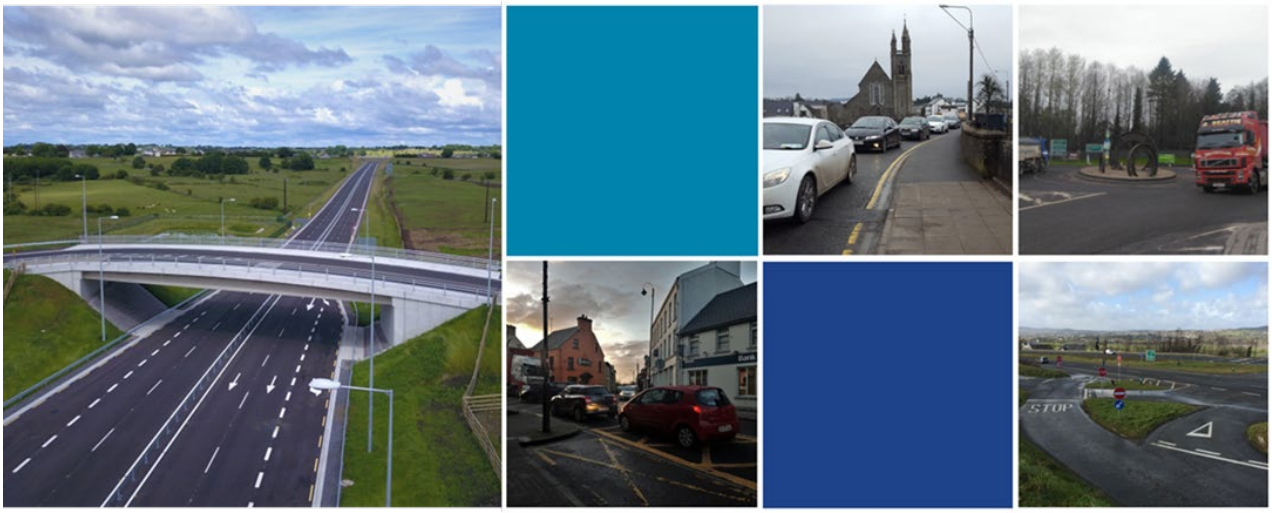
Bonneagar Iompair Éireann
Transport Infrastructure Ireland

Comhairle Contae Dhún na nGall
Donegal County Council

Donegal NRO
Oifig Boichno Naisiunta Dhun na nGall

TEN-T Priority Route Improvement Project, Donegal

Phase 2, Option Selection Report
Volume A – Main Report



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RPS BARRY TRANSPORTATION

Rialtas na hÉireann
Government of Ireland

Tionscadal Éireann
Project Ireland 2040

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Document Control Sheet

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EXECUTIVE SUMMARY

The TEN-T routes in Donegal are broadly described below:

- **N13:** a strategic route that connects Letterkenny with Derry to the north and Stranorlar/Ballybofey to the south. The N13 connects with three other national routes including; the N14 to Lifford, the N56 (national secondary route) to Letterkenny and north Donegal and to the N15 in Stranorlar/Ballybofey.

- **N14:** a strategic route that connects Letterkenny to Lifford and links to Strabane in County Tyrone, Northern Ireland. The A5 aligns to the outskirts of Strabane, and is the key route linking the northwest of Ireland to the N2 in Monaghan and onto Dublin; and

- **N15**: a strategic route that connects to Sligo and Donegal towns and continues north easterly through Ballybofey and Stranorlar to Lifford where it connects to the N14 and links to Strabane in County Tyrone, Northern Ireland. The section between Stranorlar and Lifford does not form part of the TEN-T network. The N15 also links south Donegal to Derry and Belfast.

These TEN-T strategic routes in Donegal connect to the rest of the TEN-T network in Northern Ireland and Ireland. They are particularly important for both tourism and industry, as they comprise part of the Wild Atlantic Way, and provide the only transport connectivity (due to the lack of rail infrastructure) to Letterkenny and the wider region for trade, including Killybegs fishing harbour.

Figure ES 1: TEN-T Corridor across Ireland

The EU transport infrastructure policy establishes a two-tier TEN-T network comprising:

- Comprehensive network – this network ensures effective connectivity to all EU nations and feeds into the core network and regional and national level.

- Core network – the most strategic elements of the TEN-T network.

The national primary roads included in the TEN-T Priority Route Improvement Project, Donegal form part of the Comprehensive Network. EU Regulation 1315/2013 item (11) states that the comprehensive network should be:

"A Europe-wide transport network ensuring the accessibility and connectivity of all regions in the Union, including the remote, insular and outermost regions …… and strengthening social and economic cohesion between them. The guidelines laid down by this Regulation ("the guidelines") should set the requirements for the infrastructure of the comprehensive network, in order to promote the development of a high-quality network throughout the Union by 2050".

Much of the TEN-T road network in Donegal does not meet the current design standards for a National Primary road in terms cross-section, horizontal and vertical alignments, junctions, overtaking opportunities, drainage, etc. Given the strategic importance of the N13, N14 and N15 routes to Donegal providing connectivity to the rest of the island, a study into the condition of the existing infrastructure was undertaken as part of the Trans-European Transport Network Corridor Needs Study, Donegal in 2015. This study reviewed the TEN-T network in Donegal, assessing the network against various technical, non-technical, economic, traffic and safety criteria. The assessment comprised a site visit, journey time surveys and a desktop study for all parts of the TEN-T network in the county, except the N15 from south of Ballybofey to the county boundary, as numerous upgrades of this section have been completed in recent times.

Six sections of the TEN-T network in Donegal were identified and ranked in order of intervention priority due to deficiencies in the existing infrastructure provision. Three sections were identified as the highest priority sections requiring intervention in the TEN-T Corridor Needs Study, Donegal (November 2015).

The TEN-T Priority Route Improvement Project, Donegal consists of the following sections of road network in Donegal.

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

The study areas were developed based on the Sections above and allowing for areas to sufficiently consider constraints, options development and future road improvements.

The TEN-T Priority Route Improvement Project, Donegal includes the study areas shown in **Figure ES 2.**

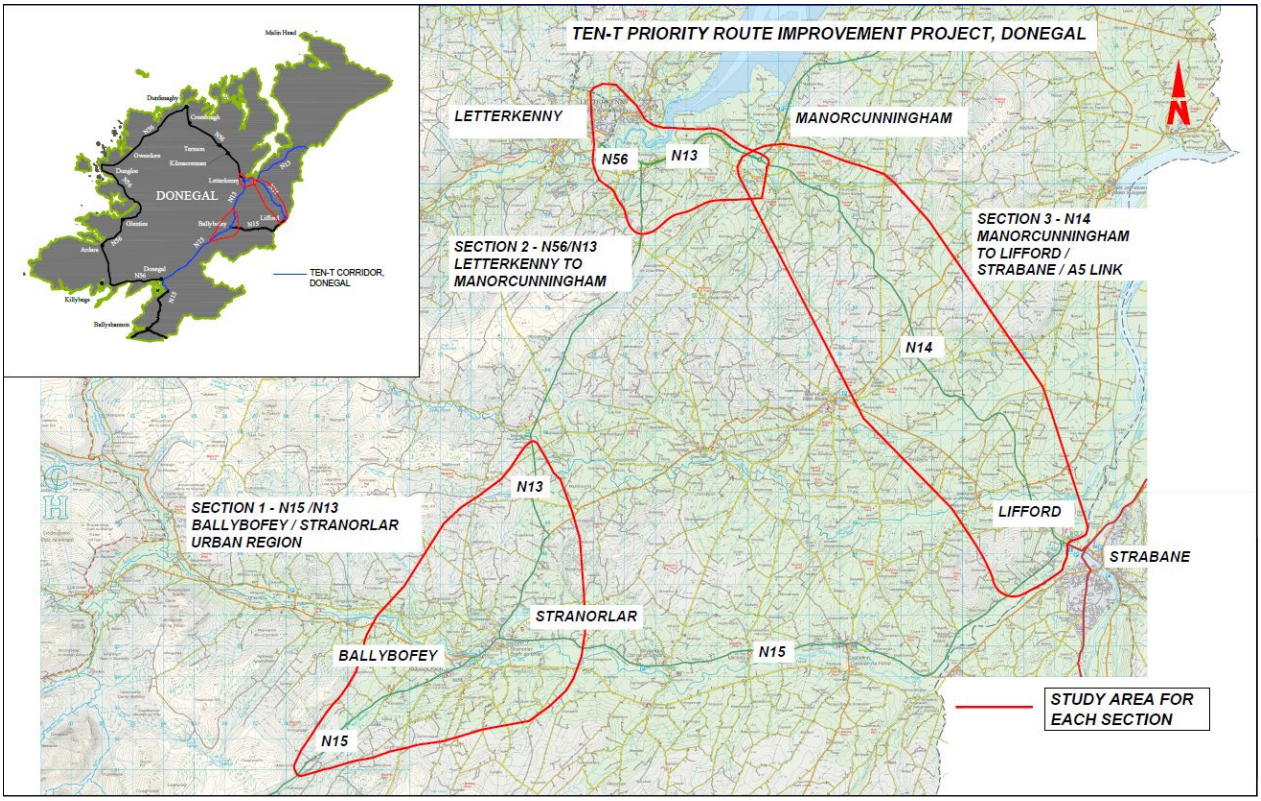

Figure ES 2: Study Areas for the TEN-T Priority Route Improvement Project, Donegal

Scheme Need and Objectives

Scheme need arises from several issues on the existing national road network corridors; including:

- Poor network resilience to and from Letterkenny due to an over reliance on the existing N56 (four lane road) between the Polestar and the Dry Arch roundabouts. Heavy traffic volumes and frequent delays result for traffic from Derry, Strabane and Dublin to the east and/or Ballybofey/Stranorlar, Donegal, Sligo and Galway to the south.
- Conflicts between strategic and non-strategic users resulting in traffic congestion, higher collision rates and unreliable journey times along the national road network.
- Poor collision history; higher than national average rates for similar roads along much of the three sections.
- Poor journey time reliability for public transport operators from Letterkenny to Dublin via the N14 and to Sligo and Galway via the N13 and N15 through Ballybofey and Stranorlar.
- Poor cross-sectional characteristics of the N15 through Ballybofey/Stranorlar and the N14 from Manorcunningham to Lifford which do not correlate with those of national primary routes.
- The N56 between Polestar and Dry Arch roundabouts and the N15 through Ballybofey/Stranorlar are currently operating beyond capacity.
- Excessive gradients on the N13 southern approach to Letterkenny (locally known as Lurgybrack).
- Numerous at-grade junctions and access conflict points on the existing N13 dual carriageway east of Letterkenny and on the N14 Manorcunningham to Lifford section that do not align with the characteristics of a TEN-T strategic corridor and do not meet current national road design standards.
- Unsustainable number of direct accesses onto the existing N56 between the Polestar and Dry Arch roundabout, and the N13 south of Dry Arch Roundabout (including St Patrick's School).

Regardless of the outcome of the UK's negotiations on leaving the EU (termed as Brexit), and the final border arrangements between the Republic and Northern Ireland, Donegal's peripheral location is likely to be exacerbated. Additional reliance on ports and infrastructure on the island of Ireland further increases the need to improve connectivity and accessibility to Donegal from Dublin to the east and Sligo/Galway to the south. This will subsequently improve connectivity to the rest of the country and prominent EU import/export infrastructure such as; ports (Dublin, Rosslare, Foynes/Shannon and Cork/Ringaskiddy) and airports (Dublin, Knock, Shannon and Cork).

The scheme is assessed against project objectives which are based on multiple criteria outlined by the Department of Transport in their publication 'Common Appraisal Framework for Transport Projects and Programmes', dated March 2016. Multi-criteria headings are as follows:

- Economy
- Safety
- Environment
- Accessibility & Social Inclusion
- Integration
- Physical Activity

The objectives of the proposed road development are summarised below. These objectives have been derived based on the deficiencies of the existing corridors and responding to the aspirations of European, national and strategic policy documentation.

Economy	▪ To improve the efficiency of the transport network by improving journey time and journey time reliability.
Safety	▪ To reduce the frequency and severity of collisions and to improve the overall safety of the national road network in Donegal.

	▪ To improve safety for users by separating strategic traffic from local traffic through towns, villages and rural communities.
Environment	▪ To reduce overall air pollution levels near sensitive receptors caused by congestive queuing of vehicles and/or excessive vertical gradients. ▪ To reduce overall traffic noise levels near sensitive receptors; includes ribbon developments. ▪ To reduce risk of watercourse pollution along the existing road network.
Accessibility and Social Inclusion	▪ Improve accessibility to/from the North West region, helping to reduce deprivation caused by the geographic location of Donegal, which is currently an area covered by the Rural Social Scheme. ▪ Remove strategic and commercial traffic from local towns and communities, thereby making these communities more inviting and encouraging more travel independence for non-motorised users and vulnerable groups. ▪ Improve accessibility to employment in regional and national centres including Donegal, Letterkenny, Derry, Belfast, Dublin, Sligo and Galway. ▪ Improve accessibility to regional health services including hospitals in Letterkenny and Sligo. ▪ Improve network resilience such as access to Letterkenny where the N56 (four lane road) is a "Lifeline Route" being the only access into Letterkenny and northwest Donegal.
Integration	▪ Meet the objectives of the TEN-T Regulations 1315/2013 to enhance geographic integration. ▪ To support the transport objectives contained in national, regional and local planning policies and strategies, including provision of *"efficient and integrated national transport system with adequate capacity, and levels of service comparable to other countries",* to equip Ireland and the North West region to *"compete for investment"*[1]. ▪ To be compatible with land use objectives as set out in regional and local land use plans. ▪ To improve connectivity to/from other transport modes, such as ports at Killybegs, Foyle (Derry), Belfast, Shannon and Dublin, and airports at Derry, Knock, Belfast, Dublin and Shannon.
Physical Activity	▪ To encourage active travel in towns/villages and longer distance non-motorised travel on strategic routes.

Strategic Fit

County Donegal is one of the most peripheral counties in Ireland with a significant shoreline on the Atlantic Ocean. Approximately 93% of Donegal's border is with counties in Northern Ireland (Derry, Tyrone and Fermanagh) with the remaining 7% bordering with Leitrim in Ireland. This positioning isolates Donegal, and particularly north Donegal, from the rest of the country.

The need for the project is set out in the following plans, policies and strategic documents:

European Policy Context

- TEN-T Regulations 1315/2013 (as amended including by Commission Delegated Regulation 2017/849)

National Policy Context

- Strategic Investment Framework for Land Transport
- National Planning Framework – Ireland 2040 – Our National Plan
- National Development Plan 2018-2027

[1] Action Plan for Jobs 2016

Regional Policy Context

- Northern and Western Regional Assembly Draft Spatial and Economic Strategy (November 2018)
- Regional Planning Guidelines (2010-2022)

Local Policy Context

- County Donegal Development Plan 2018-2024
- Seven Strategic Towns Local Area Plan 2018 – 2024

The project is also supported by numerous other regional plans and policies.

Constraints and Alternatives Considered

Constraints

Study areas were identified to ensure several option alternatives could be assessed. The study areas took cognisance of waterbodies, excessive topography and the existing transport network. A Constraints Study was carried out during the early stages of the Option Selection process. The Constraints Study collated available information on constraints within the study areas for each of the three sections of the project. The constraints informed the development of options, the decision-making process during preliminary options assessment, the appraisal of feasible options and the selection of the preferred corridor option.

The Constraints Study considered the natural constraints (landscapes and features), physical constraints (the built environment) as well as the external constraints (design standards, policy, legal issues), in accordance with the TII Project Managers Manual for Major National Road Projects, February 2019.

The natural and physical constraints were assessed in terms of the environmental factors as per Section 171A(b)(i) of the Planning and Development Act (2000) as amended by the European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018.

External constraints were considered in terms of alignment with design standards, achieving the objectives of EU, national and local policies, and meeting legal requirements, e.g. protecting the integrity of SAC and SPA designated sites.

Alternatives Considered

Alternative options were considered prior to establishing a road solution as the most suitable infrastructure to address the needs of the project. The extent to which these potential alternatives address the goals and objectives were considered. The following alternatives were considered:

- Alternative Forms of Transport
- Improved Broadband
- Staggered work times and localised improvements

The process identified a road-based solution as the most feasible option and one that would best satisfy scheme objectives. There is also support across national and regional policy documents for the implementation of road-based solutions at these locations.

Option Selection Methodology

TII Project Appraisal Guidelines (PAG) Unit 4.0 - Consideration of Alternatives and Options, October 2016 (PE-PAG-02013) outlines the alternatives that need to be considered when selecting options.

- Do Nothing Alternative
- Do Minimum Alternative
- Major Scheme Investment Alternative

The methodology utilised in the Phase 2 Option Selection process for all three sections of the TEN-T Priority Route Improvement project, Donegal covered the following steps in the process:

- Stage 1 Preliminary Options Assessment
- Stage 2 Project Appraisal
- Stage 3 Preferred Option

Option selection is an iterative process between the engineering design team and environmental experts with the objective to identify an option which would avoid, where possible, likely significant effects on the environment.

For the Stage 1 assessment each of the preliminary options were examined against the Stage 1 criteria, namely:

- Engineering
- Environment
- Economy

Equal weighting was given to each criterion and each option was identified as one of the following under each criterion:

- HIGH Preference (denoted by green in the matrix)
- MEDIUM Preference (denoted by orange in the matrix) or
- LOW Preference (denoted by red in the matrix).

Following completion of Stage 1, a shortlist of options was identified for each section to be taken forward to the Stage 2 assessment process. The shortlisted options were identified as feasible options having greater benefits / less impacts than the options eliminated at the end of Stage 1.

At the beginning of Stage 2, the shortlisted options were further developed to include preliminary designs for online improvements, link roads, grade separated junctions, termination roundabouts, etc. In all cases the objectives were to reduce impacts where feasible. Following this further refinement, a more detailed assessment of each of the shortlisted options was undertaken, using the six common appraisal framework (CAF) criteria and the relevant sub-criteria, as listed below. In addition, the Stage 2 appraisal included the Road Safety Audit and Road Safety Impact Assessment required under TII PMGs to inform option selection.

- Economy
  - Transport efficiency and effectiveness
  - Wider economic impacts
  - Funding impacts
- Safety
  - Collision Reduction
  - Security
  - Road Safety Audit
  - Road Safety Impact Assessment

- Environment
  - Air Quality & Climate
  - Noise
  - Landscape & visual
  - Biodiversity (Terrestrial and Aquatic)
  - Waste
  - Soils, Geology and Hydrogeology
  - Hydrology
  - Architectural heritage, Archaeology and Cultural Heritage
  - Material Assets (Agricultural)
  - Material Assets (Non-agricultural)
- Accessibility & Social Inclusion
  - Deprived geographical areas
  - Vulnerable groups
- Integration
  - Transport integration
  - Land use integration
  - Geographical integration
  - Other government policy integration
- Physical Activity

The project appraisal of options followed the relevant TII Guidance documents produced for the different elements of consideration, in accordance with the TII Project Appraisal Guidelines for National Roads Unit 7.0 – Multi-Criteria Analysis, PE-PAG-02031 (2016). The outcome of each appraisal included both an impact score and a preference for each option.

Following the completion of the above process, the individual impact scores for each option under each sub-criterion are compiled into a Project Appraisal Matrix for each of Section 1, Section 2 and Section 3. The impact scores under each sub-criterion are summed to give a total impact score for each option. The higher the score the better the option performs in terms of the appraisal.

The impact scoring for each of the assessment criteria was based on a seven-point scale presented in **Table ES 1** below.

Impact Level	Score Index
Major or Highly Positive	7
Moderately Positive	6
Minor or Slightly Positive	5
Neutral	4
Minor or Slightly Negative	3
Moderately Negative	2
Major or Highly Negative	1

Table ES 1: Impact Scoring Applied to Assessment Criteria

On this basis a high-level ranking of options was derived in accordance with Unit 7.0 of the PAG, which states (section 2.5) that: "*It is **not** intended that the sum of each of the individual scores will be used in selecting a preferred option. The overall impact will obviously depend on the strength of individual impacts and it is up to the assessor to weigh up the individual impacts and form a view as to the likely overall impact of the options*."

As such, a secondary appraisal matrix was developed to determine other factors that may inform a decision on the emerging preferred option. The relevant specialists for each sub criterion indicated preferences (preferred, intermediate, least preferred) for each of the options examined. These preferences were presented in a format similar to the matrix of the impact scores, to assist in identifying how each option performs in terms of preferences.

Where an option clearly stands out in terms of the Project Appraisal Matrix (sum of the impact scores) and preferences, then this option will be considered as the emerging preferred option. Where there is little between two or more options based on the matrices and preferences, then a further pairwise appraisal was undertaken to determine the emerging preferred option. The pairwise appraisal looks at the top two or more options in order to determine their relative advantages and disadvantages to each other. From this process, an emerging preferred option will be decided based on the option that performs the best against the project objectives.

Section 1

Section 1 study area includes the N15 and N13 national roads to the west and north of the towns of Ballybofey and Stranorlar respectively. The N15 is the only national road link in County Donegal which connects to Ireland providing links to Sligo, Galway and beyond. It aligns in a north westerly direction through the town centres of Ballybofey/Stranorlar to Lifford. The N13 forms a junction with the N15 in Stranorlar, aligning northward providing a connection to Letterkenny and subsequently to Derry. As this strategic route aligns through the town centres, there is a continuous mix of strategic, local and leisure traffic, resulting in congestion, poor journey time reliability and poor collision history.

Do Nothing Alternative

The objectives of the TEN-T project are to improve transportation links on key strategic routes. The existing N13 is a key strategic route through the twin towns of Ballybofey and Stranorlar that is currently operating beyond its capacity and is performing poorly with respect to safety and travel times. Considering future traffic growth, the retention of this existing road network, without any improvement, would fail to meet the core objective of the TEN-T project.

It was concluded, therefore, at an early stage of the Option Selection process, that the Do Nothing option was not a viable solution in Section 1 and this was accordingly ruled out from further consideration.

Do Minimum Alternative

A Do Minimum alignment option was also considered as part of the Options assessment. The Do Minimum option consisted of retaining the existing road with minimum online improvements.

However, an online improvement scheme, through the twin towns of Ballybofey and Stranorlar, would not provide the appropriate cross-section and junctions required to achieve the level of service, journey time reliability, safety and economic benefit required in the project objectives.

It was concluded, therefore, at an early stage of the Option Selection process, that the Do Minimum option was not a viable solution for Section 1, and this was accordingly ruled out from further consideration.

Stage 1 Preliminary Options Assessment

A total of 38 Preliminary Options were identified in Section 1: N15/N13 Ballybofey-Stranorlar Urban Region. These are shown in **Figure ES 3**.

All options start at the western end, west of Ballybofey, near to the Blackburn Bridge. All options terminate at the northern end near Callan Bridge, except for more northerly options which terminate at Drumnacross.

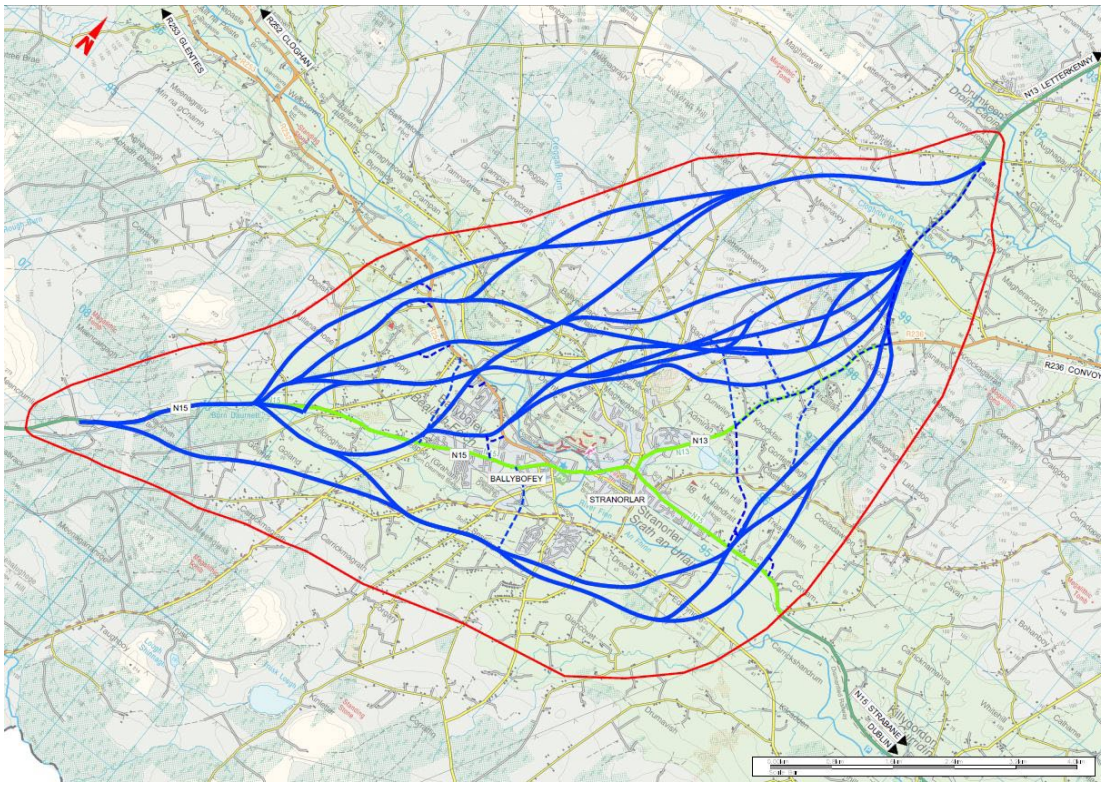

Figure ES 3 – Stage 1 Preliminary Options

The Stage 1 assessment, using the three criteria of Environment, Engineering and Economy, resulted in six shortlisted options, shown in **Figure ES 4**, brought forward to Stage 2 of the option assessment process.

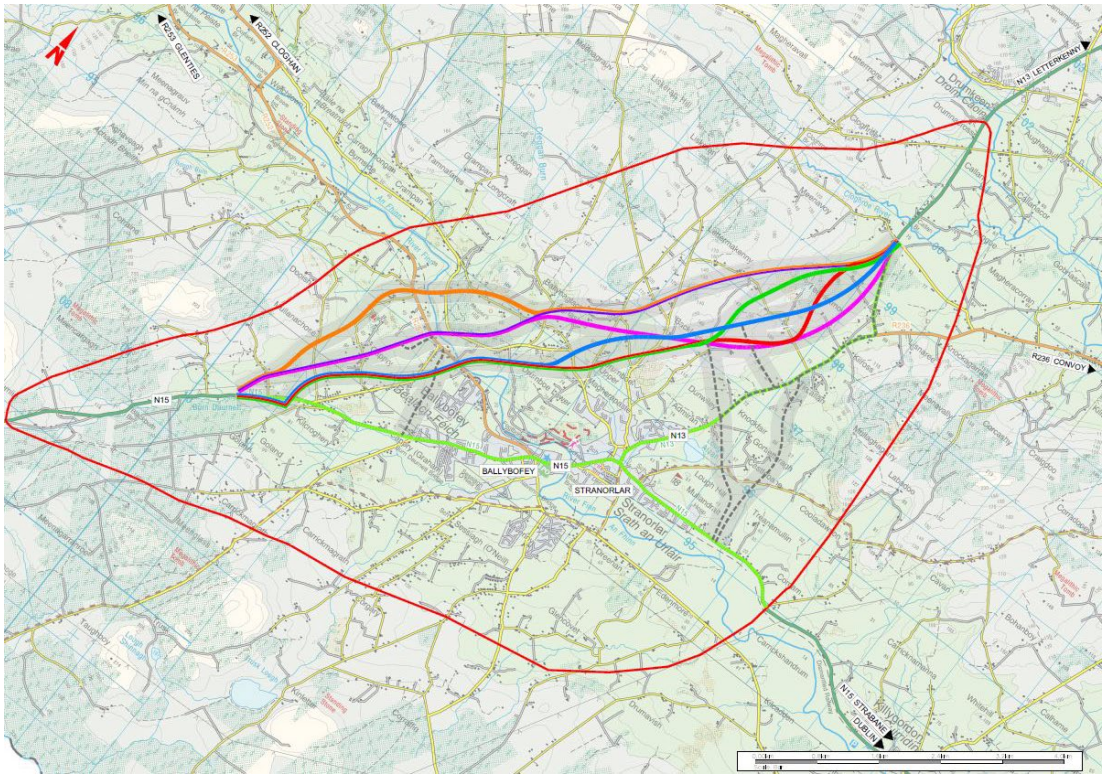

Figure ES 4 – Stage 1 Options brought forward for Stage 2 assessment

Stage 2 Options Assessment and Selection of Preferred Option

During the Stage 2 Assessment, further options were identified that comprised different combinations of link roads, and one additional mainline option that includes a composite of different components from the other options. In total, 13 options were considered during the Stage 2 appraisal of options for Section 1: N15/N13 Ballybofey-Stranorlar Urban Region. Following the multi criteria assessment Option 1G was identified as the preferred corridor – Option 1G is a combination of several of the shortlisted options.

Section 1 Preferred Option

The preferred option is approximately 8.3km long. It commences west of Ballybofey near Blackburn Bridge and heads in a north-easterly direction through Cappry. The option crosses the River Finn and continues north-easterly passing through Drumboe Lower, Backlees where the option aligns in a more northerly direction before terminating at the existing N13, near Callan Bridge.

Two links connect the preferred option to the urban centres of Ballybofey and Stranorlar, one west of the River Finn that connects to the existing N15 in Ballybofey and a second near Backlees that connects with the existing N13 north of Stranorlar and the existing N15 west of Stranorlar.

Section 1 preferred option (1G) is shown in **Figure ES 5**.

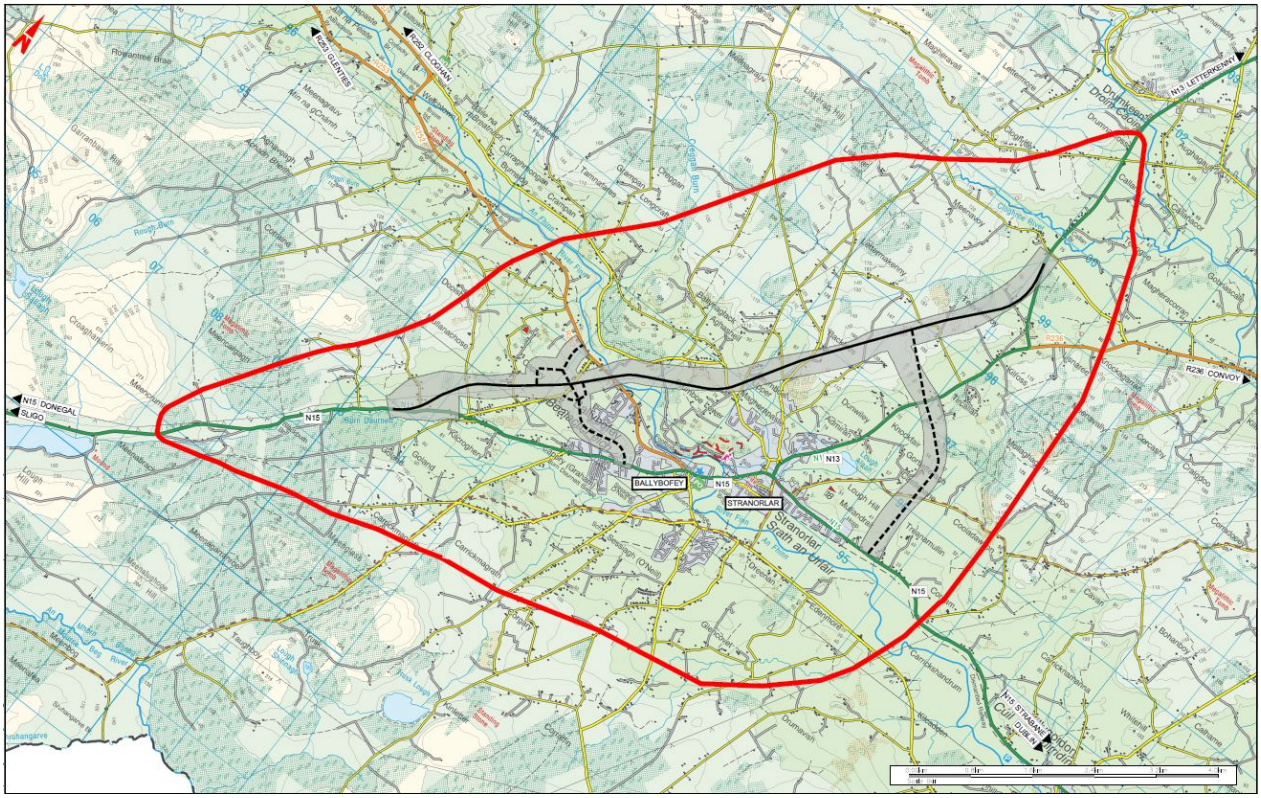

Figure ES 5 – Section 1 Preferred Option

Section 2

Section 2 study area includes the existing N13 and N56 national roads to the south and east of Letterkenny. The existing N56 immediately east of Letterkenny town (known locally as Four Lane road) is currently operating beyond capacity and is subject to frequent traffic congestion and tailbacks. This section between the N56 Polestar and N56/N13 Dry Arch roundabout is a 'lifeline route' to Letterkenny town and north-west Donegal from Sligo to the south, Dublin to the east and Derry to the north. Traffic into and out of Letterkenny passes through the N56 Polestar and N56/N13 Dry Arch roundabouts. The existing N13 extends to the

south and to the east from the Dry Arch Roundabout. The existing N13 has inadequate geometry and direct access provision and performs poorly with respect to safety.

Do Nothing Alternative

The existing N13 and N56 routes are key strategic routes operating beyond capacity and performing poorly with respect to safety and engineering standards. The retention of the existing N13 and N56 routes, without any improvement, would fail to meet the core objective of the project. It was concluded, therefore, at this early stage of the Option Selection process, that the Do Nothing option was not a viable solution for Section 2, and this was accordingly ruled out from further consideration.

Do Minimum Alternative

A Do Minimum option was also considered as part of the Options assessment. The Do Minimum option included retaining the existing N13 and N56 routes and including other committed schemes with traffic management considerations.

However, the N13 and N56 routes include multiple public and private direct accesses that fall outside design standards. In addition, existing sections of N13 include vertical gradients that far exceed national road design standards. The existing N56 section carries significant (>32,000) daily traffic volumes, has numerous commercial premises with direct access onto the adjacent existing carriageway, runs alongside designated SAC lands and would result in significant buildability issues. A do minimum online improvement option will not provide the appropriate cross-section and junction arrangements required to achieve the level of service, journey time reliability, safety and economic benefits required in the project objectives.

It was concluded, therefore, at an early stage of the Option Selection process, that the Do Minimum option was not a viable solution for Section 2, and this was accordingly ruled out from further consideration.

Stage 1 Options Assessment

A total of nine Preliminary Options were identified for Section 2: N56 / N14 Letterkenny Manorcunningham. These are shown in **Figure ES 6**.

All options commenced on the existing N13, south of the existing Dry Arch Roundabout. Seven options terminated at the existing N13/N14 Pluck Roundabout south of Manorcunningham and two options terminated south of the existing N13/N14 Pluck Roundabout where they connected with Section 3 options.

In addition, seven link options were identified and assessed in conjunction with the above nine options. Six links connected to the existing N56/R245 junction in Letterkenny, south of Kiltoy roundabout with one link connecting to the Polestar roundabout.

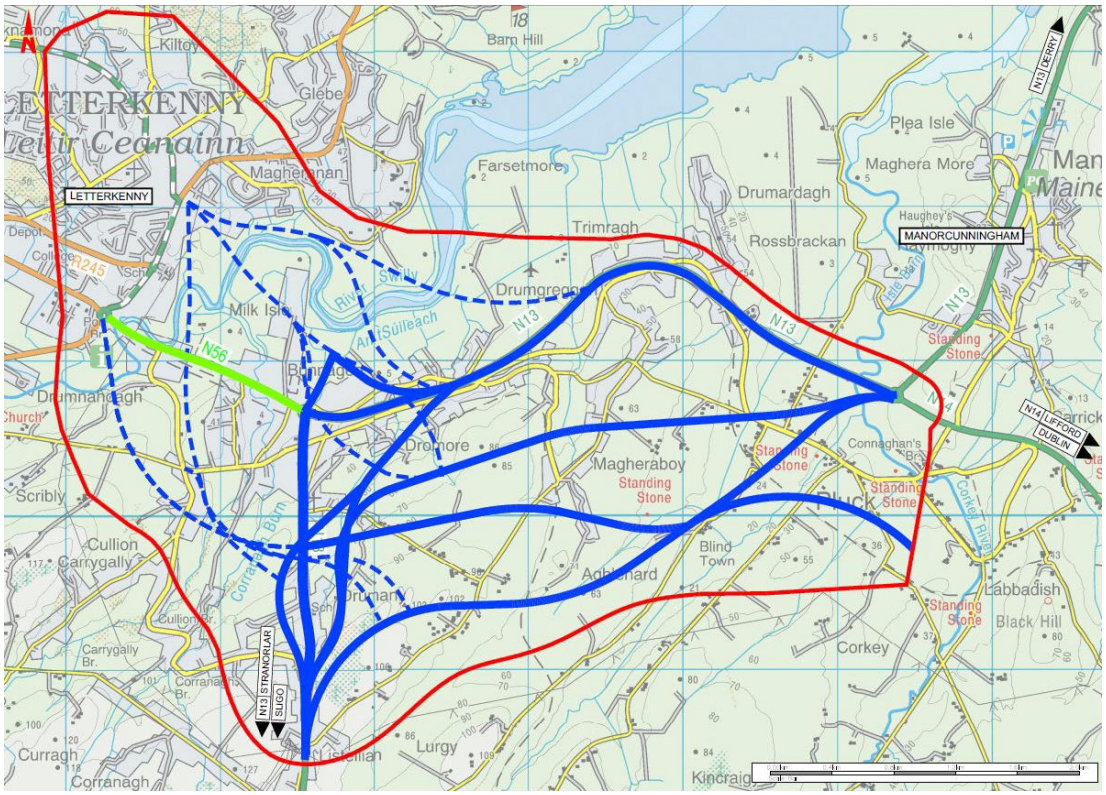

Figure ES 6 – Stage 1 Preliminary Options

The Stage 1 assessment using the criteria of Environment, Engineering and Economy, resulted in seven shortlisted options, shown in **Figure ES 7**, brought forward to the Stage 2 assessment process. In addition, three link options were carried forward for continued assessment.

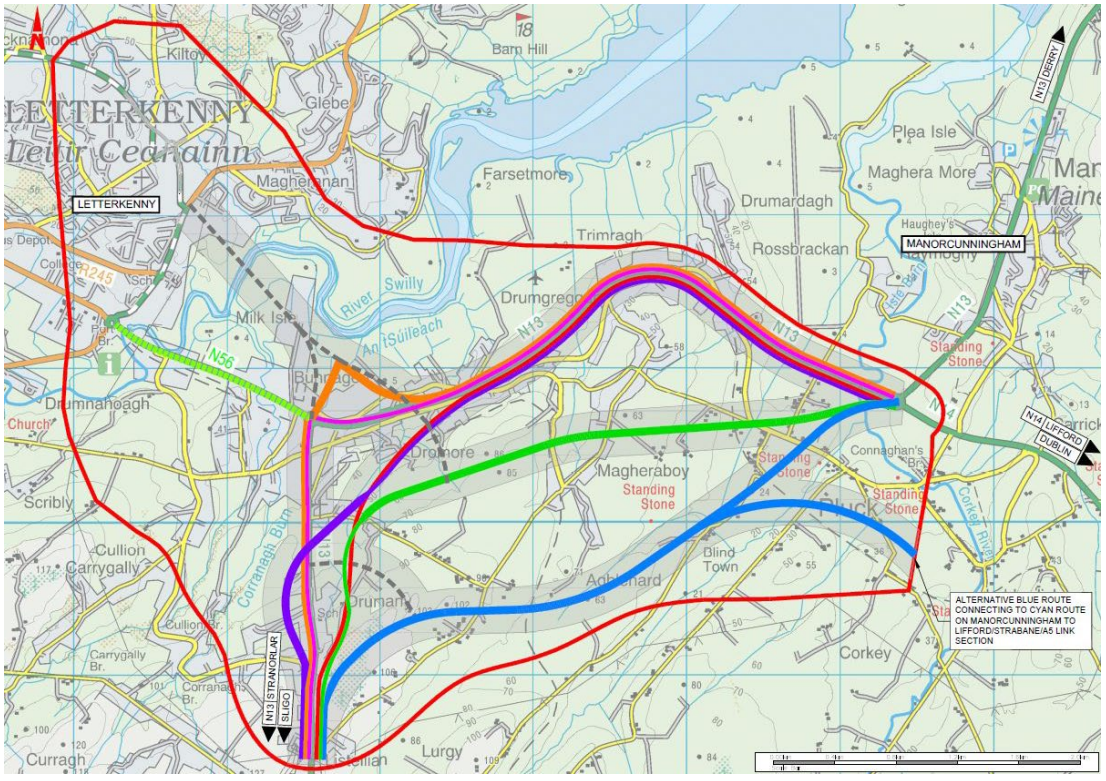

Figure ES 7 – Stage 2 Options brought forward for Stage 2 assessment

Stage 2 Options Assessment and Selection of Preferred Option

Following the multi criteria assessment both Options 2C and 2D (shown purple and red above) received the highest impact scorings and specialist preferences. These two options have similar corridors; the exception between the southern tie-in at Listellian and the proposed junction at Dromore. Therefore, a pairwise appraisal was carried out to review the full spectrum of criteria appraisals, evaluating the number and significance of impacts each option has and comparing the preferences of the options. Following the pairwise appraisal Option 2D was identified as the Preferred Option.

Section 2 Preferred Option

The preferred option is approximately 6.0km long with a 2.5km strategic link connecting to the existing N56/R245 junction north of Polestar roundabout. The preferred option commences near the townland of Listellian on the existing N13 approximately 2km south of the existing Dry Arch Roundabout at Bonagee. The option travels in a north north-easterly direction, offline, until it intersects with the existing N13 again at Dromore, approximately 0.6km east of the Dry Arch Roundabout. From here the preferred option travels easterly along the existing N13 corridor until it reaches its termination point at the existing N13/N14 junction in Raymoghy.

The 2.5km strategic link connects with the preferred option at the existing N13 in Dromore and travels northwest across the River Swilly until it reaches its termination point at the existing N56 junction with the R245, in the townland of Ballyraine.

Section 2 preferred option (2D) is shown in **Figure ES 8**.

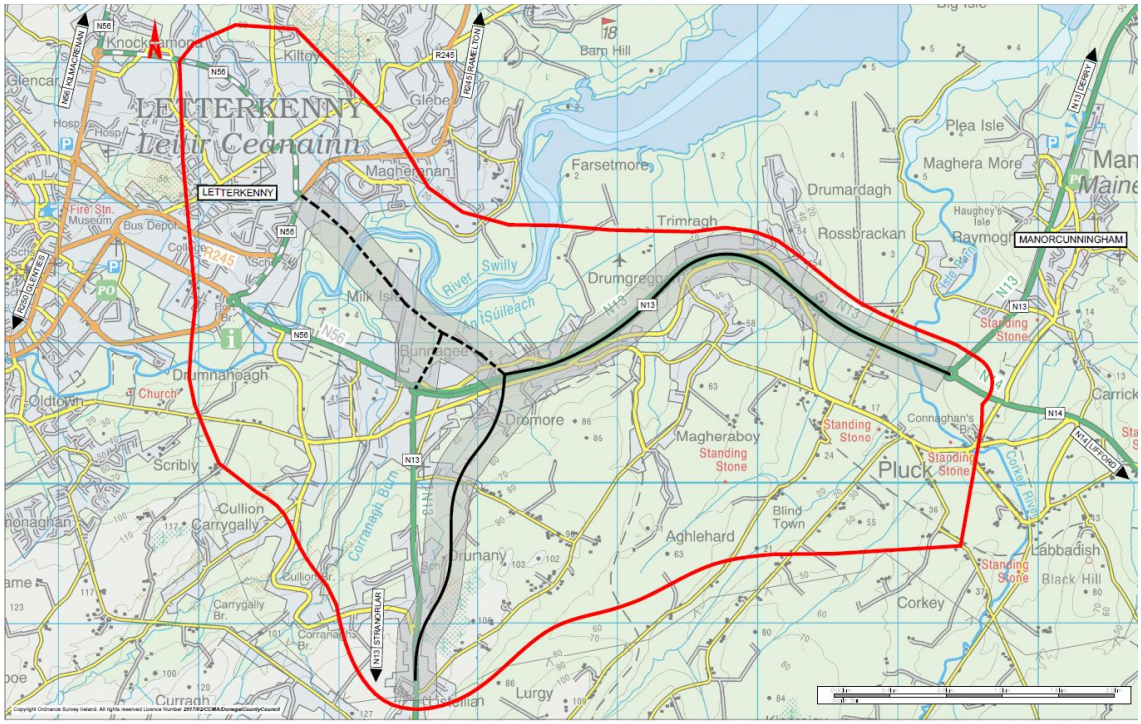

Figure ES 8 – Section 2 Preferred Option

Section 3

Section 3 study area includes the N14 from the N13/N14 roundabout junction at Pluck, south of Manorcunningham to the N15 to the south of Lifford town. The N14 national primary road is approximately 18km in length and is single carriageway of varying cross-section dimensions. The N14 connects Letterkenny and the N56 to the Lifford, which in turn connects to the A5 in Northern Ireland. The A5 is currently part of the TEN-T network in Northern Ireland and is the key route from the north-west of Ireland

to Dublin, via the N2 in Monaghan. The poor alignment, varying cross-section and numerous junctions and access points provide a substandard link, resulting in poor journey time reliability and poor collision record on this cross-border connection.

Do Nothing Alternative

The existing N14 is currently operating beyond its capacity and performing poorly with respect to safety. Considering future traffic growth and increased demand for higher quality border crossings, a Do Nothing Option was considered unviable for the TEN-T project and was accordingly ruled out from further consideration.

Do Minimum Alternative

A Do Minimum option was considered as part of the Options assessment. The Do Minimum option consisted of a combination of online and offline improvements. A Type 2 dual carriageway cross-section was applied to this option to ensure future traffic volumes could be accommodated. Additionally, direct access to the dual carriageway would be restricted to junctions, presenting additional challenges with respect to the ribbon development along the existing N14 and the substantial direct impacts the Do Minimum alignment would have on several existing properties.

Furthermore, due to the existing alignment of the N14, restricting a new road improvement to parts of the existing road corridor has a significant influence on the overall desire line of the road and subsequently the curvature of the alignment.

Therefore, the Do Minimum option was discounted for Section 3 of the TEN-T Project.

Stage 1 Options Assessment

A total of 42 Preliminary Options (including permutations of parts of options and previous options) were identified for Section 3: N14 Manorcunningham to Lifford/Strabane/A5 Link. These are shown in **Figure ES 9.**

All preliminary options commenced within the vicinity of the N13/N14 Pluck Roundabout at Manorcunningham, including off-line options that would connect to offline options considered on Section 2. All options had a target completion/tie-in point within the vicinity of the N15 south of Lifford, with connectivity to the proposed N14/N15 to A5 Link. The N14 / N15 to A5 Link is a dual carriageway link road which has already gone through Statutory Approval and is proposed to connect the A5 Western Transport Corridor (WTC) across the River Finn in Northern Ireland.

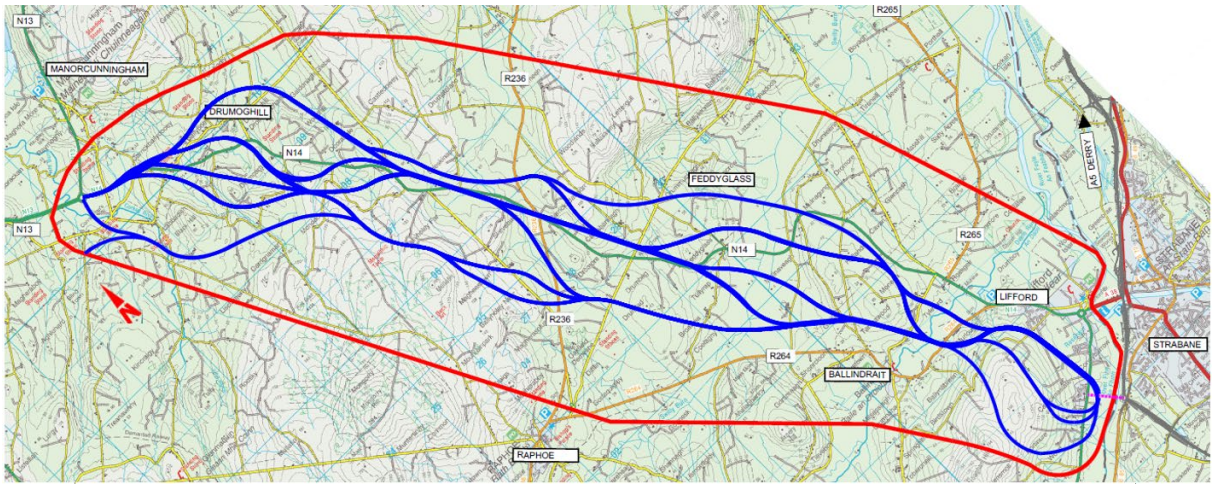

Figure ES 9 – Stage 1 Preliminary Options

The Stage 1 assessment, using the three criteria of Environment, Engineering and Economy, resulted in nine shortlisted options. Within this, there were three pairs of options that had similar alignments with only a slight variation. Each of these pairs have been identified as one option with a variation.

Therefore, six shortlisted route corridors, shown in **Figure ES 10**, were brought forward to Stage 2 of the option selection process.

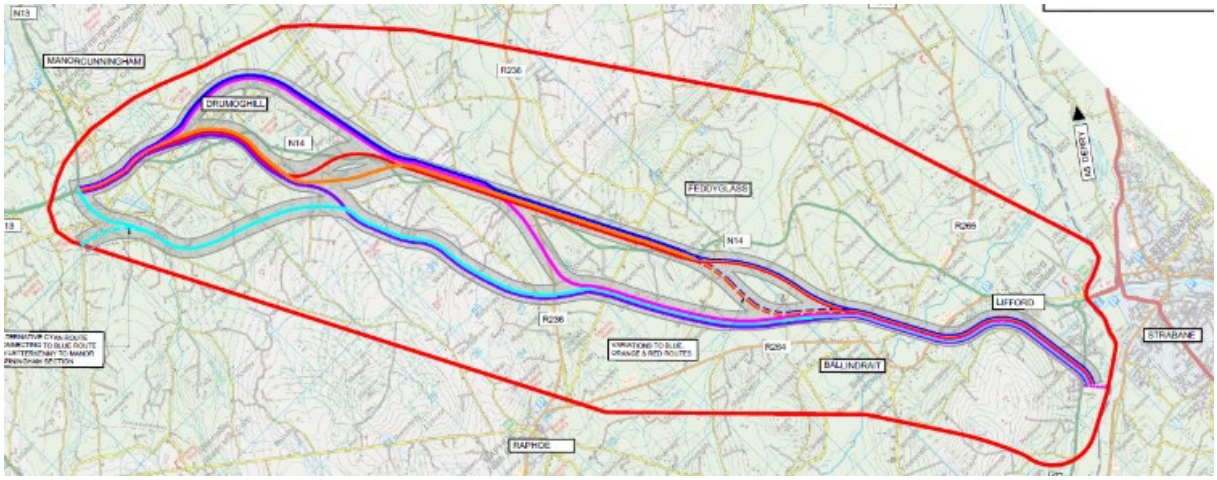

Figure ES 10 – Stage 2 Options brought forward for Stage 2 assessment

Stage 2 Options Assessment and Selection of Preferred Route Corridor

As the multi criteria analysis did not indicate a clear preferred option, a pairwise comparison was conducted to compare the best performing options: 3B and 3C2 (shown red and orange above), to identify the preferred option. These two options have similar corridors with the difference being in the Doorable/Ballyholey.

Following the pairwise comparison of options, and in reviewing the full spectrum of appraisals, evaluating the number and significance of impacts that each option has and comparing the preferences of the options, Option 3B2 was identified as the Emerging Preferred Option. This is supported qualitatively, by reviewing balance of preferences across each criterion, and quantitatively by considering the cumulative impact of each option and the significance of those impacts. For each comparison, Option 3B2 was identified as the preferred option.

Section 3 Preferred Option

The preferred option is approximately 17.6km long. It commences at the N13/N14 junction and runs along a similar alignment as the existing N14 for approximately 800m. The option then continues in a similar

westerly direction offline towards Drumoghill before turning south through Drumcairn. The option continues towards the existing N14 at Sheskinapoll. The option then aligns in a southeasterly direction for approximately 4km to Feddyglass running close to the existing N14. At this point, the option crosses the existing N14 continuing to the townland of Tamnawood. From here the option continues in a south easterly direction to Murlough and then curves around to the east side of Croaghan Hill and subsequently in a southerly direction between Coneyburrow and Beechwood park. Here the termination point occurs next to the existing N15 on greenfield land.

Section 3 preferred option (3B2) is shown in **Figure ES 11**.

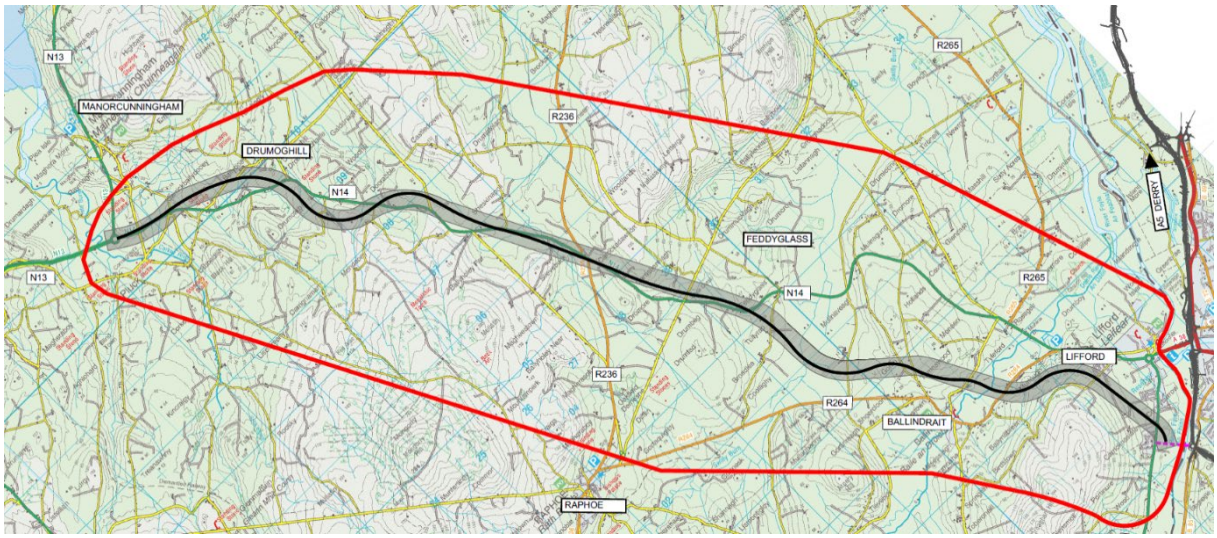

Figure ES 11 – Section 3 Preferred Option

Public Consultations

The first public consultation was undertaken on the 6th December 2017 at three different venues in Ballybofey, Letterkenny and Lifford. This Public Consultation presented the Study areas and constraints for the TEN-T project.

A second public consultation presented the Stage 1 preliminary options that were considered and the shortlisted options that were taken forward to Stage 2. This second consultation was held on the 17th, 18th and 19th April 2018 in Letterkenny, Lifford and Ballybofey respectively. This public consultation was repeated on the 29th, 30th and 31st May 2018 in Ballybofey, Letterkenny and Lifford respectively, to provide an opportunity for people unable to attend the April meetings.

A third public consultation to present the Emerging Preferred Corridor for each Section was held on the 19th, 20th and 21st February 2019 in Lifford, Letterkenny and Ballybofey respectively.

Section 1 included eight potential link options displayed at the public consultations between the 19th and 21st of February connecting into the town of Ballybofey. Public comments received, and additional link option assessments led to one further public consultation for Section 1 on the 14th of March 2019, in Ballybofey, with four possible link options displayed.

Preferred Option PABS and Recommendation

A Project Appraisal Balance Sheet (PABS) is a summary appraisal of project impacts based on the outputs of various forms of assessment carried out during the planning and design stages of project development. The PABS acts as a tool in summarising the expected impacts of proposed investment. The PABS is completed at Option Selection stage on the preferred option and is subsequently updated throughout the latter stages of the project. The Preferred Option on the TEN-T Project comprises Options 1G, 2D and 3B2 combined.

The PABS is based on a qualitative and quantitative evaluation of a range of criteria and elements as outlined in the Department of Transport Common Appraisal Framework namely; Environment, Safety, Economy, Accessibility & Social Inclusion, Integration and Physical Activity.

