and 2F2 include a new shared pedestrian/cyclist facility, however traffic transfer to these options is low due to their distance from Letterkenny and connection with Letterkenny. It is expected that pedestrians and cyclists will be less attracted to these routes for the same reasons as they are further from Letterkenny; these options are therefore unlikely to provide the benefits expected. Option 2F1 crosses the Donegal Cycle Route at its eastern end where a connection could be provided, nonetheless these options are considered less beneficial.

Options 2C, 2D and 2E have additional offline sections with a shared pedestrian/cyclist facility which connect directly to the proposed Letterkenny link segregated cycle track. These offline sections also facilitate direct connections with the L1114 local road (Donegal Cycle Route) and to the old rail line which has the potential to be developed as Greenway in the future; both safe and attractive routes.

All options will re-distribute traffic and reduce traffic volumes on the existing N56 Four Lane Road. However, options 2C, 2D and 2E provide an added benefit of taking traffic away from St. Patrick's school and residences along this segment of the N13 facilitating reduced speeds on the residual network and safer more attractive travel modes for local users. These options are considered to provide facilities that encourage walking and cycling to a greater extent than other options and therefore offer increased health benefits.

5 OPTION COMPARISON

All options include a new crossing of the River Swilly with a shared pedestrian/cyclist facility that offers connections to the existing Letterkenny walking, running and cycle network and therefore all options have positive impacts for physical activity. Some key observations between the options and physical activity impacts have are summarised as follows:

- Options 2A and 2B use the existing N13, with improvements, but offer little pedestrian/cyclist facilities beyond the new Letterkenny link. The N13 will continue to carry significant traffic volumes and south of Dry Arch roundabout has climbing lanes for heavy goods vehicles and an excessive vertical gradient. South of the Dry Arch roundabout these options are not appropriate for pedestrians and cyclists.
- Options 2C, 2D and 2E include a shared pedestrian/cyclist facility with connections to the Donegal Cycle Route, associated walking / running routes and offer a potential future connection to the old rail line.
- Options 2C and 2D are online/offline options that include a new offline segment south of the Dry Arch Roundabout. Both offline segments divert traffic off the existing N13 segment south of Dry Arch Roundabout providing safety benefits for vulnerable users. Both options will allow the existing N13 segment to be downgraded to local road status providing further benefits for vulnerable users using the existing school, nearby residents and businesses.
- Options 2E is an offline option between the N13 south of Dry Arch roundabout and the eastern tie-in, near Manorcunningham. Like options 2C and 2D this option will divert traffic away from the existing N13 south of Dry Arch Roundabout providing safety benefits for N13 vulnerable users by eliminating the existing >7% vertical gradient, multiple at-grade accesses and local school. This option will also allow the existing N13 segment to be downgraded to local road status providing further benefits for vulnerable users using the existing school, nearby residents and businesses.
- Options 2F1 and 2F2 are offline options between the N13 south of Dry Arch roundabout and the eastern tie-in, near Manorcunningham. These options differ at the eastern tie-in with Option 2F2 connecting to a Section 3 offline option. Both options provide new shared pedestrian/cycle facilities however connection from these new facilities to Letterkenny is less preferable to other options. Traffic figures show these options are less preferred.
- N13 online options between the Dry Arch and Pluck Roundabouts will require that pedestrians/cyclists continue to use the existing dual carriageway hard shoulder. Alternatively, the L1114 local road (Donegal Cycle Route) runs parallel to and alongside this segment of the N13 and is likely to be a more attractive alternative for pedestrians/cyclists.

Considering the overall benefits of each option in terms of physical activity, an impact score has been applied to each option in accordance with the TII PAG Unit 7 and is presented in Error! Reference source not found..

Table 5-1 Options Scoring Matrix with respect to Physical Activity

	2A	2B	2C	2D	2E	2F1	2F2
Impact Description	Slight Positive	Slight Positive	Major Positive	Major Positive	Major Positive	Moderate Positive	Moderate Positive
Impact Score	5	5	7	7	7	6	6
Preference	Least Preferred	Least Preferred	Preferred	Preferred	Preferred	Intermediate	Intermediate



TEN-T Priority Route Improvement Project, Donegal

Section 2: N56 / N13 Letterkenny to Manorcunningham

Option Selection Report

Appendix C2.3 – Accessibility & Social Inclusion Appraisal

Document Control Sheet

Client:	Donegal County Council
Project Title:	TEN-T Priority Route Improvement Project, Donegal – Section 2: N56 / N13 Letterkenny to Manorcunningham
Document Title:	Option Selection Report –Appendix C2.3 – Accessibility and Social Inclusion Appraisal
Document No.:	TT-MGT0337-RPS-00-02-RP-Z-RP-2009

Rev. No.	Suitability	Effective Date	Revision Description	Checked	Approved
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1 INTRODUCTION

The Accessibility and Social Inclusion appraisal has been conducted in accordance with the Project Appraisal Guidelines Unit 7: Multi-Criteria Analysis. The basis of the appraisal covers two key areas:

- Deprived Geographical Areas
- Vulnerable Groups

County Donegal is a coastal county with approximately 10% of its land boundary connecting to rest of the Republic of Ireland. It is an isolated county geographically from many of the urban centres and key services throughout the Republic of Ireland. As such, Donegal has developed a positive relationship with its neighbouring counties in Northern Ireland, particularly Derry and Tyrone which provides an element of service provision for the population of Donegal.

Section 2 of the TEN-T Priority Route Improvement Project includes the existing N13 and N56 national roads. The N13 and N56 connect Letterkenny and points in northwest Donegal with Derry to the north, Dublin to the east and Sligo / Galway to the south.

All options will provide improvements to infrastructure, there will be short-term employment opportunities during the construction of the scheme and long-term benefits due to improved accessibility to Letterkenny town centre post construction. However, the overall improvements are considered to be marginal with respect to impacts and influence on Accessibility and Social Inclusion.

All options are deemed to contribute equally to the objectives of national and regional policies including the Project Ireland 2040 National Planning Framework, Building on Recovery: Infrastructure and Capital Investment Plan, the Border Regional Authority Regional Planning Guidelines 2010 – 2022 and the Donegal Local and Economic and Community Plan 2016-2022.

2 DEPRIVED GEOGRAPHICAL AREAS

The 2016 Pobal HP Deprivation Index provides a method of measuring the relative affluence or disadvantage of a geographical area using identical measurements and scales using data from the 2016 Census of Population. Options within the Section 2 study area are within a marginally below average index as shown in **Figure 1-1**. The government has various schemes to help address the issues that are prevalent in deprived areas.

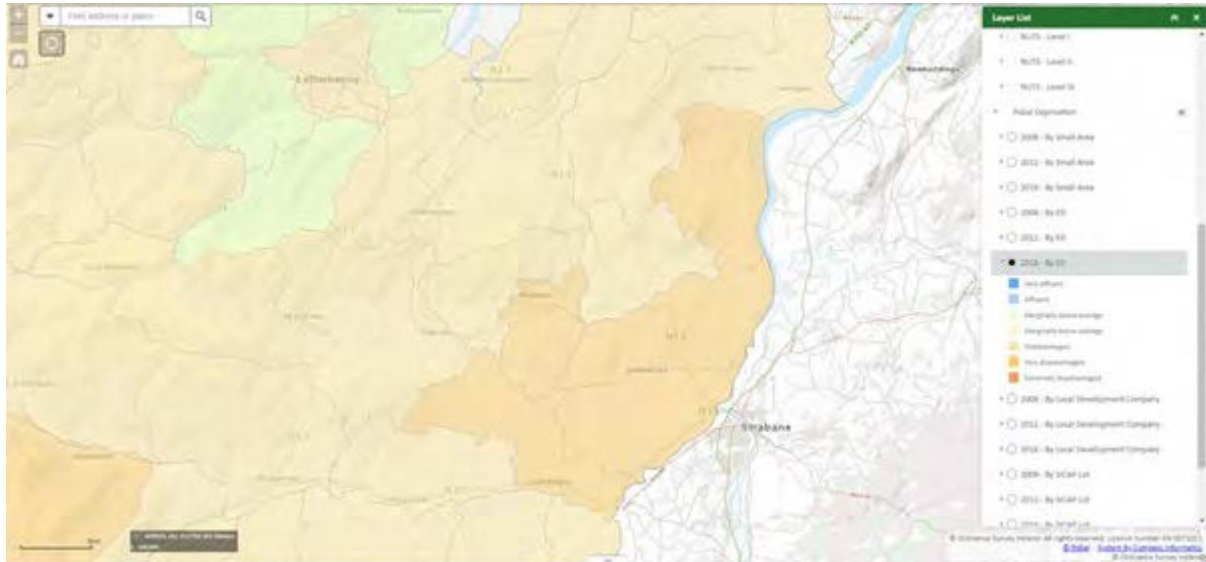


Figure 1-1 Deprivation Index for Section 2 Study Area.
(Source: <https://maps.pobal.ie/WebApps/DeprivationIndices/index.html>)

The Rural Social Scheme is an income support programme aimed at low-income farmers and fishermen/women who receive specified Social Welfare payments. It supports these individuals who are unable to earn a enough living from their farm holding by providing an additional social welfare payment in return for services that benefit rural communities for a set number of hours per week.

In County Donegal, the percentage of total employment in the agriculture, forestry and fishing sector is 6.8%, much higher than the state average of 4.4% (**Reference: western development commission**). The Section 2 study area partly comprises agricultural businesses and farmland. As the area is identified as being disadvantaged to various extents and visibly has a proportion of its industry within farming, it is likely that participants in the Rural Social Scheme reside within the study area. The options proposed in this project will improve accessibility to Letterkenny, Manorcunningham, Donegal and Lifford and the main centres of in Letterkenny and Lifford. The construction of this project will also provide short term employment opportunities.

However, it is not anticipated that the improvements will have any significant impact. All options will have a similar impact and are all scored neutral. Refer to **Table 2-1**.

Table 2-1 Options Assessment with respect to Deprived Geographical Areas

	2A	2B	2C	2D	2E	2F1	2F2
Impact Description	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Impact Score	4	4	4	4	4	4	4
Preference	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate

3 VULNERABLE GROUPS

The national road network, namely the N13 and N56, is the only transport connection between Letterkenny and points in northwest Donegal with other counties and towns to the east, south and north; there is no live rail network. Buses are the only public transport mode available to travel to and from Donegal for most individuals. Bus Eireann services from Letterkenny include Sligo, Galway, Derry and Lifford. There are direct services from Letterkenny / Manorcunningham to Dublin.

As the N13 and N56 service Letterkenny and points in northwest Donegal any improvements accessing the town centre and journey reliability is considered positive. All options considered provide a new link option to Letterkenny from the east and south and will improve prospects for jobs, key facilities and social opportunities in Letterkenny. Access to the hospital and education centres will also be improved. It is not anticipated that the improvements will have any beneficial impact on mobility or sensory impairment.

It is not anticipated that the improvements will have significant impacts however access to Letterkenny town centre is improved and considered to be a slight positive impact for Vulnerable Groups. Refer to **Table 3-1**.

Table 3-1 Options Assessment with respect to Vulnerable Groups

	2A	2B	2C	2D	2E	2F1	2F2
Impact Description	Slight Positive	Slight Positive	Slight Positive	Slight Positive	Slight Positive	Slight Positive	Slight Positive
Impact Score	5	5	5	5	5	5	5
Preference	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate



TEN-T Priority Route Improvement Project, Donegal

Section 2: N56 / N13 Letterkenny to Manorcunningham

Option Selection Report

Appendix C2.4 – Integration Appraisal

Document Control Sheet

Client:	Donegal County Council
Project Title:	TEN-T Priority Route Improvement Project, Donegal – Section 2: N56 / N13 Letterkenny to Manorcunningham
Document Title:	Option Selection Report –Appendix C2.4 – Integration Appraisal
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1 INTRODUCTION

The Integration appraisal of options has been conducted in accordance with the Project Appraisal Guidelines for National Roads Unit 7.0 – Multi-Criteria Analysis, PE PAG 02031 (2016). The outcome of each appraisal includes both an impact score and a preference for each option.

The basis of the appraisal covers the following key areas:

- Transport Integration
- Land Use Integration
- Geographical Integration
- Other Government Policy Integration: Regional Balance

The aim of this section is to compare the impact of each option on achieving local, national and EU policy objectives and on improving gaps in the existing transport network.

County Donegal is a coastal county with approximately 10% of its land boundary with the rest of the Republic of Ireland. It is isolated geographically from many of the urban centres and key services throughout the Republic of Ireland. As Donegal has no live railway network, road travel is the only transport mode available.

Section 2 of the TEN-T Priority Route Improvement Project, Donegal comprises sections of the N56 and N13 routes in the vicinity of Letterkenny and Manorcunningham. The existing road network suffers from congestion, a saturation of junctions and direct accesses, poor geometry (such as excessive vertical gradients) and high collision rates.

2 TRANSPORT INTEGRATION

This section of the appraisal focuses on gaps in the existing network and potential for opportunities for changing mode of transport. The performance of each option is considered with respect to four sub-criteria for this section.

