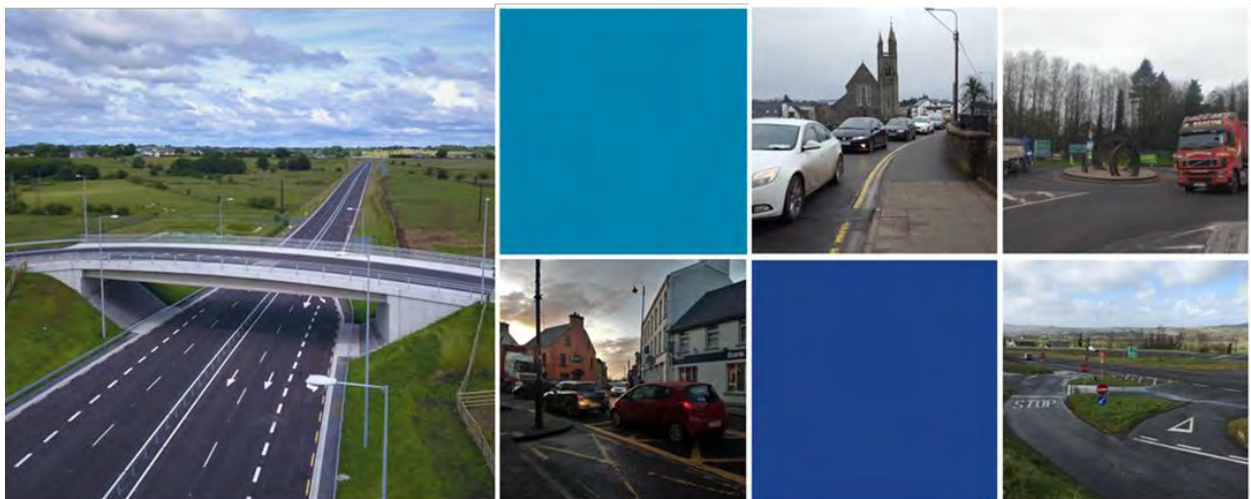


TEN-T Priority Route Improvement Project, Donegal

Phase 2, Option Selection Report Volume C3 – Section 3 Non-Environmental Appendices



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Appendix C3.6 – Section 3 Road Safety Audit Stage F – Part 2



TEN-T Priority Route Improvement Project, Donegal

Section 3: N14 Manorcunningham to Lifford/Strabane/A5 Link

Options Selection Report

Appendix C3.1 – 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 3: N14 Manorcunningham to Lifford/Strabane/A5 Link and will form part of the Option Selection Report for the project.

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

- Collision reduction and
- Security of road users.

This Report also summaries the impacts arising from the following two safety 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. This Report is included in **Appendix A of this report**.
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. This Report is included in **Appendix B of this report**.

The objectives of the report are to establish and compare the relative impacts of the options in terms of safety and provide an impact score in accordance with the PAGs for National Roads. Each impact is score is based on the seven-point scale as 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 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 existing N14 Manorcunningham to Lifford road is characterised by its alignment, with sharp horizontal bends and poor vertical alignment, which reduces opportunities for safe overtaking. This is exacerbated by the poor cross-sectional width, numerous roadside hazards, lack of hard-strip/hard shoulder along much of its length, and numerous accesses and junctions. These issues have culminated in a transport corridor that has a poor safety record and unreliable journey times.



Figure 1-1 Poor alignment on the N14 between Manorcunningham and the R236 junction

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 88 collisions from 2005 – 2014.

Table 2-1 Collision Statistics from 2005 - 2014 from RSA.ie collision database

Location	Fatal	Serious	Minor	Total
N14 between Pluck Roundabout and R236	0	4	33	37
N14/R236 Junction	0	0	6	6
N14 between R236 and R265	0	3	26	29
N14 near R265 Junction	0	0	2	2
N14 near R264 Junction	1	1	0	2
N14 between R265 and Lifford	0	0	12	12
Total	1	8	79	88

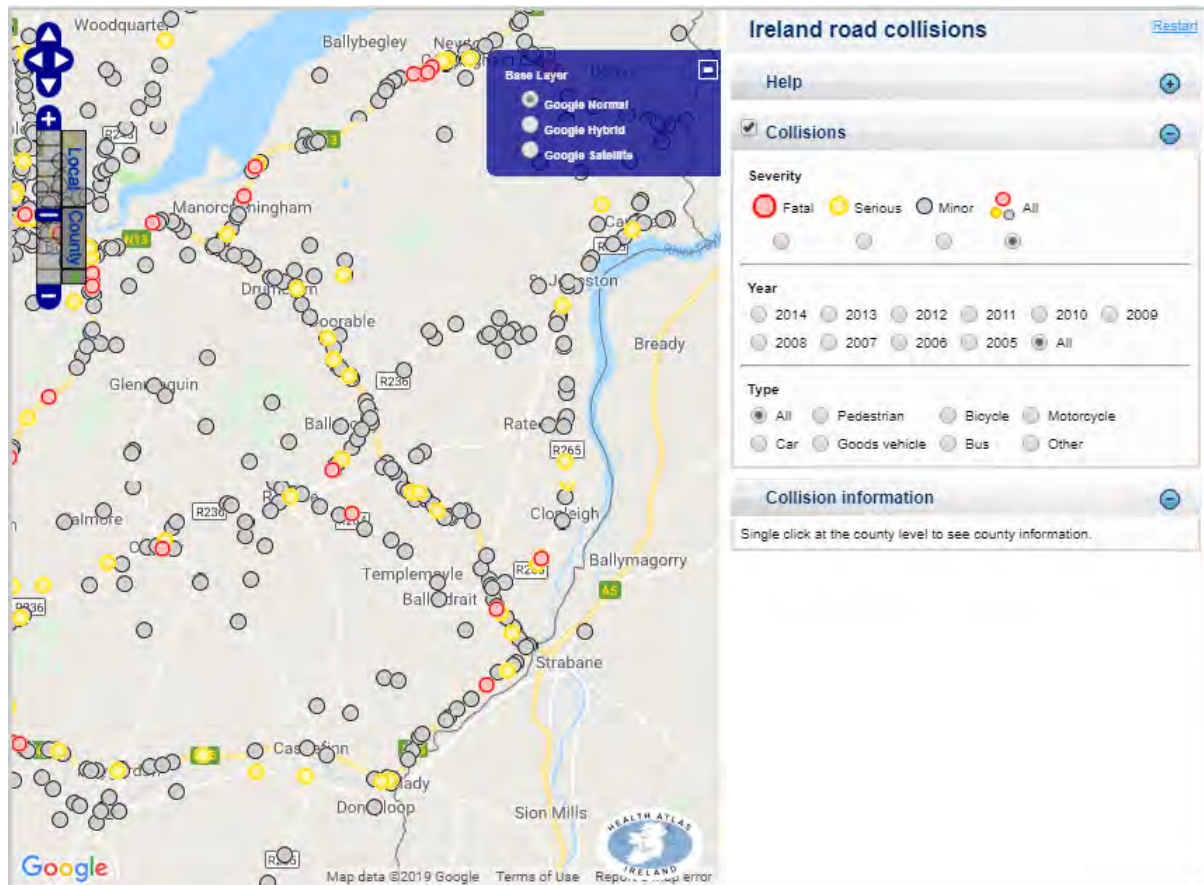


Figure 2-1 RSA.ie interactive collision database for 2005 - 2015

The statistics highlight that 23 of the collisions are classified as Rear end, right turn or Rear end straight, and 5 are Angle, right turn collisions. This indicates that there are issues with junction design and/or forward visibility to the junctions.

The significance of the quantity of collisions is difficult to interpret based on the number of collisions only. The collision rate for the N14 also highlights high collision locations along the option within Section 3, as shown in Figure 2-2. 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 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;

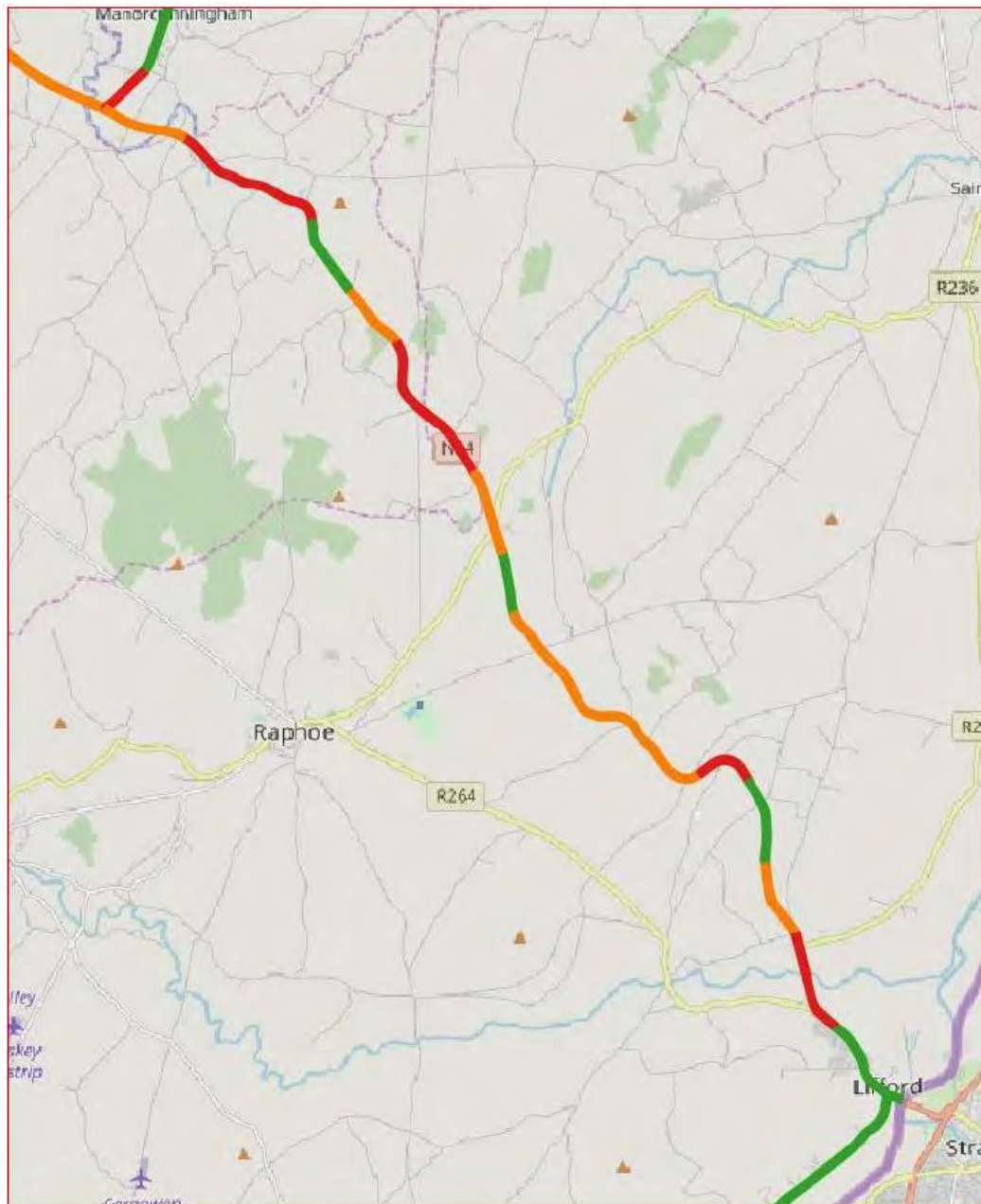


Figure 2-2 Collision Rates for Sections 1, 2 and 3

2.2 Predicted safety improvements

2.2.1 Qualitative Assessment

All options provide a significant improvement in infrastructure provision in comparison to the existing N14 route as any of the new options and junctions are designed to current design standards providing consistent cross-sectional width and sufficient capacity for current and future traffic volumes. Furthermore, all options propose to limit access to the mainline carriageway to junction locations which are either roundabout (at either end of each option) compact grade separated junctions on the intermediate sections. An intermediate junction is provided with the R236 on all options, with an additional junction also provided near Drumoghill on options 3B1/3B2 (Red), 3C1/3C2 (Orange) and 3D (Purple).

Controlled access reduces the number of conflict points along the N14 providing an improvement in safety.

From a strategic level, provision of a new N14 will accommodate the segregation of strategic and local traffic by means of grade separation. This will further reduce the conflicting requirements of these road users.

All options propose to include a segregated cycle track within the road cross-section. This assists in separating vulnerable road users from traffic and will have a net positive effect on road safety. Consideration will be required during later design stages to ensure appropriate provision for cyclists at junctions and where accessing and egressing the mainline option.

2.2.2 Quantitative Assessment

The road safety benefits of each 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. Table 2-2 Quantitative summary of Collision Reduction and Impact Scores for each highlights that all options have a positive impact in terms of collision reduction, with Option 3D having the highest collision savings.

All options have a positive road safety benefit according to the COBALT collision reduction assessment. As such, impact scores for each option have been provided in accordance with the TII PAG 1 – 7 scale. This is also shown in Table 2-2.

Table 2-2 Quantitative summary of Collision Reduction and Impact Scores for each option

	Option 3A1/3A2 (Blue)	Option 3B1/3B2 (Red)	Option 3C1/3C2 (Orange)	Option 3D (Purple)	Option 3E (Cyan)	Option 3F (Pink)
Collision Reduction benefits (€ 000's)	€ 5,701	€ 6,543	€ 6,543	€ 6,666	€ 5,954	€ 4,543
Impact Description	Highly Positive	Highly Positive	Highly Positive	Highly Positive	Highly Positive	Moderate Positive
Impact Score	7	7	7	7	7	6
Preference	Preferred	Preferred	Preferred	Preferred	Preferred	Intermediate Preferred

3 SECURITY OF ROAD USERS

As aforementioned, the existing N14 is currently a sub-standard single carriageway route that has numerous roadside hazards. There are no separated pedestrian or cycle facilities, and no hard shoulder for most of the length of the route. There are also poor opportunities for overtaking.

All new options propose a segregated cycle track within the mainline cross-section. This will provide an improvement in safety and security of cyclists.

Furthermore, all new mainline options will cater for strategic traffic and goods vehicles, which is likely to reduce the traffic volumes on the local road network. It is anticipated that the existing N14 will be re-classified and the speed limit reduced from 100km/h to 80km/h. Cumulatively, this will have a positive effect on the safety of the residual existing road network.

Therefore, all options perform moderately positively with respect to security of road users.

Table 3-1 Impact score of each option with respect to Security of road users

	Option 3A1/3A2 (Blue)	Option 3B1/3B2 (Red)	Option 3C1/3C2 (Orange)	Option 3D (Purple)	Option 3E (Cyan)	Option 3F (Pink)
Impact Description	Moderate Positive	Moderate Positive	Moderate Positive	Moderate Positive	Moderate Positive	Moderate Positive
Impact Score	6	6	6	6	6	6
Preference	Preferred	Preferred	Preferred	Preferred	Preferred	Preferred

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 RSA report provides a ranking of options, and highlights that the ranking represents the relative grading of the options with respect to each other and that the differences between the options, from a road safety perspective, are small.

It also highlights that all option options represent a significant improvement to the existing arrangement. The ranking provided in the RSA (available in Appendix A of this report) is outlined in Table 4-1 below. Based on this, an impact score has been provided by the Audit Team for each option which is also outlined in Table 4-1 below.

Table 4-1 Road Safety Audit Stage F Part 1 ranking

	Option 3A1/3A2 (Blue)	Option 3B1/3B2 (Red)	Option 3C1/3C2 (Orange)	Option 3D (Purple)	Option 3E (Cyan)	Option 3F (Pink)
Ranking	1	3	3	7	8	8
Impact Description	Highly Positive	Highly Positive	Highly Positive	Moderately Positive	Moderately Positive	Moderately Positive
Impact Score	7	7	7	6	6	6
Preference	Preferred	Preferred	Preferred	Intermediate	Intermediate	Intermediate

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.

As part of the RSIA, 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.

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

All options considered for Section 3 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 5-1 sets out the ranking of options. It should be highlighted that ranking is based on marginal differences between the options and as such, there is not a significant benefit of one option over another in terms of road safety, considering the items reviewed.

Options 3C1 and 3C2 are preferred over all other options in terms of road safety impact due to a highly positive COBALT collision benefits, engineering design and positive effects in terms of local trip distribution, due to the provision of online junction locations at Drumoghill and at the R236.

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. This is also shown in Table 5-1.

Table 5-1 Ranking of options from the RSIA

	Option 3A1/3A2 (Blue)	Option 3B1/3B2 (Red)	Option 3C1/3C2 (Orange)	Option 3D (Purple)	Option 3E (Cyan)	Option 3F (Pink)
Ranking	3	3	1	2	6	5
Impact Description	Highly Positive	Highly Positive	Highly Positive	Highly Positive	Moderately Positive	Moderately Positive
Impact Score	7	7	7	7	6	6
Preference	Preferred	Preferred	Preferred	Preferred	Intermediate	Intermediate

Appendix A

RPS Barry Transportation

TEN-T Priority Route
Improvement, Donegal

Section 3 – N14 Manorcunningham to
Lifford/Strabane/A5 Link

Stage F (Part 1) Road Safety Audit

RPS Barry Transportation

TEN-T Priority Route Improvement, Donegal

Section 3 – N14 Manorcunningham to Lifford/Strabane/A5 Link

Stage F (Part 1) Road Safety Audit

Document Ref: TT_Y16112-SC-RS-HGN-S3-RP-Z-00131

Rev	Prepared By	Reviewed By	Approved By	Issue Date	Suitability
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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 3 (N14 Manorcunningham to Lifford/Strabane/A5 Link) 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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(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 B). 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.

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 Manor Cunningham; and
3. Section 3 – N14 Manor Cunningham to Lifford/Strabane/A5 Link.

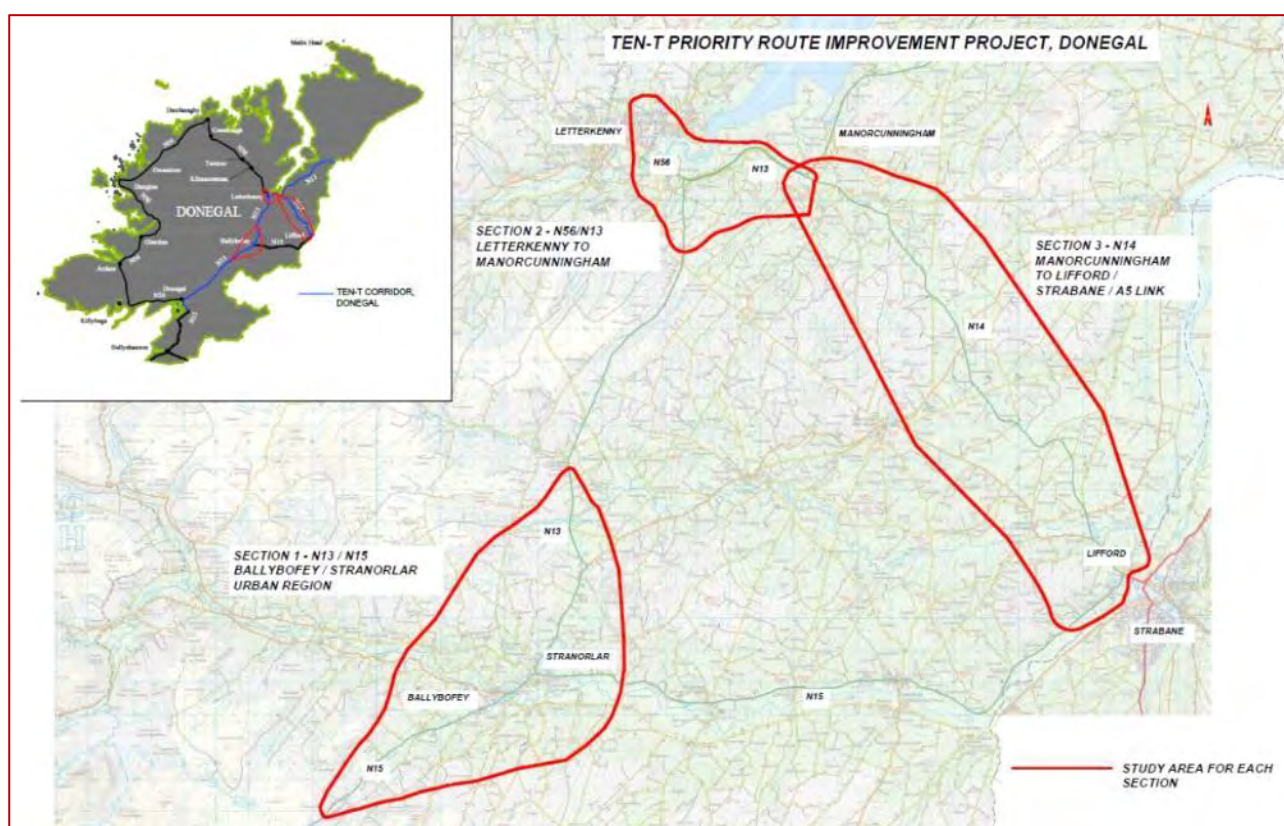


FIGURE 1.1: STUDY AREAS FOR EACH SECTION OF OVERALL SCHEME

This audit is for Section 3, 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) Audit.

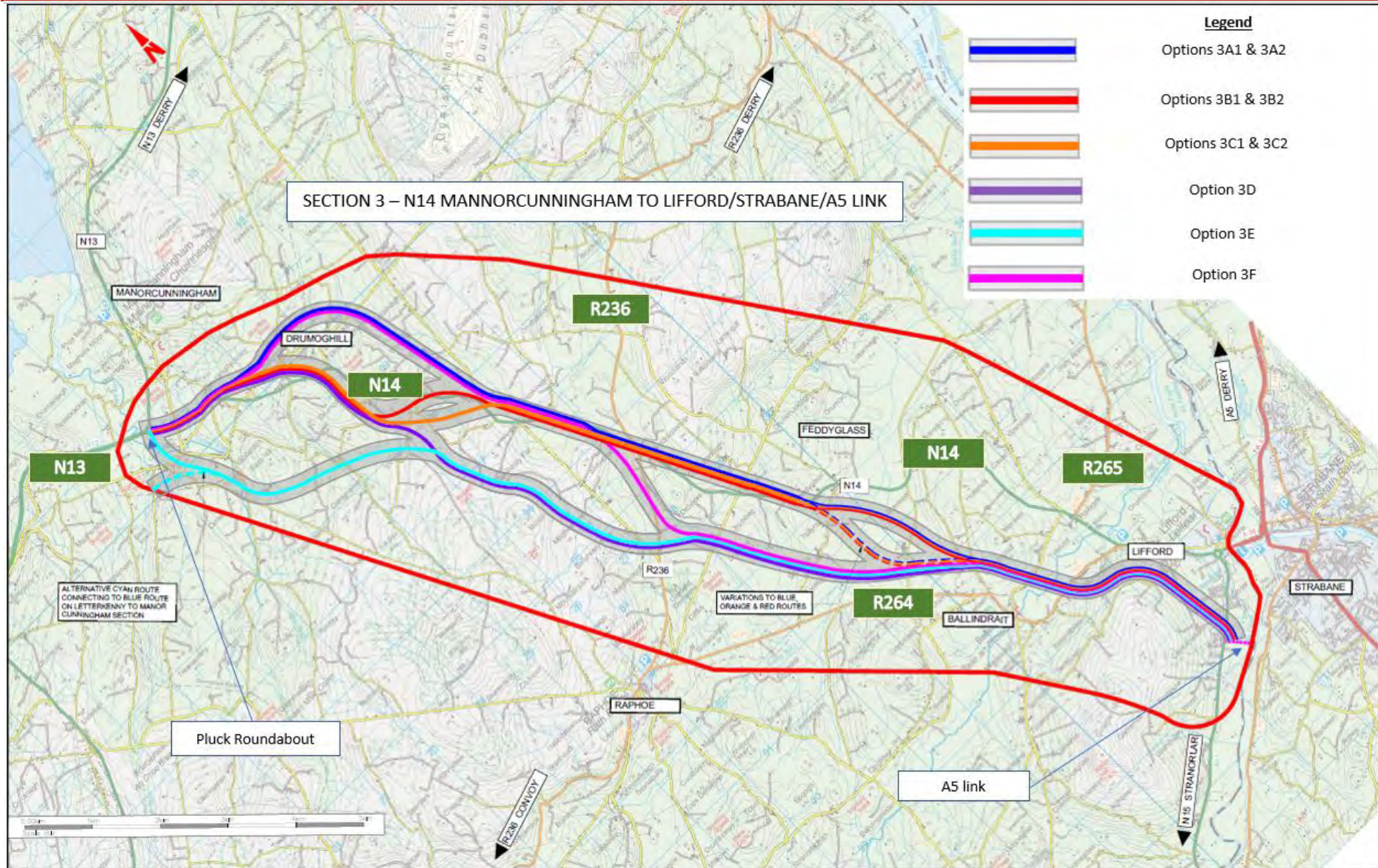


FIGURE 1.2: SECTION 3 STUDY AREA

1.4.2 Section 3

The existing N14 between Manorcunningham and Lifford is the key route connecting Letterkenny and Donegal to the A5 in Northern Ireland. The A5/N2 corridor is a strategic connection between the north-west of Ireland and Dublin. As such, the existing N14 supports traffic making strategic trips from Donegal to Dublin, and also caters for local traffic and farm vehicles.

The existing road is narrow with no hard-shoulder over much of its length, has a high-demand horizontal alignment with limited forward visibility, has no provisions for vulnerable road users, has numerous roadside hazards & direct accesses, lacks safe overtaking opportunities and has historical collisions rates above, and twice above, the national average for a similar type of national road.

The proposed road improvement is to consist of a realignment of the N14 between Lifford and the N13/N14 intersection at Pluck Roundabout. The cross-section for the road improvement will be confirmed in subsequent design phases, however for the purposes of this audit and the option selection design, the new road is assumed to 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.

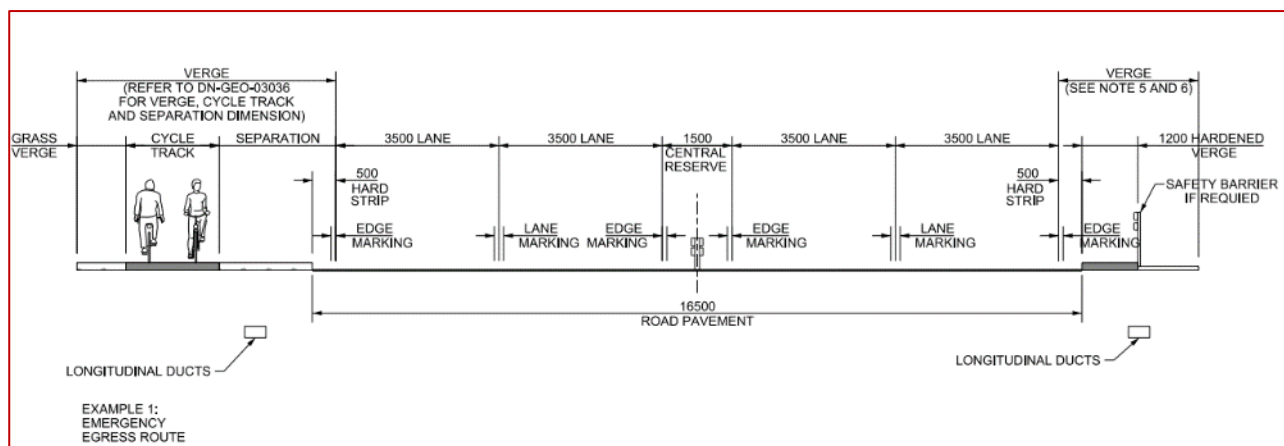


FIGURE 1.3: TYPE 2 DUAL CARRIAGEWAY

Six primary options have been audited, with three of the options (denoted by an asterisk in the following list) having additional sub-options through the townland of Mullnaveagh: -

- Option 3A*
- Option 3B*
- Option 3C*
- Option 3D
- Option 3E
- Option 3F

all of which extend in a predominantly north to south direction between the existing N13/N14 Pluck Roundabout to a proposed new intersection with the N15 to the south of Lifford, where a new link to the A5 is proposed across the River Finn, and all pass to the north of Raphoe. The A5 link across the River Finn is a separate project that has been through option selection and statutory processes and is not currently part of the scope of the TEN-T Priority Route Improvement Project, Donegal.

All of the options have similar lengths (ranging between 17.6km and 18.5km) and all options provide grade-separated crossings of the existing road network, with the exception of the tie-in points, and a grade-separated junction with either the existing N14 or the R236. Options B, C & D also include a junction with the existing N14 west of Drumoghill. No direct access from private lands is proposed onto the mainline.

Each option differs in terms of its horizontal alignment, vertical alignment and the location of the junctions with either the existing N14 or the R236.

1.4.3 Information Provided to Audit Team

Drawings detailing the proposed 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.

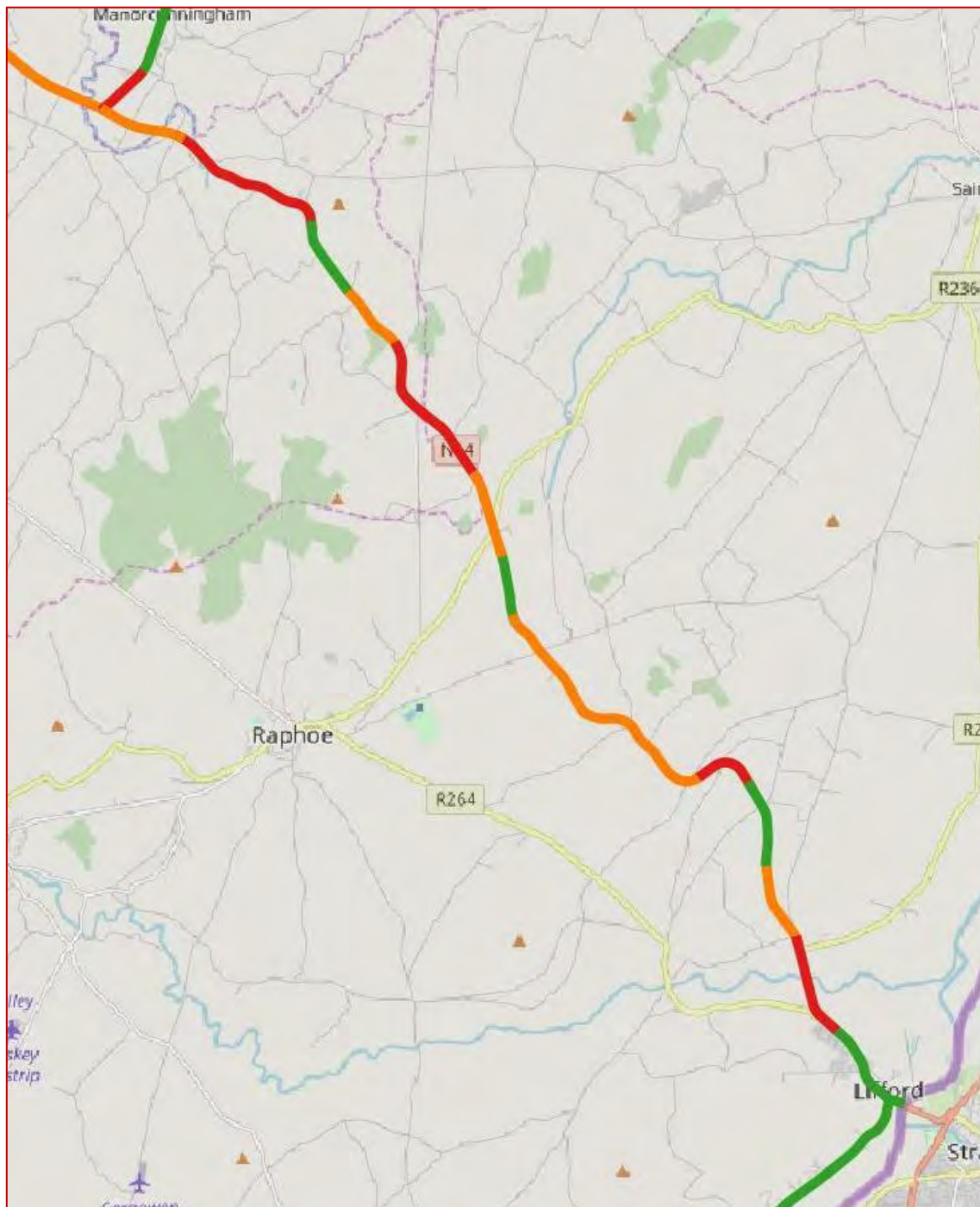


FIGURE 1.4: HD15 COLLISION RATES (2014 TO 2016)

2 Items Arising from the Audit

2.1 Overview

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

All of the options presented would provide significant improvement to safety on this section of the N14. 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 3A

Option 3A includes two sub-options, referred to as 3A1 and 3A2, with lengths of 17.9km and 18km respectively.