Project Appraisal of the TEN-T Priority Route Improvement Project, Donegal has demonstrated that this is a project with a positive scaling statement on four of the six assessment criteria (Safety, Economy, Integration and Physical Activity), a neutral scaling statement on one criterion (Accessibility & Social Inclusion) and a negative scaling statement on one criterion (Environment).

The economic assessment has demonstrated that, based on the scheme costs developed to date and the associated forecast performance of the transport network, the proposed option represents value for money.

While avoidance measures were implemented for the key environmental constraints identified, the environmental assessment has shown a Moderately Negative scaling statement. Phase 3 Design will continue to implement the avoidance measures to minimise impacts on sensitive receptors within the receiving environment.

This Option Selection Report recommends the preferred option for each Section to form the basis of Phase 3 Design and Environmental Evaluation.

1 INTRODUCTION AND DESCRIPTION

1.1 General

In January 2017, Donegal County Council appointed joint venture RPS/Barry Transportation as design consultants for the Trans-European Network - Transportation (TEN-T) Priority Route Improvement Project, Donegal. The project is divided into three sections as illustrated in **Figure 1-1**.

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

The study areas were developed based on the Sections above and allowing for areas to sufficiently consider constraints, options development and future road improvements.

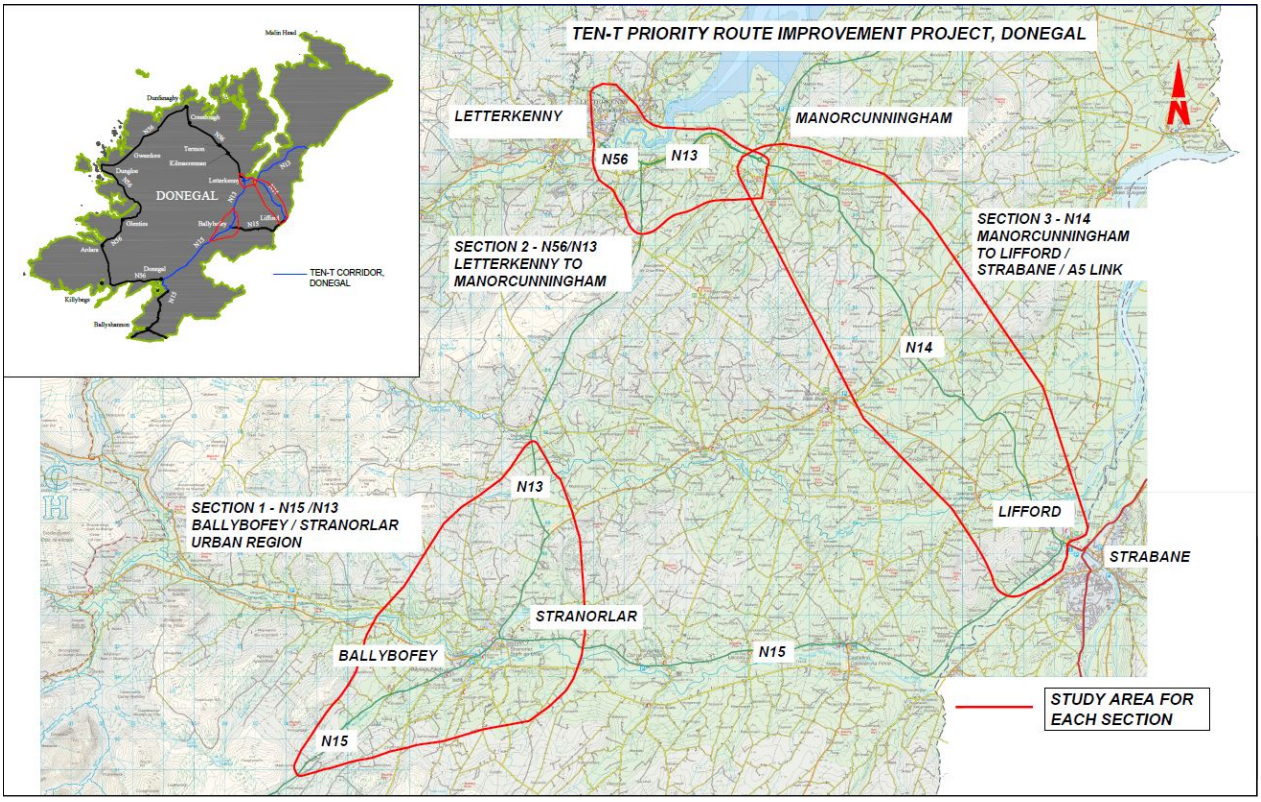

Figure 1-1 Study Areas for the TEN-T Priority Route Improvement Project, Donegal

The three sections of the TEN-T Priority Route Improvement Project, Donegal are considered as one project.

The three sections were identified as the highest priority sections requiring intervention in the TEN-T Corridor Needs Study, Donegal (November 2015).

The project is being implemented in accordance with the TII Project Management Guidelines (PMGs), January 2019; superseding the NRA's 2010 Project Management Guidelines (PE-PMG-02004) and September 2017 updates which were used on the project up until the publication of the January 2019 PMGs. In the context of this Option Selection Report the 2019 PMGs have minor differences from the 2010 PMGs.

1.2 Overview of the Proposed Project

1.2.1 Context

County Donegal is one of the most peripheral counties in Ireland, situated at the north west of the island with vast shoreline on the Atlantic coast. Approximately 93% of Donegal's border is with counties in Northern Ireland (Derry, Tyrone and Fermanagh) with the remaining 7% bordering with Leitrim in Ireland. This positioning isolates Donegal, and particularly north Donegal, from the rest of Ireland. County Donegal has a population of 158,755 (2016 Census), and the county has enjoyed a long-term, positive relationship with its neighbouring counties in Northern Ireland. This relationship has strengthened since the onset of the Good Friday Agreement/Belfast Agreement in 1998. This has culminated in a strong connection between communities on both sides of the border in the North West, creating a population of approximately 350,000[2] in what is recognised as a cross-border city region.

The largest town in Donegal is Letterkenny (population 19,274 in the 2016 census). This regional centre is connected to the rest of the island of Ireland via the N56, N13, N14 and N15 routes which radiate from Letterkenny.

The N13, N14 and N15 form part of the TEN-T, which is a selection of strategic transport corridors throughout the European Union (EU) that have been identified to play a key role in the mobility of goods and passengers through the EU. EU Regulation Number 1315/2013 sets the requirements for the TEN-T network. Letterkenny is connected to Derry via the N13, to Lifford (the County Town) via the N13-N14 and to Ballybofey/Stranorlar via the N13-N15.

The TEN-T routes in Donegal are broadly described below:

- **N13:** a strategic route that connects Letterkenny with Derry to the north and Stranorlar/Ballybofey to the south. The N13 connects with three other national routes including; the N14 to Lifford, the N56 (national secondary route) to Letterkenny and north Donegal and to the N15 in Stranorlar/Ballybofey.

- **N14:** a strategic route that connects Letterkenny to Lifford and links to Strabane in County Tyrone, Northern Ireland. The A5 aligns to the outskirts of Strabane, and is the key route linking the northwest of Ireland to the N2 in Monaghan and onto Dublin; and

- **N15**: a strategic route that connects to Sligo and Donegal towns and continues north easterly through Ballybofey and Stranorlar to Lifford where it connects to the N14 and links to Strabane in County Tyrone, Northern Ireland. The section between Stranorlar and Lifford does not form part of the TEN-T network. The N15 also links south Donegal to Derry and Belfast.

These TEN-T strategic routes in Donegal connect to the rest of the TEN-T network in Northern Ireland and Ireland. They are particularly important for both tourism and industry, as they comprise part of the Wild Atlantic Way, and provide the only transport connectivity (due to the lack of rail infrastructure) to Letterkenny and the wider region for trade, including Killybegs fishing harbour.

[2] Initial Analysis of the Challenges and Opportunities of Brexit for the Derry City and Strabane District and Donegal County Council areas – the North West City Region.

Figure 1-2 TEN-T Corridor across Ireland

The EU transport infrastructure policy establishes a two-tier TEN-T network comprising:

- Comprehensive network – this network ensures effective connectivity to all EU nations and feeds into the core network and regional and national level.
- Core network – the most strategic elements of the TEN-T network.

The national primary roads included in the TEN-T Priority Route Improvement Project, Donegal form part of the Comprehensive Network. EU Regulation 1315/2013 item (11) states that the comprehensive network should be:

"A Europe-wide transport network ensuring the accessibility and connectivity of all regions in the Union, including the remote, insular and outermost regions …… and strengthening social and economic cohesion between them. The guidelines laid down by this Regulation ("the guidelines") should set the requirements for the infrastructure of the comprehensive network, in order to promote the development of a high-quality network throughout the Union by 2050".

Article 4 of EU Regulation 1315/2013 highlights that the TEN-T network "*shall strengthen the social, economic and territorial cohesion of the Union*" and shall support "*inclusive growth*". It shall demonstrate European added value by contributing to objectives set out in four categories (Regulation 1315/2013), including:

- Cohesion – accessibility to remote, outermost and peripheral regions, a reduction of infrastructure quality gaps between member states and developing interconnection of long-distance, regional and local traffic flows;
- Efficiency – removal of bottlenecks, bridging missing links, supporting the efficient and sustainable use of the infrastructure and, where necessary, increasing capacity;
- Sustainability – improve the quality of the infrastructure in terms of safety, security, efficiency, climate change and, where appropriate, disaster resilience, environmental performance, social conditions;
- Increasing benefits for users – ensure continuity of traffic flows and journey times, accessibility for all users and increase safety measures.

Additionally, the EU regulation 1315/2013, item 1 states:
"*The trans-European networks should facilitate cross-border connections, foster greater economic, social and territorial cohesion, and contribute to a more competitive social market economy".*

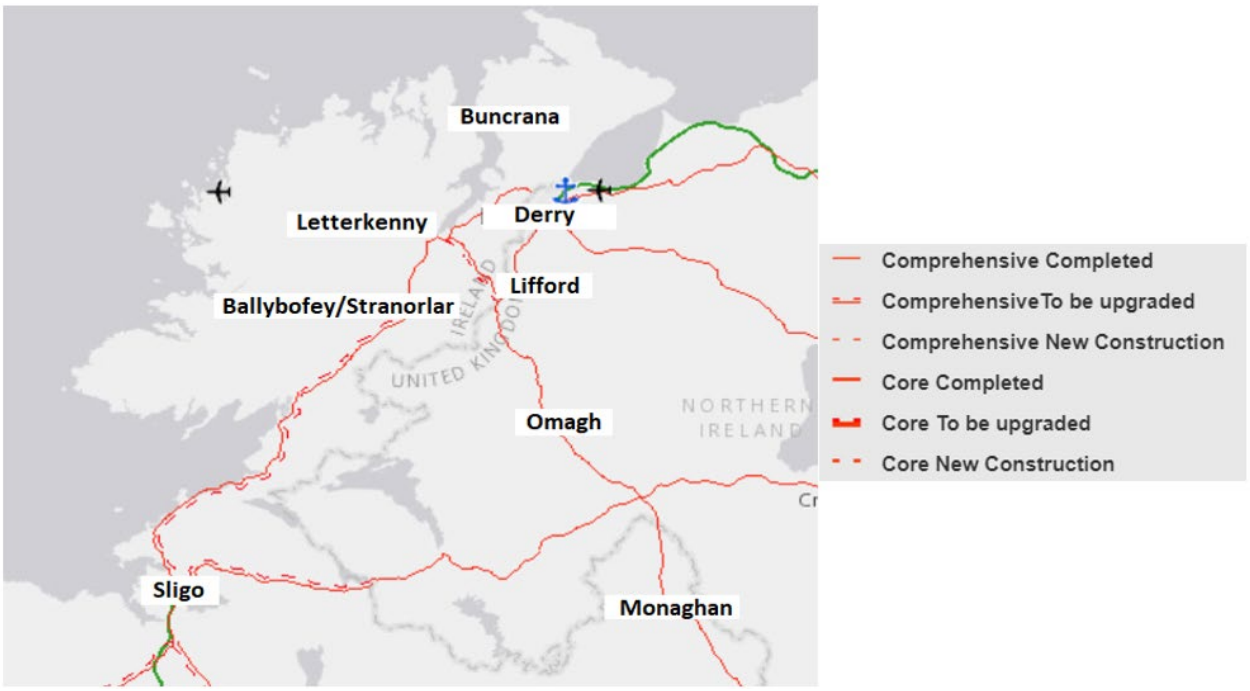

Figure 1-3 TEN-T Road Corridor in Donegal and the North West of Ireland

1.2.2 History of the Scheme

Much of the TEN-T road network in Donegal does not meet the current design standards for a National Primary road in terms cross-section, horizontal and vertical alignments, junctions, overtaking opportunities, drainage, etc. Given the strategic importance of the N13, N14 and N15 routes to Donegal providing connectivity to the rest of the island, a study into the condition of the existing infrastructure was undertaken as part of the Trans-European Transport Network Corridor Needs Study, Donegal in 2015. This study reviewed the TEN-T network in Donegal, assessing the network against various technical, non-technical, economic, traffic and safety criteria. The assessment comprised a site visit, journey time surveys and a desktop study for all parts of the TEN-T network in the county, except the N15 from south of Ballybofey to the county boundary, as numerous upgrades of this section have been completed in recent times.

Six sections of the TEN-T network in Donegal were identified and ranked in order of intervention priority due to deficiencies in the existing infrastructure provision. Three sections requiring the most immediate intervention (see **Figure 1-4**) form part of the TEN-T Priority Route Improvement Project, Donegal:

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

The remaining sections of the TEN-T network in Donegal will be upgraded in due course.

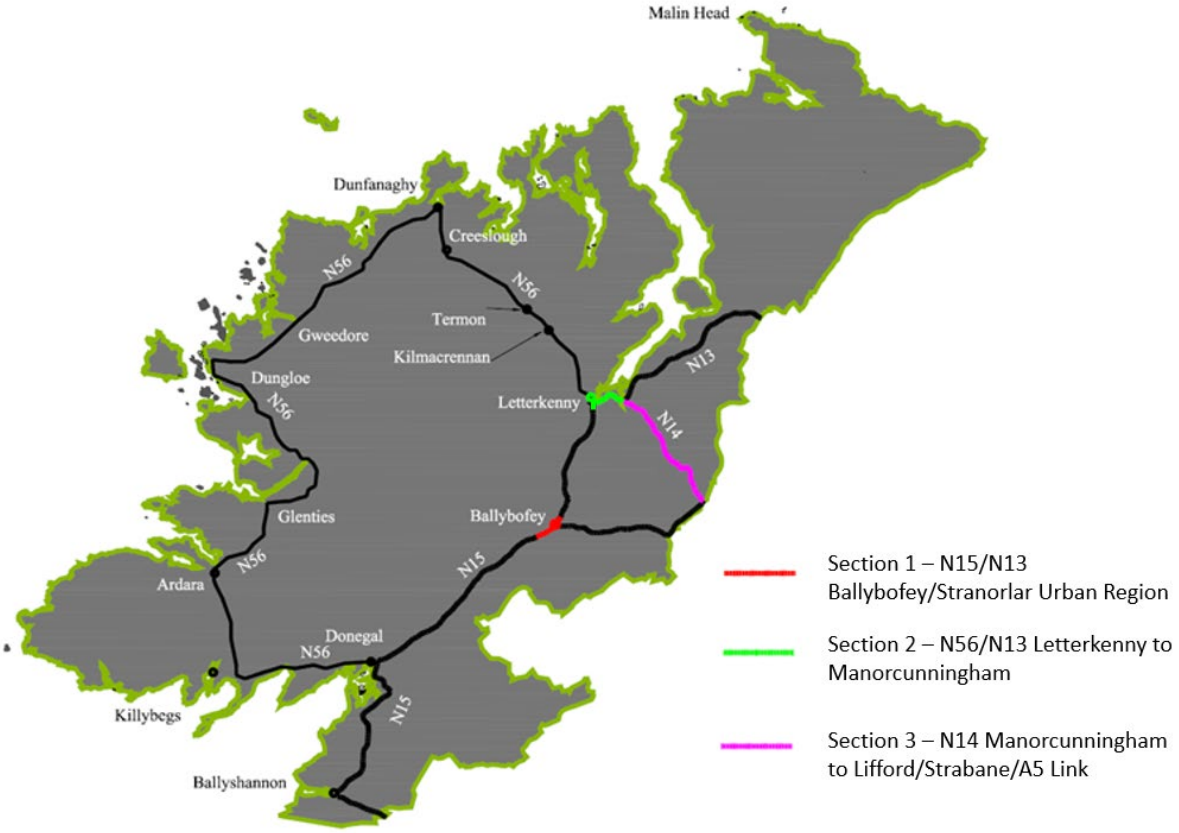

Figure 1-4 Donegal National Roads and Proposed Schemes

In addition to the fact these routes are strategic, nationally significant connections from Letterkenny/Donegal to the rest of the island, they also provide connectivity between key towns in County Donegal – Letterkenny, Ballybofey/Stranorlar and Lifford. Consequently, a high volume of traffic uses these routes, which has an impact on these towns. As a result, the towns suffer from issues such as congestion and a poor environment for vulnerable road users, while traffic suffers from longer journeys and poor journey time reliability.

The prioritisation of these three sections is also necessary to ensure the development of the county in line with the Donegal County Development Plan, which has long established a need for intervention at the three areas in question. Furthermore, the National Development Plan also recognises that work on these links are required. All three locations have had previous projects progressed to varying degrees and as a result, have reserved corridors for new routes in the County Development Plan. These corridors will be reviewed upon identification of the preferred option and amended as necessary.

1.2.3 Previous Studies

Several reports and investigations have been previously carried out across the TEN-T network in Donegal. The fundamental reports are listed here:

- Constraints Studies – these outlined the constraints for the respective sections prior to identifying options:

    i. N14/N13 Junction (Manorcunningham) to Lifford Constraints Study; 2000; Mott MacDonald,
    ii. N15 Ballybofey/Stranorlar Bypass Constraints Study (2000); McCarthy Hyder.

- Route Selection Reports – conclude with proposals for route options:

    i. N15 Ballybofey/Stranorlar Bypass Route Selection Report (2001); McCarthy Hyder,
    ii. N14/N13 Junction (Manorcunningham) to Lifford Route Selection Report (2001); Mott MacDonald,

iii. N56 Letterkenny Relief Road Route Selection Report, (2010) Donegal County Council.

- Environmental Impact Statements:

  i. Environmental Impact Statement Ballybofey/Stranorlar Bypass (2007); McCarthy Hyder,
  ii. N14/N15 to A5 Link Environmental Impact Statement (2011).

- Other reports and assessments:

  i. N14 Four Lane Road at Letterkenny Feasibility Report Nov (2005); Michael Punch and Partners,
  ii. Various Traffic Model Studies conducted by Jacobs,
  iii. Traffic model reviews on the N14 conducted by RPS.

All three sections of the TEN-T Priority Route Improvement Project were previously advanced under separate projects to various stages of planning and design. Further details on each of these previous projects are provided below.

N13/ N15 Ballybofey – Stranorlar Urban Region

The N15/N13 Ballybofey Stranorlar project has been the subject of previous planned road improvement. Between 2000 and 2008, a Constraints Study, Route Selection Report and CPO / EIS for the N13 / N15 through Ballybofey Stranorlar was completed. The project progressed to Oral Hearing in 2008, proposing a preferred route corridor located to the south and east of the Twin Towns. In 2009 An Bord Pleanála (ABP) refused approval for the scheme.

N56/N13 Letterkenny to Manorcunningham

The proposed scheme has not been promoted previously in its current form, however, a proposed Relief Road for Letterkenny (known as the N56 Letterkenny Inner Relief Road) has previously been proposed from the Dry Arch Roundabout connecting to the N56/R245 junction north of the Polestar Roundabout. This scheme includes a new bridge crossing over the River Swilly and a reserved corridor for this route is provided for within the current County Donegal Development Plan 2018-2024 (Map 5.1.6).

N14 Manorcunningham to Lifford/Strabane/A5 Link

The N14 Manorcunningham to Lifford road has been the subject of previous planned road improvements. In 2001, a Constraints Study and Route Selection for the N14 between Manorcunningham and Lifford was published. A selected preferred route corridor emerged but the scheme was not progressed further due to lack of funding.

This previous preferred route corridor has been included as part of the initial options in the Phase 2, Stage 1 Preliminary Options Assessment.

1.2.4 Project Objectives

The objectives of the TEN-T Priority Route Improvement Project, Donegal include the following:

Economy	▪ To improve the efficiency of the transport network by improving journey time and journey time reliability.
Safety	▪ To reduce the frequency and severity of collisions and to improve the overall safety of the national road network in Donegal. ▪ To improve safety for users by separating strategic traffic from local traffic through towns, villages and rural communities.
Environment	▪ To reduce overall air pollution levels near sensitive receptors caused by congestive queuing of vehicles and/or excessive vertical gradients. ▪ To reduce overall traffic noise levels near sensitive receptors; includes ribbon developments. ▪ To reduce risk of watercourse pollution along the existing road network.
Accessibility and Social Inclusion	▪ Improve accessibility to/from the North West region, helping to reduce deprivation caused by the geographic location of Donegal, which is currently an area covered by the Rural Social Scheme. ▪ Remove strategic and commercial traffic from local towns and communities, thereby making these communities more inviting and encouraging more travel independence for non-motorised users and vulnerable groups. ▪ Improve accessibility to employment in regional and national centres including Donegal, Letterkenny, Derry, ▪ Belfast, Dublin, Sligo and Galway. ▪ Improve accessibility to regional health services including hospitals in Letterkenny and Sligo. ▪ Improve network resilience such as strategic access to Letterkenny where the N56 (Four Lane Road) is a “Lifeline Route” access to Letterkenny and northwest Donegal.
Integration	▪ Meet the objectives of the TEN-T Regulations 1315/2013 to enhance geographic integration. ▪ To support the transport objectives contained in national, regional and local planning policies and strategies, including provision of *“efficient and integrated national transport system with adequate capacity, and levels of service comparable to other countries”,* to equip Ireland and the North West region to *“compete for investment”*[3]. ▪ To be compatible with land use objectives as set out in regional and local land use plans. ▪ To improve connectivity to/from other transport modes, such as ports at Killybegs, Foyle (Derry), Belfast, Shannon and Dublin, and airports at Derry, Knock, Belfast, Dublin and Shannon.
Physical Activity	▪ To encourage active travel in towns/villages and longer distance non-motorised travel on strategic routes.

1.2.5 Section 1: N15/N13 Ballybofey/Stranorlar Urban Region

The existing N15 and N13 at Ballybofey/Stranorlar (approximately 9km) has been prioritised for improvement as part of this TEN-T Priority Route Improvement Project. Ballybofey and Stranorlar are connected by a multi-span arch bridge carrying the N15 over the River Finn and are they often referred to as the Twin Towns. Refer to **Figure 1-5**.

[3] Action Plan for Jobs 2016

The N15 route provides regional and national accessibility to/from Donegal and the north-west region as it connects the Letterkenny and the North West City region to the west coast along the Atlantic Corridor through the town centres of Ballybofey/Stranorlar. As a result, strategic and local traffic travel through the town centres, on a narrow single carriageway road of speed limit 50/60km/h that has numerous retail frontages, on-street car parking, junctions with side-roads etc.

The Ballybofey/Stranorlar town centres are separated by the River Finn, which is designated as an SAC. The towns are connected by the N15 via a bridge spanning the River Finn.

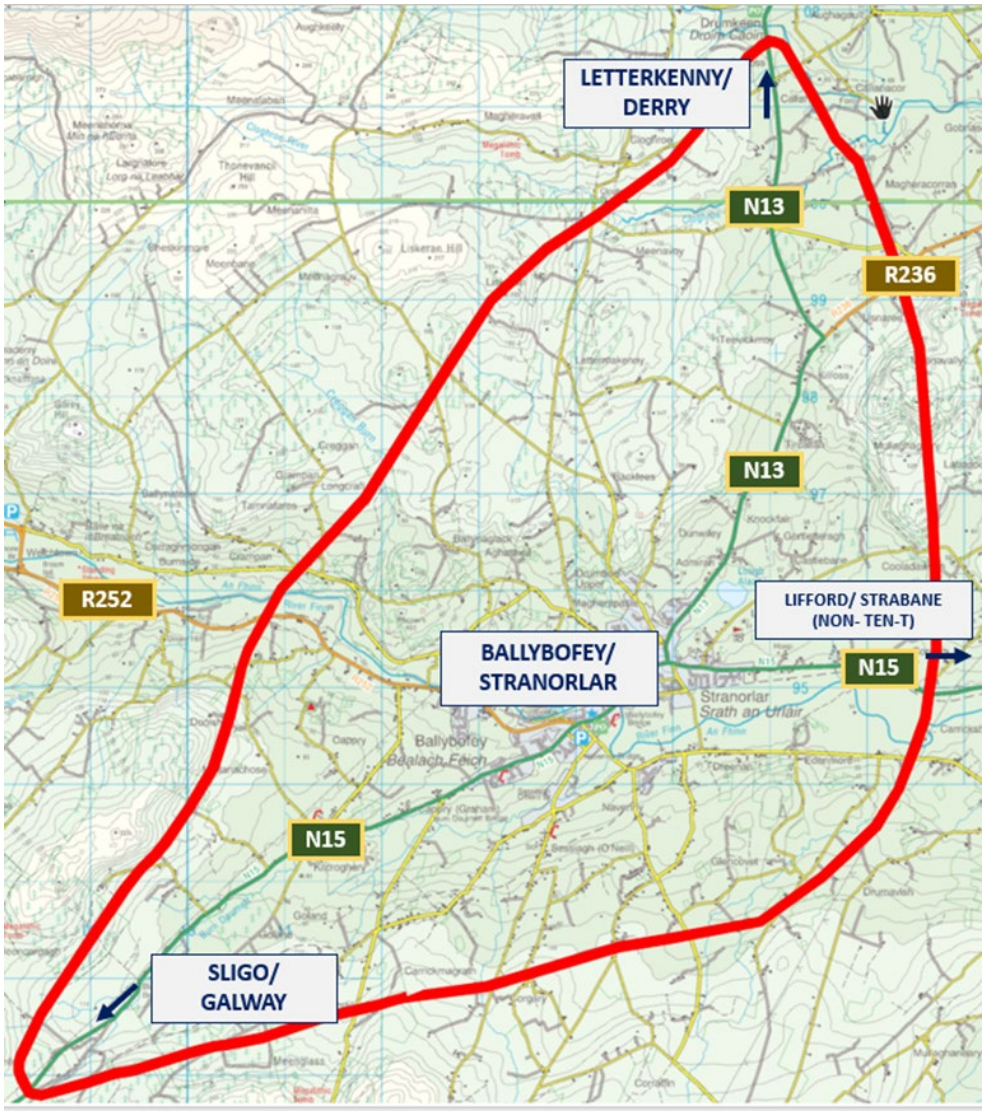

Figure 1-5 N15/N13 Ballybofey/Stranorlar Urban Region

The N15 from Stranorlar to Lifford does not form part of the TEN-T Network but is part of the national primary road network. As such, consideration of connectivity to/from this link forms an important aspect of the Section 1 development.

1.2.6 Section 2: N56/N13 Letterkenny to Manorcunningham

The existing N13 and N56 routes near Letterkenny have been prioritised for assessment and improvement as part of this TEN-T Priority Route Improvement Project. The N13 is part of the TEN-T network and the N56 is a national secondary strategic link from the TEN-T network into Letterkenny town and points north. Refer to **Figure 1-6**.

In Letterkenny the N56 begins at a roundabout junction (known locally as Dry Arch Roundabout) located to the southeast of the town. From here the N56 travels northwest through Letterkenny, Kilmacrenan and Creeslough to Dunfanaghy on the Donegal coastline where it turns south west travelling along the Donegal coastline through the villages of Gweedore, Dungloe, Glenties and Killybegs connecting to Donegal town. This N56 route provides vital accessibility to the peripheral areas north and south of the county.

The section of N56 from the Dry Arch roundabout to a second roundabout (known locally as Polestar roundabout) includes a 1.5km section of carriageway known locally as the N56 Four Lane Road. This section is heavily trafficked, has un-segregated lanes and a bridge crossing of the Swilly SAC-SPA, and is closely bounded by commercial buildings and environmental sensitive lands. This 1.5km section of the N56 between the two roundabouts is a 'lifeline route' to Letterkenny and points north from the east and south. High traffic volumes and high numbers of collisions have led to this section of road having frequent long tailbacks and occasionally becoming blocked for long periods. From the Polestar roundabout the N56 travels north and west around the outskirts of Letterkenny town as a single carriageway to Kiltoy Roundabout and beyond servicing points in northwest Donegal and including western Donegal coastal areas.

The N13 connects to the N56 route at the Dry Arch Roundabout southeast of Letterkenny town. From the Dry Arch roundabout, the N13 travels south through the townland of Lurgybrack to Stranorlar where it connects with the N15 servicing Ballybofey, Donegal town and Sligo. From the Dry Arch roundabout, the N13 travels east to Dublin, Derry and Belfast. The section of N13 within the study area of this project is approximately 6.5km. From the existing Dry Arch roundabout, the N13 extends approximately 2km to the south through the townland of Lurgybrack and approximately 4.5km east towards Manorcunningham.

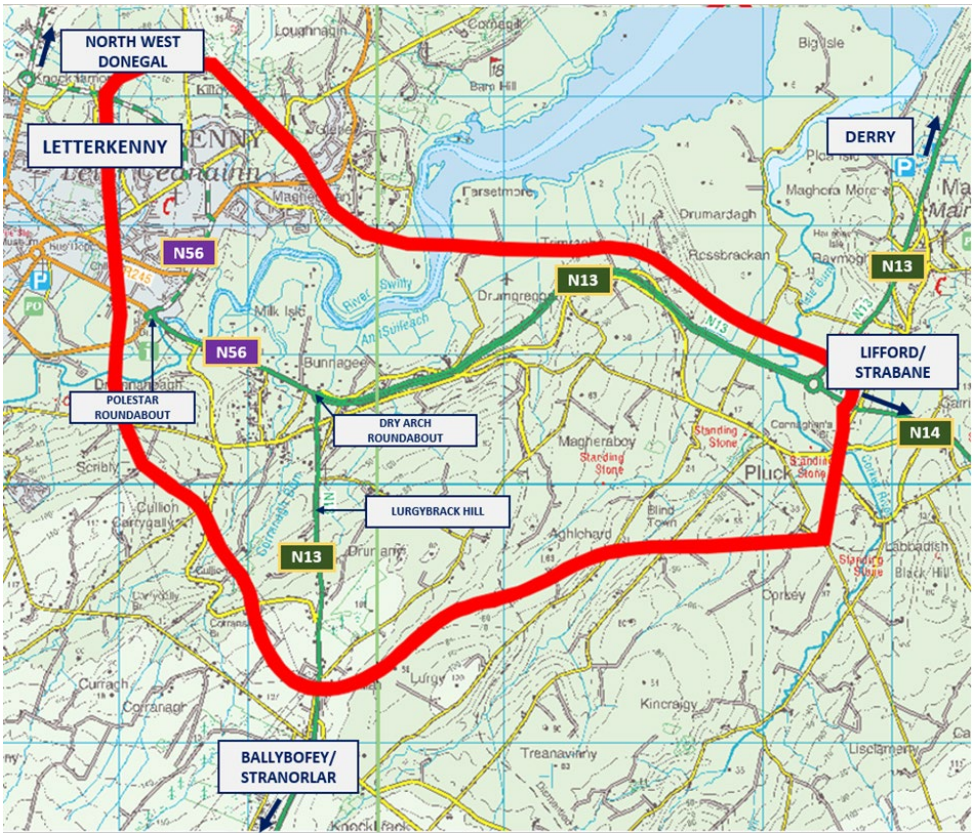

Figure 1-6 N56/N13 Letterkenny to Manorcunningham

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

This section of road which is approximately 17km in length commences at the Pluck Roundabout, the junction between the N13 and N14 near Manorcunningham, and continues as a single carriageway in a south easterly direction to Lifford. There is a border crossing at Lifford into Strabane, County Tyrone, Northern Ireland, across the River Foyle. The N14 is the key route for both commercial and private vehicles

travelling to Belfast and Dublin, in addition to buses travelling to Dublin via the A5 in Northern Ireland and the N2 in County Monaghan. Refer to **Figure 1-7**.

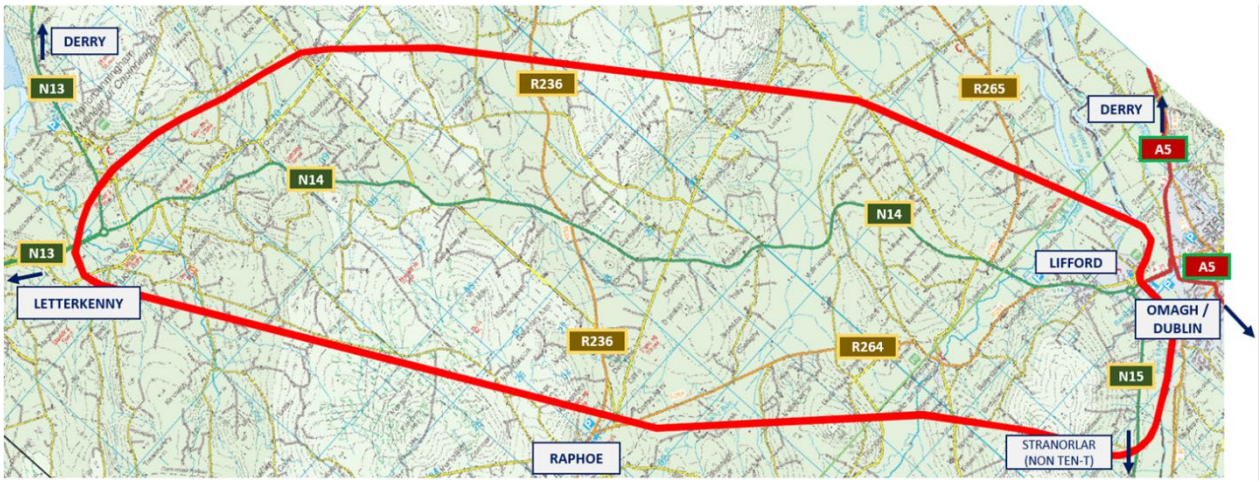

Figure 1-7 N14 Manorcunningham to Lifford/Strabane/A5 Link

The development of the A5 Western Transport Corridor from Derry to Aughnacloy in Northern Ireland will further improve accessibility to the northwest. Following conclusion of a legal challenge in 2018 to the approval of the A5 WTC project, the Northern Ireland Department for Infrastructure (DfI) published an Addendum to the existing Environmental Statement in 2019. A Public Inquiry on the scheme is expected to be held in 2020.

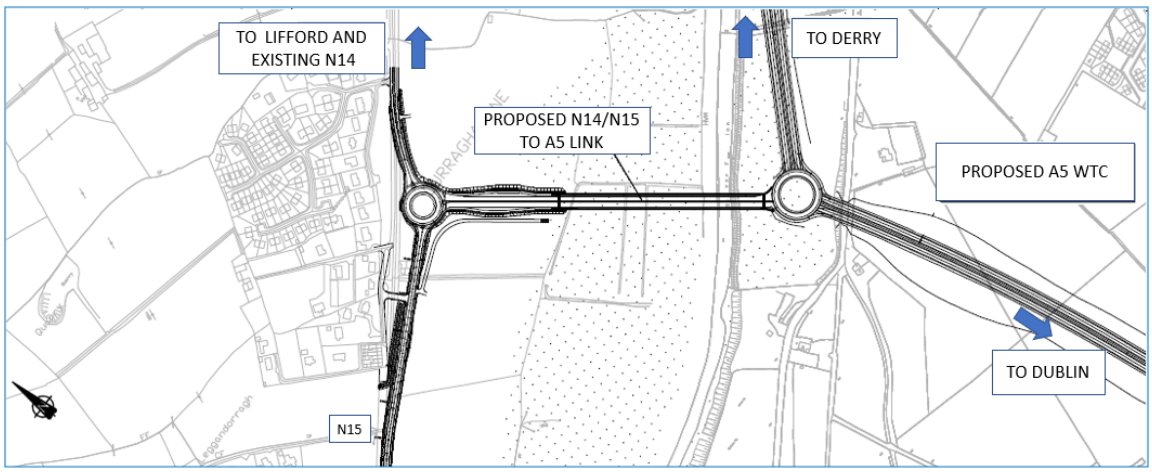

Figure 1-8 Lifford to N14/N15 to A5 Link Border Crossing

Additionally, a cross-border link (the N14/N15 to A5 Link) connecting the new A5 WTC to the N15 south of Lifford has been designed and development consent granted by An Bord Pleanála. The link location has been agreed between the various statutory bodies in both the Republic and Northern Ireland. The route for this link has been decided and where it crosses the River Finn into Ireland will determine the connecting point between the TEN-T in Lifford and the A5 WTC in Strabane. Refer to **Figure 1-8**.

The N14 Manorcunningham to Lifford/Strabane/A5 Link will therefore connect to the N14/N15 to A5 Link which connects to the A5 WTC. If construction of the A5 WTC is delayed, a temporary tie-in detail will be developed which will direct traffic from the proposed scheme along the N15 through Lifford.

1.3 Existing Conditions on the National Routes

1.3.1 Section 1: N15/N13 Ballybofey/Stranorlar Urban Region

The N15 strategic route runs through the centres of Ballybofey and Stranorlar, providing the single National Primary and TEN-T Link to the west of Ireland and the rest of Ireland. The route accommodates strategic and local traffic, all of which travels through the town centres of Ballybofey and Stranorlar, resulting in queuing and delays as the existing infrastructure is insufficient to accommodate current traffic flows.

Figure 1-9 Traffic Congestion on N15 in Stranorlar

The section can be considered in terms of three separate links, namely:

- N15 Meencrumlin to Cappry on the N15, situated to the southwest of Ballybofey;
- N15 Cappry to the N15/N13 junction in Stranorlar; and
- N15/N13 junction to the N13/ R236 junction and north towards Drumkeen.

Traffic data indicates that the through traffic travelling from south of Ballybofey/Stranorlar at the N15 / N13 junction in Stranorlar, with two thirds of the traffic volumes travelling toward Letterkenny and one third of the traffic travelling to Lifford, as shown in **Table 1-1** below.

Table 1-1 Split of through traffic between N13 to Letterkenny and N15 to Lifford

Direction	Movement	Two-way AADT 2028 (from 2028 DM traffic model) (PCU)	% of Two-Way AADT on N15 to the South of Ballybofey
Two Way	Between N15 to the South of Ballybofey and Letterkenny/N13 North	4,694	66%
Two Way	Between N15 to the South of Ballybofey and Lifford/N15 East	2,416	34%

N15 Meencrumlin to Cappry

This 2.5km section from Meencrumlin to Cappry (including the Blackburn Bridge) has recently been upgraded by Donegal County Council with improvements made to the vertical and horizontal alignment, introduction of a consistent cross section (7.3m width) and hard shoulders / hard strips, and improved geometry at existing junctions and accesses.

The improved section terminates at a point approximately 1km west of the existing junction of N15 / Cappry Road and the Roadhouse pub. Within this 1km section, the existing road consists of a single carriageway with a road width of approximately 6m to 7m and has been recently improved with the introduction of traffic calming and speed limit reductions.

N15 Cappry to N15/N13 Junction in Stranorlar

This 4.1km section from southwest Ballybofey (N15 / Cappry Road junction) through Ballybofey and Stranorlar consists of a single carriageway with generally a road width of between 6m to 7m incorporating a 1m to 1.5m wide footway. On the approach to the towns, the cross-section widens to accommodate right turn lanes and footways on both sides. A 50km/h speed limit exists within the towns, with retail frontages, junctions and on-street parking all present on the route. Ballybofey and Stranorlar are joined by the N15 which crosses over a small multi-arch bridge over the River Finn that currently accommodates traffic and pedestrians. A new footbridge over the River Finn to accommodate pedestrians and cyclists was constructed in 2018.

Figure 1-10 Traffic Congestion on N15 in Ballybofey

N15/N13 Junction to N13/R236 Junction and north towards Drumkeen

This 3.6km section consists of single carriageway with a road width of approximately 6m to 7m and 0m to 0.5m hard strips with no verges. A footway exists for approximately 300m beyond Stranorlar town. There is no provision for right turning vehicles. This section includes 50km/h, 60km/h and 100km/h speed limits.

Figure 1-11 N13 North of Stranorlar with no footway or Hardstrip

The junction with the R236 is a simple priority T-junction with priority given to the N13-R236 route. This results in vehicles travelling on the N13 from Drumkeen to Stranorlar being required to stop at this junction and take a right turn to continue on the national route.

Figure 1-12 Queuing traffic at N13/R236 Junction

The cross-section details as observed on site are summarised in **Table 1-2.**

Table 1-2 Summary of Cross Sections along the existing N15/N13 Ballybofey/Stranorlar

Section	Cross Section
N15 Meencrumlin to Cappry (2.5km)	7.3m single carriageway with hard strips
N15 Cappry to N15/N13 Junction in Stranorlar (4.1km)	6.0m – 7.0m single carriageway with 1.0m to 1.5m footway
N13 / N15 Junction to N15 / R236 Junction (3.6km)	6.0m – 7.0m single carriageway with 1.0m to 1.5m footway for part of the section

European Protected Sites – SACs/SPA

The crossing of the River Finn, irrespective of crossing point, will be achieved using a multi-span bridge. The minimum number of spans will be three, including a central span and two smaller side spans. The number of spans may be increased in order to extend the bridge structure over wider areas of floodplain. It is the intent for all options that the central span will clear the river entirely and avoid the need to place bridge piers in the river. This would in turn avoid any direct impacts on the SAC. However, this may not be possible for some options where the crossing points of the SAC is particularly wide. Any direct impacts in this regard are considered in the option assessment.

Indirect impacts will occur at all crossing points, irrespective of whether there is a direct impact or not, caused simply by the presence of the structure over the river. These indirect impacts are also considered in the option assessment.

Figure 1-13 River Finn SAC north of Ballybofey / Stranorlar

Figure 1-14 River Finn SAC south of Ballybofey / Stranorlar

Section 1 considered mainline tie-in locations with the existing road network as follows:

- The south western tie-in was selected to coincide with the eastern end of the recently improved section of the N15 known as the Blackburn Bridge improvement.
- The north eastern tie-in was selected to coincide with a straight section of the N13 south of Drumkeen to provide a safe transition between the existing road network and the proposed scheme, and simultaneously to provide the opportunity to resolve a road safety problem associated with the existing cross road junction at Callan Bridge.

1.3.2 Section 2: N56/N13 Letterkenny to Manorcunningham

The N13 and N56 routes within the study area consist of three routes emanating from the existing N13/N56 (Dry Arch) Roundabout as follows:

- N13 at Listellian (known locally as Lurgybrack) north to the N13/N56 Dry Arch Roundabout
- N56 at Polestar Roundabout east to the N13/N56 Dry Arch Roundabout; and
- N13/N56 Dry Arch Roundabout to the N13/N14 Pluck Roundabout, near Manorcunningham

N13 section north to N13/N56 Dry Arch Roundabout

This section of N13 between the Dry Arch Roundabout and the townland of Listellian, approximately 2km to the south, is known locally as Lurgybrack. This section is mostly three-lane carriageway, including right turn and climbing lane, with a hard strip of between 0m and 0.5m wide southbound and between 0.5m and 2m wide northbound.

An additional lane is provided in the southbound direction. This additional lane forms a right turn lane from the Dry Arch Roundabout for approximately 200m as the N13 approaches a crossroad junction with the L1114 Local Road. Beyond this junction the additional lane becomes a climbing lane as the vertical gradient changes from 2% to 7%. The 7% vertical gradient and climbing lane continue for over 1km (up to 8.7% in one location) after which the vertical gradient reduces and the climbing lane tapers back to zero. In the northbound direction there is a gravel runaway escape lane running alongside the excessive downhill

gradient that ends prior to the crossroad junction. Beyond this junction the additional lane then becomes a straight / right turn lane leading into Dry Arch Roundabout.

In addition to the excessive gradient along most of this section there are multiple public and private direct accesses (including St. Patricks Primary School). The posted speed is generally 100km/h however at the approaches to the school reduced posted speeds of 60km/h are in place during school hours.

N56 Polestar Roundabout to N13/N56 Dry Arch Roundabout

This N56 national secondary road section is 1.5km long with multiple direct accesses due to its semi-urban environment on approach to Letterkenny town. The carriageway comprises four-lanes (two lanes in each direction with no segregation) posted at 80km/h. Because this section of the N56 is a lifeline route into Letterkenny town from the east and south, this link suffers from particularly heavy congestion during peak hours.

Figure 1-15 Queuing traffic of Polestar Roundabout

This link also has a poor safety record and Donegal County Council are currently working on options to improve safety. This is likely to include further measures to reduce the posted speed, provide pedestrian and cycle facilities, introduce a raised central median that reduces right-turning manoeuvres and offers signalised junctions and pedestrian crossings.

N13/N56 Dry Arch Roundabout to N13/N14 Pluck Roundabout (near Manorcunningham)

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

Figure 1-16 Right Turning facility of Trimragh on N13

The cross-section details as observed on site are summarised in **Table 1-3.**

Table 1-3 Summary of Cross Sections along the N56/N13 Letterkenny to Manorcunningham

Section	Cross Section
N13/N56 Dry Arch Roundabout southbound on N13 towards Lurgybrack (2km)	Single carriageway 3.5m lanes with varying hardstrip. Section includes a 3.5m SB climbing lane for approximately 1km, right-turn lanes and a NB runaway lane feature.
N13/N56 Dry Arch Roundabout westbound on N56 towards Polestar Roundabout (1.5km)	Generally, two 3.5m lanes in both directions with 0m-1m wide hardstrips. A 1m-2m wide footway on the westbound side. Section includes multiple right-turn lanes.
N13/N56 Dry Arch Roundabout eastbound on N13 towards N13/N14 Pluck Roundabout (4.5km)	Type 1 dual carriageway including hard shoulders. Central Median varies considerably and typically >5m wide.

European Protected Sites – SACs/SPA

The crossing of the River Swilly at Letterkenny, irrespective of crossing point, will be achieved using a multi-span bridge. The minimum number of spans will be three, including a central span and two smaller side spans. The number of spans may be increased in order to extend the bridge structure over wider areas of flood plain. It is the intent for all options that the central span will clear the river entirely and avoid the need to place bridge piers in the river. This would in turn avoid any direct impacts on the Lough Swilly SAC. However, this may not be possible for some, where the crossing points of the SAC is particularly wide. Any direct impacts in this regard are considered in the option assessment.

Indirect impacts will occur at all crossing points, irrespective of whether there is a direct impact or not, caused simply by the presence of the structure over the river. These indirect impacts are also considered in the option assessment.

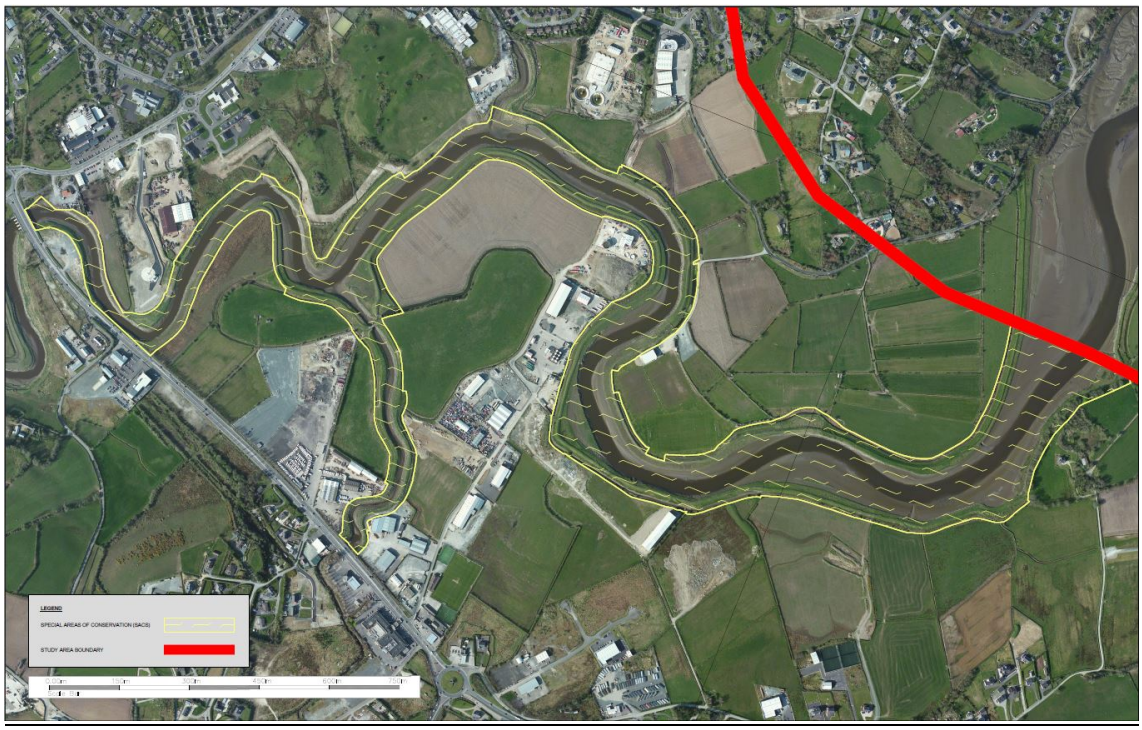

Figure 1-17 Lough Swilly SAC at Letterkenny

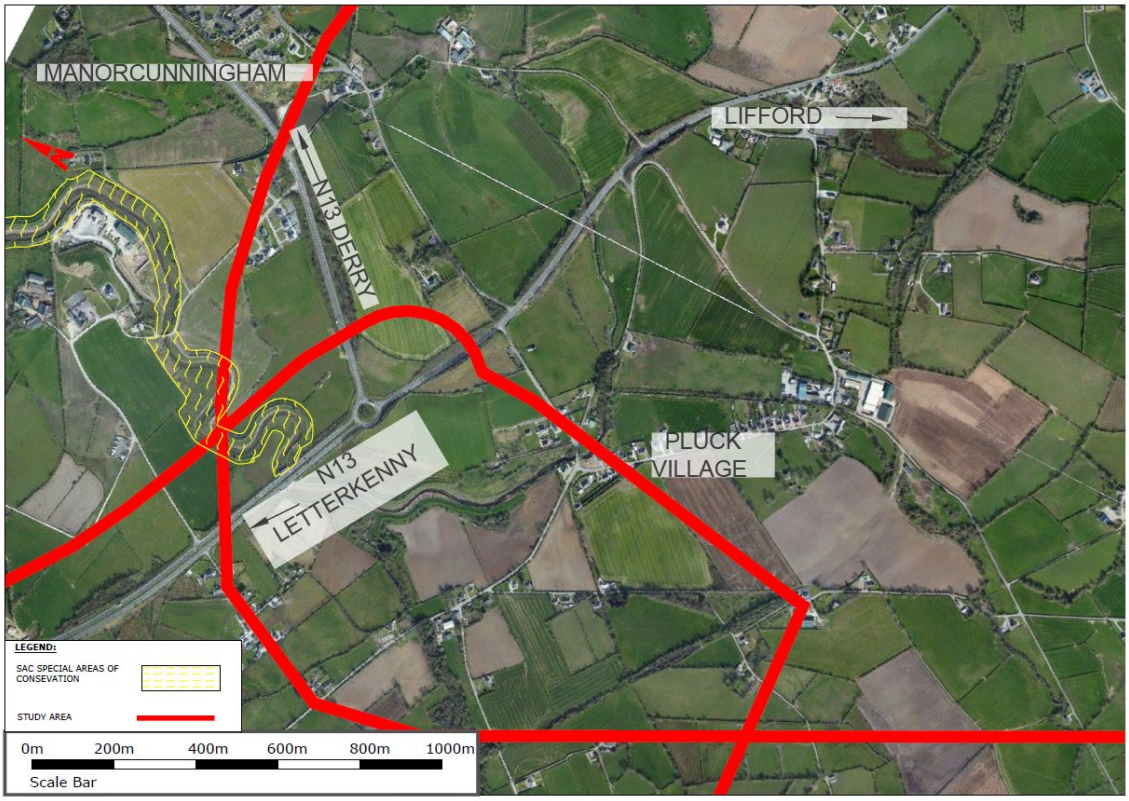

Figure 1-18 Lough Swilly SAC at Isle Burn, west of Pluck Roundabout

There is a second SAC within the study area for Section 2 near Manorcunningham, associated with the Isle Burn, a tributary of Lough Swilly, located immediately west of Pluck Roundabout. This is a much narrower part of the SAC than the main part of the Lough Swilly SAC at Letterkenny and can be crossed (irrespective of crossing point) with a single span bridge, if a new bridge is required. Similarly, any direct and/or indirect impacts on this SAC are considered as part of the options assessment.

Section 2 considered appropriate tie-in locations to the existing road network, as follows:

- The N13 southern tie-in considered topography, environmental constraints and Letterkenny urban and semi-urban features to the north and the surrounding hillside topography within rural countryside to the south.
- The eastern tie-in considered the topography, environmental constraints and existing national and TEN-T network to Derry and to Lifford. The existing Pluck Roundabout, and a new greenfield option south of the Pluck Roundabout were selected as viable tie-in options. Each location connected to Section 3, N14 east options to Lifford and the existing N13, north to Derry.
- Western tie-in options connecting back to Letterkenny and the existing N56 national route were also considered. The Swilly river, environmental constraints and Letterkenny's urban surroundings led to the existing Polestar and N56/R245 junctions as the most appropriate tie-in options.

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

The N14 between Pluck Roundabout and Lifford is noted as having an irregular alignment. Refer to **Figure 1-19**. The link is below the standard expected of a national primary route. The existing road has varying characteristics throughout its approximate 17km length and has numerous direct accesses to local villages and other properties. This section can be considered in three separate links, namely:

- N13/N14 Pluck Roundabout to R236 Junction
- R236 Junction to R265 Junction
- R265 Junction to N14/N15 Lifford Roundabout

N13/ N14 Pluck Road Roundabout to R236 Junction (7.6km)

This 7.6km section has a varying single carriageway cross section. At the Manorcunningham end the cross-section consists of approximately a 7m carriageway, with 2.5m hard shoulders and 0.5m verges. This reduces to a carriageway of approximately 6.0m to 6.5m with 0 to 0.5m hard strips and no verges until the N14 reaches the junction with the R236, where it widens out temporarily. The horizontal alignment has many sharp bends and the existing ground is undulating which leads to poor vertical alignment and reduced visibility.

Figure 1-19 Poor alignment on the N14 between Manorcunningham and the R236 junction

R236 Junction to the R265 Junction (7.9km)

As the road approaches the junction with R236, the cross-section widens to accommodate right turning lanes at the staggered junction. This is the only junction/access on this section with a right turn lane. On departure from the junction travelling from west to east, the cross-section width reduces to a 6m wide carriageway with no hard shoulders or hard strips. Overall there is a high frequency of sharp bends with poor visibility at the beginning of the section. Refer to **Figure 1-20**.

Figure 1-20 N14 from Manorcunningham to Lifford between the R236 and R265 junctions

Junction with R265 to N14/N15 Lifford Roundabout (2.2km)

The alignment continues with several junctions on approach to Lifford with right turning lanes provided. Nearer to Lifford town, a 50km/h speed limit is introduced, and the cross-section widens to a 13m carriageway with a central hatched road marking and a footway on both sides. The N14 approach to the N14/N15 roundabout at Lifford is two lanes wide for a short length.

The cross-section details as observed on site are summarised in **Table 1-4.**

Table 1-4 Summary of Cross Sections along the existing N14 Manorcunningham to Lifford Corridor

Section	Cross Section
N13/N14 Pluck Roundabout to R236 Junction (7.6km)	6.5m-7.0m carriageway with varied hard shoulder width for 1.5km and then hard strip
R236 Junction to R265 Junction (7.9km)	6.0m carriageway with 0m to 0.5m hard strip
Junction with R265 to N14/N15 Lifford Roundabout (2.2km)	6.0m carriageway with 0m to 0.5m hard strip 13m carriageway with 2.0m footpath either side (within 50km/h boundary)

The existing cross-section along the N14 should only permit a recommended speed limit of 80km/h or less in accordance with the primary criteria set out in *Guidelines for Setting and Managing Speed Limits* (DTTAS, 2015). However, the existing road is subject to a 100km/h limit. The N14 cross section is required to be enhanced to TII design standards to be suitable for the 100km/h statutory speed limit.

An assessment of the Full Overtaking Sight Distance (FOSD) for this link was measured resulting in approximately a 20% Overtaking Value as calculated using TII DMRB DN-GEO-03031 (TD9/12) para 7.20. However, it should be noted that the FOSD calculation ignores the presence of "*simple junctions and accesses with no central ghost or physical islands"* (DN-GEO-03031 (TD9/12) para 7.18). Therefore, the actual opportunities for safe overtaking on this link are fewer than this measurement indicates.

European Protected Sites – SACs/SPA

The SAC within the Section 3 occurs at the extremities of the study area at the River Finn to the south eastern side near Lifford, and the **Figure 1-18** and **Figure 1-21**. The Section 3 options considered do not include a crossing of the River Finn but intend to terminate at the N14/N15 to A5 Link: this link is a separate, cross-border river crossing which has already been through statutory processes.