2.1 Connectivity of the strategic road network

All options provide improvements to the existing N56 / N13 road network and will provide better connectivity to Letterkenny urban centre from the south and east. All options provide:

- a new link connection to the N56 north of Letterkenny centre. This new link will provide relief to the existing N56 between the Polestar and Dry Arch Roundabouts which carries over 32,000 vehicles per day and which is operating as a lifeline route. This link will provide better connection for users seeking to access Letterkenny town, north Letterkenny and northwest Donegal.
- Improvements to the existing road network by limiting access points to specific locations. Some options offer new offline segments that segregate strategic and thru traffic from local traffic but provide junctions to ensure the existing road network is connected.
- an improved infrastructure for cyclists and pedestrians improving safety and connectivity with Letterkenny supporting sustainable transport modes.

However, options 2F1 and 2F2 provide less overall benefit. These two options are located further from Letterkenny and carry little traffic; demonstrating that Letterkenny is the destination for most road users. These options result in most users continuing to use the existing network. All other options carry significant traffic volumes and improve connectivity of the existing network.

All options are highly positive except for 2F1 and 2F2 which are moderately positive.

2.2 Connectivity between transport modes

There is no live railway network in Donegal therefore the proposed improvements have a neutral impact on rail transport. All options will improve the existing road infrastructure by reducing journey times and improving journey time reliability. All options are identified as having a neutral impact on connectivity between transport modes.

2.3 Support for sustainable transport modes

All options provide a new link to Letterkenny which include a new segregated cycle track facility. This cycle track links to the existing Donegal Cycle Route making it a valuable local amenity asset for Letterkenny. It is expected the cycle track will be used by both pedestrians and cyclists.

Options 2A and 2B are online options with infrastructure improvements however the N13 segment south of Dry Arch has gradients over 7% (up to 8.7% in one location). Traffic volumes, severe vertical gradients and the restricted cross-section make this segment unsuitable for cycle track infrastructure.

Options 2C, 2D, 2E and 2F1/2F2 include offline segments with new segregated cycle track infrastructure. Options 2C, 2D, 2E will provide cycle track connections to; the existing Donegal Cycle Route on the L1114 local road, the segregated cycle track facility across the River Swilly and again to the existing Donegal Cycle Route at the N56/R245 junction. Options 2F1/2F2 are located further from Letterkenny therefore their new segregated cycle track has poorer connectivity with the new cycle track facility across the River Swilly.

Options 2C, 2D, 2E are identified as having a moderately positive impact with options 2A, 2B and 2F1/2F2 identified as having a slight positive impact.

2.4 Access to other transport infrastructure

All options provide improvements to the transport network that will improve journey times, safety and congestion. For Letterkenny and northwest Donegal all options will have a slight positive impact on access to Belfast, Dublin, Knock and Shannon airports and to Belfast, Dublin and Galway ports. All options are considered to have a slight positive impact.

3 LAND USE INTEGRATION

This criterion compares the performance of each route option with respect to compatibility with adopted land use objectives and are appraised across three sub-criteria.

3.1 Support for local development plan

The County Development Plan (CDP) 2018 – 2024 has strategic objectives including, but not limited to, planning for population growth, prioritising “key infrastructural investment required throughout the County”, and to provide the “strategic spatial framework to guide collaboration, investment, community development and sustainable growth”. The Transportation Strategy states that the “need for investment in new roads access and improvements to existing roads infrastructure within the county is a priority intervention to be sought through the life of the plan”. It continues to state how the Core Strategy Map (Figure 1-1) shows the “importance of the onward and external connections through the A5 Western Transport Corridor and the A6 road projects, the TEN-T Network and in particular the Letterkenny Relief Road and the N14 Letterkenny/Lifford road”.

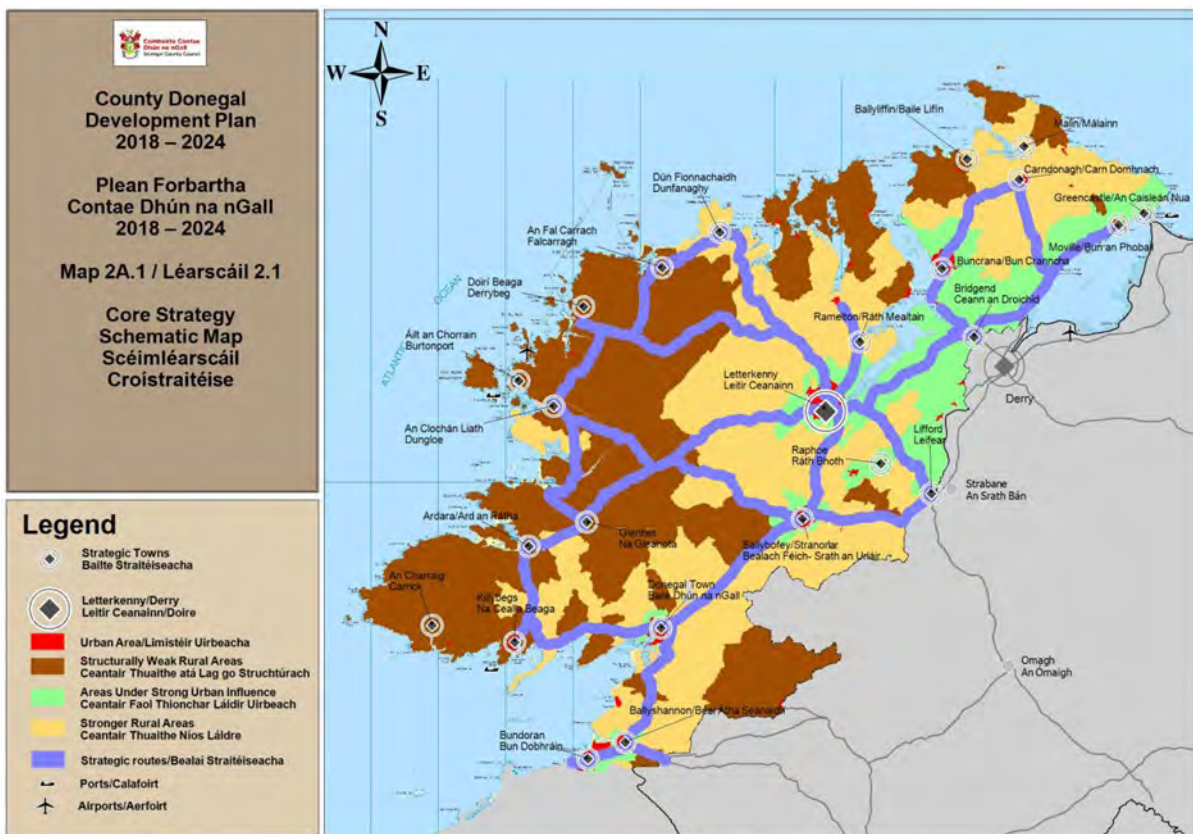


Figure 1-1 Core Strategy Schematic Map

The transportation strategy within the CDP identifies the need for investment in new roads access and improvements to existing roads infrastructure providing for important and essential connectivity of Letterkenny and the Strategic Towns to other key centres outside the county.

Core Strategy Objective (CS-O-4) in the CDP is ‘to support the growth of Letterkenny and its metropolitan area as driver of population and economic growth in the County and to make appropriate provision for approximately 4,200 additional persons by 2024’.

Core Strategy Objective (CS-O-9) in the CDP is ‘to coordinate and promote the delivery of key roads and access infrastructure (including the A5 Western Transport Corridor and A6 road projects, the TEN-T Network, Letterkenny Relief Road and the N14 Letterkenny/ Lifford road) so as to result in effective strategic connections to and throughout the County’.

Core Strategy Objective (CS-O-10) in the CDP is ‘to prioritise investment in key strategic connections between Letterkenny and the Strategic Towns together with links to transport corridors serving the rest of the County’.

Transportation Objective (T-O-1) in the CDP is ‘to deliver the Trans-European Transport Network (TEN-T), (as required by EU Regulation (EU) No 315/2013 “Guidelines for the development of the Trans European Transport Network (Ten-T)”) as part of the core and comprehensive transport network of Ireland’.

These objectives are supported by Map 5.1.2 (**Figure 1-2**) which outlines the Strategic Transport Network in Donegal.

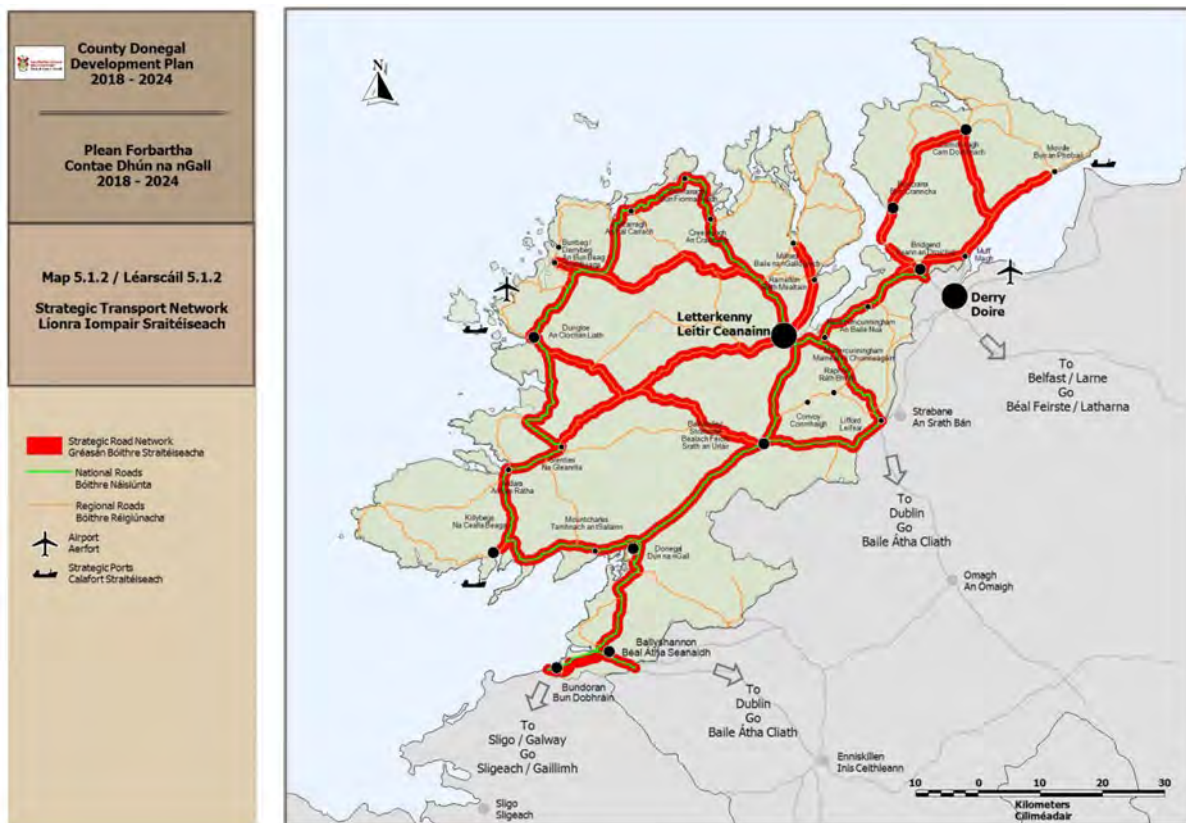


Figure 1-2 Strategic Transport Network, Donegal

The importance of the N56 / N13 is repeated in mapping and text within the CDP. As such, all options are considered to perform positively with respect to correlation with the plan.

Historic reserved corridors from the previous CDP 2012-2018 were retained in CDP 2018-2024. The CDP 2018-2024 recognises that this project is in option selection stage and therefore the plan is developed such as to accommodate an amendment pending the outcome of the option selection process. As such, an amendment to the development plan at a future date would not be unexpected. Given that all options still address key objectives in the CDP 2018-2024, all options are considered to have moderately positive impacts.

3.2 Strategic connectivity for long distance trips

Options that respond to regional and national traffic demands are considered positive. The N13 is a national primary route and the N56 is a national secondary route. Both existing routes carry heavy volumes of strategic and local traffic. Both existing routes have multiple direct accesses and junctions. The N13 is part of the Comprehensive Network within the Trans-European Transport Network (TEN-T). This means the N13 route is also considered to have international transport significance (in addition to its national and regional importance). Improvements to the existing routes that provide benefits for regional, national and international traffic is positive.

As stated in Item 2.1 of this report all options will provide improvements to the existing N56 / N13 road network and will provide better connectivity to Letterkenny urban centre from the south and east. For example, all options will provide a new crossing of the River Swilly and traffic patterns show this will provide significant relief to the existing N56 route.

All options provide a new link to Letterkenny and the N56 national route north of Letterkenny. This new link will provide relief to the existing N56 Four Lane Road and limit access points. However, some options will better segregate strategic and local traffic patterns, as follows:

Options 2A and 2B provide N13 online improvements; both options will continue to carry local and strategic traffic.

Options 2C, 2D and 2E provide offline segments that remove local traffic and provide additional benefits to regional, national and international strategic traffic. The improvements will limit connectivity to new offline road sections which will be protected from future access.

Options 2F1/2F2 are offline options and the furthest options from Letterkenny urban centre. Most road users continue to use the existing network with low traffic volumes on these options, resulting in less overall benefit to the existing network. Benefits are greater for users not entering or originating from Letterkenny.

Options 2C, 2D and 2E were identified as moderately positive whereas Options 2A, 2B, 2F1 and 2F2 were identified as slightly positive.

3.3 Mitigate risks of urban sprawl

All options are located on the eastern side of Letterkenny and include specified junctions that will connect to Letterkenny urban centre and its residential / business areas. New options have uninterrupted flow between junctions with limited local access points to protect the network. Online options, in so far as possible, will close all other direct access points to ensure the network is protected. All route options are therefore considered to be neutral.