Both sub-options commence at the existing N13/N14 junction (Pluck Roundabout) to the north and proceed south-eastwards along the line of the existing N14 for a distance of 800m (approximately).

They then move offline, passing to the north and east of Drumoghill, before rejoining the existing N14 corridor where they run south close to the existing road for approximately 4km and then move offline to the west of the existing N14 toward the southern terminal at the future N15/A5 intersection.

Both sub-options include two river bridges and fifteen grade-separated road crossings. The sub-options differ from each other in where they traverse the townland of Mullnaveagh and cross the Swilly Burn watercourse, with Option 3A2 taking a slightly longer, more westerly, course.

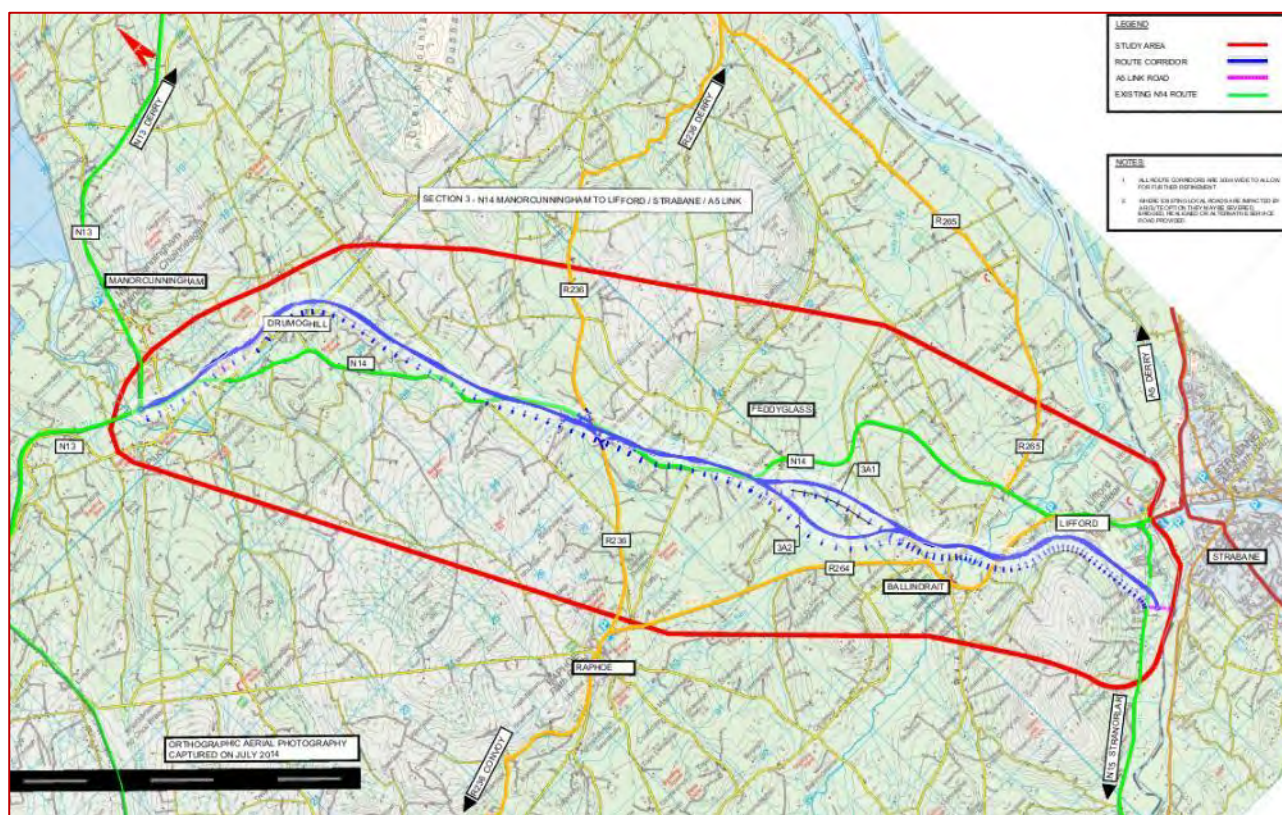


FIGURE 2.1: OPTION 3A

Both sub-options tie-into the existing N13/N14 junction (Pluck Roundabout) to the north, include a new compact grade-separated junction on the existing N14 near the existing N14/R236 junction and new terminal roundabout at the southern tie-in.

2.2.1 Options 3A1 & 3A2 - Compact Grade-Separated Junction with Existing N14/R236

Problem

The layout of the compact grade separated junction with the existing N14/R236 will result in a relatively complex road layout for traffic wishing to exit/join the mainline, in particular traffic wishing to join the mainline southbound carriageway.

The layout will also result in four at-grade t-junctions in close proximity on the regional road, increasing the number of conflicting manoeuvres within a short section of road.

Hazard

The layout of the compact grade-separated junction with the existing N14/R236 will lead to an increase in the number of conflicting, in particular right-turning, manoeuvres within a short length of road.

2.2.2 Options 3A1 & 3A2 – Connectivity with Existing Road Network

Problem

Connectivity with the local road network is proposed at three locations, the terminal roundabouts to the north & south and a compact grade separated junction with the existing N14/R236.

While it is important that any improved road does not have too many junctions along its length, as junctions are locations that give rise to safety issues, conversely insufficient connectivity between the existing road network and the improved road will result in many drivers (e.g. local traffic to/from Drumoghill, Labadish and Manorcunningham) not having the opportunity to travel along the improved road, designed to current standards, and will instead remain on the existing road network with the greater risks inherent in travelling on narrower undivided legacy roads with multiple accesses and junctions.

Given the likely traffic demand and the improved conditions offered by the new road, it is considered a junction at this location is merited/desirable.

Hazard

When compared to other options, there is less connectivity onto the new route from the existing road network.

2.3 Option 3B

Option 3B includes two sub-options, referred to as 3B1 and 3B2, with lengths of 17.6km and 17.7km respectively.

Both sub-options commence at the existing N13/N14 junction (Pluck Roundabout) to the north and proceed south-eastwards along the line of the existing N14 for a distance of 800m (approximately).

They then move offline, but remain close to, the existing N14 corridor for a distance of 9.8km approximately, passing to the west of Drumoghill, before then moving offline to the west of the existing N14 toward the southern terminal at the future N15/A5 intersection.

Both sub-options include two river bridges and sixteen grade-separated road crossings. The sub-options differ from each other in where they traverse the townland of Mullnaveagh and cross the Swilly Burn watercourse, with Option 3B2 taking a slightly longer, more westerly, course.

Both sub-options tie-into the existing N13/N14 junction (Pluck Roundabout) to the north, include a compact grade-separated junction on the existing N14 near Drumoghill, a compact grade-separated junction on the existing N14 near the existing N14/R236 junction and new terminal roundabout at the southern tie-in.

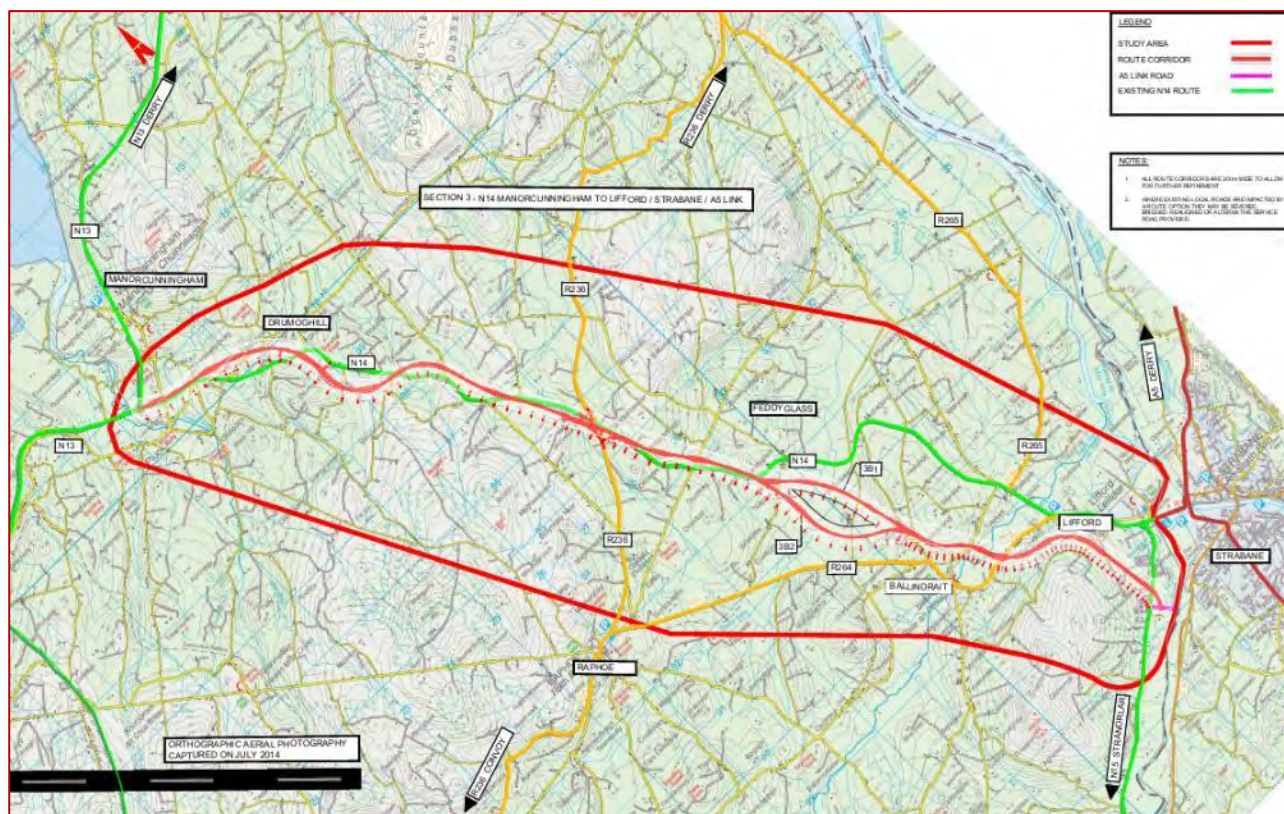


FIGURE 2.2: OPTION 3B

2.3.1 Options 3B1 & 3B2 - Compact Grade-Separated Junction with Existing N14 at Drumoghill

Problem

The proposed location of the compact grade separated junction with the existing N14 at Drumoghill is on, or close to, curves in the mainline horizontal alignment. This may reduce an approaching mainline driver's awareness of the junction leading to late exit manoeuvres and loss of control incidents or a lack of preparedness for traffic merging from the junction leading to shunt collisions.

Hazard

Proposed location of junctions on the mainline may result in insufficient awareness of the upcoming junction by mainline drivers leading to late exit manoeuvres and loss of control incidents or a lack of preparedness for traffic merging from the junction leading to shunt collisions.

2.3.2 Options 3B1 & 3B2 - Compact Grade-Separated Junction with Existing N14 at Drumoghill

Problem

The proposed location of the compact grade separated junction with the existing N14 at Drumoghill will result in two new junctions on a section of the existing N14 where the historical collision rate is above the average for a similar type of national road (e.g. rural, undivided).

The existing road cross-section is narrow, with limited forward visibility due to the existing alignment and the proximity of the roadside boundary (e.g. hedges) to the carriageway. Should drivers travelling along the existing road have insufficient forward visibility to the new junction this could lead to inappropriate approach speeds and a failure to observe a slow-moving or stationary vehicle turning into, or out of, the junction resulting in side-on collisions.

Hazard

Achieving sufficient forward visibility towards the new junctions, to reduce likelihood of side-on collisions with vehicles turning into, or out of, the new junctions, may be an issue, due to the alignment and cross-section of the existing N14 either side of the new junctions.

2.3.3 Options 3B1 & 3B2 - Compact Grade-Separated Junction with Existing N14 at Drumoghill

Problem

The proposed location of the compact grade separated junction with the existing N14 at Drumoghill will result in two new junctions on the existing N14 on a section of road where there are three existing at-grade junctions and where the historical collision rate is above the average for a similar type of national road (e.g. rural, undivided). This will result in five junctions within 1.2km (approximately). The number of junctions, and the associated turning manoeuvres, will lead to an increased likelihood of collisions.

Hazard

Increased number of at-grade junctions within a relatively short length (1.2km) of undivided legacy road will result in an increased likelihood of collisions.

2.3.4 Options 3B1 & 3B2 - Compact Grade-Separated Junction with Existing N14/R236

Problem

The layout of the compact grade separated junction with the existing N14/R236 will result in relatively complex road layout for traffic wishing to exit/join the mainline, in particular traffic wishing to join the mainline southbound carriageway. The layout will also result in four at-grade t-junctions in close proximity on the regional road, increasing the number of conflicting manoeuvres within a short section of road.

Hazard

The layout of the compact grade-separated junction with the existing N14/R236 will lead to an increase in the number of conflicting, in particular right-turning, manoeuvres within a short length of road.

2.4 Option 3C

Option 3C includes two sub-options, referred to as 3C1 and 3C2, with lengths of 17.5km and 17.6km respectively.

Both sub-options commence at the existing N13/N14 junction (Pluck Roundabout) to the north and proceed south-eastwards along the line of the existing N14 for a distance of 800m (approximately).

They then move offline, but remain close to, the existing N14 corridor for a distance of 9.8km approximately, passing to the west of Drumoghill, before then moving offline to the west of the existing N14 toward the southern terminal at the future N15/A5 intersection.

Both sub-options include two river bridges and seventeen grade-separated road crossings. The sub-options differ from each other in where they traverse the townland of Mullnaveagh and cross the Swilly Burn watercourse, with Option 3C2 taking a slightly longer, more westerly, course.

Both sub-options tie-into the existing N13/N14 junction (Pluck Roundabout) to the north, include a compact grade-separated junction on the existing N14 near Drumoghill, a compact grade-separated junction on the existing N14 near the existing N14/R236 junction and new terminal roundabout at the southern tie-in.

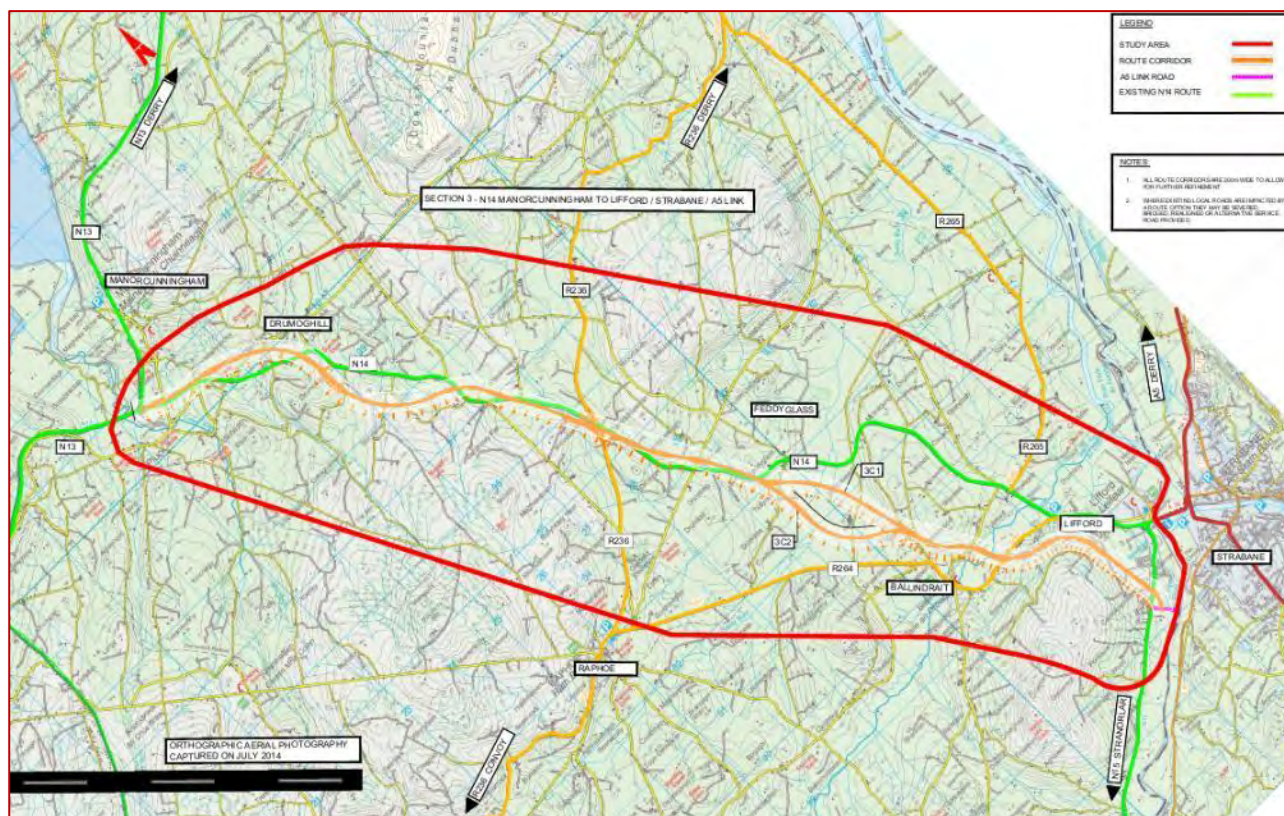


FIGURE 2.3: OPTION 3C

2.4.1 Routes 3C1 & 3C2 - Compact Grade-Separated Junction with Existing N14 at Drumoghill

Problem

The proposed location of the compact grade separated junction with the existing N14 at Drumoghill is on, or close to, curves in the mainline horizontal alignment. This may reduce an approaching mainline driver's awareness of the junction leading to late exit manoeuvres and loss of control incidents or a lack of preparedness for traffic merging from the junction leading to shunt collisions.

Hazard

Proposed location of junctions on the mainline may result in insufficient awareness of the upcoming junction by mainline drivers leading to late exit manoeuvres and loss of control incidents or a lack of preparedness for traffic merging from the junction leading to shunt collisions.

2.4.2 Routes 3C1 & 3C2 - Compact Grade-Separated Junction with Existing N14 at Drumoghill

Problem

The proposed location of the compact grade separated junction with the existing N14 at Drumoghill will result in two new junctions on a section of the existing N14 where the historical collision rate is above the average for a similar type of national road (e.g. rural, undivided).

The existing road cross-section is narrow, with limited forward visibility due to the existing alignment and the proximity of the roadside boundary (e.g. hedges) to the carriageway. Should drivers travelling along the existing road have insufficient forward visibility to the new junction this could lead to inappropriate approach speeds and a failure to observe a slow-moving or stationary vehicle turning into, or out of, the junction resulting in side-on collisions.

Hazard

Achieving sufficient forward visibility towards the new junctions, to reduce likelihood of side-on collisions with vehicles turning into, or out of, the new junctions, may be an issue, due to the alignment and cross-section of the existing N14 either side of the new junctions.

2.4.3 Routes 3C1 & 3C2 - Compact Grade-Separated Junction with Existing N14 at Drumoghill

Problem

The proposed location of the compact grade separated junction with the existing N14 at Drumoghill will result in two new junctions on the existing N14 on a section of road where there are three existing at-grade junctions and where the historical collision rate is above the average for a similar type of national road (e.g. rural, undivided). This will result in five junctions within 1.2km (approximately). The number of junctions, and the associated turning manoeuvres, will lead to an increased likelihood of collisions.

Hazard

Increased number of at-grade junctions within a relatively short length (1.2km) of undivided legacy road will result in an increased likelihood of collisions.

2.4.4 Routes 3C1 & 3C2 - Compact Grade-Separated Junction with Existing N14/R236

Problem

The layout of the compact grade separated junction with the existing N14/R236 will result in relatively complex road layout for traffic wishing to exit/join the mainline, in particular traffic wishing to join the mainline southbound carriageway.

The layout will also result in four at-grade t-junctions in close proximity on the regional road, increasing the number of conflicting manoeuvres within a short section of road.

Hazard

The layout of the compact grade-separated junction with the existing N14/R236 will lead to an increase in the number of conflicting, in particular right-turning, manoeuvres within a short length of road with a consequent increased risk of collisions.

2.5 Option D

The overall length of Option 3D is 17.75km. It commences at the existing N13/N14 junction (Pluck Roundabout) to the north, includes a compact grade-separated junction on the existing N14 near Drumoghill and a compact grade-separated junction on the R236 between the town of Raphoe & the existing N14/R236 junction, a new terminal roundabout at the southern tie-in and requires two river bridges and sixteen grade-separated road crossings.

Option 3D commences at the existing N13/N14 junction (Pluck Roundabout) to the north and proceeds south-eastwards along the line of the existing N14 for a distance of 800m (approximately) before moving offline to the north-west of the existing N14 for a distance of approximately 800m. It crosses the existing N14 to the west of Drumoghill from where it continues offline, running to the west of the existing N14 corridor, as far as its southern terminal at the future N15/A5 intersection.

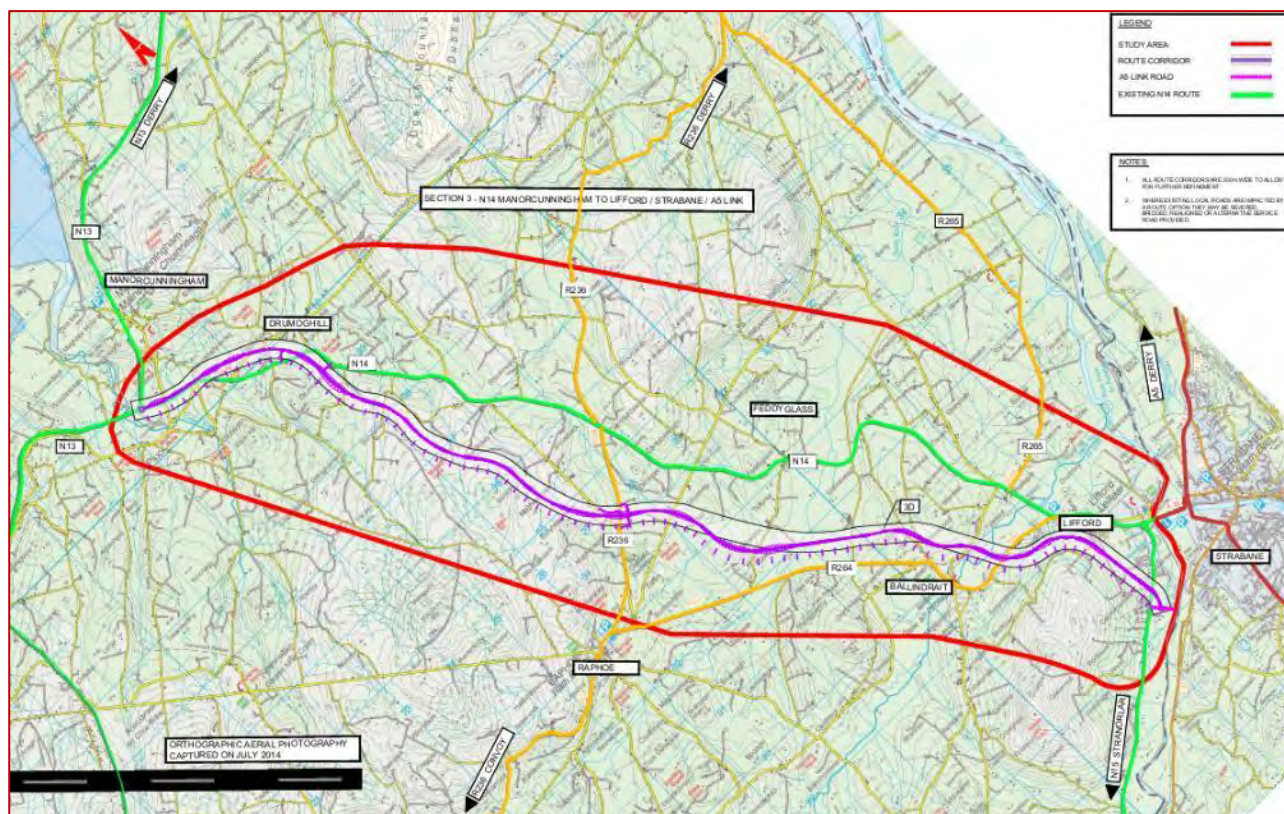


FIGURE 2.4: OPTION 3D

2.5.1 Compact Grade-Separated Junction with Existing N14 at Drumoghill

Problem

The proposed location of the compact grade separated junction with the existing N14 at Drumoghill is on, or close to, curves in the mainline horizontal alignment. This may reduce an approaching mainline driver's awareness of the junction leading to late exit manoeuvres and loss of control incidents or a lack of preparedness for traffic merging from the junction leading to shunt collisions.

Hazard

Proposed location of junctions on the mainline may result in insufficient awareness of the upcoming junction by mainline drivers leading to late exit manoeuvres and loss of control incidents or a lack of preparedness for traffic merging from the junction leading to shunt collisions.

2.5.2 Compact Grade-Separated Junction with Existing N14 at Drumoghill

Problem

The proposed location of the compact grade separated junction with the existing N14 at Drumoghill will result in two new junctions on a section of the existing N14 where the historical collision rate is above the average for a similar type of national road (e.g. rural, undivided).

The existing road cross-section is narrow, with limited forward visibility due to the existing alignment and the proximity of the roadside boundary (e.g. hedges) to the carriageway.

Should drivers travelling along the existing road have insufficient forward visibility to the new junction this could lead to inappropriate approach speeds and a failure to observe a slow-moving or stationary vehicle turning into, or out of, the junction resulting in side-on collisions.

Hazard

Achieving sufficient forward visibility towards the new junctions, to reduce likelihood of side-on collisions with vehicles turning into, or out of, the new junctions, may be an issue, due to the alignment and cross-section of the existing N14 either side of the new junctions.

2.5.3 Compact Grade-Separated Junction with Existing N14 at Drumoghill**Problem**

The proposed location of the compact grade separated junction with the existing N14 at Drumoghill will result in two new junctions on the existing N14 on a section of road where there are three existing at-grade junctions and where the historical collision rate is above the average for a similar type of national road (e.g. rural, undivided). This will result in five junctions within 1.2km (approximately).

The number of junctions, and the associated turning manoeuvres, will lead to an increased likelihood of collisions.

Hazard

Increased number of at-grade junctions within a relatively short length (1.2km) of undivided legacy road will result in an increased likelihood of collisions.

2.5.4 N14/R236 Junction**Problem**

The existing N14/R236 junction consists of an at-grade staggered t-junction. The proposed location of the junction between Option 3D and the existing R236 Regional Road will leave the existing N14/R236 junction unaltered, but is likely to alter the predominant flows through this junction with traffic from the R236 north of the existing N14 proceeding south on the R236 to access the realigned N14.

Hazard

Increased collisions at existing junction due to altered traffic flows and increased turning manoeuvres.

2.5.5 R236 – Provisions for Non-motorised Road Users**Problem**

The proposed location of the junction between Option 3D and the existing R236 Regional Road could lead to increased non-motorised road user traffic along the regional road, in particular cyclists wishing to access the cycle facility along the mainline, to/from Raphoe.

The existing regional road consists of a two-lane single carriageway without hard shoulders over much of its length, resulting in an increased likelihood of vehicular/cyclist collisions.

Hazard

The proposed junction location may result in increased cyclist traffic along the existing regional road (R236), which if not improved could lead to increased collision occurrence or to an increase in the injury severity outcome when a collision does occur.

2.5.6 R236 – Increased Traffic

Problem

The proposed location of the junction between Option 3D and the existing R236 Regional Road could lead to increased traffic along the regional road, in particular to/from Raphoe. Should improvements to the regional road not be undertaken as part of the Scheme, this could result in increased collision occurrence and/or increased injury severity outcomes along the section of regional road between the mainline and Raphoe.

Hazard

Proposed junction will result in increased traffic along the existing road, which if not improved could lead to increased collision occurrence or to an increase in the injury severity outcome when a collision does occur.

2.6 Option 3E

The overall length of Option 3E is 17.57km, with terminal roundabouts proposed at the northern & southern tie-ins and a compact grade-separated junction on the R236 between the town of Raphoe and the existing N14/R236 junction, and requires three river bridges and thirteen grade-separated road crossings.

Option 3E commences at the existing N13/N14 junction (Pluck Roundabout) to the north, forming a fourth arm on the existing three-arm at-grade roundabout. There is an alternative tie-in at this location which would connect directly to one of the options in the adjacent Section 2, which does not involve interaction with the existing Pluck Roundabout.

Option 3E then proceeds south, running to the west of the existing N14 corridor, as far as its southern terminal at the future N15/A5 intersection.