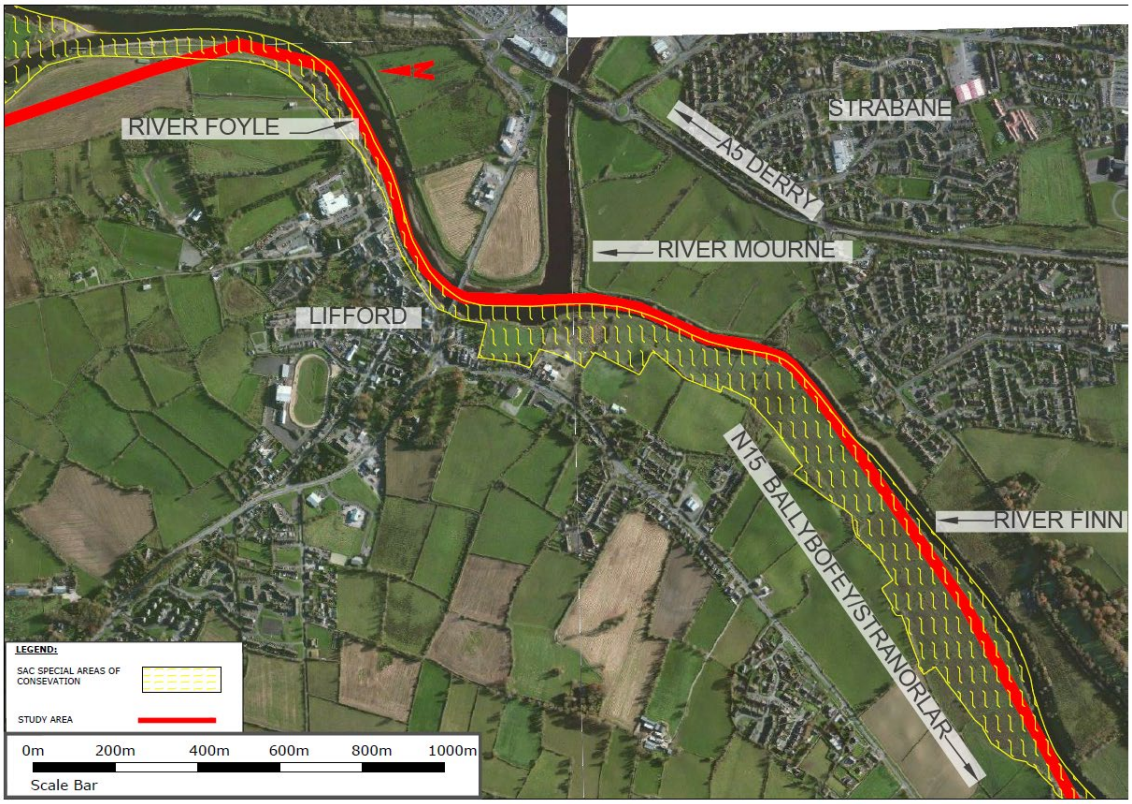

Figure 1-21 River Finn SAC at East End of Section 3 (Northern Ireland border)

There is a second SAC interface with the Section 3 study area at the northern extremity near Manorcunningham, associated with the Isle Burn, a tributary of Lough Swilly, located immediately west of Pluck Roundabout. This SAC falls within Section 2 and Section 3 which as shown in Figure 1-18. This is a much narrower part of the SAC than the main part of the Lough Swilly SAC at Letterkenny. At this stage, no direct impact on this part of the SAC is anticipated from Section 3 options due to the proposed tie-in locations with the existing road network.

Section 3 considered mainline tie-in locations with the existing road network as follows:

- The western tie-in options considered topography and environmental constraints; including the constrained nature of the locality with the Corkey River, Swilly SAC, Pluck and the tie-in required to accommodate traffic to/from the existing N13 TEN-T route to Derry. The existing Pluck Roundabout, and a new greenfield tie-in option south of the existing Pluck Roundabout were selected as viable options. Each location option connected to Section 2, N13 west to Letterkenny and to the existing N13, north to Derry.
- The southern tie-in was defined as the point at which the proposed N14/N15 to A5 Link Road coincided with the existing N15 south west of Lifford. In doing so, there would be a connection to the existing road network while also providing future opportunity to develop the N14/N15 to A5 Link Road scheme connecting across the River Finn to the new A5 Western Transport Corridor in Northern Ireland.

1.4 Purpose of Option Selection Report

1.4.1 Phase 2 Process

The Phase 1 Scheme Feasibility Report concluded that the TEN-T Priority Route Improvement Project is feasible and necessary to provide a high-quality comprehensive road network and to underpin the economic development of the North West region through improved land connectivity to and around this region. The TEN-T Priority Route Improvement Project, Donegal, was therefore advanced to Phase 2 Option Selection.

This Option Selection Report represents the main deliverable for Phase 2 of the PMGs. The term Option Selection Report (PMG, 2019) shall be taken as being synonymous with the Route Selection Report (PMG, 2010). The purpose of the Option Selection Report is to present the project constraints and the assessments that were undertaken in order to identify the preferred Option for the project.

This Option Selection Report presents the assessment in accordance with TII Guidelines. Information is presented in this Report (and its accompanying volumes) to provide clarity on the decision-making process which has resulted in the selection of a preferred option for each section. Where possible this Report is a non-technical summary of the detailed technical and scientific information collated as part of Phase 2. The detailed technical and scientific information is included in the accompanying volumes to this Report.

The main elements in Phase 2 are:

- Stage 1 – Preliminary Options Assessment
- Stage 2 – Project Appraisal
- Stage 3 – Selection of Preferred Option

The TII Guidelines sets out the implementation of the first three stages of the option selection process leading to the selection of the preferred option. This process is illustrated in **Figure 1-22**.

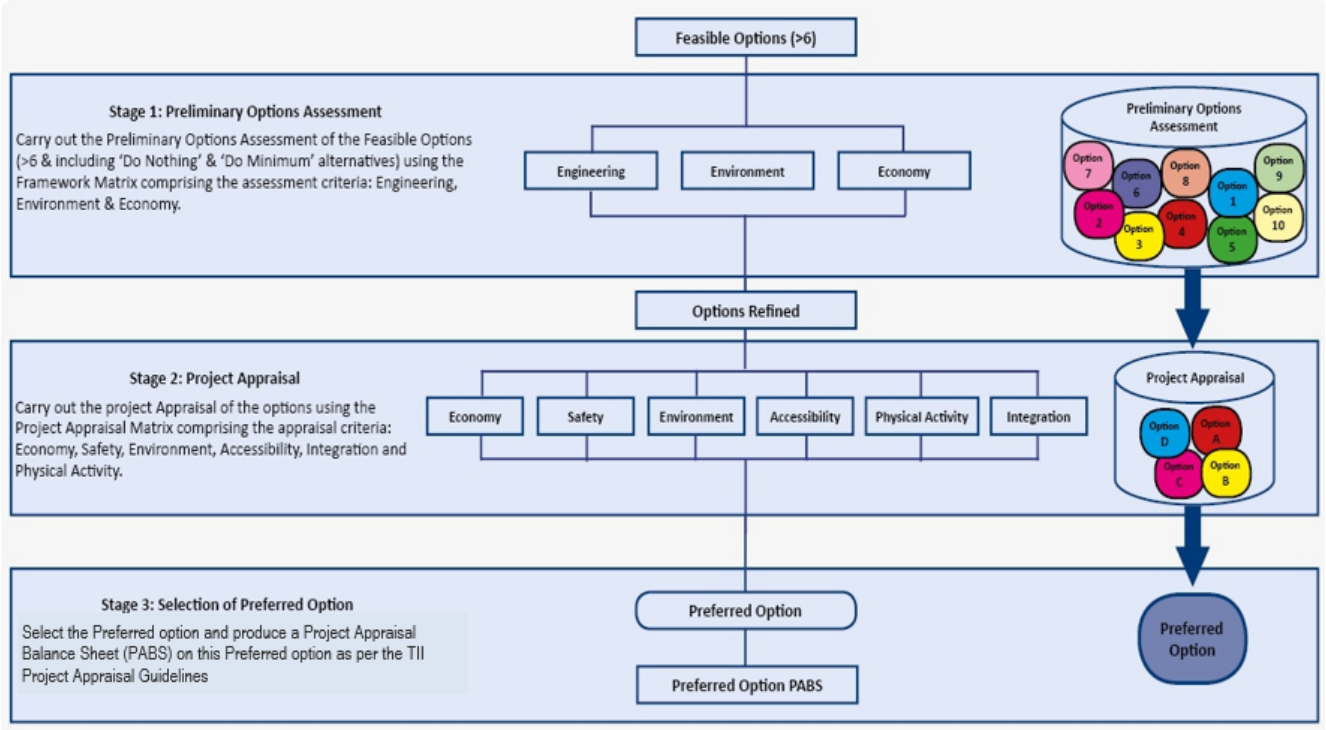

Figure 1-22 Stages of the Option Selection Process (TII Guidelines)

2 IDENTIFICATION OF NEED

2.1 Strategic Fit and Priority

As outlined in Section 1.2.1 of this Report, County Donegal is one of the most peripheral counties in Ireland, having minimal land borders with Ireland, approximately 90% of its land borders with Northern Ireland and a significant shoreline on the Atlantic Ocean.

The Draft Regional Spatial and Economic Strategy (RSES) for the Northern and Western Regional Assembly (2018) provides regional strategic planning, economic policy and coordinating initiatives to support the delivery of the National Planning Framework for the northern and western region of Ireland, including County Donegal. The draft RSES includes a strategic plan for Letterkenny as a regional growth centre which is part of the North-West City Region, incorporating Letterkenny-Derry-Strabane. Population growth in the regional centres is targeted to be 40% over the lifetime of the National Planning Framework, with Letterkenny expected to grow its population by 7,700 to approximately 27,000 by 2040 (Draft RSES Section 3.1). As outlined in **Section 4**, the existing national road network is already underperforming in terms of Level of Service. As such, the predicted and target growth rates anticipated in the region will further burden the road network in the region, unless intervention is implemented.

2.2 Road Development Policy

2.2.1 TEN-T Network

The TEN-T network is a selection of strategic transport corridors throughout the European Union (EU) that have been identified to play a key role in the mobility of goods and passengers through the EU. EU Regulation Number 1315/2013 sets the requirements for the TEN-T network. The overarching aim of the TEN-T network is that all EU citizens should be no further than 30 minutes away from the comprehensive network, thereby being connected nationally and internationally.

The TEN-T network is being developed through a dual-layer structure consisting of a comprehensive network and a core network, these two layers being the highest level of infrastructure planning within the EU. Roads forming part of the TEN-T network are to be high quality roads, designed and built for motor traffic. The TEN-T network on the island of Ireland is illustrated earlier in **Figure 1-2**.

The TEN-T Priority Route Improvement Project in Donegal forms part of this Transport Network. The project consists of three primary national roads; N13, N14 and N15 which are prioritised for improvement to address current safety and operational issues. In addition, the project includes the existing N56 national secondary strategic link into Letterkenny which is also prioritised for improvement to address current capacity and operational issues.

2.2.2 Strategic Investment Framework for Land Transport

In 2015, the Department of Transport, Tourism and Sport (DTTAS) published the Strategic Investment Framework for Land Transport which identifies investment in transport infrastructure as essential to the proper functioning of the economy and society. Within this framework, Priority 3 seeks to maximise the contribution of land transport networks to national development through investment in roads to inter alia:

- Provide access to poorly served regions, for large-scale employment proposals, to complete missing links and to address critical safety issues, and
- Support identified national and regional spatial planning priorities.

2.2.3 National Planning Framework – Project Ireland 2040

The National Planning Framework (NPF), published in April 2018, includes a section on Donegal within Section 3.3. Northern and Western Region. The county is identified as "spatially unique" given its location relative to the other counties in Ireland and its substantial border with Northern Ireland. The need to address connectivity in this area is highlighted in order to enable growth, competitiveness, secure investment and grow sustainably.

The NPF establishes National Strategic Outcomes that will be achieved by the implementation of the policy objectives of the NPF. Of particular relevance to Donegal is National Strategic Outcome 2 – Enhanced Regional Accessibility which specifically identifies the upgrading of access to the northwest border area and provides for the improvement of average journey times and an average inter-urban speed of 90km/h (NPF, 2018).

The "North West City Region", consisting of Letterkenny, Derry and Strabane, is the focus of National Policy Objective 45 in the NPF, and aims to develop greater inter-urban transport infrastructure in the northwest:

> *"In co-operation with relevant Departments in Northern Ireland, support and promote the development of the North West City Region as interlinked areas of strategic importance in the North-West of Ireland, through collaborative structures and a joined-up approach to spatial planning."*

National Policy Objective 46 also supports cross-border initiatives in transport:

> *"In co-operation with relevant Departments in Northern Ireland, enhanced transport connectivity between Ireland and Northern Ireland, …".*

The NPF also requires each Regional Assembly area to produce a Regional Spatial and Economic Strategy (RSES) as provided for under the Local Government Reform Act, 2014.

The document highlights that the "*Northern and Western Region justifies a particular focus in this Framework*". This is due to a "*historically lower level of urbanisation compared to other regions and proximity to the border and risks posed by Brexit*".

The document recognises the cross-border performance of the region identifying that "*Letterkenny, with Derry City and Strabane in Northern Ireland also functions as a cross-border city region"* and recognises the importance of Letterkenny in the North-West Gateway Initiative.

These statements are supported by National Strategic Outcome 2, which highlights plans for Accessibility to the North-West which include:

- "*upgrading access to the North-West border area, utilising existing routes (N2/N14/A5*)";
- "*Progressive development of the Atlantic Economic Corridor from Galway northwards by upgrading sections of the N17 northwards, where required and upgrading the N15/N13 link*".

2.2.4 Project Ireland National Development Plan 2018 - 2027

The National Development Plan (NDP) sets out the investment priorities that will underpin the successful implementation of the National Planning Framework (NPF) through a total investment of approximately €116 billion.

The NDP supports the NPF and sets priorities for investment including the *"N15 Ballybofey Bypass",* "*N13/N14/N56 Letterkenny Bypass and Dual Carriageway to Manorcunningham" and the "N14 Manorcunningham to Lifford*".

2.2.5 North West Regional Spatial and Economic Strategy

The North West Regional Spatial and Economic Strategy (RSES), draft dated November 2018 includes specific reference to the development of the TEN-T network and is embedded in the principles and objectives for place-making across the northwest area and the Letterkenny Regional Centre. Policy 5.1, Investing in Transport Infrastructure, highlights the requirement to develop infrastructure for strategic connectivity, "*with a particular emphasis on TEN-T routes*".

Section 6 Growth Ambition (Connectivity – Connected Region) in the Draft RSES, outlines the importance of transport infrastructure to support future visions for "*community interaction, economic prosperity and environmental quality*" locally and internationally. Completion of the TEN-T routes is identified as an example of how this may be achieved. Regional Policy for National Roads mentions the delivery of the N15/N13 Ballybofey / Stranorlar Bypass (Section 1) and the N13/N14/N56 Letterkenny Bypass and dual carriageway to Lifford (Section 2 and Section 3).

2.2.6 Regional Planning Guidelines (2010-2022)

The Border Regional Authority Regional Planning Guidelines (2010-2022), hereafter the RPG, includes County Donegal. Chapter 5 of the RPG sets out the infrastructure strategy for the region required to ensure the successful delivery and implementation of the settlement and economic strategies. The N13 is identified as an essential piece of the Atlantic Corridor linking Derry, Letterkenny, Sligo and Galway. The N14 Letterkenny to Northern Ireland road (Section 3) is identified as a priority Radial Route (p.88) while the N15/N13 Ballybofey / Stranorlar Bypass (Section 1) is identified as a strategic link road (p.89). Both are supported by roads policy INFP2 (p.90). The N56 Letterkenny Relief Road, which forms part of Section 2, is identified in Gateway Policy INFP3 as also a priority for development (p.90). This project has now been absorbed by the goals and objectives of the TEN-T project.

2.2.7 County Donegal Development Plan 2018-2024

The County Donegal Development Plan 2018-2024 contains core strategy objectives that support the development of transport infrastructure in the county. The development of the N15/N13 Ballybofey / Stranorlar Bypass, the N56 Letterkenny Relief Road and the N14 Letterkenny to Lifford roads are included as strategic roads in the County Donegal Development Plan (p.77 and Map 5.1.2).

CS-O-9 specifically mentions the TEN-T network:

"To co-ordinate and promote the delivery of key roads and access infrastructure (including the N5 Western Transport Corridor and A6 road projects, the TEN-T Network, Letterkenny Relief Road and the N14 Letterkenny / Lifford Road."

Transport objectives T-O-1, T-O-2, T-O-3 and T-O-4, within the County Donegal Development Plan, all support the development of this project. In particular, T-O-1 relates specifically to the TEN-T network:

"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."

2.2.8 Seven Strategic Towns Local Area Plan 2018 – 2024

The Seven Strategic Towns Local Area Plan 2018 – 2024 (SSTLAP) has been prepared in the context of the County Development Plan (above). The policies and objectives of the County Development Plan carry through for the SSTLAP, which seeks to apply them to the functions of each town. In this context, delivery of the TEN-T network is specifically mentioned in the sections below.

Section 5.5 recognises the economic development potential of the Ballybofey-Stranorlar area due to its strategic location at the intersection of two key national primary roads, which form part of the TEN-T network.

The Objective BS-ED-2 is to identify suitable lands on the west of Ballybofey for long term economic development. However, this will only be realised on completion of the N15/N13 Ballybofey / Stranorlar Bypass, i.e. Section 1 of the TEN-T network. Paragraph 5.7.1 under *Strategic Roads* states:

"Notwithstanding the strategic advantages of being positioned on the intersection of two key National Primary Roads, the continued absence of the bypass, and the associated continuing heavy traffic volumes passing through the towns, (and particularly the towns' main areas of commercial activity), paradoxically acts as a major impediment to commercial activity and progress in the town generally. Accordingly, it remains an imperative that the longstanding Ballybofey-Stranorlar Bypass proposal is brought to fruition as soon as possible."

Section 7 identifies Bridgend as a key border town due to its location on the N13/TEN-T route between Letterkenny and Derry. Objective BE-TC-2 and Policy BE-TC-3 is to examine options for an alternative strategic road link between Donegal and Derry and improve this section of the critical N13 TEN-T link between Letterkenny and Derry.

Section 9 identifies Donegal Town as strategically located along the TEN-T network, connecting the region via the N15 and N13 from Derry to Sligo. Policy DT-ED-5 is to consider lands on the outskirts of Donegal Town, along the N15, for tourism, leisure and economic development taking account of potential interaction with the TEN-T network.

2.3 Other Relevant Plans and Policies

Other relevant plans and policies related to the proposed TEN-T project are set out in **Table 2-1**.

Table 2-1 Other Relevant Policies

Plan/Policy	Relevance to TEN-T Priority Route Improvement Project, Donegal
National Level	
Department of Transport: Statement of Strategy, 2016 - 2019	**Land Transport – High Level Goal** To best serve the needs of society and the economy through safe, sustainable and competitive transport networks and services
A Sustainable Transport Future: A New Transport Policy for Ireland 2009-2020	The Policy contains 49 actions, they can be grouped into essentially four overarching ones: ▪ Actions to reduce distance travelled by private car and encourage smarter travel, including focusing population growth in areas of employment and to encourage people to live in close proximity to places of employment and the use of pricing mechanisms or fiscal measures to encourage behavioural change, ▪ The actions aimed at ensuring that alternatives to the car are more widely available, mainly through a radically improved public transport service and through investment in cycling and walking, ▪ Actions aimed at improving the fuel efficiency of motorised transport through improved fleet structure, energy efficient driving and alternative technologies, and ▪ Actions aimed at strengthening institutional arrangements to deliver the targets.
Regional and Local Level	
Letterkenny & Environs Development Plan 2009-2015	**2.2 Plan Aim** To promote the sustainable growth and development of Letterkenny and its environs as a linked Gateway with Derry so as to focus on the delivery of quality urban structure through the strengthening of neighbourhoods, the promotion of improved quality of life and the promotion of social inclusion and equal access to employment, housing, transport, education and social and cultural activities. **2.3 Strategic Objectives** Strategic Objective 2: To consolidate and strengthen urban form and improve the quality of residential neighbourhoods through improved connectivity and accessibility to community, social, cultural and physical infrastructure.

Plan/Policy	Relevance to TEN-T Priority Route Improvement Project, Donegal
	Strategic Objective 3: To protect and support the existing economic base of Letterkenny and promote new balanced and sustainable economic growth at a local and regional level through the provision of a quality business environment, high level infrastructural access and attractive urban form. Strategic Objective 7: To identify and prioritise infrastructural improvements, in a balanced and sustainable manner, that are required in order to support the linked gateway status of Letterkenny - Derry, in particular the growing population and economic activity. **8.0 Transport and Movement** Strategic Objective 3: To protect and support the existing economic base of Letterkenny and promote new balanced and sustainable economic growth at a local and regional level through the provision of a quality business environment, high level infrastructural access and attractive urban form. Strategic objective 6: To promote the integration of land use and transportation so as to encourage modal shift and the development of sustainable transportation policies. Strategic objective 7: To identify and prioritise infrastructural improvements, in a balanced and sustainable manner, that are required in order to support the linked gateway status of Letterkenny-Derry, in particular the growing population and economic activity. **8.4 Transport and Movement Policies** Policy T1: Letterkenny Integrated Land Use and Transportation Strategy It is the policy of the Councils to prepare an Integrated Land Use and Transportation Strategy, comprising a strategic overview of transportation issues in the town and addressing a range of issues including urban cycling, pedestrian movement, reduced mobility concerns. Policy T2: Strategic Road Links to the Town It is the policy of the Council's to safeguard national investment, by preventing the premature obsolescence of strategic road links to the town, by not permitting direct frontage access to the N13 and N14 within the Plan Area. Policy T7: New Strategic Relief Road Development and Urban Road Improvement Around the Town. The Councils seek to improve access into, through and around Letterkenny through the further upgrade and development of Urban Roads and the identification and provision of new Strategic Relief Road Corridors. (See Map No. 4 'Transport Map). The roads and corridors identified are an indicative width of 20 metres.
Lifford Local Area Plan 2007-2013	**Plan Aim** To consolidate the town by concentrating development within serviced spaces/corridors from the core outwards, that will enable the progressive extension of services throughout this and subsequent Plan periods. To facilitate development that improves the quality of life for residents, local business and those visiting the Town, and which allows for a safe, attractive and vibrant place to live. **Specific Objectives** SO 7: To reserve lands for the creation of a new inner relief road from the N14 to the Machinery Yard, and to protect the proposed N14/A5 (Manorcunningham - Lifford/Strabane) Realignment. **Roads Transportation** RT1: To reserve and safeguard the indicative new roads and access points, identified on the land-use map. RT3: To prohibit all new accesses onto the proposed N14/A5 Manorcunningham to Strabane, National Primary Route Realignment. RT4: To maintain the development free buffer corridor as indicated on the land use map, located alongside the N14 Manorcunningham – Lifford/Strabane Draft Realignment Corridor.
Draft Derry City and Strabane District Council Local Development Plan 2032 (Transboundary).	The Local Development Plan (LDP) is currently under review. Until it is adopted, the relevant Area Plans currently applicable to the area are the Derry Area Plan 2011 and the Strabane Area Plan 2001. **Derry Area Plan 2011** **Chapter 14 Transportation** The relevant strategies include the following: ▪ Maximise the efficiency of the road network by reviewing traffic management measures and implementing low cost improvements; ▪ Facilitate the safe and convenient movement of traffic and pedestrians by the appropriate development of the local road network; ▪ Implement a road works programme which will focus on the improvement and upgrading of key strategic routes.

2.4 Scheme Specific Need

Fundamentally, this project addresses the objectives of improving the TEN-T network and strategic transport network in County Donegal. The improvements are required to address the sub-standard infrastructure provision and improve the road safety performance of the network. This objective is supported by EU legislation, the NPF, the RPG, the Draft RSES and the County Development Plan. Furthermore, it is an objective of the project to provide improved journey times, journey time reliability and improve accessibility to employment in regional and national centres, including Donegal town, Letterkenny and Derry. The importance of interconnectivity across the strategic transport network and towns in Donegal is recognised by this project.

3 CONSIDERATION OF ALTERNATIVES

3.1 Introduction and Methodology

Alternative solutions must be considered prior to establishing that a road solution is the most suitable infrastructure to address the needs of the project. When identifying alternative solutions, the extent to which the potential solution responds to the needs of the project and the transport problems are considered. The extent to which the potential alternatives address the goals and objectives identified in the Project Brief set out at Phase 1 are also reviewed.

The options that have been considered as alternatives to improving / upgrading the existing road include:

- Improved broadband to accommodate more uptake of remote working with the aim of reducing reliance of workers on the transport network daily.
- Staggering work times to spread the peak hour traffic flows across longer periods of the day, thereby reducing peak hour traffic flows on the existing road network and delays currently experienced by road users on certain sections of the TEN-T route during peak hours.
- Encouraging alternative sustainable forms of transport, such as public transport, to reduce the traffic demand on the existing road and reduce the need to improve road capacity.

3.2 Pre-constraints Study Alternatives

3.2.1 Improved Broadband

One alternative solution investigated was improved broadband connections to enhance the opportunity for home working. This would have a subsequent effect of reducing the need to commute between home and work places, thereby reducing the volume of traffic using the existing road. The need to improve the broadband networks within the northern and western regions has been identified as one of several infrastructure developments that will need to take place in order to enable the objectives of the NPF to be implemented.

The Draft RSES recognises the need to improve the broadband network in the northern and western region. Policy numbers 136 through 140 support the development and roll-out of broadband in the region

The Donegal Local Economic and Community Plan 2016-2022 highlights that the "*functionality of digital technologies provides an opportunity to counteract*" the region's reliance on the road network. However, the opportunity for increased homeworking, will be limited to a few industries (for example on-line services, consultancy services, IT support services) and would not apply to other labour-intensive industries. The 2016 census has highlighted that Donegal has a higher than average percentage of workers in unskilled, semi-skilled and skilled manual work and a lower than average percentage of professional workers. Therefore, improvement in broadband alone is unlikely to result in increased working from home or have any notable impact on the road network. The plan also highlights that the "*road network is the artery for the region's economy with 100% of goods and people being transported by road*".

As such, improvement in broadband was not identified as a suitable alternative to meet the project objectives and was therefore discounted prior to Stage 1 Option Selection.

3.2.2 Staggering Worktimes and Localised Improvements

Staggering worktimes / school times is a useful measure to spread peak hour traffic flows across longer periods of the day thereby reducing peak hour traffic flows on the existing road network. This has the potential to alleviate the delays experienced, particularly on Sections 1 and 2, during peak hours. Such measures are applied to localised capacity problems such as junctions in the vicinity of school and factories, for example.

The need to implement the TEN-T project is not aimed at solving localised traffic problems (although in some cases, that may be a side effect of the scheme) but to provide a high quality transport network that will open up areas of the county and region that have been deprived of high-quality infrastructure in the past.

Therefore, staggering worktimes and implementing localised improvements will not meet the objectives of the project.

3.2.3 Alternative Forms of Transport

Transport infrastructure in Donegal is focused on the road network due to the lack of a rail network in the county. Re-opening former rail routes has been considered in previous years: a consultation paper entitled Future Railway Investment was published by Northern Ireland's Department for Regional Development in 2013. This included an option to reopen cross-border rail links from Derry to Letterkenny and Donegal town.

An initial appraisal concluded that the benefit/cost ratio was insufficient to warrant further detailed investigation. Extending the Iarnród Éireann network north from Sligo to Donegal, Letterkenny, Strabane and Derry has been considered, as the final stage of a Western Rail Corridor. However, the Irish Government's stated position is that maintaining the existing rail network takes priority over future extension plans.

As such implementation of a rail-based solution is considered not viable, this alternative was discounted during Phase 1.

3.2.4 Alternatives Shortlisted for Consideration

Sections 3.2.1 to 3.2.3 detail why improved broadband, alternative working times/localised improvements and alternative forms of transport were discounted as feasible solutions to address the needs of the scheme or meet the project objectives. This process identified that a road-based solution is the most feasible option. There is support across national and regional policy documents supporting the implementation of road-based solutions at these locations.

The "Regional Spatial and Economic Strategy Issues Paper 2035", which supports the implementation of the National Planning Framework - Ireland 2040, published by the Northern and Western Regional Assembly (NWRA) recognises the need to improve the road network:

"In addition to the legacy of underinvestment in our road's infrastructure, there are currently multiple suspended National Road Projects in the Border Region (18 no.) and in the Western Region (19 no), Source TII."

"The NWRA has identified what we consider to be the Critical Enabling Infrastructure priorities for our Region, and see these projects as crucial to the ability of our major urban centres to harness our potential, and act as Regional drivers for the wider areas they serve in role and function"

Two projects listed by the NWRA include:

"The advancement of the N2 / A5 / N14 to a Ten-T high quality road standard from the North West (Letterkenny / Derry) to Monaghan, and onwards to the M1 at Ardee.

The upgrade of the AEC (Atlantic Economic Corridor) to a Ten-T quality road standard from Letterkenny south to Sligo, and Galway, linking with the new M-17 motorway."

These projects are referred to in regional and national policies (NPF/RSES) as road-based projects, acknowledging that the preferred alternative to address the need for intervention is a road based solution. The Project Appraisal Guidelines for National Roads, Unit 4.0, (PE-PAG-02013) outlines the following in respect of scenarios to be considered:

3.3 'Do Nothing' Scenarios

Do Nothing scenarios are considered within the assessments (refer to **Chapter 8** for Section 1; **Chapter 11** for Section 2; and **Chapter 14** for Section 3).

Do Nothing scenarios represent the existing network without any improvements.

3.4 'Do Minimum' Scenarios

Do Minimum scenarios are considered within the assessments (refer to **Chapter 8** for Section 1; **Chapter 11** for Section 2; and **Chapter 14** for Section 3).

Do Minimum scenarios include the existing network and any adjacent committed schemes.

3.5 'Do Something' Scenarios

Do Something scenarios are considered within the assessments (refer to **Chapters 8 to 10** for Section 1; **Chapters 11 to 13** for Section 2; and **Chapters 14 to 16** for Section 3).

Do Something scenarios include new online and/or offline options.

4 TRAFFIC ASSESSMENT AND ROAD CROSS SECTION

4.1 Introduction

The Project assessed a series of road transport solutions within each study area, centred around the national primary road network in Donegal. The three sections of the project have been appraised together as a single project to assess the effect on the wider road network and its performance against the project objectives. This is supported by an appraisal of the three sections separately.

4.2 Scope of Traffic Modelling and Methodology

4.2.1 Introduction

This section provides a summary of the Transport Modelling Report (TMR). The full report is included in **Volume F**.

The purpose of the TMR is to describe the traffic forecasting that has been undertaken. It outlines the development of the Base Year transport model, the methodology for forecasting future year travel demands and the testing of scheme options.

4.2.2 Review of Existing Models

Due to the scale of the options and the potential for impact on traffic routing, it was considered that an assignment model was required to facilitate assessment of the improvements.

A review of existing transport models of the area was undertaken to identify if a suitable basis already existed for the assessment of the improvements. One of the criteria with the modelling platform was that it had to have enough network coverage to accommodate all of the improvements being considered. This was required to provide a consistent basis for assessing the range of options being considered as part of the Phase 2 Option Selection process.

It was considered that the National Transport Model (NTM) did not currently provide enough network or zoning detail in the area of influence to be used as the basis for assessment. As the NTM would have required updating, a review of alternative modelling platforms was also considered.

The existing N13/N14/N15 SATURN (Simulation and Assignment of Traffic to Urban Road Networks) model, validated for a base year of 2013, covered much of the required study area. However, it contained a low level of detail at Letterkenny, which had been modelled as part of the buffer network only. A standalone model of Letterkenny had also been prepared in the SATURN software and was validated for a base year of 2009.

Following a review of the existing models, it was considered that the best approach to providing a study model of the area would be to amalgamate the N13/N14/N15 SATURN model with the Letterkenny SATURN model. This approach would provide a detailed simulation model of the full study area.

Due to the age of the existing models, it was necessary to update the traffic demands contained within them. The new amalgamated model, referred to as the 'Donegal TEN-T Model', has been validated for a base year of 2017.

SATURN was retained as the software platform for the new Donegal TEN-T model. SATURN is a macro assignment simulation software package that enables the modelling of detailed network operation, including effects such as flow constraint, blocking back and the modelling of different junction types. Together with the assignment capability of the software, it was considered to provide an appropriate basis on which to

simulate the operation of the base network and to assess the impact of the proposed Donegal TEN-T options.

The network coverage of the Donegal TEN-T transport model is shown in **Figure 4-1.**

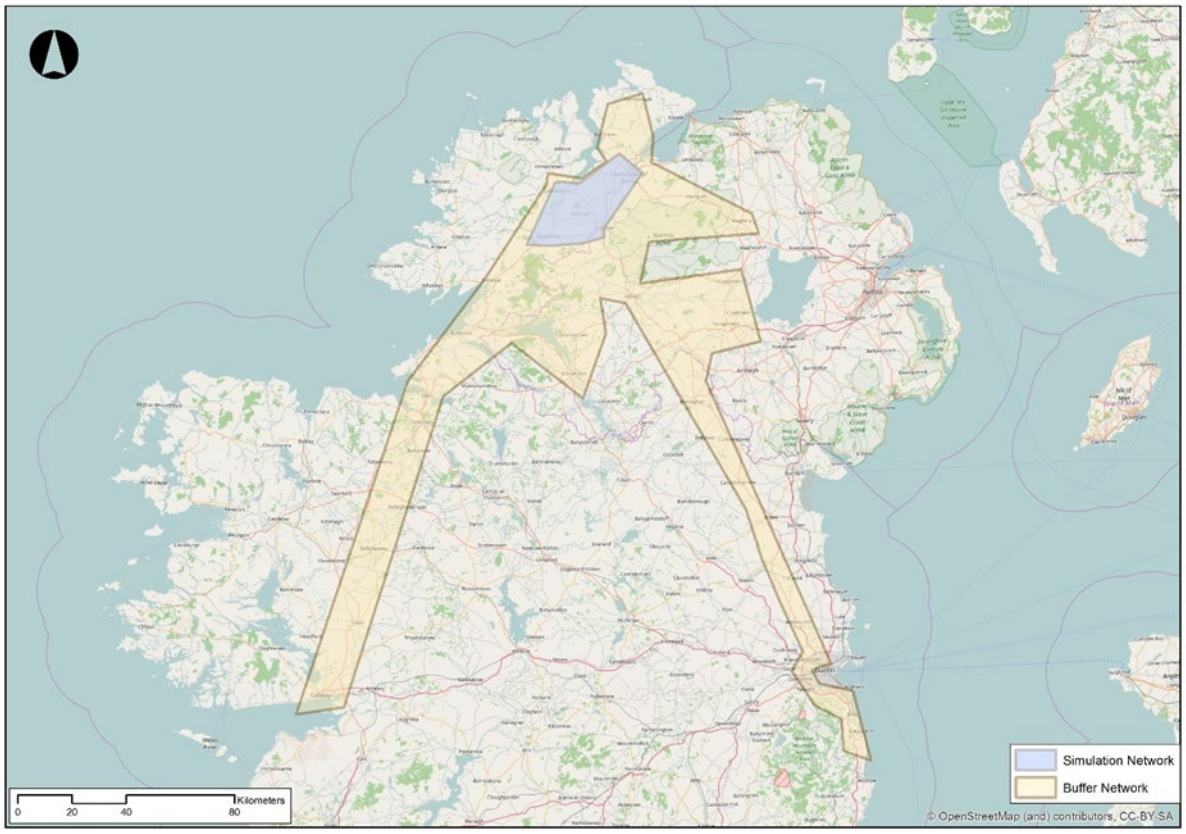

Figure 4-1 Transport Model Network Coverage

4.2.3 Traffic Survey Data

As an input to the traffic model, a programme of traffic surveys was undertaken in December 2017. The traffic surveys included Junction Turning Counts (JTC), Automatic Traffic Counts (ATC), Automatic Number Plate Recognition (ANPR) and Moving Car Observer (MCO) journey time data. A summary of the traffic survey data used within the development of the Donegal TEN-T model is shown in **Table 4-1**.

Table 4-1 Traffic Survey Data Collection

Survey Type	Number of Locations	Date of Survey
ATCs	26	ATCs carried out between the 29th November and the 12th December 2017. One site was resurveyed between the 7th and the 20th December.
Manual Classified Counts (Junction Turning Counts)	28	07:00-19:00 on 5th December 2017.
ANPR	12	07:00-19:00 on 5th December 2017
MCO Journey Times	3	07:00-10:00, 12:00-14:00 and 16:00-19:00 on 5th December 2017.

Data from the Transport Infrastructure Ireland (TII) Traffic Monitoring Unit (TMU) database was also collated for use. The TMU data provided information on the longer term trends within the study area. The December

2017 traffic survey data was compared to longer term averages from the TMU database in order to confirm that it was suitable for use in the development of a traffic model of the study area.

Full details of the traffic surveys collected including the locations are contained in the Transport Modelling Report included in **Volume F**.

4.2.4 Traffic Modelling

4.2.4.1 Flows

A matrix estimation process was adopted to update the traffic demands from the previous N13/N14/N15 and Letterkenny models, so that it reflected the 2017 traffic survey data. The was achieved by factoring the base matrices to a base year of 2017 and then applying Matrix Estimation (ME).

ME was undertaken in the model to modify the prior origin-destination (OD) matrix based on a comparison of counted volumes and assignment volumes. This process adjusted the prior OD matrix so that the assignment flows of the model on the road network matched the observed flows as closely as possible. The ATC and MCC data recorded in 2017 was used for the ME process.

The procedure for estimation of the demand matrices is illustrated in **Figure 4-2.**

The calibration exercise concluded that a very close match is achieved between modelled and surveyed flows. The comparison of modelled and recorded flows has identified that the AM, Inter and PM Peak period models match the flow criteria for all user classes. Likewise, the GEH (Geoffrey E. Havers statistic) results show that the AM, Inter and PM Peak period models also match the criteria for all user classes.

4.2.4.2 Journey Times

Journey times from the Donegal TEN-T model have been compared against data from the ANPR surveys. The comparison of surveyed and modelled journey time data for the AM peak period indicates that modelled journey times are generally within 15% of the surveyed times. The comparison of surveyed and modelled journey time data for the IP peak period indicates that modelled journey times are generally within 15% of the surveyed times. The modelled journey times through Letterkenny in the northbound direction of travel are 19% faster than surveyed and it is judged that this will contribute to a conservative estimate of the potential benefits that may be generated by the proposed Section 2 options. The comparison of surveyed and modelled journey time data for the PM peak period indicates that modelled journey times are generally within 15% of the surveyed times on the key routes. It is considered that the model provides a reasonable estimate of journey times along the key routes and is suitable for the purpose of carrying out a comparative assessment of options on the TEN-T network.

4.2.4.3 Matrix Validation

Changes brought about by ME should be carefully monitored during the ME process. Trip length distributions (TLD) were compared between the prior and post matrices for the three modelled time periods. The results of the comparison between the prior and post matrices for the three time periods indicate that the ME process provided matrices that provide a reasonable distribution of trip lengths.

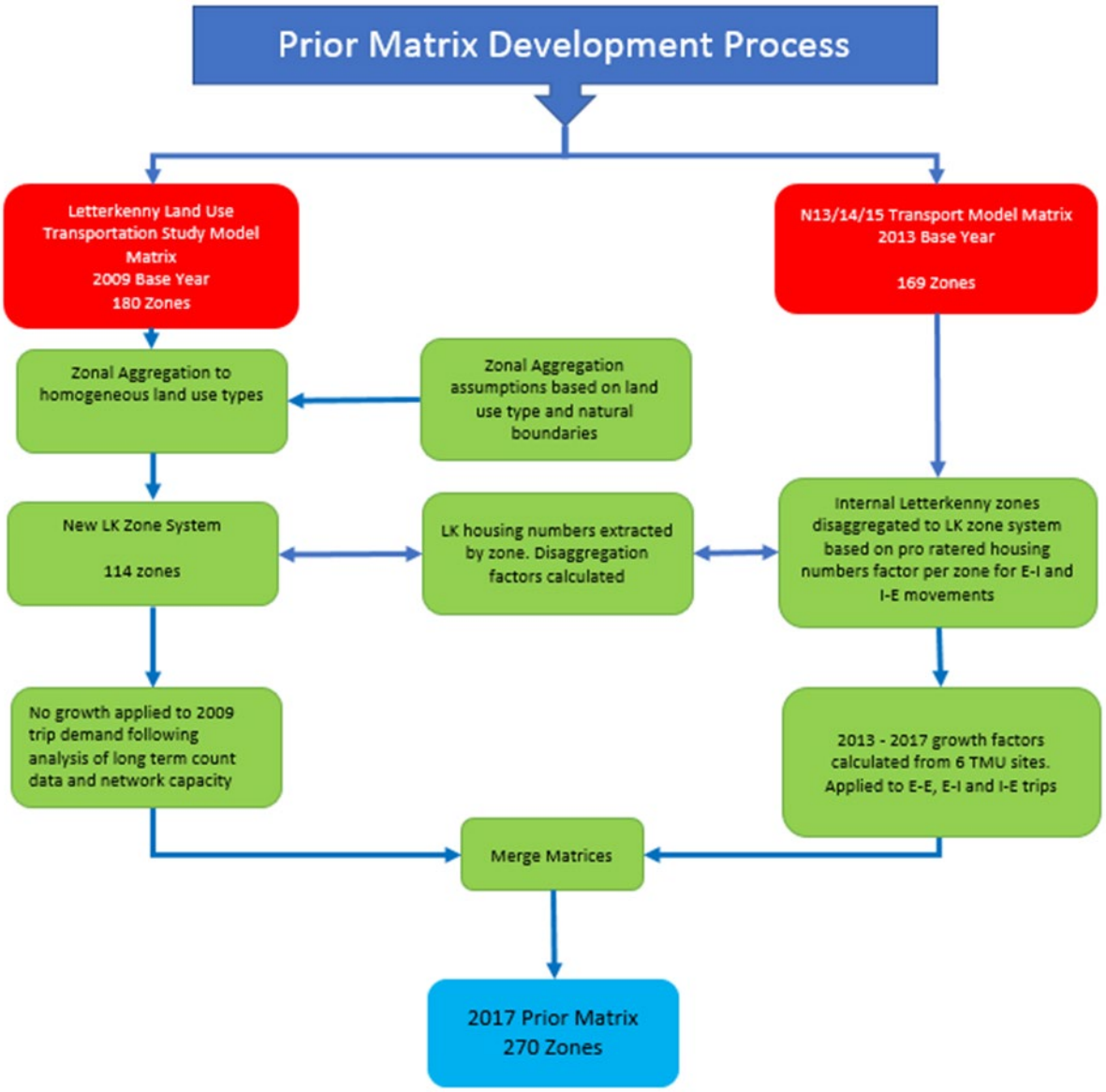

Figure 4-2 Matrix Estimation Procedure

4.2.5 Traffic Demand Projections

The development of the Do Minimum models includes the preparation of forecast demands and the inclusion of committed schemes with the modelled network.

The following future year scenarios have been prepared:

- Opening Year: 2028
- Design Year: 2043 (opening year + 15 years)
- Forecast Year: 2058 (opening year + 30 years)

The traffic demands within the Do Minimum and Do Something scenarios have been forecast based on a fixed trip assumption.

4.2.5.1 Demand Growth

The demands within the future year models are based on the traffic growth factors included with PAG Unit 5.3: Travel Demand Projections (PE-PAG-02017, 2019). The base demands were factored according to the 'Annual Growth Factors' in Table 5.3.2 of PAG Unit 5.3, for the Border Region Central Growth Scenario. The growth rate has been applied as a global factor to the matrices. Linear interpolation of the growth rates was applied to produce the demands for the modelled years used within the Donegal TEN-T assessment.

4.2.5.2 Do Minimum Network

A series of committed infrastructure schemes have been added to the Do Minimum modelled network in the future year scenarios, based on consultation with Donegal County Council. The committed infrastructure schemes included in the future year models are shown in **Table 4-2.**

Table 4-2 Committed Schemes Included in Future Year Model

Name of Scheme	Description
Port-Blaney Link	Link Road going from Southern Relief Road to Neil T Blaney Rd and the N14 Port Road, connecting with signalised junctions.
Joe Bonnar Link Road	Small Link Road, also connecting Port Road to Neil T Blaney Rd, with priority junctions.
Swilly Access Road and R250 Road Improvements	New link roads modelled as a high-quality single carriageway connecting (via signalised junctions) the new Southern Relief at Leck to the R250 at the Aurora Leisure Centre and the R250 at Dunnes Stores.
Southern Relief Road	Upgrade to a high-quality single carriageway with an 80km/h speed limit, of the L1114 between Leck and Strahirley.
Northern Relief Road	The provision of high-quality single carriageway with an 80km/h speed limit along the route of the existing Windy Hall (the existing Windy Hall is not in the base model).
Port Bridge Roundabout	Junction Signalisation.
Oldtown Junction	Junction signalisation.
Justice Walsh Junction	Junction signalisation.
Town Centre Circulation - One Way System	Two-way roads become one-way circulatory as part of public realm improvement.
N56 Four Lane Road – Safety Improvement Scheme	Introduction of 60km/h speed limit, central median and on demand pedestrian crossings between Polestar and Dry Arch roundabouts.

4.2.5.3 Do Something Network

Traffic flow diagrams for each of the options assessed, showing modelled Annual Average Daily Traffic (AADT) flows are presented in **Appendix B** of the Transport Modelling Report contained in **Volume F** of this report.

4.3 Selection of Road Type

In order to assesses and compare the Do Something options, design parameters were established so that alignment designs for each option could be developed. The alignment designs developed for the Option Selection process are not the finalised design and are subject to further changes as the project develops and further assessments and information become available. In addition, as the project develops option designs may extend beyond the 300m corridor. However, the initial alignment designs are required to feed

into the comparative assessment of options, including the economic assessment: for example, determining and comparing the costs of the options, future traffic flow capacities etc.

As all sections aim to provide an upgrade to the National Primary road network and TEN-T network in the county, design speeds of 100km/h have been selected as appropriate for this phase. Sections 4.3.1 to 4.3.3 discuss the cross-section proposed for each section.

The selection of road type and access to the proposed road has been developed to comply with the TEN-T Regulations.

4.3.1 Section 1: N15/N13 Ballybofey/Stranorlar Urban Region

The traffic flows on the existing N15 / N13 are predicted to approximately 12,600 AADT for the scheme Design Year 2028 with higher flows in future years. The forecast traffic flows are within the range of a Type 2 dual carriageway road cross section as indicated in Table 6/1 of DN-GEO-03031. It is noted that the appropriate cross section is required to be selected with reference to the TII Project Appraisal Guidelines. To accommodate the predicted traffic volumes and ensure route consistency, a Type 2 dual carriageway is proposed at option selection stage however more detailed analysis at the Design Stage will verify the cross section.

The Type 2 dual carriageway cross section is depicted in **Figure 4-3** below. For the option selection stage, the cycle track is a shared pedestrian/cycle facility in the verge of the Type 2 dual carriageway. Alternative off road cycle routes will be considered further at the Design Phase.

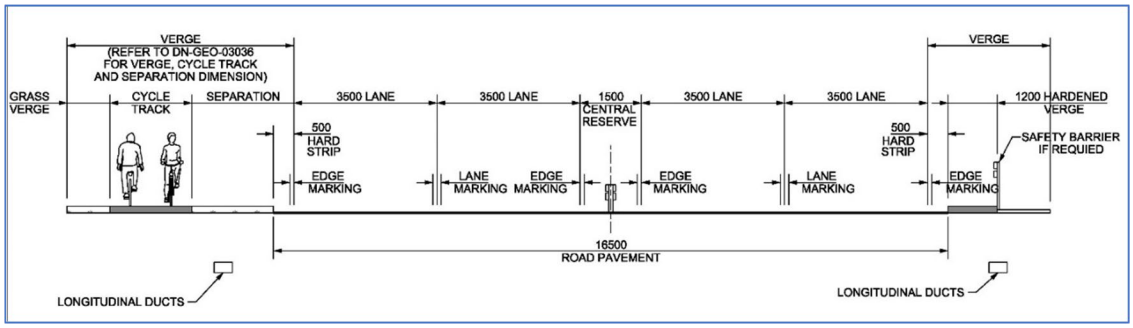

Figure 4-3 Type 2 Dual Carriageway Cross Section

4.3.2 Section 2: N56/N13 Letterkenny to Manorcunningham

The traffic flows on the existing N13 between Dry Arch Roundabout and Lurgybrack (2km to the south) are predicted to grow to approximately 16,800 AADT for the scheme Design Year 2028 with higher flows in future years. These flow volumes are within the range of a Type 2 dual carriageway road cross section as indicated in Table 6/1 of DN-GEO-03031. It is noted that the appropriate cross section is required to be selected with reference to the TII Project Appraisal Guidelines. To accommodate the predicted traffic volumes and ensure route consistency, a Type 2 dual carriageway is proposed at option selection stage however more detailed analysis at the Design Stage will verify the cross section.

The Type 2 dual carriageway cross section is depicted in **Figure 4-3** above. For the option selection stage, the cycle track is a shared pedestrian/cycle facility in the verge of the Type 2 dual carriageway. Alternative off road cycle routes will be considered further at the Design Phase.

The traffic flows on the existing N13 between Dry Arch Roundabout and Manorcunningham Roundabout is predicted to grow to approximately 25,500 AADT for the scheme Design Year 2028 with higher flows in future years. These flow volumes are within the range of a Type 1 dual carriageway road cross section as indicated in Table 6/1 of DN-GEO-03031. This section of the N13 is currently Type 1 dual carriageway therefore the same cross section is proposed at option selection stage which will require confirmed at the Design Stage. A typical Type 1 dual carriageway cross section is depicted in **Figure 4-4**.

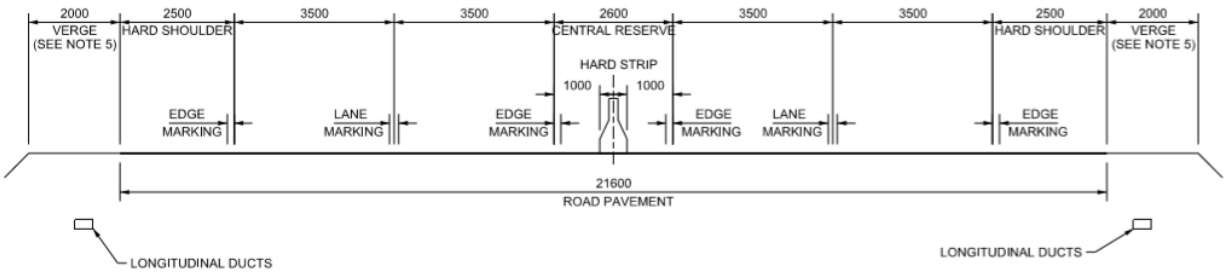

Figure 4-4 Type 1 Dual Carriageway Cross Section

The traffic flows on the existing N56 between Dry Arch and Polestar Roundabout (1.5km to the west) is predicted to grow to approximately 34,000 AADT for the scheme Design Year 2028 with higher flows in future years. These flow volumes are within the range of a Type 1 dual carriageway road cross section as indicated in Table 6/1 of DN-GEO-03031; the appropriate cross section is required to be selected with reference to the TII Project Appraisal Guidelines.

The existing N56 traffic volumes, adjacent business/residences, obstacles to widening, its 'lifeline route' status and constructability impacts in combination make widening the existing N56 Four Lane Road to a Type 1 Dual carriageway unviable and impractical. Like other options, the N56 is also in proximity to the Swilly SAC-SPA and would require a widened/new bridge crossing. For the existing N56 (Four Lane Road) segment between the Dry Arch and Polestar roundabouts it was concluded that new link options that provide alternate access and improve network resilience to Letterkenny must be assessed.

Therefore, a new Type 2 Dual Carriageway is proposed at option selection stage, to accommodate the predicted traffic volumes and infrastructure required, on approach to Letterkenny and to access northwest Donegal. Further detailed analysis at the Design Stage will verify this cross section.

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

The traffic flows on the proposed N14 are predicted to grow to approximately 10,900 AADT for the scheme Design Year 2028 with higher flows in future years. The flow volumes are within the range of a Type 2 dual carriageway road cross section as indicated in Table 6/1 of DN-GEO-03031. It is noted that the appropriate cross section is required to be selected with reference to the TII Project Appraisal Guidelines. The N14 Manorcunningham to Lifford/Strabane/A5 Link section connects to dual carriageway roads at either end (once the N14/N15 to A5 Link is constructed). Therefore, to accommodate predicted traffic volumes and to ensure route consistency, a Type 2 dual carriageway is proposed for the option selection stage.

An incremental analysis was undertaken in accordance with the TII Project Appraisal Guidelines to verify choice of cross section. This incremental analysis consisted of comparing costs and benefits of a Type 1 single carriageway against a Type 2 dual carriageway. This incremental analysis confirmed that the benefit to cost ratio was superior for the Type 2 dual carriageway over a Type 1 single carriageway. However, more detailed capacity and economic analysis will be required to confirm this at the Design Stage.

The Type 2 dual carriageway cross section is depicted in **Figure 4-3** above. For the option selection stage, the cycle track is a shared pedestrian/cycle facility in the verge of the Type 2 dual carriageway. Alternative off road cycle routes will be considered further at the Design Phase.

4.4 Junction Strategy

As part of the Option Selection it was necessary to determine requirements for junctions providing access on and off the new Road Scheme. A junction strategy has been carried out with analysis at this stage being of a preliminary nature with further detailed analysis to be undertaken at the Phase 3 Design Stage for the preferred Route. This may lead to proposed alternative locations or layouts for junctions.

Whilst it is acknowledged that further consideration will have to be given to junction strategy and the detailed layouts of each individual junction, sufficient assessment has been undertaken at this stage to determine the general line of each Route for the purpose of selecting the preferred Route. It is recognised that refinement of the preferred Route in terms of horizontal and vertical alignment as well as development of the detailed layouts of each junction arrangement will be necessary at during preliminary and detailed design.

The junction strategy considered scheme tie-in locations / constraints to the existing road network, traffic analysis and consistency. The traffic analysis examined the preliminary engineering, traffic, safety and economic justifications for junction access strategies for the proposed scheme and recommended the preferred location and form of these junctions to assist with preliminary costing analysis.

In determining suitable locations for junction's consideration is given to:

- The tie-in locations of each section of the Scheme
- The level of demand for vehicles wishing access to and from the surrounding area; and
- The level of demand for access to other principal Routes.

The TII Publications provides guidance on the type of junction recommended for different design flows. The selection process for all types of junctions depends on the volume of traffic and the proportion of minor road flow compared with major road flow.

Single Carriageways

Single carriageways allow for the following types of junctions

- Priority Junctions
- Roundabouts
- Compact Grade Separated Junctions

Type 2 Dual Carriageways

Type 2 dual carriageways allow for the following types of junctions

- Roundabouts;
- Compact Grade Separated Junctions; and
- Left-in/Left-out.

Type 1 Dual carriageways

Type 1 dual carriageways allow for the following types of junctions

- Roundabouts;
- Grade Separated Junctions
- Left-in/Left-out.

Access to private lands and houses off the proposed mainline carriageways will be avoided by diverting either the house access or access tracks onto the local road network. By limiting the number of accesses onto the new proposed mainline carriageway the overall safety of the road will be improved. Where access cannot be gained to private land or houses via local roads or access tracks, consideration may be given to the use of a left in / left out junctions.

The type and location of junctions will be further assessed during Phase 3 Design and may be changed from what is proposed at Phase 2 Option Selection.

4.4.1 Section 1: N15/N13 Ballybofey/Stranorlar Urban Region

The road cross section for Section 1 has been determined to be a Type 2 dual carriageway for the option selection stage. The junctions permitted for a Type 2 dual carriageway are left in / left out, roundabouts and compact grade separated junctions.

Three common junction locations have been identified for all options for Section 1, at the following locations:

- South-western tie-in of the scheme to the N15 at Dooish,
- Adjacent to the crossing point with the R252 and the River Finn at Cappry, and
- North-eastern tie-in to the N13 at Callan Bridge, north of Kilross.

An additional intermediate junction is proposed on all routes except Routes 1A, 1A1, 1C and 1C1 at Teevickmoy (north of the towns) that links back to the existing N13 and then onwards to the N15 east of the towns.

While the final choice of junction type will be determined during Phase 3 Design, for the purpose of the Phase 2 Option Assessment the choice of junction has been determined as follows:

South-western tie-in of the scheme to the N15 – A roundabout has been chosen for the following reasons:

- There are high levels of traffic on the N15 to the north and south,
- The proposed location at Dooish ties in with the recently completed N15 Blackburn Bridge improvement,
- Each of the roads connecting at this location have a different cross section. The N15 north-east of the junction is proposed as being a Type 2 dual carriageway and the N15 to the south-west is a single carriageway. A roundabout provides the safest transition from single to dual carriageway, and also provides the additional benefit of accessing the residual local road network to the east of the junction and the community at Cappry.