4 GEOGRAPHICAL INTEGRATION

Project Ireland 2040, the National Planning Framework (NPF) addresses where to plan population growth, and outlines objectives with respect to regions. A prevalent theme throughout the NPF is the need for improved “access from the north-west to Dublin and the east and to Cork, Limerick, Galway and Waterford”, as outlined in the “Overview” section of the strategy. Within the text, it states:

Addressing enhanced connectivity is a priority for this regional area [Donegal] as well as enabling growth and competitiveness to support the strong links that exist between Letterkenny and Northern Ireland.

The ambition of the NPF is to create a single vision and shared goals nationally. These goals are expressed as National Strategic Outcomes (NSOs). NSO 2 deals with Enhanced Regional Accessibility, and Accessibility to the North-West to enable unrealised potential to be activated. It highlights

- Upgrading access to the North-West border area, utilising existing routes (N2/N14/A5)
- Progressive development of the Atlantic Economic Corridor from Galway northwards by upgrading the N15/N13 link.

All route options perform equally in satisfying the goals of the NPF. They also follow through with themes from the National Spatial Strategy, by improving connectivity between Hubs and Gateways. The N13 is part of the Trans European Transport Network (TEN-T) and as such is a links to other European routes. The N13 also links to Derry and therefore provides cross-border connectivity. Therefore, all options score highly positive with respect to geographical integration.

5 OTHER GOVERNMENT POLICY INTEGRATION: REGIONAL BALANCE

In addition to improved accessibility, another theme of the NPF is promotion of regional parity, with National Policy Objective 1a stating that “The projected level of population and employment growth in the Eastern and Midland Regional Assembly area will be at least matched by that of the Northern and Western and Southern Regional Assembly areas combined”.

As such, the TII Project Appraisal Guidelines Unit 7 advise that transport projects should be scored positively for regional balance if transport investment is:

- Within or to urban centres from peripheral regions
- On links between urban centres
- On routes which improve access to international ports and airports

All options meet the above criteria by improving connectivity and travel times to:

- Letterkenny urban centre,
- Derry (to the north) and Ballybofey/Stranorlar (to the south),
- the remainder of the TEN-T network,
- to Belfast, Dublin, Knock and Shannon airports, and
- to Belfast, Dublin and Galway ports.

In addition, all options are consistent with the objectives of the National Development Plan, 2018-2027 (NDP), of which one objective is to invest in the Border Region to fully realise the potential of the North-West. Therefore, all options score highly positive with respect to Government Policy Integration: Regional Balance.

6 OPTION COMPARISON

In comparison to the existing network all options provide positive benefits with respect to Integration.

Table 4-1 outlines the integration criteria and impact scoring for each option. Sub-criteria impact scores were totalled and then averaged to get the overall impact score for that Criteria. If the overall impact score was not a whole number (included a fraction like 1/4 or 1/3) then that option impact score was compared with impact scores of other options to determine the overall impact score as a whole number.

Table 4-1 confirms that when the impact scores for each of the four integration criteria were totalled all options scored equally. However, small differences in the impact scores between options are represented within the preference rankings.

Table 4-1 Integration Scoring Matrix

Option	Criteria	Sub-criteria	Sub-criteria Impact Score	Impact Score	Preference
2A	Transport Integration	Connectivity of the strategic road network	7	5	Intermediate
		Connectivity between transport modes	4		
		Support for sustainable transport modes	5		
		Access to other transport infrastructure	5		
	Land Use Integration	Support for Local Development Plan	6	5	Intermediate
		Strategic connectivity for long distance trips	5		
		Mitigate risks of urban sprawl	4		
	Geographical Integration		7	7	Preferred
Other Government Policy		7	7	Preferred	
2B	Transport Integration	Connectivity of the strategic road network	7	5	Intermediate
		Connectivity between transport modes	4		
		Support for sustainable transport modes	5		
		Access to other transport infrastructure	5		
	Land Use Integration	Support for Local Development Plan	6	5	Intermediate
		Strategic connectivity for long distance trips	5		
		Mitigate risks of urban sprawl	4		
	Geographical Integration		7	7	Preferred
Other Government Policy		7	7	Preferred	
2C	Transport Integration	Connectivity of the strategic road network	7	5	Preferred
		Connectivity between transport modes	4		
		Support for sustainable transport modes	6		
		Access to other transport infrastructure	5		
	Land Use Integration	Support for Local Development Plan	6	5	Preferred
		Strategic connectivity for long distance trips	6		
		Mitigate risks of urban sprawl	4		
	Geographical Integration		7	7	Preferred
Other Government Policy		7	7	Preferred	
2D	Transport Integration	Connectivity of the strategic road network	7	5	Preferred
		Connectivity between transport modes	4		
		Support for sustainable transport modes	6		
		Access to other transport infrastructure	5		
	Land Use Integration	Support for Local Development Plan	6	5	Preferred
		Strategic connectivity for long distance trips	6		
		Mitigate risks of urban sprawl	4		
	Geographical Integration		7	7	Preferred
Other Government Policy		7	7	Preferred	

Option	Criteria	Sub-criteria	Sub-criteria Impact Score	Impact Score	Preference
2E	Transport Integration	Connectivity of the strategic road network	7	5	Preferred
		Connectivity between transport modes	4		
		Support for sustainable transport modes	6		
		Access to other transport infrastructure	5		
	Land Use Integration	Support for Local Development Plan	6	5	Preferred
		Strategic connectivity for long distance trips	6		
		Mitigate risks of urban sprawl	4		
	Geographical Integration		7	7	Preferred
Other Government Policy		7	7	Preferred	
2F1	Transport Integration	Connectivity of the strategic road network	6	5	Intermediate
		Connectivity between transport modes	4		
		Support for sustainable transport modes	5		
		Access to other transport infrastructure	5		
	Land Use Integration	Support for Local Development Plan	6	5	Intermediate
		Strategic connectivity for long distance trips	5		
		Mitigate risks of urban sprawl	4		
	Geographical Integration		7	7	Preferred
Other Government Policy		7	7	Preferred	
2F2	Transport Integration	Connectivity of the strategic road network	6	5	Intermediate
		Connectivity between transport modes	4		
		Support for sustainable transport modes	5		
		Access to other transport infrastructure	5		
	Land Use Integration	Support for Local Development Plan	6	5	Intermediate
		Strategic connectivity for long distance trips	5		
		Mitigate risks of urban sprawl	4		
	Geographical Integration		7	7	Preferred
Other Government Policy		7	7	Preferred	



TEN-T Priority Route Improvement Project, Donegal

Section 2: N56 / N13 Letterkenny to Manorcunningham

Option Selection Report

Appendix C2.5 – Road Safety Audit Stage F – Part 2

Document Control Sheet

Client:	Donegal County Council
Project Title:	TEN-T Priority Route Improvement Project, Donegal – Section 1: N15/N13 Ballybofey/Stranorlar Urban Region
Document Title:	Option Selection Report –Appendix C2.5 – Road Safety Audit Stage F – Part 2
Document No.:	TT-MGT0337-RPS-00-01-RP-Z-RP-2011

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TEN-T Priority Route
Improvement, Donegal

Section 2 – N56/N13
Letterkenny to Manorcunningham

Stage F (Part 2) Road Safety Audit

RPS Barry Transportation

TEN-T Priority Route Improvement, Donegal

Section 2 – N56/N13 Letterkenny to Manorcunningham

Stage F (Part 2) Road Safety Audit

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1 Introduction

1.1 General

This report results from the Part 2 of a Stage F Road Safety Audit carried out on the emerging preferred option for Section 2 (N56/N13 Letterkenny to Manorcunningham) of the proposed TEN-T Priority Route Improvement, Donegal. The audit was carried out at the request of Ms Emma Coyle of Barry Transportation, on behalf of RPS Barry Transportation.

1.2 Audit Team

The members of the Road Safety Audit Team are independent of the design team, and include:

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(BE MSc CEng FIEI RSACert)
Road Safety Audit Team Leader

Ms. Laura Woodbyrne
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Trainee/Observer

Mr. Peter Morehan
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Road Safety Audit Team Member

1.3 Audit Information

The Road Safety Audit took place during March 2019 and comprised an examination of the documents provided by RPS Barry Transportation (see Appendix A). In addition to examining the documents supplied the Road Safety Audit Team visited the site of the proposed measures on the 15th August 2018. Weather conditions during the site visit were mainly dry & overcast with some rain showers, the road surface was dry and traffic volumes were moderate to heavy.

This Stage F (Part 2) Road Safety Audit has been carried out in accordance with the requirements of GE-STY-01024 - Road Safety Audit, dated December 2017, contained on the Transport Infrastructure Ireland (TII) Publications website.

The scheme has been examined and this report compiled in respect of the consideration of those matters that have an adverse effect on road safety and considers the perspective of all road users for the emerging preferred option. It has not been examined or verified for compliance with any other standards or criteria. The problems identified in this report are considered to require action in order to improve the safety of the scheme and minimise collision occurrence.

If any of the recommendations within this road safety audit report are not accepted, a written response is required, stating reasons for non-acceptance. Comments made within the report under the heading of Observations are intended to be for information only. Written responses to Observations are not required.

1.4 Scheme Description

1.4.1 Overall Scheme

The overall project comprises three sections of the TEN-T Network in Donegal that have been prioritised for improvement to address existing safety and operational issues. The Trans-European Transport Network (TEN-T) is a selection of strategic transport corridors that have been identified to play a key role in the mobility of goods and passengers through the European Union. The TEN-T Network in Donegal consists of three National Primary Roads (N13, N14 and N15).

The three sections of the TEN-T in Donegal that have been prioritised for improvement are: -

1. Section 1 – N15/N13 Ballybofey/Stranorlar Urban Region;
2. Section 2 – N56/N13 Letterkenny to Manorcunningham; and
3. Section 3 – N14 Manorcunningham to Lifford/Strabane/A5 Link.

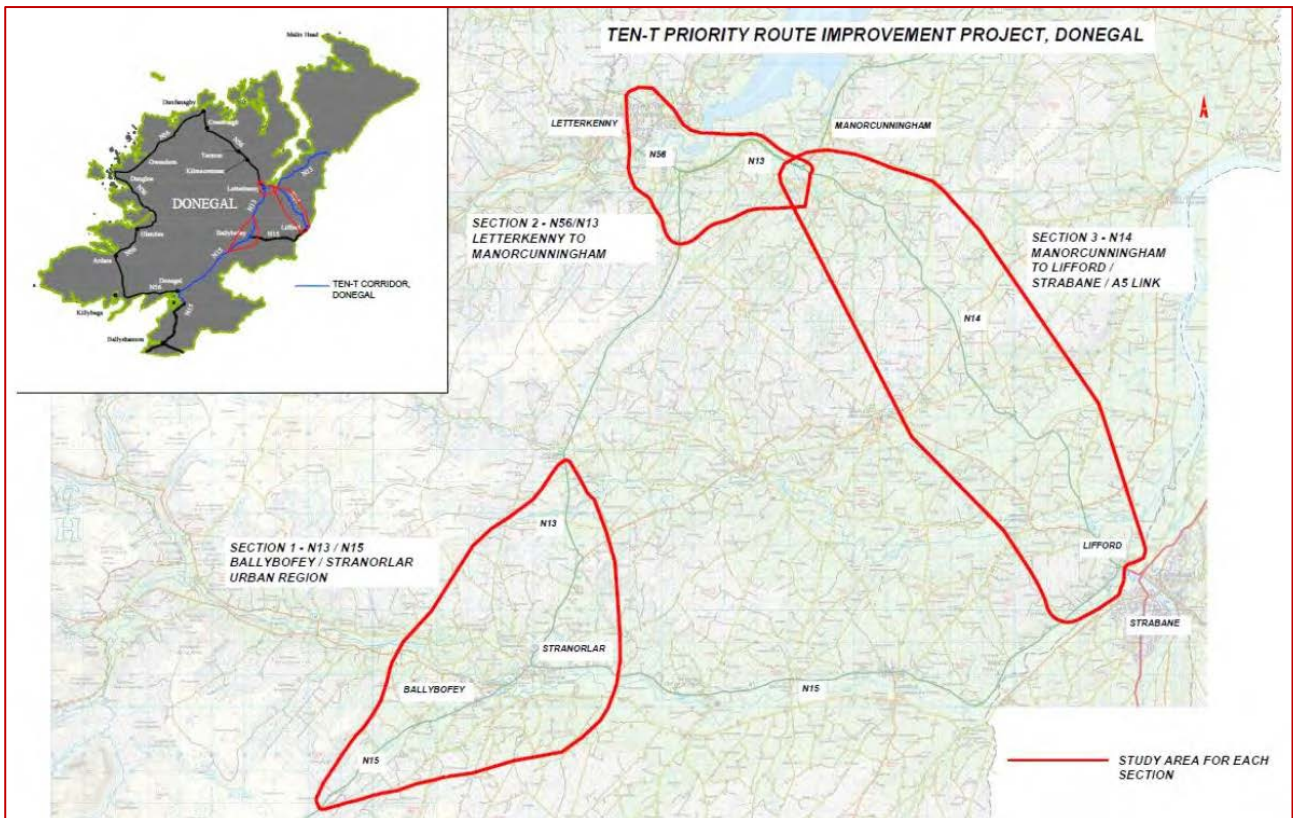


FIGURE 1.1: STUDY AREAS FOR EACH SECTION OF OVERALL SCHEME

This audit is for Section 2, which is described in the following section of this report.