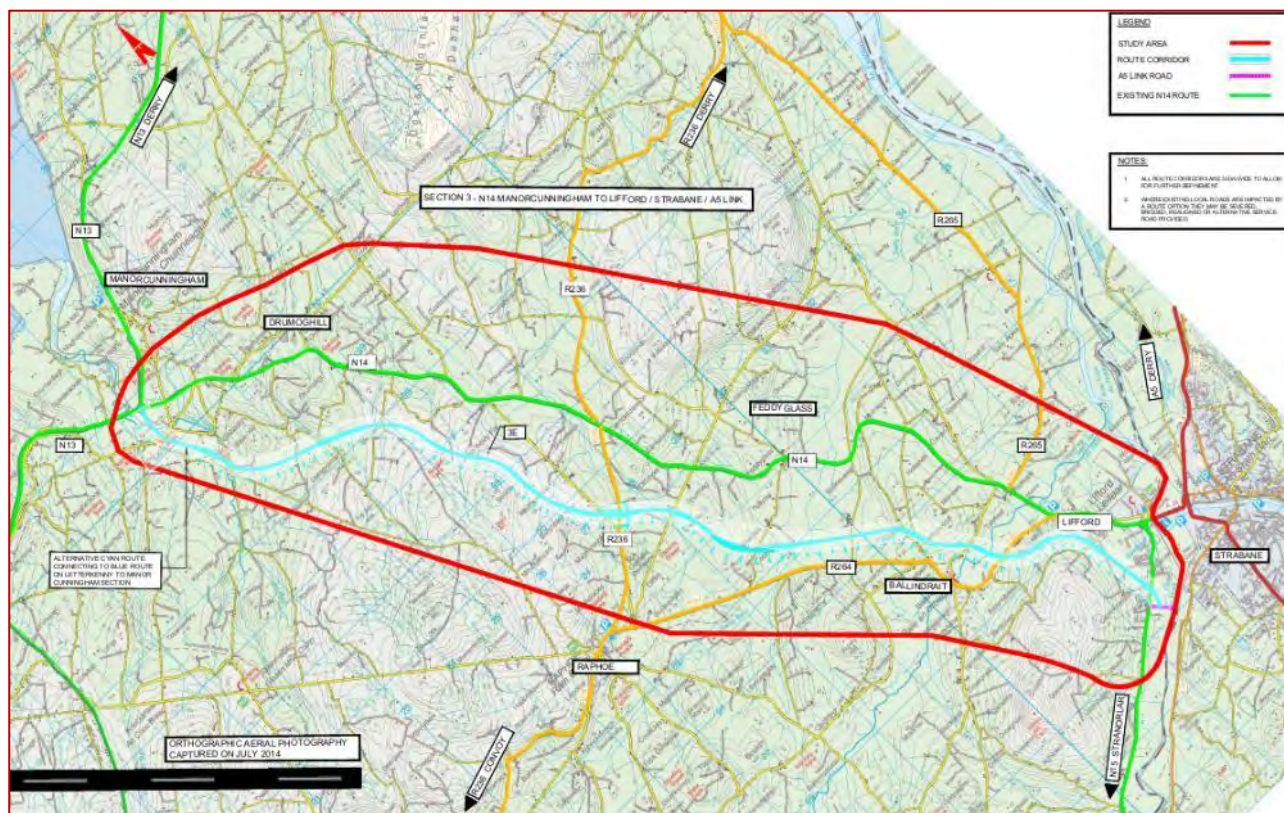


FIGURE 2.5: OPTION 3E

2.6.1 Connectivity with Existing Road Network

Problem

Connectivity with the local road network is proposed at three locations, the terminal roundabouts to the north & south and a compact grade separated junction with the existing N14/R236.

While it is important that any improved route does not have too many junctions along its length, as junctions are locations that give rise to safety issues. conversely insufficient connectivity between the existing road network and the improved route will result in many drivers (e.g. local traffic to/from Drumoghill, Labadish and Manorcunningham) not having the opportunity to travel along the improved route, designed to current standards, and will instead remain on the existing road network with the greater risks inherent in travelling on narrower undivided legacy roads with multiple accesses and junctions.

Given the likely traffic demand and the improved conditions offered by the new road, it is considered a junction at this location is merited/desirable.

Hazard

When compared to other options, there is less connectivity onto the new road from the existing road network.

2.6.2 N14/R236 Junction

Problem

The existing N14/R236 junction consists of an at-grade staggered t-junction. The proposed location of the junction between Option 3E and the existing R236 Regional Road will leave the existing N14/R236 junction unaltered, but is likely to alter the predominant flows through this junction with traffic from the R236 north of the existing N14 proceeding south on the R236 to access the realigned N14.

Hazard

Increased collisions at existing junction due to altered traffic flows and increased turning manoeuvres.

2.6.3 R236 – Provisions for Non-motorised Road Users

Problem

The proposed location of the junction between Option 3E and the existing R236 Regional Road could lead to increased non-motorised road user traffic along the regional road, in particular cyclists wishing to access the cycle facility along the mainline, to/from Raphoe.

The existing regional road consists of a two-lane single carriageway without hard shoulders over much of its length.

Hazard

Proposed junction may result in increased cyclist traffic along the existing road, which if not improved could lead to increased risk of collisions.

2.6.4 R236 – Increased Traffic

Problem

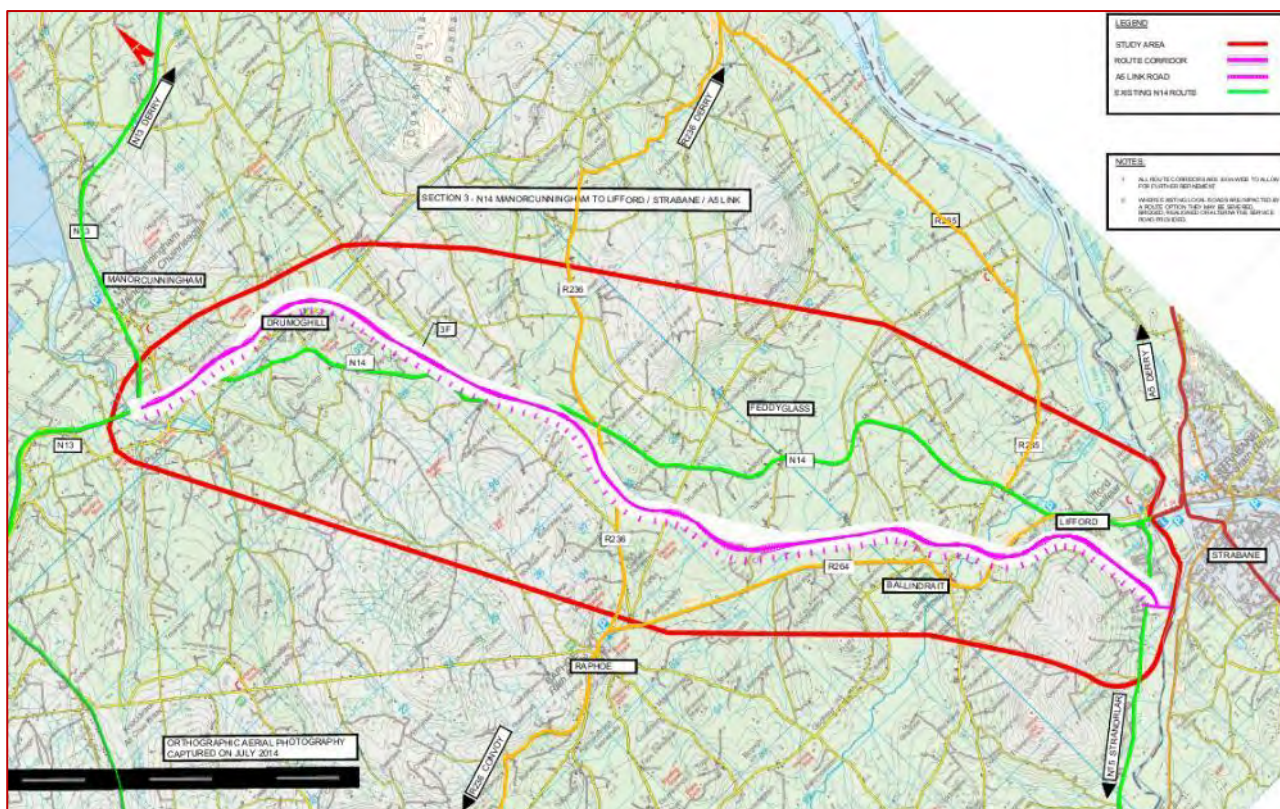
The proposed location of the junction between Option 3E and the existing R236 Regional Road could lead to increased traffic along the regional road, in particular to/from Raphoe. Should improvements to the regional road not be undertaken as part of the Scheme, this could result in increased collision occurrence and/or increased injury severity outcomes along the section of regional road between the mainline and Raphoe.

Hazard

Proposed junction will result in increased traffic along the existing road, which if not improved could lead to increased risk of collisions.

2.7 Option 3F

The overall length of Option 3F is 18.47km, with terminal roundabouts proposed at the northern & southern tie-ins and a compact grade-separated junction on the R236 between the town of Raphoe and the existing N14/R236 junction, and requires two river bridges and fourteen grade-separated road crossings.



Hazard

Less connectivity onto the new route from the existing road network when compared with other options.

2.7.2 N14/R236 Junction**Problem**

The existing N14/R236 junction consists of an at-grade staggered t-junction. The proposed location of the junction between Option 3F and the existing R236 Regional Road will leave the existing N14/R236 junction unaltered, but is likely to alter the predominant flows through this junction with traffic from the R236 north of the existing N14 proceeding south on the R236 to access the realigned N14.

Hazard

Increased collisions at existing junction due to altered traffic flows and increased turning manoeuvres.

2.7.3 R236 – Provisions for Non-motorised Road Users**Problem**

The proposed location of the junction between Option 3F and the existing R236 Regional Road could lead to increased non-motorised road user traffic along the regional road, in particular cyclists wishing to access the cycle facility along the mainline, to/from Raphoe.

The existing regional road consists of a two-lane single carriageway without hard shoulders over much of its length, resulting in an increased likelihood of vehicular/cyclist collisions.

Hazard

Proposed junction may result in increased cyclist traffic along the existing road, which if not improved could lead to increased collision occurrence or to an increase in the injury severity outcome when a collision does occur.

2.7.4 R236 – Increased Traffic**Problem**

The proposed location of the junction between Option 3F and the existing R236 Regional Road could lead to increased traffic along the regional road, in particular to/from Raphoe. Should improvements to the regional road not be undertaken as part of the Scheme, this could result in increased collision occurrence and/or increased injury severity outcomes along the section of regional road between the mainline and Raphoe.

Hazard

Proposed junction will result in increased traffic along the existing road, which if not improved could lead to increased collision occurrence or to an increase in the injury severity outcome when a collision does occur.

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 3A1

The layout of the compact grade-separated junction the existing N14/R236 results in complicated junction arrangement and a significant number of at-grade t-junctions within close proximity on the regional road.

When compared with other options there is less connectivity onto the new road from the existing road network.

3.2 Option 3A2

The layout of the compact grade-separated junction the existing N14/R236 results in complicated junction arrangement and a significant number of at-grade t-junctions within close proximity on the regional road.

When compared with other options there is less connectivity onto the new road from the existing road network.

3.3 Option 3B1

Proposed location of the Compact Grade-Separated Junction with the existing N14 at Drumoghill is shown near bends in the mainline horizontal alignment which may result in insufficient awareness of the upcoming junction by mainline drivers.

The new junctions on the existing N14 as a result of the Compact Grade-Separated Junction with the existing N14 at Drumoghill will result in a number of junctions in close proximity along the existing road, increasing the number of turning manoeuvres and hence increasing the potential for collisions. Achieving sufficient forward visibility towards the new junctions may also be an issue, due to the alignment and cross-section of the existing N14 either side of the new junctions.

The layout of the compact grade-separated junction the existing N14/R236 results in complicated junction arrangement and a significant number of at-grade t-junctions within close proximity on the regional road.

3.4 Option 3B2

Proposed location of the Compact Grade-Separated Junction with the existing N14 at Drumoghill is shown near bends in the mainline horizontal alignment which may result in insufficient awareness of the upcoming junction by mainline drivers.

The new junctions on the existing N14 as a result of the Compact Grade-Separated Junction with the existing N14 at Drumoghill will result in a number of junctions in close proximity along the existing road, increasing the number of turning manoeuvres and hence increasing the potential for collisions. Achieving sufficient forward visibility towards the new junctions may also be an issue, due to the alignment and cross-section of the existing N14 either side of the new junctions.

The layout of the compact grade-separated junction the existing N14/R236 results in complicated junction arrangement and a significant number of at-grade t-junctions within close proximity on the regional road.

3.5 Option 3C1

Proposed location of the Compact Grade-Separated Junction with the existing N14 at Drumoghill is shown near bends in the mainline horizontal alignment which may result in insufficient awareness of the upcoming junction by mainline drivers.

The new junctions on the existing N14 as a result of the Compact Grade-Separated Junction with the existing N14 at Drumoghill will result in a number of junctions in close proximity along the existing road, increasing the number of turning manoeuvres and hence increasing the potential for collisions. Achieving sufficient forward visibility towards the new junctions may also be an issue, due to the alignment and cross-section of the existing N14 either side of the new junctions.

The layout of the compact grade-separated junction the existing N14/R236 results in complicated junction arrangement and a significant number of at-grade t-junctions within close proximity on the regional road.

3.6 Option 3C2

Proposed location of the Compact Grade-Separated Junction with the existing N14 at Drumoghill is shown near bends in the mainline horizontal alignment which may result in insufficient awareness of the upcoming junction by mainline drivers.

The new junctions on the existing N14 as a result of the Compact Grade-Separated Junction with the existing N14 at Drumoghill will result in a number of junctions in close proximity along the existing road, increasing the number of turning manoeuvres and hence increasing the potential for collisions. Achieving sufficient forward visibility towards the new junctions may also be an issue, due to the alignment and cross-section of the existing N14 either side of the new junctions.

The layout of the compact grade-separated junction the existing N14/R236 results in complicated junction arrangement and a significant number of at-grade t-junctions within close proximity on the regional road.

3.7 Option 3D

Proposed location of the Compact Grade-Separated Junction with the existing N14 at Drumoghill is shown near bends in the mainline horizontal alignment which may result in insufficient awareness of the upcoming junction by mainline drivers.

The new junctions on the existing N14 as a result of the Compact Grade-Separated Junction with the existing N14 at Drumoghill will result in a number of junctions in close proximity along the existing road, increasing the number of turning manoeuvres and hence increasing the potential for collisions. Achieving sufficient forward visibility towards the new junctions may also be an issue, due to the alignment and cross-section of the existing N14 either side of the new junctions.

The proposed location of the compact grade-separated junction with the R236 will result in increased turning manoeuvres at the existing N14/R236 junction.

The proposed location of the compact grade-separated junction with the R236 will result in increased traffic along the regional road, including cyclists.

3.8 Option 3E

Less connectivity onto the new route from the existing road network when compared with other options.

The proposed location of the compact grade-separated junction with the R236 will result in increased turning manoeuvres at the existing N14/R236 junction.

The proposed location of the compact grade-separated junction with the R236 will result in increased traffic along the regional road, including cyclists.

3.9 Option 3F

Less connectivity onto the new route from the existing road network when compared with other options.

The proposed location of the compact grade-separated junction with the R236 will result in increased turning manoeuvres at the existing N14/R236 junction.

The proposed location of the compact grade-separated junction with the R236 will result in increased traffic along the regional road, including cyclists.

3.10 Ranking of Options

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

- Impact, interface and effect of the route on the existing road network;
- Impact on the R236 and the existing N14/R236 Junction;
- Horizontal & Vertical Alignment;
- 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 most of the issues identified are common to all Options. The most likely differentiators are related to connectivity and geometry, for example: -

1. Consistency of horizontal alignment (Table 3.1 Ranking: Low, Medium & High; 'High' is preferred);
2. Connectivity with existing road network (Table 3.1 Ranking: Low, Medium & High; 'High' is preferred);
3. Provisions for vulnerable road users (Table 3.1 Ranking: Low, Medium & High; 'High' is preferred);
4. Effect on existing road network (Table 3.1 Ranking: Low, Medium & High; 'Low' is preferred);
5. Effect on N14/R236 Junction (Table 3.1 Ranking: Poor, Good);
6. Maximum gradients;
7. Number of crests/sags; and
8. Number of road crossings.

Route Option	Length [km]	Vertical Alignment			Horizontal Alignment	Local Road Connectivity	Provisions for VRUs	Effect on Existing Road Network	Effect on Existing N14/R236 Junction	Road Crossings
		Maximum Grade	Crests	Sags						
3A1	17.921	5%	13	12	High	Low	Medium	Low	Good	15
3A2	18.025	5%	13	13	High	Low	Medium	Low	Good	15
3B1	17.620	5%	13	11	Medium	Medium	Medium	Medium	Good	16
3B2	17.725	5%	13	11	Medium	Medium	Medium	Medium	Good	16
3C1	17.536	5%	13	11	Medium	Medium	Medium	Medium	Good	17
3C2	17.640	5%	13	12	Medium	Medium	Medium	Medium	Good	17
3D	17.747	5%	13	9	Low	Medium	Medium	Medium	Poor	16
3E	17.575	5%	11	11	Low	Low	Medium	High	Poor	13
3F	18.474	5%	14	15	Low	Low	Medium	High	Poor	14

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

The Audit Team have concluded that the Options, as provided, rank as shown in Table 3.2 in terms of road safety.

The ranking is purely a relative grading of the options with respect to each other. The differences between the options, from a road safety perspective, are small and all of the proposed Options represent a significant improvement to the existing arrangement.

The existing road is narrow with no hard-shoulder over much of its length, has a high demand horizontal alignment with limited forward visibility, has no provisions for vulnerable road users, includes many direct accesses for adjacent lands and has historical collisions rates above, and twice above, the national average for a similar type of national road.

Some of the options are considered to be equivalent, from a road safety perspective, and are therefore given the same ranking.

Option	Rank
Option 3A1	1
Option 3A2	1
Option 3B1	3
Option 3B2	3
Option 3C1	3
Option 3C2	3
Option 3D	7
Option 3E	8
Option 3F	8

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 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 suggestions for a preferred option.

ROAD SAFETY AUDIT TEAM LEADER

Peter Monahan

Signed:



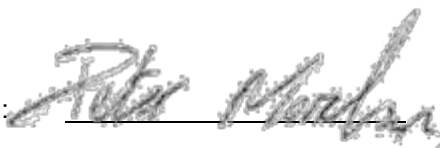
Dated:

2nd October 2019

ROAD SAFETY AUDIT TEAM MEMBER

Peter Morehan

Signed:



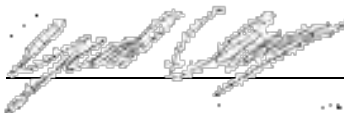
Dated:

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		
Traffic Count and Forecast Traffic Data		
6989880-HB-RSR-S3_ZZ_ZZZ_DR_ZZ-0003	N14 MANORCUNNINGHAM TO LIFFORD/STRABANE/A5 LINK STAGE 2 - ROUTE CORRIDORS	P01
Y16112-BT-RS-HML-3A-DR-CH-00001	SECTION 3 ROUTE 3A1 & 3A2	P01.01
Y16112-BT-RS-HML-3B-DR-CH-00001	SECTION 3 ROUTE 3B1 & 3B2	P01.01
Y16112-BT-RS-HML-3C-DR-CH-00001	SECTION 3 ROUTE 3C1 & 3C2	P01.01
Y16112-BT-RS-HML-3D-DR-CH-00001	SECTION 3 ROUTE 3D	P01.01
6989880-HB-RSR-S3_ZZ_ZZZ_DR_ZZ-0008	SECTION 3 ROUTE 3E	P01.01
6989880-HB-RSR-S3_ZZ_ZZZ_DR_ZZ-0009	SECTION 3 ROUTE 3F	P01.01
SK019 - A1 Plan Profiles 300718-1		
SK019 - A2 Plan Profiles 300718-1		
SK019 - B1 Plan Profiles 300718-1		
SK019 - B2 Plan Profiles 300718-1		
SK019 - C1 Plan Profiles 300718-1		
SK019 - C2 Plan Profiles 300718-1		
SK019 - D Plan Profiles 300718-1		
SK019 - E Plan Profiles 300718-1		
SK019 - F Plan Profiles 300718-1		

Appendix B – Audit Team Approval

*Emma Coyle
Classon House
Dundrum Business Park
Dublin 14*

Date: 13/08/2018

Our Ref: 1336546/5353/Stage F

re: N14 N14 Manorcunningham to Lifford 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 N14 N14 Manorcunningham to Lifford 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 B



TEN-T Priority Route Improvement Project, Donegal

Section 3: N14 Manorcunningham to Lifford/Strabane/A5 Link

Phase 2 - Road Safety Impact Assessment

Document Control Sheet

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1 SECTION 3 PHASE 2 IMPACT ASSESSMENT REPORT

1.1 Introduction

This report is for a Phase 2 Road Safety Impact Assessment and considers the “Do Something” options only for Section 3 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 carry 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

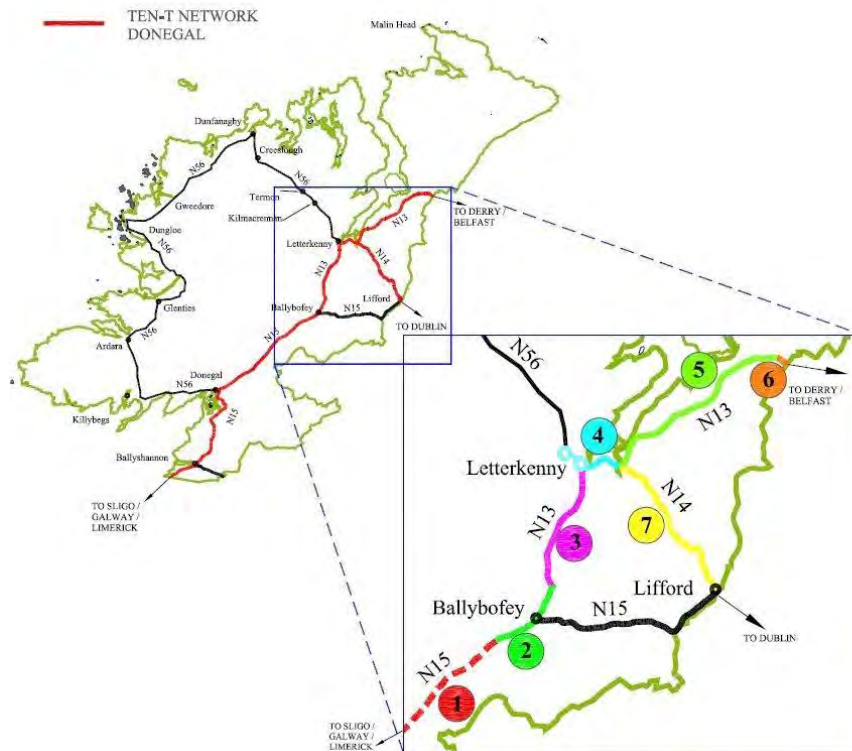


Figure 1-1 Sections of the TEN-T Network in County Donegal

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, which performed worst overall, were each of the three sections making up 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 above three sections of the TEN-T network form part of the TEN-T Priority Route Improvement Project, Donegal.

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.

Within Section 3 is the subject of this report which incorporates the N14 national primary road which link the N13 at Manorcunningham to the A5 at Lifford/Strabane, providing a strategic route connecting Letterkenny and North Donegal to Dublin via the N2 and the rest of the National Primary network in County Donegal. The termination point for the Section 3 scheme ties-into a proposed new cross-border link at the Northern Ireland border. This cross-border link is currently part of a separate project and is not currently part of the TEN-T Project.

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 that anticipated for the nature of the road). A key objective for this scheme is the improvement in journey time reliability for strategic traffic on the N14 route between Letterkenny and Dublin, increasing the capacity of the route and improving safety performance.

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 LOS¹: 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.

Table 1-1 Collision Statistics from 2005 to 2014 from the rsa.ie collision database

Location	Fatal	Serious	Minor	Total
N14 between Pluck Roundabout and R236	0	4	33	37
N14/R236 Junction	0	0	6	6
N14 between R236 and R265	0	3	26	28
N14 near R265 Junction	0	0	2	2
N14 near R264 Junction	1	1	0	2
N14 between R265 and Lifford	0	0	12	12
Total	1	7	79	

The statistics highlight that 23 of the collisions are classified as rear-end, right turn or rear-end straight, and 5 are angle, right turn collisions. This indicates that there are issues with junction design and/or forward visibility to the junctions. 33 collisions are single vehicle collisions, of which a likely contributory factor is the sub-standard alignment.

¹ The minimum acceptable LOS is 'D', where a LOS 'A' describes free-flow operation and a LOS 'E' describes operating at design capacity as per TII Design Standard DN-GEO-03031 (formally TD9/12) Table 6/1

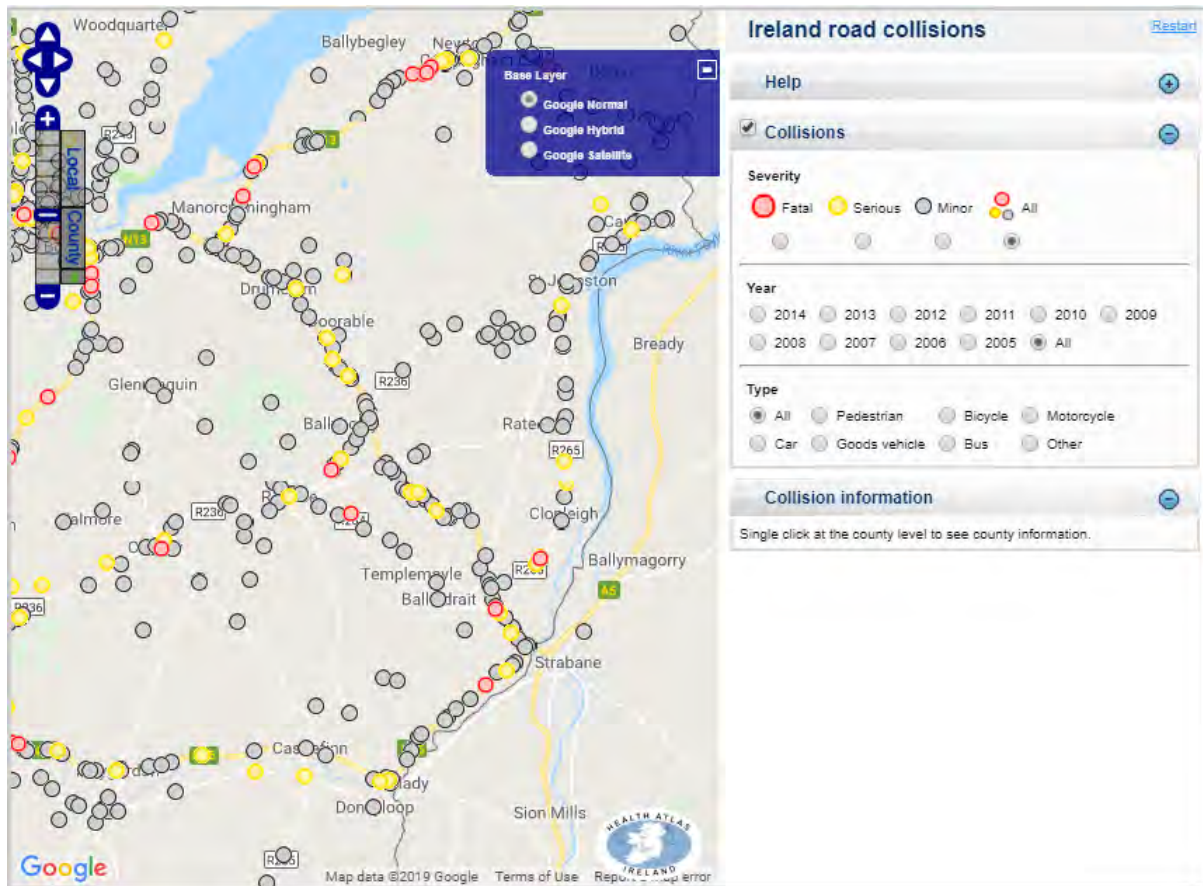


Figure 1-2 Collision Information on the N14 Manorcunningham to Lifford

1.4 The area of influence

All options under consideration have a similar effect on the area of influence. The provision of an intermediate interchange on the N14 to connect with the R236 regional road to Raphoe, will influence the local road network: drivers' route choice will change as the interchange will act as a draw for local traffic towards the new N14. There will be other effects on the network such as, where currently the R264 is used for trips between Raphoe and Lifford, the intermediate interchange will attract this traffic to the N14 via the R236. It is not anticipated that this redistribution of traffic will have any negative safety impacts on the operation of the network.

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 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.

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 N14. 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;
- Improve safety for vulnerable road users;
- To support the Government's Road Safety Strategy 2013-2020.

2 OPTION COMPARISON

There are 6 options shortlisted within Section 3 of the project, 3 of which have a variation for approximately 2.8km, resulting in a different crossing location over the Swilly Burn River.

Each option has been reviewed in terms of 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 option on the residual network, as well as the route itself. As such, consideration was given to local trip attractors and traffic generators. A non-exhaustive list of these is provided in Appendix B. The list shows that there is a high demand for local trips in the Section 3 study area, and a significant amount of recreational activities.

2.1 Analysis of impacts on road safety

Note that options 3A, 3B and 3C have second variant options. However, as these variants offer no significant difference from a road safety point of view, they do not need to be considered for option comparison purposes, leaving six options for assessment.

The results of the road safety assessment are listed below for the six options analysed.

In considering climatic conditions particular to each option, there should be a degree of commonality for all options due to the narrow zone occupied by the six options. The 3E Cyan and 3D Purple options will reach a higher altitude (156m) compared to the other four options (86-103m) and therefore may be more prone to snow and ice.

No differences in road safety attributes of any significance were identified based on the following:

- All options involve provision of a new Type 2 Dual Carriageway road between the two tie-in points at Manorcunningham and Lifford/Strabane/A5 Link. All options would replace the existing N14 as the national route and in all cases the new route is to be constructed off-line of the current N14. In all cases the current N14 is to remain as a functioning link, in the form of a downgraded regional road.
- All options involve provision of a compact grade-separated junction at the intersection with the R236 regional road, at the midpoint of the project link.
- Options 3B1/3B2 (Red), 3C1/3C2 (Orange) and 3D (Purple) propose an additional intermediate junction with the N14 at Drumoghill.
- Most regional road and minor road crossings are generally retained in the form of an underpass or overpass of the new N14 with a small number of road closures resulting in diversions in the order of hundreds of metres.
- There are no intermediate at-grade junctions proposed for any of the options.
- Generally, there is no negative effect on existing travel patterns. Retention of the existing N14 will continue to serve local traffic as it does currently. A key benefit of this arrangement common to all options, is that most local traffic is unlikely to interact with strategic traffic, which will be on the new mainline dual carriageway.
- An off-road pedestrian/cycle facility will be provided parallel to the new N14 mainline. The retention of the former N14 as a contiguous option will also likely be used by cyclists.
- The lengths of each option at circa 18km would benefit from safe parking areas, especially as this is not a motorway and drivers are permitted to stop. Also, tourists are likely to stop along

the option. The adoption of Type 2 Dual Carriageway cross-section means that there will be no hard shoulders. This should be considered in later stages of design.