Crossing point with the R252 – A compact grade separated junction has been chosen for the following reasons:

- The proposed location at Cappry enables access to be provided to both the R252 and existing N15,
- This junction will provide the main access to Ballybofey. There is a high volume of traffic turning at this junction and a compact grade separated junction provides a safe way of providing this turning manoeuvre while not interrupting the mainline traffic flow. The mainline will be separated vertically from the existing road network in order to accommodate a grade separated junction, cross the existing R252 and cross the River Finn. The compact grade separated junction allows for the mainline traffic to proceed unimpeded, providing better journey time savings than a roundabout.

Intermediate junction applicable to all routes, except 1A, 1A1, 1C and 1C1 – A compact grade separated junction has been chosen for the following reasons:

- The proposed location at Callan Bridge enables the proposed road to tie in with a straight section of the existing N15 and to provide a safer junction arrangement in place of the existing unsafe crossroads,
- This junction will provide the main access to Stranorlar, and to the N15 leading to Lifford. There is a high volume of traffic turning at this junction and a compact grade separated junction provides a safe way of providing this turning manoeuvre while not interrupting the mainline traffic flow.
- The mainline is elevated at this point as it crossed high ground, while the link road approaching from the N13 is climbing from lower land. The difference in levels between the link road and the mainline will facilitate a grade separated junction without the need to place the mainline in a cutting, which would significantly increase earthworks and impact on landscape if an at-grade junction (such as a roundabout) were to be used instead. The compact grade separated junction allows for the mainline traffic to proceed unimpeded, providing better journey time savings than a roundabout.

- It is not feasible to introduce an intermediate junction at this location for Routes 1A, 1A1, 1C and 1C1 since the approaching link road would need to pass through the summit of a hill at Backlees, which will result in unacceptably high earthworks, environmental impact and cost.

North-eastern tie-in to the existing N13 – A roundabout has been chosen for similar reasons as the roundabout for the south-western tie-in, as follows:

- There are high levels of traffic on the N13 to the north of the junction on the existing road, and to south on the proposed road.
- Each of the roads connecting at this location have a different cross section. The N13 south of the junction is proposed as being a Type 2 dual carriageway and the N13 to the north is a single carriageway. A roundabout provides the safest transition from single to dual carriageway.
- Access will be provided to the local road network to the east and west of the junction, replacing an existing cross road junction at Callan Bridge considered to be road safety problem, thereby improving road safety at Callan Bridge.

4.4.2 Section 2: N56/N13 Letterkenny to Manorcunningham

The existing N13 between Dry Arch Roundabout and Pluck Roundabout is a Type 1 dual carriageway cross section. For online improvement options a Type 1 cross section has been determined at option selection stage.

The existing N13 south of Dry Arch Roundabout is mostly three-lane carriageway, two lanes southbound and one lane northbound. The existing “2+1” lane arrangement provides for a right-turn arrangement between the roundabout and the L1114 local road approximately 200m to the south and a climbing lane heading southbound beyond the L1114 junction. The vertical gradient on the climbing lane is mostly 7%, reaching a maximum gradient of 8.7% with no segregation between northbound/southbound traffic. The climbing lane ends approximately 2km south of the Dry Arch Roundabout. There are approximately 31 no. direct accesses along this 100kph segment of the N13, comprising 6 public roads (including a cross-roads), 2 accesses to St. Patricks primary school, 2 commercial properties and 21 no. residential dwellings. Hard strips vary but are typically between 0m - 0.5m wide southbound and 0.5m - 2m wide northbound.
Traffic volumes indicate a Type 2 Dual Carriageway (2+2 lanes) should be provided however inclusion of an over-taking lane in the northbound direction on an excessive downhill gradient was considered unsafe. Therefore, a Type 3 cross-section (2+1 lanes) with improvements has been determined at option selection stage. Improvements include a central median on the climbing lane section to prevent right turn movements and closure of the existing direct accesses. The existing gradient, that is outside standards, must remain as to achieve a gradient meeting standard (=5% in hilly terrain) cuttings up to 30m deep are required.

For offline options a Type 2 dual carriageway has been determined at option selection stage.

The junctions permitted for a Type 2 dual carriageway are left in / left out, roundabouts and compact grade separated junctions. The junctions permitted for a Type 1 dual carriageway are left in / left out, roundabouts and full-or compact grade separation.

Three common junction locations were identified for Section 2 tie-ins, at the following locations:

- Southern tie-in of the scheme with the existing N13 at Listellian;
- Eastern tie-in of the scheme with the existing N13/N14 at Raymoghy; and
- Western tie-in of the Letterkenny link with the existing N56/R245 at Ballyraine.

An exception to this is an alternate eastern tie-in, located south of the existing N13/N14 junction at Raymoghy, that connects to offline options from Section 3 at Corkey.

Intermediate junctions were proposed at different locations at Bonagee, Dromore, Drumany, Trimragh and Lurgybrack.

For the Phase 2 Option Selection phase the choice of junction has been determined as follows:

Southern tie-in of the scheme with the existing N13 - A roundabout has been chosen for the following reasons:

- Traffic on this section of the N13 is predicted at 16,800 AADT for the scheme Design Year 2028.
- The N13 from the south is a single carriageway cross section and the N13 north of the junction is proposed as Type 2 dual carriageway; a roundabout provides a safe transition from single to dual.
- A roundabout facilitates access to the residual local road network (incl. St Patricks National School).

Eastern tie-in of the scheme with the existing N13/N14 - A roundabout has been chosen for the following reasons:

- Traffic along the N13 and N14 approaches is predicted at 16,000 and 11,200 AADT respectively for the scheme Design Year 2028.
- The N13 from the north has a single carriageway cross section and the N14 from the east has a single carriageway (but is proposed as Type 2 dual carriageway in Section 3 of this report). The N13 from the west is a Type 1 dual carriageway (no change proposed). A roundabout provides a safe transition between the single and dual carriageways.
- A roundabout facilitates access to the residual local road network.

Western tie-in of the Letterkenny link with the existing N56/R245 - A roundabout has been chosen for the following reasons:

- Traffic on the new proposed link ranges between 15,000-18,000 AADT for all options Design Year 2028.
- The N56 and R245 from the north and the N56 from the south are single carriageway cross sections with the new proposed link a Type 2 dual carriageway; a roundabout provides a safe transition from single to dual.
- A roundabout facilitates access to the residual local road network.

Intermediate Junctions – apart from Trimragh the intermediate junctions were chosen as roundabouts for similar reasons to the above. The junction at Trimragh is located along the existing Type 1 dual carriageway, between the existing Dry Arch and Pluck roundabout junctions, and is proposed as a compact grade separated junction to facilitate safe and continued local access movements.

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

The Road Cross Section for Section 3 has been determined to be a Type 2 dual carriageway for the option selection stage. The junctions permitted for a Type 2 dual carriageway are left in / left out, roundabouts and compact grade separated junctions.

Three common junction locations have been identified for the Section 3, at the following locations:

- Northern tie-in of the scheme to the N13: this location overlaps with the Section 2 eastern tie-in.
- Crossing point with the R236, which aligns from Raphoe to Derry.
- Southern tie-in to the N14/N15 to A5 Link.

An additional intermediate junction is proposed on all routes that intersect the existing N14 north of the R236. These are at the location where the new mainline alignment intersects the existing N14 at Drumoghill. This additional intermediate junction applies to:

- Options 3A1 and 3A2
- Options 3B1 and 3B2
- Options 3C1 and 3C2
- Option 3D

For the Phase 2 Option Selection phase the choice of junction has been determined as follows:

Northern tie-in of the scheme to the N13 – A roundabout has been chosen for the following reasons:

- There are high levels of traffic on the N13 to the north and west.
- Each of the roads connecting at this location have a different cross section a roundabout provides a safe transition between these links. The N13 west of the junction is a Type 1 dual carriageway, the N13 north of the junction is a single carriageway, and the proposed N14 is currently proposed to be a Type 2 dual carriageway.
- A roundabout facilitates access to the residual local road network.

Intermediate junction applicable to Routes 3A1/3A2, 3B2/3B2, 3C1/3C2 and 3D - A compact grade separated junction has been chosen.

- The approximate proposed design year mainline traffic is 10,900 AADT with the side road traffic being in the order of 2,300 AADT.
- A compact grade separated junction allows for the mainline traffic, which constitutes the majority of traffic to proceed without giving way, providing better journey time savings than a roundabout.

Crossing point with the R236 – A compact grade separated junction has been chosen for the following reasons:

- The approximate proposed design year mainline traffic is 7500 AADT with the side road traffic being in the order of 1400 AADT.
- A compact grade separated junction allows for the mainline traffic, which constitutes the majority of traffic to proceed without giving way, providing better journey time savings than a roundabout.

Southern tie-in to the N14/N15 to A5 Link – A roundabout has been chosen for the following reasons:

- Each of the roads connecting at this location have a different cross section. The N14/N15 to A5 Link is a is a Type 2 dual carriageway, the proposed link to the N15 is a single carriageway, the N15 is a single carriageway and the proposed N14 is a Type 2 dual carriageway.
- The tie-in location is constrained with a roundabout proposed at the tie-in of the N15 to the N14/N15 to A5 link. The provision of a compact grade separated junction would not be possible without significant impact on adjoining properties and amendments to the N14/N15 to A5 link.
- If there are delays in construction the A5 WTC / N14/N15 to A5 Link, a roundabout option can facilitate connecting to the existing N15.

4.5 Side Roads

At this stage in the project it has been assumed that public side roads will generally be bridged over or under the mainline route where it is necessary or extinguished where there is no significant adverse impact or community severance. For the option selection stage of the project a side road alignment designs have been prepared for each route to assist with the evaluation of impacts. A review of the side road strategy will be undertaken at preliminary Design Phase.

Side roads were designed in accordance with Section 10 of DN-GEO-03031.The design speed of realigned side roads was calculated in accordance with Section 10.2 of DN-GEO-03031. The minimum carriageway width provided for realigned side roads for the option selection stage is 5.5m with 2.5m verges. The cross section of realigned side roads will be reviewed at the preliminary Design Phase.

5 CONSTRAINTS STUDY

5.1 Overview

The constraints study is presented in **Volume B.** It collates the available information on the constraints within the study areas for each of the three sections of the project. These constraints and their assessment inform the decision-making process in terms of the preliminary options assessment, the appraisal of feasible options and the selection of the preferred route corridor.

The constraints study considered the natural constraints (landscapes and features), physical constraints (the built environment) as well as the external constraints (design standards, policy, legal issues), in accordance with the TII Project Management Guidelines.

The natural and physical constraints were assessed in terms of the environmental factors as per Section 171A(b)(i) of the Planning and Development Act (2000) as amended by the European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018.

External constraints were considered in terms of alignment with design standards, achieving the objectives of EU, national and local policies, and meeting legal requirements, e.g. protecting the integrity of SAC and SPA designated sites.

5.2 Conclusions

The natural and physical constraints likely to be potentially impacted by the proposed project have been mapped within the study area for each of the three sections. Several of the principal constraints identified for the project are common to all three sections. These include:

- Archaeological and architectural constraints such as national monuments, protected structures,
- Landscape constraints including protected views and landscape character areas, and
- Ecologically sensitive areas including sites protected under the Habitats and Birds Directives.

A summary of the principal constraints identified in the constraints study is provided in **Table 5-1.**

Table 5-1 Constraints Identified in the Study Areas

Category	Source	Constraints
Legislative, Planning and Policy	EU and National Legislation National, Regional and Local Planning Policy	▪ Compliance with the Water Framework Directive, Habitats Directive, Birds Directive and fishery related legislation will create constraints on the proposed measures to varying degrees depending on the final project route. ▪ National and regional policies aim to contribute to mitigating the effects of floods and are also required to enhance the protection for the aquatic environment through complying with the requirements of the Habitats Directive and Birds Directive. ▪ Archaeological and Cultural Heritage legislation pertaining to protected structures may constrain proposed structural works at river crossings.
Population and Human Health	Central Statistics Office, County Donegal Development Plan, Various County and Local Level strategies and Local Area Plans	▪ Socio-economic constraints in the region, such as the population, employment and health provisions, will for the most part, not be adversely affected by the project. Overall, the project aims to improve conditions within the town by reducing traffic congestion and improving the safety conditions of the road.

Category	Source	Constraints
Cultural Heritage	Record of Monuments and Places for County Donegal Sites and Monuments Records for County Donegal Monuments in State Care Database County Donegal.	▪ The combined study area around the three sections cumulatively contains a total of 137 recorded archaeological sites that range in date from the Neolithic onwards, indicating that the lands in the area have been continuously settled during the past six thousand years. ▪ The combined study area around the three sections cumulatively contains a total of 172 buildings and structures that are listed in the NIAH and 17 of these have been designated as Protected Structures in the County Development Plan. Sites identified within Archaeological and Cultural Heritage legislation pertaining to protected structures may constrain proposed structural works at river crossings. Option Selection processes will require cognisance to be taken regarding any identified sites present along any proposed footprint and efforts made to avoid impacting them.
Landscape	County Donegal Development Plan 2018-2024	As classified by the County Donegal Development Plan 2018-2024: ▪ The proposed study area is located within the following Landscape Character Assessment Area; Finn Valley (LCA 14), Letterkenny Estuary and Farmland (LCA 15), Lagan Valley (LCA 12) and Foyle Valley (LCA 13). ▪ The study area encompasses areas of Especially High Scenic Amenity (EHSA), in particular Section 1 and Section 2, with Manorcunningham, supporting views and prospects towards Lough Swilly.
Ecology	NPWS natural heritage database for designated areas NPWS Rare and Threatened Species Database National Biodiversity Data Centre New Atlas of the British and Irish Flora CD-ROM Bat Conservation Ireland Irish Butterflies website Water Framework Directive website Ordnance Survey maps and aerial images of the survey area	**Section 1** ▪ The project within the constraints study area will cross the River Finn and consequently the River Finn SAC (Site Code: 002301) between Ballybofey and Stranorlar. ▪ The following are the qualifying interests of the River Finn SAC: Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae) [3110], Northern Atlantic wet heaths with Erica tetralix [4010], Blanket bogs (* if active bog) [7130], Transition mires and quaking bogs [7140], *Salmo salar* (Salmon) [1106] and *Lutra lutra* (Otter) [1355]. **Section 2** ▪ Any crossing of the River Swilly has the potential to impact on the Lough Swilly SAC and SPA. ▪ The following are the qualifying interests of the SAC: Estuaries [1130], Coastal lagoons [1150], Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330], Molinia meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*) [6410], Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles [91A0] and Otter (*Lutra lutra*) [1355]. **Section 3** ▪ Proposed corridor options may intersect with Feddyglass Woods pNHA (Site Code: 001129). ▪ Proposed corridor options crossing the Corkey River, the Swilly Burn and Deele River must consider that these watercourses subsequently flow into Lough Swilly and River Finn, which are both protected sites. In the absence of suitably defined mitigation these sites that form part of the Natura 2000 network, may be impacted by the project either directly, indirectly or there may be cumulative impacts either alone or in combination with other plans or projects.
Water	OS Survey vector. Six inch and “Discovery” Series mapping Aerial Photography The Office of Public Works	▪ The main hydrology and water quality constraints are in relation to the objectives set under the WFD and the fisheries status of the rivers present along the route. The WFD requires that rivers of Good status within the study area are protected. Avoidance and prevention of deterioration of water quality status as a result of any works being carried out during the project is also of importance. This would apply particularly where any works are being carried out over or adjacent to watercourses and waterbodies which could potentially result in silt

Category	Source	Constraints
	Western River Basin Management Plan (2009 - 2015) EPA Maps website	releases or other negative impacts on the receiving water quality and by extension aquatic flora and fauna present.
Land and Soils	A Geological Description to accompany the Bedrock Geology 1:100,000 Map Series for Galway Geological Survey of Ireland (GSI) online mapping database Aerial Photography (OSI, flown 2000 and 2005) Ordnance Survey 1:50,000 Discovery Series	▪ The removal of material during the construction of the project may give rise to an increase in aquifer vulnerability. ▪ The project will not impact on any areas of national geological importance or areas currently recorded by the GSI as having mining, quarrying or water resource development. ▪ The proposed study area is predominantly low to moderate risk in terms of landslide susceptibility. Two areas of high risk (A) were identified, one to the south west of Ballybofey in Section1 and one to the west of the staggered N14/R236 junction in Section3.
Air and Climate		▪ The majority of air, noise and climates effects associated with the project will be experienced during the operational phase of the project. ▪ The will be minor air, noise and climate impacts during the construction phase. Such emissions will be temporary and localised.
Material Assets (non-agricultural)		▪ The primary constraints within the study area are the utilities and existing transport infrastructure. Early consideration of how options can integrate with the existing material assets in the area is essential and will require engagement with service providers to ensure that utilities can be avoided and/ or modified to mitigate impacts.
Material Assets (Agricultural)	EPA/ Teagasc/ GSI GIS Map of National Soil Types, 2006; Census of Agriculture 2010, final results; Aerial Photography (Google Earth 2011 – 2016)	▪ Dairy farms, intensive pig/poultry facilities and horse facilities all represent and present a potential constraint to the development of a new road scheme. ▪ At this stage it would appear that study area No. 2 does not have any agricultural or forestry constraints, but this will need to be confirmed at the Stage 2 of Phase 2 Option Selection. ▪ Observations would indicate that there are a number of agricultural enterprises within Section 3 that may represent a constraint and as such will need further consideration at the Stage 2 of Phase 2 Option Selection. Furthermore, forestry blocks in both Section 2 Section 3 may represent a constraining factor and will require greater consideration during the option selection process.

6 CONSULTATIONS

6.1 Public Consultation No.1 (December 2017)

The first public consultation event for the TEN-T Priority Route Improvement Project, Donegal took place on 6th December 2017 between 2pm to 8pm at three venues, one in each of the project study areas:

- Villa Rose Hotel in Ballybofey
- Clanree Hotel in Letterkenny
- County House in Lifford

Information provided by the public at this consultation and through the project website[4] has been reviewed and included in the constraints study where appropriate.

6.2 Public Consultation No. 2 (April and May 2018)

The second public consultation presented Stage 1 preliminary options considered and Stage 1 shortlisted options to be taken forward for Stage 2 assessment.

This public consultation was held in April 2018 and repeated in May 2018 for persons unable to attend the April meetings. The consultations were advertised in advance as follows:

- Donegal County Council website
- Donegal County Council Facebook
- Donegal County Council Twitter
- Donegal County Council Press Release
- TEN-T website
- Radio – Highland Radio advert placed for 6 days x 4 times per day
- Paper Adverts as follows:
  - Derry People & Donegal News (Circulation date Friday 13th April)
  - Donegal Democrat (Circulation dates Thursday 12th April & Tuesday 17th April)
  - Donegal Peoples Press (Circulation date Tuesday 17th April)
  - Finn Valley Voice (Circulation dates of Wednesday 11th April & Wednesday 18th April)
  - Letterkenny Post (Circulation dates of Wednesday 11th April & Wednesday 18th April)

A summary of the attendance at both sets of consultation meetings is provided in **Table 6-1.**

Table 6-1 Public Consultation No.2 Summary of Attendance

Dates	Venues	No. Public Attendees
17th April 2018	Radisson Blu Hotel, Letterkenny (2pm – 8pm)	66
18th April 2018	County House, Lifford (2pm – 8pm)	81
19th April 2018	Jacksons Hotel, Ballybofey (2pm – 8pm)	288
	April consultation total:	**435**
29th May 2018	Jacksons Hotel, Ballybofey (2pm – 8pm)	84
30th May 2018	Radisson Blu Hotel, Letterkenny (2pm – 8pm)	147
31st May 2018	County House, Lifford (2pm – 8pm)	56

[4] Project Website; http://www.donegal-ten-t.ie/

Dates	Venues	No. Public Attendees
	May consultation total:	**287**
	Grand total for both consultations	**722**

Brochures with feedback forms were handed to all attendees as they arrived at the consultation, and attendees were asked to register. Feedback could be provided by attendees at the consultations in several forms. Refer to **Table 6-2.**

- Feedback form completed and submitted at the consultation.
- Feedback form completed and submitted following the consultation using freepost envelope provided.
- Online submission made through the project website (address provided on the brochure).
- Emailed submission made using the project email address (provided on the brochure).
- Hard copy submission posted to the Land Liaison Team located in DCC's offices.
- Follow up meeting (by appointment) with the Land Liaison Team if requested by the public.

Table 6-2 Summary of Feedback from Public Consultation No.2

Feedback Form Relates to:	Method of Receipt of Feedback Form				
	At Event	Email	Website Submission	Postal	Totals
Section 1	4	45	117	83	249
Section 2	6	27	0	117	150
Section 3	3	12	6	52	73
All Sections	0	3	0	6	9
Two Sections	0	0	0	52	52
				Total	**533**

Summaries of the feedback received during the public consultation process are included in the Stage 1 chapters relating to each individual section.

6.3 Public Consultation No. 3 (February 2019)

The third public consultation presented the preliminary conclusions of the Stage 2 Options Assessment and the alignment of the Emerging Preferred Option and an outline draft design of the Emerging Preferred Option.

This public consultation was held in February 2019 to provide the opportunity for people to view the Emerging Preferred Route and provide feedback that could be considered during the final stages of the Option Selection process. The consultations were advertised in advance as follows:

- Donegal County Council website
- Donegal County Council Facebook
- Donegal County Council Twitter
- Donegal County Council Press Release
- TEN-T website
- Radio – Highland Radio advert placed for 6 days x 4 times per day
- Paper Adverts as follows:
  - Derry People & Donegal News (18th February 2019)
  - Donegal Peoples Press (19th February 2019)
  - Finn Valley Voice (Circulation dates 13th and 20th February 2019)
  - Letterkenny Post (Circulation dates 13th and 20th February 2019)

A summary of the attendance at both sets of consultation meetings is provided in **Table 6-3**.

Table 6-3 Public Consultation No.3 Summary of Attendance

Dates	Venues	No. Public Attendees
Tuesday, 19th February 2019	County House, Lifford (2pm – 8pm)	90
Wednesday, 20th February 2019	Radisson Blu Hotel, Letterkenny (2pm – 8pm)	172
Thursday 21st February, 2019	Jacksons Hotel, Ballybofey (2pm – 8pm)	313
	Consultation total:	**575**

Brochures with feedback forms were handed to all attendees as they arrived at the consultation, and attendees were asked to register. Feedback could be provided by attendees at the consultations in several forms Refer to **Table 6-4.**

- Feedback form completed and submitted at the consultation.
- Feedback form completed and submitted following the consultation using freepost envelope provided.
- Online submission made through the project website (address provided on the brochure).
- Emailed submission made using the project email address (provided on the brochure).
- Hard copy submission posted to the Land Liaison team located in DCC's offices.
- Follow up meeting (by appointment) with the Land Liaison Team if requested by the public.

Table 6-4 Summary of Feedback from Public Consultation No.3

Feedback Form Relates to:	Method of Receipt of Feedback Form			
	At Event	Email	Postal	Totals
Section 1	5	33	44	82
Section 2	2	17	27	46
Section 3	2	5	17	24
Total	9	**55**	**88**	**152**

Private consultations were also held with individuals impacted by the emerging options consultations. The Land Liaison Officers made every effort to inform those affected within the Emerging Preferred Options. Refer to **Table 6-5**. Those within the corridor who wished to avail of a private consultation to address any queries and concerns were encouraged to contact the Donegal TEN-T Land Liaison Office to arrange a meeting with our team.

Table 6-5 Letters Sent to Landowners for Emerging Option

Dates	Numbers of Letter Issued to Landowners
Section 1	750
Section 2	218
Section 3	129
Total	1097

Many of these consultations took place with individual house/landowners and families. A smaller number of consultations took places with businesses and other affected groups. These small groups tended to be either extended family members living inside the option corridor or neighbours inside the corridor wanting to consult as a group.

The meetings were attended by a member of the Land Liaison Team and by a member of staff from the National Roads Office. Each meeting was allocated thirty minutes to allow people an opportunity to view the maps and discuss the project, along with any questions that arose. Meetings started at 11:00am and

continued up to 7:00pm on Monday to Thursday and on Friday from 10.30am to 6:30pm. There were several people who were 'walk-in's' that did not have appointments and these people were also accommodated on the day usually by a member of the staff that was not allocated to a meeting. A summary of the consultations is presented in **Table 6-6**.

Table 6-6 Individual Consultation Meetings

Location	Venue	Dates	No. of meetings per day	No. of attendees per day
Letterkenny	Radisson Blu Hotel	11th Feb 2019	43	97
Letterkenny	Radisson Blu Hotel	12th Feb 2019	51	84
Ballybofey	Jackson's Hotel	13th Feb 2019	52	94
Ballybofey	Jackson's Hotel	14th Feb 2019	50	96
Letterkenny	Radisson Blu Hotel	15th Feb 2019	52	90
		Total	249	461

All attendees were encouraged to submit feedback outlining their opinions and concerns. People attending these meetings were informed about the public consultation event happening on the 19th to 21st February in Lifford, Letterkenny, and Ballybofey. All were encouraged to come along if they wished to discuss the Emerging Preferred Option with a member of the design team.

Individual meetings with landowners will continue during the Design Phase and following publication of this report. A specific one day of consultations was held with landowners in Jacksons Hotel in Ballybofey in which 14 separate meetings were held and 28 people attended.

The feedback from the public and individual consultation is summarised below under general issues raised and then under specific points for each Section.

General Points Raised on All Options

- Programme for design, statutory procedures and construction of the projects.
- Particular interest in the Compulsory Purchase Order (CPO) in terms of the process, timelines, opportunity for comment, submissions, objections etc.)
- If people had any concerns or wanted to object to the scheme, how and when can they do this.
- Closure of local roads and alternative access (locally and for farm accommodation works).
- Wanting clarity on what exactly the corridor means.
- How close can the road be to a property before it needs to be acquired as part of the scheme.
- Concern about various forms of pollution (air/noise/vibration etc).
- More detailed information regarding the road (heights/widths at specific locations etc).
- Potential for planning applications within corridor (planning freeze/hold, future developments).
- IFA good-will payments for agricultural land.
- Concern regarding damage to utilities during construction (potential for upgrade of utilities in certain areas).
- How will access to properties and land be accommodated during the construction phase of the road project.
- House devaluation – some people felt their homes would be devalued by the proposed new road close to their properties.
- Structural integrity of properties in the area during the construction phase of the project.
- Is there Public Liability Insurance for people carrying out surveys on private land.

Specific Points for Section 1

- Support in general for bypassing Ballybofey (traffic volumes and commuting times mentioned as reasons for the scheme).

- More information requested regarding the junction location in the Cappry/Glenfin road area.
- Impact on residences from the potential link road.
- Closure of the Woodland/Dooish road, like to see a different arrangement in this location.
- Concern over disturbance of Historic Landscape and features.

Specific Points for Section 2

- The N56 Link Road (previously the Bonagee Link) shown is critical for Letterkenny.
- Disruption to peoples' lives during the construction stage.
- Some business were concerned about access to their premises during the construction stage.
- Access onto the new road from the industrial park at Bonagee.
- Changes to existing junctions and proximity of proposed road to some properties.
- Proximity of some businesses to the road and the impact on those business during and after construction.
- Support for the closure of Lurgybrack to through traffic due to safety concerns.
- Support for new junction on the existing dual carriageway, as Trimragh is seen as very unsafe.
- Health and welfare of residents in Dromore, concern that stress levels may increase due to the new road coming through their area.

Specific Points for Section 3

- Landowners that were previously affected by the Letterkenny to Lifford road scheme queried if ground investigation and other surveys would be necessary again.
- Enquiries on the difference between the new corridor compared to the previous Letterkenny to Lifford road scheme and why these differences exist.
- Concerns raised regarding proximity of the new road to private dwellings, particularly at Drumoghill and Lifford.
- Queries regarding and support for a junction at Ballindrait.
- How farm severance and land/property access will be accommodated.
- IFA good-will payments for agricultural land.
- Concern over removal of trees at Drumoghill.

6.4 Section 1 Ballybofey Link Road Public Consultation (March 2019)

The conclusion of the Stage 1 Options Assessment led to four shortlisted link options to Ballybofey within Section 1.

A standalone public consultation was held in March 2019 to provide the opportunity for people to view these four shortlisted options to the town of Ballybofey with associated junction arrangements. Feedback was encouraged so that it could be considered during the Stage 2 assessment of the link road options.

A summary of the details and attendance at this consultation meeting is provided in **Table 6-7.**

Table 6-7 Ballybofey Link Road Consultation Summary of Attendance

Dates	Venues	No. Public Attendees
Thursday 14th March, 2019	Jacksons Hotel, Ballybofey (2pm – 8pm)	252

6.5 Statutory Consultations

Throughout Phase 2 Option Selection and Constraints, consultation was undertaken with various statutory bodies, outlined in **Table 6-8.** Individual consultation meetings also took place with respective bodies where necessary.

Table 6-8 List of Statutory Consultees contacted

Consultee	Consultee	Consultee
Office of Public Works Head Office	Geological Survey of Ireland	Irish Farmers Association (Donegal Branch)
EPA Regional Inspectorate	Inland Fisheries Ireland	Coillte
Department of Communications, Climate Action and Environment	Road Safety Authority	The Heritage Council
Department of Culture, Heritage and the Gaeltacht	National Museum of Ireland	Bat Conservation Ireland
Department of Agriculture, Food and the Marine	Teagasc	The Irish Cycling Advocacy Network
Health Service Executive	Royal Irish Academy: Committee for Historical Studies	Údarás na Gaeltachta
Birdwatch Ireland	Fáilte Ireland	Irish Aviation Authority
Donegal County Development Board	Donegal County Council (Environment, Planning, Pollution, Water Services and Road Services)	Bus Eireann
BT Ireland	ESB (High Voltage)	Three
Irish Water	Connaught Ulster Waste Region	Northern Ireland Department of Agriculture, Environment and Rural Affairs
Northern Ireland Environment Agency	Department for Infrastructure Northern Ireland – Rivers, Roads	Northern Ireland Department of Agriculture, Environment and Rural Affairs – Marine and Fisheries Division
Vodafone	Gas Networks Ireland	Airtricity – Public Lighting
The Loughs Agency (Northern Ireland)	EirGrid	

7 COMMON METHODOLOGY FOR PHASE 2 OPTION SELECTION PROCESS

7.1 Introduction

This section summarises the common methodology that applies to the Phase 2 Option Selection process for all three sections of the TEN-T Priority Route Improvement Project, Donegal. This covers the following steps in the process:

- Stage 1 Preliminary Options Assessment.
- Stage 2 Project Appraisal.
- Stage 3 Preferred Route Corridor.

Details specific to each stage in the process for each section of the project are provided in the following chapters, as summarised in **Table 7-1.**

Table 7-1 Phase 2 Option Selection Report Layout

Phase 2 Stage	Section 1	Section 2	Section 3
Stage 1 Preliminary Options Assessment	Chapter 8	Chapter 11	Chapter 14
Stage 2 Project Appraisal	Chapter 9	Chapter 12	Chapter 15
Stage 3 Preferred Route Corridor	Chapter 10	Chapter 13	Chapter 16

7.2 Stage 1 Preliminary Options Assessment

7.2.1 Introduction

Following the identification of constraints, preliminary options were identified for each of the three sections, including the Do Nothing option which would involve using the existing roads, with no improvements being undertaken.

An objective of option selection is to identify a route which would avoid, where possible, impacts on the environment at early stages of project planning and design. This is achieved in the first instance through the avoidance of the major constraints identified during the constraints study. Where avoidance is not possible, every effort is made to ensure that any interaction is minimised.

Consideration was given to the constraints within the study areas for each section, as identified in the Constraints Study (**Appendix B** and summarised in **Section 5**).

7.2.2 Methodology

At the outset of option development, the constraints within the study area were identified. Basic plan designs using 50m lines and curves were developed by navigating between constraints as much as reasonably practicable. This 50m wide line corresponds with the centre of the option and represents the approximate width of a proposed road between the fence lines. Each option has an overall corridor width of 300m and provides the indicative boundaries within which a road could be constructed, and which allows for refinement of routes within the option to facilitate improvements in alignments that would reduce overall impact and provide overall benefit for the project.

The number of options identified by the design team for the Stage 1 Preliminary Options Assessment far exceeded the minimum number of six options recommended in the PMGs. Although there were many preliminary options, many had common/overlapping parts. Therefore, the process adopted for option assessment was to split the routes into segments and nodes. This allowed common segments to be assessed only once and improved the efficiency of the process.

In the development of the preliminary options for assessment purposes, the proposed horizontal and vertical alignments for all preliminary options (mainlines only) were developed using road design software to ensure that potential alignments fall within the required standards, and to derive realistic estimates of earthworks quantities (cut/fill) for each option.

Options were represented with a cross sectional width of 50m, enough to accommodate a Type 2 dual carriageway road cross section, with associated verges, indicative earthworks and top / bottom of slope clearances to the fence-lines. Proposed roundabouts were drawn indicatively with an outside diameter of 80m to allow for the construction of the roundabout, footways and verges to the fence-lines. Proposed compact grade separated junctions were drawn indicatively to represent junction configurations with overbridges over the mainline and ramps accessing and egressing the mainline complete with associated earthworks. Potential link roads and side roads were also identified. The cross-sections considered for the project comprised of:

- Section 1: Type 3 single carriageway roads.
- Section 2: Type 2 dual carriageway roads and Type 3 single carriageway roads
- Section 3: Type 3 single carriageway roads.

The mainline alignments under consideration for the Phase 2 Option Selection assessments are presented in **Volume E Drawings**.

7.2.3 Matrix Development

The matrix assessment process deployed during Stage 1 follows that provided in the PMGs. Each of the preliminary options were examined against the Stage 1 assessment criteria, namely:

- Engineering,
- Environment,
- Economy.

Equal weighting was given to each criterion. Within the Engineering and Environment criteria, the design team identified sub-criteria that were used to provide an overall assessment under these respective headings. Within the Economy criteria, only cost of the options was considered in accordance with the TII guidance.

Each option was identified as one of the following:

- HIGH Preference (denoted by green in the matrix),
- MEDIUM Preference (denoted by orange in the matrix),
- LOW Preference (denoted by red in the matrix).

The assessment criteria were developed to be of a quantitative nature in order to keep the Stage 1 assessment as objective as possible, while still allowing some subjectivity with the application of qualitative assessment where appropriate.

To identify the best performing options, the characteristics of each route (such as route length, cut/fill balance, designated site interfaces, significant constraints, etc.) were examined comparatively using a matrix to record the scores. Thresholds for determining high, medium or low preference were identified

individually for each section. This was necessary to assess options using criteria that would show comparative differences between the options.

The values for the different criteria were inserted into the matrix in order that the full range of values could be objectively assessed between the different preliminary options. The criteria and scoring methodology used in the Stage 1 process, for each section, are explained in **Table 7-2.**

Table 7-2 Criteria and Scoring System used in the Assessment of Options during Stage 1

	Stage 1 Route Selection Assessment Criteria	Description	Section 1 Stage 1 assessment criteria applied			Section 2 Stage 1 assessment criteria applied			Section 3 Stage 1 assessment criteria applied		
			High Preference	Medium Preference	Low Preference	High Preference	Medium Preference	Low Preference	High Preference	Medium Preference	Low Preference
Engineering	Road Length (m)	Length of mainline centreline	<8,200	8,200-12,300	>12,300	<5,500	5,500-7,000	>7,000	<17,400	17,400-18,300	>18,300
	Length of Link Roads (m)	Length of Link Roads (if any) connecting the mainline to the existing road network.	<2,000	2,000 – 6,000	>6,000	<2,000	2,000 – 4,000	>4,000	<7,470	7,470 – 9,130	>9,130
	Number of Road Crossings	Number of times that the mainline crosses existing side roads. These will either be kept open by means of an overbridge or underbridge, or in some cases will be closed with the introduction of a turning head at the end of the road at its interface with the proposed mainline. Road closures are proposed where there is an alternative crossing of the mainline close-by that does not cause an unreasonable diversion for local traffic.	<11	11 to 14	>14	<4	4 to 6	>6	<24	24 to 29	>29
	Number of Primary / Regional roads accessed	Number of Primary / Regional roads accessed from the proposed road	>4	4	0 to 3	>4	3 to 4	0 to 2	>2	2	0 to 2

Stage 1 Route Selection Assessment Criteria	Description	Section 1 Stage 1 assessment criteria applied			Section 2 Stage 1 assessment criteria applied			Section 3 Stage 1 assessment criteria applied		
		High Preference	Medium Preference	Low Preference	High Preference	Medium Preference	Low Preference	High Preference	Medium Preference	Low Preference
Number of Strategic Services Crossed	Number of times that the mainline crosses existing strategic services / utilities such as overhead HV / EHV transmission powerlines, trunk water transmission lines, oil / gas lines or fibre-optic transmission lines.	<4	4 to 6	>6	<3	3 to 6	>6	<3	3 to 6	>6
Major River Crossings	The number of long span bridge crossings including the River Swilly, Swilly Burn, River Deele and River Finn.	0	1	>1	0	1	>1	0	1 to 2	>2
Length of Road Within Flood Plain (m)	The length of the road that lies within the floodplain defined by 1 in 100 year storm event.	<100	100-500	>500	<100	100-500	>500	<100	100-500	>500
Other Watercourse Crossings	The number of crossings of other watercourses including tributaries of the River Swilly, River Foyle and River Finn.	0 to 2	3 to 5	>5	0 to 2	3 to 5	>5	<10	11 to 20	>20
Road Safety Assessment	Significant improvements to safety of the overall network can be gauged by the amount of traffic that is taken off the existing road and transferred to a newer, safer road. The more traffic transfer, the greater the improvement to safety within the overall network.	All options are deemed to provide a high preference in terms of safety at this stage			All new offline options are deemed to provide a high preference in terms of safety at this stage. Online options that make safety improvements difficult to implement are deemed to be less preferable.			All options are deemed to provide a high preference in terms of safety at this stage		

	Stage 1 Route Selection Assessment Criteria	Description	Section 1 Stage 1 assessment criteria applied			Section 2 Stage 1 assessment criteria applied			Section 3 Stage 1 assessment criteria applied		
			High Preference	Medium Preference	Low Preference	High Preference	Medium Preference	Low Preference	High Preference	Medium Preference	Low Preference
	Earthworks - Cut / Fill balance (m^3)	Total volume of cut volume – fill volume. A negative number represents the volume of material that requires to be imported, a positive number represents the volume of material to be disposed, in order to construct the road. A zero, or close to zero, volume indicates a balance of earthworks volume and is considered the optimum / best solution from an economic and environmental aspect.	< +/- 100,000	(+ or -) 100,000 to 500,000	> +/- 500,000	< +/- 100,000	(+ or -) 100,000 to 500,000	> +/- 500,000	< +/- 100,000	(+ or -) 100,000 to 500,000	> +/- 500,000
	Alignment Constraints	Road alignment constraints vary by section. Offline alignments consider the Ac value which provides an indication of the bendiness of the alignment; higher Ac value means the more bendy the road. Online options consider the existing alignments and constraints.	<10.8	10.8-11.4	>11.4	Alignment constraints arise when the existing network is included, and current standards cannot be fully met. For example; options with geometry outside current standards will receive a lower preference than offline routes which will implement current design standards.			<10.8	10.8-11.4	>11.4
Environmental	Planning and Development - length of road within zoned land	The length of proposed road (measured along the road centreline) that is located within land zoned for development.	<1km	1-2km	>2km	<1km	1-2km	>2km	N/A	N/A	N/A
	Geology - length of road over peat/ soft ground	The length of proposed road (measured along the road centreline) that is located within land that has been identified as containing peat or soft soils (as defined by Teagasc soils and subsoils mapping).	<910m	910m – 1360m	>1360m	<1km	1km-2km	>2km	<1km	1-2km	>2km

Stage 1 Route Selection Assessment Criteria	Description	Section 1 Stage 1 assessment criteria applied			Section 2 Stage 1 assessment criteria applied			Section 3 Stage 1 assessment criteria applied		
		High Preference	Medium Preference	Low Preference	High Preference	Medium Preference	Low Preference	High Preference	Medium Preference	Low Preference
Ecology – Impact to SACs & SPAs	The impact that the proposed road has on land / rivers designated as SAC or SPA's under European legislation.	Low indirect impact. No direct impact	Medium indirect impact. No direct impact.	Medium / high indirect impact. Risk of direct impact.	Low indirect impact. No direct impact	Medium indirect impact. No direct impact.	Medium / high indirect impact. Risk of direct impact.	Low indirect impact. No direct impact	Medium indirect impact. No direct impact.	Medium / high indirect impact. Risk of direct impact.
Ecology - Impact to NHAs & pNHAs	The impact that the proposed road has on land / rivers designated as NHA's or Proposed NHA's under European legislation.	Low indirect impact. No direct impact	Medium indirect impact. No direct impact.	Medium / high indirect impact. Risk of direct impact.	Low indirect impact. No direct impact	Medium indirect impact. No direct impact.	Medium / high indirect impact. Risk of direct impact.	Low indirect impact. No direct impact	Medium indirect impact. No direct impact.	Medium / high indirect impact. Risk of direct impact.
Ecology - length of road within mature woodland (m)	The length of proposed road (measured along the road centreline) that is located within areas of mature woodland.	<500	500-1000	>1000	<250	250-500	>500	<250	250-500	>500
Landscape and Visual - length of road within high landscape sensitivity (m)	The length of proposed road (measured along the road centreline) that is located within land identified as being of high scenic sensitivity. Proposed online sections are excluded from the assessment.	<5,040	5,040 - 7,560	>7,560	<2,500	2,500 - 3,250	>3,250	<9,790	9,790 – 13,000	>13,000
Archaeology and Cultural Heritage - number of RHM / RMPs direct hits	The number of archaeological sites (RHM's / RMP's) that fall within the footprint of the proposed roads and would therefore be directly impacted by the proposed road and its associated junctions.	0	N/A	>0	0	N/A	>0	0	N/A	>0

Stage 1 Route Selection Assessment Criteria	Description	Section 1 Stage 1 assessment criteria applied			Section 2 Stage 1 assessment criteria applied			Section 3 Stage 1 assessment criteria applied		
		High Preference	Medium Preference	Low Preference	High Preference	Medium Preference	Low Preference	High Preference	Medium Preference	Low Preference
Archaeology and Cultural Heritage - number of RHM / RMPs within 300m	The number of archaeological sites (RHM's / RMP's) that fall within 300m of the centreline of the proposed road but are not directly impacted by the proposed road and its associated junctions.	0	1 to 3	>3	0	1 to 2	>2	<10	10 to 15	> 15
Agriculture (m)	The length of proposed road (measured along the road centreline) that is located within land currently being used for agricultural purposes (including commercial forestry).	<5,040	5,040-8,130	>8,130	<2,000	2,000-3,000	>3,000	<17,500	17,500-19,000	>19,000
Residential / Private Properties - direct hits	The number of private properties that fall within the footprint of the proposed roads and would therefore be directly impacted (requiring demolition) by the proposed road and its associated junctions.	<=3	4 to 9	>9	<=1	2 to 4	>4	0	1 to 3	>3
Air quality / noise / vibration - properties within 300m	The number of private properties that fall within 300m of the centreline of the proposed road but would not require demolition by the proposed road and its associated junctions.	< 25	25 - 80	> 80	< 100	100 - 200	> 200	< 430	430 - 526	> 526
Community impacts (schools, sports grounds, churches etc)	The number of community areas / public amenities impacted by the proposed road.	0	1 to 2	>2	0	1 to 2	>2	0	N/A	>0

	Stage 1 Route Selection Assessment Criteria	Description	Section 1 Stage 1 assessment criteria applied			Section 2 Stage 1 assessment criteria applied			Section 3 Stage 1 assessment criteria applied		
			High Preference	Medium Preference	Low Preference	High Preference	Medium Preference	Low Preference	High Preference	Medium Preference	Low Preference
	Communities severed	The number of communities (clusters of houses) that are severed by the proposed road.	<5	5 to 7	>7	<=1	2 to 3	>3	<=1	2 to 3	>3
Economy (Cost)	Total Scheme Cost Comparison (Land and Construct)	Total cost comparisons for the construction (including design and supervision) and land, based on rates equivalent to those used in the preparation of Feasibility Working Costs (which themselves are based on recently tendered construction rates for projects undertaken in Donegal). Land cost rates have been advised by DCC.	< €120M	€120M - €200M	> €200M	< €90M	€90M - €130M	> €130M	< €158M	€158M - €166M	> €166M

7.3 Stage 2 Project Appraisal

7.3.1 Introduction

Following completion of Stage 1, a shortlist of options was identified for each project to be taken forward to the Stage 2 process. All shortlisted options were identified as being feasible and having greater benefit / lower impact than the options eliminated at the end of Stage 1.

At the beginning of Stage 2, the shortlisted options were further developed to include preliminary designs for link roads, grade separated junctions, termination roundabouts, etc. Further refinement and improvements were made to reduce impacts where feasible. Following this further refinement, a more detailed assessment of each of the shortlisted options was then undertaken, using the six common appraisal framework (CAF) criteria and the relevant sub-criteria. Additionally, the Stage 2 appraisal included the Road Safety Audit and Road Safety Impact Assessments. These elements are required under TII PMGs (2019) to inform the option selection.

Economy
- Transport efficiency and effectiveness.
- Wider economic impacts.
- Funding impacts.

Safety
- Collision Reduction.
- Security.
- Road Safety Audit.
- Road Safety Impact Assessment.

Environment
- Air Quality & Climate.
- Noise.
- Landscape & visual.
- Biodiversity (Terrestrial and Aquatic).
- Waste.
- Soils, Geology and Hydrogeology.
- Hydrology.
- Architectural heritage, Archaeology and Cultural Heritage.
- Material Assets (Agricultural).
- Material Assets (Non-agricultural).

Accessibility & Social Inclusion
- Deprived geographical areas.
- Vulnerable groups.

Integration
- Transport integration.
- Land use integration.
- Geographical integration.
- Other government policy integration.

Physical Activity

The project appraisal of options followed the relevant TII Guidance documents produced for the different elements of consideration, in accordance with the TII PMGs (2019) and the Project Appraisal Guidelines for National Roads Unit 7.0 – Multi-Criteria Analysis, PE-PAG-02031 (2016).

7.3.2 Methodology

The methodology for Stage 2 Project Appraisal of shortlisted options is described in the following paragraphs. The appraisals are presented in the relevant chapters of this report corresponding to each section of the project.

Outline designs were developed for each option, including vertical and horizontal alignments, and three-dimensional designs for the proposed grade separated junctions, to enable a high-level assessment to be completed for the feasible road alignment within each option corridor.

The appraisal criteria listed above were individually assessed by competent experts. The assessments are a combination of quantitative and qualitative processes, with a high emphasis placed on detailed expert opinion used in the assessments of each option.

The approach taken was a comparative analysis between the options in each section of the project. All of the options were appraised in accordance with relevant TII/NRA Guidelines. The impact score has been based on the likely impact of each option under the various headings. Section 2 of the PE-PAG-02031, (2016) provides a recommended scoring system. Each impact is scored on a scale of 1 (major or highly negative impact) to 7 (major or highly positive impact). A score of 4 represents a neutral or not significant impact.

Within each discipline, the relevant specialist has assessed options based solely on the extent of an option's potential to impact on that discipline as per the PAG. Following both a quantitative and qualitative assessment within each sub-criterion outlined in the PAG, each option has been given an overall impact score as per **Table 7-3**.

Table 7-3 Impact scoring system used in the appraisal of Options during Stage 2

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

Subsequently, each option has been ranked and a preference determined. Preferences are grouped into one of three types:

- Preferred – the option(s) which have the most positive impact, considering the project objectives.
- Intermediate – the option(s) where negative and positive impacts are considered reasonable in terms of the anticipated impacts and overall project objectives. Impacts are greater than those of the preferred option(s) but considerably better than those of the least preferred option(s),
- Least Preferred - the option(s) which have the potential for the greatest negative impact.

For some options there will be very little difference between their impact score, and some may have the same impact score. In such circumstances the relevant specialist has applied expert judgement and evaluated each option comparatively against the other options considering the quantitative and qualitative assessments. This has allowed the relevant specialist to determine a preference for each option. In some instances, similar options may have the same preference.

The above process has been followed for each sub-criterion as set out in PE-PAG-02031 and listed in **Section 7.3.1** above.

7.3.3 Project Appraisal Matrix

Following the completion of the above process, the individual impact scores for each option under each sub-criterion are compiled into a Project Appraisal Matrix for each of Section 1, Section 2 and Section 3. The impact scores under each sub-criterion are summed to give a total impact score for each option. The higher the score the better the option performs in terms of the appraisal. On this basis a high-level ranking of options can be obtained. Unit 7.0 of the PAG (PE-PAG-02031) states (p.3):

"*The high level ranking of options is intended only to provide a guide to the impact of options and as a record for future reference. It is **not** intended that the sum of each of the individual scores will be used in selecting a preferred option. The overall impact will obviously depend on the strength of individual impacts and it is up to the assessor to weigh up the individual impacts and form a view as to the likely overall impact of the options*."

A secondary appraisal matrix is also undertaken at this point to determine other factors that may inform a decision on the emerging preferred option. The preferences (preferred, intermediate, least preferred) for each option under each sub-criterion are examined and presented in a format like the matrix for the impact scores.

Where an option clearly stands out in terms of the Project Appraisal Matrix (sum of the impact scores) and relevant specialist preference, then this option will be considered as the emerging preferred option. Where there is little between two or more options based on the matrices and preferences, then a further pairwise appraisal was undertaken to determine the emerging preferred option. The pairwise appraisal looks at the top two or more options in order to determine their relative advantages and disadvantages to each other. From this process, an emerging preferred option will be decided based on the option that performs the best against the project objectives.

7.4 Stage 3 Preferred Option - Project Appraisal Balance Sheet

The Stage 2 process results in a preferred option identified for each of the three sections. At Stage 3 a Project Appraisal Balance Sheet (PABS) is developed for the three preferred options in accordance with Unit 7.0 – Multi Criteria Analysis, Section 4.3 (PE-PAG-02031, dated 2016, p.24).

The six CAF criteria used in Stage 2 are used for the Stage 3 appraisal which is carried out in accordance with Unit 7.1 of the Project Appraisal Guidelines (PE-PAG-02032, 2016). TII has developed an automated spreadsheet for use in the PABS. The PABS provides a summary appraisal of project impacts based on the outputs of the quantitative and qualitative assessment carried out as part of the MCA assessment in Stage 2.

SECTION 1: N15/N13 BALLYBOFEY / STRANORLAR URBAN REGION

8 STAGE 1 PRELIMINARY OPTIONS ASSESSMENT

8.1 Do Nothing and Do Minimum Options

A total of 36 preliminary options (Options 1.1 to 1.36, including permutations of parts of options) were identified at Stage 1 assessment for the N15/N13 Ballybofey-Stranorlar Urban Region. Options 1.1 to 1.36 are illustrated in Drawings included in **Appendix E1.**

In addition to the 36 preliminary options identified, the Do Nothing option, using the existing N15 and N13 national primary roads, was also considered within the Stage 1 Assessment.

The Do Nothing option represents the retention of the existing road network without improvement, while the Do Minimum option represents the Do Nothing option with the inclusion of committed schemes and on-line improvements. In the case of Section 1, there are no committed schemes within the Study Area, and there is no opportunity to significantly improve the existing road network through the town without unacceptably high impact on communities, businesses and private property, so the there is no viable Do-Minimum option.

In this scenario, the Ten T route would follow the existing N15 through the towns until the junction of the N15 / N13, and would then continue along the N13, turning left at the junction with the R236 at Kilross, and then on towards Letterkenny through Drumkeen. The route would continue to retain the existing constraints in terms of road width, poor alignment and visibility, poor safety and congestion within the towns leading to poor journey times.

The Do-Nothing option does not meet the project objectives for the following reasons:

- At 13km, it is longer than all other options considered,
- The congestion within the town centres results in high journey times and journey time unreliability, compared with other offline options, resulting in a failure to meet the strategic connectivity objective for the TEN T scheme,
- The poor alignment and cross section do not meet the required standards and results in poor safety,
- The poor / non- existent facilities for pedestrians and cyclists results in poor safety for non-motorised road users over parts of the existing route,
- The concentration of traffic along the existing road causes high community impact and severance through residential areas and the town centre,
- The presence of high traffic volumes near an extremely high number of sensitive receptors along the existing road results in unacceptably high noise and air quality impacts,
- The retention of the existing road would result in no improvement in conditions, and likely a worsening of the wider economic conditions for both the scheme and the towns, and a failure to meet national and local planning policies (refer to Section 2.2).

Accordingly, the Do-Nothing option is eliminated from further consideration.

8.2 Preliminary Options

Each of the 36 options identified could be broadly described as falling into one of three categories, as described below:

Northern Extremity Options – these are options that are located remotely from Ballybofey and Stranorlar and would provide the most direct link between the N15 south west of Ballybofey and the N13 north of Stranorlar and have one intermediate junction. Traffic travelling from Donegal directly to Letterkenny, along the TEN-T Route, would benefit the most from this new road as it would shorten the journey both in distance and time, avoiding the need to travel through the Twin Towns. These options would, however, have less connectivity between the proposed road and the residual road network, so local traffic making journeys

within the Twin Towns and to / from the N15 Lifford road, would get less benefit from these options. This traffic would be more likely to use the existing road network but would benefit indirectly from having less traffic using the local roads. These options would provide the shortest options in terms of distance between N15 and N13.

Northern Bypass Options – these are options that are located closer to the northern side of the Twin Towns and would provide an improved link between the N15 south west of Ballybofey / Stranorlar and the N13 north of the towns. They would also facilitate local traffic travelling between the two sides of the towns since they have two or more intermediate junctions. Traffic travelling between Donegal and Letterkenny, along the TEN-T Route will benefit from shortened journeys both in distance and time by avoiding the need to travel through the Twin Towns. Traffic travelling between the N15 south west of the Twin Towns and N15 east of the Twin Towns (to Lifford) would likely also benefit from the scheme options as they would negotiate a less congested residual road network.

Southern Bypass Options – these are options that follow an alignment south of the Twin Towns and intersect the N15 between the Twin Towns and Lifford. These options would provide benefit to traffic travelling between Donegal and Letterkenny on the TEN-T Route in the form of a faster, safer road than the existing road network, but the distances travelled would be similar or more than the distance taken on the existing roads or those associated with all of the northern options. These southern options would provide benefits for local traffic bypassing the town centres and traffic travelling between Donegal and Lifford.