1.4.2 Section 2

The Section 2 study area includes sections of the existing N56 and N13 national roads. The section of existing N56 is between the Polestar and Dry Arch (junction with N13) Roundabouts. This section of the N56 crosses the River Swilly and is currently the only connection between the National Primary road network and Letterkenny. It is also one of only two connections between the N56 National Secondary Road and the National Primary Road Network in Donegal, and there is a high dependence on this semi-urban link. It is currently a four-lane single carriageway with a posted speed of 80kph and multiple direct accesses. It suffers from operational & safety issues and has historical collision rates twice the national average for a similar type of national road.

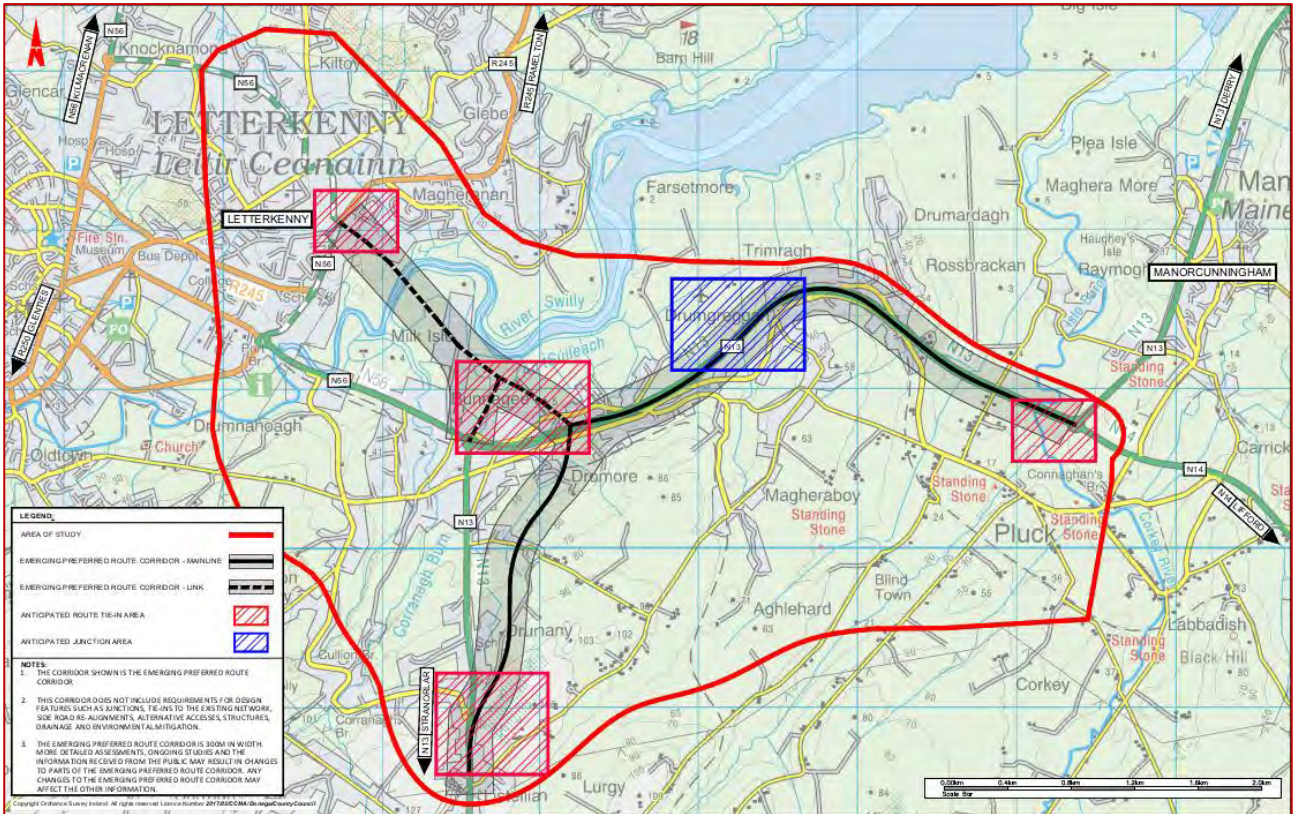


FIGURE 1.2: EMERGING PREFERRED OPTION

A separate safety scheme is currently being progressed to address some of the safety issues on this section of the N56 (e.g. implementation of central median, restricting right turns, signalisation at two intermediate junctions, 60kph posted speed) however, this will not resolve the lack of network resilience in the area. The N56 safety scheme is presently at detailed design and outside the scope of this audit.

The section of the existing N13 east of the Dry Arch Roundabout consists of a Type 1 dual carriageway with a grassed median. It includes at-grade accesses/junctions and crossings, has no provisions for vulnerable road users, includes many direct accesses to adjacent lands and has historical collisions rates above & twice above the national average for a similar type of national road.

The existing N13 south of the Dry Arch Roundabout consists of a wide single carriageway and features steep gradients and numerous direct accesses. It has historical collisions rates below the national average for a similar type of national road.

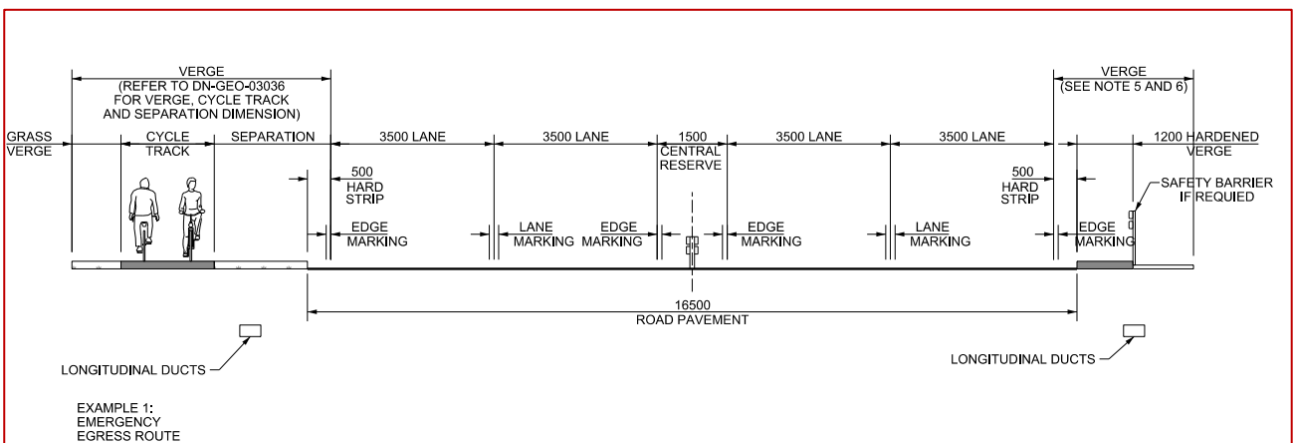


FIGURE 1.3: TYPE 2 DUAL CARRIAGEWAY

The overall length of the emerging preferred option is 6km, consisting of an online improvement of the 3.5km of the N13 to the west of the N13/N14 Pluck Roundabout, on offline improvement of the N13 south of the Dry Arch Roundabout and a new link road across the River Swilly.

A compact grade separated junction is proposed on the section of the N13 between the Dry Arch Roundabout and Pluck Roundabout to facilitate the closure of existing at-grade left-in/left-out junctions connecting with the local road network.

New offline sections of the proposed improvement, including the new link road across the River Swilly, will consist of a Type 2 Dual Carriageway (Ref: DN-GEO-03036) including a cycle track of 2.5m in width offset from the carriageway edge by 2.5m.

The existing Type 1 Dual Carriageway cross-section will be retained on the existing N13 between the Dry Arch Roundabout and the N14 Pluck Roundabout.

One river bridge and one grade-separated road crossing are proposed, and a total of eight roundabouts, three of which are new, three of which are improvements/upgrades to existing roundabouts and two which are associated with the compact grade-separated junction.

The roundabouts are proposed at the eastern & southern tie-ins, on the new link road across the River Swilly south of the river, as part of the compact grade-separated junction, at the existing Dry Arch Roundabout, on the existing N13 to the east of the Dry Arch Roundabout and at the north-western tie in with the N56.

1.4.3 Information Provided to Audit Team

Drawings detailing the emerging preferred option were provided, details of which are listed in Appendix A.

Collision records for the period 2005 to 2015 on the Road Safety Authority's website (www.rsa.ie) was also reviewed as part of the audit.

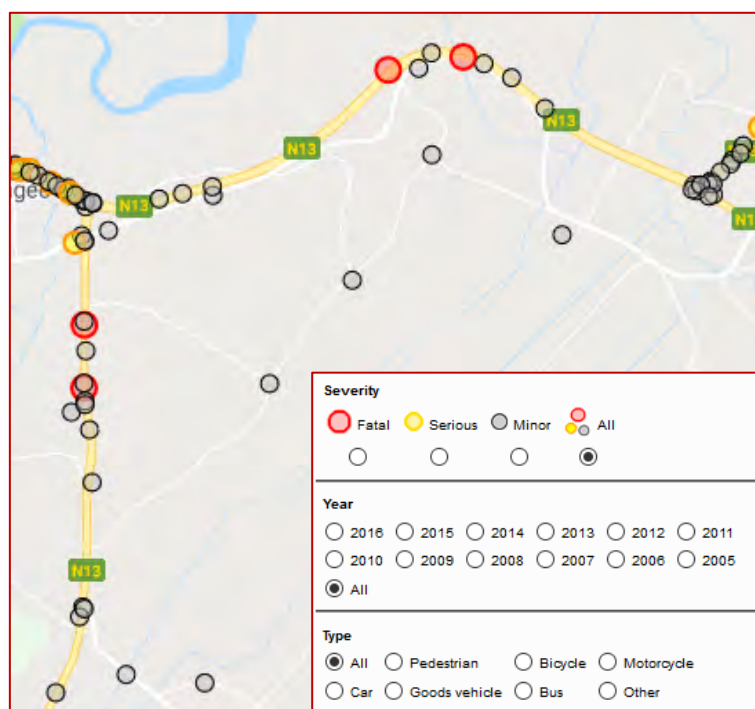


FIGURE 1.4: COLLISION RECORDS FROM ROAD SAFETY AUTHORITY WEBSITE

In addition, national road HD15 collision rates for the period 2014 to 2016 were obtained from the Open Data Portal (data.gov.ie) which are shown in Figure 1.5.

The sections shown in red are those sections of road with collision rates twice (or more) above the average, sections shown in orange are those sections of road with collision rates above the average, sections shown in blue are those sections of road with collision rates below the average & sections shown in green are those sections of road with collision rates twice (or more) below the average.

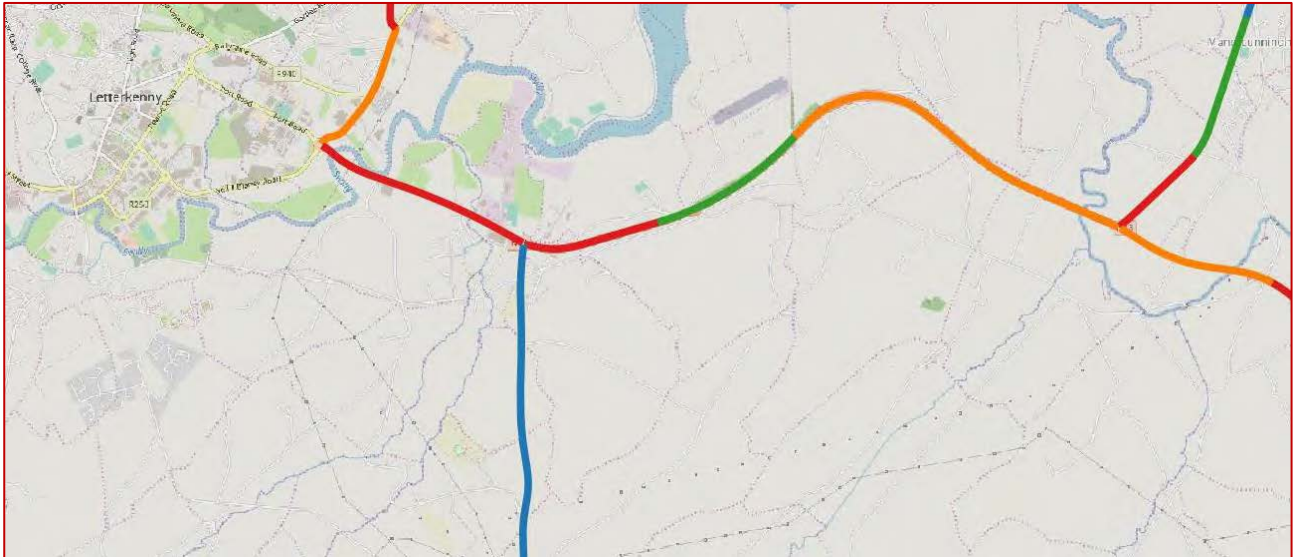


FIGURE 1.5: HD15 COLLISION RATES (2014 TO 2016)

1.5 Stage F (Part 1) Road Safety Audit

A Stage F (Part 1) Road Safety Audit was previously undertaken on this project, which identified possible safety issues for each option considered, which were compared to differentiate between the options in order to identify an emerging preferred option.