- All options will have the same effect on existing road traffic collision clusters. The transfer of national road traffic from the existing N14, which has a poor collision record along its length, onto a new roadway designed to current geometric standards as a dual carriageway with grade separation throughout and with the downgrading of the current N14 to regional road, should resolve safety issues at cluster sites. The reduction in traffic collisions will arise not only due to the reduction in traffic volume but also due to the change in nature of driving with less pressure imposed on local drivers to come up to national speed limit driving.
- There will be a reduction in events on the existing N14 that increase driver frustration and risk-taking, such as attempted overtaking, due to the fact that strategic road traffic will be using the new N14 roadway.
- All options will have the same tie-in arrangement consisting of roundabout junctions at the N13 and N15/A5 Link. Not providing grade separation at these intersections is considered a missed opportunity to achieve a significant road safety gain, i.e. provision of continuous dual carriageway from the N15 to the N13.
- An assessment was made of each option for the extent of embankments requiring safety barrier, in the context of minimising barrier provision and provision of forgiving roadsides. There was no appreciable difference between the six options considered:

Table 2-2-1 Extent of Embankments requiring vehicle restraints system

Option	Proportion of length requiring safety barrier
3A1 Blue	40%
3B1 Red	41%
3C1 Orange	40%
3D Purple	52%
3E Cyan	48%
3F Pink	49%

- It was also observed that there was scope at detailed design stage to reduce these percentage figures to achieve more forgiving roadsides. This could be achieved by lowering the mainline vertical road geometry, extending verges and softening the earthworks embankment side slopes.
- An assessment of the road geometry and geometric element was used to check for alignments that could give rise to standing water on the carriageway creating poor driving visibility conditions during rain (spray), possibility of aquaplaning and ice. All six options were identical in this regard: two locations were identified on each option that would be a concern and should be addressed at preliminary design stage:

Table 2-2-2 Locations for required review of road surface geometry during Preliminary Design stage

Option	Location
3A1 Blue	Ch. 14+660 and Ch. 17+620
3B1 Red	Ch. 14+340 and Ch. 17+320
3C1 Orange	Ch. 14+260 and Ch. 17+240
3D Purple	Ch. 14+480 and Ch. 17+440
3E Cyan	Ch. 14+300 and Ch. 17+260
3F Pink	Ch. 15+220 and Ch. 18+180

Table 2-2-3 Summary of Analysis of Impacts for Section 3

Option	Impact on Road Safety – All Options	Differentiating Factors
Effect on Traffic Flow	All options separate local traffic from strategic traffic and will have positive safety benefits on the residual road network with approximately 45% of the traffic on the northern end of the option transferring to the new road alignment. The existing N14 will still be used by local traffic however the flow will be considerably reduced.	Options 3B1/3B2, 3C1/3C2 and 3D all have a second intermediate junction at Drumoghill. As such, these options will attract a larger volume of traffic to the mainline from the N13 to the new Drumoghill (approximately 40% increase), with the indirect effect of reduced traffic volumes on the local/residual road network. This would provide greater benefit than the other options. Option 2F attracts less vehicles than any other option, and therefore performs worse in terms of removing strategic traffic from the residual road network.
Effect on Traffic Patterns	With access points to the new N14 limited to the two tie-in points and intermediate junctions, there will be a change in traffic pattern as some local traffic will gravitate towards these junctions. All other local traffic will be unhindered by the new N14.	The proposed N14/R236 junction for Options 3D, 3E and 3F is offline to the existing junction. As such, this may result in a localised change to traffic patterns as people leave the existing N14 to join the proposed mainline at a different location.
Impact on Non-Motorised User Travel	Minimal impact anticipated for change to existing pedestrian and cycle travel. The downgrading of the current N14 to regional road will result in it becoming a more attractive option for cyclists. All options are currently proposed as a Type 2 Dual Carriageway, incorporating a segregated cycle/pedestrian facility along the mainline corridor, resulting in improved infrastructure provision for NMUs	The proposed N14/R236 junction for Options 3D, 3E and 3F is offline to the existing junction. As a result, cyclists utilising the existing N14 wishing to join the new mainline are likely to use the R236. Specific vulnerable road user measures to accommodate this potential increase in cyclist volumes on this regional option should be considered in preliminary design.
Seasonal Conditions.	Likelihood of increased seasonal summer traffic due to tourism. No issues of note. Climatic Conditions. No issues.	
Safe Parking Areas.	No safe parking areas indicated. Recommend consideration of provision of such at next design stage.	
Effect on Existing Accident Cluster Sites.	The downgrading of the existing N14 to a regional road combined with lower traffic volumes using it, should have a positive influence historic collision cluster sites, which are localised near junctions and areas of poor horizontal alignment.	

Option	Impact on Road Safety – All Options	Differentiating Factors
Road Geometry	Considerable improvement in Level of Service, particularly in horizontal curvature compared to the existing.	
	No significant road issues identified with regards the current option selection alignment design.	
	All options propose a grade separated junction is proposed at the N14/R236 interface, which is centrally located on the link and an optimum location for facilitating local traffic.	Options 3B1/3B2, 3C1/3C2 and 3D all have a second intermediate junction at Drumoghill. The location of this junction is ideal to capture traffic that would otherwise “rat run” through local roads, having a negative impact on safety, but also increases the number of conflict points on the overall road network. Mainline options at the Drumoghill junction location are however characterised by tight/limiting geometry, sinuous horizontal alignment and restricted visibility by virtue of the geometry.
Junction Frequency	All options significantly reduce the number of junctions in comparison to the existing N14.	
Direct Access.	All options currently propose no direct access from properties. This is a significant improvement in comparison to the existing network.	
Tie-ins.	The form of tie-in proposed is roundabout junctions for all the options, including an existing junction (N13/N14 at Pluck) and proposed (N14 and proposed A5 Link). This form of junction provides a suitable tie-in arrangement when transitioning from dual carriageway to single carriageway however full grade separation would ultimately offer the safest arrangement here.	
Forgiving Roadsides and Safety Barriers.	An assessment for safety barrier requirements indicated no appreciable difference between the six options considered: a safety barrier requirement of between 40% and 52% was identified. There is scope for improving these figures at preliminary and detailed design.	

2.2 Engineering Design Review

To further understand the differences between the options proposed, the Phase 2 mainline alignment designs were reviewed. Although all 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 2-4 Criteria reviewed to determine designs approaching limiting values

	Desirable Minimum	Desirable Maximum
Horizontal Radii	720m	
Vertical Crest	100	
Vertical Sag	37	
Vertical Gradient		4%

As Options 3A1/3A2 (Blue), 3B1/3B2 (Red) and 3C1/3C2 (Orange) are similar across most of their length, the assessment has been conducted for a single alignment only, which is representative of both alignment designs.

Table 2-5 Review of Mainline Engineering Designs with respect to limiting values

	3A1/3A2	3B1/3B2	3C1/3C2	3D	3E	3F
Use of limiting horizontal radius (no. of instances)	6	7	5	5	8	7
Length of use of limiting radius (m)	2680	4069	2389	2631	3444	3413
Large changes in horizontal bearing (no. of instances)	2	4	2	2	3	2
Length of use of 4% gradient or greater (m)	3733	3462	3347	4936	5643	3195
Use of limiting vertical crest curvature (no. of instances)	9	12	10	9	9	14

In terms of limiting geometric design criteria, the options perform similarly. Option 3E is the least preferable as it has the highest level of adoption of desirable minimum horizontal radius and the greatest length at the limiting vertical gradient of 4% or steeper. Option 3C1/3C2 has the least instances of utilising limiting geometry and would therefore be preferred, followed closely by Options 3A1/3A2.

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

From a qualitative perspective, all options are likely to provide benefits in comparison to the existing infrastructure.

Option	Benefits	Dis-benefits
All options	Provision of a dual carriageway with solid median. Intermediate junctions provided as a grade-separated junctions with no at-grade junctions proposed. Retention of existing N14 and all local roads accommodate existing local trips with minimal trip displacement anticipated.	

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 option. This was derived using COBALT (Cost and Benefits to Accidents – Light Touch).

Table 2-6 Quantitative summary of options

	Option 3A1/3A2 (Blue)	Option 3B1/3B2 (Red)	Option 3C1/3C2 (Orange)	Option 3D (Purple)	Option 3E (Cyan)	Option 3F (Pink)
Monetary Value of Collision Reduction Savings in €m for 60-years discounted to 2011	€ 4,298,000	€ 4,298,000	€ 4,951,000	€ 5,020,000	€ 4,502,000	€ 3,449,000
Preference Rank	3	2	2	1	3	4

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 ranking is based on marginal differences between the options and as such, there is not a significant benefit of one option over another in terms of road safety, considering the items reviewed.

The Qualitative Assessment of the six options demonstrated no difference between the new options of any significance. The higher altitude achieved with the 3E Cyan and 3D Purple options could make these options more prone to adverse winter weather conditions, however as there is a degree of uncertainty here, we cannot use this alone as a basis for scheme ranking.

In terms of adoption of limiting geometric design criteria, all options are similar, with Option 3E utilising the longest length (over 5.5km) of the maximum desirable gradient and horizontal radius. Additionally, Option 3E provides an offline junction with the R236, resulting in re-distribution of traffic and potential increased risk for cyclists utilising the R236. As such, Option 3E is least preferable.

Similarly, Option 3F proposes the N14/R236 junction to be offline to the existing N14, with similar potential for changes to local traffic patterns. Additionally, Option 3F is ranked fourth in terms of COBALT collision benefits and also attracts the least traffic volumes. Therefore, Option 3F is ranked fifth.

Following 3F, Options 3B1/3B2 incorporates a significant amount of limiting geometry and is joint fourth in COBALT collision savings, resulting in an overall ranking of fourth. Option 3A1/3A2 has the same performance as 3B1/3B2 in terms of COBALT collision benefits but is ranked second in terms of engineering geometry. Therefore, Options 3A1/3A2 rank third.

Option 3D is ranked first terms of COBALT collision savings and is ranked fourth in terms of limiting geometry and is therefore ranked second.

Therefore, Options 3C1/3C2 are preferred over all other options in terms of road safety impact. This is due to a highly positive COBALT collision benefits, being ranked second, and the least utilisation of limiting alignment geometry in comparison to all other options. These options also have similar positive benefits as Options 3A1/3A2 and 3B1/3B2 in terms of local trip distribution, due to the provision of online junction locations.

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

Option	Ranking
3C1 and 3C2 Orange	1
3D Purple	2
3A1 and 3A2 Blue	3
3B1 and 3B2 Red	4
3F Pink	5
3E Cyan	6

APPENDIX A – Collision Information

Accident No.	Severity	Year	Location	Vehicle	Circumstances	Day	Time	Casualties
1	Fatal	2012	N14 near R264	Car	Single Vehicle	Sunday	1000-1600	3
2	Serious	2005	N14 between Pluck Roundabout and R236	Car	Single Vehicle	Sunday	1900-2300	2
3	Serious	2005	N14 between Pluck Roundabout and R236	Car	Angle, Right Turn	Sunday	1000-1600	2
4	Serious	2011	N14 between Pluck Roundabout and R236	Car	Single Vehicle	Sunday	2300-0300	2
5	Serious	2010	N14 between R236 and R265	Car	Single Vehicle	Tuesday	1900-2300	2
6	Serious	2008	N14 between R236 and R265	Car	Single Vehicle	Friday	1000-1600	2
7	Serious	2014	N14 between Pluck Roundabout and R236	Car	Other	Tuesday	1600-1900	2
8	Serious	2014	N14 at R264	Car	Other	Monday	1000-1600	1
9	Serious	2014	N14 between R236 and R265	Car	Head on-conflict	Friday	0700-1000	2
10	Minor	2012	N14 between Pluck Roundabout and R236	Bus	Rear end, Straight	Tuesday	1900-2300	1
11	Minor	2009	N14 between Pluck Roundabout and R236	Car	Rear end, Straight	Monday	1600-1900	1
12	Minor	2005	N14 between Pluck Roundabout and R236	Car	Single Vehicle	Friday	1900-2300	1
13	Minor	2008	N14 between Pluck Roundabout and R236	Car	Rear end, Straight	Saturday	1900-2300	1
14	Minor	2012	N14 between Pluck Roundabout and R236	Car	Other	Wednesday	1600-1900	1
15	Minor	2009	N14 between Pluck Roundabout and R236	Car	Other	Saturday	1600-1900	6
16	Minor	2009	N14 between Pluck Roundabout and R236	Car	Single Vehicle	Sunday	1000-1600	1
17	Minor	2012	N14 between Pluck Roundabout and R236	Car	Single Vehicle	Saturday	0700-1000	1
18	Minor	2008	N14 between Pluck Roundabout and R236	Goods Vehicle	Rear end, straight	Thursday	1000-1600	2
19	Minor	2012	N14 between Pluck Roundabout and R236	Car	Rear end, straight	Thursday	0700-1000	1
20	Minor	2008	N14 between Pluck Roundabout and R236	Car	Rear end, straight	Thursday	1000-1600	1
21	Minor	2012	N14 between Pluck Roundabout and R236	Car	Other	Saturday	1000-1600	2

Accident No.	Severity	Year	Location	Vehicle	Circumstances	Day	Time	Casualties
22	Minor	2008	N14 between Pluck Roundabout and R236	Car	Angle, Right Turn	Thursday	1000-1600	1
23	Minor	2005	N14 between Pluck Roundabout and R236	Car	Angle, Right Turn	Monday	1600-1900	2
24	Minor	2012	N14 between Pluck Roundabout and R236	Car	Angle, Right Turn	Tuesday	1600-1900	1
25	Minor	2010	N14 between Pluck Roundabout and R236	Car	Single Vehicle	Sunday	2300-0300	5
26	Minor	2007	N14 between Pluck Roundabout and R236	Car	Single Vehicle	Wednesday	1000-1600	1
27	Minor	2005	N14 between Pluck Roundabout and R236	Car	Single Vehicle	Wednesday	1000-1600	2
28	Minor	2008	N14 between Pluck Roundabout and R236	Car	Head-on-Conflict	Monday	0700-1000	4
29	Minor	2009	N14 between Pluck Roundabout and R236	Car	Rear end, Straight	Wednesday	1000-1600	-
30	Minor	2007	N14 between Pluck Roundabout and R236	Car	Rear end, Straight	Tuesday	1900-2300	1
31	Minor	2012	N14 between Pluck Roundabout and R236	Car	Head-On-Conflict	Friday	1900-2300	5
32	Minor	2009	N14 between Pluck Roundabout and R236	Car	Single Vehicle	Sunday	1000-1600	1
33	Minor	2005	N14 between Pluck Roundabout and R236	Car	Rear end, Straight	Friday	1000-1600	2
34	Minor	2005	N14 between Pluck Roundabout and R236	Car	Single Vehicle	Wednesday	1600-1900	1
35	Minor	2006	N14 between Pluck Roundabout and R236	Car	Single Vehicle	Tuesday	2300-0300	4
36	Minor	2005	N14 between Pluck Roundabout and R236	Car	Head-on-Conflict	Monday	0700-1000	2
37	Minor	2005	N14 between Pluck Roundabout and R236	Car	Other	Saturday	2300-0300	1
38	Minor	2006	N14 between Pluck Roundabout and R236	Car	Rear end, right turn	Saturday	0700-1000	1
39	Minor	2011	N14 between Pluck Roundabout and R236	Car	Single Vehicle	Friday	1000-1600	2
40	Minor	2011	N14/R236 Junction	Car	Angle, right turn	Tuesday	1000-1600	3
41	Minor	2006	N14/R236 Junction	Car	Head-on-Conflict	Monday	1000-1600	3
42	Minor	2008	N14/R236 Junction	Car	Rear end, straight	Tuesday	1600-1900	1

Accident No.	Severity	Year	Location	Vehicle	Circumstances	Day	Time	Casualties
43	Minor	2006	N14/R236 Junction	Goods Vehicle	Rear end, right turn	Thursday	1600-1900	1
44	Minor	2009	N14/R236 Junction	Car	Rear end, Straight	Monday	1600-1900	4
45	Minor	2007	N14 between R236 and R265	Car	Head-on right turn	Monday	1000-1600	2
46	Minor	2010	N14 between R236 and R265	Car	Other	Saturday	1000-1600	2
47	Minor	2009	N14 between R236 and R265	Car	Rear end, straight	Saturday	1000-1600	2
48	Minor	2010	N14 between R236 and R265	Car	Angle, both straight	Sunday	1000-1600	1
49	Minor	2008	N14 between R236 and R265	Car	Other	Thursday	2300-0300	1
50	Minor	2010	N14 between R236 and R265	Car	Single Vehicle	Saturday	0300-0700	2
51	Minor	2012	N14 between R236 and R265	Car	Other	Wednesday	0700-1000	3
52	Minor	2005	N14 between R236 and R265	Car	Single Vehicle	Tuesday	2300-0300	1
53	Minor	2008	N14 between R236 and R265	Car	Angle, both straight	Saturday	1000-1600	2
54	Minor	2005	N14 between R236 and R265	Bus	Single Vehicle	Friday	1600-1900	2
55	Minor	2010	N14 between R236 and R265	Car	Single Vehicle	Thursday	2300-0300	3
56	Minor	2007	N14 between R236 and R265	Car	Head-on-Conflict	Thursday	0700-1000	2
57	Minor	2006	N14 between R236 and R265	Car	Single Vehicle	Saturday	2300-0300	1
58	Minor	2005	N14 between R236 and R265	Car	Single Vehicle	Sunday	1600-1900	3
59	Minor	2008	N14 between R236 and R265	Car	Single Vehicle	Friday	1900-2300	4
60	Minor	2008	N14 between R236 and R265	Car	Single Vehicle	Thursday	2300-0300	1
61	Minor	2008	N14 between R236 and R265	Car	Single Vehicle	Tuesday	1600-1900	1
62	Minor	2007	N14 between R236 and R265	Car	Single Vehicle	Monday	1600-1900	1
63	Minor	2006	N14 between R236 and R265	Car	Single Vehicle	Monday	1000-1600	1

Accident No.	Severity	Year	Location	Vehicle	Circumstances	Day	Time	Casualties
64	Minor	2013	N14 between R236 and R265	Car	Single Vehicle	Monday	2300-0300	1
65	Minor	2009	N14 between R236 and R265	Car	Single Vehicle	Monday	0700-1000	1
66	Minor	2005	N14 between R236 and R265	Car	Rear end, Straight	Wednesday	2300-0300	1
67	Minor	2013	N14 between R236 and R265	Car	Head-on-Conflict	Sunday	1600-1900	1
68	Minor	2009	N14 between R236 and R265	Car	Rear end, Straight	Wednesday	1000-1600	1
69	Minor	2006	N14 near R265 Junction	Car	Rear end, Straight	Sunday	1000-1600	1
70	Minor	2005	N14 near R265 Junction	Car	Other	Thursday	0700-1000	1
71	Minor	2006	N14 between R265 and Lifford	Car	Rear end, Straight	Tuesday	1600-1900	3
72	Minor	2012	N14 between R265 and Lifford	Car	Pedestrian	Wednesday	1900-2300	1
73	Minor	2007	N14 between R265 and Lifford	Car	Pedestrian	Monday	0700-1000	1
74	Minor	2006	N14 between R265 and Lifford	Car	Rear end, straight	Tuesday	1600-1900	1
75	Minor	2010	N14 between R265 and Lifford	Goods Vehicle	Single Vehicle	Monday	0700-1000	1
76	Minor	2011	N14 between R265 and Lifford	Other	Other	Thursday	0700-1000	1
77	Minor	2007	N14 between R265 and Lifford	Car	Unknown	Monday	0300-0700	1
78	Minor	2013	N14 between R265 and Lifford	Goods Vehicle	Single Vehicle	Saturday	1900-2300	1
79	Minor	2010	N14 between R265 and Lifford	Car	Rear end, straight	Friday	1000-1600	1
80	Minor	2013	N14 between R265 and Lifford	Car	Other	Saturday	1000-1600	1
81	Minor	2006	N14 between R265 and Lifford	Car	Rear end, straight	Monday	1600-1900	2
82	Minor	2014	N14 between R265 and Lifford	Car	Other	Monday	1000-1600	3
83	Minor	2014	N14 between Pluck Roundabout and R236	Car	Single vehicle only	Saturday	1900-2300	3
84	Minor	2014	N14/R236 Junction	Car	Rear end, Straight	Friday	1000-1600	1

Accident No.	Severity	Year	Location	Vehicle	Circumstances	Day	Time	Casualties
85	Minor	2014	N14 between Pluck Roundabout and R236	Car	Single vehicle only	Saturday	0300-0700	1
86	Minor	2014	N14/Dromore Park Junction	Car	Rear end, Straight	Wednesday	1600-1900	2
87	Minor	2014	N14 between R236 and R265	Car	Single vehicle only	Sunday	0300-0700	4
88	Minor	2011	N14 between R265 and Lifford	Car	Pedestrian	Wednesday	1600-1900	1

APPENDIX B – Key Traffic Generators

Type	Name
National School	Rays NS Labadish, St. Patricks Murlog, Muire Gan Small Lifford.
Secondary School	Royal and Prior Secondary School Lifford, Deele College Vocational School Lifford.
Entertainment	Lifford Cinema, Weekends nights are very busy.
Markets	Raphoe Mart- Monday, Tuesday & Thursday, can be on in the evening as well during the summer.
Leisure	Oakfield Park Raphoe, busy during summer season. Racetrack in Lifford, every Saturday night and some Friday nights during Xmas.
Filling Station	Daly's petrol station would be very busy.
Church	The churches at Mass time can add to the traffic down especially if there are wedding and Funerals.



TEN-T Priority Route Improvement Project, Donegal

Section 3: N14 Manorcunningham to Lifford/Strabane/A5 Link

Option Selection Report

Appendix C3.2 – Physical Activity

Document Control Sheet

Client:	Donegal County Council
Project Title:	TEN-T Priority Route Improvement Project, Donegal – Section 3: N14 Manorcunningham – Lifford/Strabane/A5 Link
Document Title:	Option Selection Report –Appendix C3.2 – Physical Activity
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1 INTRODUCTION

This report is concerned with assessing each shortlisted option with respect to impact on Physical Activity within Section 3. 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 cyclist facilities or enhancement to existing pedestrian and / or cyclist facilities.

1.1 Methodology

For the purposes of Option Selection, each option will be appraised based on any new pedestrian / cyclist facilities being provided as part of the project, or any new linkages to existing 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

There is a lack of available information on the number or frequency of cyclists and pedestrians across the TEN-T Priority Route Improvement Project, Donegal study area, including Section 3 along the N14. Therefore, the standalone, quantitative assessments outlined in TII PAG Unit 13 are not be undertaken at this stage. Furthermore, the assessments a prediction of use could not be 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 Cycle Facilities

The following cycle facilities and organisations can be found within the Section 3 study area:

- **The Donegal Cycle Route:**

200km route which 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 Donegal Cycle Route also forms part of the Eurovelo European Cycling Network, Route 1. 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.

<http://www.donegalcycleroute.ie/>

The Donegal Cycle Route route leaves the town of Letterkenny within Section 2 study area, travelling along the L1114 to the south of the existing N13 dual carriageway where it continues to the townland of Pluck. At this point, it crosses along the existing N14 near Pluck/Manorcunningham, before continuing in a northwesterly direction towards Newtowncunningham.



Figure 1 Donegal Cycle Route

- **Northern Ireland Greenways – Derry to Buncrana and Letterkenny former Railway**

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 which is within the study area of the TEN-T Priority Route Improvement Project, Donegal.

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

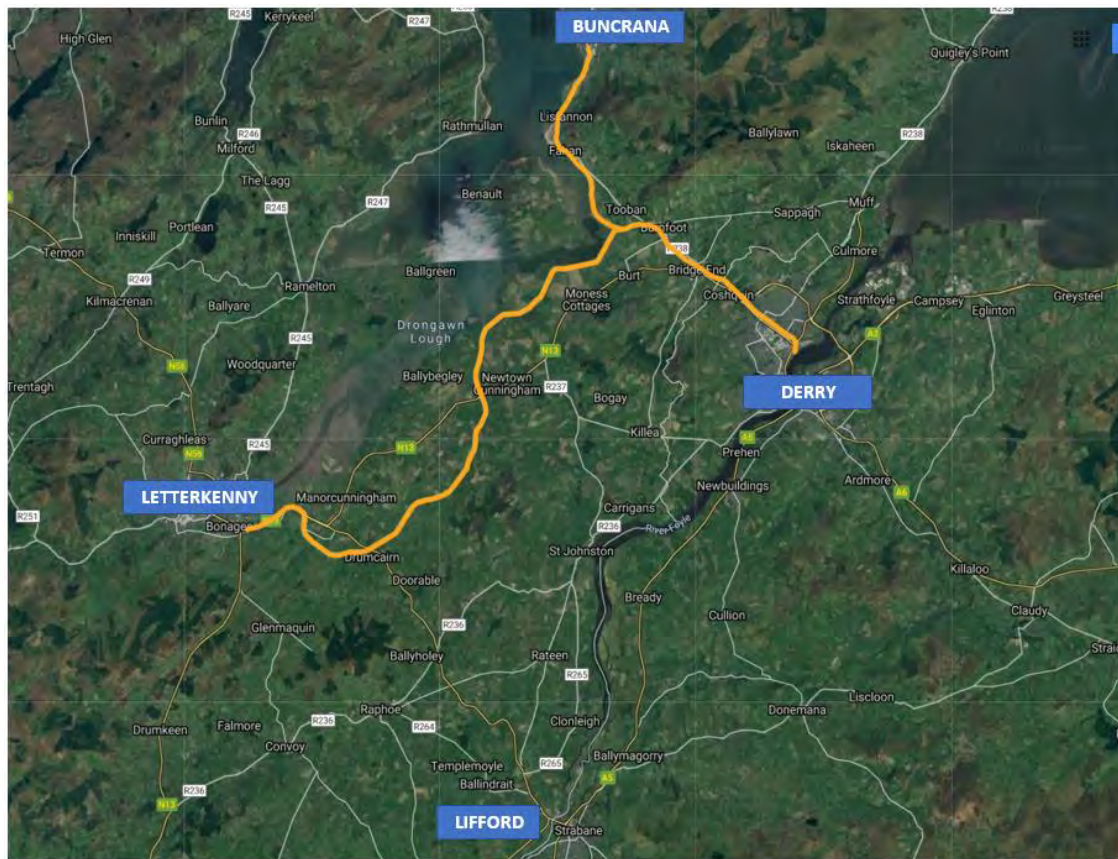


Figure 2 Proposed Northern Ireland Greenway

- **EuroVelo Cycle Route**

EuroVelo1: In the Republic of Ireland the Atlantic Coast Route starts at the village of Newtownunningham in County Donegal and aligns along the existing Donegal Cycle Route. 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.

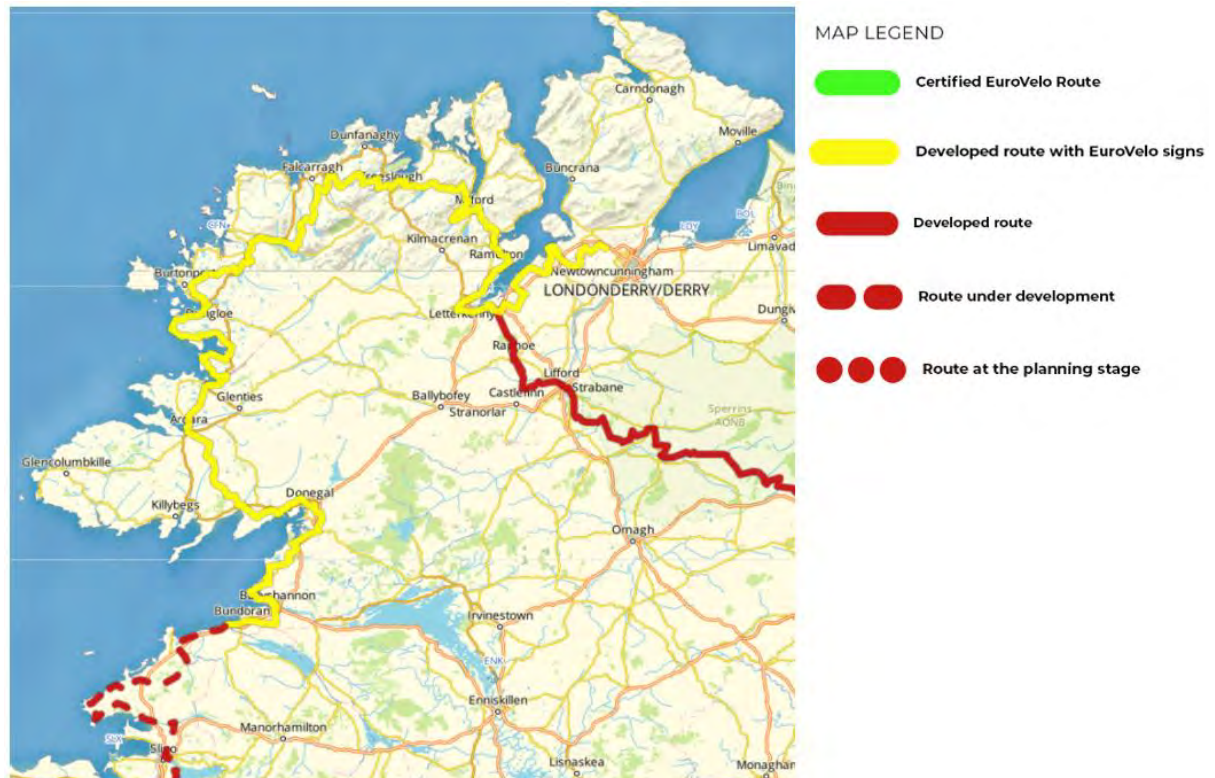


Figure 3 EuroVelo 1 Atlantic Coast Route (<http://www.eurovelo.com/en>)

- **Strabane Lifford Cycling Club:**
 This club caters for novice and competitive cyclists and therefore suggests that cyclists may use the road network in the vicinity of Strabane and Lifford for training purposes.