The options that were subject to the Stage 1 Preliminary Options Assessment are listed in **Table 8-1** below:

Table 8-1 Section 1 Stage 1 Preliminary Option Descriptions

Option	Description
1.1	Two variants of similar Northern Extremity Options being close to the northern boundary of the study area. Passing through least densely populated part of the study area. These options start east of the recently improved N15 Blackburn Bridge (Phase 1). The proposed road crosses the River Finn east of Crampan on a bridge elevated above the R252. The northern termination point on the N13 is approximately 2.5km north of the R236 junction. Only 1 intermediate junction at Cappry makes it is less beneficial to local traffic.
1.2	
1.3	Three variants of similar Northern Extremity Options – Located closer to Ballybofey and Stranorlar, they pass through more populated areas than Options 1.1 and 1.2. These options are shorter than Options 1.1 and 1.2 although Options 1.3 and 1.4 converge with the Options 1.1 and 1.2 approximately mid-way along their lengths. These options start east of the recently improved N15 Blackburn Bridge (Phase 1) and cross the River Finn north of Trooper's Hill on a bridge elevated above the R252. The northern termination point is on the N13 approximately 2.5km north of the junction with the R236. Only 1 intermediate junction at Cappry means it is less beneficial to local traffic.
1.4	
1.5	
1.6	A shorter variant of Options 1.3, 1.4 and 1.5. Another Northern Extremity Option – Located closer to the Twin Towns, it is shorter than Options 1.3, 1.4, and 1.5 because it terminates east of the recently improved N15 Blackburn Bridge (Phase 1) to the south of Ballybofey and, north of the Twin Towns, connects to the N13 at a point approximately 1km north of the junction with the R236. The proposed road crosses the River Finn north of Troopers Hill on a bridge elevated above the R252. Only 1 intermediate junction at Cappry means it is less beneficial to local traffic.
1.7	Like Option 1.6, this option passes through more populated areas closer to the Twin Towns than the northern extremity options. Its length is like Option 1.6, as it has the same termination points, but it has two intermediate junctions on the crossing of the R252 (same as Option 1.6) and at a new junction north of the Twin Towns, with a link back to the existing N13 at Tircallan. This second junction will make this option more attractive to local traffic and it will operate as a local bypass, as well as a strategic TEN-T Route. The proposed option crosses the River Finn north of Trooper's Hill on a bridge elevated above the R252.
1.8	A variant of Option 1.5, it is one of the northern extremity options. The southwestern half of this route is located in close proximity to the Twin Towns and connects to the N15 east of the recently improved N15 Blackburn Bridge (Phase 1). Approximately half-way along its length, the option moves away from the towns in a northerly direction and connects to the N13, north of the Twin Towns, at a point approximately 2.5km north of the R236 junction. The proposed road crosses the River Finn west of Trooper's Hill on a bridge elevated above the R252. Only 1 intermediate junction at the crossing point of the R252 still means it is less beneficial to local traffic.
1.9	Option 1.9 is a northern extremity option located closer to the Twin Towns within a more populated area than previous northern extremity options. The shortest of all the northern extremity options, it connects to the N15 east of the recently improved N15 Blackburn Bridge (Phase 1) and connects to the N13 at a point approximately 1km

Option	Description
	north of the junction with the R236. The proposed road crosses the River Finn west of Trooper's Hill on a bridge elevated above the R252. Only 1 intermediate junction at the crossing point of the R252 still means it is less beneficial to local traffic.
1.10	This northern bypass option has two intermediate junctions and terminations points, at the crossing point of the R252 and north of Stranorlar with a link back to the existing N13 at Tircallan, and onto the existing N15 west of St Joseph's Hospital. The proposed road crosses the River Finn west of Trooper's Hill on a bridge elevated above the R252.
1.11	This northern extremity option has one intermediate junction south of the River Finn on the R252. The proposed road crosses the River Finn between Drumboe Lower and Cappry on a bridge elevated above the R252. North of the Finn, the option moves north-westwards, from the towns towards higher ground and less populated areas of Lettermakenny and Meenavoy.
1.12 1.13	Like Options 1.8 and 1.11 to the south of the River Finn but whose northern sections stay closer to Stranorlar. These routes are located close to the Twin Towns, both Options have an intermediate junction at the crossing of the R252, while Option 1.13 has a second intermediate junction north of Stranorlar with a link back to the existing N13 at Tircallan, and onto the existing N15 west of St Joseph's Hospital. Both options have the same termination points and cross the River Finn at the same point between Drumboe Lower and Cappry on a bridge at a point elevated above the R252.
1.14	This option operates as a northern bypass with two intermediate junctions located at the crossing points of the N15 west of the Twin Towns and the R252. The proposed road crosses the River Finn between Drumboe Lower and Cappry on a bridge elevated above the R252. It is one of the longer bypass routes with its termination points located east of the recently improved N15 Blackburn Bridge (Phase 1) and on the N13 approximately 2.5km north of the junction with the R236.
1.15	A variant of Option 1.14 with the difference being a shorter distance with its northern termination point on the N13 approximately 1km north of the junction with the R236. The proposed road crosses the River Finn between Drumboe Lower and Cappry on a bridge elevated above the R252.
1.16	A northern bypass option with three intermediate junctions located at the crossing points of the N15 west of the Twin Towns, the R252 and the N13 north of the Twin Towns where a new link road would tie it back to the existing network. The proposed road crosses the River Finn between Drumboe Lower and Cappry on a bridge elevated above the R252. This option would operate effectively as a local bypass. Located fairly close to the towns, it is located in areas with a higher population density than the northern extremity options. It meets the N15 east of the recently improved N15 Blackburn Bridge (Phase 1) and the N13 at a point approximately 1km north of the junction with the R236.
1.17 1.18	Similar northern bypass options that have the advantage of accessing both the N15 and the R252 close to the town centres, with just one junction and a link road providing access to both the N15 and R252. These options are located closest to the town centres and located in the areas of highest population compared to other options. The proposed road crosses the River Finn immediately north of Drumboe Woods on a bridge at a point where the river floods to a width of approximately 200m. Both options terminate east of the recently improved N15 Blackburn Bridge (Phase 1) and at a point on the N13 approximately 1km north of the junction with the R236.
1.19 1.20	Variants of similar southern bypass options with two intermediate junctions, the first located at Navenny south of Ballybofey, and the second located adjacent to the crossing point of the N15 east of the Twin Towns on the road to Lifford east of St. Joseph's Hospital. The proposed road crosses the River Finn at Edenmore on a bridge at a point where the river floods to a width of 800m. Both options terminate east of the recently improved N15 Blackburn Bridge (Phase 1) and at a point on the N13 approximately 1km north of the junction with the R236.
1.21	Option 1.21 represents the Preferred Option for the previous bypass project undertaken between 2000 and 2009. It has two intermediate junctions, the first located at Navenny south of Ballybofey, and the second located adjacent to the crossing point of the N15 east of the Twin Towns on the road to Lifford east of St. Joseph's Hospital. The option crosses the River Finn at Edenmore on a bridge at a point where the river floods to a width of 800m. Its termination points are located west of the recently improved N15 Blackburn Bridge (Phase 1) and at a point on the N13 approximately 1km north of the junction with the R236. This option is located in areas with higher population density than the northern extremity routes.
1.22 1.23 1.24	These are all variations of similar options, all of which are located further away from the Twin Towns than Option 1.21. They all have two intermediate junctions, the first located at Navenny south of Ballybofey, and the second located adjacent to the crossing point of the N15 east of the Twin Towns on the road to Lifford east of St Joseph's Hospital. Termination points are located west of the recently improved N15 Blackburn Bridge (Phase 1) and at a point on the N13 approximately 1km north of the junction with the R236. Option 1.22 is the longest of all options considered and is the most southerly located of the southern bypass options. Like Option 1.21, all these options are located in areas with higher population density than the northern extremity routes. The proposed road crosses the River Finn at Edenmore on a bridge where the river floods to a width of between 800m and 900m.

Option	Description
1.25	These are versions of similar options, starting east of the Blackburn Bridge Improvement on the N15 and all having two junctions in similar (but not identical) locations, the first located west of Ballybofey south of the Finn with a link road to the R252, the second located north of Stranorlar with a link road to the N13. Their crossing points of the Finn are located where the Finn is in deep channel, without excessive flood plain so the bridge crossings are shorter than the options that run south of the towns.
1.26	
1.27	
1.28	
1.29	This option starts east of the Blackburn Bridge Improvement on the N15 and initially follows an alignment south of the existing N15, but unlike Option 1.28, it passes south of the towns similar to Option 1.22, with similar junction provision and locations.
1.30	These are variations of similar options. Unlike all other options, these start at the western end with a continuation of the Blackburn Bridge Improvement that follows an alignment (with single carriageway cross section) south of the existing N15 until reaching a proposed roundabout at Doowish. Here the options head northwards, crossing the existing N15, before continuing a combination of alignments similar to Options 1.25, 1.26 and 1.27. These have two junctions, the first located south of the proposed Finn crossing with the R252 and the second located north of Stranorlar with a link road back to the N13. The difference between the options is due to a different alignment for each through Troopers Hill, Backlees and Teevickmoy. All options cross the river where it is deep channel and the river is less than 100m wide.
1.31	
1.32	
1.33	
1.34	
1.35	
1.36	

8.3 Public Consultation Feedback

A second series of public consultations was held in April and May 2018, in which the Stage 1 options were presented alongside the shortlisted options. Features and possible constraints identified by attendees at the public consultation included:

- Highlighting areas of private lands severed as a result of previous road design projects.
- Areas that have been prone to serious flooding.
- Areas that have been considered for archaeological excavations.
- Dunwiley Woods which has been identified by locals to host ringforts, old stone walls, wells and historic settlements.
- An area along the River Finn was identified, east of Stranorlar and north of Edenmore, as a salmon bed area.
- Remnants of ring forts and old bridges.
- The Mullandrait townland south of Stranorlar is prone to significant flooding. Issues with flooding close to the local wastewater treatment plant were also raised.
- The construction of a new school in Stranorlar.
- A suggested tidal river at Edenmore should be taken into consideration when investigating routes;
- Drumboe Wood, the Drumboe Lower townland, was identified as an area of nature conservation value and important locally.
- Badger activity in the townland of Sessiagh (O'Neil).

8.4 Elimination of Options

The Stage 1 Preliminary Options Assessment for Section 1 is presented in the form of a matrix in Appendix G1. The impact under each criterion is coloured as LOW PREFERENCE (red), MEDIUM PREFERENCE (orange) or HIGH PREFERENCE (green). The matrix presents the detailed assessment under each criterion, while a high-level commentary on the key differentiators between options is presented below:

- All of the southern bypass options are considerably longer than other options located to the north of the Twin Towns, with significantly higher costs. This differential between the option lengths equally applies when considering the proposed mainlines only, and when considering the cumulative lengths of proposed mainline + link roads. The additional length of the options meant that they were all assessed as having a higher environmental impact and land take requirements than other shorter options located to the north of the towns. Options 1.22, 1.23 and 1.24 are additionally longer than other southern routes

since they started at a point west of the Blackburn Bridge Improvement, and therefore do not benefit from this recently improved infrastructure.

- The most northerly options, Options 1.1 to 1.4, offer shorter routes between the N15 and N13 than many other options considered, but were located remotely from the towns and have just one intermediate junction. These options provide only limited benefit to the towns, although removing the Donegal / Letterkenny traffic from the local road network, they do not facilitate movement of local traffic from one side of the town to another.
- The options located to the north, and closest to the Twin Towns, carry the advantages of having shorter lengths than the southern options, and having a greater traffic distribution function than the northern extremity options.
- All options located remotely to the north of the towns have the advantage of having less impact on existing development (as they pass through less densely populated areas) and have lower impact crossings of the Finn. The closer the routes are to the towns, the higher impact on residential property, both in the form of direct impacts on properties and those properties situated within 300m of the proposed road.
- All options located south of the town, Options 1.19, 1.20, 1.21, 1.22, 1.23 and 1.24, have a significantly higher impact on the crossing points of the Finn than all other options considered since they are located in a wide flood plain in the vicinity of their crossing points of the river. These crossing points all have highly negative and potentially significant impacts on ecological grounds and on hydrology due to the potential impediment to water flow caused by the bridge being within the flood plain. Options 1.19, 1.20, 1.21 and 1.22 have medium indirect impacts on the SAC, whereas Options 1.23 and 1.24 have a low indirect impact on the SAC.
- None of the options have direct impact on archaeological sites.
- All options have direct impacts, to varying degrees, on existing residential properties and areas of mature woodlands.
- All options pass through areas of poor ground in the form of alluvial deposits adjacent to the Finn (particularly the options to the south of the towns) while some options located to the north of the towns also pass through highlands and isolated areas of peat.
- All options pass through areas of landscape with high sensitivity, although the northern options, which are located on higher ground, generally pass through a greater area of landscape with higher sensitivity than the southern options.
- None of the options have direct impacts on Natural Heritage Areas (NHAs) or Proposed Natural Heritage Areas (pNHA).

Table 8-2 presents a brief summary of the eliminated options from Stage 1 and reasons why they were not taken forward.

Table 8-2 Eliminated Options following the Stage 1 Assessment

Option	Reasons for Elimination
1.1	▪ Low connectivity with the towns ▪ High landscape impact ▪ High property impact ▪ High bio-diversity impact
1.2	
1.3	
1.4	▪ Low connectivity with the towns ▪ High landscape impact ▪ High property impact
1.5	▪ Low connectivity with the towns ▪ High landscape impact
1.7	▪ High direct impact on properties
1.8	▪ Low connectivity with the towns ▪ High landscape impact

Option	Reasons for Elimination
1.11	▪ Low connectivity with the towns ▪ High landscape impact ▪ High property impact
1.12	▪ High community impact
1.13	▪ Marginally lower scores than similar shortlisted options
1.14	▪ Poor ground ▪ High landscape impact ▪ High archaeology impact
1.15 to 1.18	▪ Poor ground ▪ High property impact ▪ High archaeology impact
1.19 and 1.20	▪ High cost ▪ High impact on area prone to flooding ▪ High landscape impact ▪ High property impact
1.21 to 1.24	▪ High cost ▪ High impact on area prone to flooding ▪ High ecology impact ▪ High community impact
1.25 to 1.28	▪ Marginally lower scores than similar shortlisted options
1.29	▪ High cost ▪ High impact on area prone to flooding
1.32 to 1.35	▪ Marginally lower scores than similar shortlisted options

8.5 Stage 1 Recommendation

Having completed the Stage 1 Preliminary Options Assessment for Section 1 of the TEN-T Priority Route Improvement Project, Donegal, a shortlist of feasible options was taken forward to Stage 2 of the Option Selection process. These shortlisted options are presented in **Table 8-3**. They are also illustrated in the Drawings **in Appendix E1**.

Table 8-3 Shortlisted Options taken forward to Stage 2

Option	Description
1.6	Option 1.6 is the longest (cumulative length of mainline and link roads – 14.1km) and fourth lowest cost of the shortlisted options, with relatively low environmental impact compared to the other options. It crosses the River Finn at a point where the river channel is well defined, so it can be crossed without the need to place piers in the river, and thereby has low indirect impact on the SAC. It has just one junction located adjacent to the crossing of the R252, resulting in lower benefit to local traffic within the Twin Towns, than the other options with more junctions.
1.9	Option 1.9 is the second longest (13.8km) of the shortlisted options and is the second lowest cost option with higher environmental impact compared to Option 1.6. Option 1.9 also crosses the River Finn at a point where the river channel is well defined, so it can be crossed without the need to place piers in the river, and thereby has medium indirect impact on the SAC. Being one of the northern options, but closer to the Twin Towns, it also has just one junction located adjacent to the crossing of the R252, resulting in limited benefit to local traffic within the Twin Towns but better than Option 1.6.
1.10	Option 1.10 is the third shortest of the shortlisted options (12.0km) with a similar environmental impact to Option 1.6. It also crosses the River Finn at a point where the river channel is well defined, so it can be crossed without the need to place piers in the river, and thereby has medium indirect impact on the SAC. Having two junctions with the local road

Option	Description
	network at the R252 and N13 North, it provides greater benefit to local traffic within the Twin Towns than Options 1.6 and 1.9.
1.30 1.31 1.36	Options 1.30, 1.31 and 1.36 are all similar in terms of direction but differing in alignment on the northern side of the river crossing with lengths of 11.9km (second shortest), 11.1km (shortest) and 12.1km (3rd longest) respectively. Each option crosses the River Finn at the same point where the river channel is well defined, so it can be crossed without the need to place piers in the river and has low indirect impact on the SAC. All options have two junctions with the local road network at the R252 and N13 North, providing similar benefit to local traffic, as Option 1.10. Option 1.31 is the lowest cost of all options considered. Each of these three options are located closer to the towns that Options 1.6, 1.9 and 1.10 which mean they impact a higher number of houses and have a higher impact on zoned land.

It should be noted that the six shortlisted options that ranged in cumulative length between 11.1km and 14.1km with an average of 12.5km, were generally shorter than the southern options that ranged in cumulative length from 12.9km to 15.8km with an average of 14.6km. This difference is magnified when comparing the mainline lengths only, where the six shortlisted options that ranged in mainline length between 7.2km and 9.3km with an average of 8.4km, compared to the southern options that ranged in mainline length from 11.6km to 14.1km with an average of 13.3km. Given that the net impact of a route is roughly proportional to its length, it is unsurprising that the shorter northern options were shortlisted in preference to the considerably longer southern options.

All the above shortlisted options are taken forward to Phase 2, Stage 2 Project Appraisal Matrix. In order to simplify the description of the options during Stages 2 and 3, the option naming convention in Stage 1 has been amended as set out in **Table 8-4.**

Table 8-4 Option Names for Stage 2

Stage 1 Option Name	Stage 2 Option Name and Variants	
Option 1.6	Orange	1A
Option 1.9	Purple	1B
Option 1.10	Pink	1C
Option 1.30	Red	1D
Option 1.31	Green	1E
Option 1.36	Blue	1F

8.6 Comparison of Shortlisted Options with Previous Project

In a previous project completed by Hyder PH McCarthy between 2000 and 2008, the Route Selection Report considered options located both to the north and the south of the towns and concluded by recommending an option to the south of the town.

The four options considered during the previous project are illustrated in **Figure 8-1.**

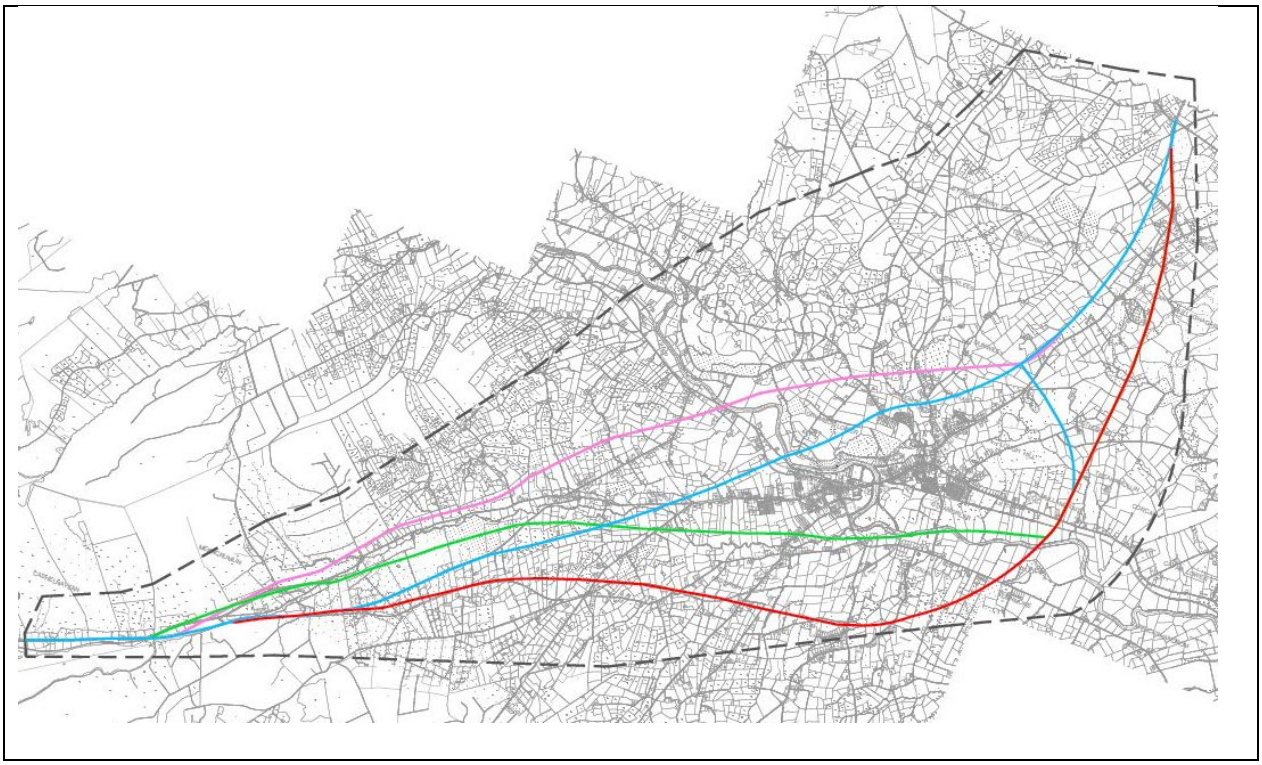

Figure 8-1 Shortlisted Options assessed during previous project 2000 – 2008

Figure 8-1 includes two options considered north of Ballybofey and Stranorlar at that time. The two northern options, eliminated in the previous project, differed from the six options selected for the Stage 2 assessment for this project. For example:

- The Pink option in the previous project severed Dunwiley Woods. In this project Dunwiley Woods was highlighted as a constraint and therefore none of the options brought forward for Stage 2 assessment, have a direct impact on Dunwiley Woods.
- The Blue option in the previous project passes immediately north of Drumboe Woods and south of Dunwiley Woods. This option passes close to Ballybofey and Stranorlar and impacts the Aisling Court housing estate (which did not exist at the time), crosses the River Finn immediately upstream of the existing footbridge linking Beechwood Avenue with Drumboe Woods, and passes between Drumboe Woods and the existing memorial. The alignment continues in a north-easterly direction through an area now heavily populated with residential properties, with direct impacts including Castle Gardens and Ash Meadows housing estates. None of the options selected for Stage 2 assessment, for this project, come as close to the town as the previous Blue option or sever the linkage between the Drumboe Woodlands and the associated Memorial; nor have the high impact on residential properties in the area through which the Blue option would have passed.

This project includes constraints identified within the study area at the time of this Report and the options reviewed and assessed considered these constraints; several constraints identified were not present at the time of the previous project.

9 STAGE 2 PROJECT APPRAISAL

9.1 Shortlisted Options

The initial six options, 1A to 1F, were then assessed in terms of the layout, possible alignments and junction arrangements. As a result, a further six variations on these options were added as slight modifications to the original six options and these were given the names Options 1A1 to 1F1. The only differences between the original and modified options were the arrangements with the link roads associated with each option, and modifications to the vertical alignments of some of the mainlines. None of the new options introduced new corridors to the original options shortlisted from the Stage 1 assessment.

Following the initial assessment of Options 1A to 1F and 1A1 to 1F1, a further Option 1G (Yellow) was identified. This is a composite option formed by combining the best sections of other options. Once again, Option 1G did not introduce any new corridors to those considered during the Stage 1 assessment.

The summary of all shortlisted options that were considered for assessment as part of Stage 2 of Phase 2 Options Selection is provided in **Table 9-1** below:

Table 9-1 Options for Stage 2 Assessment

Stage 2 Options	
Orange	1A
	1A1
Purple	1B
	1B1
Pink	1C
	1C1
Red	1D
	1D1
Green	1E
	1E1
Blue	1F
	1F1
Yellow	1G

These thirteen options were assessed under each of the six project appraisal criteria, and their associated sub-criteria, as previously described in **Section 7.3**.

9.2 Economy

9.2.1 Introduction

The Economic assessment of the options aims to determine and compare the relative economic benefits of each option, drawing conclusions from qualitative and quantitative assessments.

The Economy appraisal was assessed under the following sub-criteria:

- Transport Efficiency and Effectiveness
- Wider Economic Impacts
- Funding Impacts

9.2.2 Transport Efficiency and Effectiveness

Cost estimates were completed for the options considered during Stage 2 in accordance with the TII Cost Management Manual (CMM), using rates calculated to reflect market conditions in 2018. The cost estimates were based on alignment designs for Section 1 options prepared during the Stage 2 assessment, using 2018 prices. Refer to **Table 9-2** for Stage 2 cost estimates for each of the thirteen Section 1 options.

Table 9-2 Option Comparison Cost Estimates

Option	1A	1B	1C	1D	1E	1F
Options Comparison Estimate (millions €)	€152	€146	€137	€157	€163	€151

Option	1A1	1B1	1C1	1D1	1E1	1F1	1G
Options Comparison Estimate (millions €)	€156	€147	€141	€153	€143	€145	€148

Table 9-3 below sets out the Present Value of Costs (PVC), Present Value of Benefits (PVB) and Benefit Cost Ratio (BCR). These have been calculated using TUBA and COBALT. All options assessed had major positive BCR values and have accordingly all equally been given scores of 7.

In addition, the economic assessment is based on annualisation of the weekday AM, IP and PM periods for the TUBA assessment, based on data from TII TMU counters. PAG guidance indicates that extrapolation to other periods may be acceptable if justification can be provided. Having reviewed the full years count data, it is justifiable to expand the TUBA assessment to include the weekend interpeak period. This would add to the PVB for the options. In the case of Section 1 it may add in the region of 10% to the benefits. The potential to expand the assessment periods will be considered at the next phase of the project.

While there were variations in the BCR values for the different options, all BCR values exceeded 2.11 indicating a major positive economic performance, and accordingly all options have equally been given the highest impact scores of 7.

Table 9-3 Impact Scores for PVC, PVB and BCR

Option	1A	1B	1C	1D	1E	1F
PVC (millions €)	€ 81	€ 78	€ 73	€ 83	€ 87	€ 80
PVB (millions €)	€ 174	€ 182	€ 176	€ 191	€ 194	€ 183
BCR	**2.15**	**2.35**	**2.41**	**2.30**	**2.23**	**2.28**
Impact Description	**Major Positive**	**Major Positive**	**Major Positive**	**Major Positive**	**Major Positive**	**Major Positive**
Impact Score	**7**	**7**	**7**	**7**	**7**	**7**

Option	1A1	1B1	1C1	1D1	1E1	1F1	1G
PVC (millions €)	€ 83	€ 79	€ 75	€ 81	€ 76	€ 77	€ 78
PVB (millions €)	€ 175	€ 188	€ 178	€ 179.7	€ 180	€ 184	€ 183
BCR	2.11	2.39	2.37	2.22	2.37	2.38	2.35
Impact Description	Major Positive	Major Positive	Major Positive	Major Positive	Major Positive	Major Positive	Major Positive
Impact Score	7	7	7	7	7	7	7

9.2.3 Wider Economic Impacts

9.2.3.1 Competition in the Market

All options for the N15/N13 Ballybofey / Stranorlar section present an improved link between Donegal and Stranorlar / Lifford and Letterkenny, and further afield to Dublin and Northern Ireland. All options also provide a significant improvement to the local road network conditions within Ballybofey / Stranorlar by the removal of through-traffic which currently causes congestion on a daily basis. These factors will lead to a residual positive effect in terms of commercial attractiveness.

The availability of efficient access from the scheme to the businesses within the town is an important factor in contributing to their attractiveness in the market. Currently, the daily congestion in the town is a significant constraint to accessing businesses and all options will result in an improvement. The options that have access points to the north and south of the river, with comparatively shorter link roads to the town centre, will be more beneficial than the options that have one access point, and/or are reliant on links that provide less efficient linkage to the town centre.

Accordingly, the favoured options are 1D & 1D1, 1E & 1E1, 1F & 1F1 and 1G as they have access points north and south of the town and new link roads that will provide efficient access to businesses. The 1A & 1A1, 1B & 1B1 , and 1C & 1C1 options have lower preference. The 1A & 1A1 and 1C & 1C options have only one access from the bypass (south of the river) and utilise a link that passes through the constrained junction of the R252 (Glenties Road) / N15. The 1B & 1B1 option has two access points (north and south of the river) but also uses a link that passes through the constrained junction of R252 / N15 (at Bonner's Bar corner).

The 1A & 1A1, 1B & 1B1, and 1C & 1C1 options will have a slightly positive impact and the 1D & 1D1, 1E & 1E1, 1F & 1F1 and 1G options will have a moderately positive impact.

9.2.3.2 Agglomeration

All options will reduce travel time between Ballybofey/Stranorlar and Letterkenny. This is a positive outcome in terms of reducing travel time between production centres. Additionally, in conjunction with Section 2 and Section 3, journey times from Donegal to Northern Ireland will be reduced significantly. This results in improved connectivity to Derry, Belfast and Dublin. All options perform similarly in this regard and are deemed slightly positive.

9.2.3.3 Inward Investment

The improved infrastructure and connectivity to other larger economic centres, such as Dublin, Derry and Belfast, is likely to improve the attractiveness of the region and assist in securing inward investment. All options score slightly positive in this regard.

9.2.3.4 Labour Supply

The existing N15/13 between Ballybofey/Stranorlar and Letterkenny currently provides a link between existing labour markets. All the shortlisted options for N15/N13 are likely to improve the journey time, journey time reliability and the safety of road users travelling between labour markets. It is not anticipated that a significant change in labour supply will occur as a result of the options, however it is anticipated that a

residual positive effect in terms of labour markets and attractiveness will remain. Therefore, all options score slightly positive in terms of Labour Supply.

9.2.3.5 Urban Regeneration

None of the N15/N13 options will support urban regeneration, due to the rural location of the link. All options score neutral.

9.2.3.6 Wider Economic Impacts Summary

Taking account of the five factors above that contribute to the overall scores for Wider Economic Impact, all options scores equally as providing a slightly positive impact score of 5. An overall summary of the wider economic impact criterion is provided in **Table 9-4.**

Table 9-4 Impact Scores for Wider Economic Benefits

Option	1A	1B	1C	1D	1E	1F
Impact Description	Slight Positive	Slight Positive	Slight Positive	Slight Positive	Slight Positive	Slight Positive
Impact Score	5	5	5	5	5	5

Option	1A1	1B1	1C1	1D1	1E1	1F1	1G
Impact Description	Slight Positive	Slight Positive	Slight Positive	Slight Positive	Slight Positive	Slight Positive	Slight Positive
Impact Score	5	5	5	5	5	5	5

9.2.4 Funding Impacts

The project aims to improve the strategic transport network in County Donegal.

As the project will assist in improving connectivity to a peripheral region in Europe (which may become more isolated as a result of Brexit), then there is the potential opportunity to secure non-exchequer funding through the European Union.

Additionally, there is an opportunity to secure non-exchequer funding through the contract type, by employing a Public Private Partnership (PPP) type contract.

All options have the same opportunity to avail of the above funding streams and therefore score slightly positive.

Table 9-5 Impact Scores for Funding Impacts

Option	1A	1B	1C	1D	1E	1F
Impact Description	Slight Positive	Slight Positive	Slight Positive	Slight Positive	Slight Positive	Slight Positive
Impact Score	5	5	5	5	5	5

Option	1A1	1B1	1C1	1D1	1E1	1F1	1G
Impact Description	Slight Positive	Slight Positive	Slight Positive	Slight Positive	Slight Positive	Slight Positive	Slight Positive
Impact Score	5	5	5	5	5	5	5

9.2.5 Comparison of Options

All options have very similar impacts in terms of Wider Economic Impacts and Funding Impacts. Therefore, the differentiating factors are based on the Transport Efficiency and Effectiveness sub criteria.

While all options have been given equal impact scores, there will be slight variations between them in terms of preferences. Option 1A1 is the least preferred as it has the lowest BCR. Option 1E1 has the highest BCR making it the preferred option.

9.3 Safety

The safety assessment considers safety impacts as part of the Project Appraisal (Multi-Criteria Analysis). Refer to **Appendix C1.1.**

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

- Collision reduction
- Security of road users

The assessment also includes the findings of the following two safety reports:

- 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.
- 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.

9.3.1 Collision Reduction

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. All options provided a benefit in terms of collision reduction in the order of €1.8m to €3.4 million.

Table 9-6 Collision Reduction Appraisal

	1A	1B	1C	1D	1E	1F
Impact Description	Moderately Positive	Moderately Positive	Moderately Positive	Slight Positive	Slight Positive	Slight Positive
Impact Score	6	6	6	5	5	5

	1A1	1B1	1C1	1D1	1E1	1F1	1G
Impact Description	Moderately Positive	Moderately Positive	Moderately Positive	Slight Positive	Slight Positive	Slight Positive	Moderately Positive
Impact Score	6	6	6	5	5	5	6

9.3.2 Security

The N13 / N15 is currently a sub-standard single carriageway route that has numerous roadside hazards. Despite the urban nature of the area through which the existing road passes, there are sections with no pedestrian or cycle facilities, and no hard shoulder. There are also poor opportunities for overtaking.

All new options propose a shared pedestrian/cycle facility within the mainline cross-section. This will provide an improvement in safety and security of pedestrians and cyclists.

Furthermore, all new mainline Options will cater for strategic traffic and goods vehicles, which will significantly reduce the traffic volumes on the local road network. It is anticipated that the existing N13 / N15 will be re-classified and the speed limit reduced from 100km/h to 80km/h and 50km/h. Cumulatively, this will have a moderately positive effect on the safety and security of the residual existing road network. **Table 9-7** sets out the impact descriptions and scores of options.

Table 9-7 Security Appraisal

	1A	1B	1C	1D	1E	1F
Impact Description	Moderately Positive	Moderately Positive	Moderately Positive	Moderately Positive	Moderately Positive	Moderately Positive
Impact Score	6	6	6	6	6	6

	1A1	1B1	1C1	1D1	1E1	1F1	1G
Impact Description	Moderately Positive	Moderately Positive	Moderately Positive	Moderately Positive	Moderately Positive	Moderately Positive	Moderately Positive
Impact Score	6	6	6	6	6	6	6

9.3.3 Road Safety Audit (Stage F, Part 1)

A Stage F Road Safety Audit Part 1 was undertaken which examined the options to consider all matters that may have an adverse effect on road safety and the perspective of all road users. The Road Safety Audit Report notes that all options represent a significant improvement to the existing arrangement in terms of safety. All Options provide a reduction in the number of potential conflict points.

All options have been compared and subsequently ranked in preference based on safety considerations. The audit report is provided in **Appendix C1.1**, with a summary included below.

Options 1A, 1A1, 1C, 1C1 that passed through higher ground and included a greater extent of embankments and cuttings, and therefore provision of safety barriers and were prone to greater risk of snow and ice coverage. All options have smooth geometric alignments and attract high volumes of traffic from the residual network onto the new, higher standard road, with Option G performing best. **Table 9-8** sets out the impact descriptions and scores of options.

Table 9-8 Road Safety Audit Appraisal

	1A	1B	1C	1D	1E	1F
Impact Description	Moderately Positive	Moderately Positive	Moderately Positive	Moderately Positive	Moderately Positive	Slight Positive
Impact Score	6	6	6	6	6	5

	1A1	1B1	1C1	1D1	1E1	1F1	1G
Impact Description	Slight Positive	Moderately Positive	Slight Positive	Moderately Positive	Moderately Positive	Slight Positive	Major positive
Impact Score	5	6	5	6	6	5	7

9.3.4 Road Safety Impact Assessment

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 1 as part of this Phase 2 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.

Table 9-9 sets out the impact descriptions and scores of options.

It should be highlighted that preferences are 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 1B1, 1C1 and 1G 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 the transfer of traffic from the existing urban road network to the proposed scheme.

Considering the overall benefits of each option in terms of road safety impact and the preference 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.

Table 9-9 Road Safety Impact Assessment Appraisal

	1A	1B	1C	1D	1E	1F
Impact Description	Moderately Positive	Moderately Positive	Moderately Positive	Moderately Positive	Moderately Positive	Moderately Positive
Impact Score	6	6	6	6	6	6

	1A1	1B1	1C1	1D1	1E1	1F1	1G
Impact Description	Moderately Positive	Major Positive	Moderately Positive	Major Positive	Major Positive	Major Positive	Major Positive
Impact Score	6	7	7	6	6	6	7

9.4 Environment

The Stage 2 environmental appraisal was carried out considering the following sub-criteria:

- Air Quality and Climate.
- Noise.
- Landscape and Visual.
- Biodiversity (aquatic and terrestrial).
- Waste.
- Soils, Geology, and Hydrogeology.
- Hydrology.
- Architectural Heritage, Archaeological and Cultural Heritage.
- Material assets (Agricultural).
- Material assets (Non-Agricultural).

Each option was appraised by competent experts and preferences determined. A summary of the findings of the competent expert in terms of each sub-criterion is presented in **Section 9.4.1** through **Section 9.4.10**. The completed environmental appraisal matrix is presented in **Section 9.8, Table 9-29**.

9.4.1 Air Quality and Climate

The air quality and climate analysis was undertaken by means of a desktop assessment. The assessment focussed on NOx exposure, PM_{10} exposure and the anticipated climate impacts through a calculation on greenhouse gas emissions (GHG). The detailed report on the assessment is included in the **Appendix D1.1**.

Option 1A (Orange) has the potential to impact on the greatest number of properties (41) relative to each of the other proposed options. Of these other options, 1E (Green) (11), 1E1 (Green) (11), 1D (Red) (12), and 1D1 (Red) (12) will impact on the least number of properties relative to the options 1F1 (Blue) (14), 1G (Yellow) (14), 1B1 (Pink) (15), 1F (Blue) (17), 1C1 (Purple) (25), 1A1 (Orange) (28), 1B (Pink) (29) and 1C (Purple) (27). The predicted emissions between the various options show lower variation as expected given the similarities in the traffic patterns and option lengths. As a consequence, the air quality scores are largely dominated by the trend in receptor numbers with the link length also having a minor impact on preference.

Climate impacts are largely the same for each option and they all were determined to be moderately negative in impact.

A summary of each option assessment is provided in **Table 9-10**.

Table 9-10 Summary of Air Quality and Climate Appraisal

Option	1A	1A1	1B	1B1	1C	1C1	1D	1D1
Impact Description	Moderately Negative	Moderately Negative	Moderately Negative	Slightly Negative	Moderately Negative	Moderately Negative	Slightly Negative	Slightly Negative
Impact Score	2	2	2	3	2	2	3	3

Option	1E	1E1	1F	1F1	1G
Impact Description	Slightly Negative	Slightly Negative	Slightly Negative	Slightly Negative	Slightly Negative
Impact Score	3	3	3	3	3

9.4.2 Noise

A comparative assessment of each of the thirteen options in Section 1 was carried out in relation to noise with reference to key sensitive receptors in proximity to the proposed options. The noise impacts for each of the options are identified so that those impacted by unacceptably high levels of noise can be avoided where feasible as part of the overall option selection process.

A qualitative assessment was carried out where the property impact rating (PIR) was calculated. The PIR is based on the anticipated traffic flows using each option and the number of properties likely to be impacted, banded into distances from the centreline of each option and within a 300m wide corridor. A qualitative assessment was then carried out which considered factors such as noise sensitive receptors and populated areas. The results of the quantitative and qualitative assessments were then combined to provide an overall impact level for each option. The detailed report on the assessment is included in **Appendix D1.2**.

The current traffic level through Ballybofey is 12,200 AADT and all options are showing a reduction in traffic levels through this area. The greatest reductions are for the 1D/1D1 (Red) and 1E/1E1 (Green) options which are awarded a score of 100 each. The next greatest reductions are on the 1F/1F1 (Blue) and 1G (Yellow) and 1B/1B2 (Pink) options which are awarded a subjective score of 200. The remaining options are scored at 300.

Option 1E1 is the most preferred option from an acoustic perspective as it leads to a noticeable reduction in noise levels in the urban centre of Ballybofey-Stranorlar. There is only a marginal difference between Option 1E1 and Options 1B, 1D, 1D1, 1E and 1G which would see similar reductions in noise levels through the urban centre.

The least preferred options from a noise and vibration perspective are 1A1 and 1C1 with the highest number of properties outside the urban centre affected. A summary of each option and the impacts in terms of noise appraisal is provided in **Table 9-11.**

Table 9-11 Summary of Noise Appraisal

Option	1A	1A1	1B	1B1	1C	1C1	1D	1D1
Impact Description	Neutral	Slightly Negative	Minor or slightly positive	Neutral	Neutral	Slightly Negative	Slightly Positive	Slightly Positive
Impact Score	4	3	5	4	4	3	5	5

Option	1E	1E1	1F	1F1	1G
Impact Description	Slightly Positive	Slightly Positive	Neutral	Neutral	Slightly Positive
Impact Score	5	5	4	4	5

9.4.3 Landscape and Visual

The landscape and visual impact assessment was undertaken to identify the receptors associated with each option and the likely effects upon them which are then taken into consideration in developing and refining the options A desktop study was undertaken, as well as site visits to establish an understanding of the landscape and visual context of the proposed options. Landscape and visual impact assessments are assessed as two discrete topics:

- Landscape impact assessment is concerned with the alteration to the physical landscape which can give rise to changes in its character, how it is experienced and the ascribed value of the landscape.
- Visual impact assessment is concerned with changes that arise in the overall effect on the area's visual amenity.

The detailed report on the assessment is included in **Appendix D1.3**.

When landscape impacts are considered overall for the proposed options there is a slight preference for Option 1G as this option avoids impacts on larger areas of mixed species woodland on the southern slopes of Trooper's Hill associated with other options. However, there will still be an impact on the woodland to the west of Drumboe Lower. Also, Option 1G is closer in proximity to Ballybofey and therefore is likely to have a lesser impact on the landscape in terms of the River Finn crossing than the other options. There is little difference between all of the other options considered with all options having a major or highly negative impact level.

When visual impacts are considered all options have the potential to directly affect existing residential properties to some degree. Out of all the options considered, there would be a slight preference, in visual impact terms, for either of Option 1F or Option 1G. In a comparative assessment between the two, Option 1G would be the preferred option, as it has a lower number of residential properties within the 0-50m and 50-100m distance banding when compared against Option 1F.

A summary of each option and the impacts in terms of landscape and visual impact appraisal is provided in **Table 9-12**.

Table 9-12 Summary of Landscape and Visual Appraisal

Option	1A	1A1	1B	1B1	1C	1C1	1D	1D1
Impact description	Major Negative	Major Negative	Major Negative	Major Negative	Major Negative	Major Negative	Major Negative	Major Negative
Score	1	1	1	1	1	1	1	1

Option	1E	1E1	1F	1F1	1G
Impact description	Major Negative	Major Negative	Major Negative	Major Negative	Major Negative
Score	1	1	1	1	1

It should be noted that potential landscape and visual effects for the preferred option shall be mitigated by minimising the footprint of the new road in the landscape and by using carefully sited landscape screening and boundary treatments.

9.4.4 Biodiversity (Terrestrial and Aquatic)

The biodiversity study compared the potential impacts of the options for Section 1 on the terrestrial and aquatic natural environment. Each of the options was assessed as a 300m wide corridor to determine potential impacts on the principal ecological receptors within or adjacent to each option, and also in relation to potential impacts arising from fragmentation or interference with species' movement across the options. The assessment was undertaken in accordance with the NRA Guidelines for the Assessment of Ecological Impacts of National Road Schemes (Revision 2, June 2009).

The study area encompasses approximately 321 hectares which contains the thirteen options. The area examined extends from the townland of Teevickmoy approximately 4.6km north of Stranorlar, to the townland of Kilcroghery, located approximately 3.75km to the south-west of Ballybofey.

The appraisal of biodiversity, both aquatic and terrestrial ecology, involved desk and field studies in order to characterise habitats and identify flora and fauna of ecological value of all potentially affected habitats intercepted by, or within the Zone of Influence of, each of the options.

A detailed assessment of the biodiversity (terrestrial) elements of the Section 1 options is included in **Appendix D1.4** while the biodiversity (aquatic) elements is included in **Appendix D1.5**.

All thirteen options in Section 1 intersect the River Finn Special Area of Conservation (River Finn SAC: Site Code 002301) at various points with varying degrees of severity, between Ballybofey and Stranorlar. No other designated European site is intersected by the proposed options. The River Finn is designated for the following six qualifying features:

- Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*) [3110];
- Northern Atlantic wet heaths with *Erica tetralix* [4010];
- Blanket bogs (* if active bog) [7130];
- Transition mires and quaking bogs [7140];
- Salmon (*Salmo salar*) [1106];
- Otter (*Lutra lutra*) [1355].

Watercourses intersected by the proposed options lie within the River Finn and River Deele (Cloghroe River) sub-catchments of the greater River Foyle catchment. The majority of the potentially affected surface waters are of the River Finn catchment, with one small tributary potentially affected in the Cloghroe River. The main channel of the River Finn is a designated Salmonid Water and has high quality salmonid nursery habitat within the proposed crossing zones in the study area. Otter (*Lutra lutra*) are Annex II species under the

Habitats Directive are also Qualifying Interests of the River Finn SAC and are identified as sensitive receptors in the aquatic and riparian environment.

The River Finn is also a Freshwater Pearl Mussel (*Margaritifera margaritifera*) sensitive area, therefore a Stage 1 Freshwater Pearl Mussel survey was undertaken on the River Finn in summer 2018. Water levels were at an historic low level on the river owing to extended drought conditions which presented ideal conditions for the survey. Freshwater pearl mussels were absent from both reaches surveyed, covering a total of almost 2km of river channel. There was plenty of suitable habitat opportunity for the species, although biological water quality (Q3 / Poor Status) was sub-optimal for this pollution sensitive invertebrate. Filamentous green algae recorded on substrates and in slow glides and margins, indicated nutrient enrichment - a poor indicator for Freshwater Pearl Mussels.

Surveys were undertaken at the options assessment phase to inform the process. These included seasonally appropriate surveys such as habitats, flora and invasive alien plant species as well as repeat surveys to ensure an understanding of the key ecological features was available to inform the biodiversity appraisal. These included a number of dedicated visits to the River Finn to confirm earlier records and, as far as was practical, otter activity/habitation. The survey of the main River Finn channel also allowed for greater characterisation of the habitats along the river.

A diversity of semi-natural habitats including grasslands, wetlands and woodlands which support a diversity of rare and protected species were recorded within the study area and identified as Ecological Receptors in **Appendix D1.4** and **Appendix D1.5**.

There are no individual options that offer a neutral or negligible impact when addressing potential ecological impacts as part of the project. Comparatively all of the options assessed display similar potential negative impacts to the identified Ecological Receptors when assessed at both the qualitative and quantitative levels.

Of the individual options assessed, Option 1B and 1B1 are Preferred as they impact the least number of ERs categorised as International, National or County Importance in comparison to the other options assessed. Option 1B has the potential to impact the least number of ERs overall (26). Option 1B1 also affects the least number of ERs, however the additional modified southern link road increases the potential net biodiversity loss and land take (hedgerows etc.) and further construction in proximity to the River Finn SAC. The remaining options potentially impact between 27 and 32 Ecological Receptors and will potentially impact more ERs categorised as International, National or County Importance, than 1B and 1B1. These options are less preferable than 1B and 1B1 and are therefore classified as Intermediate.

In conclusion, the emerging preferred options in relation to Biodiversity are Options 1B and 1B1**,** given the limited number of risks to the identified ERs when compared to other options assessed.

A summary of each option and the impacts in terms of biodiversity (terrestrial) and biodiversity (aquatic) is provided in **Table 9-13 and Table 9-14** respectively. The information from both assessments has been combined to give an overall biodiversity assessment as presented in **Table 9-15**.

Table 9-13 Summary of Biodiversity (Terrestrial) Appraisal

Option	1A	1A1	1B	1B1	1C	1C1	1D	1D1	1E	1E1	1F	1F1	1G
Impact Description	Major Negative	Major Negative	Moderately Negative	Moderately Negative	Major Negative	Major Negative	Major Negative	Major Negative	Major Negative	Major Negative	Major Negative	Major Negative	Major Negative
Impact Score	1	1	2	2	1	1	1	1	1	1	1	1	1

Table 9-14 Summary of Biodiversity (Aquatic) Appraisal

Option	1A	1A1	1B	1B1	1C	1C1	1D	1D1	1E	1E1	1F	1F1	1G
Impact Description	Moderately Negative	Moderately Negative	Moderately Negative	Moderately Negative	Moderately Negative	Moderately Negative	Moderately Negative	Moderately Negative	Moderately Negative	Moderately Negative	Moderately Negative	Moderately Negative	Moderately Negative
Impact Score	2	2	2	2	2	2	2	2	2	2	2	2	2

Table 9-15 Summary of Biodiversity (Terrestrial and Aquatic) Appraisal

Option	1A	1A1	1B	1B1	1C	1C1	1D	1D1	1E	1E1	1F	1F1	1G
Impact Description	Major Negative	Major Negative	Moderately negative	Moderately negative	Major Negative	Major Negative	Major Negative	Major Negative	Major Negative	Major Negative	Major Negative	Major Negative	Major Negative
Impact Score	1	1	2	2	1	1	1	1	1	1	1	1	1

9.4.5 Waste

Waste is defined as any substance or object which the holder discards or intends or is required to discard. In terms of a road construction project, most naturally occurring materials excavated as part of the works will not be considered a waste as they can be re-used within the works. There are three broad types of excavated material as set out in TII's *Specification for Road Works Series 600 – Earthworks*:

- Acceptable material: material excavated from within the site or imported on to the site which meets the requirements of the specification for acceptability for use in the works.
- Unacceptable material Class U1: material excavated from within the site which, unless processed so that it meets the requirements of the specification for acceptable material will not be used in the works.
- Unacceptable material Class U2: material having hazardous chemical or physical properties requiring special measures for its excavation, handling, storing, transportation, deposition and disposal. Class U2 material excavated from within the site will not be used in the works unless processed so that it meets the requirements of the specification for acceptable material.

Acceptable excavated material that is not surplus to requirements will be re-used in the works for engineering purposes including fill to embankments, landscaping, etc. Acceptable material that is surplus to requirements will be used in spoil heaps on-site or at off-site locations, subject to proper approvals.

Both Class U1 and Class U2 material may be processed by mechanical, chemical or other means to render the material acceptable for use in the works. It is possible that some unacceptable material may become a waste if disposal of the material is required.

All excavated material from the site of the proposed road will be managed in accordance with best practice to ensure in so far as possible that there is minimal waste generated.

Any excavated contaminated material will fall under Class U2 and must be removed off-site for disposal at an authorised waste management facility. Currently, there is no indication of contaminated material being present within the footprint of the options.

Where there is a deficit of fill material for the construction of the project then clean soil and stone must be imported from other sources to make up the shortfall. This has the effect of requiring the use of fill material from quarries or borrow pits outside of the site boundary or the importation of inert waste fill material that has been re-classified as a by-product and which meets the specification for acceptable material. Production, processing and transporting of material to make up the deficit could have a significant environmental impact in terms of traffic movements, greenhouse gas emissions, use of valuable raw materials, etc.

At this stage in the project approximate estimates of the likely quantities of waste that will be generated from the works have been made. This will be further evaluated and assessed during the next phase.

The cut/fill balance estimates associated with each option are addressed within the Material Assets (non-agricultural) report included in **Appendix D1.10**.

A summary of each option and the impacts in terms of waste appraisal is provided in **Table 9-16**.

Table 9-16 Summary of Waste Appraisal

Option	1A	1A1	1B	1B1	1C	1C1
Surplus material for disposal ('000 m3)	184	191	590	524	145	152
Impact description	Moderately Negative	Moderately Negative	Moderately Negative	Moderately Negative	Moderately Negative	Moderately Negative
Score	2	2	2	2	2	2

Option	1D	1D1	1E	1E1	1F	1F1	1G
Surplus material for disposal ('000 m3)	1,171	-204	1,991	-85	171	99	29
Impact Description	Major Negative	Neutral	Major Negative	Neutral	Moderately Negative	Slightly Negative	Neutral
Score	1	4	1	4	2	3	4

9.4.6 Soils, Geology, and Hydrogeology

The soils, geology and hydrogeology assessment examine each option in terms of their importance and the possible impacts resulting from the construction of a proposed option. The options are compared, and impacts assessed from a land, soil, and hydrogeological perspective. In order to compare the options, the assessment has considered and appraised the following attributes.

Soils and Geology

- Geological heritage sites;
- Landfills and historic waste sites;
- Quarries;
- Karst features;
- Agricultural soils;
- Extent of peat and soft ground.

Hydrogeology

- Aquifers;
- Groundwater vulnerability;
- Source Protection Areas;
- Important abstractions for water supply.

A detailed assessment of the options is included in **Appendix D1.6**.

All options cross areas of alluvial soils associated with the River Finn and areas of mapped peat. Both alluvium and peat were grouped together to determine the proportion of each option that will cross soft soils. The proportion ranges from 5% of total option length (1G Yellow) to 16% of total option length (1A1 Orange). The estimated volumes of soils to be removed ranges from approximately 59,220m^3, along the 1F/1F1 (Blue), to 146,450m^3, along the 1D/1D1 (Red). There is a Low attribute importance associated with soft soils (NRA Guidelines). In a regional context, the proportion of the attribute that will be removed is considered small.

In terms of hydrogeology, the aquifers in the area are predominantly poorly productive aquifers which are generally unproductive except for local zones. A locally important bedrock aquifer, that is moderately productive only in local zones, is mapped in the north of the study area. All options traverse aquifers which have groundwater vulnerability ratings ranging from high, extreme to areas where rock is at or near the surface (denoted 'X' by the GSI). Such areas are more prone to pollution and run-off as the attenuation capacity of the overlying surficial deposits of soil and subsoil is limited by the soil strata thickness or lack of soils in the area.

The amount of cut which is required along each option has been calculated based on the preliminary option design by the engineering team. This has been considered in the assessment where cut is greater than 3m depth and traverse areas of high groundwater vulnerability; this could increase the vulnerability rating to extreme through removal of soil and subsoil cover.

Options 1A, 1A1, 1C, 1C1, 1D, 1D1, 1E and 1E1 are the most favourable options with the same number of minor negative and neutral impacts. All eight of these options traverse poor or soft ground that requires excavation, and all eight option traverse areas of Locally important aquifer (Ll & Lg) and areas of extreme groundwater vulnerability. Option 1B and 1B1 are the least preferred with respect to their impact on the soil, geology and hydrogeology in the Zone of Influence, since these options traverse and cut through longer areas of high groundwater vulnerability and locally important aquifer than the other option.

Option 1A, 1A1, 1C, 1C1, 1D, 1D1, 1E and 1E1 have an overall impact score of 'not significant or neutral' on the soil, geology and hydrogeology in the TEN-T Section 1 Zone of Influence with an impact score of 'minor negative' applied to all other option in Section 1.

A summary of each option and the impacts in terms of soils, geology and hydrogeology appraisal is provided in **Table 9-17.**

Table 9-17 Summary of Soils, Geology and Hydrogeology Appraisal

Option	1A (Orange)	1A1 (Orange)	1B (Pink)	1B1 (Pink)	1C (Purple)	1C1 (Purple)	1D (Red)	1D1 (Red)
Impact Description	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Impact Score	4	4	3	3	4	4	4	4

Option	1E (Green)	1E1 (Green)	1F (Blue)	1F1 (Blue)	1G (Yellow)
Impact Description	Neutral	Neutral	Slightly Negative	Slightly Negative	Slightly Negative
Impact Score	4	4	3	3	3

9.4.7 Hydrology

The hydrology assessment was prepared having regard to the *TII Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes* as recommended by the TII *Project Appraisal Guidelines for National Roads Unit 7.0 – Multi Criteria Analysis*. A comparative evaluation of the options was undertaken, having regard to the specific hydrological impacts associated with each option in order to identify a preferred option(s).

A detailed assessment of the hydrological impacts of the options is included in **Appendix D1.7**.

The entire study area lies within the River Foyle Catchment and forms part of the National Hydrometric Area – 01. The main surface water features potentially impacted by the option extents include the River Finn and its tributaries and also a tributary to the River Deele (Donegal).

The River Finn is one of the major tributaries of the greater Foyle catchment (HA 01) and emanates from the Bluestack and Glendowan Mountains in the interior of Donegal. The River Finn flows into the River Mourne to form the River Foyle at Lifford/Strabane. The Finn catchment is a medium to large sized catchment (502km^2) with a mixture of peat, pasture and forest coverage. The study area is also affected by a number of tributaries of the Finn with catchments ranging in size from 2km^2 to 26km^2. The largest of these is the Daurnett Burn which flows from the south west of the study area. The tributaries largely emanate from farmland within the Finn Valley although the Daurnett Burn represents a more upland catchment with a fair degree of peat land coverage.

The River Deele is a medium sized catchment (134km^2) that forms part of the greater Foyle Catchment and originates in the hilly area to the west of the village of Convoy. The catchment is largely agricultural land with some peat and forest land coverage also. The River Deele flows into the River Foyle approximately 2.8km downstream of the River Finn/River Foyle confluence.

The hydrological assessment has determined that Option 1B/1B1 (Pink) is the preferred option. This is primarily on the basis of the avoidance of areas with a potential for flooding and reduction in required river crossing lengths.

In terms of drainage of road runoff and water quality issues, each option would have similar effects both during and after construction. Again, the 1B/1B2 (Pink) option would be considered the preferred option as it encounters the least number of watercourses along its length.

It is recommended that the ultimate preferred option be aligned as necessary to avoid encroaching upon watercourses and their potential flood extents. Any required crossings will require detailed hydrological and hydraulic analysis so as to eliminate any risk of flooding to adjacent lands. Adequate storm water attenuation and treatment will be required before out-falling to any watercourse along the option due to every watercourse being *At Risk* to not meet its WFD objectives.

A summary of each option and the impacts in terms of hydrology appraisal is provided in **Table 9-18.**

Table 9-18 Summary of Hydrology Appraisal

Option	1A (Orange)	1A1 (Orange)	1B (Pink)	1B1 (Pink)	1C (Purple)	1C1 (Purple)	1D (Red)	1D1 (Red)
Impact Description	Moderately Negative	Moderately Negative	Slightly Negative	Slightly Negative	Slightly Negative	Moderately Negative	Moderately Negative	Moderately Negative
Impact Score	2	2	3	3	3	2	2	2

Option	1E (Green)	1E1 (Green)	1F (Blue)	1F1 (Blue)	1G (Yellow)
Impact Description	Moderately Negative	Moderately Negative	Moderately Negative	Moderately Negative	Moderately Negative
Impact Score	2	2	2	2	2

9.4.8 Architectural Heritage, Archaeology and Cultural Heritage

The architectural heritage and archaeology assessments (together known as cultural heritage) was undertaken in accordance with *TII Guidelines for the Assessment of Archaeological Heritage Impacts of National Road Schemes (2005)* and *Guidelines for the Assessment of Architectural Heritage Impacts of National Road Schemes (2005)*.

Principles applied in this assessment have been both desk and field-based.

- **Desk-Study**: further expansion of information gathered during the Constraints Study (refer to **Volume B**), including the examination of historical cartographic sources, NMI files, aerial mapping/photography and relevant published information.
- **Field-Study**: primarily a windshield survey of the environs, topography and landscape and observations therein with a view to identifying significant cultural heritage impacts and/or areas of archaeological potential. This has been coupled with site specific visits, as required, in order to determine level of impact and extent and condition of the heritage asset.

The compilation of a cultural heritage constraints inventory has been undertaken to include core locational and descriptive data, as well as identification of the distance to the options and the type of impact (direct/indirect).

The comparative evaluation of each overall option corridor was assisted by scoring of impacts to the overall presence of sensitive receptors using the Preference Rating Key per the *Project Appraisal Guidelines for National Roads Unit 7.0 - Multi Criteria Analysis* (TII, 2016). An impact assessment was undertaken on each option to include both quantitative and qualitative assessment. Each option was scored based on the seven-point scale and an integer was assigned according to the overall impact level. A detailed assessment of the cultural heritage impacts of the options is included in **Appendix D1.8**.