The Stage F (Part 1) report ranked this option as second out of the seven options considered.

2 Main Report

The audit has been undertaken on preliminary designs developed for the option selection (Phase 2) stage of the project. It is noted that these are indicative designs developed within a 300m corridor and that they are subject to change and development as the project progresses into Design and Environmental Evaluation (Phase 3) stage.

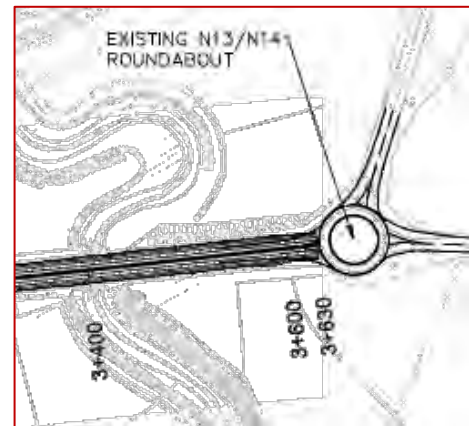
2.1 Problem

Location: Eastern Tie-in at Pluck Roundabout

Summary: Collisions arising from a lack of driver preparedness when encountering the at-grade junction at Pluck Roundabout.

It is proposed to provide to retain the Pluck Roundabout at the eastern tie-in. On the adjacent section of the N14 east of Pluck Roundabout, towards Lifford, within Section 3 of the Scheme it is proposed to provide a compact grade-separated junction with the existing N14 and the R264 and a roundabout at the tie-in with the A5 Link.

It is considered appropriate that terminal roundabouts be provided at Letterkenny and Lifford due to the transition from a dual carriageway to a single carriageway, or on the entry to an urban area, however the mix of at-grade and grade-separated junctions along the improved road between Lifford and Letterkenny may result in increased collisions due to a lack of driver preparedness when encountering the at-grade junction at Pluck Roundabout.



The historical collision data indicates that the existing approaches to Pluck Roundabout have collision rates above, or twice above, that expected for an equivalent section of national road.

Whilst it is acknowledged that a roundabout junction is an appropriate transition between roads of a different cross-section (e.g. single carriageway and dual carriageway) there is a risk that drivers who travel through a grade-separated junction (e.g. at Trimragh or the R264 junction) may be insufficiently prepared for the need to slow down, or stop, at Pluck Roundabout leading to overshoot into the circulating carriageway and side-on collisions.

Recommendation

During the development of the scheme design review the proposed junction type at this location in the context of the overall junction strategy for Sections 2 & 3 and ensure that the selected junction type can perform safely.

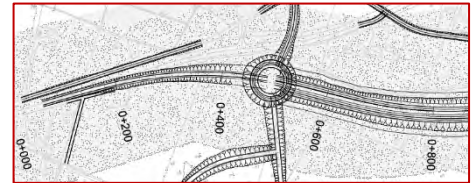
Ensure all measures required to ensure the safe operation of the junction are included during the subsequent design development phases.

2.2 Problem

Location: N13 Southern Terminal Roundabout at Lurgybrack

Summary: Unexpected junction type (roundabout) on rural section of national road could lead to drivers failing to adequately moderate their speeds on the approach to the roundabout resulting in overshoot incidents or run-off-road incidents.

A new roundabout is proposed on the N13 at the southern tie-in at the transition between the Type 2 Dual Carriageway cross-section and the existing single carriageway to the south, which is considered an appropriate transition arrangement between a single carriageway road network and the dual carriageway.



However, the introduction of a roundabout onto a rural section of national road has potential to result in an increase in collisions at the roundabout location where drivers fail to anticipate this type of junction on a rural section of national road. This is exacerbated by the existing high-demand vertical alignment of the N13 to the south which limits forward visibility.

Recommendation

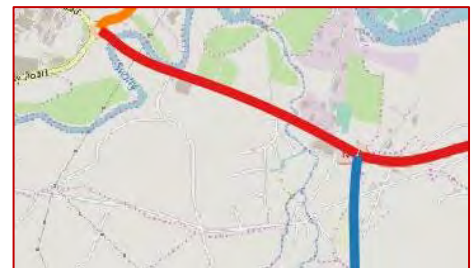
During the design development ensure that adequate forward visibility to, and advance warning of, the roundabout is provided for approaching drivers on the N13.

2.3 Problem

Location: Existing N56 West of Dry Arch Roundabout

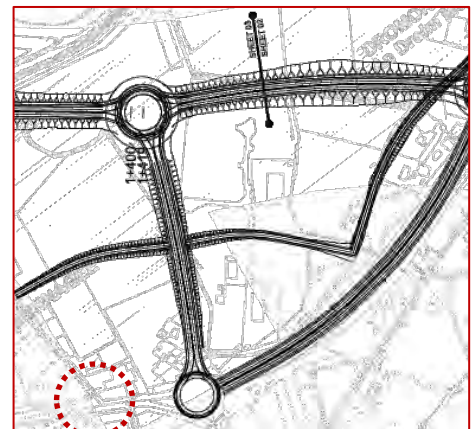
Summary: Increased traffic through the existing at-grade junction onto the undivided four-lane N56 which has a poor historical collision record may lead to increased collision occurrence.

No measures are included within the scheme to improve the section of the existing N56 between the Dry Arch Roundabout and the Polestar Roundabout. The Audit Team have been informed that there is a separate scheme proposed to address this section of road, however the Audit Team have no information on the expected timeline for this project to be implemented.



This section of road consists of a heavily trafficked four-lane single carriageway with numerous direct accesses onto it, and historically high numbers of collisions.

As part of this Scheme a new link road is proposed between two local roads in the lands north of the Dry Arch Roundabout and south of the River Swilly, passing under one arm of the new link road across the River Swilly, and the associated closure of the existing local road arm to the north-east of Dry Arch roundabout.



This may result in increased traffic through the existing at-grade junction on the N56 immediately north-west of the Dry Arch Roundabout. And changed traffic patterns. It is unclear if the existing junction can safely accommodate any additional traffic or increased right-turning volumes.

Recommendation

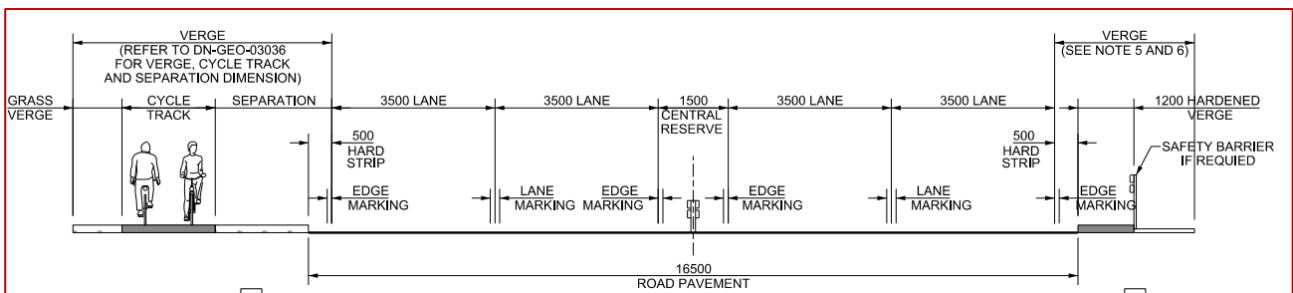
During the design development assess the effect of this Scheme on the operation of this junction, and if necessary, include measures to ensure its safe operation as part of this Scheme or the N56 Improvement scheme.

2.4 Problem

Location: New Link Road across the River Swilly

Summary: Lack of provisions for pedestrians on link road, and unclear how cyclists will interface with junctions.

The proposed cross-section on the new link road across the River Swilly does not include measures for pedestrians, and only caters for cyclists on one side.



It is likely that this new section of road could attract significant volumes of both pedestrians & cyclists. Should appropriate provisions not be made for non-motorised road users on the new link road there is an increased risk of these road users travelling within the carriageway and being struck by vehicles.

Pedestrians using the link road in the absence of dedicated facilities will either walk along the cyclist provision, which may not be wide enough to cater for both pedestrians and cyclists, leading to collisions between these non-motorised road user groups. Alternatively, pedestrians may choose to walk within the carriageway with a resulting risk of being struck by a passing high-speed vehicle.

In addition, the details are unclear relating to the likely pedestrian and cyclist crossing provisions at these junctions. Roundabouts present particular difficulties for non-motorised road users, in particular for cyclists.

Inappropriate junction types for expected mix of road users, or a lack of facilities for vulnerable road users generally, could lead to pedestrians or cyclists travelling within the carriageway or crossing at unsafe locations, leading to vehicle/pedestrian collisions.

Recommendation

During the design development assess likely pedestrian walking routes and desire lines and include safe routes and crossings where a need is identified.

The selection of the junction type should take account of the expected mix of road users at each location and provide the safest option, in particular for vulnerable road users where these are expected.

2.5 Problem

Location: Lack of Hardshoulder of Type 2 Dual Carriageway

Summary: The absence of a hardshoulder may expose occupants of broken-down vehicles to the risk of being struck by through-traffic.

The proposed cross-section of the new offline sections of road does not include a hardshoulder. The absence of a hardshoulder may expose occupants of broken-down vehicles to the risk of being struck by through-traffic and increase the likelihood of high-speed shunt collisions between through-traffic and stationary vehicles on the mainline carriageway.

Recommendation

During the development of the scheme design include measures to reduce the risk, for example: -

- Providing a hard-shoulder or lay-bys to accommodate broken-down vehicles; or
- Ensuring that the verge and hardstrip are capable of accommodating a broken-down vehicle without encroachment within the traffic lanes or the cycletrack, and that any vehicle restraint systems provided do not impede this arrangement.

2.6 Problem

Location: Dual Carriageway Approaches to Roundabouts

Summary: Possible inappropriate approach speeds leading to a failure to stop and overshoot into the circulating carriageway resulting in side-on collisions or run-off-road collisions.

The scheme includes at-grade roundabouts at the intersections at the southern terminal, and between the N13 and the new link road across the River Swilly. The proposed scheme is a dual carriageway with two lanes approaching the roundabouts. This could lead to inappropriate approach speeds, a failure to stop and overshoot into the circulating carriageway resulting in side-on collisions or to run off road collisions, particularly for vehicles approaching on the outside lane.

Recommendation

During the design development, ensure that adequate signage is provided for both nearside and offside drivers on the dual carriageway approaches to roundabouts, and that where required median widening is provided to accommodate any necessary signage on these approaches.

2.7 Problem

Location: Type 2 Dual Carriageway

Summary: Insufficient forward visibility could result in drivers failing to observe a hazard in the upcoming carriageway in sufficient time, leading to a failure to stop and collisions.

The proposed Type 2 Dual Carriageway cross-section will require verge and/or median widening on some horizontal curves in order to ensure adequate forward visibility.

Insufficient forward visibility could result in drivers failing to observe a hazard in the upcoming carriageway in sufficient time, leading to a failure to stop and collisions.

Recommendation

During the design development ensure that the required forward visibility is available at all locations along the roads within the scheme, and that adequate lands are acquired to provide any verge/median widening required to achieve this.

2.8 Problem

Location: Proposed Roundabout at Northern Tie-in of new Link Road across the River Swilly

Summary: Possible shunt collisions arising from drivers exiting the new roundabout on the N56/R245 failing to anticipate a slowing or stationary right-turning vehicle turning into the t-junction immediately downstream of the roundabout exit.

A new roundabout is proposed at the northern tie-in of the new link road across the River Swilly, at the location of the existing N56/R245 junction. There are existing t-junctions on the N56 and the R245 to the north and south of the proposed roundabout, which are to be retained.

The proximity of these t-junctions to the roundabout could result in drivers exiting the roundabout being unprepared for a slowing, or stationary, right-turning vehicle at the t-junction resulting in a failure to stop and shunt collisions.

Recommendation

During the design development include measures to ensure the safety of road users (e.g. right turn lanes or left in / left out only junctions).

2.9 Problem

Location: N13 Southern Tie-in at Lurgybrack

Summary: Absence of connectivity onto the existing N13, between the southern tie-in and the Dry Arch Roundabout, could lead to increased volumes of traffic on the local road network around the southern tie-in which cannot be safely accommodated.

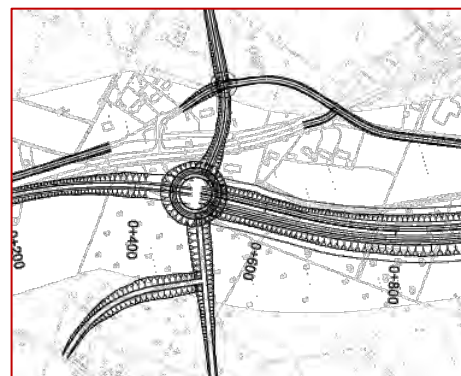
The proposed road layout at the southern tie-in does not include connectivity from the realigned N13 onto the existing N13 towards the Dry Arch Roundabout.

This could result in an increased volume of traffic on the adjacent local road network, which may not be able to cater for these increased traffic volumes safely.

Recommendation

During the design development assess the level of additional traffic, if any, generated on local roads by the proposed road layout at Lurgybrack.

If necessary, include measures to ensure that unsafe levels of traffic on local roads does not arise, or include measures to ensure that any routes that will experience increased traffic can safely accommodate the forecast flows.