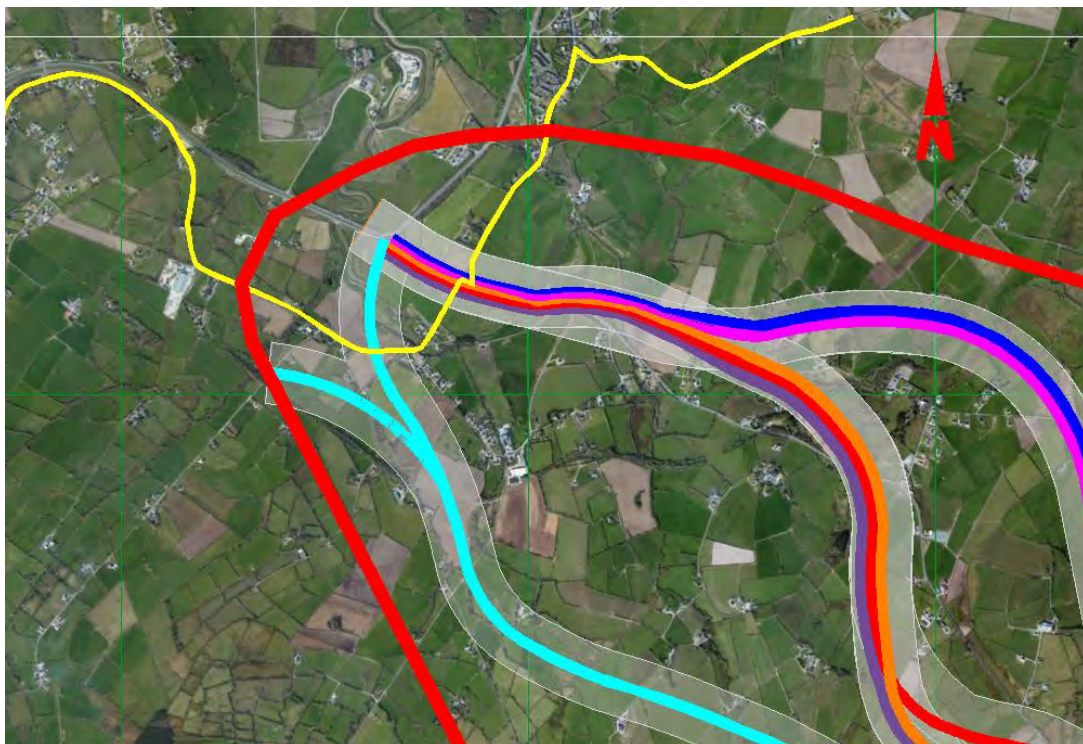


Figure 4 All Options interface with Donegal Cycle Route/EuroVelo Cycle Route and location of proposed Northern Ireland Greenway

2.2 Walking Facilities

The following cycle facilities and organisations can be found within the Section 3 study area:

- **Lifford Slí (Slí na Sláinte route):** A recognised walking route within the study area is the Lifford Slí (Slí na Sláinte route). It is 3km in length and connects to a similar facility, the “Highway to Health” in Strabane, and is the first cross-border Slí na Sláinte route. The route starts at the Church in Murlough (on the R264) and continues eastward the existing N14 north of Lifford. It aligns onto the N14 continuing into Lifford and onto the Lifford Bridge.

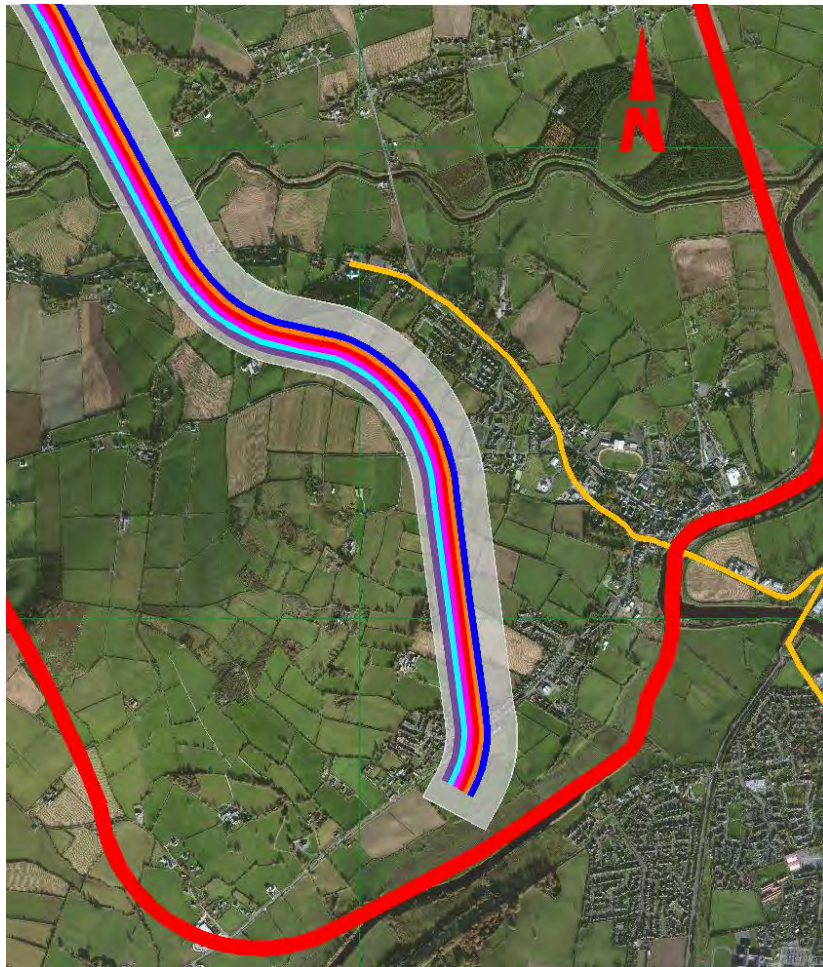


Figure 5 All Options interface with Lifford Slí na Sláinte Route

Although the new N14 may be visible from the Slí na Sláinte route, no option will have a direct impact on the facility and therefore, all route options have a neutral effect on it. Other impacts relating to Population and Human health and Landscape and Visual are addressed separately in Appendix D3.9 and Appendix D3.3 respectively.

2.3 Other Facilities

Drumoghill soccer pitch falls within the corridor of Options 3B1/3B2, 3C1/3C2 and 3D. Currently the soccer pitch is accessible via a local road which forms a junction to the existing N14. Access to the soccer pitch is not restricted by the implementation of the option corridors, therefore there will be no direct impact in terms of physical activity.

Other impacts relating to Population are addressed separately in Appendix D10.3.

3 PROPOSED INFRASTRUCTURE

All options propose a Type 2 dual carriageway to replace the existing N14 route, aligning from N13/N14 junction at Pluck to the A5 Link, south of Lifford. All options currently propose a roundabout at each end of the route, and a compact grade separated junction between the new N14 and the R236, while Options 3B1/3B2, 3C1/3C2 and 3D also have an additional grade separated junction with the N14 in the vicinity of Drumoghill.

All options propose a segregated cycle facility along the full length of the alignment that is separated from the carriageway by the provision of a grass verge. As the design develops, there is the opportunity to develop the cycle track to a shared pedestrian/cycle facility. Connectivity from the cycle track to any existing cycle facilities, including the Donegal Cycle Network at Pluck will be investigated during preliminary design.

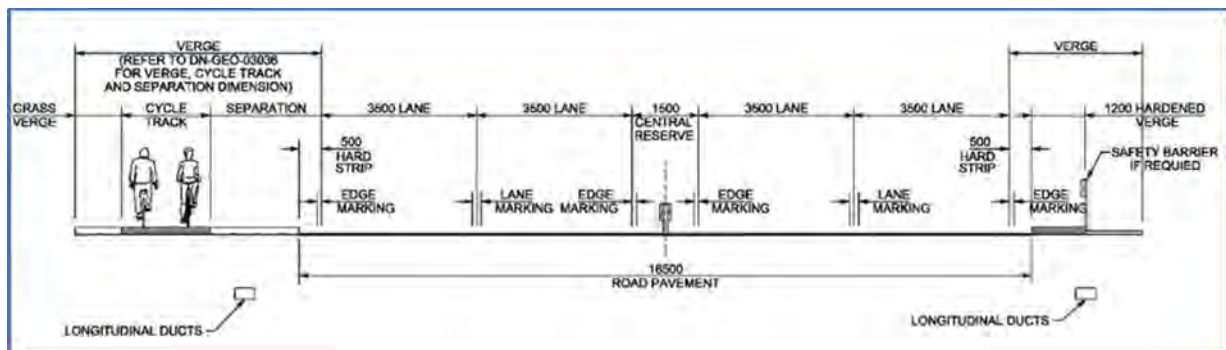


Figure 3-1 Typical Cross Section – Type 2 Carriageway

4 PHYSICAL ACTIVITY IMPACTS

All options have the same material impact on the local cycle network provision for Section 3, with all options traversing the Donegal Cycle Network at one location near Pluck or Manorcunningham. There are benefits associated with including the cycle track which are outlined qualitatively below.

4.1 Health Benefits

For all options, the proposed cycle track will intersect the existing Donegal cycle network, providing the opportunity for expansion of the network itself. The new segregated facility will be over 17km in length and will therefore accommodate longer active mode journeys. The connectivity of the N14 cycle track to the Donegal Cycle Network is not yet determined and will be established at the 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.

Any improvement in infrastructure is likely to attract more pedestrians and cyclists, with the likelihood of improving the health benefits.

In terms of health benefits, it is considered all options will have a moderately positive impact score with the same preference across each option.

Table 4-1 Options Assessment with respect to Health Benefits

	3A1	3A2	3B1	3B2	3C1	3C2	3D	3E	3F
Impact Description	Moderate Positive	Moderate Positive	Moderate Positive	Moderate Positive	Moderate Positive	Moderate Positive	Moderate Positive	Moderate Positive	Moderate Positive
Impact Score	6	6	6	6	6	6	6	6	6

4.2 Journey Ambience Benefits

Provision of a segregated cycle track with each option reduces conflict points between cyclists and vehicles utilising the N14. This improved segregation can improve safety and subsequently increase the attractiveness of the route for cycling.

For all options, the construction of a new mainline N14 will re-distribute traffic and reduce traffic volumes on the existing N14. The existing N14 speed limit will also be reduced, further improving conditions for residual cyclists on the local road network. This has the potential to make the existing residual road network more attractive for cyclists, however the journey time for cyclists is unlikely to be significantly reduced by any option.

Therefore, in terms of journey ambience benefits, it is considered all options will have a slightly positive impact score with the same preference across each option.

Table 4-2 Options Assessment with respect to Journey Ambience

	3A1	3A2	3B1	3B2	3C1	3C2	3D	3E	3F
Impact Description	Slightly Positive	Slightly Positive	Slightly Positive	Slightly Positive	Slightly Positive	Slightly Positive	Slightly Positive	Slightly Positive	Slightly Positive
Impact Score	5	5	5	5	5	5	5	5	5

4.3 Other Factors

Options 3A1, 3A2, 3B1, 3B2, 3C1 and 3C2 have a junction with the R236 at the location of the existing N14/R236 junction. Options 3D, 3E and 3F intersect the R236 offline to the existing junction, and therefore will introduce a junction on the R236 between the existing N14/R236 intersection and Raphoe. The introduction of an additional junction on the R236 has the potential to re-direct cyclists along the regional route to access/exit the new N14 Mainline and cycle track. The existing R236 is a single carriageway with no hard strip or hard shoulder. As such it would be undesirable to direct cyclists to this route without significant upgrade. As a result, Options 3D, 3E and 3F are slightly less favourable than the other options.

Considering these additional factors, it is considered all options will have a moderately positive impact score, with a lower preference given to options 3D, 3E and 3F.

Table 4-3 Options Assessment with respect to other Physical Activity considerations

	3A1	3A2	3B1	3B2	3C1	3C2	3D	3E	3F
Impact Description	Moderate Positive	Moderate Positive	Moderate Positive	Moderate Positive	Moderate Positive	Moderate Positive	Moderate Positive	Moderate Positive	Moderate Positive
Impact Score	6	6	6	6	6	6	6	6	6

5 OPTION COMPARISON

All options result in reduced traffic volumes on the existing road network and proposals also include lowering the speed limits of the existing N14, which is likely to have a positive effect in terms of journey ambience and health benefits for any non-motorised users on the residual road network. However, the net effect of this is not regarded as a differentiating factor between options in terms of the physical activity assessment.

All options currently include the provision of a cycle track along the mainline corridor, with the potential to be designed for shared use. As such, all options are considered to have a similar, positive impact in terms of physical activity. It is concluded that all options score 6 – Moderately Positive with respect to Physical Activity. A difference in preferences reflects the introduction of additional conflict points on Options 3D, 3E and 3F on the R236, which is not present on the other options.

Table 5-1 Options Assessment with respect to Physical Activity

	3A1	3A2	3B1	3B2	3C1	3C2	3D	3E	3F
Impact Description	Moderate Positive	Moderate Positive	Moderate Positive	Moderate Positive	Moderate Positive	Moderate Positive	Moderate Positive	Moderate Positive	Moderate Positive
Impact Score	6	6	6	6	6	6	6	6	6
Preference	Preferred	Preferred	Preferred	Preferred	Preferred	Preferred	Intermediate Preferred	Intermediate Preferred	Intermediate Preferred



TEN-T Priority Route Improvement Project, Donegal

Section 3: N14 Manorcunningham to Lifford/ Strabane/A5 Link

Options Selection Report

Appendix C3.3 – Accessibility and Social Inclusion Appraisal

DOCUMENT CONTROL SHEET

Client:	Donegal County Council
Project Title:	TEN-T Priority Route Improvement Project, Donegal – Section 3: N14 Manorcunningham – Lifford/Strabane/A5 Link
Document Title:	Option Selection Report –Appendix C3.3 – Accessibility and Social Inclusion
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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 with the 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 3 of the TEN-T Priority Route Improvement Project, Donegal is from Manorcunningham to Lifford/Strabane.

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 shows the level of overall affluence and deprivation across the country using identical measurements and scales using data from the 2016 Census of Population. All the Section 3 study area is marginally below average or disadvantaged according to this index. The government has various schemes to help address the issues that are prevalent in these deprived areas.

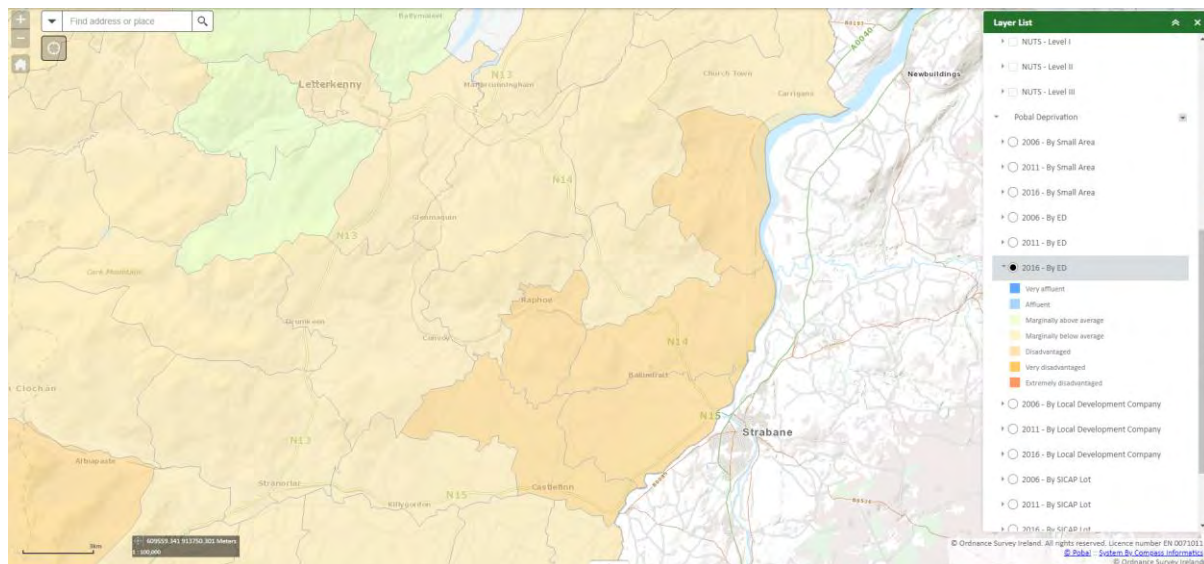


Figure 1 Deprivation Index for Section 3 Study Area. Source: (Source: <https://maps.pobal.ie/WebApps/DeprivationIndices/index.html>)

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 sufficient 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%¹. The Section 3 study area comprises mostly of agricultural businesses and farmland. As the area is identified as being disadvantaged to various extents and visibly has a significant proportion of its industry within farming, it is likely that participants in the Rural Social Scheme reside within the study area. The proposed N14 scheme is likely will improve accessibility from the rural area to Letterkenny and Lifford and improve access between Letterkenny and Lifford. The construction of the scheme 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.

¹ <https://www.wdc.ie/wp-content/uploads/WDC-Insights-County-Donegal-Labour-Market-Census-2016-Oct-17.pdf>

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

	3A1	3A2	3B1	3B2	3C1	3C2	3D	3E	3F
Impact Description	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Impact Score	4	4	4	4	4	4	4	4	4
Preference	Preferred	Preferred	Preferred	Preferred	Preferred	Preferred	Preferred	Preferred	Preferred

3 VULNERABLE GROUPS

Currently the national primary road network, which includes the N14 within Section 3, is the only transport connection between County Donegal and other counties in the Republic and Northern Ireland, as there is no live rail network. This means that buses are the only public transport mode available to travel to/from Donegal for many individuals. Bus Eireann services from Letterkenny include Letterkenny – Dublin (which stops in Lifford) and Letterkenny – Ireland West Airport, Knock – Galway.

As the N14 is forms part of the route between Letterkenny and Dublin, any proposed improvement to the N14 will improve the journey time and journey time reliability on the 17km section between Manorcunningham to Lifford. This improves accessibility between Lifford and Letterkenny and subsequently to/from Dublin, improving the access from residents in Section 3 to jobs, key facilities and social opportunities in Letterkenny, Lifford and further to Dublin.

It is not anticipated that the improved N14 will have any beneficial impact on mobility or sensory impairment.

It is not anticipated that the improvements will have any significant impact, and all options will perform similarly in terms of Vulnerable Groups. All options are therefore scored neutral.

Table 3-1 Options Assessment with respect to Vulnerable Groups

	3A1	3A2	3B1	3B2	3C1	3C2	3D	3E	3F
Impact Description	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Impact Score	4	4	4	4	4	4	4	4	4
Preference	Preferred	Preferred	Preferred	Preferred	Preferred	Preferred	Preferred	Preferred	Preferred

4 OPTION COMPARISON

In comparison to the existing N14, all of the new option corridors provide for an improvement in infrastructure. There will be short term employment opportunities due to the construction of the scheme and longer-term benefits due to improved accessibility between Letterkenny and Lifford. However, this improvement is deemed to be marginal with respect to impact/influence on Accessibility and Social Inclusion. Furthermore, 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.

Considering the shortlisted options being assessed and their connectivity to local communities and start/end points, all options are deemed to perform equally in the context of Accessibility and Social Inclusion. In summary, it is concluded that all options score 4 – Not significant/Neutral impact with respect to Accessibility and Social Inclusion.

Table 4-1 Accessibility and Social Inclusion Option Scoring and Preference Matrix

Option	Qualitative Assessment	Impact Score	Preference
3A1 3A2	Options are unlikely to have enough impact to alter the Pobal HP Deprivation score or have measurable impact on Vulnerable Groups	4	Preferred
3B1 3B2	Options are unlikely to have enough impact to alter the Pobal HP Deprivation score or have measurable impact on Vulnerable Groups	4	Preferred
3C1 3C2	Options are unlikely to have enough impact to alter the Pobal HP Deprivation score or have measurable impact on Vulnerable Groups	4	Preferred
3D	Options are unlikely to have enough impact to alter the Pobal HP Deprivation score or have measurable impact on Vulnerable Groups	4	Preferred
3E	Options are unlikely to have enough impact to alter the Pobal HP Deprivation score or have measurable impact on Vulnerable Groups	4	Preferred
3F	Options are unlikely to have enough impact to alter the Pobal HP Deprivation score or have measurable impact on Vulnerable Groups	4	Preferred



TEN-T Priority Route Improvement Project, Donegal

Section 3: N14 Manorcunningham to Lifford/Strabane/A5 Link

Options Selection Report

Appendix C3.4 – Integration Appraisal

Document Control Sheet

Client:	Donegal County Council
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1 INTRODUCTION

The Integration appraisal has been conducted in accordance with the TII Project Appraisal Guidelines Unit 7: Multi-Criteria Analysis. 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 corridor on achieving objectives of EU and Government Policy.

1.1 Context

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 3 of the TEN-T Priority Route Improvement Project, Donegal comprises the N14 route from Manor Cunningham to Lifford/Strabane. This is a key cross-border route connecting Donegal to Tyrone (Strabane) and also connecting to the A5, a key transport corridor linking the North West and Donegal to Dublin.

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 with respect to four sub-criteria is considered for this section.

2.1 Connectivity of the strategic road network

A new N14 alignment would result in improved linkages between the N13, N15 and future A5 routes, all of which form part of the strategic TEN-T network in the region. Furthermore, with the existing N13 Type 1 dual carriageway to the west and the proposed A5 to the east, which is due to be upgraded as part of the A5 Western Transport Corridor (A5 WTC), a new N14 alignment would address a gap in the quality of the existing infrastructure at this location, bringing it in line with the transport network to which it joins.

Access to the new N14 will be possible at both tie-in points and at one (3A1/3A2, 3E, 3F) or two (3B1/3B2, 3C1/3C2, 3D) intermediate junctions, providing an opportunity for strategic traffic to access the route, without introducing a significant number of conflict/access points.

All options are identified as being highly positive in this respect.

2.2 Connectivity between transport modes

There is no live railway network in Donegal or therefore any new N14 road would not have an impact on modal change from road to rail. Improving the road infrastructure may make public transport by bus more desirable by improving journey times and journey time reliability.

Therefore, all options are deemed to have a neutral impact with respect to this criterion.

2.3 Support for sustainable transport modes

The cross-section currently proposed for all options is a Type 2 dual carriageway. This cross-section includes a cycle track within the corridor which is separated from the paved road surface. This mainline cycle track will link to the existing Donegal Cycle Route on the L1114 local road, which crosses the existing N14 near the townland of Pluck. Adding a new cycle track approximately 17km long, fully segregated from traffic and connecting it to the existing Donegal Cycle Route would be of great benefit to existing cyclists and may attract more users.

In addition, the existing N14 will also be more desirable for cyclists due to reduced traffic volumes. The connection of the Section 3 to the A5 Western Transport Corridor, via the A5 link will also remove traffic from Lifford / Strabane, improving conditions for cyclists and pedestrians in these more urban areas.

Therefore, all options are deemed to be perform moderately positive in this regard.

2.4 Access to other transport infrastructure

The N14 is the primary route utilised for residents in Donegal to access Dublin City, Dublin Airport and Port. An upgraded N14 would accommodate increased capacity, with the potential for improved journey times and journey time reliability, while also improving access to Belfast Airport and Port. All options perform similarly in this way, and therefore are deemed to score moderately positive in this regard.

3 LAND USE INTEGRATION

This criterion compares the performance of each 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 Donegal county development plan 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 in Figure 3-1 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”.

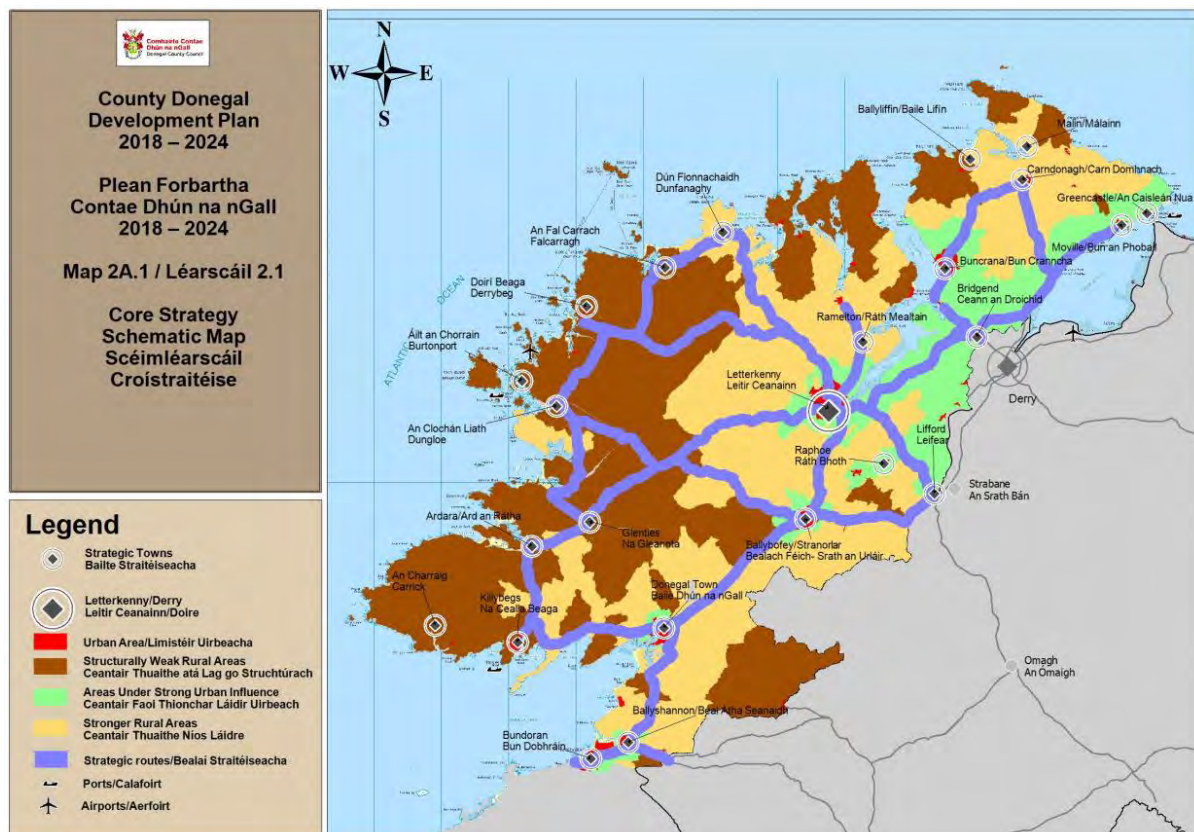


Figure 3-1 Core Strategy Map

Core Strategy Objective (CS-O-9) states:

“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) with the other relevant authorities including partners in the North West Strategic Growth Partnership and within the Northern and Western Regional Assembly so as to result in effective strategic connections to and throughout the County”.

Similarly, Transportation Objective (T-O-1) states:

“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”.

Furthermore, **Transportation Objective T-0-12** states:

“To strengthen cross border transportation links (including the A5 Western Transport Corridor) and support the development of new links to and within the North West City Region.”

These objectives are supported by Map 5.1.2 (Figure 3-2) which outlines the Strategic Transport Network in Donegal. The development plan includes a reserved corridor for the N14 improvement which is based on a previous option selection process.

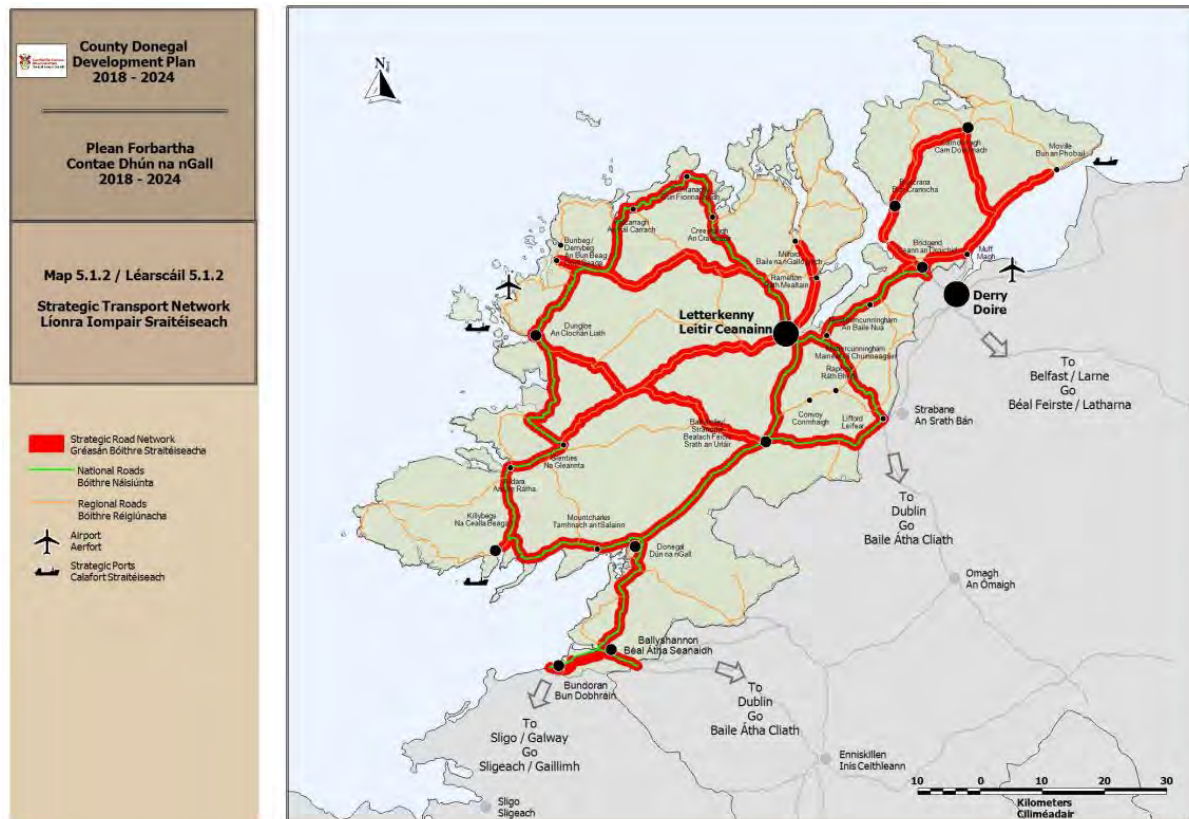


Figure 3-2 Strategic Transport Network, Donegal

The importance of the N14 is repeated in mapping and text within the County Development Plan. As such, all options perform positively respect to correlation with the plan.

There is a reserved corridor within the previous 2012-2018 plan which has been retained in the new County Development Plan 2018 – 2024. This option was included as one of the Stage 1 options and was shortlisted to progress to Stage 2 (Option 3B1). Therefore, this option has a higher preference over the other options in terms of support for local development plan. Option 3B2 is very similar to 3B1 with only one slight deviation. Options 3C1 and 3C2 are also similar over the majority of the route to Option 3B1. Options 3B2, 3C1 and 3C2 would be next in preference to Option 3B1 in terms of compatibility with the current reserved corridor.

Although this corridor is reserved in the current plan, the plan is developed such as to accommodate an amendment pending the outcome of the Option Selection process, and as such, an amendment to the development plan would not be unexpected. Given that all other options would still be addressing key objectives in the development plan, these options are considered to be highly positive.

3.2 Strategic connectivity for long distance trips

The N14 is identified as a Comprehensive Corridor on the Trans-European Transport Network, meaning it has regional significance. As all options aim to replace the full length of the existing N14 with an improved option alignment with a wider cross-section, which will subsequently improve the capacity, operation and safety of the N14. In addition, the scheme provides for an offline improvement of the road network with limited connectivity to national and regional roads and therefore be a protected road regarding future access. In this respect, all options will have a moderately positive impact.

3.3 Mitigate risks of urban sprawl

As the N14 takes a linear form and does not “wrap around” any urban centres. Furthermore, it is likely that the proposed N14 will only have access points at the N13 to the north west, and the existing N14, R236 and A5 Link/N15 through the provision of junctions. This eliminates the risk of ribbon development. Therefore, all options are deemed to perform neutrally in this respect.

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 that “enhanced connectivity is a priority for this regional area [Donegal]” and 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 explicitly states that better accessibility to the “Northern and Western region will enable unrealised potential to be activated”. The framework recognises Letterkenny, with Derry City and Strabane as functioning as a “cross-border city region”, and aims to complete linkages to Dublin by a “high-quality road network”. Project Ireland 2040 National Development Plan 2018-2027 (which sets out the investment priorities that underpin successful implementation of the NPF) recognises that the North-West region has been “comparatively neglected” in terms of accessibility to Dublin. the Framework also highlights “upgrading access to the North-West border area, utilising existing routes (N2/N14/A5)” as being necessary for improving regional accessibility to the North-West.