The study area, north of Ballybofey-Stranorlar, has a long history of human settlement, as demonstrated by the archaeological and historical record. The River Finn has excellent fishing resources, and this fertile river valley, with gently undulating hillslopes, coupled with the fact that the River is navigable towards the River Foyle and Lough Foyle, ultimately out to sea, indicates that it was an important natural resource in terms of social, economic and political terms since earliest prehistoric times.

From a Cultural Heritage perspective and based on a quantitative and qualitative assessment; the Purple 1C Route is the preferred option, followed by, in order of preference: 1C1 (Purple), 1A (Orange), 1A1 (Orange), 1B1 (Pink), 1B (Pink), 1F1 (Blue), 1F (Blue), 1G (Yellow), 1E1 (Green), 1D1 (Red), 1E (Green), and 1D (Red).

None of the proposed options have a direct negative profound impact on the recorded Cultural Heritage resource.

A summary of each option and the impacts in terms of architectural heritage, archaeology and cultural heritage appraisal is provided in **Table 9-19.**

Table 9-19 Summary of Architectural Heritage, Archaeology and Cultural Heritage Appraisal

Option	1A	1A1	1B	1B1	1C	1C1	1D	1D1
Impact Description	Moderatel y Negative	Moderately Negative	Moderately Negative	Moderately Negative	Moderately Negative	Moderately Negative	Major Negative	Major Negative
Score	2	2	2	2	2	2	1	1

Option	1E	1E1	1F	1F1	1G
Impact Description	Major Negative	Major Negative	Moderately Negative	Moderately Negative	Moderately Negative
Score	1	1	2	2	2

9.4.9 Material Assets (Agricultural)

The following aspects were considered in the assessment for agriculture;

- Land to be acquired;
- Area and orientation of lands severed;
- Removal of farm buildings and/or facilities;
- Farm enterprises;
- Intensity and viability of farming practices.
- Length of centreline;
- Number of constraints potentially affected;
- Number of landholdings intersected;
- Number of landholdings significantly severed.

A detailed assessment of the Material Assets (Agricultural) impacts of the options is included in **Appendix D1.9**.

From this assessment Option 1E was determined to be the preferred option as it interacts the least with agricultural activities and land. This is closely followed by Option 1D. Option 1B and 1C follow, being the third most preferred route, as they do not significantly affect sensitive farms or landholdings. Option 1A1 is the least preferred option since it interacts with the greatest number of landholdings.

A summary of each option and the impacts in terms of material assets (agricultural) appraisal is provided in **Table 9-20.**

Table 9-20 Summary of Material Assets (Agricultural) Appraisal

Option	1A	1A1	1B	1B1	1C	1C1
Impact Description	Moderately Negative	Moderately Negative	Moderately Negative	Moderately Negative	Moderately Negative	Moderately Negative
Score	2	2	2	2	2	2

Option	1D	1D1	1E	1E1	1F	1F1	1G
Impact Description	Moderately Negative	Moderately Negative	Moderately Negative	Moderately Negative	Moderately Negative	Moderately Negative	Moderately Negative
Score	2	2	2	2	2	2	2

9.4.10 Material Assets (Non-agricultural)

The assessment was informed by the Transport Infrastructure Ireland (TII) *Project Appraisal Guidelines for National Roads Unit 7.0 – Multi Criteria Analysis (PE-PAG-02031)*[5] with regards to headings to approaching utilities and infrastructural features, for example in this case non-agricultural properties are assessed in this section and agricultural areas are assessed within a separate Material Assets (Agricultural) Technical **Appendix D1.9** and summarised in Section 9.4.9 above. The *EPA Draft Guidelines on the Information to be contained in Environmental Impact Assessment Reports* (EIAR)[6] (EPA, 2017) were consulted for the specific topics to assess under the environmental factor of Material Assets (Non-agricultural).

The principal objectives of the Material Assets (Non-agricultural) assessment is to:

- Complete a desk study and to obtain relevant data relating to material assets including utilities, properties, quarries, transport, infrastructure and other amenities for each option;
- Assess the significance of the likely direct physical impacts of the proposed road scheme on each of these material assets along each option;
- Evaluate and compare the impact on material assets for each option taking into account interaction with other environmental, engineering and economic criteria,
- Assess each option in line with the Project Appraisal Guidelines for National Roads Unit 7.0 – Multi Criteria Analysis TII[7] in October 2016;
- Compare the options and determine a preference.

The methodology adopted for the option selection comprised primarily of a desktop study and additional information gathered during windscreen surveys. These elements, including transport infrastructure, utilities, non-agricultural land use and properties, were used to identify and describe areas of potential infrastructural value or sensitivity.

The assessment can broadly be categorised into two areas:

- **Infrastructure**
  - Utilities.
  - Quarries.
  - Transport Infrastructure.
  - Waste Management.
  - Forestry.
- **Properties**
  - Settlements and Zoning.
  - Residential and Commercial Properties.
  - Community Severance.
  -

A detailed assessment of the Material Assets (Non-agricultural) impacts of the options is included in **Appendix D1.10**.

A summary of each option and the impacts in terms of material assets (non-agricultural) appraisal is provided in **Table 9-21.**

[5] http://www.tiipublications.ie/library/PE-PAG-02031-01.pdf
[6] http://www.epa.ie/pubs/advice/ea/EPA%20EIAR%20Guidelines.pdf
[7] The National Roads Authority (NRA) and the Railway Procurement Agency were merged to become Transport Infrastructure Ireland (TII) in 2015.

Table 9-21 Summary of Material Assets (Non-agricultural) Appraisal

Option	1A	1A1	1B	1B1	1C	1C1
Impact Description	Slightly Negative	Slightly Negative	Slightly Negative	Slightly Negative	Slightly Negative	Slightly Negative
Score	3	3	3	3	3	3

Option	1D	1D1	1E	1E1	1F	1F1	1G
Impact Description	Slightly Negative	Slightly Negative	Slightly Negative	Slightly Negative	Slightly Negative	Slightly Negative	Slightly Negative
Score	3	3	3	3	3	3	3

9.5 Accessibility and Social Inclusion

This assessment 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.

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. The Section 2 study area is generally marginally below average according to this index. The government has various schemes to help address the issues that are prevalent in these deprived areas, including the Rural Social Scheme. It is anticipated that participants in the Rural Social Scheme who reside within the study area may receive small to neutral benefits from improved accessibility to/from areas of employment and economic activity. All options will have a similar impact and are therefore scored neutral.

A copy of the report is included in **Appendix C1.3** which concludes that that all options have either a neutral or positive impact.

All options provide an equal neutral score of 4 for Deprived Geographical Areas.

The summary table is presented below in **Table 9-22.**

Table 9-22 Summary of Deprived Geographical Areas Assessment Section 1

Option	1A	1A1	1B	1B1	1C	1C1	1D	1D1
Impact Description	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Score	4	4	4	4	4	4	4	4

Option	1E	1E1	1F	1F1	1G
Impact Description	Neutral	Neutral	Neutral	Neutral	Neutral
Score	4	4	4	4	4

The differentiating factor is the accessibility of the option from the town to provide benefit for vulnerable groups. Options 1A, 1A1, 1C and 1C1 have lower accessibility (due to the location and number of

intermediate junctions) than Options 1D, 1D1, 1E, 1E1, 1F, 1F1 and 1G which all have two intermediate junctions located closer to the towns. All Options, except Options 1A, 1A1, 1C and 1C1 score slight positive however there is a higher preference for Options 1D, 1D1, 1E, 1E1, 1F, 1F1 and 1G due to the better accessibility provided by the two intermediate junctions.

The summary table is presented below in **Table 9-23.**

Table 9-23 Summary of Vulnerable Groups Assessment Section 1

Option	1A	1A1	1B	1B1	1C	1C1	1D	1D1
Impact Description	Neutral	Neutral	Slight Positive	Slight Positive	Neutral	Neutral	Slight Positive	Slight Positive
Score	4	4	5	5	4	4	5	5

Option	1E	1E1	1F	1F1	1G
Impact Description	Slight Positive	Slight Positive	Slight Positive	Slight Positive	Slight Positive
Score	5	5	5	5	5

9.6 Integration

The basis of the appraisal covers the following key areas:

- Transport integration,
- Land use integration,
- Geographical integration,
- Other government policy integration: Regional balance.

A copy of the report is included in **Appendix C1.4** which concludes that all new corridor options provide an improvement in infrastructure with a positive impact on the region.

The comparative scoring indicates all options score similarly, with the minor differentiating factor being the accessibility of the options to the existing road network and twin towns, and the mitigation of risk of urban sprawl.

Options closer to Ballybofey and Stranorlar that have two intermediate junctions (1D, 1D1, 1E, 1E1, 1F, 1F1 and 1G) were preferable to options further from the towns with one intermediate junction (1A, 1A1, 1B and 1B1), and also preferable to options 1C and 1C1 that had two intermediate junctions but were located further from the towns. The impact scores for Integration are presented in **Transport Integration.**

9.6.1 Transport Integration

In terms of Transport integration, Section 1 of the TEN-T would address a gap in the quality of the existing infrastructure at this location. An upgraded N15 / N13 may make public transport by bus (the only mode available) more desirable and improve connectivity to Dublin and other urban centres and transport hubs. Furthermore, the currently proposed cross-section adopts a segregated cycle track within the mainline corridor. Connecting this new facility to the existing cycle routes would be of great benefit to existing cyclists and may attract more users. Overall, there will be benefits in terms of connectivity of the strategic road network, connectivity between transport modes, support for sustainable transport modes and access to other transport infrastructure. Results of the assessment are presented in **Table 9-24** to **Table 9-27.**

Table 9-24 Summary of Transport Integration Assessment Section 1

Option	1A	1A1	1B	1B1	1C	1C1	1D	1D1
Impact Description	Moderately Positive	Moderately Positive	Moderately Positive	Moderately Positive	Moderately Positive	Moderately Positive	Moderately Positive	Moderately Positive
Score	6	6	6	6	6	6	6	6

Option	1E	1E1	1F	1F1	1G
Impact Description	Moderately Positive	Moderately Positive	Moderately Positive	Moderately Positive	Moderately Positive
Score	6	6	6	6	6

9.6.2 Land Use Integration

Regarding Land Use Integration, Section 1 would align with the Transportation Strategy set out in the 2018-2024 County Development plan, which identifies the "N15 Ballybofey / Stranorlar Bypass" as a policy objective. At a local level, the Seven Strategic Towns Local Area Plan 2018 – 2024 identifies transport links within Ballybofey and Stranorlar to which most of the options considered are directly aligned. Section 3 Options all have a positive impact in terms of strategic connectivity for long distance trips. All options also comply with the objectives as set out in the National Planning Framework (NPF).

Table 9-25 Summary of Land Use Integration Assessment Section 1

Option	1A	1A1	1B	1B1	1C	1C1	1D	1D1
Impact Description	Slight Positive	Slight Positive	Slight Positive	Slight Positive	Slight Positive	Slight Positive	Moderately Positive	Moderately Positive
Score	5	5	5	5	5	5	6	6

Option	1E	1E1	1F	1F1	1G
Impact Description	Moderately Positive	Moderately Positive	Moderately Positive	Moderately Positive	Moderately Positive
Score	6	6	6	6	6

9.6.3 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. Furthermore, National Strategic Outcome 2 – Enhanced Regional Accessibility, aims to complete linkages to Dublin by a "high-quality road network" recognising that the North-West region has been "comparatively neglected" in this regard.

The plan also provides for investment to support the ambition for development of the border region, listing projects that improve accessibility to the North-West.

All options perform equally in satisfying the goals of the NDP. They also follow through with themes from the National Spatial Strategy, by improving connectivity between Hubs and Gateways. Additionally, the N15 / N13 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 major positive with respect to geographical integration.

Table 9-26 Summary of Geographical Integration Assessment Section 1

Option	1A	1A1	1B	1B1	1C	1C1	1D	1D1
Impact Description	Major Positive	Major Positive	Major Positive	Major Positive	Major Positive	Major Positive	Major Positive	Major Positive
Score	7	7	7	7	7	7	7	7

Option	1E	1E1	1F	1F1	1G
Impact Description	Major Positive	Major Positive	Major Positive	Major Positive	Major Positive
Score	7	7	7	7	7

9.6.4 Other Government Policy Integration

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 N15 / N13 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. All Section 1 options would also improve connectivity to ports and airports in across Ireland.

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

Table 9-27 Summary of Other Government Policy Assessment Section 1

Option	1A	1A1	1B	1B1	1C	1C1	1D	1D1
Impact Description	Major Positive	Major Positive	Major Positive	Major Positive	Major Positive	Major Positive	Major Positive	Major Positive
Score	7	7	7	7	7	7	7	7

Option	1E	1E1	1F	1F1	1G
Impact Description	Major Positive	Major Positive	Major Positive	Major Positive	Major Positive
Score	7	7	7	7	7

9.7 Physical Activity

This assessment has been conducted in accordance with the Project Appraisal Guidelines Unit 13: Walking and Cycling Facilities. The appraisal is based on any new pedestrian/cyclist facilities or linkages to existing facilities being provided as part of the scheme. A copy of the report is included in **Appendix C1.2**. The appraisal considers the following sub-criteria:

- Health benefits,
- Absenteeism benefits,
- Journey ambience benefits,
- Changes in the number of incidents or journey times,
- Other possible impacts.

In terms of promoting health benefits, dedicated shared pedestrian / cycling facilities are provided as part of the scheme.

All options provide similar benefits in terms of absenteeism, journey ambience and journey times. All options, except Option 1G, have significant negative impacts on at least one area of woodland which has a negative impact on the amenity value of the woodlands affected. As a result, all Options except Option 1G receive the same impact score of 6.

Option 1G, however, is the only option whose corridor can facilitate an alignment that does not have a significant impact on any woodland amenity, and therefore receives the highest score of 7 for physical activity. This is the differentiating factor between all options. The summary scoring matrix is presented below in **Table 9-28.**

Table 9-28 Summary of Physical Activity Assessment Section 1

Option	1A	1A1	1B	1B1	1C	1C1	1D	1D1
Impact description	Moderately Positive	Moderately Positive	Moderately Positive	Moderately Positive	Moderately Positive	Moderately Positive	Moderately Positive	Moderately Positive
Score	6	6	6	6	6	6	6	6

Option	1E	1E1	1F	1F1	1G
Impact description	Moderately Positive	Moderately Positive	Moderately Positive	Moderately Positive	Major Positive
Score	6	6	6	6	7

9.8 Project Appraisal Matrix (Multi-criteria Analysis)

The appraisal of each option for each section was undertaken as set out in Section 7.3. An overall multi-criteria project appraisal matrix for Section 1 combines the above assessments. This is presented below in **Table 9-29** where the impact scores under each sub-criterion are summed to give a total impact score for each option, where the higher the score, the better the option performs.

This matrix shows that Option 1G achieved the top overall score of 110, followed by Options 1B1, 1D1 and Option 1E1 with a score of 107, with all other options scoring lower. It must be emphasised that summing of impact scores does not account for the relative importance of each sub criteria or the individual impacts or preferences, but provides and initial comparison between the overall, non-weighted performance of each option. As such, Option 1G emerges to the front as an option performing well, on balance, considering all impacts.

A secondary appraisal matrix showing the preferences of each option across the sub-criterion was also prepared to ensure consideration of other factors that may inform a decision on the emerging preferred option. This matrix is based on expert opinion and was used as the primary tool for the choice of option. **Table 9-30** provides the preferences for the different options, highlighting the preferred (coloured green). The table demonstrates that Option 1G also has the highest number of preferences with no ‘least preferred’ across all the criteria. This supports further the choice of Option 1G as the Emerging Preferred Option.

Section 1 options were assessed under each Project Appraisal criteria, and upon review of the Project Appraisal matrices prepared, it is evident that Option 1G is preferred in terms of impact score and preferences. As such, Option 1G was identified as the emerging preferred option and presented at the public consultation days held during March 2019.

Table 9-29 Stage 2 Multi-Criteria Project Appraisal Matrix Section 1

Option	1A	1A1	1B	1B1	1C	1C1	1D	1D1	1E	1E1	1F	1F1	1G
Environment	**Orange**		**Pink**		**Purple**		**Red**		**Green**		**Blue**		**Yellow**
Air Quality & Climate	2	2	2	3	2	2	3	3	3	3	3	3	3
Noise	4	3	5	4	4	3	5	5	5	5	4	4	5
Landscape & Visual	1	1	1	1	1	1	1	1	1	1	1	1	1
Biodiversity	1	1	2	2	1	1	1	1	1	1	1	1	1
Waste	2	2	2	2	2	2	1	4	1	4	2	3	4
Soils, Geology and Hydrogeology	4	4	3	3	4	4	4	4	4	4	3	3	3
Hydrology	2	2	3	3	3	2	2	2	2	2	2	2	2
Cultural Heritage	2	2	2	2	2	2	1	1	1	1	2	2	2
Material Assets - Agricultural	2	2	2	2	2	2	2	2	2	2	2	2	2
Material Assets - Non-agricultural	3	3	3	3	3	3	3	3	3	3	3	3	3
Environment Sub-Total	**23**	**22**	**25**	**25**	**24**	**22**	**23**	**26**	**23**	**26**	**23**	**24**	**26**
Safety													
Safety and Security of Road Users	6	6	6	6	6	6	6	6	6	6	6	6	6
Collision Reduction	6	6	6	6	6	6	5	5	5	5	5	5	6
Road Safety Audit (Stage F)	6	5	6	6	6	5	6	6	6	6	5	5	7
Road Safety Impact Assessment	6	6	6	7	6	7	6	6	6	6	6	6	7
Safety Sub-Total	**24**	**23**	**24**	**25**	**24**	**24**	**23**	**23**	**23**	**23**	**22**	**22**	**26**
Physical Activity													
Physical Activity	6	6	6	6	6	6	6	6	6	6	6	6	6
Physical Activity Sub-Total	**6**	**6**	**6**	**6**	**6**	**6**	**6**	**6**	**6**	**6**	**6**	**6**	**6**
Economy													
Transport Efficiency and Effectiveness	7	7	7	7	7	7	7	7	7	7	7	7	7
Wider Economic Impacts	5	5	5	5	5	5	5	5	5	5	5	5	5
Funding Impacts	5	5	5	5	5	5	5	5	5	5	5	5	5
Economy Sub-Total	**17**	**17**	**17**	**17**	**17**	**17**	**17**	**17**	**17**	**17**	**17**	**17**	**17**
Accessibility and Social Inclusion													
Deprived Geographical Areas	4	4	4	4	4	4	4	4	4	4	4	4	4
Vulnerable Groups	4	4	5	5	4	4	5	5	5	5	5	5	5
Accessibility and Social Inclusion Sub-Total	**8**	**8**	**9**	**9**	**8**	**8**	**9**	**9**	**9**	**9**	**9**	**9**	**9**
Integration													
Transport Integration	6	6	6	6	6	6	6	6	6	6	6	6	6
Land use Integration	5	5	5	5	5	5	6	6	6	6	6	6	6
Geographical Integration	7	7	7	7	7	7	7	7	7	7	7	7	7
Other Government Policy Integration	7	7	7	7	7	7	7	7	7	7	7	7	7
Integration Sub-Total	**25**	**25**	**25**	**25**	**25**	**25**	**26**	**26**	**26**	**26**	**26**	**26**	**26**
Total Impact Scores	**103**	**101**	**106**	**107**	**104**	**102**	**104**	**107**	**104**	**107**	**103**	**104**	**110**

Table 9-30 Stage 2 Preference Summary Section 1

Option	1A	1A1	1B	1B1	1C	1C1	1D	1D1	1E	1E1	1F	1F1	1G
Environment													
Air Quality & Climate	Least Preferred	Intermediate	Intermediate	Preferred	Intermediate	Intermediate	Preferred	Preferred	Preferred	Preferred	Preferred	Preferred	Preferred
Noise	Intermediate	Least Preferred	Preferred	Intermediate	Intermediate	Least Preferred	Preferred	Preferred	Preferred	Preferred	Intermediate	Intermediate	Preferred
Landscape & Visual	Least Preferred	Least Preferred	Least Preferred	Least Preferred	Least Preferred	Least Preferred	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Preferred
Biodiversity	Least Preferred	Intermediate	Intermediate	Preferred	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate
Waste	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Least Preferred	Preferred	Least Preferred	Preferred	Intermediate	Intermediate	Preferred
Soils, Geology and Hydrogeology	Preferred	Preferred	Least Preferred	Least Preferred	Preferred	Preferred	Preferred	Preferred	Preferred	Preferred	Intermediate	Intermediate	Intermediate
Hydrology	Intermediate	Intermediate	Preferred	Preferred	Preferred	Intermediate	Intermediate	Least Preferred	Intermediate	Least Preferred	Intermediate	Intermediate	Intermediate
Cultural Heritage	Intermediate	Intermediate	Intermediate	Intermediate	Preferred	Preferred	Least Preferred	Least Preferred	Least Preferred	Least Preferred	Intermediate	Intermediate	Intermediate
Material Assets - Agricultural	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Preferred	Intermediate	Intermediate	Intermediate	Intermediate
Material Assets - Non-agricultural	Preferred	Preferred	Least Preferred	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate
Safety													
Safety and Security of Road Users	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate
Collision Reduction	Preferred	Preferred	Preferred	Preferred	Preferred	Preferred	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Preferred
Road Safety Audit (Stage F)	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Preferred
Road Safety Impact Assessment	Intermediate	Intermediate	Intermediate	Preferred	Intermediate	Preferred	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Preferred
Physical Activity													
Physical Activity	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Preferred
Economy													
Transport Efficiency and Effectiveness	Least Preferred	Least Preferred	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Preferred	Preferred	Intermediate	Intermediate	Intermediate
Wider Economic Impacts	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate
Funding Impacts	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate
Accessibility and Social Inclusion													
Deprived Geographical Areas	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate
Vulnerable Groups	Least Preferred	Least Preferred	Intermediate	Intermediate	Least Preferred	Least Preferred	Preferred	Preferred	Preferred	Preferred	Preferred	Preferred	Preferred
Integration													
Transport Integration	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Preferred	Preferred	Preferred	Preferred	Preferred	Preferred	Preferred
Land use Integration	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Preferred	Preferred	Preferred	Preferred	Preferred	Preferred	Preferred
Geographical Integration	Preferred	Preferred	Preferred	Preferred	Preferred	Preferred	Preferred	Preferred	Preferred	Preferred	Preferred	Preferred	Preferred
Other Government Policy Integration	Preferred	Preferred	Preferred	Preferred	Preferred	Preferred	Preferred	Preferred	Preferred	Preferred	Preferred	Preferred	Preferred

9.9 Recommendation

Having completed the assessment of Stage 2 Project Appraisal for Section 1 for the TEN-T Priority Route Improvement Project, Donegal, the Preferred Option has been identified as the Option 1G, which will be taken forward to Stage 3 of the Phase 2 Option Selection process.

9.10 Ballybofey Link Road Options Assessment

9.10.1 Background

During the Stage 2 assessment of options, a local link for Ballybofey was included equally for each option that provided connectivity from the proposed junction on the mainline at Cappry to the existing road network. For Option 1G, this local connection took the form of two separate links from the proposed Ballybofey junction, the first connecting with the R252 in the vicinity of Logue's Bridge and the second connecting to the existing N15 in the vicinity of Woodland Road / Aishling Court. Both the mainline and associated links were subject to a Stage 2 assessment in accordance the Project Appraisal Guidelines.

The Stage 2 Option Selection process for the mainline concluded by identifying Option 1G as being preferred and being taken forward to Stage 3 of the option selection process. Following this, further detailed consideration was given to the optimisation of the Ballybofey Link Road, described above, to explore alternative alignments and junction arrangements for this link.

9.10.2 Further Development of Ballybofey Link Road

Nineteen preliminary options for the Ballybofey Link Road were identified and underwent a Stage 1 assessment, from which options were shortlisted. Options for the Ballybofey Link Road were presented to the public at a public consultation held on 14th March 2019 at Jacksons Hotel in Ballybofey between 2pm and 8pm which attracted 252 attendees. Plans showing the Ballybofey Link Road Options that underwent the Stage 1 Assessment are included in **Appendix C1.5.**

Feedback was received from the public from the Ballybofey Link Road public consultation and incorporated as further refinement to the alignments of five shortlisted options that then underwent a Stage 2 Assessment. The Option Selection Report (Non-environment) for the Ballybofey Link Road is presented in **Appendix C1.5** and Option Selection Report (Environment) is presented in **Appendix D1.11.** The summary of these assessments is presented below, and plans showing the Ballybofey Link Road Options that underwent the Stage 2 Assessments are provided within the report contained in **Appendix C1.5**.

9.10.3 Project Appraisal Matrix (Multi-Criteria Analysis) for Link Road

The appraisal of each Ballybofey link road option was undertaken as set out in Section 7.3. An overall multi-criteria project appraisal matrix for Section 1 combines the above assessments. This is presented in **Table 9-31** where the impact scores under each sub-criterion are summed to give a total impact score for each link road option, where the higher the score, the better the option performs. **Table 9-32** presents the option preferences for the same criteria. This matrix is based on expert opinion and was used as the primary tool for the choice of option for the Link Road.

Table 9-31 Stage 2 Multi-Criteria Project Appraisal Matrix Section 1– Ballybofey Link Options

Environment	Link A	Link B	Link C	Link D	Link E
Air Quality & Climate	3	3	2	2	3
Noise	4	3	3	3	3
Landscape & Visual	2	1	1	1	1
Terrestrial Biodiversity	2	1	1	2	2
Aquatic Biodiversity	3	2	2	2	2
Soils, Geology and Hydrogeology	4	4	4	4	4
Hydrology	3	3	2	2	3
Cultural Heritage	3	3	3	3	3
Material Assets - Agricultural	2	2	2	3	2
Material Assets - Non-agricultural	3	3	2	2	3
Environment Sub-Total	**29**	**25**	**22**	**24**	**26**
Safety	**A**	**B**	**C**	**D**	**E**
Safety and Security of Road Users	6	6	6	6	6
Collision Reduction	4	5	5	5	6
Road Safety Audit (Stage F)	5	6	6	6	6
Road Safety Impact Assessment	5	6	5	5	6
Safety Sub-Total	**20**	**23**	**22**	**22**	**25**
Physical Activity	**A**	**B**	**C**	**D**	**E**
Physical Activity	5	5	5	5	5
Physical Activity Sub-Total	**5**	**5**	**5**	**5**	**5**
Economy	**A**	**B**	**C**	**D**	**E**
Transport Efficiency and Effectiveness	7	7	7	7	7
Wider Economic Impacts	5	6	6	6	7
Funding Impacts	5	5	5	5	5
Economy Sub-Total	**17**	**18**	**18**	**18**	**19**
Accessibility and Social Inclusion	**A**	**B**	**C**	**D**	**E**
Deprived Geographical Areas	4	4	4	4	4
Vulnerable Groups	5	5	5	5	5
Accessibility and Social Inclusion Sub-Total	**9**	**9**	**9**	**9**	**9**
Integration	**A**	**B**	**C**	**D**	**E**
Transport Integration	5	5	5	5	5
Land use Integration	4	6	6	6	6
Geographical Integration	6	6	6	6	6
Other Government Policy Integration	6	6	6	6	6
Integration Sub-Total	**21**	**23**	**23**	**23**	**23**
Total Impact Scores	**101**	**103**	**99**	**101**	**107**

Table 9-32 Stage 2 Preference Summary Section 1 – Ballybofey Link Options

Environment	Link A	Link B	Link C	Link D	Link E
Air Quality & Climate	Preferred	Preferred	Intermediate	Intermediate	Preferred
Noise	Preferred	Intermediate	Intermediate	Least Preferred	Intermediate
Landscape & Visual	Preferred	Intermediate	Least Preferred	Intermediate	Least Preferred
Terrestrial Biodiversity	Intermediate	Intermediate	Least Preferred	Intermediate	Preferred
Aquatic Biodiversity	Preferred	Intermediate	Least Preferred	Intermediate	Intermediate
Soils, Geology and Hydrogeology	Preferred	Preferred	Preferred	Preferred	Preferred
Hydrology	Intermediate	Intermediate	Least Preferred	Intermediate	Preferred
Cultural Heritage	Intermediate	Intermediate	Intermediate	Preferred	Intermediate
Material Assets - Agricultural	Intermediate	Intermediate	Intermediate	Preferred	Intermediate
Material Assets - Non-agricultural	Preferred	Intermediate	Least Preferred	Least Preferred	Intermediate
Safety	**A**	**B**	**C**	**D**	**E**
Safety and Security of Road Users	**Intermediate**	**Intermediate**	**Intermediate**	**Intermediate**	**Intermediate**
Collision Reduction	**Least Preferred**	**Intermediate**	**Intermediate**	**Intermediate**	**Preferred**
Road Safety Audit (Stage F)	**Least Preferred**	**Intermediate**	**Intermediate**	**Intermediate**	**Preferred**
Road Safety Impact Assessment	**Intermediate**	**Preferred**	**Intermediate**	**Intermediate**	**Preferred**
Physical Activity	**A**	**B**	**C**	**D**	**E**
Physical Activity	**Intermediate**	**Intermediate**	**Intermediate**	**Intermediate**	**Intermediate**
Economy	**A**	**B**	**C**	**D**	**E**
Transport Efficiency and Effectiveness	**Intermediate**	**Intermediate**	**Intermediate**	**Intermediate**	**Preferred**
Wider Economic Impacts	**Least Preferred**	**Intermediate**	**Intermediate**	**Intermediate**	**Preferred**
Funding Impacts	**Intermediate**	**Intermediate**	**Intermediate**	**Intermediate**	**Intermediate**
Accessibility and Social Inclusion	**A**	**B**	**C**	**D**	**E**
Deprived Geographical Areas	**Intermediate**	**Intermediate**	**Intermediate**	**Intermediate**	**Intermediate**
Vulnerable Groups	**Intermediate**	**Intermediate**	**Intermediate**	**Intermediate**	**Preferred**
Integration	**A**	**B**	**C**	**D**	**E**
Transport Integration	**Intermediate**	**Intermediate**	**Intermediate**	**Intermediate**	**Intermediate**
Land use Integration	**Least Preferred**	**Preferred**	**Preferred**	**Preferred**	**Preferred**
Geographical Integration	**Intermediate**	**Intermediate**	**Intermediate**	**Intermediate**	**Intermediate**
Other Government Policy Integration	**Intermediate**	**Intermediate**	**Intermediate**	**Intermediate**	**Intermediate**

9.10.4 Conclusion of Ballybofey Link Road Options Assessment

From Environmental assessments (**Table 9-31**), Option A scores the highest amongst all the Ballybofey link road options. Options E, B and D equally score slightly lower and Option C scores the lowest. In terms of preferences (**Table 9-32**), Option A is preferred, with Option E having slightly lower preference, Options B and D having lower preference and Option C being the lowest preferred.

From Non-Environmental assessments (**Table 9-31**), Option E is the highest scoring option with Options B, C and D being equally slightly lower scoring Options. Option A is the lowest scoring option. Similarly, from **Table 9-32**, Option E has the highest preferences, with Options B, C and D having slightly lower preference and Option A having the lowest preference.

On balance, considering the cumulative impact scores and preferences for environmental assessment and non-environmental assessment of the Ballybofey Link Roads, Link Road **Option E** is the preferred option with the highest cumulative score and the highest number of preferences.

10 STAGE 3 PREFERRED OPTION

A Project Appraisal Balance Sheet has been prepared for the TEN-T Priority Route Improvement Project, Donegal, based on the preferred Option 1G with Ballybofey Link Road Option E and included within the overall PABS for the entire project. Refer to Chapter 17 for details.

SECTION 2: N56/N13 LETTERKENNY TO MANORCUNNINGHAM

11 STAGE 1 PRELIMINARY OPTIONS ASSESSMENT

11.1 Do Nothing and Do Minimum Options

For Section 2 a total of eleven mainline options were considered as part of the Stage 1 of Phase 2 Option Selection process. Of the eleven options identified, one was a Do Nothing option and one was a Do Minimum option. These options meant maintaining the existing N13 and N56 routes with no improvements in the case of the Do Nothing option and with the inclusion of committed schemes and online improvements (such as the replacement of roundabouts with traffic signalised junctions, carriageway widening) for the Do Minimum Scheme (as defined by NRA PMG's 2010). In considering these options, the following observations were made on the existing network:

The existing N13 from the Dry Arch Roundabout south approximately 2km (thru Lurgybrack) includes multiple at-grade direct accesses, a 7% vertical gradient for over 1km (up to 8.7%) and a climbing lane. St. Patricks National School is located alongside the southbound carriageway with a drop-off lane running parallel to the N13 carriageway. The proximity and the geometry of direct accesses on both sides, cross-overs at the climbing lanes and the excessive vertical gradient are all non-compliances with national road design standards. No vulnerable road user facilities are in place and pedestrian fatalities have been recorded along this road segment. The design year (2043 AADT) traffic flows along this section of the N13 south of the Dry Arch Roundabout without improvements taking place is predicted to be 19,500 indicating a Type 2 Dual carriageway (or greater) is required in accordance with TII DMRB standards.

The existing N13 from the Dry Arch Roundabout east approximately 4.3km (thru Dromore and Trimragh) includes at-grade direct accesses and cross-overs of dual carriageway. Several non-compliances with national road design standards exist and fatal and cluster collisions have also occurred along this road segment. The design year (2043 AADT) traffic flow on the N13 east of Dry Arch Roundabout (towards Manorcunningham) without improvements taking place is predicted to be 26,600 indicating a Type 1 Dual carriageway is required in accordance with TII DMRB standards.

The existing N56 (Four Lane Road) from the Dry Arch roundabout west to the Polestar roundabout is semi-urban and is bounded by numerous commercial premises whose direct accesses are onto the N56. This section of the N56 is the primary access route into Letterkenny town and has been blocked on several occasions in the past due to collisions and traffic congestion. Donegal County Council is committed to implementing safety improvements on this road segment however these improvements will not address the capacity issues on this primary access. Traffic from Sligo, Dublin, Belfast and Derry travelling to Letterkenny and other destinations in northwest Donegal use this primary access route. The design year (2043 AADT) traffic flow for the N56 Four Lane Road without improvements is predicted to be 35,300 indicating that a Type 1 Dual carriageway is required in accordance with TII DMRB standards.

An objective of this project is to improve transportation links, connectivity and reliability along key strategic routes and to/from key urban nodes, integrating with national regional and local policy. The retention of the existing road network, with on-line improvements and currently committed schemes, fails to meet this objective.

Sections of the existing N13 network included substantial cross-sectional width and geometry that required careful consideration. Additional considerations were given to the provision of improvements at existing junctions (such as the replacement of roundabouts with traffic signalised junctions) to improve traffic management on the existing road network. However, the existing N56 traffic volumes, adjacent business/residences, obstacles to widening, its 'lifeline route' status and constructability impacts in combination make any widening of the existing N56 Four Lane Road unviable and impractical. Like other options, the N56 is in proximity to the Swilly SAC-SPA and would require a widened/new bridge crossing. For the existing N56 (Four Lane Road) segment between the Dry Arch and Polestar roundabouts it was

concluded that new link options that provide alternate access and improve network resilience to Letterkenny must be assessed.

The Do Nothing option was retained until after the Stage 1 Route Selection Public Consultation however the Stage 1 Preliminary Options Assessment ultimately concluded that Do Nothing and Do Minimum options were not viable solutions and these options were eliminated.

11.2 Preliminary Options

Following elimination of the Do Nothing and Do Minimum options nine mainline options were combined with various new link options to Letterkenny. Mainline options that did not provide a new link to Letterkenny were not assessed as these did not present a viable solution for the TEN-T project. The various combinations of mainline and link options are shown on Drawings in **Appendix E2**.

The nine mainline options start along the existing N13, south of the Dry Arch Roundabout. Seven of these options terminate at the existing N13/N14 Pluck Roundabout south of Manorcunningham and two options terminate south of the existing N13/N14 Pluck Roundabout where they connect to Section 3 options.

All nine mainline options included varying levels of improvement and can broadly be described as falling into one of three categories:

1) Online options – using the existing N13 route corridor
2) Offline options – located in greenfield off the existing N13 route corridor
3) Online and Offline options – a combination of the online and offline options above

Seven new link options that provide alternate access to Letterkenny and points in northwest Donegal were identified for Stage 1 assessment. Six link options provide a new crossing of the River Swilly SAC/SPA and connect to the existing N56/R245 junction, approximately 1km northeast of Polestar roundabout and south of the N56 Kiltoy roundabout. One link option connects to the existing Polestar roundabout.

The options considered for Stage 1 of Phase 2 are summarised in **Table 11-1.** The options are illustrated in the drawings contained in **Appendix E2**.

Table 11-1 Section 2 Stage 1 Options Selection Assessment

Option	Description
Option 2.1 (Orange)	Option 2.1 is predominantly an online option. This option uses the existing N13 commencing approximately 2km south of Dry Arch Roundabout near the townland of Listellian. A new junction is proposed online to allow for a change in road type and the closure of multiple direct accesses in the vicinity. The route continues northbound and online to the existing Dry Arch Roundabout where a junction facilitates traffic splitting: (i) West along the existing N56 to the existing Polestar roundabout, (ii) North on a new link to the N56/R245 junction providing access to north Letterkenny and northwest Donegal, and (iii) East along the existing N13 dual carriageway. The new link to the N56/R245 junction starts at the Dry Arch roundabout and passes through commercial lands heading north to a new junction. From this junction the new link turns north west heading towards the existing N56/R245 junction; a new bridge crossing of the River Swilly (approximately 100m wide) is proposed. The link terminates at the existing N56/R245. Travelling east along the existing N13 dual carriageway from the Dry Arch roundabout the route remains online to where it meets the N13/N14 routes at the existing Pluck roundabout, near Manorcunningham. Approximately 0.5km east of Dry Arch Roundabout a new junction allows westbound traffic to divert to the new link serving the existing N56/R245 junction. Midway along this route section between the Dry Arch and Pluck roundabouts a new grade separated junction is proposed near Trimragh which will facilitate local access onto the N13, crossing of the N13 and existing N13 access closures.

Option	Description
	This proposed route is online, which means existing sub-standard carriageway sections must be improved for this to be a viable option. Existing accesses along the N13 will be closed with alternate access options provided.
Options 2.2 - 2.7 (Purple)	Options 2.2 – 2.7 have an identical realignment of the N13 from approximately 2km south of Dry Arch Roundabout, near the townland of Listellian to the eastern tie-in at the existing N13/N14 Pluck roundabout, near Manorcunningham. A new junction is proposed approximately 2km south of Dry Arch Roundabout to allow for a change in road type and the closure of multiple direct accesses in the vicinity. The N13 is realigned initially to the northwest however the option quickly sweeps back to the northeast crossing over the existing N13 (skewed), south of the existing St Patrick's School travelling downhill, through Dromore, where it connects back to the N13 approximately 600m east of Dry Arch roundabout. From this point the option travels east along the existing dual carriageway to the N13/N14 junction. All options differ in their proposed link option to Letterkenny. Option 2.2 has no link provision and therefore fails to meet project objectives and must be eliminated. Options 2.3 - 2.7 include alternate link options connecting to Letterkenny. Each alternate requires a new crossing of the River Swilly connecting to the existing N56/R245 junction servicing north Letterkenny and northwest Donegal.
Option 2.8	This reference is to the 'Do Nothing' option eliminated.
Option 2.9 – 2.12 (Pink)	Options 2.9 – 2.12 are N13 online improvement options. These options propose to use the existing N13 corridor from approximately 2km south of Dry Arch Roundabout, near the townland of Listellian, north to the Dry Arch roundabout, at Bonagee, and then east to the tie-in termination point at the existing N13/N14 junction, near Manorcunningham. Existing and new proposed junctions will require assessed to facilitate change in road type, the closure of multiple direct accesses in the vicinity and the link connections across the River Swilly connecting to the existing N56/R245 junction, servicing north Letterkenny and points in northwest Donegal. The existing carriageway has sub-standard sections that must be improved for this to be a viable option. It is considered that direct local accesses onto the existing network will be closed for safety and alternate access points provided. All options differ in their proposed link option to Letterkenny. Option 2.9 has no link provision and therefore fails to meet project objectives and is eliminated. Options 2.10 - 2.12 include alternate link options connecting to Letterkenny. Each alternate requires a new crossing of the River Swilly connecting to the existing N56/R245 junction servicing north Letterkenny and northwest Donegal.
Option 2.13 – 2.17 (Red)	Options 2.13 – 2.17 have an identical realignment of the N13 from approximately 2km south of Dry Arch Roundabout, near the townland of Listellian to the eastern tie-in at the existing N13/N14 Pluck roundabout, near Manorcunningham. A new junction is proposed approximately 2km south of Dry Arch Roundabout to allow for a change in road type and the closure of multiple direct accesses in the vicinity. The N13 is realigned to the northeast behind the existing St Patrick's school travelling downhill, through Dromore, where it connects back to the N13 approximately 600m east of Dry Arch roundabout. From this point the option travels east along the existing dual carriageway to the N13/N14 junction. All options differ in their proposed link option to Letterkenny. Option 2.13 has no link provision and therefore fails to meet project objectives and is eliminated. Options 2.14 - 2.17 include alternate link options connecting to Letterkenny. Each alternate requires a new crossing of the River Swilly connecting to the existing N56/R245 junction servicing north Letterkenny and northwest Donegal.
Option 2.18 – 2.21 (Green)	Options 2.18 – 2.21 have an identical realignment of the N13 from approximately 2km south of Dry Arch Roundabout, near the townland of Listellian to the eastern tie-in at the existing N13/N14 Pluck roundabout, near Manorcunningham. A new junction is proposed approximately 2km south of Dry Arch Roundabout to allow for a change in road type and the closure of multiple direct accesses in the vicinity. The N13 is realigned to the northeast behind the existing St Patrick's school travelling downhill, turning due east in Dromore travelling through Magheraboy and Rossbrackan terminating with a new connection at the existing N13/N14 junction. All options differ in their proposed link option to Letterkenny. Option 2.18 has no link provision and therefore fails to meet project objectives and is eliminated. Options 2.19 - 2.21 include alternate link options connecting to Letterkenny. Each alternate requires a new crossing of the River Swilly connecting to the existing N56/R245 junction servicing north Letterkenny and northwest Donegal.
Option 2.22 – 2.26 (Blue A)	Options 2.22 – 2.26 have an identical realignment of the N13 from approximately 2km south of Dry Arch Roundabout, near the townland of Listellian to the eastern tie-in at the existing N13/N14 Pluck roundabout, near Manorcunningham. A new junction is proposed approximately 2km south of Dry Arch Roundabout to allow for a change in road type and the closure of multiple direct accesses in the vicinity. The N13 is realigned travelling easterly through Lurgy and Aughlihard terminating with a new connection at the existing N13/N14 junction. All options differ in their proposed link option to Letterkenny. Option 2.22 has no link provision and therefore fails to meet project objectives and is eliminated. Options 2.23 – 2.25 include link provisions that offer an alternative to/from Letterkenny to the existing N56 Four lane Road. Each provides a new crossing of the River Swilly and connects to the existing N56/R245 junction servicing north Letterkenny and northwest Donegal. Option 2.26 has a link provision that connects from the realigned N13 option back to the existing N13 north of St. Patrick's school

Option	Description
	however this option has no link provision across the River Swilly and therefore fails to meet project objectives and is eliminated.
Option 2.27 – 2.31 (Blue B)	Options 2.27 – 2.31 have an identical realignment of the N13 from approximately 2km south of Dry Arch Roundabout at Lurgybrack to a new proposed N14 connection at Corkey with the N14 Manorcunningham to Lifford/Strabane/A5 Link scheme (Section 3 of this project). The options commence with a realignment of the N13 northeast behind the existing St Patrick's school where the option turns east travelling through Lurgy and Aughlihard and terminating in Corkey where a new connection is proposed with the adjacent scheme and the existing N13/N14 junction. All options differ in their proposed link option to Letterkenny. Option 2.27 has no link provision and therefore fails to meet project objectives and is eliminated. Options 2.28 – 2.30 include link provisions that offer an alternative to/from Letterkenny to the existing N56 Four lane Road. Each provides a new crossing of the River Swilly and connects to the existing N56/R245 junction servicing north Letterkenny and all points in north Donegal. Option 2.31 has a link that connects from the realigned N13 option back to the existing N13 north of St. Patrick's school however this option has no link provision across the River Swilly and therefore fails to meet project objectives and is eliminated.
Option 2.32 – 2.35 (Yellow A)	Options 2.32 – 2.35 have an identical realignment of the N13 from approximately 1km south of Dry Arch Roundabout at Lurgybrack east to the eastern tie-in connection at the N13/N14 junction, near Manorcunningham. The options commence with a realignment of the N13 easterly towards Aghlehard terminating with a new connection at the existing N13/N14 junction. All options differ in their proposed link option to Letterkenny. Option 2.32 has no link provision and therefore fails to meet project objectives and is eliminated. Options 2.33 and 2.34 include link provisions that offer an alternative to/from Letterkenny to the existing N56 Four lane Road. Each of these link options provides a new crossing of the River Swilly connecting to the existing N56/R245 junction servicing north Letterkenny and northwest Donegal. Option 2.35 crosses over the existing local road L1114 and the river Swilly connecting to the existing Polestar roundabout.
Option 2.36 – 2.39 (Yellow B)	Options 2.36 – 2.39 have an identical realignment of the N13 from approximately 1km south of Dry Arch Roundabout at Lurgybrack east to a new proposed N14 connection at Corkey with the N14 Manorcunningham to Lifford/Strabane/A5 Link scheme (Section 3 of this project). The options commence with a realignment of the N13 easterly towards Aghlehard terminating in Corkey where a new connection is proposed with the adjacent scheme and the existing N13/N14 junction. All options differ in their proposed link option to Letterkenny. Option 2.36 has no link provision and therefore fails to meet project objectives and is eliminated. Options 2.37 and 2.38 include link provisions that offer an alternative to/from Letterkenny to the existing N56 Four lane Road. Each of these link options provides a new crossing of the River Swilly connecting to the existing N56/R245 junction servicing north Letterkenny and northwest Donegal. Option 2.39 crosses over the existing local road L1114 and the river Swilly connecting to the existing Polestar roundabout.

11.3 Public Consultation Feedback

A second series of public consultations was held in April and May 2018, the Stage 1 options were presented alongside the shortlisted options.

Feedback included matters relating to land severance, flooding, traffic congestion and safety. There was strong support for a new proposed link over the River Swilly connecting the N13 to the N56. Concerns were raised on traffic congestion and safety at St. Patrick's School during the morning and afternoon drop-off and pick-ups. The inclusion of the 'Southern Relief Road Scheme' to improve traffic congestion in Letterkenny was also referred to.

11.4 Elimination of Options

From the nine mainline options and seven link options a total of 28no. varying and in-combination options were identified for more detailed assessment.

These 28no. options were assessed against engineering, environmental and economic criteria. The Option Selection – Stage 1 Assessment for Section 2 is presented in the form of a matrix in **Appendix G2**, colour coded as LOW PREFERENCE (red), MEDIUM PREFERENCE (orange) or HIGH PREFERENCE (green) in accordance with the PMGs. The matrix presents the assessments undertaken for each criterion.

During the assessment process poorer performing options under the assessment criteria were given lower preferences. Options were then subsequently eliminated as part of the Stage 1 assessment. Some of the options eliminated had a few common poor performing criteria such as:

- Road Alignment Constraints; where new options were compromised by existing topography
- More involved works alongside and within SAC/SPA/NHA designated lands
- Community impacts (schools, sports grounds, churches, etc.)

However, options were not eliminated only because one criterion within the assessment scored poorly. For example, all Letterkenny link options cross the Swilly SAC/SPA/NHA and over poor ground and floodplain. Where more than one criterion performed worse and it became clear that alternate options available perform better, the poorer performing options were eliminated.

The Option Selection – Stage 1 Assessment for Section 2 is presented in the form of a matrix in **Appendix G2.**

Table 11-2 lists the options eliminated during the Stage 1 process and provides reasons for elimination in each case.

Table 11-2 Eliminated Options following the Stage 1 Assessment

Option Ref.	Description
Options 2.2, 2.3, 2.4 and 2.7	Option 2.2 is eliminated as it does not provide a new link option to Letterkenny. Options 2.3 and 2.4 had longer link lengths, longer crossings of the SAC/SPA/NHA/pNHA and peat/soft lands, greater impacts to the floodplain, more community impacts and higher construction costs. Option 2.7 had a long link length, higher agricultural impacts and construction cost.
Option 2.8	The Do Nothing option was eliminated as retention of the existing road network fails to meet project objectives.
Options 2.9, 2.10 and 2.11	Option 2.9 is eliminated as it does not provide a new link option to Letterkenny. Options 2.10 and 2.11 had longer link lengths, longer crossings of the SAC/SPA/NHA/pNHA and peat/soft lands, greater impacts to the floodplain, more community impacts and higher construction costs.
Options 2.13, 2.14 and 2.15	Option 2.13 is eliminated as it does not provide a new link option to Letterkenny. Options 2.14 and 2.15 had longer link lengths, longer crossings of the SAC/SPA/NHA/pNHA and peat/soft lands, greater impacts to the floodplain, more community impacts and higher construction costs.
Option 2.18 and 2.21	Option 2.18 is eliminated as it does not provide a new link option to Letterkenny. Option 2.21 had greater impacts on air quality, noise and visibility near properties, greater impacts on communities and higher construction costs.
Options 2.22, 2.24, 2.25 and 2.26	Options 2.22 and 2.26 were eliminated as they do not provide a new link option to Letterkenny. Options 2.24 and 2.25 performed poorly due to length of links, number of road crossings, earthworks, landscape and visual, agriculture, length of links in zoned lands and higher costs.
Options 2.27, 2.29, 2.30 and 2.31	Option 2.27 and 2.31 were eliminated as they do not provide a new link option to Letterkenny. Options 2.29 and 2.30 performed poorly due to length of links, number of road crossings, earthworks, greater impacts on residential properties, air quality/noise and agriculture, length of links in zoned lands and higher costs.
Options 2.32, 2.33, 2.34 and 2.35	Option 2.32 is eliminated as it does not provide a new link option to Letterkenny. Options 2.33, 2.34 and 2.35 were eliminated as these options resulted in more significant river crossings, greater earthworks, geometry constraints and higher costs than other options.

Option Ref.	Description
Options 2.36, 2.37, 2.38 and 2.39	Option 2.36 is eliminated as it does not provide a new link option to Letterkenny. Options 2.37, 2.38 and 2.39 were eliminated as these options resulted in more minor road crossings, greater earthworks, geometry constraints and higher costs than other options.

11.5 Stage 1 Recommendation

Having completed the Stage 1 Preliminary Options Assessment for Section 2 of the TEN-T Priority Route Improvement Project, Donegal, a shortlist of feasible options was identified to be taken forward to Stage 2 of the Option Selection process. These shortlisted options are presented in **Table 11-3**. They are also illustrated in the Drawings in **Appendix E2**.

Table 11-3 Shortlisted Options to be taken forward to Stage 2

Option Ref.	Description
Option 2.1 (Orange)	This online option proposes significant re-use of the existing road network. Stage 2 will require further traffic, geometry and safety assessments to facilitate design improvements that enable this option to be viable for continued re-use. This option requires minimal land-take compared to other options and results in lower overall environmental impacts and construction cost. To facilitate splitting the existing traffic and providing relief at the Dry Arch Roundabout this route provides a link option for traffic approaching Letterkenny from the east to divert towards a new crossing of the River Swilly SAC (approximately 100m) connecting to the existing N56/R245 junction heading to north Donegal. Various junction options are to be considered along the route.
Options 2.5 and 2.6 (Purple)	Options 2.5 and 2.6 are essentially the same however each option proposed a slight variation in the proposed link crossing the River Swilly. A combination of online and offline these routes use the existing Type 1 dual carriageway and their offline route section provides an alternative option to the existing 8% gradient along the N13 at Lurgybrack. Both link options include a new crossing of the River Swilly SAC (approximately 100m) connecting to the existing N56/R245 junction heading to north Donegal however the links commence at different locations. Various junction options will be considered along the route.
Option 2.12 (Pink)	Like option 2.1 this online option also proposes significant re-use of the existing road network. Stage 2 will require further traffic, geometry and safety assessments to facilitate design improvements that enable this option to be viable for continued re-use. This option requires minimal land-take compared to other options and results in lower overall environmental impacts and construction cost. To facilitate splitting the existing traffic and providing relief along the N56 Four Lane Road this route provides a new link crossing over the River Swilly SAC (approximately 100m) connecting to the existing N56/R245 junction heading to north Donegal is proposed from the Dry Arch Roundabout. The link utilises a reserved corridor identified in the Letterkenny Development Plan. Various junction options are to be considered along the route.
Options 2.16 and 2.17 (Red)	Like options 2.5 and 2.6 these options are essentially the same however each option proposed a slight variation in the proposed link crossing the River Swilly. A combination of online and offline these routes use the existing Type 1 dual carriageway and their offline route section provides an alternative option to the existing 8% gradient along the N13 at Lurgybrack. Both link options include a new crossing of the River Swilly SAC (approximately 100m) connecting to the existing N56/R245 junction heading to north Donegal however the links commence at different locations. Various junction options will be considered along the route.
Options 2.19 and 2.20 (Green)	Options 2.19 and 2.20 are essentially the same however each option proposed a slight variation in the proposed link crossing the River Swilly. This offline option runs to the southeast of the existing N13. Because this option is new offline it requires significant lands however it is more direct for strategic traffic travelling between Sligo and Derry. Two link options have been taken forward for Stage 2 assessment; both link options include a new crossing of the River Swilly SAC (approximately 100m) connecting to the existing N56/R245 junction heading to north Donegal however the links commence at different locations. Various junction options will be considered along the route.
Option 2.23 and 2.28 (Blue)	Option 2.23 and 2.28 are offline options that run to the southeast of the existing N13 and further south of options 2.19 and 2.20 above. The difference between option 2.23 and 2.28 is the tie-in on the eastern Manorcunningham end. Option 2.23 ties into the existing N13/N14 junction whereas option 2.28 offers an alternative to tie-into an option on the Section 3 – N14 Manorcunningham to Lifford scheme. Because each option is new offline each requires significant lands however each is more direct for strategic traffic travelling between Sligo and Derry. Link options taken forward for Stage 2 assessment on these options include: i. a link option connecting back to the existing N13 north of the existing St. Patrick's school. ii. a new link crossing over the River Swilly SAC (approximately 100m) connecting to the existing N56/R245 junction heading to north Donegal is proposed from the Dry Arch Roundabout. The link utilises a reserved

Option Ref.	Description
	corridor identified in the Letterkenny Development Plan. Various junction options are to be considered along the route.

All shortlisted options in **Table 11-3** are taken forward to Phase 2, Stage 2 Project Appraisal. However, to simplify the description of the options during Stages 2 and 3, the option naming convention used during Stage 1 has been amended as set out in **Table 11-4.**

Table 11-4 Option Names for Stage 2

Stage 1 Option Name	Stage 2 Option Name	
Option 2.1	Orange	2A
Option 2.12	Pink	2B
Options 2.5 and 2.6	Purple	2C
Options 2.16 and 2.17	Red	2D
Options 2.19 and 2.20	Green	2E
Option 2.23 Option 2.28	Blue	2F1
		2F2

12 STAGE 2 PROJECT APPRAISAL

12.1 Shortlisted Options

The shortlisted options for assessment as part of Stage 2 of Phase 2 Options Selection are listed in **Table 12-1.**

Table 12-1 Options for Stage 2 Assessment

Stage 2 Options	
Orange	2A
Pink	2B
Purple	2C
Red	2D
Green	2E
Blue	2F1
	2F2

These seven options were assessed under each of the six project appraisal criteria, and their associated sub-criteria, as previously described in **Section 7.3**.

12.2 Economy

12.2.1 Introduction

The Economic assessment of the options aims to determine and compare the relative economic benefits of each option, drawing conclusions from qualitative and quantitative assessments.

The Economy appraisal was assessed under the following sub-criteria:

- Transport Efficiency and Effectiveness
- Wider Economic Impacts
- Funding Impacts

12.2.2 Transport Efficiency and Effectiveness

Cost estimates were completed for the options considered during Stage 2 in accordance with the TII Cost Management Manual (CMM), using rates calculated to reflect market conditions in 2018. The cost estimates were based on alignment designs for Section 2 Options prepared during the Stage 2 assessment, using 2018 prices. Refer to **Table 12-2** for Stage 2 cost estimates for each of the seven Section 2 options.

Table 12-2 Option Comparison Cost Estimates

Option	2A	2B	2C	2D	2E	2F1	2F2
Options Comparison Estimate (millions €)	€110	€94	€127	€124	€161	€124	€125

Table 12-3 below sets out the Present Value of Costs (PVC), Present Value of Benefits (PVB) and Benefit Cost Ratio. These have been calculated using TUBA and COBALT.

In addition, the economic assessment is based on annualisation of the weekday AM, IP and PM periods for the TUBA assessment, based on data from TII TMU counters. PAG guidance indicates that extrapolation to other periods may be acceptable if justification can be provided. Having reviewed the full years count data, we consider it may be justifiable to expand the TUBA assessment to include the weekend interpeak period. This would add to the PVB for the schemes. In the case of Section 2 it may add in the region of 10% to the benefits. The potential to expand the assessment periods will be considered at the next phase of the project.