2.10 Problem

Location: Existing N13 between Lurgybrack and Dry Arch Roundabout

Summary: Retaining the existing cross-section on the severed section of the existing N13 south of the Dry Arch Roundabout coupled with significantly reduced traffic flows could lead to excessive speeds or anti-social behaviour.

The proposed road layout at the southern tie-in does not include connectivity from the realigned N13 onto the existing N13 towards the Dry Arch Roundabout. resulting in a significant decrease in the likely traffic along this section of road.

Retaining the existing cross-section coupled with significantly reduced traffic volumes could lead to excessive speeds or anti-social behaviour along this section of road resulting in collisions.

In addition, no measures are indicated to cater for vulnerable road users (e.g. footpath) on this section of the existing N13. The RSA Online Collision Database indicates that there have been nine collisions along this section of the N13 in the period 2005 to 2014, two of which involved pedestrians, and which resulted in fatalities. The likelihood of vehicular/VRU collisions will reduce with the reduction in traffic, however increased VRU traffic may also arise.

The absence of pedestrian provisions will result in vulnerable road users continuing to travel within the carriageway where they are at an increased risk of being struck.

Recommendation

During the design development include measures to cater for the volumes of traffic and the nature of need for severed section of the existing N13 south of the Dry Arch Roundabout.

2.11 Problem

Location: Intersection of Realigned N13, Existing N13 and new Link Road across the River Swilly

Summary: Relatively steep downhill gradient leading to excessive speeds on approach to roundabout resulting in overshoot into the circulating carriageway.

The vertical alignment of the realigned N13, although to standard, includes a downhill gradient of 4.9% to within 130m of the proposed roundabout at its intersection with the existing N13 and the new link road across the River Swilly. This could lead to excessive speeds on the northbound approach to the roundabout resulting in overshoot into the circulating carriageway and side-on collisions.

Recommendation

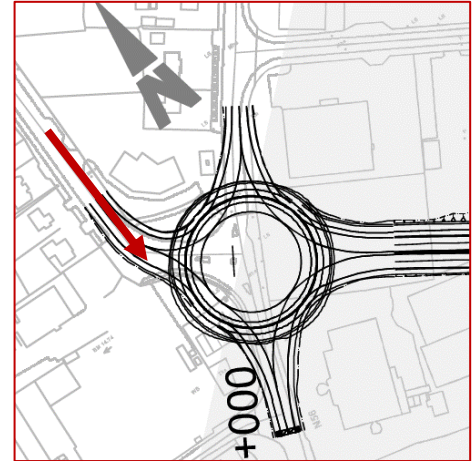
During the development of the design investigate if further improvements can be made to the vertical alignment taking into account the existing topography, and ensure the proposed signage and other guidance provided adequately conveys to northbound drivers the location of the upcoming junction & of the need to moderate their speeds.

2.12 Problem

Location: Existing N56 southbound approach to new Roundabout at the Northern Tie-in of the new Link Road across the River Swilly

Summary: Potential for drivers to sight, and move, to the right of splitter island at roundabout leading to low-speed head-on collisions.

The horizontal alignment of the existing N56 north of the proposed roundabout at the northern tie-in of the new link road across the River Swilly could result in southbound drivers approaching the roundabout sighting to the right of the splitter island at the roundabout, misunderstanding the road layout and driving to the right of the island leading to possible low-speed head-on collisions with vehicles exiting the roundabout.



Recommendation

During the design development include measures to ensure drivers are adequately aware of the upcoming road layout.

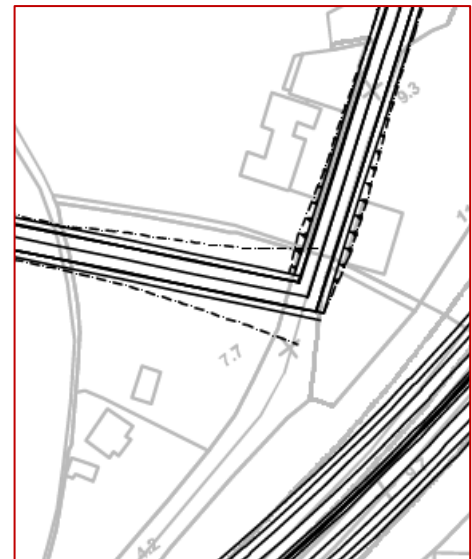
2.13 Problem

Location: New Link Road under new Link Road across the River Swilly (north of the Dry Arch Roundabout and south of the River Swilly)

Summary: 90° Bend in proposed Local Road Alignment

It is unclear from the drawings provided what junction, if any, is proposed between the existing local road and the new link road which passes under the new link road across the River Swilly, in the lands north of the Dry Arch Roundabout and south of the River Swilly.

Nevertheless, and while it is acknowledged that the design is an indicative preliminary design, whether the proposed arrangement is to be as shown, or if a t-junction is intended, the result is that the predominant traffic flow at this location is likely to turn through 90°, resulting in increased potential conflicts.



Similarly, as drivers become familiar with the new road layout, and in particular the low likelihood of meeting traffic on one of the junction arms, they may be unprepared when a vehicle emerges from this arm which may have priority due to the junction layout.

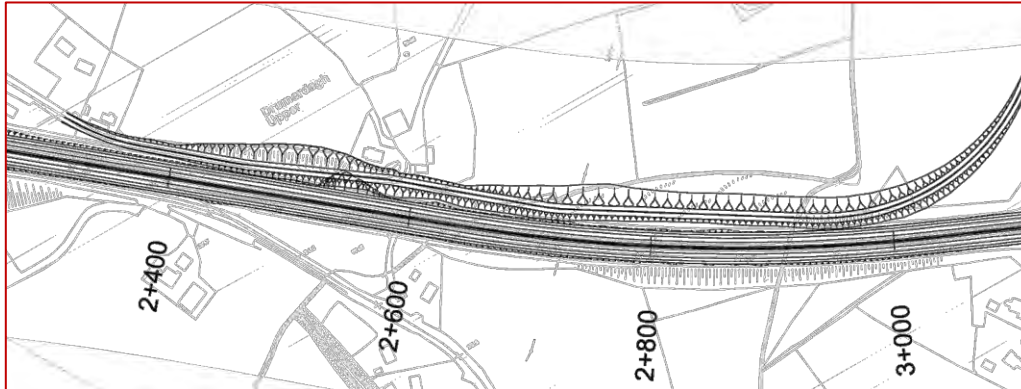
Recommendation

During the design development remove the 90° bend from the proposed link road alignment, with priority given to the expected main traffic flow and provide a suitable junction with the remaining (severed) section of road.

2.14 Problem

Location: Existing N13 west of Pluck Roundabout

Summary: Drivers could be dazzled by lights of vehicles on adjacent road.



A realigned local road is located to the north of, and adjacent to, the existing N13 west of Pluck Roundabout (approximate Chainage 2,400 to 3,000).

There is a risk that during the hours of darkness that lights of vehicles on the local road could dazzle drivers on the N13 resulting in them momentarily being unable to discern a hazard in the upcoming carriageway, and vice versa.

Recommendation

Provide anti-dazzle screening measures between the N13 and the realigned local road at this location.

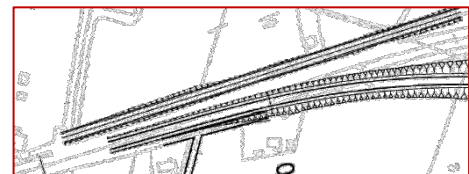
2.15 Problem

Location: Existing N13 south of Lurgybrack Roundabout

Summary: Drivers could be dazzled by lights of vehicles on adjacent roads.

Service roads are proposed either side of the existing N13, south of the proposed Lurgybrack roundabout.

There is a risk that during the hours of darkness that lights of vehicles on the service roads could dazzle drivers on the N13 resulting in them momentarily being unable to discern a hazard in the upcoming carriageway, and vice versa. This is exacerbated by the proximity of the nearby roundabout junction.



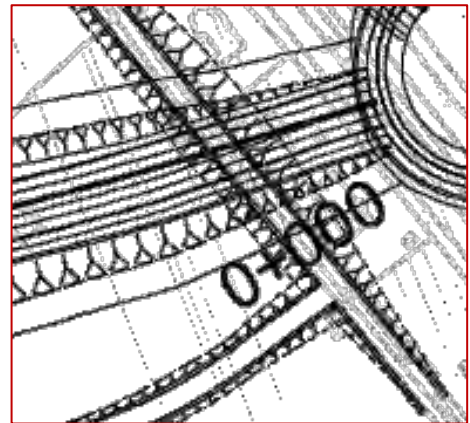
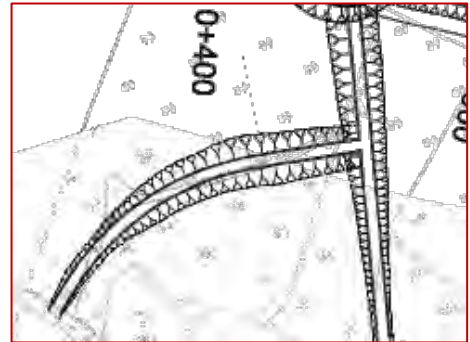
Recommendation

Provide anti-dazzle screening measures between the N13 and the service roads at this location.

3 Observations

- 3.1 In a number of locations junctions/accesses on realigned side roads are indicated within cuttings or adjacent to proposed underbridges/overbridges.

During the design development ensure that the visibility splays for drivers exiting from the minor arm of these junctions is not obstructed by the earthworks or the nearby structures & associated parapets.



4 Road Safety Audit Team Statement

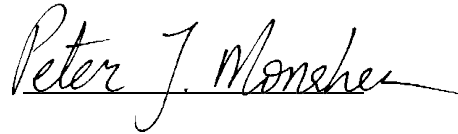
We certify that we have examined the drawings and other information referred to in this report and listed in Appendix B, and visited the site during daytime on the 15th August 2018. We certify that we are independent from the design team for the scheme. The examination has been carried out with the sole purpose of identifying any features of the design that could be removed or modified in order to improve the safety of the scheme.

The problems identified have been noted in this report together with associated safety improvement suggestions, which we would recommend should be studied for implementation.

ROAD SAFETY AUDIT TEAM LEADER

Peter Monahan

Signed:



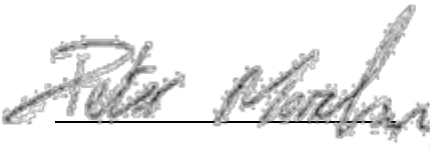
Dated:

2nd October 2019

ROAD SAFETY AUDIT TEAM MEMBER

Peter Morehan

Signed:



Dated:

2nd October 2019

OTHERS INVOLVED

Ms. Laura Woodbyrne, Trainee/Observer

Appendix A – Documents Submitted to the Road Safety Audit Team

DOCUMENT/DRAWING TITLE	DOCUMENT/DRAWING NO.	REVISION
Route 2D Plan & Profile Figure 2D Sheet 1 of 5	TT_MGT0377-RPS-00-ZZ-DR-D-GE0023-01	P02
Route 2D Plan & Profile Figure 2D Sheet 2 of 5	TT_MGT0377-RPS-00-ZZ-DR-D-GE0023-02	P02
Route 2D Plan & Profile Figure 2D Sheet 3 of 5	TT_MGT0377-RPS-00-ZZ-DR-D-GE0023-03	P02
Route 2D Plan & Profile Figure 2D Sheet 4 of 5	TT_MGT0377-RPS-00-ZZ-DR-D-GE0023-04	P02
Route 2D Plan & Profile Figure 2D Sheet 5 of 5	TT_MGT0377-RPS-00-ZZ-DR-D-GE0023-05	P02
Section 2 Plan Drawing – Brochure	-	-
Calculated Traffic Flows based on ATC Surveys	-	-
Collision Data from rsa.ie Interactive Mapping (2005 – 2014)	-	-

Appendix B – Audit Team Approval

*Emma Coyle
Classon House
Dundrum Business Park
Dublin 14*

Date: 13/08/2018

Our Ref: 1335546/5352/Stage F

**re: N13 N56/N13 Letterkenny to Manorcunningham TEN-T
APPROVAL OF ROAD SAFETY AUDIT TEAM, Stage F**

Dear Emma Coyle,

The following members of the proposed road safety audit team are approved to carry out the Stage F road safety audit of N13 N56/N13 Letterkenny to Manorcunningham TEN-T.

1. Peter Monahan - PMCE Ltd. - Leader
2. Peter Morehan - J.B. Barry & Partners Ltd. (Dublin) - Leader
3. Gerard Claffey - J.B. Barry & Partners Ltd. (Dublin) - Member

A copy of all audit reports, design team response and exception reports must be uploaded through RSAAS. Successful upload of these reports and completion of the audit approval process is necessary for any further audit approval on this scheme.