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. Additionally, the N14 is also part of the Trans European Transport Network (TEN-T), meaning it has National and European significance and provides cross-border, international connectivity. As such all routes score an equal score of highly positive with respect to geographical integration.

The National Development Plan addresses where to plan population growth, and outlines objectives with respect to regions in order to achieve more “balanced development” of the country, including the North-West.

Additionally, the N14 is also part of the Trans European Transport Network (TEN-T), meaning it has National and European significance and provides cross-border, international connectivity. As such all options have an equal impact score of highly positive with respect to geographical integration.

5 OTHER GOVERNMENT POLICY INTEGRATION:

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 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 for the N14 meet these criteria to varying extents, by improving connectivity from County Donegal, one of the most peripheral counties in the country, to the rest of the TEN-T network and subsequently to urban centres in the Republic and Northern Ireland Dublin. All section 3 options would also improve connectivity to ports and airports in across Ireland.

The NDP provides for investment to support the ambition for development of the border region by upgrading road networks including the N14 Manorcunningham to Lifford.

As such, all option corridors score equally under this criterion, which is highly positive.

6 OPTION COMPARISON

In comparison to the existing N14, all the new option corridors provide for an improvement in infrastructure which in turn are likely to have a positive impact on the with respect to integration.

Table 6-1 outlines the scoring of each option with respect to Integration. When scores are combined, all options score equally regarding Integration, with an overall moderately positive score. In terms of option preference Option 3B1 is slightly preferred due to it being similar to the reserved corridor in the current County Development Plan. Table 6-1 summarises the overall Qualitative assessment and ranking.

Table 6-1 Option Scoring Matrix for Integration

Option	Criteria	Sub-criteria	Sub-criteria Impact Score	Impact Score	Preference
3A1 / 3A2	Transport Integration	Connectivity of the strategic road network	7	6	Preferred
		Connectivity between transport modes	4		
		Support for sustainable transport modes	6		
		Access to other transport infrastructure	6		
	Land Use Integration	Support for Local Development Plan	7	6	Intermediate
		Strategic connectivity for long distance trips	6		
		Mitigate risks of urban sprawl	4		
	Geographical Integration		7	7	Preferred
	Other Government Policy		7	7	Preferred
3B1 / 3B2	Transport Integration	Connectivity of the strategic road network	7	6	Preferred
		Connectivity between transport modes	4		
		Support for sustainable transport modes	6		
		Access to other transport infrastructure	6		
	Land Use Integration	Support for Local Development Plan	7	6	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
3C1 / 3C2	Transport Integration	Connectivity of the strategic road network	7	6	Preferred
		Connectivity between transport modes	4		
		Support for sustainable transport modes	6		
		Access to other transport infrastructure	6		
	Land Use Integration	Support for Local Development Plan	7	6	Intermediate
		Strategic connectivity for long distance trips	6		
		Mitigate risks of urban sprawl	4		
	Geographical Integration		7	7	Preferred
	Other Government Policy		7	7	Preferred
3D	Transport Integration	Connectivity of the strategic road network	7	6	Preferred
		Connectivity between transport modes	4		
		Support for sustainable transport modes	6		
		Access to other transport infrastructure	6		
	Land Use Integration	Support for Local Development Plan	7	6	Intermediate
		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
3E	Transport Integration	Connectivity of the strategic road network	7	6	Preferred
		Connectivity between transport modes	4		
		Support for sustainable transport modes	6		
		Access to other transport infrastructure	6		
	Land Use Integration	Support for Local Development Plan	7	6	Intermediate
		Strategic connectivity for long distance trips	6		
		Mitigate risks of urban sprawl	4		
	Geographical Integration		7	7	Preferred
	Other Government Policy		7	7	Preferred
3F	Transport Integration	Connectivity of the strategic road network	7	6	Preferred
		Connectivity between transport modes	4		
		Support for sustainable transport modes	6		
		Access to other transport infrastructure	6		
	Land Use Integration	Support for Local Development Plan	7	6	Intermediate
		Strategic connectivity for long distance trips	6		
		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 3: N14 Manorcunningham to Lifford/Strabane/A5 Link

Option Selection Report

Appendix C3.5 – Pair-Wise Comparison

Document Control Sheet

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Pairwise Competition – Options 3B2 and 3C2

Pairwise Competition Option Corridors: 3B2 and 3C2	
Criteria	Notes
Environment	
Air Quality & Climate	No material difference between options, with both having slightly negative impact score.
Noise	No material difference between options with both having a neutral / not significant impact score and have the same preference ranking
Biodiversity	Both options have a moderately negative impact and have a similar preference ranking
Waste	Both Options have slightly negative impacts as both options require disposal of earthworks material. Option 3C2 is slightly preferred over 3B2 due to less potential generation of earthworks waste.
Material Assets - Agriculture	Option 3B2 impacts on 72 folios and severs approx. 80 fields while Option 3C2 affects the least number of folios (69). Therefore, Option 3C2 is marginally preferred over Option 3B2.
Material Assets - Non-agricultural	Both options have a minor negative impact score with similar impacts, but Option 3B2 is slightly preferred over 3C2 with respect to the impact on the existing road network, telecommunications and properties/community severance.
Cultural Heritage	Both option corridors have highly negative impacts, however 3C2 is slightly preferred as it has one less moderately negative impact within the assessment corridor.
Landscape & Visual	Options 3B2 and 3C2 both have moderately negative impacts and no discernible difference in preference.
Land and Soils	Both options have minor negative impacts and are very similar. Option 3C2 is slightly preferred due to less deep cuttings which has the potential to increase vulnerability of groundwater.
Water	Options 3B2 and 3C2 have slightly negative impacts and have similar preferences.
Summary - Environment	Over the majority of the Environmental sub-criteria there is no significant differences between Options 3B2 and 3C2. Option 3C2 is slightly preferred over Option 3B2 in terms of Noise, Cultural Heritage and Land and Soils. Option 3B2 is slightly preferred over Option 3C2 in terms of Non-Agricultural Material Assets. Overall in terms of the Environment, Options 3B2 and 3C2 have a similar impact, with Option 3C2 having a marginal preference
Economy	
Transport Efficiency and Effectiveness	Option 3B2 has a lower scheme cost due to lesser side road construction and road realignment. Option 3B2 also has a slightly better Benefit to Cost ratio (BCR) than Option 3C2. Therefore, Option 3B2 is preferred over Option 3C2.
Wider Economic Impacts	Both options perform the same under this sub criteria
Funding Impacts	Both options perform the same under this sub criteria
Summary - Economy	Overall in terms of Economy Options 3B2 and 3C2 have a similar impact with Option 3B2 being slightly preferred due to it having a marginally better BCR and a lower Capital cost.
Safety	
Collision Reduction	Both 3B2 and 3C2 have the same estimated quantity of collision reduction within the COBALT assessment.
Safety and Security of Road Users	All options perform similarly and therefore Options 3B2 and 3C2 also have the same impact score (moderately positive) and preference
Road Safety Audit (Stage F Part 1)	Both options have highly positive impact score and the same preference in the Road Safety Audit Stage F Part 1 report.
Road Safety Impact Assessment	Both options have a highly positive impact score however Option 3C2 is preferred over Option 3B2 due to more favourable engineering design.

Pairwise Competition Option Corridors: 3B2 and 3C2	
Criteria	Notes
Summary – Safety	Both options perform similarly as they are very similar along their length, however Option 3C2 is slightly preferred over 3B2 due to slightly favourable engineering design.
Physical Activity	
Health benefits	All options will have a highly positive impact as all options propose new cycle infrastructure.
Journey Ambience Benefits	All options will have a highly positive impact score with the same preference across each option
Other Factors	As Option 3B2 and 3C2 provide similar facilities and access to/from the cycle network at the same locations, preferences and impact scores for both options are similar.
Summary – Physical Activity	Options 3B2 and 3C2 provide similar proposals and as such all have similar preferences and impact scores
Accessibility and Social Inclusion	
Deprived geographical areas	It is not anticipated that the improvements will have any significant impact. All options will have a similar impact and are all scored neutral with similar preferences.
Vulnerable groups	Overall, all options will have a similar impact in terms of Vulnerable Groups. The impact is not anticipated to be significant. As such, all options have a neutral impact score and similar preferences.
Summary – Accessibility and Social Inclusion	Options are unlikely to alter the Pobal HP Deprivation score or have measurable impact on Vulnerable Groups therefore both Options have a similar preference
Integration	
Transport Integration	All options have an impact score of moderately positive as all options improve connectivity to the strategic road network, connectivity between transport modes and support sustainable transport modes. All options will also give better access to other transport infrastructure. As such, there is no discernible difference between Option 3B2 and 3C2
Land Use Integration	All options support the county development plan and score moderately positively. Option 3B2 is marginally preferred over Option 3C2 due to it following the reserved corridor in the current County Development Plan more closely
Geographical Integration	All options have a highly positive impact score and similar preference.
Other government policy integration: Regional Balance	All options have a highly positive impact score and similar preference.
Summary – Integration	All options score the same with Option 3B2 marginally preferred over 3C2 due to closer alignment with the reserved corridor in the County Development Plan

As the impacts of both 3C2 and 3B2 in terms of Physical Activity and Accessibility and Social Inclusion are similar the preferred option is determined based on the Economic, Environmental, Safety and Integration impacts. In terms of Economics the scheme costs and benefits Option 3B2 is slightly preferred over Option 3C2, with both options ranked as minor positive. Under the Environmental criteria, Option 3C2 is slightly preferred in terms of Cultural Heritage, Waste, Noise and Land and Soils whereas Option 3B2 is slightly preferred in terms of Non-agricultural material assets. Overall in terms of the Environment Option 3C2 is slightly preferred over Option 3B2. In terms of safety Option 3B2 is marginally preferred over Option 3C2. In terms of Integration Option 3B2 is slightly preferred over Option 3C2. With the difference in Environment and Safety being so close between the options, it is considered that Option 3B2 is the preferred option due to it being preferred in terms of Economy and Integration.

Pairwise Competition Options 3B2 and 3B1

Pairwise Competition Option Corridors: 3B2 and 3B1	
Criteria	Notes
Environment	
Air Quality & Climate	No material difference between options, with both having slightly negative impact score
Noise	No material difference between options with both having a neutral / not significant impact score and have the same preference ranking
Biodiversity	Option 3B1 has a highly negative impact compared to Option 3B2 which has a moderately negative impact. This is a result of the direct impact on a local site identified as supporting whooper swans during winter 2018-2019.
Waste	Both Options 3B1 and 3B2 have slightly negative impacts with the two options requiring disposal of earthworks material. Estimates volumes of material disposal are similar for each option and therefore both options are equally preferred
Material Assets - Agriculture	3B1 and 3B2 both have a moderately negative impact score. Option 3B2 is slightly shorter than 3B1, resulting in slightly less land impact. Option 3B1 also has potentially greater impact on a sensitive farm than Option 3B2. Option 3B2 has slightly higher severance on impact on folios, however overall, 3B2 is preferred over 3B1 in terms of Agricultural Material Assets
Material Assets - Non-agricultural	Both options are given an overall minor negative impact score. Both options have similar impacts across sub criteria – both options encroach onto the Drumoghill football field, However, Option 3B1 has less an impact on forestry therefore Option 3B1 is slightly preferred over Option 3B2
Cultural Heritage	Both options have negative impacts. Both options have similar preferences.
Landscape & Visual	Both 3B1 and 3B2 have a moderately negative impact. There is a slight preference of Option 3B1 over Option 3B2 as this road is slightly closer to the existing Road network near the Swilly Burn River
Land and Soils	Both 3B1 and 3B2 both have a minor negative impact and are the same, high preference.
Water	Both 3B1 and 3B2 have a slightly negative impact. Option 3B2 has a slight preference over Option 3B1 due to Option 3B1 having one highly negative impact as a result of the encroachment on the River Swilly Burn Floodplain. Option 3B2 has no highly negative impacts.
Summary - Environment	Over the majority of the Environmental sub-criteria there is limited distinction between Options 3B1 and 3B2. Option 3B1 is slightly preferred over Option 3B2 in terms of Material Assets Non-Agricultural and Landscape and Visual whereas Option 3B2 has a slight preference over Option 3B1 in terms of Material Assets Agricultural and Water. Additionally, Option 3B2 is strongly preferred over Option 3B1 in terms of Biodiversity due to a direct impact on a potentially nationally significant whooper swan foraging area. This Biodiversity impact is quantitatively big enough and ecologically significant enough to establish Option 3B2 is preferred over 3B1
Economy	
Transport Efficiency and Effectiveness	Option 3B1 has a slightly preferred Benefit to Cost ratio (BCR) over 3B2. Option 3B1 has a slightly lower scheme cost than 3B2 by approximately €2.2m
Wider Economic Impacts	Options 3B1 and 3B2 rank the same under this sub criteria
Funding Impacts	Options 3B1 and 3B2 rank the same under this sub criteria
Summary - Economy	Overall in terms of Economy Options 3B1 and 3B2 have a similar impact with Option 3B1 being preferred due to it having a marginally better BCR
Safety	
Collision Reduction	Both 3B2 and 3B1 have a similar estimated quantity of collision reduction within the COBALT assessment.

Pairwise Competition Option Corridors: 3B2 and 3B1	
Criteria	Notes
Safety and Security of Road Users	All options perform similarly and therefore Options 3B2 and 3B1 also have the same impact score (moderately positive) and preference
Road Safety Audit (Stage F Part 1)	Both options have highly positive impact score and the same preference in the Road Safety Audit Stage F Part 1 report.
Road Safety Impact Assessment	Both options have a highly positive impact score and have similar preferences
Summary – Safety	Options 3B1 and 3B2 perform similarly across all safety criteria
Physical Activity	
Health benefits	All options have a highly positive impact score and similar preference
Journey Ambience Benefits	All options have a highly positive impact score. Options 3B1 and 3B2 have a similar preference.
Other Factors	All options have a highly positive impact score. Options 3B1 and 3B2 have a similar preference.
Summary – Physical Activity	All Options 3B1 and 3B2 have similar impact score and preference across the Physical Activity criteria.
Accessibility and Social Inclusion	
Deprived geographical areas	It is not anticipated that the improvements will have any significant impact. All options will have a similar impact and are all scored neutral with similar preferences.
Vulnerable groups	Overall, all options will have a similar impact in terms of Vulnerable Groups. The impact is not anticipated to be significant. As such, all options have a neutral impact score and similar preferences.
Summary – Accessibility and Social Inclusion	Options are unlikely to have enough impact to alter the Pobal HP Deprivation score or have measurable impact on Vulnerable Groups therefore both Options have a similar preference
Integration	
Transport Integration	All options have an impact score of moderately positive as all options improve connectivity to the strategic road network, connectivity between transport modes and support sustainable transport modes. All options will also give better access to other transport infrastructure. As such, there is no discernible difference between Option 3B2 and 3C2
Land Use Integration	All options support the county development plan and score moderately positively. Option 3B1 is marginally preferred over Option 3B2 due to it following the reserved corridor in the current County Development Plan more closely
Geographical Integration	All options have a highly positive impact score and similar preference.
Other government policy integration: Regional Balance	All options have a highly positive impact score and similar preference.
Summary – Integration	Options 3B1 and 3B2 have similar impacts and preferences across the integration criteria, with Option 3B1 is marginally preferred over 3B2 as it follows the currently reserved corridor in the county development plan more closely

As the impacts of both 3B1 and 3B2 in terms of Safety, Physical Activity, Accessibility and Social Inclusion are similar the preferred option is determined based on the Economic, Environmental and Integration impacts. In terms of Economics the scheme costs and benefits Option 3B1 is slightly preferred over Option 3B2, but the benefits are marginal, and both options are ranked as minor positive. Under the Environmental criteria, the difference between both options is marginal for the majority of the

sub-criteria with the exception of the Biodiversity sub-criteria for which Option 3B2 is strongly preferred over Option 3B1 in terms of Biodiversity due to a direct impact on a local site which supported whooper swan foraging s in winter 2018/2019. In terms of Integration Option 3B1 is slightly preferred over Option 3B2 but not significantly as to alter the decision of option choice.

This Biodiversity impact on a whooper swan foraging area is quantitatively big enough, and ecologically significant enough to establish that Option 3B2 is preferred over 3B1 in terms of Environment, and also overall across the six MCA headings.

Pairwise Competition Options 3A2 and 3B2

Pairwise Competition Option Corridors: 3B2 and 3A2	
Criteria	Notes
Environment	
Air Quality & Climate	Both 3A2 and 3B2 have a slightly negative score and have the same preference in ranking
Noise	Both 3A2 and 3B2 have a neutral / insignificant impact score and have the same preference ranking
Biodiversity	Option 3A2 has a minor negative impact compared to Option 3B2 which has a moderately negative impact. This is due to the fact that Option 3A2 does not impact on any sites greater than Local Importance (higher value), whereas Option 3B2 has one site (Drumcarn) impacted that is rated as high local to county importance. In terms of Biodiversity Option 3A2 is slightly preferred over Option 3B2.
Waste	Both Options 3B2 and 3A2 have slightly negative impacts with the two options requiring disposal of earthworks material. The potential volume of earthworks material disposal for Option 3A2 is slightly higher than 3B2. Therefore, Option 3B2 is slightly preferred over option 3A2.
Material Assets - Agriculture	Option 3A2 impacts a greater number of folios and has higher severance than Option 3B2, Option 3B2 is slightly preferred over Option 3A2
Material Assets - Non-agricultural	Both options are given an overall minor negative impact score and have similar impact across most sub-criteria. Option 3A2 is slightly preferred over Option 3B2 as corridor Option 3B2 intersects the football pitch at Drumoghill.
Cultural Heritage	Both 3B2 and 3A2 have highly negative impacts. Option 3A2 is slightly preferred over Option 3B2 as Option 3B2 has an additional Moderate Negative impact over 3A2.
Landscape & Visual	Both 3B2 has a moderately negative impact whereas Option 3A2 has a highly negative impact. There is little difference between Options 3A2 and 3B2 in terms of landscape effects. The visual effects are considered greater for 3A2 due to a larger degree of visual impact associated with new embankments and cuttings being formed to the north and east of Ballyboe in areas not already affected by such features. Option 3B2 is preferred for this reason and the fact that properties closer to Option 3B2 are already impacted visually upon by the existing N14 Corridor
Land and Soils	Both 3B2 and 3A2 have a minor negative impact. Option 3B2 is preferred over Option 3A2 due to Option 3A2 having a greater amount of soft soils underlying the option and also preferred in terms of the volume of potentially high to very high crushed rock aggregate with Option 3B2 having more potential for rock, which is beneficial from a sustainability impact.
Water	3B2 has a slightly negative impact whereas Option 3A2 has a moderately negative impact. Option 3B2 is preferred over Option 3A2 due to Option 3A2 having two highly negative impacts, the encroachment on the floodplain of the Leslie Hill Stream at approximate chainage 3+800 to 4+600 and also because of the required extent of the diversion of the Leslie Hill stream required. Option 3B2 has no highly negative impacts.
Summary - Environment	Over the majority of the Environmental sub-criteria there are no significant differences between Options 3B2 and 3A2. Option 3A2 is slightly preferred over Option 3B2 in terms of Biodiversity, Cultural Heritage and Material Assets Non Agricultural whereas Option 3B2 is preferred over Option 3A2 in terms Waste, Landscape and Visual, Soils, Geology, and Hydrogeology, and Water. Overall in terms of the Environment, Option 3B2 is preferred over Option 3A2.
Economy	
Transport Efficiency and Effectiveness	Option 3B2 has a preferred Benefit to Cost ratio (BCR) over 3A2. While the scheme costs are very similar, 3B2 provides greater benefits than 3B2 in the order 11%
Wider Economic Impacts	Options 3B2 and 3A2 rank the same under this sub criteria
Funding Impacts	Options 3B2 and 3A2 rank the same under this sub criteria
Summary - Economy	Option 3B2 is preferred over Option 3A2 due to it having better BCR
Safety	
Collision Reduction	Option 3B2 has a higher estimated quantity of collision reduction than 3A2 within the COBALT assessment

Pairwise Competition Option Corridors: 3B2 and 3A2	
Criteria	Notes
Safety and Security of Road Users	All options perform similarly and therefore Options 3B2 and 3B1 also have the same impact score (moderately positive) and preference
Road Safety Audit (Stage F Part 1)	Options 3A2 and 3B2 both have a highly positive impact score, however Option 3A2 is slightly preferred over 3B2 due to more desirable consistency in horizontal alignment.
Road Safety Impact Assessment	Both options have highly positive impact scores the same preference ranking.
Summary – Safety	Both options have merits across the safety criteria. Overall, the preferences are similar for Options 3A2 and 3B2 in terms of Safety.
Physical Activity	
Health benefits	All options have a highly positive impact score and similar preference
Journey Ambience Benefits	All options have a highly positive impact score. Options 3A2 and 3B2 have a similar preference.
Other Factors	All options have a highly positive impact score. Options 3A2 and 3B2 have a similar preference.
Summary – Physical Activity	All Options 3A2 and 3B2 have similar impact score and preference across the Physical Activity criteria.
Accessibility and Social Inclusion	
Deprived geographical areas	It is not anticipated that the improvements will have any significant impact. All options will have a similar impact and are all scored neutral with similar preferences.
Vulnerable groups	Overall, all options will have a similar impact in terms of Vulnerable Groups. The impact is not anticipated to be significant. As such, all options have a neutral impact score and similar preferences.
Summary – Accessibility and Social Inclusion	Options are unlikely to have enough impact to alter the Pobal HP Deprivation score or have measurable impact on Vulnerable Groups therefore both Options have a similar preference
Integration	
Transport Integration	All options have an impact score of moderately positive as all options improve connectivity to the strategic road network, connectivity between transport modes and support sustainable transport modes. All options will also give better access to other transport infrastructure. As such, there is no discernible difference between Option 3B2 and 3A2
Land Use Integration	All options support the county development plan and score moderately positively. Option 3B2 is marginally preferred over Option 3A2 due to it following the reserved corridor in the current County Development Plan more closely
Geographical Integration	All options have a highly positive impact score and similar preference.
Other government policy integration: Regional Balance	All options have a highly positive impact score and similar preference.
Summary – Integration	Under Land Use Integration Option 3B2 is slightly preferred over Option 3A2 due to it following the reserved corridor in the current County Development Plan more closely.

As the impacts of both Options 3B2 and 3A2 in terms of Safety, Physical Activity and Accessibility and Social Inclusion are similar, the preferred option is determined by examining the results under the other three criteria. In terms of Economics, Option 3B2 is preferred over Option 3A2 due to better BCR. Under the Environmental criteria, overall Option 3B2 is preferred over Option 3A2. For Integration, Option 3B2 is preferred over Option 3A2. Considering all Criteria, Option 3B2 is preferred over Option 3A2.

Pairwise Competition Options 3B2 and 3D

Pairwise Competition Option Corridors: 3B2 and 3D	
Criteria	Notes
Environment	
Air Quality & Climate	Both 3B2 and 3D have a slightly negative impact score and have the same preference ranking
Noise	Both 3B2 and 3D have insignificant impact scores and have the same preference ranking
Biodiversity	Option 3D has a highly negative impact compared to Option 3B2 which has a moderately negative impact. This results from Option 3D having a more extensive impact on the conifer plantation to the south of the Swilly Burn and impacts on heath with extensive gorse and willow scrub in the vicinity of Ballyholey Far and Mondooey.
Waste	Both Options 3B2 and 3D have slightly negative impacts with the two options requiring disposal of earthworks material. Option 3D is slightly preferred over Option 3B2 due to less potential earthworks material disposal.
Material Assets - Agriculture	Both options have a moderate negative impact. Option 3D will significantly sever 49 folios compared to 40 for 3B2. Option 3D potentially affects the largest number of sensitive farms. For these reasons Option 3B2 is slightly preferred over Option 3D.
Material Assets - Non-agricultural	Option 3B2 is has an impact score of slightly negative while Option 3D has a moderately negative score. Both options have similar impacts across most sub criteria except property impacts. Option 3B2 corridor encroaches onto the Drumoghill football field, however Option 3D has a greater direct impact on residential and commercial properties, in the vicinity of the proposed junction with the R236 regional road. It also a more significant impact on the impact on forestry. Therefore Option 3B2 is preferred over Option 3D.
Cultural Heritage	Option 3B2 has a highly negative impact whereas Option 3D has a moderate negative impact. Option 3D is preferred over Option 3B2 as Option 3B2 has a higher number of identified impacts (39 versus 35) including a higher number of Moderate Negative impacts (12 versus 10).
Landscape & Visual	3B2 has a moderately negative impact whereas Option 3D has a highly negative impact. Option 3B2 is a Preferred Option in terms of Landscape and Visual while Option 3D is a least preferred option. Option 3B2 is preferred over Option 3D mainly due to the introduction of earthworks and other features associated with road construction into views and areas not currently experiencing such features.
Land and Soils	Both 3B2 and 3D have a minor negative impact. Option 3B2 also have a similar preference ranking. Option 3D has a longer length of cuttings greater than 10m in depth (1400m compared to 970m) which can impact on the groundwater by causing dewatering of the groundwater in the vicinity. Option 3D has more potential for aggregate which is beneficial in terms of sustainability. Overall both are similar options in terms of Land and Soils.
Water	Both options 3B2 and 3D have a slightly negative impact and both are preferred options in terms of Water. Option 3D is slightly preferred over Option 3B2 due to Option 3B2 having six moderate negative impacts compared to 3 moderate negative impacts for Option 3D. Neither option has any highly negative impacts.
Summary - Environment	Option 3B2 is preferred over Option 3D in terms of Biodiversity and Landscape and Visual which both have highly negative impacts for Option 3D compared to moderate negative impacts for Option 3B2. Additionally, Option 3B2 is preferred over 3D in terms of non-agricultural material assets due to the larger impact that Option 3D has on forestry and dwellings. Conversely, Option 3D is preferred over Option 3B2 for Waste and Cultural Heritage. Overall in terms of the Environment, Option 3B2 is preferred over Option 3D.
Economy	
Transport Efficiency and Effectiveness	Option 3B2 has a preferred Benefit to Cost ratio (BCR) over 3D (0.65 compared to 0.60) due to Option 3B2 having a lower scheme cost and slightly greater benefits.
Wider Economic Impacts	Options 3B2 and 3D rank the same under this sub criteria
Funding Impacts	Options 3B2 and 3D rank the same under this sub criteria
Summary - Economy	Overall in terms of Economy Option 3B2 is preferred over Option 3D due to it having a marginally better BCR.
Safety	

Pairwise Competition Option Corridors: 3B2 and 3D	
Criteria	Notes
Collision Reduction	Option 3D has marginally higher estimated quantity of collision reduction than 3B2 within the COBALT assessment. Option 3D has the highest COBALT collision saving estimate of all options. As such, Option 3D is preferred over Option 3B2.
Safety and Security of Road Users	All options perform similarly and therefore Options 3D and 3B2 also have the same impact score (moderately positive) and preference
Road Safety Audit (Stage F Part 1)	Option 3B2 has a highly positive impact score and Option 3D has a moderately positive score. Similarly, Option 3B2 has a higher preference over 3D due to the residual impact on the existing road network.
Road Safety Impact Assessment	Options 3B2 and 3D both have a highly positive impact scores and a similar preference ranking with Option 3D being marginally preferred.
Summary – Safety	Option 3D has marginally better performance in terms of COBALT predicted collision savings which influences higher preference in the Road Safety Impact Assessment and Collision Reduction criteria, however the potential redistribution of traffic at the N14/R236 junction on Option 3D has resulted in a lower preference in the Road Safety Audit. Overall, Option 3D is slightly preferred over Option 3B2
Physical Activity	
Health benefits	All options have a highly positive impact score and similar preference
Journey Ambience Benefits	All options have a highly positive impact score. Options 3D and 3B2 have a similar preference.
Other Factors	All options have a highly positive impact score, however Option 3B2 is slightly preferred over 3D due to introduction of an additional junction location on the R236 and increased conflict points for pedestrians/cyclists on a regional route.
Summary – Physical Activity	Options 3B2 and 3D have similar impact scores across the Physical Activity criteria however Option 3B2 is slightly preferred over Option 3D due to introduction of a junction on the R236, which may increase cyclists on this link.
Accessibility and Social Inclusion	
Deprived geographical areas	It is not anticipated that the improvements will have any significant impact. All options will have a similar impact and are all scored neutral with similar preferences.
Vulnerable groups	Overall, all options will have a similar impact in terms of Vulnerable Groups. The impact is not anticipated to be significant. As such, all options have a neutral impact score and similar preferences.
Summary – Accessibility and Social Inclusion	Options are unlikely to have enough impact to alter the Pobal HP Deprivation score or have measurable impact on Vulnerable Groups therefore both Options have a similar preference
Integration	
Transport Integration	All options have an impact score of moderately positive as all options improve connectivity to the strategic road network, connectivity between transport modes and support sustainable transport modes. All options will also give better access to other transport infrastructure. As such, there is no discernible difference between Option 3B2 and 3D
Land Use Integration	All options support the county development plan and score moderately positively. Option 3B2 is marginally preferred over Option 3D due to it following the reserved corridor in the current County Development Plan more closely
Geographical Integration	All options have a highly positive impact score and similar preference.
Other government policy integration: Regional Balance	All options have a highly positive impact score and similar preference.
Summary – Integration	Under Land Use Integration Option 3B2 is slightly preferred over Option 3D due to it following the reserved corridor in the current County Development Plan more closely.

As the impacts of both 3B2 and 3D in terms of Physical Activity and Accessibility and Social Inclusion are similar, the preferred option is determined by examining the results under the other four criteria. In terms of Economics, Option 3B2 is preferred over Option 3D. Under the Environmental criteria, overall Option 3B2 is preferred over Option 3D with Option 3B2 preferred in terms of Biodiversity, Landscape and Visual and Material Assets Non-Agricultural. For Integration and Safety, Option 3B2 is preferred over Option 3D. Considering all Criteria, Option 3B2 is preferred over Option 3D.