Table 12-3 Impact scoring of options in terms of Transport Efficiency and Effectiveness

Option	2A	2B	2C	2D	2E	2F1/2F2
PVC (millions €)	€ 57	€ 49	€ 67	€ 65	€ 85	€ 65
PVB (millions €)	€ 252	€ 132	€ 230	€ 227	€ 206	€ 265
BCR	**4.40**	**2.68**	**3.44**	**3.50**	**2.42**	**4.09**
Impact Description	**Major Positive**	**Major Positive**	**Major Positive**	**Major Positive**	**Major Positive**	**Major Positive**
Impact Score	**7**	**7**	**7**	**7**	**7**	**7**

12.2.3 Wider Economic Impacts

12.2.3.1 Competition in the Market

All options for the N56/N13 Letterkenny to Manorcunningham offer improved linkage between these two areas. There will also be a residual positive effect in terms of commercial attractiveness.

All options are similar in terms of the improvements being made to the alignment, cross-section and future growth capacity, therefore, all routes score the same in this regard, which is slightly positive.

12.2.3.2 Agglomeration

The N13 will reduce travel time between Letterkenny and Manorcunningham. This is a positive outcome in terms of reducing travel time between these areas. Additionally, in conjunction with Section 1 and Section 3, journey times from Donegal to the A5/Northern Ireland will be reduced significantly. This results in improved connectivity to Derry, Belfast and Dublin. All options perform similarly in this regard and deemed slightly positive.

12.2.3.3 Inward Investment

The improved infrastructure and connectivity to other larger economic centres, such as Dublin, Derry and Belfast, is likely to improve the attractiveness of the region and assist in securing inward investment. All options score slightly positive in this regard.

12.2.3.4 Labour Supply

The existing N13 between Letterkenny and Manorcunningham currently provides a link between existing labour markets. All the shortlisted options for N13 are likely to improve the journey time, journey time reliability and the safety of road users travelling between labour markets. It is not anticipated that a significant

change in labour supply will occur because of the options, however it is anticipated that a residual positive effect in terms of labour markets and attractiveness will remain. Therefore, all options score slightly positive in terms of Labour Supply.

12.2.3.5 Urban Regeneration

None of the N13 options will support urban regeneration, due to the rural location of the link. All options score neutral.

Table 12-4 Impact scoring of options in terms of Wider Economic Benefits

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

12.2.4 Funding Impacts

The project aims to improve the strategic transport network in County Donegal. As the project will assist in improving connectivity to a peripheral region in Europe (which may become more isolated as a result of Brexit), then there is the potential opportunity to secure non-exchequer funding through the European Union.

Additionally, there is an opportunity to secure non-exchequer funding through the contract type, by employing a Public Private Partnership (PPP) type contract.

All options have the same opportunity avail of the above funding streams and therefore score slightly positive.

Table 12-5 Impact scoring of options in terms of Funding Impacts

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

12.2.5 Comparison of Options

The economic impacts greatly vary between the different options. The Benefit to Cost Ratios (BCR) range from 2.42 to 4.40 which represent a strong economic performance for all options.

Regarding the Present Value of Benefits (PVB), Options 2F1/2F2 offer the highest return with Option 2B being lowest. Option 2B also offers the lowest Present Value Costs (PVC) making its net effect the lowest overall. Option 2E has the highest PVC and its low PVB gives it the lowest BCR.

All options have very similar impacts in terms of Wider Economic Impacts and Funding Impacts. Therefore, the differentiating factors are based on the Transport Efficiency and Effectiveness sub criteria.

Outstanding Options include 2A for having the highest Benefit to Cost ratio with its benefit some 90% higher than the lowest option and its Cost only 18% higher than the lowest option. The other strong performing options are 2F1/2F2 with the highest PVB and their cost only 34% higher than the lowest option. There are two more options which would follow as preferred options namely Options 2C and 2D. The least preferred options are 2B and 2E for the reason mentioned above.

Options 2A, 2F, 2D, 2C, 2B and 2E are preferred options in that order.

12.3 Safety

The safety assessment considers safety impacts as part of the Project Appraisal (Multi-Criteria Analysis). Refer to **Appendix C2.1.**

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

- Collision reduction
- Security of road users

The assessment also includes the findings of the following two safety reports:

- 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.
- 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.

12.3.1 Collision Reduction

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. All options provided a benefit in terms of collision reduction in the order of €1.4m to €3.3 million.

Table 12-6 Collision Reduction Appraisal

Option	2A	2B	2C	2D	2E	2F1	2F2
Impact Description	Slight Positive	Moderate Positive	Moderate Positive	Moderate Positive	Major Positive	Slight Positive	Slight Positive
Impact Score	5	6	6	6	7	5	5

12.3.2 Security

The security objective is concerned with improving the personal security of travellers and their property. This includes the security of vulnerable road users, such as pedestrians and cyclists. Apart from the proposed new link across the Swilly, which will provide shared pedestrian/cycle facilities, other provisions for vulnerable road users varies between the options.

Options 2A and 2B are online options with infrastructure improvements. However, these options include the excessive vertical gradient on the N13 at Lurgybrack; a gradient that is outside design standards and unsuitable for pedestrians and cyclists. Hence these options are least preferred.

Options 2E, 2F1 and 2F2 are offline options that provide segregated shared pedestrian/cycle facilities. However, because options 2F1 and 2F2 are less connected with Letterkenny and option 2E provides better connection to vulnerable user facilities, option 2E is preferred.

Options 2C and 2D are online / offline options. At the N13 online section pedestrian/cyclists can use the existing L1114 cycle route which connects to the new Trimragh grade separated junction and has direct connection to residential areas along the N13. The offline section provides new segregated shared pedestrian/cycle facilities connecting to populated areas. Both options provide moderately positive benefits for the security of pedestrians and cyclists.

All options with respect to security are outlined in **Table 12-7**.

Table 12-7 Security Appraisal

Option	2A	2B	2C	2D	2E	2F1	2F2
Impact Description	Neutral	Neutral	Moderate Positive	Moderate Positive	Moderate Positive	Slight Positive	Slight Positive
Impact Score	4	4	6	6	6	5	5

12.3.3 Road Safety Audit (Stage F, Part 1)

A Stage F Road Safety Audit Part 1 was undertaken which examined the options to consider all matters that may have an adverse effect on road safety and the perspective of all road users. The Road Safety Audit Report notes that all options represent a significant improvement to the existing arrangement in terms of safety.

The audit has been completed for Section 2 with all options compared and subsequently ranked in preference based on safety considerations. The audit report is provided in **Appendix C2.1**, with a summary included below.

Options 2A and 2B are online options that retain the existing N13 south of the Dry Arch Roundabout, a single carriageway with steep downhill gradient approaching an existing crossroad junction. Options 2A and 2B will not result in safety improvements for vulnerable road users. Option 2A also has new at-grade junctions close to the existing Dry Arch junction. Both options include the closure of direct accesses and the replacement of the at grade junction at Trimnagh with a grade separated junction.

Options 2C and 2D provide a dual-carriageway with shared pedestrian and cycle facilities for the full length of the N13 corridor. The auditor did however raise a concern that these options currently show no changes to the severed section of the existing N13 south of Dry Arch. Options 2C and 2D include new at-grade junctions close to the existing Dry Arch junction. Both options also include the closure of direct accesses and the replacement of the at grade junction at Trimnagh with a grade separated junction.

Options 2E provides a dual-carriageway with shared pedestrian and cycle facilities for the full length of the N13 corridor. The auditor did however raise a concern that this option currently shows no change to the severed section of the existing N13 south of Dry Arch junction. Option 2E includes new at-grade junctions close to the existing Dry Arch junction.

Options 2F1 and 2F2 provide a dual-carriageway with shared pedestrian and cycle facilities for the full length of the N13 corridor. The auditor did however raise a concern that these options currently show no changes to the severed section of the existing N13 south of Dry Arch junction. The options include new at-grade junctions close to the existing Dry Arch junction.

The auditors considered traffic flows, vulnerable road users, existing collision locations, road layout complexity and impacts on the local road network with respect to the Road Safety Audit appraisal outlined in **Table 12-8**.

Table 12-8 Road Safety Audit Appraisal

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

12.3.4 Road Safety Impact Assessment (RSIA)

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 2 as part of this Phase 2 are either neutral or 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 12-9** sets out the impacts of options.

Considering the overall benefits of each option in terms of road safety impact 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.

Table 12-9 Road Safety Impact Assessment Appraisal

	2A	2B	2C	2D	2E	2F1	2F2
Impact Description	Moderate Positive	Moderate Positive	Major Positive	Major Positive	Major Positive	Moderate Positive	Moderate Positive
Impact Score	6	6	7	7	7	6	6

12.4 Environment

The Stage 2 environmental appraisal was carried out considering the following sub-criteria:

- Air Quality and Climate.
- Noise.
- Landscape and Visual.
- Biodiversity (aquatic and terrestrial).
- Waste.
- Soils, Geology, and Hydrogeology.
- Hydrology.
- Architectural Heritage, Archaeological and Cultural Heritage.
- Material assets (Agricultural).
- Material assets (Non-Agricultural).

Each option was appraised by competent experts and preferences determined. A summary of the findings of the competent expert in terms of each sub-criterion is presented in **Section 12.4.1** through **Section 12.4.10**. The completed environmental appraisal matrix is presented in **Section 12.8**.

12.4.1 Air Quality and Climate

The air quality and climate analysis was undertaken by means of a desktop assessment. The assessment focussed on NOx exposure, PM_{10} exposure and the anticipated climate impacts through a calculation on greenhouse gas emissions (GHG). The detailed report on the assessment is included in **Appendix D2.1**.

From the assessment Option 2B (Pink) was identified as the option with the potential to impact on the greatest number of properties (56) relative to each of the other proposed options. Of the other options, 2F1 (Blue) (9) and 2F2 (Blue) (12) will impact the least number of properties relative to 2E (Green) (17), 2D (Red) (35), 2C (Purple) (35) and 2A (Orange) (44). The predicted emissions between the various options show low variation as expected given the similarities in the traffic patterns and option lengths. As a consequence, the air quality scores are largely dominated by the trend in receptor numbers with the link length also having a minor impact on preference.

Climate impacts are largely the same for each option and they all were determined to be moderately negative in impact.

Table 12-10 provides the summary of the overall combined assessment of both air quality and climate. For the three assessment sub-criteria both Option 2F1 (Blue) and 2F2 (Blue) indicate the highest preference score as these options are the shortest and potentially impact on the lowest number of properties. These two options are the preferred options for air quality and climate.

Option 2E (Green) scores high for air quality as a consequence of the low number of properties potentially impacted but scores low for climate given the length. Option 2D (Red) scores similarly in terms of air quality and climate impacts.

Options 2A (Orange), 2B (Pink), and 2C (Purple) impact on the greatest number of properties and are longer than the preferred options and as such, these are the least preferred in terms of both air quality and climate.

Table 12-10 Summary of Air Quality and Climate Appraisal

	2A	2B	2C	2D	2E	2F1	2F2
Impact description	Moderately negative	Moderately negative	Moderately negative	Moderately negative	Moderately negative	Minor or slightly negative	Minor or slightly negative
Impact Score	2	2	2	2	2	3	3

12.4.2 Noise

A comparative assessment of each of the seven options in Section 2 was carried out in relation to noise with reference to key sensitive receptors in proximity to the proposed options. The noise impacts for each of the options are identified so that those impacted by unacceptably high levels of noise can be avoided where feasible as part of the overall option selection process.

A qualitative assessment was carried out where the property impact rating (PIR) was calculated. The PIR is based on the anticipated traffic flows using each option and the number of properties likely to be impacted, banded into distances from the centreline of each option and within a 300m wide corridor. A qualitative assessment was then carried out which considered factors such as noise sensitive receptors and populated areas. The results of the quantitative and qualitative assessments were then combined to provide an overall impact level for each option. The detailed report on the assessment is included in **Appendix D2.2**.

The overall rating shows that the 2F1/2F2 (Blue) options have the lowest noise impact, followed closely by the 2E (Green) option. The 2F1/2F2 (Blue) options relocate the corridor furthest from St. Patricks School and properties along the existing N13/N14 corridor. The 2C (Purple) and 2D (Red) options have received an intermediate preference due to the fact that they remove traffic from the existing N13 and divert around the national school. The 2A (Orange) and 2B (Pink) options are largely online. They do not divert traffic from the national school or other receptors currently located along the existing road network.

A summary of each option and the impacts in terms of noise appraisal is provided in **Table 12-11.**

Table 12-11 Summary of Noise Appraisal

	2A	2B	2C	2D	2E	2F1	2F2
Impact description	Minor or slightly negative	Minor or slightly negative	Not significant/ Neutral	Not significant/ Neutral	Minor or slightly positive	Minor or slightly positive	Minor or slightly positive
Impact Score	3	3	4	4	5	5	5

12.4.3 Landscape and Visual

The landscape and visual impact assessment was undertaken to identify the receptors associated with each option and the likely effects upon them which are then taken into consideration in developing and refining the options. A desktop study was undertaken, as well as site visits to establish an understanding of the landscape and visual context of the proposed options. Landscape and visual impact assessments are assessed as two discrete topics:

- Landscape impact assessment is concerned with the alteration to the physical landscape which can give rise to changes in its character, how it is experienced and the ascribed value of the landscape.
- Visual impact assessment is concerned with changes that arise in the overall effect on the area's visual amenity.

The detailed report on the assessment is included in **Appendix D2.3**.

When landscape impacts are considered overall for the proposed options there is a slight preference for Option 2B as it is considered to introduce fewer newer features into the low lying floodplain than Option 2A. Both the Option 2A and Option 2B are of a similar length; however, Option 2A creates a new roundabout within the floodplain.

Option 2C and Option 2D are considered to have a similar landscape effect; however, both options create new link roads through more elevated land to the south of the N13 corridor, which has a greater landscape effect than either Option 2A or Option 2B.

The remaining Option 2E, Option 2F1 and Option 2F2 are least preferred as they create the greatest length of new road corridor in areas currently unaffected by such features.

When visual impacts are considered overall Option 2A and Option 2B are preferred. Whilst having the greatest potential for impacts on residential properties in the 0-50m distance band, they are preferred as such impacts are already experienced by residential properties adjacent to the N13 corridor. Remaining options are least preferred as whilst these option options may have a lower potential impact on properties in the 0-50m distance banding, such properties are in locations where main road corridors do not impact on visual amenity, and it is considered that these receptors would be of a higher sensitivity than those impacted upon by either the Option 2A or Option 2B. It is also considered that Option 2F1 and Option 2F2 options have a greater potential for impact on the Protected View and Prospect in the south-west of the study area.

When both landscape and visual impacts are combined there is a slight preference for Option 2B, as it introduces fewer new features into the lower elevation landscape to the south of Lough Swilly. It should be noted that potential landscape and visual effects for the preferred option shall be mitigated by minimising the footprint of the new road in the landscape and by using carefully sited landscape screening and boundary treatments.

A summary of each option and the impacts in terms of landscape and visual impact appraisal is provided in **Table 12-12.**

Table 12-12 Summary of Landscape and Visual Appraisal

	2A	2B	2C	2D	2E	2F1	2F2
Impact description	Moderately negative	Moderately negative	Moderately negative	Moderately negative	Major or highly negative	Major or highly negative	Major or highly negative
Impact Score	2	2	2	2	1	1	1

12.4.4 Biodiversity (Terrestrial and Aquatic)

The biodiversity study compared the potential impacts of the options for Section 2 on the terrestrial and aquatic natural environment. Each of the options was assessed as a 300m wide corridor to determine potential impacts on the principal ecological receptors within or adjacent to each option, and in relation to potential impacts arising from fragmentation or interference with species' movement across the options. The assessment was undertaken in accordance with the NRA Guidelines for the Assessment of Ecological Impacts of National Road Schemes (Revision 2, June 2009).

A detailed assessment of the biodiversity (terrestrial) elements of the Section 2 options is included in **Appendix D2.4** while the biodiversity (aquatic) elements is included in **Appendix D2.5**.

The western extremity of the study area for Section 2 commences in the centre of Letterkenny and extends east to the N13/N14 Manorcunningham junction, to the townlands Trimnagh in the north and Scribly and Corkey in the south. The N56 from Polestar Roundabout crosses the River Swilly Estuary and continues eastward to the Dry Arch Roundabout. The N13 continues from the Dry Arch roundabout towards the east, crossing the River Corkey prior to a roundabout which forms a junction with the N14.

Watercourses intersected by the proposed options lie within the Lough Swilly and tributaries catchment, specifically the River Swilly and Isle Burn/Corkey River sub-catchments. The Lough Swilly catchment is largely located within County Donegal with a very small portion of the upper Corkey sub-catchment located in Northern Ireland. In total the catchment area covers some 1,130 km^2 (DCC, 2015).

The proposed new crossing of the Swilly main channel downstream of Letterkenny, intersects the Lough Swilly SPA, Lough Swilly SAC and the Lough Swilly including Big Isle, Blanket Nook and Inch Lake pNHA. A proposed new crossing of the Isle Burn (2F1 and 2E options) is about 100m upstream of the Lough Swilly SAC, pNHA and SPA boundary. Qualifying habitats of the SAC include the marine Annex I habitats Estuaries [3110], Coastal lagoons [1150] and Atlantic salt meadows [1330] and the qualifying species include Otter (*Lutra lutra*) [1355]. Bird species of Special Conservation Interest (SCI) of the SPA include 24 wetland and waterbirds, some of which include Redshank (*Tringa totanus*), Wigeon (*Anas Penelope*), Greenland White-fronted Goose (*Anser albifrons flavirostris*), Whooper Swan (*Cygnus cygnus*), Mallard (*Anas platyrhynchos*), Common Gull (*Larus canus*), Curlew (*Numenius arquata*), Shelduck (*Tadorna tadorna*), Shoveler (*Anas clypeata*), Teal (*Anas crecca*), Dunlin (*Calidris alpina*), Greenshank (*Tringa nebularia*), Grey Heron (*Ardea cinerea*), Oystercatcher (*Haematopus ostralegus*) and Black-headed gull (*Larus ridibundus*).

Lough Swilly is an important fisheries resource with evidence that it is nursery to a number of commercially important fish species. The River Swilly at the crossing location is also an important migration option for anadromous fish species (salmon, sea trout, eel, lampreys) in and out of the upstream catchment. In addition, watercourses and their riparian zone connected to the Lough Swilly within the study area are considered to provide potential habitat for otter.

The two potential crossings within, or just upstream of the Lough Swilly SAC, are potentially the most sensitive aspects of the scheme on account of their international designation (River Swilly and Isle Burn). It is noted, however, that estuarine habitat at the River Swilly crossing, for example, was a typical Mud Community Complex with low faunal diversity and abundance. The SAC qualifying interest Annex I habitat Estuaries Habitat 3110, was the main habitat in the vicinity of the River Swilly crossing. From site surveys,

there was no evidence of the other qualifying interests. Furthermore, at the River Swilly, the nature of the proposed crossing (clear single span structure, no in-channel footprint) will result in no direct impact on the marine communities present in the area. Any impact associated with the proposed crossing will be indirect and associated with the construction and/or maintenance phase of the development. Such impacts will be temporary and can very likely be adequately mitigated to minimise or remove any potential impact on the aquatic biodiversity.

Qualifying species of the SPA recorded during field surveys at the River Swilly crossing include Curlew, Shelduck, Black-headed gull, Redshank, Grey Heron and Mallard and SCI Species present in fields adjoining or west of study area include Greenland White-fronted Goose, Greylag Goose and Whooper Swan. Therefore, potential impacts to the SCI species of the Lough Swilly SPA during the construction and operation of the road present a potentially significant constraint to the project.

The overall emerging preferred option is the Option 2B (Pink) due to the location of the option along the existing N13 and the limited intersection with habitats or features of high ecological significance. The option is assigned an impact score of 3 – Minor or Slightly Negative.

Options 2F1 (Blue) and 2F2 (Blue) are the least preferred options due to the greater number of Ecological Receptors intersected by these routes. Option 2F1 (Blue) and 2F2 (Blue) encounter numerous ecological receptors in the form of habitats of Local Importance (higher value) and protected mammal species. Both options have an assigned impact score of 1 - Major or Highly Negative Impacts. 2E (Green) is next least preferable to 2F1/2F2, although aside from the River Swilly crossing, the 2E option really does not impact on any particularly sensitive waters apart from the new crossing location at Isle Burn.

In conclusion, the emerging preferred option in relation to Biodiversity is Option 2B (Pink) given its limited land take and impacts to Ecological Receptors when compared with other options. The information from both of the terrestrial and aquatic assessments has been combined to give an overall biodiversity assessment as presented in **Table 12-13.**

Table 12-13 Summary of Biodiversity (Terrestrial and Aquatic) Appraisal

	2A	2B	2C	2D	2E	2F1	2F2
Impact description	Minor or Slightly Negative	Minor or Slightly Negative	Minor or Slightly Negative	Minor or Slightly Negative	Moderately Negative	Major or Highly Negative	Major or Highly Negative
Impact Score	3	3	3	3	2	1	1

12.4.5 Waste

Waste is defined as any substance or object which the holder discards or intends or is required to discard. In terms of a road construction project, most naturally occurring materials excavated as part of the works will not be considered a waste as they can be re-used within the works. There are three broad types of excavated material as set out in TII's *Specification for Road Works Series 600 – Earthworks*:

- Acceptable material: material excavated from within the site or imported on to the site which meets the requirements of the specification for acceptability for use in the works.
- Unacceptable material Class U1: material excavated from within the site which, unless processed so that it meets the requirements of the specification for acceptable material will not be used in the works.
- Unacceptable material Class U2: material having hazardous chemical or physical properties requiring special measures for its excavation, handling, storing, transportation, deposition and disposal. Class U2 material excavated from within the site will not be used in the works unless processed so that it meets the requirements of the specification for acceptable material.

Acceptable excavated material that is not surplus to requirements will be re-used in the works for engineering purposes including fill to embankments, landscaping, etc. Acceptable material that is surplus to requirements will be used in spoil heaps on-site or at off-site locations, subject to proper approvals.

Both Class U1 and Class U2 material may be processed by mechanical, chemical or other means to render the material acceptable for use in the works. It is possible that some unacceptable material may become a waste if disposal of the material is required.

All excavated material from the site of the proposed road will be managed in accordance with best practice to ensure in so far as possible that there is minimal waste generated.

Any excavated contaminated material will fall under Class U2 and must be removed off-site for disposal at an authorised waste management facility. Currently, there is no indication of contaminated material being present within the footprint of the options.

Where there is a deficit of fill material for the construction of the project then clean soil and stone must be imported from other sources to make up the shortfall. This has the effect of requiring the use of fill material from quarries or borrow pits outside of the site boundary or the importation of inert waste fill material that has been re-classified as a by-product and which meets the specification for acceptable material. Production, processing and transporting of material to make up the deficit could have a significant environmental impact in terms of traffic movements, greenhouse gas emissions, use of valuable raw materials, etc.

At this stage in the project approximate estimates of the likely quantities of waste that will be generated from the works have been made. This will be further evaluated and assessed during the next phase.The cut/fill balance estimates associated with each option are addressed within the Material Assets (non-agricultural) report included in **Appendix D2.10**.

A summary of each option and the impacts in terms of waste appraisal is provided in **Table 12-14.**

Table 12-14 Summary of Waste Appraisal

Option	2A	2B	2C	2D	2E	2F1	2F2
Surplus material for disposal ('000 cub m)	442	255	500	517	1,136	580	557
Impact description	Moderately Negative	Slightly Negative	Moderately Negative	Moderately Negative	Major or Highly Negative	Moderately Negative	Moderately Negative
Impact Score	2	3	2	2	1	2	2

12.4.6 Soils, Geology, and Hydrogeology

The soils, geology and hydrogeology assessment examine each option in terms of their importance and the possible impacts resulting from the construction of a proposed option. The options are compared, and impacts assessed from a land, soil, and hydrogeological perspective. In order to compare the options, the assessment has taken into account and appraised the following attributes.

Soils and Geology

- Geological heritage sites;
- Landfills and historic waste sites;
- Quarries;
- Karst features;

- Agricultural soils; and
- Extent of peat and soft ground.

Hydrogeology

- Aquifers;
- Groundwater vulnerability;
- Source Protection Areas; and
- Important abstractions for water supply.

A detailed assessment of the options is included in **Appendix D2.6**.

There are no recorded karst features, geological heritage areas, active quarries, mineral sites, landfills or contaminated land in the ZoI of each option. The main impact associated with each option is excavation of soft soil deposits. The quantitative aspect of the comparative assessment of impacts is carried out along the centre-line of each option. The estimate of the volume of soft soils to be removed assumes a 21.5 metres wide carriageway and an excavation of 4 metres deep.

All seven options cross the Swilly Estuary. The proportion of the options that cross alluvial soils associated with the Swilly Estuary ranges from 21% of the total length (Option 2B) to 27% of the total length (Option 2F1). The estimated volumes of soils to be removed ranges from 138,374m^3 along the Option 2B to 175,354m^3 along Option 2A. There is a Low attribute importance associated with soft soils. In a regional context, the proportion of the attribute that will be removed is generally considered small. The impact associated with removal of soft soils is considered Neutral for five of the seven options. Along two of the options, where more than 25% of the option will cross a section of soft soils, the level of impact is deemed to be Minor Negative.

In terms of hydrogeology, the aquifers in the area are poorly productive, which are generally unproductive except for local zones; a locally important bedrock aquifer, that is moderately productive only in local zones; and a locally important sand and gravel aquifer. All options traverse aquifers which have groundwater vulnerability ratings ranging from high, extreme to areas where rock is at or near the surface (denoted ‘X’ by the GSI). Such areas are more prone to pollution and run-off as the attenuation of the overlying surficial deposits of soil and subsoil are thinner or not present.

From the review of the impacts of each proposed option on the soil, geology and hydrogeology in the Zone of Influence, Options 2B, 2C, 2D and 2E are the preferable options with the same number of moderate and minor negative, and neutral impacts. All four of these options traverse poor or soft ground that requires excavation, and all four routes traverse areas of Locally important aquifer (Ll & Lg) and areas of extreme groundwater vulnerability. Options 2F1 and 2F2 are the least preferred with respect to their impact on the land and soils in the Zone of Influence, since these routes traverse and cut through longer areas of high groundwater vulnerability.

All options have an overall impact score of ‘moderately negative’ on the land and soil in the TEN-T Section 2 Zone of Influence.

A summary of each option and the impacts in terms of soils, geology and hydrogeology appraisal is provided in **Table 12-15.**

Table 12-15 Summary of Soils, Geology and Hydrogeology Appraisal

Option	2A	2B	2C	2D	2E	2F1	2F2
Impact description	Moderately Negative	Moderately Negative	Moderately Negative	Moderately Negative	Moderately Negative	Moderately Negative	Moderately Negative
Impact Score	2	2	2	2	2	2	2

12.4.7 Hydrology

The hydrology assessment was prepared having regard to the *TII Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes* as recommended by the TII *Project Appraisal Guidelines for National Roads Unit 7.0 – Multi Criteria Analysis*. A comparative evaluation of the options was undertaken, having regard to the specific hydrological impacts associated with each option in order to identify a preferred option(s).

A detailed assessment of the hydrological impacts of the options is included in **Appendix D2.7**.

The entire study area lies within the Lough Swilly Catchment and forms part of the National Hydrometric Area – 39. The main surface water features potentially impacted by the option extents include the River Swilly, River Pluck (Leslie Hill Stream) and their tributaries, and also the Swilly Estuary.

The River Swilly is the major river of the greater Lough Swilly catchment (HA 39) and receives flows from a number of tributaries including the Sprack, Corravaddy Burns and the Knocknamona watercourse. The Swilly River catchment is fairly mixed in land coverage with forested land, pasture, peat bog and urban area due to Letterkenny. The modelled tributaries which enter the Swilly emanate from the hills surrounding Letterkenny to the north and south. Some of these tributaries pick up a significant amount of urban drainage along the way to their discharge points into the Swilly. The River Swilly Sub Catchment (Swilly_SC_010) is a medium sized catchment with an area of 112km^2.

The hydrological assessment has determined that the 2F2 (Blue) option is the preferred option. This is primarily on the basis of the avoidance of areas with a potential for flooding and reduction in required river crossing lengths.

In terms of drainage of road runoff and water quality issues, each option would have similar effects both during and after construction. The 2F2 (Blue) option would be considered the preferred option as it encounters the least number of watercourses along its option corridor.

It is recommended that the ultimate preferred option be aligned as necessary to avoid encroaching upon watercourses and their potential flood extents. Any required crossings will require detailed hydrological and hydraulic analysis so as to eliminate any risk of flooding to adjacent lands. Adequate storm water attenuation and treatment will be required before out-falling to any watercourse along the option corridor due to every watercourse being *At Risk* to not meet its WFD objectives.

A summary of each option and the impacts in terms of hydrology is provided in **Table 12-16.**

Table 12-16 Summary of Hydrology Appraisal

Option	2A	2B	2C	2D	2E	2F1	2F2
Impact description	Moderately negative	Moderately negative	Moderately negative	Moderately negative	Moderately negative	Moderately negative	Minor or Slightly Negative
Impact Score	2	2	2	2	2	2	3

12.4.8 Architectural Heritage, Archaeology and Cultural Heritage

The architectural heritage and archaeology assessments (together known as cultural heritage) was undertaken in accordance with *TII Guidelines for the Assessment of Archaeological Heritage Impacts of National Road Schemes (2005)* and *Guidelines for the Assessment of Architectural Heritage Impacts of National Road Schemes (2005)*.

Principles applied in this assessment have been both desk and field-based.

- **Desk-Study**: further expansion of information gathered during the Constraints Study (refer to **Volume B**), including the examination of historical cartographic sources, NMI files, aerial mapping/photography and relevant published information.
- **Field-Study**: primarily a windshield survey of the environs, topography and landscape and observations therein with a view to identifying significant cultural heritage impacts and/or areas of archaeological potential. This has been coupled with site specific visits, as required, in order to determine level of impact and extent and condition of the heritage asset.

The compilation of a cultural heritage constraints inventory has been undertaken to include core locational and descriptive data, as well as identification of the distance to the options and the type of impact (direct/indirect).

The comparative evaluation of each option was assessed by scoring of impacts to the overall presence of sensitive receptors using the Preference Rating Key per the *Project Appraisal Guidelines for National Roads Unit 7.0 - Multi Criteria Analysis* (TII, 2016). An impact assessment was undertaken on each option to include both quantitative and qualitative assessment. Each option was scored based on the seven-point scale and an integer was assigned according to the overall impact level.

A detailed assessment of the cultural heritage impacts of the options is included in **Appendix D2.8**.

The area has a long history of human settlement, as demonstrated by the archaeological and historical record. The River Swilly and its estuarine flatlands would have provided an important crossing point which resulted in human settlement within the area since earliest times. Indeed, this fertile river valley, coupled with the fact that the river is navigable north-westwards, ultimately out to sea; indicates that it was an important natural resource in terms of social, economic and political terms since earliest times. This has resulted in the convergence of a number of transport networks at this river crossing up to the present time. There are a number of examples of built heritage of vernacular importance scattered throughout the area, in particular within the urban environs of Letterkenny town and associations with the previous railway line that facilitated the area up to its closure in the 1960s.

The study area contains a number of predominantly prehistoric sites however a large majority of the recorded archaeological sites have been noted by the Archaeological Survey of Ireland as having no visible trace, which may attest to the impact of more intensive agricultural practices and land improvement works during the 20th century. Despite this, there is still potential for the survival of sub-surface archaeological features, deposits and artefacts at such locations as well as within the wider greenfield environs.

From a cultural heritage perspective and based on a quantitative and qualitative assessment; the 2B (Pink) Option is the preferred option, followed closely by, in order of preference: 2A (Orange), 2D (Red), 2C (Purple), 2F2 (Blue), 2E (Green) and 2F1 (Blue).

The 2B (Pink) option would involve retention of the existing road network with junction rationalisation, particularly on the existing dual carriageway at Trimragh, with closure of several existing at grade junctions including the central median cross-over; and replace with a single grade separated junction. The 2B (Pink) option has 14 identified constraints, the majority of which are focused at the proposed junction area at Trimragh (Rock Art sites, Church and Graveyard site, and built heritage items) as well as the relief road at Ballyraine (area of archaeological potential and site of a ringfort).

A summary of each option and the impacts in terms of architectural heritage, archaeology and cultural heritage appraisal is provided in **Table 12-17.**

Table 12-17 Summary of Architectural Heritage, Archaeology and Cultural Heritage Appraisal

	2A	2B	2C	2D	2E	2F1	2F2
Impact description	Moderately Negative	Moderately Negative	Moderately Negative	Moderately Negative	Major or highly negative	Major or highly negative	Major or highly negative
Impact Score	2	2	2	2	1	1	1

12.4.9 Material Assets (Agricultural)

The following aspects were considered in the assessment for agriculture;

- Land to be acquired;
- Area and orientation of lands severed;
- Removal of farm buildings and/or facilities;
- Farm enterprises;
- Intensity and viability of farming practices.
- Length of centreline;
- Number of constraints potentially affected;
- Number of folios intersected; and
- Number of folios significantly severed.

A detailed assessment of the Material Assets (Agricultural) impacts of the options is included in **Appendix D2.9**.

From this assessment Option 2B (Pink) was determined to be the preferred option as it interacts the least with agricultural activities and land. This was closely followed by Option 2A (Orange). Both of these options are largely online and as such would be expected to perform better than the other options. Options 2C (Purple) and 2D (Red) are similar in length and agricultural impacts, with 2C marginally less impacting than 2D. Options 2E, and 2F1/2 are the least preferable options due to their impacts on agricultural lands from their largely offline routes.

A summary of each option and the impacts in terms of material assets (agricultural) appraisal is provided in **Table 12-18.**

Table 12-18 Summary of Material Assets (Agricultural) Appraisal

	2A	2B	2C	2D	2E	2F1	2F2
Impact description	Moderately Negative	Minor to Slightly Negative	Moderately Negative	Moderately Negative	Moderately Negative	Moderately Negative	Moderately Negative
Impact Score	2	3	2	2	2	2	2

12.4.10 Material Assets (Non-agricultural)

The assessment was informed by the Transport Infrastructure Ireland (TII) *Project Appraisal Guidelines for National Roads Unit 7.0 – Multi Criteria Analysis (PE-PAG-02031)*[8] with regards to headings to approaching utilities and infrastructural features, for example in this case non-agricultural properties are assessed in this section and agricultural areas are assessed within a separate Material Assets (Agricultural) Technical **Appendix D2.9** and summarised in Section 12.4.9 above. The *EPA Draft Guidelines on the Information to be contained in Environmental Impact Assessment Reports* (EIAR)[9] (EPA, 2017) were consulted for the specific topics to assess under the environmental factor of Material Assets (Non-agricultural).

The principal objectives of the Material Assets (Non-agricultural) assessment is to:

- Complete a desk study and to obtain relevant data relating to material assets including utilities, properties, quarries, transport, infrastructure and other amenities for each option;
- Assess the significance of the likely direct physical impacts of the proposed road scheme on each of these material assets along each option;
- Evaluate and compare the impact on material assets for each option taking into account interaction with other environmental, engineering and economic criteria,
- Assess each option in line with the Project Appraisal Guidelines for National Roads Unit 7.0 – Multi Criteria Analysis TII in October 2016, and
- Compare the options and determine a preference.

The methodology adopted for the option selection comprised primarily of a desktop study and additional information gathered during windscreen surveys. These elements, including transport infrastructure, utilities and non-agricultural land use, were used to identify and describe areas of potential infrastructural value or sensitivity.

The assessment can broadly be categorised into two areas:

- **Infrastructure**
  - Utilities.
  - Quarries.
  - Transport Infrastructure.
  - Waste Management.
  - Forestry.
- **Properties**
  - Settlements and Zoning.
  - Residential and Commercial Properties.
  - Community Severance.
  - Residential
  - Commercial
  - Community Facilities
  - Community Severance
  - Tourism

A detailed assessment of the Material Assets (Non-agricultural) impacts of the options is included in **Appendix D2.10**.

[8] http://www.tiipublications.ie/library/PE-PAG-02031-01.pdf
[9] http://www.epa.ie/pubs/advice/ea/EPA%20EIAR%20Guidelines.pdf

Options 2E is the preferred option as it has the least number of negative impacts when compared with the other options. The overall impact score for Option 2E is slightly less than that of Options 2F1 and 2F2, but because Option 2E has a lesser impact on forestry it has been preferred over those two options. There is very little between Options 2A and 2B. Options 2C and 2D have the same overall impact score as Options 2A and 2B but are less preferred, as their impact on residential properties is considered greater.

A summary of each option and the impact in terms of material assets (non-agricultural) appraisal is provided in **Table 12-19.**

Table 12-19 Summary of Material Assets (non-agricultural) Appraisal

Option	2A	2B	2C	2D	2E	2F1	2F2
Impact description	Minor to slightly negative	Minor to slightly negative	Moderately negative	Moderately negative	Minor to slightly negative	Minor to slightly negative	Minor to slightly negative
Impact Score	3	3	2	2	3	3	3

12.5 Accessibility and Social Inclusion

This assessment has been conducted in accordance with the Project Appraisal Guidelines Unit 7: Multi-Criteria Analysis. The appraisal included in **Appendix C2.3** covers two key areas:

- Deprived geographical areas, and
- Vulnerable groups

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. The Section 2 study area is generally marginally below average according to the index. The government has various schemes to help address the issues that are prevalent in these deprived areas, including the Rural Social Scheme. It is anticipated that participants in the Rural Social Scheme who reside within the study area will receive small to neutral benefits resulting from improved accessibility to/from areas of employment and economic activity. All options will provide similar impacts and are therefore scored neutral.

The summary is presented in **Table 12-20**.

Table 12-20 Summary of Deprived Geographical Areas Assessment Section 2

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

Donegal is reliant on its road network for transport and buses are the primary public transport mode available for individuals. National Bus services from Letterkenny to Dublin travel along the N13 to Manorcunningham, and onto the N14/A5 Corridor to Dublin, while bus services from Letterkenny to Sligo/Galway travel southbound on the N13 via Ballybofey/Stranorlar. As such, any proposed improvement to the N13 and N56 will improve the journey times and reliability for these services, but the impacts are unlikely to be significant.

All mainline options provide travel benefits however the differences between the options are likely to have a neutral impact on vulnerable user groups. The provision of a new link crossing to Letterkenny (included in all options) means accessibility to and from Letterkenny town will improve for vulnerable user groups seeking

to access the hospital, education facilities and centres of employment within Letterkenny. The benefits are likely to have a slight positive impact for vulnerable user groups.

The option impact scores for Vulnerable groups is presented in **Table 12-21**.

Table 12-21 Summary of Vulnerable Groups Assessment Section 2

Option	2A	2B	2C	2D	2E	2F1	2F2
Impact Description	Slightly Positive	Slightly Positive	Slightly Positive	Slightly Positive	Slightly Positive	Slightly Positive	Slightly Positive
Score	5	5	5	5	5	5	5

12.6 Integration

The basis of the appraisal covers the following key areas:

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

A copy of the report is included in **Appendix C2.4** which concludes that all of the new route corridors provide an improvement in infrastructure with a positive impact on the region.

12.6.1 Transport Integration

In terms of Transport integration, Section 2 of the TEN-T was assessed for its connectivity to the National Road network and other transport modes, including sustainable transport modes. All Section 2 options will have highly positive benefits due to the new link access to Letterkenny. Similarly, all options will have slightly positive benefits for longer journeys to Belfast, Dublin, Knock and Shannon airports and to Belfast, Dublin and Galway ports. All options are likely to improve connectivity within the network however it is important that each option is strategic and provides appropriate benefits for all users.

Traffic modelling demonstrates that options 2F1 and 2F2 provide less connectivity to Letterkenny as these options carry little traffic with most users continuing to use the existing network. Options 2A and 2B had less benefits in separating strategic and local traffic as these options were online. Options that include segregated shared pedestrian/cycle facilities and connect these facilities to existing facilities, such as the Donegal Cycle Route will provide benefit for cyclists and pedestrians attracting more users and improving safety. Overall, there will be benefits in terms of connectivity of the strategic road network, support for sustainable transport modes and access to other transport infrastructure.

Table 12-22 Summary of Transport Integration Assessment Section 2

Option	2A	2B	2C	2D	2E	2F1	2F2
Impact description	Slight Positive	Slight Positive	Slight Positive	Slight Positive	Slight Positive	Slight Positive	Slight Positive
Score	5	5	5	5	5	5	5

12.6.2 Land Use Integration

Regarding Land Use Integration, Section 2 aligns with the Transportation Strategy set out in the 2018-2024 County Development plan, which highlights 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.” Section 2 Options all have a positive impact in terms of support for the local development plan and strategic connectivity for long distance trips.

Table 12-23 Summary of Land Use Integration Assessment Section 2

Option	2A	2B	2C	2D	2E	2F1	2F2
Impact description	Slight Positive	Slight Positive	Slight Positive	Slight Positive	Slight Positive	Slight Positive	Slight Positive
Score	5	5	5	5	5	5	5

12.6.3 Geographical Integration

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

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

All options perform equally in satisfying the goals of the NDP. They also follow through with themes from the National Spatial Strategy, by improving connectivity between Hubs and Gateways. Additionally, the N13 provides cross-border, international connectivity and is part of the Trans European Transport Network (TEN-T) which links with other European routes. All options score highly positive with respect to geographical integration.

Table 12-24 Summary of Geographical Integration Assessment Section 2

Option	2A	2B	2C	2D	2E	2F1	2F2
Impact description	Major Positive	Major Positive	Major Positive	Major Positive	Major Positive	Major Positive	Major Positive
Score	7	7	7	7	7	7	7

12.6.4 Other Government Policy Integration

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

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

All options meet these criteria by improving connectivity to Letterkenny urban centre, within Donegal (one of the most peripheral counties in the country), to the remainder of the TEN-T network and to other urban centres in the Republic and Northern Ireland. All section 2 options also improve connectivity to ports and airports across Ireland.

The NDP objectives include for investment to support the ambition for development of the border region by upgrading road networks including the N56/N13 Letterkenny to Manorcunningham.

As such, all options score highly positive with respect to Other Government Policy Integration: Regional Balance.

Table 12-25 Summary of Other Government Policy Assessment Section 2

Option	2A	2B	2C	2D	2E	2F1	2F2
Impact description	Major Positive	Major Positive	Major Positive	Major Positive	Major Positive	Major Positive	Major Positive
Score	7	7	7	7	7	7	7

12.7 Physical Activity

This assessment has been conducted in accordance with the Project Appraisal Guidelines Unit 13: Walking and Cycling Facilities. The appraisal is based on any new segregated shared pedestrian/cyclist facilities or linkages to existing facilities being provided as part of the scheme. A copy of the report is included in **Appendix C2.2**. The appraisal considers the following sub-criteria:

- Health benefits,
- Absenteeism benefits,
- Journey ambience benefits,
- Changes in the number of incidents or journey times,
- Other possible impacts.

All options have a positive impact on Physical Activity as all options provide a new link to Letterkenny with a segregated and shared pedestrian/cyclist facility. Aside from the Letterkenny link the options vary considerably between each other and key differentiating factors include:

Options 2A and 2B retain the existing N13 with improvements. These online options include the excessive 7% vertical gradient (up to 8.4%) south of the Dry Arch roundabout and do not include vulnerable road user facilities, instead utilising adjacent sections of the existing road network to provide routes. Options 2A and 2B do not improve the scenario at St Patrick's School for vulnerable users and overall retain the status quo in terms of physical activity and are therefore less attractive. These options are considered to have only a slight positive impact.

Options 2C and 2D provide a new segregated shared facility for pedestrians and cyclists from the southern tie-in on the N13 to a new proposed junction with the N13 at Dromore. Both options will facilitate future connections to the existing Donegal Cycle Route (along the L1114 local road) and the old Letterkenny to Lifford and Strabane Railway. These options provide positive benefits to the residual network by removing all but local traffic from the existing N13 between the southern tie-in and the N13/L1114 junction. Overall, Options 2C and 2D have significant benefits and a major positive impact on Physical Activity.

Option 2E provides a new segregated shared facility for pedestrians and cyclists from the southern tie-in on the N13 to the eastern tie-in at the existing N13/N14 junction. Like 2C and 2D this option will facilitate future connections to the existing Donegal Cycle Route and old Letterkenny to Lifford and Strabane Railway. This option also provides positive benefits to the residual network between the southern tie-in and the existing N13/L1114 junction. Option 2E has significant benefits and a major positive impact on Physical Activity.

Options 2F1 and 2F2 provide a new segregated shared facility for pedestrians and cyclists from their southern tie-in on the N13 to their eastern tie-ins. These options have no junctions between their southern and eastern tie-ins however option 2F1 will facilitate future connections to the existing Donegal Cycle Route at its eastern end. These options show a low traffic transfer from the existing network and their connectivity to Letterkenny is likely to result in lower usage by pedestrians and cyclists. Both options will result in the continued use of the existing N13 and are therefore less attractive to vulnerable users than other offline options. Both options 2F1 and 2F2 are considered to provide moderately positive impacts.

The summary scoring matrix is presented below.

Table 12-26 Physical Activity Appraisal

Option	2A	2B	2C	2D	2E	2F1	2F2
Impact description	Slight Positive	Slight Positive	Major Positive	Major Positive	Major Positive	Moderate Positive	Moderate Positive
Score	5	5	7	7	7	6	6

12.8 Project Appraisal Matrix (Multi-criteria Analysis)

The appraisal of each option for each section was undertaken as set out in Section 7.3. An overall multi-criteria project appraisal matrix for Section 2 combines the above assessments. This is represented below in **Table 12-27** where the impact scores under each sub-criterion are summed to give a total impact score for each option, where the higher the score, the better the option performs.

In reviewing total impact scores in the Multi-Criteria Project Appraisal Matrix, Options 2C, 2D achieve an overall top score of 106. Option 2E achieved an overall score of 105 with other options scoring less. It must be emphasised that summing up of impact scores does not take account of the relative importance of each sub-criterion or the individual impacts or preferences, but provides an initial comparison between the overall, non-weighted performance of each option. As such, Options 2C and 2D emerge to the front as options performing well, on balance, considering all impacts.

A secondary appraisal showing specialist preferences of each option across each sub-criterion was prepared to ensure consideration of other factors that may inform a decision on the preferred option. **Table 12-28** provides the preferences for the different options indicating preferred (green), intermediate (orange) and least preferred (red) option preferences.

A review of the two appraisal summary tables clarifies:

- Options 2C and 2D have identical impact scores and preferences for each sub-criterion resulting in the same overall impact score of 106.

- Options 2C and 2D are the lowest scoring options, over all other options, in only one criterion; Material Assets – non-agricultural. The impact score for this criterion is categorised as moderately negative due to impacts on residential properties. However, the highest impact score for this criterion is only one impact level higher and therefore the better performing options were categorised as minor to slightly negative impact.

- Options 2C and 2D are least preferred in only one criterion; Material Assets – non-agricultural. For all other criteria, Options 2C and 2D specialist preferences are either Preferred or Intermediate.

- Option 2E impact score of 105 while close to Options 2C and 2D includes considerable variance in preferences. This option is least preferred by four of the environmental specialists; Landscape & Visual, Waste, Cultural Heritage and Material Assets - Agriculture. This option is preferred by three environmental specialists; Noise, Soils-Geology-Hydrogeology and Material Assets, non-Agriculture.

The appraisal process clarifies that Options 2A, 2B, 2F1 and 2F2 are the worst performing options. As Option E is considered by several category specialists to be the ‘least preferred’ this option is a poorer performing option than Options 2C and 2D.

Option 2C and Option 2D have identical impact scores and identical preferences for each of the sub-criterion. A pairwise competition is necessary to differentiate which of these two options is the preferred option.

Table 12-27 Stage 2 Multi-Criteria Project Appraisal Matrix for Section 2

Option	2A	2B	2C	2D	2E	2F1	2F2
Environment	**Orange**	**Pink**	**Purple**	**Red**	**Green**	**Blue**	
Air Quality & Climate	2	2	2	2	2	3	3
Noise	3	3	4	4	5	5	5
Landscape & Visual	2	2	2	2	1	1	1
Biodiversity	3	3	3	3	2	1	1
Waste	2	3	2	2	1	2	2
Soils, Geology and Hydrogeology	2	2	2	2	2	2	2
Hydrology	2	2	2	2	2	2	3
Cultural Heritage	2	2	2	2	1	1	1
Material Assets - Agricultural	2	3	2	2	2	2	2
Material Assets - Non-agricultural	3	3	2	2	3	3	3
Environment Sub-Total	**23**	**25**	**23**	**23**	**21**	**22**	**23**
Safety							
Security of Road Users	4	4	6	6	6	5	5
Collision Reduction	5	6	6	6	7	5	5
Road Safety Audit (Stage F, Part 1)	6	6	7	7	7	5	5
Road Safety Impact Assessment	6	6	7	7	7	6	6
Safety Sub-Total	**21**	**22**	**26**	**26**	**27**	**21**	**21**
Physical Activity							
Physical Activity	5	5	7	7	7	6	6
Physical Activity Sub-Total	**5**	**5**	**7**	**7**	**7**	**6**	**6**
Economy							
Transport Efficiency and Effectiveness	7	7	7	7	7	7	7
Wider Economic Impacts	5	5	5	5	5	5	5
Funding Impacts	5	5	5	5	5	5	5
Economy Sub-Total	**17**	**17**	**17**	**17**	**17**	**17**	**17**
Accessibility and Social Inclusion							
Deprived Geographical Areas	4	4	4	4	4	4	4
Vulnerable Groups	5	5	5	5	5	5	5
Accessibility and Social Inclusion Sub-Total	**9**	**9**	**9**	**9**	**9**	**9**	**9**
Integration							
Transport Integration	5	5	5	5	5	5	5
Land use Integration	5	5	5	5	5	5	5
Geographical Integration	7	7	7	7	7	7	7
Other Government Policy Integration	7	7	7	7	7	7	7
Integration Sub-Total	**24**	**24**	**24**	**24**	**24**	**24**	**24**
Totals	**99**	**102**	**106**	**106**	**105**	**99**	**100**

Table 12-28 Stage 2 Preferences Summary

Option	2A	2B	2C	2D	2E	2F1	2F2
Environment	**Orange**	**Pink**	**Purple**	**Red**	**Green**	**Blue**	
Air Quality & Climate	Least Preferred	Least Preferred	Intermediate	Intermediate	Intermediate	Preferred	Preferred
Noise	Least Preferred	Least Preferred	Intermediate	Intermediate	Preferred	Preferred	Preferred
Landscape & Visual	Intermediate	Preferred	Intermediate	Intermediate	Least Preferred	Least Preferred	Least Preferred
Biodiversity	Preferred	Preferred	Intermediate	Intermediate	Intermediate	Least Preferred	Least Preferred
Waste	Intermediate	Preferred	Intermediate	Intermediate	Least Preferred	Intermediate	Intermediate
Soils, Geology and Hydrogeology	Intermediate	Preferred	Preferred	Preferred	Preferred	Least Preferred	Least Preferred
Hydrology	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Preferred
Cultural Heritage	Preferred	Preferred	Intermediate	Intermediate	Least Preferred	Least Preferred	Least Preferred
Material Assets - Agricultural	Intermediate	Preferred	Intermediate	Intermediate	Least Preferred	Least Preferred	Least Preferred
Material Assets - Non-agricultural	Intermediate	Intermediate	Least Preferred	Least Preferred	Preferred	Intermediate	Intermediate
Safety							
Security	Least Preferred	Least Preferred	Preferred	Preferred	Preferred	Intermediate	Intermediate
Collision Reduction	Least Preferred	Intermediate	Intermediate	Intermediate	Preferred	Least Preferred	Least Preferred
Road Safety Audit (Stage F)	Intermediate	Intermediate	Preferred	Preferred	Preferred	Least Preferred	Least Preferred
Road Safety Impact Assessment	Intermediate	Intermediate	Preferred	Preferred	Preferred	Intermediate	Intermediate
Physical Activity							
Physical Activity	Least Preferred	Least Preferred	Preferred	Preferred	Preferred	Intermediate	Intermediate
Economy							
Transport Efficiency and Effectiveness	Preferred	Preferred	Preferred	Preferred	Preferred	Preferred	Preferred
Wider Economic Impacts	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate
Funding Impacts	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate
Accessibility and Social Inclusion							
Deprived Geographical Areas	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate
Vulnerable Groups	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate
Integration							
Transport Integration	Intermediate	Intermediate	Preferred	Preferred	Preferred	Intermediate	Intermediate
Land use Integration	Intermediate	Intermediate	Preferred	Preferred	Preferred	Intermediate	Intermediate
Geographical Integration	Preferred	Preferred	Preferred	Preferred	Preferred	Preferred	Preferred
Other Government Policy Integration	Preferred	Preferred	Preferred	Preferred	Preferred	Preferred	Preferred

12.8.1 Pairwise Competition

12.8.1.1 Option 2C vs Option 2D Preferred Option Choice

Options 2C and 2D have similar alignments over approximately 90% of their length. They differ over approximately 1.2km between the townlands of Corranagh, Lurgybrack and Drumany. A pairwise competition was conducted on these two Options to establish the better of the two based on the impact score and preference of each option under each criterion.

Table 12-29 Pairwise Competition Options

Pairwise Competition Options: 2C and 2D	
Criteria	Notes
Environment	
Air Quality & Climate	No significant differences with both options having the same impact score and preference. Option 2D is ranked higher as Option 2C is closer to more residential houses.
Noise	No significant differences with both options having the same impact score and preference. Option 2D is ranked higher as Option 2C is routed on three sides of St Patrick's school and is closer to more residential houses.
Landscape & Visual	No significant differences with both options having the same impact score and preference. No clear differences however Option 2C is ranked higher than Option 2D due to Option 2D having a greater impact on view.
Biodiversity	No significant differences with both options having the same impact score and preference.
Waste	No significant differences with both options having the same impact score and preference.
Soils, Geology and Hydrogeology	No significant differences with both options having the same impact score and preference.
Hydrology	No significant differences with both options having the same impact score and preference. Option 2C had a slightly greater interaction with water course.
Cultural Heritage	No significant differences with both options having the same impact score and preference. Option 2D is ranked higher as Option 2C due to its higher number of impacts.
Material Assets - Agricultural	No significant differences with both options having the same impact score and preference. Option 2C is ranked higher than Option 2D due to Option 2D having a slightly greater impact on agricultural lands.
Material Assets – Non-agricultural	No significant differences with both options having the same impact score and preference. Option 2D is ranked higher as Option 2C due to Option 2C having a greater impact on residential properties.
Summary - Environment	For some of the Environmental sub-criteria there remains no clear difference between Options 2C and 2D. However, Option 2D is ranked higher than Option 2C by the relevant specialists on Air Quality & Climate, Noise, Cultural Heritage and Non-Agricultural Material Assets. Whereas Option 2C is ranked higher than Option 2D by the relevant specialists on Landscape & Visual and Agricultural Material Assets.
Safety	
Security	No significant differences with both options having the same impact score and preference.
Collision Reduction	No significant differences with both options having the same impact score and preference.
Road Safety Audit (Stage F)	No significant differences with both options having the same impact score and preference. Option 2D is ranked slightly higher than Option 2C by the specialist.

Pairwise Competition Options: 2C and 2D	
Criteria	Notes
Road Safety Impact Assessment	No significant difference between the options with the same impact score and preference. Option 2C is ranked slightly higher than Option 2D due to the draft alignment approaching limiting design standards; however, remaining within design standards.
Summary – Safety	For the Safety sub-criteria there is little difference between Options 2C and 2D. However, Option 2D is ranked higher than Option 2C by the Road Safety Auditor.
Physical Activity	
Physical Activity	Both options have a highly positive impact score and the same preference with health and journey ambience benefits arising from the proposed new segregated cycle infrastructure, connections to existing cycle infrastructure and residual network advantages.
Summary – Physical Activity	Options 2C and 2D provide similar proposals and therefore have similar preferences and impact scores.
Economy	
Transport Efficiency and Effectiveness	Option 2D has a slightly lower scheme cost due to lesser bridge crossing over the N13. Option 2D also has a slightly higher Benefit to Cost ratio (BCR) than Option 2C. Therefore, Option 2D is more preferable than Option 2C.
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 2C and 2D have a similar impact however Option 2D is preferable due to it having a marginally better BCR and a lower Capital cost.
Accessibility and Social Inclusion	
Deprived geographical areas	Both options will have a similar impact and are all scored neutral with similar preferences.
Vulnerable groups	Both options have a slightly positive impact score and preference; there was no difference between the options.
Summary – Accessibility and Social Inclusion	Both options are unlikely to alter the Pobal HP Deprivation index and will have a slight positive impact on Vulnerable Groups therefore both Options have a similar preference.
Integration	
Transport Integration	Both options have a positive impact score and preference; there was no difference between the options.
Land Use Integration	Both options support the county development plan, have a positive impact score and preference; there was no difference between the options.
Geographical Integration	Both options have a positive impact score and preference; there was no difference between the options.
Other government policy integration: Regional Balance	Both options have a positive impact score and preference; there was no difference between the options.
Summary – Integration	Both options have a positive impact score and preference; there was no difference between the options under Integration.