Yours sincerely,

Lucy Curtis

Regional Road Safety Engineer
roadsafetyaudits@nra.ie

Appendix C – Feedback Form

Road Safety Audit Feedback Form

Scheme: TEN-T Priority Route Improvement, Donegal

Section 2 – N56/N13 Letterkenny to Manorcunningham

Route No.: N13 & N56

Audit Stage: Stage F (Part 2) **Date Audit Completed:** 2nd Oct. 2019

To Be Completed By Designer				To Be Completed By Audit Team Leader
Paragraph No. in Safety Audit Report	Problem Accepted (Yes/No)	Recommended Measure(s) Accepted (Yes/No)	Describe Alternative Measure(s). Give reasons for not accepting recommended measure	Alternative Measures or Reasons Accepted by Auditors (Yes/No)
2.1	No	No	<p>The road cross section changes from Type 1 Dual (existing dual carriageway from Letterkenny) to Type 2 Dual N14 Manorcunningham to Lifford) and Type 1 single carriageway N13 north of roundabout.</p> <p>A roundabout is considered appropriate and safe for this transition.</p>	Yes
2.2	Yes	Yes		
2.3	Yes	No	<p>Detailed designs are being carried out that will implement safety improvements along this section as part of a separate safety scheme.</p> <p>These detailed designs are subject to Road Safety Audit for that scheme with construction anticipated in 2020.</p> <p>It is envisaged that improvements may be carried out at the junction west of Dry Arch as part of this works.</p> <p>The TEN-T project will consider all options including future designs/construction at this location to ensure safety is not compromised.</p>	Yes
2.4	Yes	Yes		
2.5	Yes	Yes		

Road Safety Audit Feedback Form

Scheme: TEN-T Priority Route Improvement, Donegal


Section 2 – N56/N13 Letterkenny to Manorcunningham

Route No.: N13 & N56

Audit Stage: Stage F (Part 2) **Date Audit Completed:** 2nd Oct. 2019

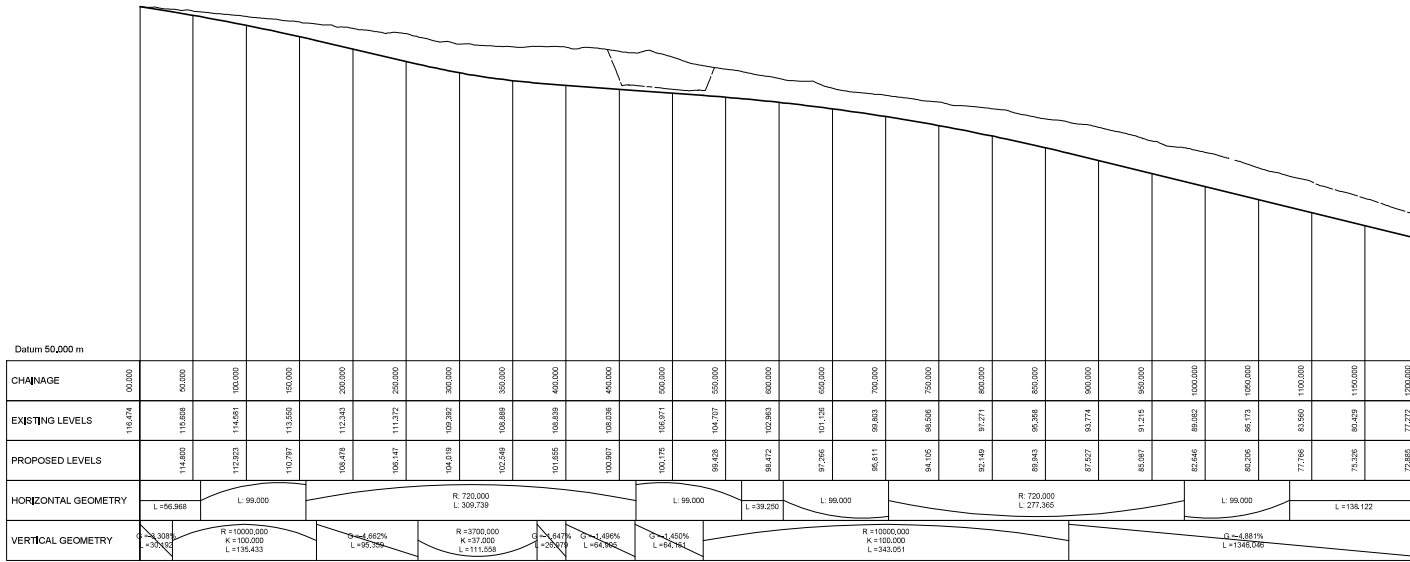
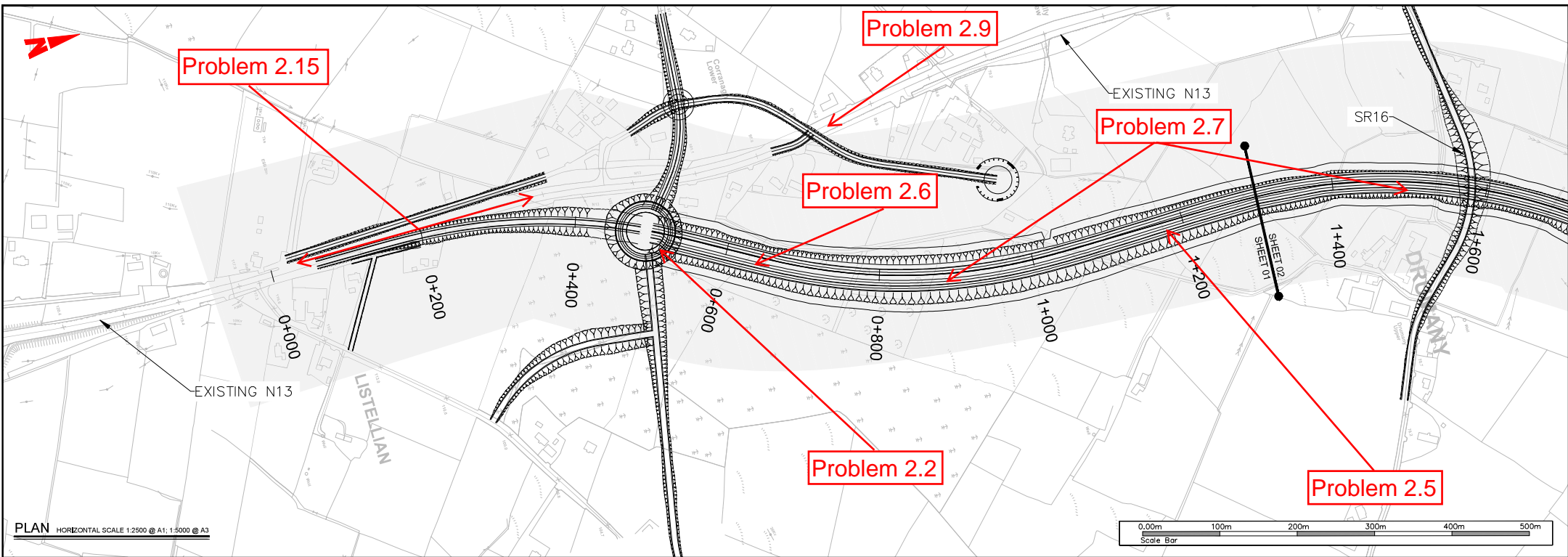
To Be Completed By Designer				To Be Completed By Audit Team Leader
Paragraph No. in Safety Audit Report	Problem Accepted (Yes/No)	Recommended Measure(s) Accepted (Yes/No)	Describe Alternative Measure(s). Give reasons for not accepting recommended measure	Alternative Measures or Reasons Accepted by Auditors (Yes/No)
2.6	Yes	Yes		
2.7	Yes	Yes		
2.8	Yes	Yes	Individual locations will be assessed during the design phase. Where feasible T-junctions in close proximity to the roundabout will be realigned and/or alternative measures proposed to improve safety.	
2.9	Yes	Yes		
2.10	Yes	Yes		
2.11	Yes	Yes		
2.12	Yes	Yes		
2.13	Yes	Yes		
2.14	Yes	Yes		
2.15	Yes	Yes		

Signed:  Designer **Date** 2nd Oct 2019

Signed:  Audit Team Leader **Date** 2nd Oct 2019

Signed:  Employer **Date** 4/10/2019

Appendix D – Problem Locations



PROFILE VERTICAL SCALE 1:500 @ A1; 1:1000 @ A3
HORIZONTAL SCALE 1:2500 @ A1; 1:5000 @ A3

R:\MGT0337 - Ten-T Priority Route - Donegal\8.0 Drawings\GEIT_MGT0337-RPS-00-ZZ-DR-D-GE0023_01_Road Route Section 2 2500.dwg



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W www.rpsgroup.com/ireland
E ireland@rpsgroup.com

BARRY TRANSPORTATION
Unit 14C, NS Business Park, Castlebar, Co Mayo, Ireland
Phone +353 94 906 8900
Email info@barry.ie

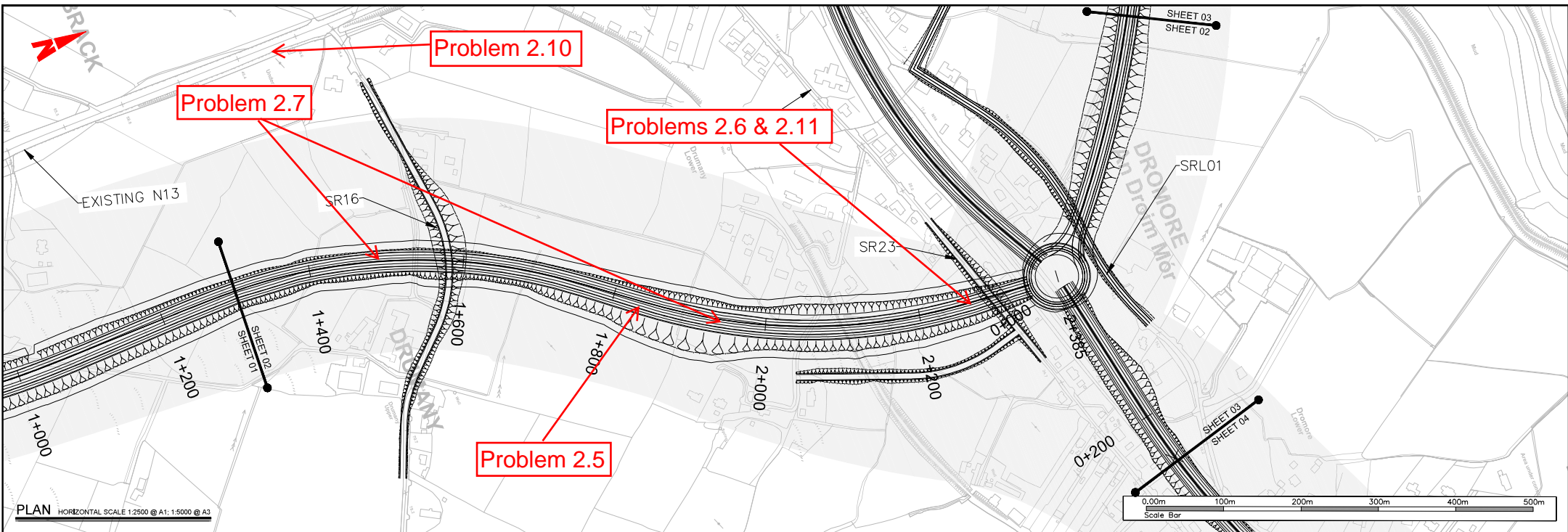
NOTES
DO NOT SCALE, use figured dimensions only.
All levels are referred to Ordnance Survey Datum, Mean Head.
This drawing is the property of the Transport Infrastructure Ireland, Parkside Business Centre, Parkside Street, Dublin 8, Ireland. It is a confidential document and must not be copied, used or its contents divulged without prior written consent. The document shall not be relied on or used in circumstances other than those for which it was originally prepared. RPS / Barry Transportation accept no responsibility for this document to any other party other than the party by whom it was commissioned.
Information including topographical survey, geotechnical investigation and utility data used in the design have been provided by others.

Rev.	Date	Drawn	Description	Chkd	Appr.
P02	13.03.19	DC	FOR REVIEW & COMMENT	TP	EC
P01.02	17.09.18	LH	VECTOR ADDED TO SHEET 01	LH	EC
P01.01	30.08.18	MIN	WORK IN PROGRESS	LH	EC

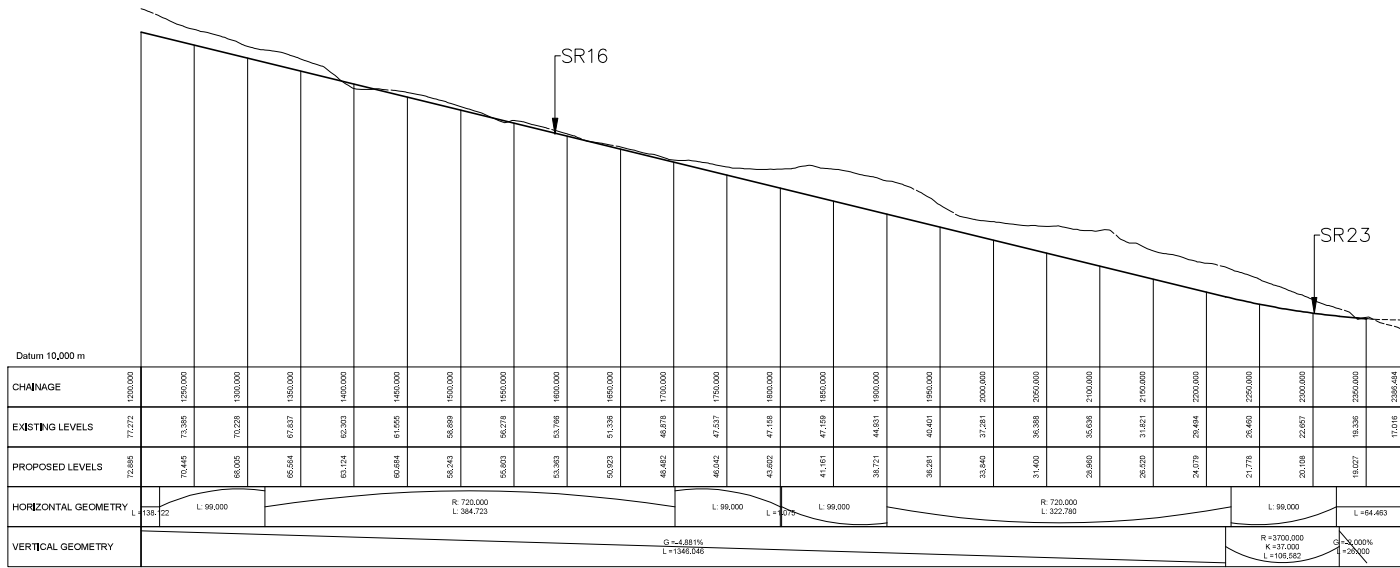
Project Title: TEN-T Priority Route Improvement Project, Donegal