Pairwise Competition Options 3B2 and 3E

Pairwise Competition Option Corridors: 3B2 and 3E	
Criteria	Notes
Environment	
Air Quality & Climate	Both options have a slightly negative impact score and have the same preference ranking
Noise	Option 3B2 has an insignificant impact score compared to Option 3E which has a slightly positive impact score. Option 3E is preferred to 3B2 mainly due to fewer receptors near the road corridor.
Biodiversity	Options 3E and 3B2 have similar impacts in terms of Biodiversity, both having a moderately negative impact score and intermediate preference. Option 3B2 and Option 3E also have a similar preference ranking with both options having similar biodiversity impacts.
Waste	Both Options 3B2 and 3E have slightly negative impacts with the two options requiring disposal of earthworks material. Option 3E is slightly preferred over Option 3B2 due to less potential earthworks material disposal.
Material Assets - Agriculture	Both 3B2 and 3E have a moderately negative impact rating. Option 3E results in more severance than Option 3B2, however Option 3E is slightly preferred over Option 3B2 as it impacts on less folios (64 compared to 72).
Material Assets - Non-agricultural	Option 3B2 has an overall minor negative impact score, While Option 3D has a moderately negative impact. Both options have similar impacts across most sub criteria however Option 3B2 corridor does encroach onto Drumoghill football pitch and both have different property impacts. Option 3E has a greater impact on residential and commercial properties, primarily in the vicinity of the proposed junction with the R236 regional road. It also a more significant impact on the impact on forestry. Overall Option 3B2 is slightly preferred over Option 3E.
Cultural Heritage	Options 3B2 and 3E have the same highly negative impact score, however 3B2 is preferred over 3E, due to the anticipated direct (profound) impact Option 3E would have on a standing stone and National monument at Pluck.
Landscape & Visual	Option 3B2 has an impact score of moderately negative, while Option 3E has a highly negative. Option 3B2 has a lower impact due to its positioning closer to the existing N14. Therefore, it is preferred over Option 3E.
Land and Soils	Option 3B2 and 3E have the same impact score (slightly negative) and preferences in terms of Land and Soils. In reviewing the data, Option 3B2 has fewer deep cuttings of greater than 10m (1210m for E compared to 970m for B2). Option 3E has more potential for aggregate which is beneficial in terms of sustainability. Overall both are similar options in terms of Land and Soils.
Water	Option 3E has a moderately negative impact score, due to the additional river crossing required at the Corkey River. This river is upstream of Big Isle Burn, which is within the Lough Swilly SAC. Option 3B2 has a slightly negative impact score, with less sensitive river crossings, and is therefore preferred.
Summary - Environment	Option 3B2 is preferred over 3E in terms of Environment. This is due to Option 3E having a greater negative impact on properties and also a direct (profound) impact on a national monument at Pluck. As Option 3B2 is closer to the existing road, it is also preferred in terms of Landscape and Visual. Additionally, Option 3E would require an additional river crossing at the Corkey river, a tributary to the Big Isle Burn which falls within the Lough Swilly SAC. Option 3E is slightly preferred over Option 3B2 in terms of waste, with estimated material disposal being greater for Option 3B2.
Economy	
Transport Efficiency and Effectiveness	Both Options 3B2 and 3E perform slightly positively, with Option 3B2 being preferred over 3E due to a higher BCR value which is mainly due to having greater benefits.
Wider Economic Impacts	Both 3B2 and 3E rank the same under this criterion.
Funding Impacts	Both 3B2 and 3E rank the same under this criterion
Summary - Economy	While Wider Economic and Funding impacts are the same, Option 3B2 is preferred over Option 3E due to a better economic performance.
Safety	

Pairwise Competition Option Corridors: 3B2 and 3E	
Criteria	Notes
Collision Reduction	Both 3B2 and 3E have a highly positive impact in terms of collision reduction. Option 3E is preferred over 3B2 due to a slightly higher collision saving.
Safety and Security of Road Users	Both 3B2 and 3E rank the same under this criterion
Road Safety Audit (Stage F Part 1)	Option 3B2 has a highly positive impact while 3E has a moderately positive impact, as such, Option 3B2 is preferred. The addition of a junction on the R236 for Option 3E is offline to the existing junction. This results in additional conflict points on Option 3E that are not introduced in Option 3B2 and therefore, 3B2 is preferred over 3E.
Road Safety Impact Assessment	Option 3B2 has a highly positive impact while 3E has a moderately positive impact, as such, Option 3B2 is preferred. Overall in terms of Safety Option 3B2 is preferred over Option 3E.
Summary – Safety	Option 3B2 is preferred over 3E due to higher estimated collision savings using COBALT assessments, and higher ranking on the Road Safety Audit and Road Safety Impact assessment. This is a result of likely introduction of conflict points on the R236 where a grade separated junction is proposed.
Physical Activity	
Health benefits	All options have a highly positive impact score and similar preference
Journey Ambience Benefits	All options have a highly positive impact score. Options 3E and 3B2 have a similar preference.
Other Factors	All options have a highly positive impact score, however Option 3B2 is slightly preferred over 3E due to introduction of an additional junction location on the R236 and increased conflict points for pedestrians/cyclists on a regional route.
Summary – Physical Activity	Options 3B2 and 3E have similar impact scores across the Physical Activity criteria however Option 3B2 is slightly preferred over Option 3E due to introduction of a junction on the R236, which may increase cyclists on this link
Accessibility and Social Inclusion	
Deprived geographical areas	It is not anticipated that the improvements will have any significant impact. All options will have a similar impact and are all scored neutral with similar preferences.
Vulnerable groups	Overall, all options will have a similar impact in terms of Vulnerable Groups. The impact is not anticipated to be significant. As such, all options have a neutral impact score and similar preferences.
Summary – Accessibility and Social Inclusion	Options are unlikely to have enough impact to alter the Pobal HP Deprivation score or have measurable impact on Vulnerable Groups therefore both Options have a similar preference
Integration	
Transport Integration	All options have an impact score of moderately positive as all options improve connectivity to the strategic road network, connectivity between transport modes and support sustainable transport modes. All options will also give better access to other transport infrastructure. As such, there is no discernible difference between Option 3B2 and 3D
Land Use Integration	All options support the county development plan and score moderately positively. Option 3B2 is marginally preferred over Option 3D due to it following the reserved corridor in the current County Development Plan more closely
Geographical Integration	All options have a highly positive impact score and similar preference.
Other government policy integration: Regional Balance	All options have a highly positive impact score and similar preference.
Summary – Integration	Under Land Use Integration Option 3B2 is slightly preferred over Option 3E due to it following the reserved corridor in the current County Development Plan more closely.

In terms of Environment, Option 3B2 is preferred over Option 3E due to a lesser impact on properties, fewer river crossings and less impact in terms of landscape. Option 3B2 is also preferred over 3E in terms of Economy, due to a slightly higher BCR. Option 3B2 is preferred over 3E in terms of safety, as Option 3E introduces additional conflict points. Considering the total performance of these options, Option 3B2 is preferred over Option 3E.

Pairwise Competition Options 3B2 and 3F

Pairwise Competition Option Corridors: 3B2 and 3F	
Criteria	Notes
Environment	
Air Quality & Climate	There is no material difference comparing both options in terms of air quality and climate. Both options have a slightly negative impact score and have the same preference ranking.
Noise	Both options have a neutral / not significant impact score and have the same preference ranking.
Biodiversity	Option 3F has an impact score of slightly negative, while Option 3B2 is moderately negative. Option 3B2 impacts on less biodiversity sites, but there is one impact on a site of high local to county importance at Drumcarn near Drumoghill, making Option 3F preferred over Option 3B2 in terms of Biodiversity.
Waste	Both Options 3B2 and 3F have slightly negative impacts with the two options requiring disposal of earthworks material. Option 3B2 has less potential earthworks material disposal than Option 3F, and therefore Option 3B2 is preferred in terms of waste.
Material Assets - Agriculture	Option 3F is longer than Option 3B2 and affects more folios. Option 3B2 is preferred over Option 3F in terms of Agricultural Material Assets.
Material Assets - Non-agricultural	Both 3B2 and 3F have a slightly negative impact rating, with most impacts being the same, and both options having similar high preferences. However, Option 3F aligns through the middle of a forestry, while Option 3B2 aligns along the edge of the forestry. Conversely, Option 3B2 corridor intersects the football pitch at Drumoghill. Overall both options have a similar preference and impact
Cultural Heritage	Option 3B2 has a highly negative impact rating while Option 3F has a moderately negative rating. This is due to Option 3B2 having a higher quantity of impacts of a similar significance, therefore Option 3F is preferred.
Landscape & Visual	Option 3B2 has a moderately negative impact rating while Option 3F has a highly negative rating. This is due to the fact that Option 3F traverses areas where there is little existing road infrastructure, while Option 3B2 is closer to the existing network. Option 3B2 is preferred in terms of Landscape and visual.
Land and Soils	Options 3B2 and 3F have the same slightly negative impact score. Option 3F is preferred over Option 3B2 due to 3F having less potential for impact on vulnerable aquifers, having more potential for aggregate which is beneficial in terms of sustainability. However there is more potential for soft soils associated with Option 3F. Overall there is a slight preference for Option 3F.
Water	Option 3B2 has a slightly negative impact rating and Option 3F has a moderately negative rating. This is due to Option 3F having a potentially highly negative impact as a result of clashes with existing watercourses, which is likely to require a diversion of the Leslie hill watercourse and also encroaching on the floodplain of the Leslie Hill stream. Option 3B2 is preferred.
Summary - Environment	Option 3F is preferred over 3B2 in terms of Biodiversity, Population, Cultural Heritage and Land & Soils. Conversely Option 3B2 is preferred in terms of Material Assets, Waste, Landscape and Visual and Water. Overall, Options 3B2 and 3F are similar in terms of impacts on the environment.
Economy	
Transport Efficiency and Effectiveness	Options 3B2 and 3F have impact ratings of slightly positive and neutral, respectively, Option 3B2 is preferred over Option 3F as it has a higher BCR (0.65 compared to 0.39). Option 3F has the lowest BCR of all options
Wider Economic Impacts	Both 3B2 and 3F rank the same under this criterion.
Funding Impacts	Both 3B2 and 3F rank the same under this criterion.
Summary - Economy	In terms of wider economic impacts and funding impacts, both options perform similarly. Option 3B2 is preferred over Option 3F, as it has a better BCR primarily due to higher costs and lower benefits .
Safety	
Collision Reduction	Option 3B2 has higher predicted collision reduction than Option 3F using COBALT assessment, therefore Option 3B2 is preferred.

Pairwise Competition Option Corridors: 3B2 and 3F	
Criteria	Notes
Safety and Security of Road Users	Both 3B2 and 3F rank the same under this criterion.
Road Safety Audit (Stage F Part 1)	Option 3B2 has a highly positive impact while 3F has a moderately positive impact, as such, Option 3B2 is preferred. The addition of a junction on the R236 for Option 3F is offline to the existing junction results in additional conflict points on a regional route that are not introduced in Option 3B2 and therefore, 3B2 is preferred over 3F
Road Safety Impact Assessment	Option 3B2 has a highly positive impact while 3F has a moderately positive impact, as such, Option 3B2 is preferred over option 3F. Overall in terms of Safety Option 3B2 is preferred over Option 3F.
Summary – Safety	Option 3B2 is preferred over 3F due to higher estimated collision savings using COBALT assessments, and higher ranking on the Road Safety Audit and Road Safety Impact assessment. This is a result of likely introduction of conflict points on the R236 where a grade separated junction is proposed.
Physical Activity	
Health benefits	Both 3B2 and 3F rank the same under these criteria.
Journey Ambience Benefits	Both 3B2 and 3F rank the same under these criteria.
Other Factors	Both 3B2 and 3F rank the same under these criteria.
Summary – Physical Activity	Options 3B2 and 3F have similar impact scores across the Physical Activity criteria however Option 3B2 is slightly preferred over Option 3F due to introduction of a junction on the R236, which may increase cyclists on this link
Accessibility and Social Inclusion	
Deprived geographical areas	It is not anticipated that the improvements will have any significant impact. All options will have a similar impact and are all scored neutral with similar preferences.
Vulnerable groups	Overall, all options will have a similar impact in terms of Vulnerable Groups. The impact is not anticipated to be significant. As such, all options have a neutral impact score and similar preferences.
Summary – Accessibility and Social Inclusion	Options are unlikely to have enough impact to alter the Pobal HP Deprivation score or have measurable impact on Vulnerable Groups therefore both Options have a similar preference
Integration	
Transport Integration	All options have an impact score of moderately positive as all options improve connectivity to the strategic road network, connectivity between transport modes and support sustainable transport modes. All options will also give better access to other transport infrastructure. As such, there is no discernible difference between Option 3B2 and 3D
Land Use Integration	All options support the county development plan and score moderately positively. Option 3B2 is marginally preferred over Option 3D due to it following the reserved corridor in the current County Development Plan more closely
Geographical Integration	All options have a highly positive impact score and similar preference.
Other government policy integration: Regional Balance	All options have a highly positive impact score and similar preference.
Summary – Integration	Under Land Use Integration Option 3B2 is slightly preferred over Option 3F due to it following the reserved corridor in the current County Development Plan more closely

In terms of Environment both Option 3B2 and Option 3F are similar. In terms of Economy Option 3B2 is preferred due to higher benefits and lower costs. Option 3B2 is also preferred in terms of Safety. Given that the options have the same impact and scoring across the other three criteria, Option 3B2 is preferred over Option 3F.



TEN-T Priority Route Improvement Project, Donegal

Section 3: N14 Manorcunningham to Lifford/Strabane/A5 Link

Option Selection Report

Appendix C3.6 – Road Safety Audit Stage F Part 2

RPS Barry Transportation

TEN-T Priority Route
Improvement, Donegal

Section 3 – N14 Manorcunningham to
Lifford/Strabane/A5 Link

Stage F (Part 2) Road Safety Audit

RPS Barry Transportation

TEN-T Priority Route Improvement, Donegal

Section 3 – N14 Manorcunningham to Lifford/Strabane/A5 Link

Stage F (Part 2) Road Safety Audit

Document Ref: TT_Y16112-SC-RS-HGN-S3-RP-Z-00132

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P01	PJM	PM	PJM	2 nd Oct. 2019	S4

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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 3 (N14 Manorcunningham to Lifford/Strabane/A5 Link) 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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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 Manor Cunningham; and
3. Section 3 – N14 Manor Cunningham to Lifford/Strabane/A5 Link.

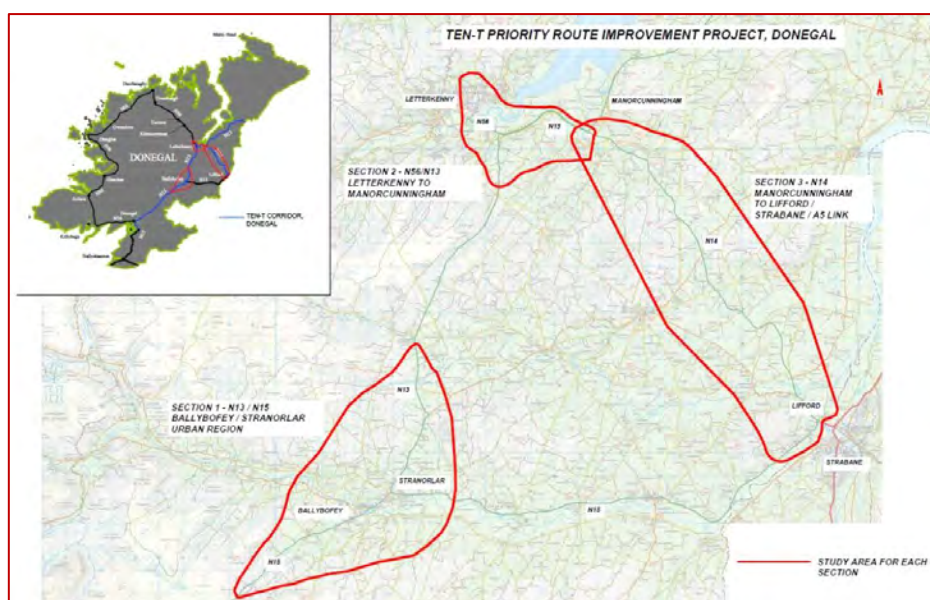


FIGURE 1.1: STUDY AREAS FOR EACH SECTION OF OVERALL SCHEME

This audit is for Section 3, which is described in the following section of this report.

1.4.2 Section 3

The existing N14 between Manor Cunningham and Lifford is the key route connecting Letterkenny and Donegal to the A5 in Northern Ireland. The A5/N2 corridor is a strategic connection between the north-west of Ireland and Dublin. As such, the existing N14 supports traffic making strategic trips from Donegal to Dublin, and also caters for local traffic and farm vehicles.

The existing road is narrow with no hard-shoulder over much of its length, has a high-demand horizontal alignment with limited forward visibility, has no provisions for vulnerable road users, has numerous roadside hazards & direct accesses, lacks safe overtaking opportunities and has historical collisions rates above, and twice above, the national average for a similar type of national road.

The proposed road improvement is to consist of a realignment of the N14 between Lifford and the N13/N14 intersection at Pluck Roundabout. The cross-section for the road improvement will be confirmed in subsequent design phases, however for the purposes of this audit the new road is assumed to 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.

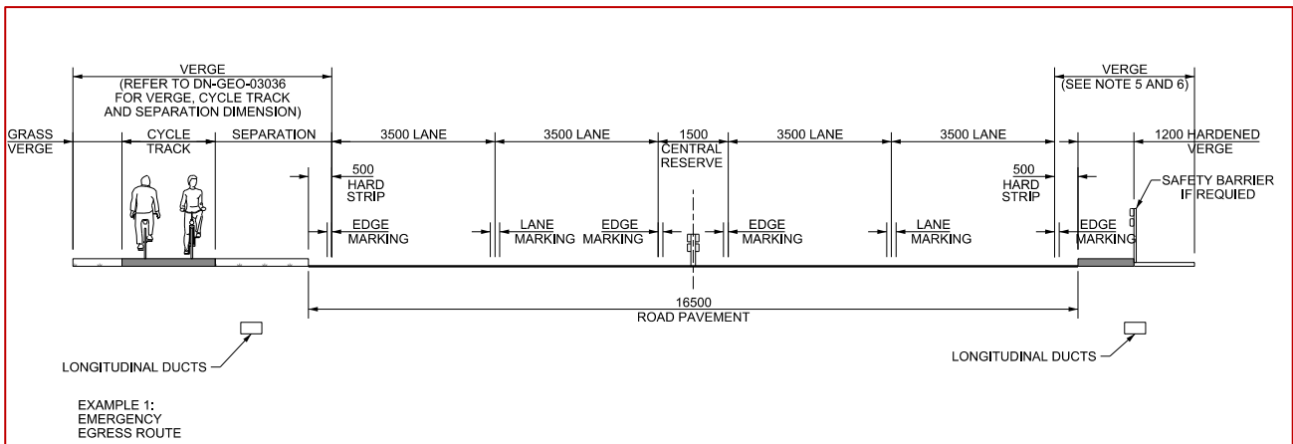


FIGURE 1.2: TYPE 2 DUAL CARRIAGEWAY

The emerging preferred option is approximately 17.6km in length and extends in a predominantly north to south direction between the existing N13/N14 Pluck Roundabout to a proposed new intersection with the N15 to the south of Lifford, where a new link to the A5 is proposed across the River Finn, and all pass to the north of Raphoe.

The emerging preferred option commences at the existing N13/N14 junction (Pluck Roundabout) to the north and proceeds south-eastwards along the line of the existing N14 for a distance of 800m (approximately) before moving offline, passing to the west of Drumoghill. It remains offline and close to the existing N14 corridor for a distance of 9.8km approximately, before then moving to the west of the existing N14 towards its southern terminal at the future N15/A5 Link.

The option will include two river bridges and sixteen grade-separated road crossings. It will connect with the existing Pluck Roundabout at its northern tie-in, a new terminal roundabout is proposed at the southern tie-in, and compact grade-separated junctions are proposed on the existing N14 near Drumoghill & on the existing N14 near the existing N14/R236 junction.

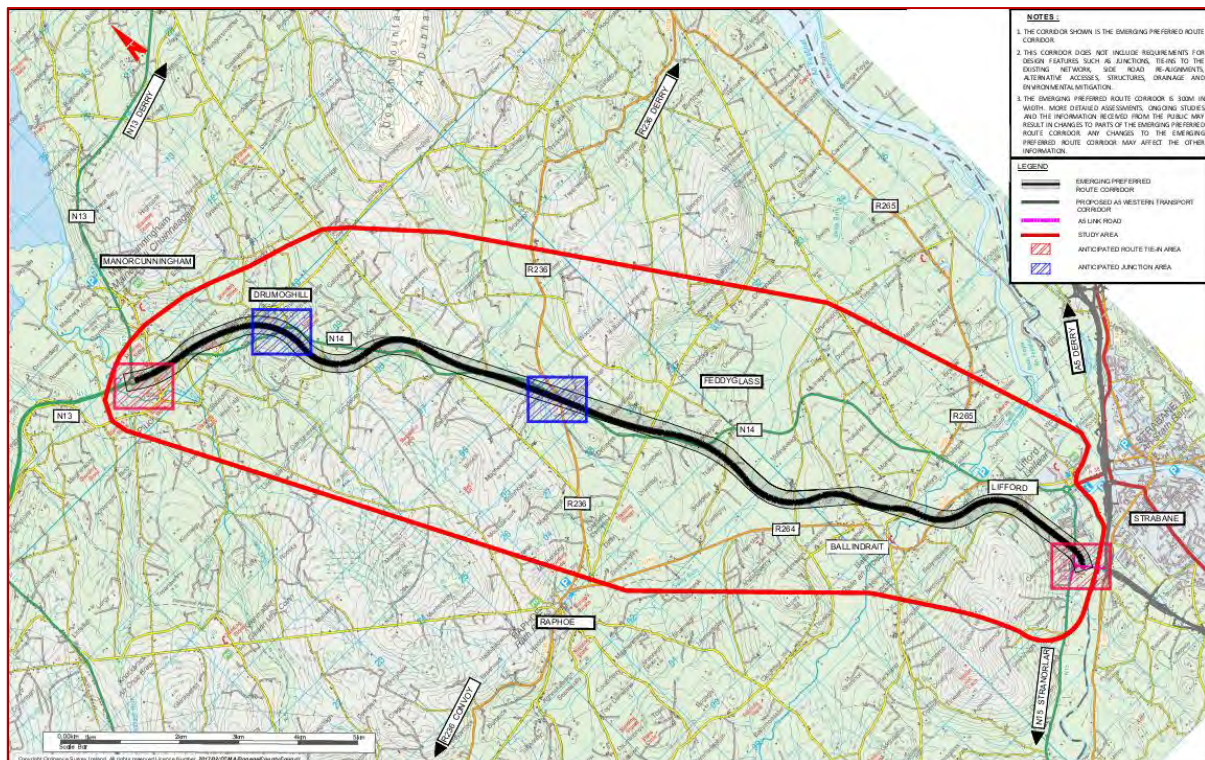


FIGURE 1.3: SECTION 3 EMERGING PREFERRED OPTION

1.4.3 Information Provided to Audit Team

Drawings detailing the emerging preferred option were provided, details of which and 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.

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 1.4. 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.

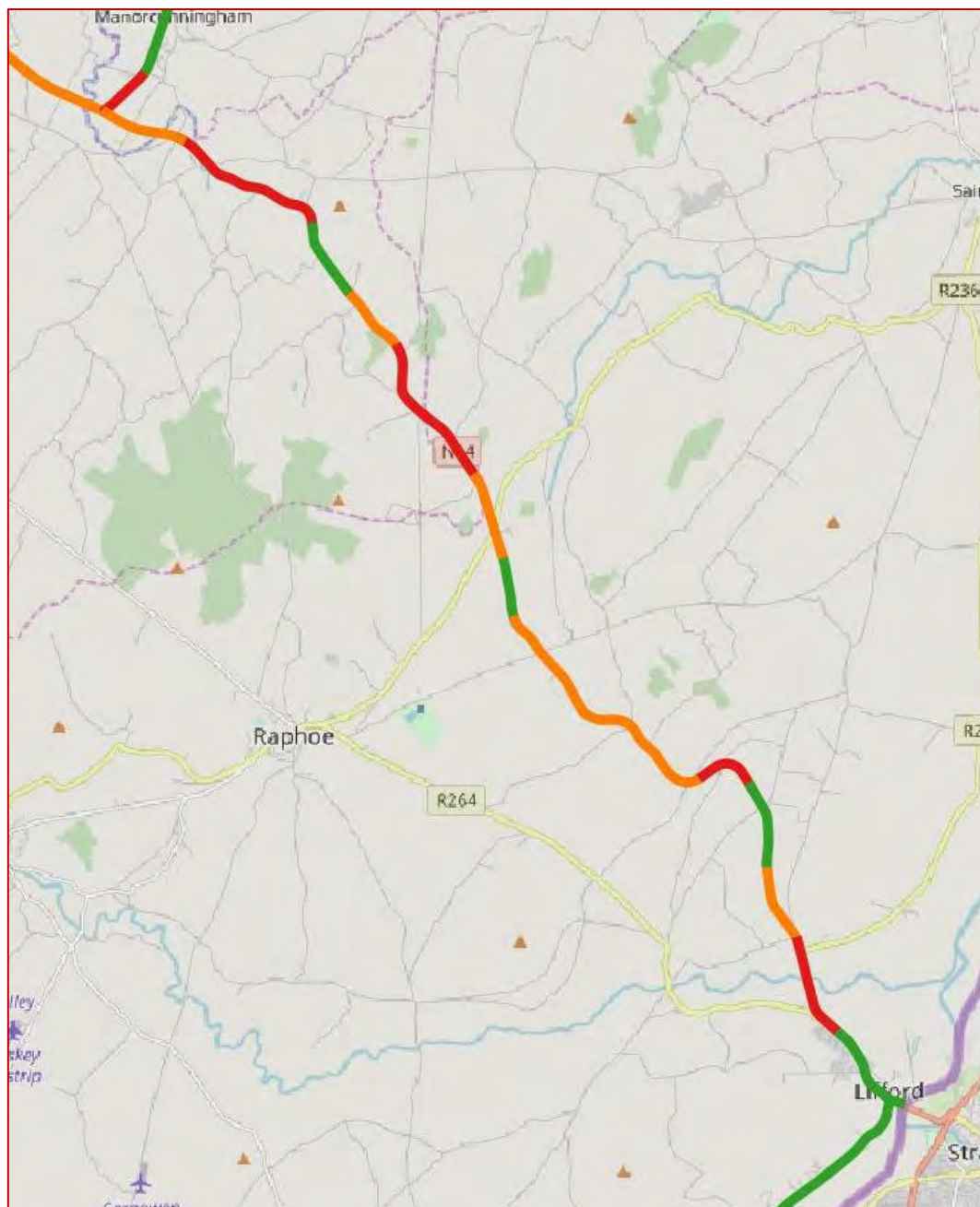


FIGURE 1.4: HD15 COLLISION RATES (2014 TO 2016)

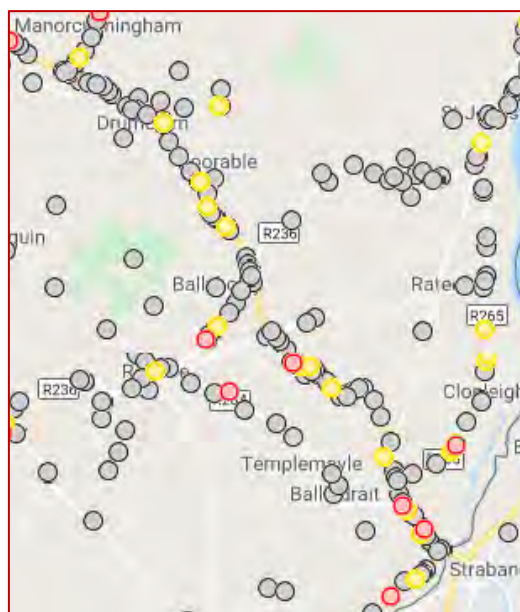


FIGURE 1.5: COLLISION RECORDS FROM ROAD SAFETY AUTHORITY WEBSITE

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 joint third out of the nine 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.

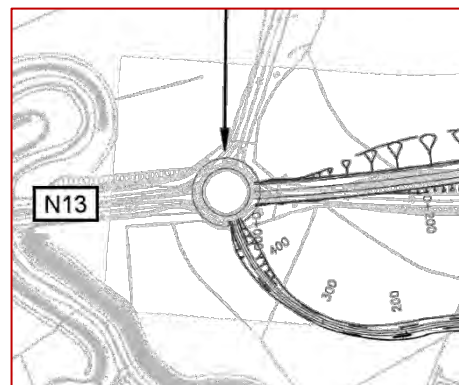
2.1 Problem

Location: Northern 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 a terminal roundabout at the southern tie-in with the A5 Link, a compact grade-separated junction with the R264 & existing N14 and to retain the Pluck Roundabout at the northern tie-in.

On the adjacent section of the N13 west of Pluck Roundabout, towards Letterkenny, within Section 2 of the Scheme it is proposed to provide a compact grade-separated junction with the L1114 at Trimragh and roundabouts at the tie-in with the Bonagee Link, the N56 and the realigned N13 (south).



It is considered appropriate that terminal roundabouts be provided at Lifford and Letterkenny 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 proposed realigned 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.

Drivers who travel through a grade-separated junction (e.g. at 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 design development 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.

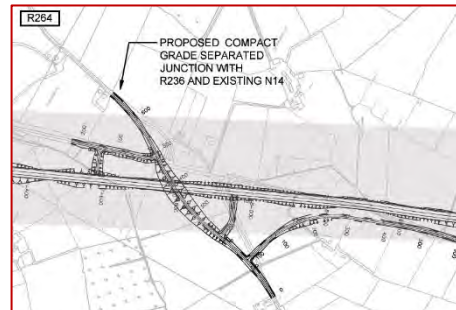
2.2 Problem

Location: Compact Grade-Separated Junction with Existing N14/R236

Summary: Layout of compact grade-separated junction with the existing N14/R236 will increase the number of conflicting, in particular right-turning, manoeuvres within a short length of road with a consequent increased risk of collisions.

The proposed layout of the compact grade separated junction with the existing N14/R236 will result in relatively complex road layout for traffic wishing to exit/join the mainline, in particular traffic wishing to join the mainline southbound carriageway or for traffic travelling along the existing N14.

The layout will also result in four at-grade t-junctions in close proximity on the regional road, increasing the number of conflicting manoeuvres within a short section of road.



Recommendation

During the design development, amend the proposed junction layout to simplify the layout and reduce the number of junctions.

2.3 Problem

Location: Compact Grade-Separated Junction with Existing N14 at Drumoghill

Summary: Increased number of at-grade junctions within a relatively short length (1.2km) of undivided legacy road may result in an increased likelihood of collisions.

The proposed location of the compact grade separated junction with the existing N14 at Drumoghill will result in two new junctions on the existing N14 on a section of road where there are three existing at-grade junctions and where the historical collision rate is greater than twice the average for a similar type of national road (e.g. rural, undivided). This will result in five junctions within 1.2km (approximately).



The number of junctions, and the associated turning manoeuvres, will lead to an increased likelihood of collisions.

Recommendation

During the design development, where possible reduce/rationalise the number of junctions along this section of the existing N14 as part of the scheme. Include treatment of this section of the existing road and the remaining junctions to ensure safe turning manoeuvres can be undertaken.

2.4 Problem

Location: Compact Grade-Separated Junction with Existing N14 at Drumoghill

Summary: Insufficient forward visibility to new junctions on the existing N14 could lead to side-on collisions with vehicles turning into, or out of, the new junction.

The proposed location of the compact grade separated junction with the existing N14 at Drumoghill will result in two new junctions on a section of the existing N14 where the historical collision rate is greater than twice the average for a similar type of national road (e.g. rural, undivided).



The existing road cross-section is narrow, with limited forward visibility due to the existing alignment and the proximity of the roadside boundary (e.g. hedges) to the carriageway. Should drivers travelling along the existing road have insufficient forward visibility to the new junction this could lead to inappropriate approach speeds and a failure to observe a slow-moving or stationary vehicle turning into, or out of, the junction resulting in side-on collisions.