Drawing Title: ROUTE 2D PLAN & PROFILE
FIGURE 2D SHEET 1 OF 5

Designed: DC	Date: AUG 18	Model File Identifier:	Status: S0
Drawn: MN	Scale @ A1: AS SHOWN	N/A	Rev: P02
Approved: EC	@ A3: AS SHOWN	File Identifier:	
Checked: LH	Sheet: 01 of 05	TI_MGT0337-RPS-00-ZZ-DR-D-GE0023-01	



PLAN HORIZONTAL SCALE 1:2500 @ A1: 1:5000 @ A3



PROFILE VERTICAL SCALE 1:500 @ A1: 1:1000 @ A3
HORIZONTAL SCALE 1:2500 @ A1: 1:5000 @ A3

R:\MG0337 - Ten-T Priority Route - Donegal\8.0 Drawings\GETT_MGT0337-RPS-00-ZZ-DR-D-GE0023_Road Route Section 2 2500.dwg



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Lynn 2, IDA Business & Technology Park,
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NOTES
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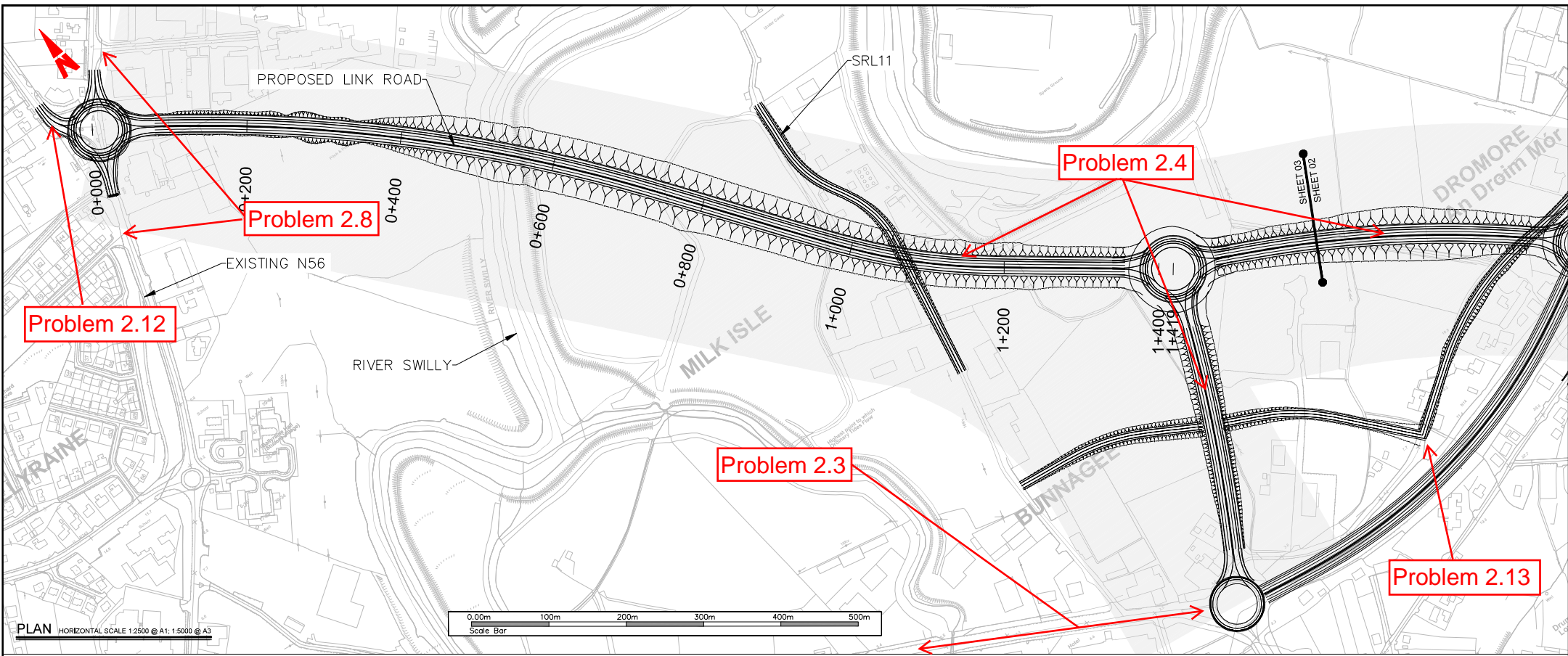
Rev.	Date	Drawn	Description	Chkd	Appr.
P02	13.03.19	DC	FOR REVIEW & COMMENT	TP	EC
P01.02	17.09.18	LH	VECTOR ADDED TO SHEET 01	LH	EC
P01.01	30.08.18	MIN	WORK IN PROGRESS	LH	EC

Project Title: TEN-T Priority Route Improvement Project, Donegal

Drawing Title: ROUTE 2D PLAN & PROFILE
FIGURE 2D SHEET 2 OF 5

Designed: DC	Date: AUG 18	Model File Identifier:
Drawn: MN	Scale @ A1: AS SHOWN	N/A
Approved: EC	@ A3: AS SHOWN	File Identifier:
Checked: LH	Sheet: 02 of 05	TT_MGT0337-RPS-00-ZZ-DR-D-GE0023-02

Status: S0
Rev: P02



PLAN HORIZONTAL SCALE 1:2500 @ A1: 1:5000 @ A3



PROFILE VERTICAL SCALE 1:500 @ A1: 1:1000 @ A3
HORIZONTAL SCALE 1:2500 @ A1: 1:5000 @ A3

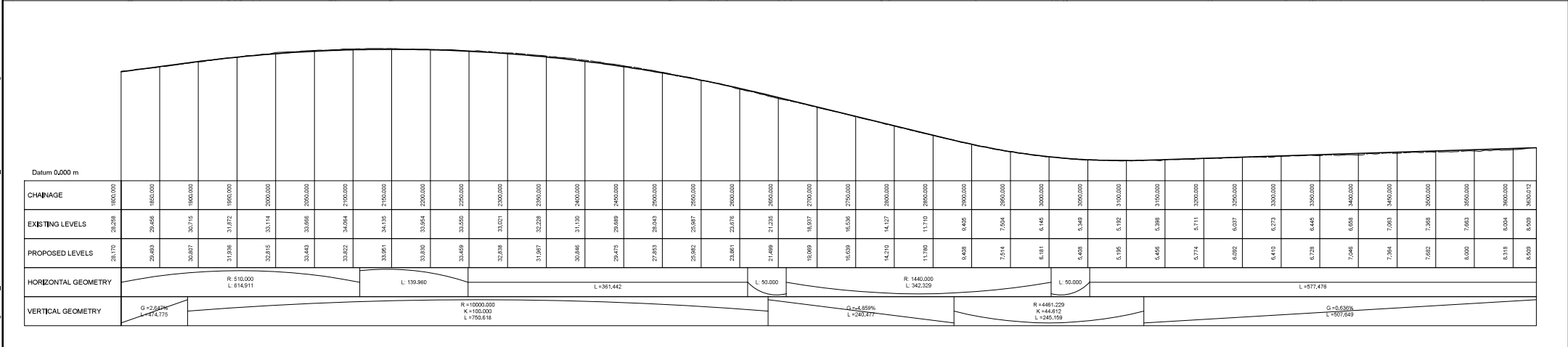
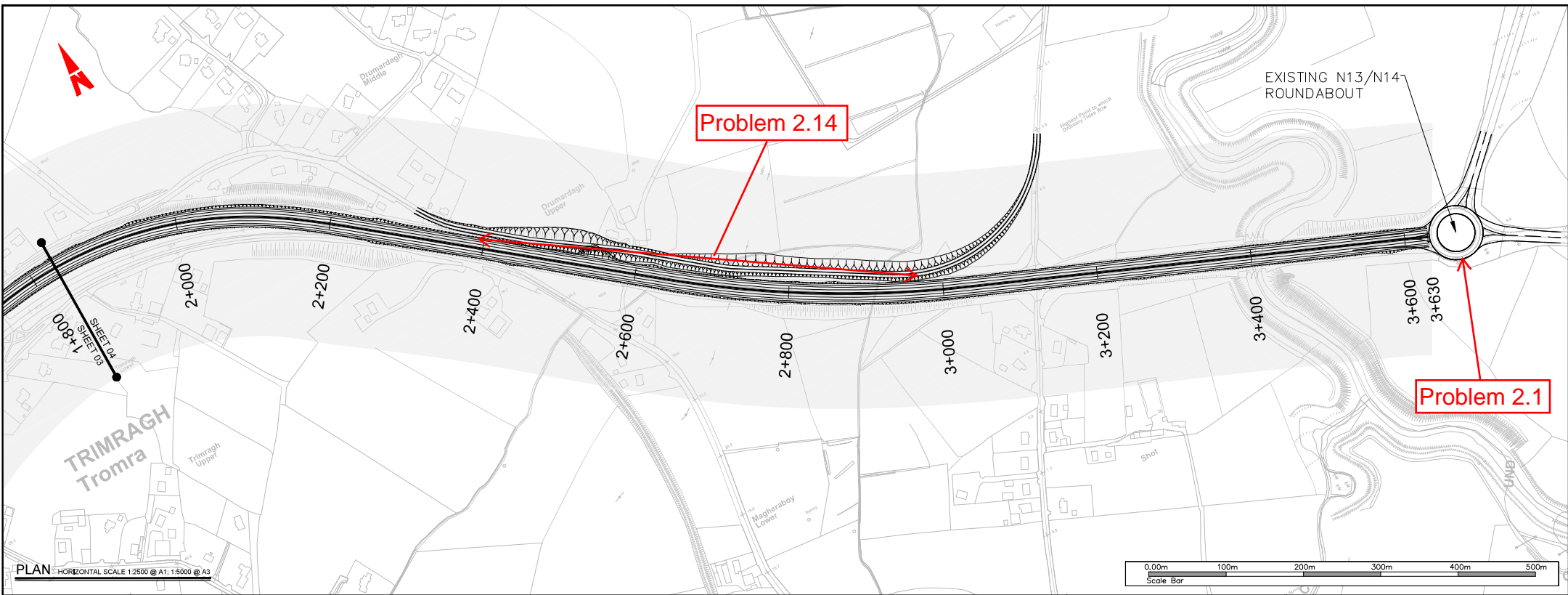
R:\MGT0337-RPS-00-ZZ-DR-D-GE0023_Reel Route Section 2 2500.dwg



NOTES
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Rev.	Date	Drawn	Description	Chkd	Appr.
P02	13.03.19	DC	FOR REVIEW & COMMENT	TP	EC
P01.02	17.09.18	LH	VECTOR ADDED TO SHEET 01	LH	EC
P01.01	30.08.18	MIN	WORK IN PROGRESS	LH	EC

Project Title: TEN-T Priority Route Improvement Project, Donegal		Status: S0
Drawing Title: ROUTE 2D PLAN & PROFILE FIGURE 2D SHEET 3 OF 5		Rev: P02
Designed: DC	Date: AUG 18	Model File Identifier:
Drawn: MN	Scale @ A1: AS SHOWN	N/A
Approved: EC	@ A3: AS SHOWN	File Identifier:
Checked: LH	Sheet: 03 of 05	TTI_MGT0337-RPS-00-ZZ-DR-D-GE0023-03



PROFILE VERTICAL SCALE 1:500 @ A1; 1:1000 @ A3
HORIZONTAL SCALE 1:2500 @ A1; 1:5000 @ A3

R:\MG0337-Ten-T Priority Route Imp - Donegal\8.0 Drawings\GEIT_MGT0337-RPS-QZ-DR-D-GE0023_Reel Route Section 2 2500.dwg



NOTES
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Rev.	Date	Drawn	Description	Chkd	Appr.
P02	13.03.19	DC	FOR REVIEW & COMMENT	TP	EC
P01.02	17.09.18	LH	VECTOR ADDED TO SHEET 01	LH	EC
P01.01	30.08.18	MN	WORK IN PROGRESS	LH	EC

Project Title: TEN-T Priority Route Improvement Project, Donegal		Status: S0	
Drawing Title: ROUTE 2D PLAN & PROFILE FIGURE 2D SHEET 5 OF 5		Rev: P02	
Designed: DC	Date: AUG 18	Model File Identifier:	
Drawn: MN	Scale: @ A1: AS SHOWN	N/A	
Approved: EC	@ A3: AS SHOWN	File Identifier:	
Checked: LH	Sheet: 05 of 05	TI_MGT0337-RPS-00-ZZ-DR-D-GE0023-05	