Recommendation

During the design development ensure adequate forward visibility, for the likely operational speeds along the existing road following scheme construction, on the existing N14 towards the proposed new junctions, and adequate visibility splay for drivers exiting from the new links.

Right-turn ghost-island arrangements may be required at these locations to allow stationary right-turning drivers to wait for a safe gap in the opposing traffic without presenting a hazard to through traffic on the existing road.

2.5 Problem

Location: Compact Grade-Separated Junction with Existing N14 at Drumoghill

Summary: Insufficient awareness of upcoming junction by mainline drivers could lead to late exit manoeuvres and loss of control incidents or a lack of preparedness for traffic merging from the junction leading to shunt collisions.

The proposed location of the compact grade separated junction with the existing N14 at Drumoghill is on, or close to, curves in the mainline horizontal alignment.

This may reduce an approaching northbound mainline driver's awareness of the junction leading to late exit manoeuvres and loss of control incidents or a lack of preparedness for traffic merging from the junction leading to shunt collisions.



Recommendation

During the design development ensure adequate forward visibility for mainline drivers on the approaches to the proposed junctions. Ensure that safe diverging and merging manoeuvres can be undertaken (e.g. if necessary provide acceleration and deceleration lanes).

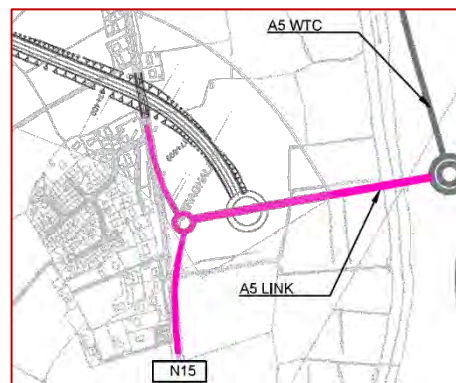
2.6 Problem

Location: Southern Tie-in at N15 & A5 Link

Summary: Roundabouts in close proximity leading to increased numbers of turning manoeuvres and an increased likelihood of collisions.

The southern terminal of the proposed realigned road consists of a roundabout located on the proposed A5 Link, with two roundabouts in close proximity.

This arrangement results in a relatively complex road layout at the southern terminal and increases the number of potential conflicting manoeuvres being undertaken. Increased numbers of turning manoeuvres results in an increased likelihood of collisions.



Recommendation

During the design development, examine the feasibility of improving this junction arrangement, such as by providing a single 4-arm roundabout at the southern tie-in.

2.7 Problem

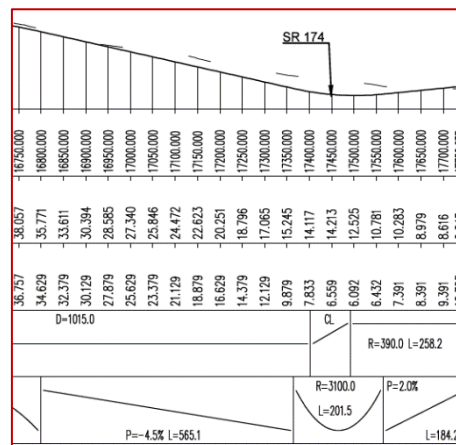
Location: Approach to Southern Terminal Roundabout

Summary: Loss of control collisions at relatively low-radius curve.

The horizontal alignment on the southbound approach to the southern terminal roundabout includes a curve with a radius of approximately 390m on the immediate approach to the roundabout.

Drivers who have been travelling for some distance along the new road at the Design Speed may fail to negotiate this curve leading to loss of control incidents.

This situation will be exacerbated by the preceding vertical alignment which, while to standard, includes a 4.5% down-gradient over a distance of approximately 1.5km resulting in southbound drivers carrying significant speed into the curve.



Recommendation

During the design development include measures to ensure the safety on the approach to the roundabout such as:-

- Provide measures to ensure that drivers adequately moderate their speeds on the southbound approach to this curve; or
- Amend horizontal alignment to match the expected operational speeds at this location.

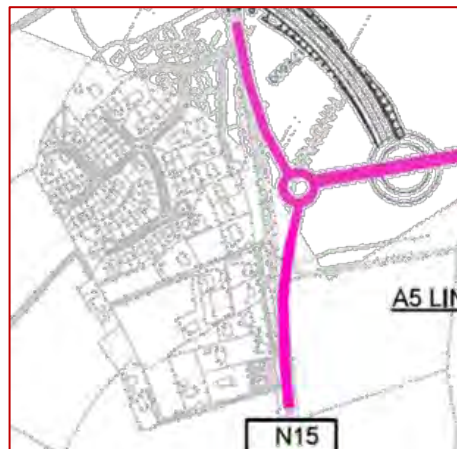
2.8 Problem

Location: Southern Tie-in at N15 & A5 Link

Summary: Unexpected junction type (roundabout) on rural section of national road could lead to overshoot incidents or run-off-road incidents.

The A5 Link proposal includes the provision of roundabout on the existing N15, which could 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 high-demand nature of the vertical alignment of the existing N15 to the south-west of the proposed roundabout location which limits forward visibility for northbound drivers approaching the roundabout.



Recommendation

During the design development ensure that adequate forward visibility to, and advance warning of, the roundabout is provided for northbound drivers on the N15.

2.9 Problem

Location: Mainline Approaches to Terminal 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 terminal roundabouts at either end. The proposed scheme is a type 2 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 mainline approaches to the terminal roundabouts, and that where required median widening is provided to accommodate any necessary signage on these approaches.

2.10 Problem

Location: Throughout the Scheme - Mainline

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

The proposed mainline cross-section 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 including either: -

- 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.

2.11 Problem

Location: Throughout the Scheme - Mainline

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 may require verge and/or median widening on some horizontal curves in order to ensure adequate forward visibility. At this early stage in the design development the required widening is not normally indicated.

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.

2.12 Problem

Location: Throughout the Scheme - Mainline

Summary: Possible unsafe parking at scenic view locations.

The road improvement is located in an area with high volumes of seasonal/tourist traffic. The proposed road may present scenic views across the adjacent landscape at certain locations. This, in turn, could lead to drivers choosing to stop at these locations.

The absence of a suitable parking location could result in unsafe roadside parking with a resulting increased risk of collisions between high-speed through traffic and non-motorised users.

Risk of unsafe parking along road at unscreened scenic viewpoints increasing the likelihood of vehicular/non-motorised road user collisions.

Recommendation

During the design development provide screen landscaping at appropriate locations.

2.13 Problem

Location: Sections of Mainline near Lifford and Drumoghill

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

It is not proposed to include any provisions for pedestrians along the mainline. The proximity of the road to Lifford and Drumoghill could lead to pedestrian traffic along sections of the mainline as part of a leisure walking route.

Pedestrians using the mainline in the absence of dedicated facilities will potentially 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.

At-grade non-motorised user crossings at junctions, or crossings away from likely desire lines, will lead to pedestrians or cyclists interacting with high-speed traffic leading to collisions between non-motorised road user groups and vehicles.

Recommendation

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

2.14 Problem

Location: Existing N14/N15 Roundabout in Lifford

Summary: Changes to traffic patterns at the existing roundabout in Lifford could give rise to difficulties for drivers on other, lightly trafficked, arms of the roundabout safely entering the roundabout.

It is unclear when the proposed A5 Link will be constructed. Should this scheme be completed before the A5 Link is in place traffic wishing to travel to/from the A5 will travel along the existing N15 from the southern terminal roundabout to the existing roundabout in Lifford.

This will change the predominant traffic flows through the existing roundabout and could give rise to an imbalance in the traffic flows leading to difficulties for traffic on other, lightly trafficked, arms of the roundabout in entering the roundabout safely, resulting in driver frustration and rash manoeuvres.

Recommendation

During the design development assess the likely performance of the existing roundabout in Lifford and if necessary incorporate measures to address any safety issues arising.

2.15 Problem

Location: Existing N14 south of Existing N14/R264 Compact Grade-separated Junction

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



The realigned section of the existing N14, south of the proposed compact grade-separated junction between the mainline and the existing N14 and the R264 (approximate mainline chainages 8,100 to 8,600) runs close to the proposed mainline. There is a risk that during the hours of darkness that lights of vehicles on the realigned N14 could dazzle drivers on the mainline northbound carriageway 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 diverge for the nearby junction.

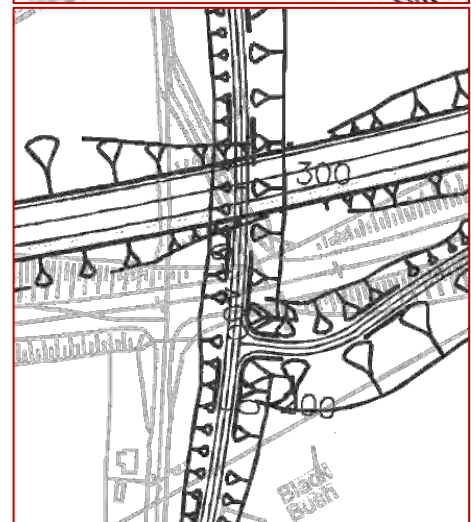
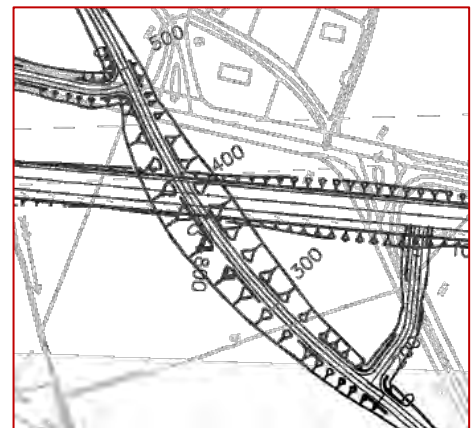
Recommendation

During the design development provide anti-dazzle screening measures between the mainline and the side road at this location.

3 Observations

- 5.1 In a number of locations junctions/accesses on realigned side roads are indicated adjacent to proposed underbridges or 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 nearby structure or 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:



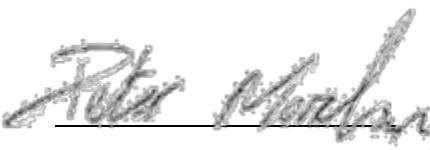
Dated:

2nd Oct. 2019

ROAD SAFETY AUDIT TEAM MEMBER

Peter Morehan

Signed:



Dated:

2nd Oct. 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 3B2 Plan & Profile: Figure 3B2 Sheet 1 of 5: Emerging Preferred Route	Y16112-3B2-0100-0102	P03
Route 3B2 Plan & Profile: Figure 3B2 Sheet 2 of 5: Emerging Preferred Route	Y16112-3B2-0100-0102	P03
Route 3B2 Plan & Profile: Figure 3B2 Sheet 3 of 5: Emerging Preferred Route	Y16112-3B2-0100-0103	P03
Route 3B2 Plan & Profile: Figure 3B2 Sheet 4 of 5: Emerging Preferred Route	Y16112-3B2-0100-0104	P03
Route 3B2 Plan & Profile: Figure 3B2 Sheet 5 of 5: Emerging Preferred Route	Y16112-3B2-0100-0105	P03
Section 3 Emerging Preferred Route 3B2 S3 P02	Section 3 Emerging Preferred Route 3B2 S3 P02	P02
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: 1336546/5353/Stage F

**re: N14 N14 Manorcunningham to Lifford 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 N14 N14 Manorcunningham to Lifford 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 3 – N14 Manorcunningham to Lifford/Strabane/A5 Link

Route No.: N14

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	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. A roundabout is considered appropriate and safe for this transition.	Yes
2.2	Yes	Yes		
2.3	Yes	Yes		
2.4	Yes	Yes		
2.5	Yes	Yes		
2.6	Yes	Yes		
2.7	Yes	Yes		
2.8	Yes	Yes		
2.9	Yes	Yes		
2.10	Yes	Yes		
2.11	Yes	Yes		
2.12	Yes	Yes		

Road Safety Audit Feedback Form

Scheme: TEN-T Priority Route Improvement, Donegal

Section 3 – N14 Manorcunningham to Lifford/Strabane/A5 Link

Route No.: N14

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

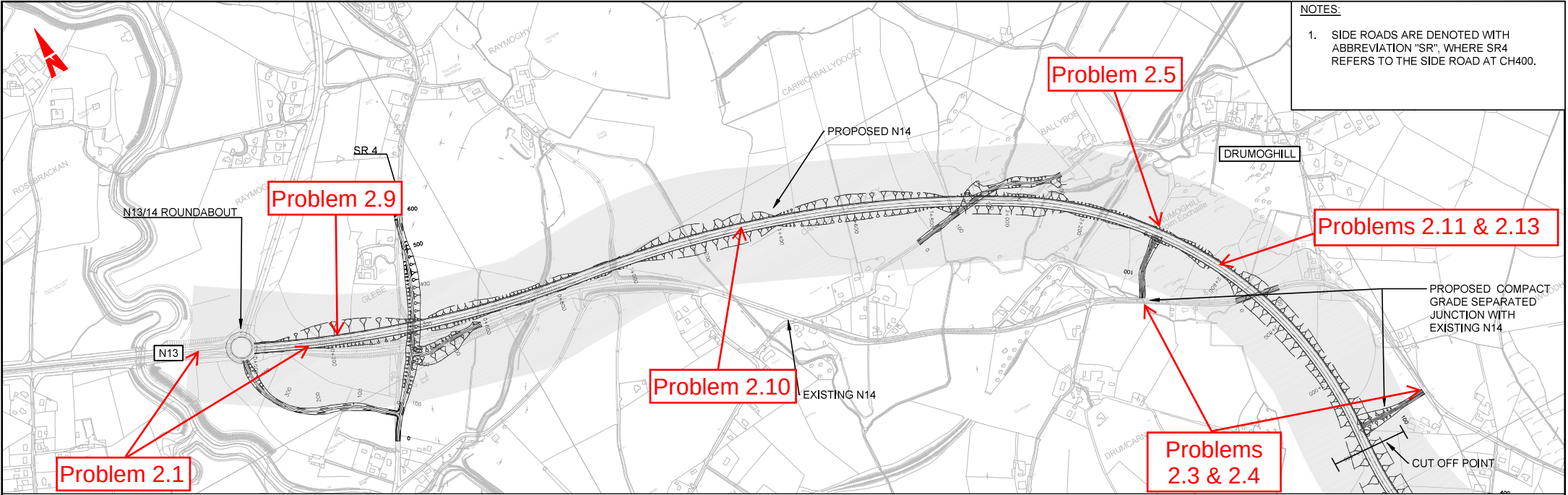
To Be Completed By Designer				To Be Completed By Audit Team Leader
Paragraph No. in Safety Audit Report	Problem Accepted (Yes/No)	Recommended Measure(s) Accepted (Yes/No)	Describe Alternative Measure(s). Give reasons for not accepting recommended measure	Alternative Measures or Reasons Accepted by Auditors (Yes/No)
2.13	Yes	Yes		
2.14	Yes	Yes		
2.15	Yes	Yes		

Signed: Eamon Dohy Designer Date 2nd Oct 2019

Signed: Peter J. Monahan Audit Team Leader Date 2nd Oct. 2019

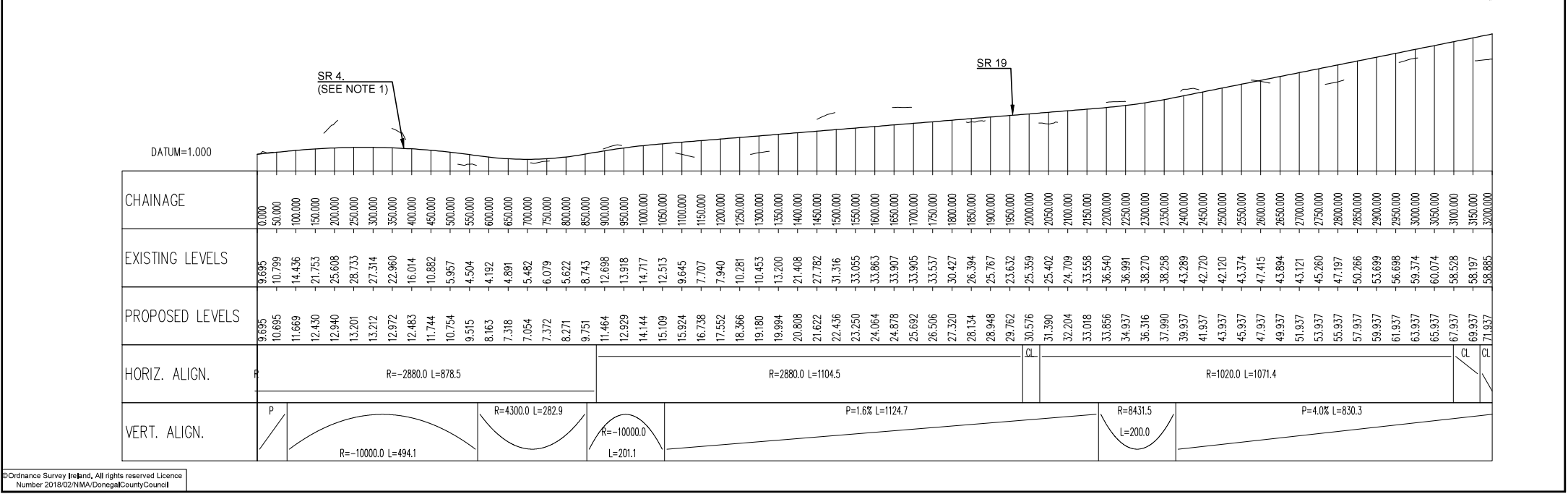
Signed: Nice McHugh Employer Date 4/10/2019

Appendix D – Problem Locations



NOTES:

1. SIDE ROADS ARE DENOTED WITH ABBREVIATION "SR", WHERE SR4 REFERS TO THE SIDE ROAD AT CH400.



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Notes

DO NOT SCALE, use figured dimensions only.

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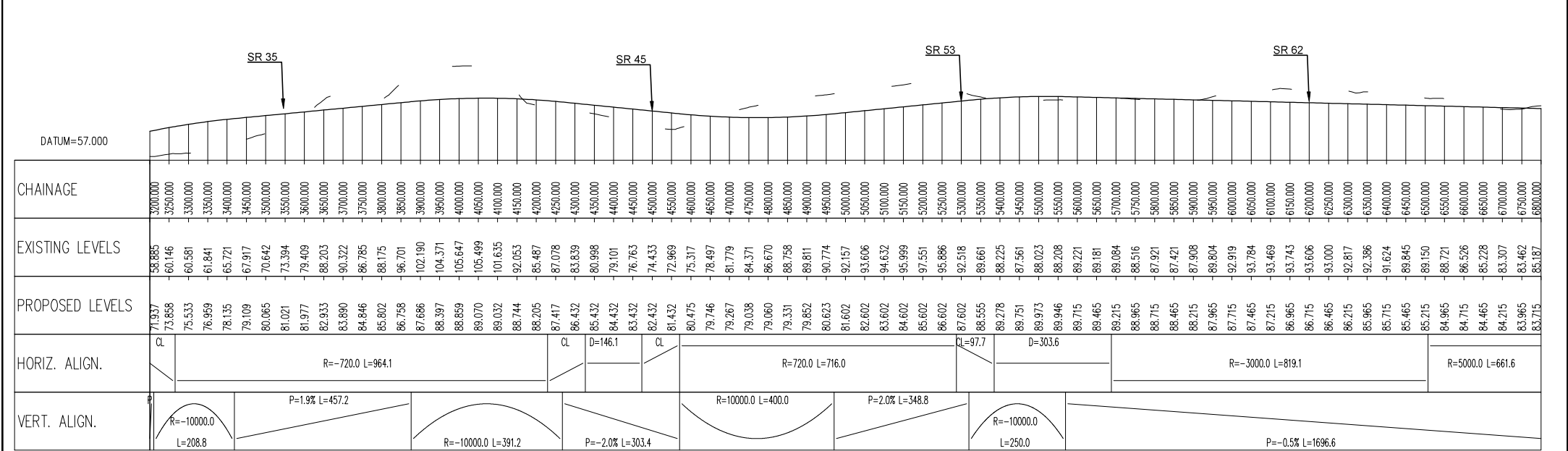
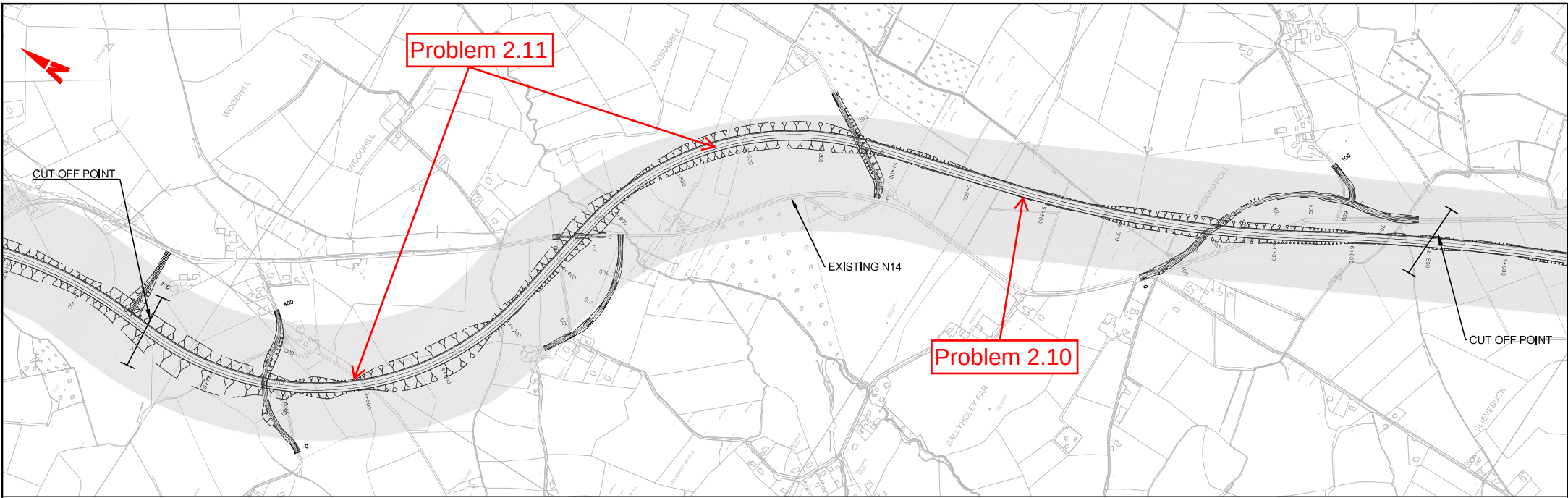
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The options shown are draft only and subject to change. No detailed assessments, on-going studies and the information shown on this drawing are not to be used for any other purpose without the written consent of Barry Transportation.

Rev.	Date	Drawn	Description	Checked	Appr.
P03	13/03/19	JHM	ISSUE FOR OPTION SELECTION REPORT	EC	ED
P02	28/06/18	JHM	UPDATE FOR COMMENT & REVIEW	EC	ED
P01	06/08/18	JHM	COMMENT & REVIEW	EC	ED

Project Title: TENT PRIORITY ROUTE IMPROVEMENT PROJECT DONEGAL		Status:
Drawing Title: ROUTE 3B2 PLAN & PROFILE		S3
FIGURE 3B2 SHEET 1 OF 5: EMERGING PREFERRED ROUTE		
Designed: JHM	File Name: P:\11152474\SHI\03B2\CH-0101 TO 0105 3B2 PLAN AND PROFILE	Drawing No:
Drawn: JHM	Scale: AT 1:5000	Rev:
Approved: ED	Date: 10/01/2019	P03
Checked: EC		



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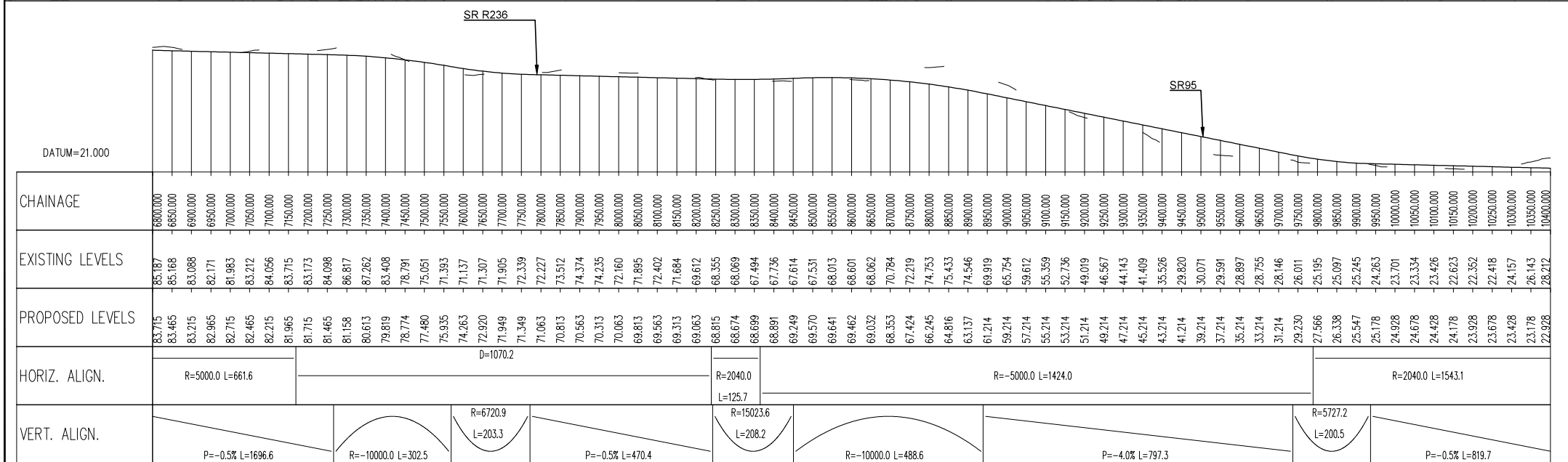
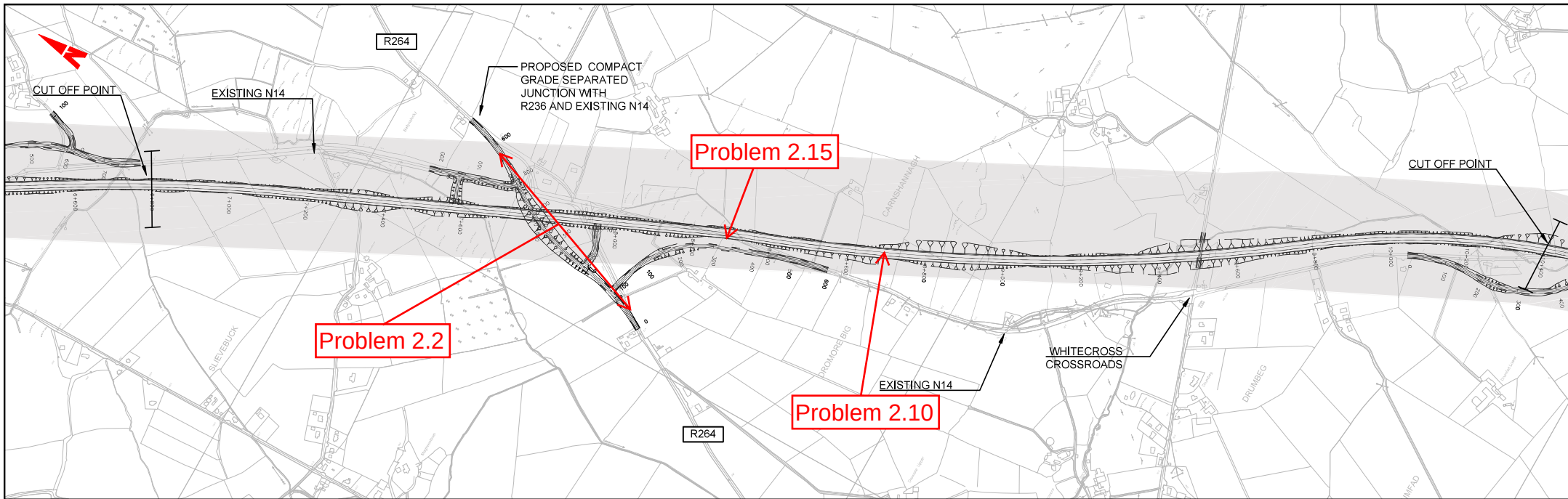
Notes
DO NOT SCALE, use figured dimensions only.
All levels are referred to Ordnance Survey datum, Mean Sea Level.
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responsibility for this document to any other party other than the party by which it was commissioned.
The options shown are draft only and subject to change. More detailed assessments, on-going audits and the information changes to these constraints and options shall be the responsibility of the client.

Rev.	Date	Drawn	Description	Check	Appr.
P01	10/01/2019	JH	COMMENT & REVIEW	EC	ED
P02	28/08/18	JH	UPDATE FOR COMMENT & REVIEW	EC	ED
P03	10/03/19	JH	BLUE FOR OPTION SELECTION REPORT	EC	ED

Project Title: TEN-T PRIORITY ROUTE IMPROVEMENT PROJECT DONEGAL		Status:
Drawing Title: ROUTE 3B2 PLAN & PROFILE FIGURE 3B2 SHEET 2 OF 5 EMERGING PREFERRED ROUTE		S3
Designed: JMM	File Name: T:\16112-3B2-ROUTE-IMPROVEMENT-CH02011 TO 0105 3B2 PLAN AND PROFILE	Drawn No.
Drawn: JMM	Scale: 1:5000	Rev: P03
Approved: ED	Date: 10/01/2019	Y16112-3B2-0100-0102
Checked: EC		

File Name: \\H:\Barr\Barr\161115 - TENET Priority Route Improvement Project Donegal\GIS\CAD\2D_Route Selection\Stage 2 Route Selection\Task 161115_0105_001_001.dwg
Project: TENET Priority Route Improvement Project Donegal\GIS\CAD\2D_Route Selection\Stage 2 Route Selection\Task 161115_0105_001_001.dwg



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Notes
DO NOT SCALE, use figured dimensions only.
All levels are referred to Ordnance Survey datum, Mean Sea.
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The options shown are draft only and subject to change. More detailed assessments, including studies and the information changes to these constraints and options.

Rev.	Date	Drawn	Description	Chkd	App.
P01	06/06/18	JH	COMMENT & REVIEW	EC	ED
P02	28/06/18	JH	UPDATE FOR COMMENT & REVIEW	EC	ED
P03	10/07/18	JH	ISSUE FOR OPTION SELECTION REPORT	EC	ED

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Project Title: TENET PRIORITY ROUTE IMPROVEMENT PROJECT DONEGAL		Status:
Drawing Title: ROUTE 3B2 PLAN & PROFILE FIGURE 3B2 SHEET 3 OF 5 EMERGING PREFERRED ROUTE		63
Designed: EC	File Name:	Drawing No.
Drawn: JMM	Scale: 1:5000	Y16112-3B2-0100-0103
Approved: ED	Date: 10/07/2019	Rev: P03
Checked: EC		