Option 2C vs Option 2D Preferred Option Choice

The pairwise appraisal confirms the impacts of both Options 2C and 2D in relation to Physical Activity, Accessibility and Social Inclusion and Integration are similar. Therefore, the Emerging Preferred Option is determined based on the Environment, Safety and Economy impacts.

Under the Environmental criteria, Option 2D is preferred in four sub-criteria (Air Quality & Climate, Noise, Cultural Heritage and Non-Agricultural Material Assets). This is due to the additional receptors (residential properties) that will be directly impacted by Option 2C. Whereas Option 2C is preferred in two sub-criteria (Landscape & Visual and Agricultural Material Assets); most likely the result of Option 2D impacts on agricultural lands. Overall in terms of the Environment Option 2D is preferred.

Under the Safety criteria Option 2D is marginally preferred over Option 2C. Although little between the options, Option 2D is given a slightly higher preference by the Road Safety Auditor. Option 2C has a slightly higher preference in the Road Safety Impact Assessment however this determination was because the preliminary road geometry design for Option 2D approached limiting design standards; although still within design standards. Given that the design is preliminary and would be developed at the Design Stage this was not considered as an appropriate reason to give Option 2C more preference.

Under the Economics criteria both options performed well however Option 2D is preferable due to it having a marginally better BCR and a lower capital cost.

Therefore, the pairwise assessment distinguishes that Option 2D is a better performing option than 2C.

12.8.2 Option Assessment

In reviewing the full spectrum of appraisals, evaluating the number and significance of impacts that each option has and comparing the preferences of the Options, Option 2D is identified as the Preferred Option Corridor. This is supported qualitatively, by reviewing balance of preferences across each criterion, and quantitatively by considering the cumulative impact of each option and the significance of those impacts. The result is also supported by a pairwise comparison above.

Therefore, it is concluded the **Option 2D is the Preferred Option** for Section 2.

12.9 Recommendation

Having completed the assessment of Stage 2 Project Appraisal for Section 2 of the TEN-T Priority Route Improvement Project, Donegal, the Preferred Option is identified as Option 2D (Red), which will be taken forward to Stage 3 of the Phase 2 Option Selection process.

13 STAGE 3 PREFERRED OPTION

Following completion of Stage 2 of the Option Selection process, the identified Preferred Option has been identified as Option 2D and this will be taken forward to Stage 3 of the Option Selection process.

A Project Appraisal Balance Sheet has been prepared for the TEN-T Priority Route Improvement Project, Donegal, based on the preferred routes for each section of the scheme. Refer to Chapter 17 for details.

SECTION 3: N14 MANORCUNNINGHAM TO LIFFORD/STRABANE/A5 LINK

14 STAGE 1 PRELIMINARY OPTIONS ASSESSMENT

14.1 Do Nothing and Do Minimum Options

At the outset of the Stage 1 assessment, a total of 42 Preliminary Options were developed for Section 3: N14 Manorcunningham to Lifford/Strabane/A5 Link. These are shown in Drawing Figure 3.1 in **Appendix E3**.

All preliminary options commenced within the vicinity of the N13/N14 Pluck Roundabout at Manorcunningham and all had a target completion/tie-in point within the vicinity of the N15 south of Lifford, with connectivity to the proposed N14/N15 to A5 Link from Northern Ireland. The N14/N15 to A5 Link is a dual carriageway link road which has already gone through Statutory Approval and is proposed to connect the existing N15 to the A5 Western Transport Corridor (WTC) across the River Finn in Northern Ireland.

The existing N14 is characterised by its irregular sub-standard alignment and numerous direct property accesses and junctions. As the N14 provides a key connection across the border to Northern Ireland, it is heavily trafficked with private and commercial vehicles, and has a varying cross-sectional width of 6m-7m. The N14 currently provides insufficient opportunities for safe overtaking and operates at a Level of Service (LOS) worse than D where LOS A is free flow conditions and LOS D being breakdown flow. LOS D is the point at which “speeds begin to decline slightly with slight increase of flows and density begins to increase somewhat more quickly” according to the TII design standard DN-GEO-03031. There is also a lack of vulnerable road user provision along the N14 and collision rates are higher than those prescribed in the National Parameters Value Sheet.

One of the TEN-T Project aims is to improve the regional connectivity throughout County Donegal. A Do Nothing scenario on the N14 would not work towards meeting any of the safety, operational or economic criteria set out in the TEN-T EU Directive (see Project Brief for project objectives). Furthermore, Donegal County Council are forecasting a population growth within the wider County Donegal area, with population expected to grow by 1.1% per annum between 2016 and 2024 and by 1.5% per annum between 2024 and 2038. Notwithstanding any future population growth, Brexit negotiations are underway, which is likely to result in the requirement for fewer, higher quality border crossings to channel vehicles through any potential border control. This may result in trip reassignment and attract vehicles that currently use a mixture of regional/local roads onto the National Primary roads to complete their strategic national and cross-border trips, further increasing the amount of traffic utilising these options.

The existing N14 is currently operating beyond its capacity and performing poorly with respect to safety. Considering future traffic growth and increased demand for higher quality border crossings, a Do Nothing Option was considered an unviable solution for the TEN-T project and was accordingly ruled out from further consideration for Section 3.

A Do Minimum alignment option has been considered as part of the Options assessment. This Do Minimum alignment consists of a combination of online and offline improvements, which utilises sections of the existing N14 and provides road alignment upgrades where necessary. When considering future traffic growth as previously discussed, a Type 2 Dual Carriageway cross-section would be the anticipated road corridor required to accommodate the daily traffic volumes and provide a LOS D. Additionally, access will not be permitted to the proposed route except for specific junctions. This presents additional challenges with respect to the ribbon development along the existing N14 and the substantial direct impacts the alignment would have on several existing properties.

Furthermore, due to the existing alignment of the N14, restricting a new road improvement to parts of the existing road corridor has a significant influence on the overall desire line of the road and subsequently the curvature of the alignment. The resulting alignment could be considered undesirable in comparison to a fully off-line option using optimum horizontal and vertical alignments.

Therefore, the Do Minimum option was discounted for Section 3 of the TEN-T Project.

14.2 Lifford Termination

During the constraint review for Section 3 it became apparent that there are significant topographical constraints within the study area. The most significant topographical constraint was on the eastern end of the study area at Croaghan Hill, which is situated to the immediate south west of Lifford, within the line between Manorcunningham and the N14/N15 to A5 Link road. Croaghan Hill is centred in an area of steep topography. Four termination options were developed and assessed with respect to Environment, Engineering and Economy. Three of the options performed poorly due to significant excavation and earthworks to obtain an acceptable road alignment, which had a consequent effect on cost and environmental impact. Subsequently one feasible option segment was identified and brought forward as a common termination segment for all Stage 1, Phase 2 options. This termination runs to the east of Croaghan Hill, following the general contour lines of the hill.

14.3 Preliminary Options

The Option Selection – Stage 1 Assessment for Section 3 is presented in the form of a matrix in **Appendix G3**, colour coded as LOW PREFERENCE (red), MEDIUM PREFERENCE (orange) or HIGH PREFERENCE (green). The matrix presents the detailed assessment under each criterion. A summary of each option is presented in **Table 14-1.** A drawing of the preliminary options is shown in Figure 3.1 in **Appendix E3**. This drawing defines the segments for each option as detailed in **Table 14-1**.

Table 14-1 Section 3 Stage 1 Preliminary Options

Option	Segments included within Option	Description
Option 3.1	B01 R01 R02 P04 P05 R04 R05 R06 B05	All these options begin near to/online the existing N14 for approximately 1km before continuing off in an easterly direction and curving around the eastern side of Drumoghill. They then turn southward toward the existing N14 at Sheskinapoll. The corridor continues in a south easterly direction close to the existing N14 to Drumbeg. At this point the options differ with Options 3.1 and 3.2 taking a south-west direction and aligning through Hollands and Moneen. These then curve back toward the other options. Option 3.1 crosses the Deele to the East of Murlough and Option 3.2 crosses the Deele to the west. Options 3.3 and 3.4 curve in a northerly direction to the townland of Tamnawood. At this point the options take the same alignment over the Deele to the west of Murlough. All the options finish with the same segment at the Lifford end – B05.
Option 3.2	B01 R01 R02 P04 P05 R04 R05 P09 G04 B05	
Option 3.3	B01 R01 R02 P04 P05 P06 B04 G03 G04 B05	
Option 3.4	B01 R01 R02 P04 P05 P06 G01 G02 G03 G04 B05	
Option 3.5	B01 R01 R03 DG04 P05 R04 R05 R06 B05	These options begin with the same alignment as Options 3.1 to 3.4 around the eastern side of Drumoghill. They then deviate to the east of Options 3.1 to 3.4 in a south easterly direction from Doorable, parallel to the existing N14 for approximately 3km just beyond the R236. At this point all options then curve back in a southerly direction toward the existing N14 to Carnshannagh. At this point, the options vary with Options 3.5 and 3.6 curving eastward again, taking the same alignments as Options 3.1 and 3.2, while Options 3.7 and 3.8 continue the alignment in a south easterly direction in the same way as Options 3.3 and 3.4. All the options finish with the same segment at the Lifford end – B05.
Option 3.6	B01 R01 R03 DG04 P05 R04 R05 P09 G04 B05	
Option 3.7	B01 R01 R03 DG04 P05 P06 B04 G03 G04 B05	
Option 3.8	B01 R01 R03 DG04 P05 P06 G01 G02 G03 G04 B05	
Option 3.9	B01 R01 R03 DG03 R06 B05	These options begin with the same alignment as Options 3.1 to 3.8 around the eastern side of Drumoghill. They then continue on the same alignment as Options 3.5 to 3.8, aligning
Option 3.10	B01 R01 R03 DG03 P09 G04 B05	

Option	Segments included within Option	Description
		to the east of the existing N14 from Doorable to the east of the R236. At this point the options take a new alignment to the east of all other options, through the townlands of Drummucklagh and Mulnagung before returning to Moneen. At this point, the options go in two opposite directions as previously described (to the east or west of Murlough) across the River Deele to tie into Segment B05.
Option 3.11	B01 B02 B03 P04 P05 RO4 R05 R06 B05	All these options begin near to/online the existing N14 for approximately 1km. They then align to the south of Drumoghill before curving near the townland of Drumcairn back toward the existing N14 at Sheskinapoll. The options then align in a south easterly direction for approximately 4km to Feddyglass where Options 3.11 to 3.14 differ. Option 3.11 takes the most easterly direction through Hollands and Moneen and Option 3.14 being the most westerly option via the southern curve from Feddyglass to Tamnawood.
Option 3.12	B01 B02 B03 P04 P05 RO4 R05 P09 G04 B05	
Option 3.13	B01 B02 B03 P04 P05 P06 B04 G03 G04 B05	
Option 3.14	B01 B02 B03 P04 P05 P06 G01 G02 G03 G04 B05	
Option 3.15	B01 B02 DG02 C02 C03 G02 G03 G04 B05	This option begins near to/online the existing N14 for approximately 1km. It then aligns to the south of Drumoghill before curving past Drumcairn and continuing in a southerly direction away from the existing N14 through the townland of Ballyholey Far. At this point, the option continues on the western extremity through the townlands of Drumfad and Broadlea parallel to other options and the existing N14 before returning toward at Tamnawood. The option then continues across the River Deele to the west of Murlough and ties into Segment BO5.
Option 3.16	B01 B02 DG02 O01 P04 P05 R04 R05 R06 B05	These options follow a similar alignment to Option 3.15 aligning to the south of Drumoghill before curving past Drumcairn. At this point, these options return the curvature back toward the existing N14 at Sheskinapoll. All options then align south eastward for approximately 3 to 4km. Options to the east include Options 3.16 and 3.17 which go through Hollands and Moneen. Options 3.18 and 3.19 continue in the same direction, with a curve to the north or south to Tamnawood and subsequently cross the Deele to the west of Murlough. All options then tie into Segment B04.
Option 3.17	B01 B02 DG02 O01 P04 P05 R04 R05 P09 G04 B05	
Option 3.18	B01 B02 DG02 O01 P04 P05 P06 B04 G03 G04 B05	
Option 3.19	B01 B02 DG02 O01 P04 P05 P06 G01 G02 G03 G04 B05	
Option 3.20	B01 P01 C01 O01 P04 P05 R04 R05 R06 B05	These options commence as per the previous options near the existing N14 at Manorcunningham but change to a direct south eastern alignment from Labbadish, through Drumcairn and subsequently curve back toward the existing N14 near Sheskinapoll. The options then take various forms as per Options 3.16 to 3.19 above.
Option 3.21	B01 P01 C01 O01 P04 P05 R04 R05 P09 G04 B05	
Option 3.22	B01 P01 C01 O01 P04 P05 P06 B04 G03 G04 B05	
Option 3.23	B01 P01 C01 O01 P04 P05 P06 G01 G02 G03 G04 B05	
Option 3.24	B01 P01 C01 C02 C03 G02 G03 G04 B05	This option commences as per the previous options near the existing N14 at Manorcunningham but changes to a direct south eastern alignment from Labbadish through Drumcairn and then curves in a southerly direction to the western extremity of the study area. The option aligns through the townlands of Drumfad and Broadlea parallel to other options and the existing N14 before returning toward at Tamnawood. The option then continues across the River Deele to the west of Murlough and ties into Segment BO5.
Option 3.25	B01 DG01 C02 C03 G02 G03 G04 B05	This option commences on/near the existing N14 at Manorcunningham for approximately 800m before coming offline at Labbadish. The option then curves around the south of the townland of Drumcairn. Option 3.25 then continues on the same alignment as Option 3.24 through Ballyholey Far, Drumfad, Broadlea and crosses the River Deele to the west of Murlough before tying into segment B05.

Option	Segments included within Option	Description
Option 3.26	B01 DG01 O01 P04 P05 R04 R05 R06 B05	These options commence on/near the existing N14 at Manorcunningham for approximately 800m before coming offline at Labbadish. The options then curve around the south of the townland of Drumcairn and continue toward the existing N14 at Sheskinapoll. The options then take various forms as per Options 3.16 to 3.19 above.
Option 3.27	B01 DG01 O01 P04 P05 R04 R05 P09 G04 B05	
Option 3.28	B01 DG01 O01 P04 P05 P06 B04 G03 G04 B05	
Option 3.29	B01 DG01 O01 P04 P05 P06 G01 G02 G03 G04 B05	
Option 3.30	LP01 C03 G02 G03 G04 B05	These are the most westerly options. The options follow an off-line alignment in a south westerly direction from the N13/N14 junction around south of the townland of Pluck. After crossing the Corkey river, the options curve back to an easterly direction through Mondooey following the same alignment as Option 3.25.
Option 3.31	LP01 C03a L01 C03c G02 G03 G04 B05	
Option 3.32	B01 DG01 C02 C03a L01 C03c G02 G03 G04 B05	This option commences on/near the existing N14 at Manorcunningham for approximately 800m before coming offline at Labbadish. The option then curves around the south of the townland of Drumcairn southerly direction to the western extremity with the remaining alignment the same as Option 3.24.
Option 3.33	B01 P01 C01 C02 C03a L01 C03c G02 G03 G04 B05	This option is the same as Option 3.24 but with one variation for approximately 3km from Ballyholey Far to Dromore Little. This alternative segment is to the east of Option 3.24.
Option 3.34	B01 B02 DG02 C02 C03a L01 C03c G02 G03 G04 B05	This option is the same as Option 3.15 but with one variation for approximately 3km from Ballyholey Far to Dromore Little. This alternative segment is to the east of Option 3.15.
Option 3.35	B01 DG01 O01 P04a L02 C03c G02 G03 G04 B05	This option begins the same as Option 3.26 with a new alignment in a due south direction from Carrickdawson to Dromore Little. From this point, the option has the same alignment as Options 3.24, 3.25, 3.31, 3.32 and 3.33.
Option 3.36	B01 P01 C01 O01 P04a L02 C03c G02 G03 G04 B05	This option commences as per the previous options near the existing N14 at Manorcunningham, but abruptly change to a direct south eastern alignment from Labbadish through Drumcairn and subsequently curve back toward the existing N14 near Sheskinapoll. The option aligns south easterly for <2km and then takes a direction due south from Carrickdawson to Dromore Little. From this point, the option has the same alignment as Options 3.24, 3.25, 3.31, 3.32 and 3.33.
Option 3.37	B01 B02 DG02 O01 P04a L02 C03c G02 G03 G04 B05	This option is the same as Options 3.16 to 3.19 until Sheskinapoll. At this point, the option continues to align south eastward for 1-2km and then changes direction due south from Carrickdawson to Dromore Little. From this point, the option has the same alignment as Options 3.24, 3.25, 3.31, 3.32 and 3.33.
Option 3.38	B01 B02 B03 P04a L02 C03c G02 G03 G04 B05	This option is the same as Options 3.11 to 3.14 until Sheskinapoll. At this point, the option continues to align south eastward for 1-2km and then changes direction due south from Carrickdawson to Dromore Little. From this point, the option has the same alignment as Options 3.24, 3.25, 3.31, 3.32 and 3.33.
Option 3.38a	B01 B02 B03 P04a L02 C03c G02 G03 M01	This option is the same as Option 3.38 with an alternative segment at the Lifford end of the scheme.
Option 3.38b	B01 B02 B03 P04a L02 C03c G02 G03 M02	This option is the same as Option 3.38 with an alternative segment at the Lifford end of the scheme.
Option 3.38c	B01 B02 B03 P04a L02 C03c G02 G03 F01	This option is the same as Option 3.38 with an alternative segment at the Lifford end of the scheme.

Option	Segments included within Option	Description
Option 3.39	B01 R01 R02 P04a L02 C03c G02 G03 G04 B05	This option is the same as Option 3.1 until Sheskinapoll. At this point, the option continues to align south eastward for 1-2km and then changes direction due south from Carrickdawson to Dromore Little. From this point, the option has the same alignment as Options 3.24, 3.25, 3.31, 3.32 and 3.33.

14.4 Public Consultation Feedback

A second series of public consultations was held in April and May 2018, the Stage 1 options were presented alongside the shortlisted options.

Features and possible constraints identified by attendees included:

- A windmill was identified south-west of Lifford;
- West of Feddyglass Woods is a long, significant treeline area;
- A potential souterrain was identified south of Feddyglass;
- Agricultural lands north of Feddyglass were identified as being areas utilised by Whooper Swans.

14.5 Elimination of Options

Following the identification of an initial number of 42 options, an assessment was undertaken between segment options at the Lifford end only. The aim of this was to determine which of the four terminations would be most feasible to bring forward into Stage 1 Preliminary Options. As a result, the 42 options were initially refined to 39 viable options for further consideration in Stage 1.

The 39 options were assessed and elimination of a further 20 options were eliminated taking into consideration those options which were poorly performing across numerous criteria as outlined in

Table 14-2**.** The remaining 19 options were brought forward for further examination as part of the Stage 1 assessment. Some of the options eliminated had a few common poor performing criteria such as:

- Options with the greatest impact on residential properties or local community facilities;
- Options aligning through Feddyglass Woods, a proposed Natural Heritage Area (pNHA);
- Some options to the eastern extremity of the study area performed poorly due to length, topography and alignment;
- Options that crossed the Deele River to the east of Murlough resulted in significant earthworks.

It should be noted that options were not eliminated if only one criterion in the matrix scored poorly – the option eliminations were as a result of more than one element performing worse than other options.

At this point, option elimination was continued by completing competitions between options. For example, where two options took the same alignment for most of the length except over a short distance between two "nodes", the characteristics and scoring of these options were compared to identify the most appropriate option to retain for further assessment. In cases where both options were deemed to perform equally, both options were retained and brought forward as a shortlisted option.

The Option Selection – Stage 1 Assessment for Section 3 is presented in the form of a matrix in **Appendix G3.**

Table 14-2 lists the options eliminated during the Stage 1 process and provides reasons for elimination in each case.

Table 14-2 Eliminated Options following the Stage 1 Assessment

Option	Option Segments	Reason for Elimination
Option 3.1	B01 R01 R02 P04 P05 R04 R05 R06 B05	Eliminated due High impact on archaeology and poor performance across other criteria including: ▪ The length of side roads required ▪ Number of communities severed ▪ Length of the mainline within the floodplain ▪ Cost
Option 3.2	B01 R01 R02 P04 P05 R04 R05 P09 G04 B05	Eliminated due to poor performance across the following criteria: ▪ Length of the mainline road ▪ The length of side roads required ▪ Significant earthworks ▪ Cost
Option 3.5	B01 R01 R03 DG04 P05 R04 R05 R06 B05	Eliminated due to impact on archaeology and poor performance across other criteria including: ▪ Length of the mainline road ▪ The length of side roads required ▪ Number of interfaces with the existing road network ▪ Alignment
Option 3.6	B01 R01 R03 DG04 P05 R04 R05 P09 G04 B05	Eliminated due to poor performance across the following criteria: ▪ Length of the mainline road ▪ The length of side roads required ▪ Significant earthworks ▪ Cost ▪ Alignment
Option 3.7	B01 R01 R03 DG04 P05 P06 B04 G03 G04 B05	Options 3.7 and 3.8 follow a similar alignment to Options 3.3 and 3.4. A comparison between these four options resulted in Options 3.7 and 3.8 being eliminated due to poorer performance on the following criteria: ▪ Length of the mainline road ▪ Alignment
Option 3.8	B01 R01 R03 DG04 P05 P06 G01 G02 G03 G04 B05	

Option	Option Segments	Reason for Elimination
Option 3.9	B01 R01 R03 DG03 R06 B05	Eliminated due to impact on archaeology and ecology, as well as poor performance across other criteria including: ▪ Length of the mainline within the floodplain ▪ Number of interfaces with the existing road network
Option 3.10	B01 R01 R03 DG03 P09 G04 B05	Eliminated due to impact on ecology and poor performance across other criteria including: ▪ Length of the mainline road ▪ Number of interfaces with the existing road network ▪ Significant earthworks
Option 3.11	B01 B02 B03 P04 P05 RO4 R05 R06 B05	Eliminated due to impact on archaeology and poor performance across other criteria including: ▪ Air quality ▪ The length of side roads required ▪ Length of the mainline within the floodplain ▪ Significant earthworks
Option 3.12	B01 B02 B03 P04 P05 RO4 R05 P09 G04 B05	This option follows a similar alignment to Option 3.13. A comparison between the options resulted in Option 3.12 being eliminated due to poorer performance on the following criteria: ▪ Length of the mainline road ▪ The length of side roads required ▪ Significant earthworks ▪ Residential Impact ▪ Cost
Option 3.16	B01 B02 DG02 O01 P04 P05 R04 R05 R06 B05	Eliminated due to impact on archaeology and poor performance across other criteria including: ▪ The length of side roads required ▪ Significant earthworks ▪ Length of the mainline within the flood plain ▪ Air quality
Option 3.17	B01 B02 DG02 O01 P04 P05 R04 R05 P09 G04 B05	Eliminated due poor performance across the following criteria: ▪ The length of side roads required ▪ Significant earthworks ▪ Air quality
Option 3.20	B01 P01 C01 O01 P04 P05 R04 R05 R06 B05	Eliminated due to impact on archaeology and poor performance across other criteria including: ▪ Length of the mainline within the floodplain ▪ The length of side roads required ▪ Number of interfaces with the existing road network
Option 3.21	B01 P01 C01 O01 P04 P05 R04 R05 P09 G04 B05	Eliminated due to poor performance across the following criteria: ▪ Number of interfaces with the existing road network ▪ The length of side roads required ▪ Significant earthworks ▪ Cost
Option 3.22	B01 P01 C01 O01 P04 P05 P06 B04 G03 G04 B05	Options 3.22 and 3.23 follow a similar alignment to Options 3.13 and 3.18. A comparison between the four options resulted in Options 3.22 and 3.23 being eliminated due to poorer performance on the following criteria: ▪ Significant earthworks ▪ Residential impact ▪ Cost
Option 3.23	B01 P01 C01 O01 P04 P05 P06 G01 G02 G03 G04 B05	
Option 3.24	B01 P01 C01 C02 C03 G02 G03 G04 B05	This option follows a similar alignment to Option 3.15. A comparison between the two options resulted in Option 3.24 being eliminated due to poorer performance on the following criteria: ▪ Residential Impact
Option 3.25	B01 DG01 C02 C03 G02 G03 G04 B05	Eliminated due to impact on archaeology and poor performance across other criteria including:

Option	Option Segments	Reason for Elimination
		▪ Community impact ▪ Community severance ▪ Residential impact ▪ Significant earthworks ▪ Alignment
Option 3.26	B01 DG01 O01 P04 P05 R04 R05 R06 B05	Eliminated due to impact on archaeology and poor performance across other criteria including: ▪ Community impact ▪ Residential impact ▪ The length of side roads required ▪ Number of interfaces with the existing road network ▪ Length of the mainline within the flood plain ▪ Significant earthworks
Option 3.27	B01 DG01 O01 P04 P05 R04 R05 P09 G04 B05	Eliminated due to impact on archaeology and poor performance across other criteria including: ▪ Community impact ▪ Residential impact ▪ The length of side roads required ▪ Number of interfaces with the existing road network ▪ Length of the mainline within the floodplain ▪ Significant earthworks ▪ Cost
Option 3.28	B01 DG01 O01 P04 P05 P06 B04 G03 G04 B05	Eliminated due to impact on archaeology and poor performance across other criteria including: ▪ Community impact ▪ Residential impact ▪ Significant earthworks
Option 3.29	B01 DG01 O01 P04 P05 P06 G01 G02 G03 G04 B05	Eliminated due to impact on archaeology and poor performance across other criteria including: ▪ Community impact ▪ Residential impact ▪ Significant earthworks ▪ Number of interfaces with the existing road network ▪ Alignment
Option 3.31	LP01 C03a L01 C03c G02 G03 G04 B05	Eliminated due to poor performance across the following criteria: ▪ Community severance ▪ Major river crossings ▪ Alignment ▪ Cost
Option 3.32	B01 DG01 C02 C03a L01 C03c G02 G03 G04 B05	Eliminated due to impact on archaeology and poor performance across other criteria including: ▪ Community impact ▪ Community severance ▪ Residential impact ▪ Alignment
Option 3.33	B01 P01 C01 C02 C03a L01 C03c G02 G03 G04 B05	This option follows a similar alignment to Option 3.24. A comparison between the two options resulted in Option 3.33 being eliminated due to poorer performance on the following criteria: ▪ Residential impact
Option 3.34	B01 B02 DG02 C02 C03a L01 C03c G02 G03 G04 B05	Eliminated due to poor performance across the following criteria: ▪ Significant earthworks ▪ Community severance ▪ Alignment
Option 3.35	B01 DG01 O01 P04a L02 C03c G02 G03 G04 B05	Eliminated due to impact on archaeology and poor performance across other criteria including: ▪ Community impact ▪ Community severance ▪ Residential impact

Option	Option Segments	Reason for Elimination
		▪ Earthworks
Option 3.36	B01 P01 C01 O01 P04a L02 C03c G02 G03 G04 B05	This option follows a similar alignment to Option 3.39. A comparison between the two options resulted in Option 3.36 being eliminated due to poorer performance on the following criteria: ▪ Community impact ▪ Residential impact
Option 3.37	B01 B02 DG02 O01 P04a L02 C03c G02 G03 G04 B05	This option follows a similar alignment to Option 3.38. A comparison between the two options resulted in Option 3.37 being eliminated due to poorer performance on the following criteria: ▪ Length of the mainline within the flood plain ▪ The length of side roads required ▪ Significant earthworks ▪ Cost
Option 3.38	B01 B02 B03 P04a L02 C03c G02 G03 G04 B05	This option follows a similar alignment to Option 3.39. A comparison between the two options resulted in Option 3.38 being eliminated due to poorer performance on the following criteria: ▪ Impact on archaeology ▪ Significant earthworks
Option 3.38a	B01 B02 B03 P04a L02 C03c G02 G03 M01	Eliminated due to poor performance across the following criteria: ▪ Length of the mainline road ▪ Significant earthworks (greater than 3.5 million m^3 surplus material) ▪ Cost
Option 3.38b	B01 B02 B03 P04a L02 C03c G02 G03 M02	Eliminated due to poor performance across the following criteria: ▪ Significant earthworks (greater than 3 million m^3 surplus material) ▪ Cost
Option 3.38c	B01 B02 B03 P04a L02 C03c G02 G03 F01	Eliminated due to poor performance across the following criteria: ▪ Length of the mainline road ▪ Significant earthworks (greater than 7.4 million m^3 surplus material) ▪ Cost

Following this assessment nine options remained. Within this, there were three pairs of options that had similar alignments with only slight variation. Each pair is identified as one option with a variation.

Therefore, there are six shortlisted options, with three of the options having a similar variation of the option, being brought forward to Stage 2 of the option selection process.

14.6 Stage 1 Recommendation

Having completed the Stage 1 Preliminary Options Assessment for Section 3 of the TEN-T Priority Route Improvement Project, Donegal, a total of 6 shortlisted options are to be taken forward to Stage 2 of the Phase 2 Option Selection process. These shortlisted options are presented in **Table 14-3**. They are also illustrated in the Drawings in **Appendix E3.**

Table 14-3 Shortlisted Options to be taken forward to Stage 2

	Option	Segments	Description
1	Option 3A1/3A2 Blue (Options 3.3 and 3.4)	B01 R01 R02 P04 P05 P06 And B04 G03 G04 B05 Or G01 G02 G03 G04 B05	This option is approximately 18km long. It at the N13/N14 junction and runs along a similar/same alignment as the existing N14 for approximately 800m. The option then changes to a westerly direction before curving around the townland of Drumoghill and aligning southward for approximately 3km close to the existing N14 at Sheskinapoll. The option continues in a south easterly direction for approximately 4km to Feddyglass. At this point, the option can go one of two ways for approximately 2km: in a northerly curve or a southerly curve to the townland of Tamnawood. At this point the option, along with all other options, continues in a south easterly direction to Murlough. All the options then curve around to the east side of Croaghan hill and subsequently in a southerly direction between Coneyburrow and Beechwood park. Here the termination point occurs next to the existing N15 on greenfield land.
2	Option 3B1/3B2 Red (Options 3.13 and 3.14)	B01 B02 B03 P04 P05 P06 And B04 G03 G04 B05 Or G01 G02 G03 G04 B05	This option is approximately 17.4km long. It runs along a similar alignment to the Orange corridor (Options 3.18 and 3.19). It begins at the N13/N14 junction and runs along a similar/same alignment as the existing N14 for approximately 800m. The option then continues in a similar westerly direction offline towards Drumoghill before a large curve bring the corridor south through Drumcairn. At this point, the Red option differs to the Orange option, with a wider curve bringing the option towards the existing N14 at Sheskinapoll. The option then aligns in a south easterly direction for approximately 4km to Feddyglass. At this point, the option can go one of two ways for approximately 2km: in a northerly curve or a southerly curve to the townland of Tamnawood. At this point the option, along with all other options, continues in a south easterly direction to Murlough. All the options then curve around to the east side of Croaghan hill and subsequently in a southerly direction between Coneyburrow and Beechwood park. Here the termination point occurs next to the existing N15 on greenfield land.
3	Option 3C1/3C2 Orange (Options 3.18 and 3.19)	B01 B02 DG02 O01 P04 P05 P06 and B04 G03 G04 B05 Or G01 G02 G03 G04 B05	This option is approximately 17.7km long. It begins at the N13/N14 junction and runs along a similar/same alignment as the existing N14 for approximately 800m. The option then continues in a similar westerly direction offline towards Drumoghill direction before two large curves bring the option close to the existing N14 at Sheskinapoll. The option then aligns in a south easterly direction for approximately 4km to Feddyglass. At this point, the option can go one of two ways for approximately 2km: in a northerly curve or a southerly curve to the townland of Tamnawood. At this point the option, along with all other options, continue in a south easterly direction to Murlough. All the options then curve around to the east side of Croaghan hill and subsequently in a southerly direction between Coneyburrow and Beechwood park. Here the termination point occurs next to the existing N15 on greenfield land.

	Option	Segments	Description
4	Option 3D Purple (Option 3.15)	B01 B02 DG02 C02 C03 G02 G03 G04 B05	This option is approximately 17.5km long. It begins at the N13/N14 junction and runs along a similar/same alignment as the existing N14 for approximately 800m. The option then continues in a similar westerly direction offline towards Drumoghill before a large curve southward to Drumcairn. Subsequently, the option aligns in a generally south easterly direction north of Mondooey and through Ballyholey Far, Ballyholey Near and Drumfad to Broadlea. At this point, the option turns to a more easterly direction to the townland of Tamnawood. At this point the option, along with all other options, continues in a south easterly direction to Murlough. All the options then curve around to the east side of Croaghan hill and subsequently in a southerly direction between Coneyburrow and Beechwood park. Here the termination point occurs next to the existing N15 on greenfield land.
5	Option 3E Cyan (Options 3.30)	LP01 C03 G02 G03 G04 B05	This option is approximately 17.4km long. It begins at the N13/N14 junction and continues in a southerly direction, curving around the village of Pluck and the townland of Labbadish before changing to a more easterly direction through Mondooey. The option then follows the alignment of the Purple option through Ballyholey Far, Ballyholey Near and Drumfad to Broadlea. At this point, the option turns to a more easterly direction to the townland of Tamnawood. At this point the option, along with all other options, continues in a south easterly direction to Murlough. All the options then curve around to the east side of Croaghan hill and subsequently in a southerly direction between Coneyburrow and Beechwood park. Here the termination point occurs next to the existing N15 on greenfield land. This option also provides for an alternative connection to Section 2 Option 2F2.
6	Option 3F Pink (Options 3.39)	B01 R01 R02 P04a L02 C03c G02 G03 G04 B05	This option is approximately 18.4km long. It begins at the N13/N14 junction and runs along a similar/same alignment as the existing N14 for approximately 800m. The option then changes to a westerly direction before curving around the townland of Drumoghill and aligning southward for approximately 3km close to the existing N14 at Sheskinapoll. The option continues in a south easterly direction for approximately 4km to Feddyglass. At this point, the option can go one of two ways for approximately 2km: in a northerly curve or a southerly curve to the townland of Tamnawood. At this point the option, along with all other options, continues in a south easterly direction to Murlough. All the options then curve around to the east side of Croaghan hill and subsequently in a southerly direction between Coneyburrow and Beechwood park. Here the termination point occurs next to the existing N15 on greenfield land.

All the above shortlisted options are taken forward to Phase 2, Stage 2 Project Appraisal. In order to simplify the description of the options during Stages 2 and 3, the option naming convention in Stage 1 has been amended as set out in **Table 14-4.**

Table 14-4 Option Names for Stage 2

Stage 1 Option Name	Stage 2 Option Name and Variants	
Option 3.3 and 3.4	Blue	3A1
		3A2
Option 3.13 and 3.14	Red	3B1
		3B2
Option 3.18 and 3.19	Orange	3C1
		3C2

Stage 1 Option Name	Stage 2 Option Name and Variants	
Option 3.15	Purple	3D
Option 3.30	Cyan	3E
Option 3.39	Pink	3F

15 STAGE 2 PROJECT APPRAISAL

15.1 Shortlisted Options

The summary of all shortlisted options that were considered for assessment for Stage 2 of the Option Selection process are shown in **Table 15-1.**

Table 15-1 Options for Stage 2 Assessment

Stage 2 Options	
Blue	3A1
	3A2
Red	3B1
	3B2
Orange	3C1
	3C2
Purple	3D
Cyan	3E
Pink	3F

These nine options, including the option variations, were assessed under each of the six project appraisal criteria, and their associated sub-criteria, as previously described in **Section 7.3**.

At the start of Stage 2, the options were further developed to outline designs to include all link / side roads and junctions. Further minor improvements were also made to the shortlisted options to reduce impacts where feasible. Following this further refinement, a more detailed project appraisal of each of the shortlisted options was undertaken in compliance with the TII PMGs and the TII Project Appraisal Guidelines Unit 7.0. Refer to Section 7 for a description of the Stage 2 option selection process.

15.2 Economy

15.2.1 Introduction

The Economic assessment of the options aims to determine and compare the relative economic benefits of each option, drawing conclusions from qualitative and quantitative assessments.

The Economy appraisal was assessed under the following sub-criteria:

- Transport Efficiency and Effectiveness
- Wider Economic Impacts
- Funding Impacts

15.2.2 Transport Efficiency and Effectiveness

Cost estimates were completed for the options considered during Stage 2 in accordance with the TII Cost Management Manual (CMM), using rates calculated to reflect market conditions in 2018. The cost estimates were based on alignment designs for Section 3 options prepared during the Stage 2 assessment. Refer to **Table 15-2** for Stage 2 cost estimates for each of the nine Section 3 options.

Table 15-2 Option Comparison Cost Estimates

	3A1	3A2	3B1	3B2	3C1	3C2	3D	3E	3F
Options Comparison Estimate (millions €)	€202	€206	€202	€205	€207	€210	€208	€206	€218

Table 15-3 below sets out the Present Value of Costs (PVC), Present Value of Benefits (PVB) and Benefit Cost Ratio. These have been calculated using TUBA and COBALT. The benefits shown do not include for the connection to the A5 Western Transport Corridor (A5 WTC), however a sensitivity test has been undertaken on one of the options to assess the potential additional benefits. For this sensitivity analysis, Option 3C1 (orange) was chosen. The inclusion of the A5 WTC increases the PVB to approximately €114m (TUBA + COBALT) for Option 3C1 with the BCR increasing to approximately 0.9.

In addition, the economic assessment is based on annualisation of the weekday AM, IP and PM periods for the TUBA assessment, based on data from TII TMU counters. PAG guidance indicates that extrapolation to other periods may be acceptable if justification can be provided. Having reviewed the full years count data, we consider it may be justifiable to expand the TUBA assessment to include the weekend interpeak period. This would add to the PVB for the schemes. In the case of Section 3 it may add in the region of 10% to the benefits. The potential to expand the assessment periods will be considered at the next phase of the project.

Table 15-3 Impact Scoring of Options in terms of Transport Efficiency and Effectiveness

	3A1	3A2	3B1	3B2	3C1	3C2	3D	3E	3F
PVC (millions €)	€107	€109	€107	€109	€110	€112	€111	€110	€116
PVB (millions €)	€61	€61	€68	€68	€68	€68	€64	€64	€44
BCR	**0.57**	**0.56**	**0.63**	**0.62**	**0.61**	**0.61**	**0.57**	**0.58**	**0.38**
Impact Description	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Slightly Negative
Impact Score	4	4	4	4	4	4	4	4	3

Based on the above and taking account of the sensitivity analysis of the A5 WTC, all options are given a neutral score with the exception of Option 3F which has a slightly negative impact score. The difference in scoring reflects that all options, except 3F have a similar BCR. Option 3F has a lower BCR than all other routes. The Neutral score is assigned as the options with the sensitivity tests included result in a BCR close to 1.0.

15.2.3 Wider Economic Impacts

15.2.3.1 Competition in the Market

All options for the N14 Manorcunningham to Lifford/Strabane/A5 link present an improved link to Northern Ireland. This directly improves links to Dublin, with improved connectivity to Derry and Belfast particularly following the full upgrade of the A5 WTC. There will also be a residual positive effect in terms of commercial attractiveness.

All Options are similar in terms of the improvements being made to the alignment, cross-section and future growth capacity, therefore, all Options score the same in this regard, which is slightly positive.

15.2.3.2 Agglomeration

The N14 will reduce travel time between Manorcunningham and the A5. This is a positive outcome in terms of reducing travel time between production centres on both sides of the border. Additionally, in conjunction with Section 2, journey times from Letterkenny to the A5/Northern Ireland will be reduced significantly. This results in improved connectivity to Derry, Belfast and Dublin. All Options perform similarly in this regard and deemed slightly positive.

15.2.3.3 Inward Investment

The improved infrastructure and connectivity to other larger economic centres, such as Dublin, Derry and Belfast, is likely to improve the attractiveness of the region and assist in securing inward investment. All options score slightly positive in this regard.

15.2.3.4 Labour Supply

The existing N14 between Manorcunningham and Lifford currently provides a link between existing labour markets. All the shortlisted Options for N14 are likely to improve the journey time, journey time reliability and the safety of road users travelling between labour markets. It is not anticipated that a significant change in labour supply will occur as a result of the options, however it is anticipated that a residual positive effect in terms of labour markets and attractiveness will remain. Therefore, all options score slightly positive in terms of Labour Supply.

15.2.3.5 Urban Regeneration

None of the N14 options will support urban regeneration, due to the rural location of the link. All options score neutral in terms of Wider Economic Benefits, the overall impact scores are shown in **Table 15-4.**

Table 15-4 Impact Scoring of Options in Terms of Wider Economic Benefits

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

15.2.4 Funding Impacts

The project aims to improve the strategic transport network in County Donegal. As the project will assist in improving connectivity to a peripheral region in Europe (which may become more isolated as a result of Brexit), then there is the potential opportunity to secure non-exchequer funding through the European Union.

Additionally, there is an opportunity to secure non-exchequer funding through the contract type, by employing a Public Private Partnership (PPP) type contract.

All options have the same opportunity avail of the above funding streams and therefore score slightly positive.

Table 15-5 Impact Scoring of Options in Terms of Funding Impacts

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

15.2.5 Comparison of Options

As previously described, all options have a similar impact on Economy with an overall slightly positive impact with the exception of Option 3F, which has an overall Neutral impact, due to it having the highest cost and worst Benefit Cost Ratio.

All options have very similar impacts in terms of Wider Economic Impacts and Funding Impacts. Therefore, the differentiating factors are based on the Transport Efficiency and Effectiveness sub criteria.

Under this sub criteria Options, in terms of Section 3 Option Comparison Estimates, excluding Option 3F which has the highest cost estimate, all Options are within approximately 4% of each other, with the preferred Options being 3A1, 3B1, 3B2, 3A2 and 3E. However, in terms of benefits Options 3B1/3B2 have increased benefits over Options 3A1/3A2 by the order of 11% and over Option 3E by the order of 7% in terms of Benefit to Cost Ratio

The key measure of Efficiency and Effectiveness to be used in the MCA is the transport user related Present Value of Benefits (PVB) the monetised benefits relating to the economy, safety and environment impacts of the scheme. Options 3B1/3B2/3C1/3C2 all provide similar PVB and are the preferred Options under this element.

The PVB are combined with the Present Value of Cost (PVC) as part of the overall economic assessment to identify the overall Benefit to Cost Ratio (BCR). In this regard the preferred Options, in order are 3B1, 3B2, 3C1, 3C2, 3E, 3D, 3A1, 3A2, 3F.

15.3 Safety

The safety assessment considers safety impacts as part of the Project Appraisal (Multi-Criteria Analysis). Refer to **Appendix C3.1.**

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

- Collision reduction
- Security of road users

The assessment also includes the findings of the following two safety reports:

- 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.
- 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.

15.3.1 Collision Reduction

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. All options provided a benefit in terms of collision reduction in the order of €5.9 to €5.7 million, except Option 3F, which provided a benefit of €4.5 million.

Table 15-6 Collision Reduction Appraisal

Option	3A1	3A2	3B1	3B2	3C1	3C2	3D	3E	3F
Impact Description	Major Positive	Major Positive	Major Positive	Major Positive	Major Positive	Major Positive	Major Positive	Major Positive	Moderate Positive
Impact Score	7	7	7	7	7	7	7	7	6

15.3.2 Security

The N14 is currently a sub-standard single carriageway route that has numerous roadside hazards. There are no 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 segregated shared pedestrian/cycle facilities within the mainline cross-section. This will provide an improvement in safety and security of cyclists and pedestrians.

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 safety and security of road users.

Table 15-7 Security Appraisal

	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

15.3.3 Road Safety Audit (Stage F, Part 1)

A Stage F Road Safety Audit Part 1 was undertaken which examined the options to consider all matters that may have an adverse effect on road safety and the perspective of all road users. The Road Safety Audit Report notes that all options represent a significant improvement to the existing arrangement in terms of safety.

A Stage F (Part 1) Road Safety Audit has been completed for Section 1. All options have been compared and subsequently ranked in preference based on safety considerations. The audit report is provided in **Appendix C3.1**, with a summary included below.

All options represent a significant improvement to the existing arrangements. All Options provide a reduction in the number of potential conflict points.

Options 3A1, 3A2, 3B1, 3B2, 3C1 and 3C2 are all scored as having a good effect on the existing N14/R236 junction and as having a high or medium horizontal alignment ranking. Options 3D, 3E and 3F poorer scoring reflects the potential negative impact on the existing N14/R236 junction and as having a low horizontal alignment ranking. Therefore, for the purposes of the Option selection Options 3A1, 3A2, 3B1, 3B2, 3C1 and 3C2 are provided with a Highly Positive score while Options 3D, 3E and 3F are provided with a Moderately Positive score.

The impact score of each option assessed with respect to Road Safety Audit is shown in **Table 15-8**.

Table 15-8 Road Safety Audit Appraisal

	3A1	3A2	3B1	3B2	3C1	3C2	3D	3E	3F
Impact Description	Major Positive	Major Positive	Major Positive	Major Positive	Major Positive	Major Positive	Moderate Positive	Moderate Positive	Moderate Positive
Impact Score	7	7	7	7	7	7	6	6	6

15.3.4 Road Safety Impact Assessment

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 as part of this Phase 2 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 15-9** sets out the impacts 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.

Table 15-9 Road Safety Impact Assessment Appraisal

	3A1	3A2	3B1	3B2	3C1	3C2	3D	3E	3F
Impact Description	Major Positive	Major Positive	Major Positive	Major Positive	Major Positive	Major Positive	Major Positive	Moderate Positive	Moderate Positive
Impact Score	7	7	7	7	7	7	7	6	6

15.4 Environment

The Stage 2 environmental appraisal was carried out considering the following sub-criteria:

- Air Quality and Climate,
- Noise,
- Landscape and Visual,
- Biodiversity (aquatic and terrestrial),
- Waste,
- Soils, Geology, and Hydrogeology,
- Hydrology,
- Architectural Heritage, Archaeological and Cultural Heritage, and
- Material assets (Agricultural)
- Material assets (Non-Agricultural).

Each option was appraised by competent experts and preferences determined. A summary of the findings of the competent expert in terms of each sub-criterion is presented in **Section 15.4.1** through **Section 15.8**. The completed environmental appraisal matrix is presented in **Section 15.8, Table 15-27.**

15.4.1 Air Quality and Climate

The air quality and climate analysis was undertaken by means of a desktop assessment. The assessment focussed on NOx exposure, PM_{10} exposure and the anticipated climate impacts through a calculation on greenhouse gas emissions (GHG). The detailed report on the assessment is included in **Appendix D3.1**.

The air quality scores provided in **Table 15-10** are largely dominated by the trend in receptor numbers. However, for this section, the variance in the number of properties affected is minimal and hence all options are considered to have a minor or slightly negative impact on air quality. As such, there is no clear preference for air quality amongst the options presented.

Climate impacts during the operation stage are based on total greenhouse gas (GHG) emissions associated with traffic on the road network as calculated by the DMRB regional model. The results of the study indicate no significant variation between the options which is unsurprising given the similarity in traffic patterns. Hence all options are classed as moderately negative for climate.

Table 15-10 Air Quality and Climate Appraisal

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

15.4.2 Noise

A comparative assessment of each of the nine options in Section 3 was carried out in relation to noise with reference to key sensitive receptors in proximity to the proposed options. The noise impacts for each of the options are identified so that those impacted by unacceptably high levels of noise can be avoided where feasible as part of the overall option selection process.

A qualitative assessment was carried out where the property impact rating (PIR) was calculated. The PIR is based on the anticipated traffic flows using each option and the number of properties likely to be impacted, banded into distances from the centreline of each option and within a 300m wide corridor. A qualitative assessment was then carried out which considered factors such as noise sensitive receptors and populated

areas. The results of the quantitative and qualitative assessments were then combined to provide an overall impact level for each option. The detailed report on the assessment is included in **Appendix D3.2**.

The options are not significantly different from a subjective point of view other than the Cyan (3E) Option which routes traffic away from the concentration of receptors in the Drumoghill area. This results in the ranking being predominantly on the PIR scores in a situation where there is little else to differentiate between them subjectively.

The quantitative assessment for the PIR was calculated from the Geodirectory counts. The qualitative assessment is based on a site visit, analysis of changes in traffic flows, the construction requirements and the location of proximal noise sensitive locations.

Option 3E (Cyan) is the overall preferred option from a noise and vibration perspective primarily due to the fact that it redirects traffic from the Drumoghill area.

Table 15-11 Noise Appraisal

	3A1	3A2	3B1	3B2	3C1	3C2	3D	3E	3F
Impact Description	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Slightly Positive	Neutral
Impact Score	4	4	4	4	4	4	4	5	4

15.4.3 Landscape and Visual

The landscape and visual impact assessment was undertaken to identify the landscape and visual receptors associated with each option and the likely effects upon them which are then taken into consideration in developing and refining the options. A desktop study, as well as site visits were undertaken to establish an understanding of the landscape and visual context of the proposed options. Landscape and visual impact assessments are assessed as two discrete topics:

- Landscape impact assessment is concerned with the alteration to the physical landscape which can give rise to changes in its character, how it is experienced and the ascribed value of the landscape.
- Visual impact assessment is concerned with changes that arise in the overall effect on the area's visual amenity.

The detailed report on the assessment is included in **Appendix D3.3**

It was concluded that when landscape impacts are considered overall for the proposed options there is a slight preference for Option 3B1 and Option 3C1 as these options utilise the existing N14 corridor for a greater proportion of their length when compared with other options. Proposed Options 3D, 3E and 3F are considered to have a greater potential impact on the landscape as these are further removed from the existing N14 corridor and would introduce new features into portions of the landscape where such features are not apparent.

There is little difference between Options 3A1, 3A2, 3C2 and 3B2 with regard to potential landscape effects, however Options 3A1, 3A2 introduce new features into the landscape to the east of Ballyboe, whilst proposed southern options associated with Option 3C2 and 3B2 are further west where embankments would be required.

When visual impacts are considered, proposed Options 3D, 3E and 3F have the least number of residential properties within the 0m-50m distance band. However, Option 3E has the highest number of residential properties in the 50m-100m distance band. All three options are considered to introduce embankments and cuttings into a portion of the landscape not currently impacted by such features.

When considering potential visual impacts in regard to Options 3A1 and 3A2, it is considered that whilst these options share similarities in the number of properties potentially being affected within 300m of the option, there is 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.

When considering Options 3B1 and 3B2 it is considered that whilst these options have the potential to impact on larger property numbers within 300m of the options, such affected properties are already impacted by the existing N14 road corridor. There is a slight preference for Option 3B1 as this is considered to have a slightly less visual impact in lower elevated land adjacent to the Deele River.

For Options 3C1 and 3C2 it is considered that whilst these options have the potential to impact on larger property numbers within 300m of the proposed options, such affected properties are already impacted by the existing N14 road corridor. There is a slight preference for Option 3C1 as this is considered to have a slightly less visual impact in lower elevated land adjacent to the Deele River.

A summary of each option and the impacts in terms of landscape and visual impact assessment is provided in **Table 15-12**.

Table 15-12 Summary of Landscape and Visual Appraisal

Option	3A1	3A2	3B1	3B2	3C1	3C2	3D	3E	3F
Impact Description	Major Negative	Major Negative	Moderate Negative	Moderate Negative	Moderate Negative	Moderate Negative	Major Negative	Major Negative	Major Negative
Impact Score	1	1	2	2	2	2	1	1	1

It should be noted that potential landscape and visual effects for the preferred option shall be mitigated by minimising the footprint of the new road in the landscape and by using carefully sited landscape screening and boundary treatments.

15.4.4 Biodiversity (Terrestrial and Aquatic)

The biodiversity study compared the potential impacts of the options for the proposed Section 3 on the terrestrial and aquatic natural environment. Each of the options was assessed as a 300m wide corridor to determine potential impacts on the principal ecological receptors within or adjacent to each option, and in relation to potential impacts arising from fragmentation or interference with species' movement across the options. The assessment was undertaken in accordance with the NRA Guidelines for the Assessment of Ecological Impacts of National Road Schemes (Revision 2, June 2009)

Consultations were undertaken with Inland Fisheries Ireland (IFI) and The Loughs Agency to determine the fisheries value of watercourses crossed by any of the options. Surveys were carried out targeting potential ecological receptors identified from the various data sources on or within the potential zone of influence of any of the options. Surveys aimed at confirming the habitat classification on a suite of sites identified from a review of aerial photography were undertaken in June 2018. All watercourses within the study area have potential ecological value, particularly the Deele River, the Swilly Burn, the Leslie hill Stream and the Corkey River. The Deele and Swilly Burn both flow into the River Foyle which is a designated SAC. The River Finn marks the southern boundary of the study area. The River Finn is one of Ireland's premier salmon waters.

An assessment of bat activity from the study area was also undertaken in August and September 2018. The study area is likely to be of low to moderate value for bats on account of the habitats present. The hot spots of bat activity are usually in areas of suitable foraging habitat such as woodlands.

A detailed assessment of the biodiversity (terrestrial and aquatic) of Section 3 options is included in **Appendix D3.4.**

Important areas for birds within and in the vicinity of the study area were identified from the BirdWatch Ireland and other organisations. Lough Swilly, which is located to the north of the Section 3 study area (within Section 2) supports internationally important numbers of Whooper Swan. The Swilly Burn lies within Section 3 study area, approximately 9km from Lough Swilly, and is surrounded by low lying open grassland, suitable for Whooper Swans for winter foraging. Apart from the Swilly Burn floodplain, there are no important bird areas identified within the study area and the habitats present are unsuited to supporting significant aggregations of wintering birds or likely flyways for wintering species. Other mammals are present throughout the study area such as foxes, hedgehogs' badgers and hares.

The NPWS and National Biodiversity Data Centre (NBDC) databases were used to identify the occurrence of protected faunal species within the study area. Species such as the Kingfisher, Atlantic salmon and lamprey are present in the Deele River.

All Options entail a crossing of the River Deele at Cavanacor where flood embankments on the river provide a high local importance. Similarly, all options cross the Swilly Burn flood embankments and wet grassland and scrub embankments which are also high local importance. The historic floodplain of the river here has low-lying open agricultural grassland on both sides of the river and is used frequently by wintering Whooper swan as a foraging ground.

Considering the relative importance of each site and the impact of each option it was concluded that Options 3A2 and 3F are joint preferred options from the biodiversity perspective as neither option impacts on any sites greater than Local Importance (higher value). Options 3B2, 3C2 and 3E are all equal as second preferences, while Option 3D emerges as the sole third preference. Options 3A1, 3B1 and 3C1 are all the least preferred options, as they all impact on the Whooper Swan foraging grounds at Mulnaveagh near the Swilly Burn.

Table 15-13 Summary of Biodiversity Appraisal

	3A1	3A2	3B1	3B2	3C1	3C2	3D	3E	3F
Impact Description	Major Negative	Slightly Negative	Major Negative	Moderately Negative	Major Negative	Moderately Negative	Major Negative	Moderately Negative	Slightly Negative
Impact Score	1	3	1	2	1	2	1	2	3

15.4.5 Waste

Waste is defined as any substance or object which the holder discards or intends or is required to discard. In terms of a road construction project, most naturally occurring materials excavated as part of the works will not be considered a waste as they can be re-used within the works. There are three broad types of excavated material as set out in TII's *Specification for Road Works Series 600 – Earthworks*:

- Acceptable material: material excavated from within the site or imported on to the site which meets the requirements of the specification for acceptability for use in the works;
- Unacceptable material Class U1: material excavated from within the site which, unless processed so that it meets the requirements of the specification for acceptable material will not be used in the works;
- Unacceptable material Class U2: material having hazardous chemical or physical properties requiring special measures for its excavation, handling, storing, transportation, deposition and disposal. Class U2 material excavated from within the site will not be used in the works unless processed so that it meets the requirements of the specification for acceptable material.

Acceptable excavated material that is not surplus to requirements will be re-used in the works for engineering purposes including fill to embankments, landscaping, etc. Acceptable material that is surplus to requirements will be used in spoil heaps on-site or at off-site locations, subject to proper approvals.

Both Class U1 and Class U2 material may be processed by mechanical, chemical or other means to render the material acceptable for use in the works. It is possible that some unacceptable material may become a waste if disposal of the material is required.

All excavated material from the site of the proposed road will be managed in accordance with best practice to ensure in so far as possible that there is minimal waste generated.

Any excavated contaminated material will fall under Class U2 and must be removed off-site for disposal at an authorised waste management facility. Currently, there is no indication of contaminated material being present within the footprint of the options.

Where there is a deficit of fill material for the construction of the project then clean soil and stone must be imported from other sources to make up the shortfall. This has the effect of requiring the use of fill material from quarries or borrow pits outside of the site boundary or the importation of inert waste fill material that has been re-classified as a by-product and which meets the specification for acceptable material. Production, processing and transporting of material to make up the deficit could have a significant environmental impact in terms of traffic movements, greenhouse gas emissions, use of valuable raw materials, etc.

At this stage in the project approximate estimates of the likely quantities of waste that will be generated from the works have been made. This will be further evaluated and assessed during the next phase.

In Section 3, all options have significant earthwork operations as the study area has a drumlin topography and a combination of low-lying alluvial areas and high elevation alignments. Where this material is to be stored on-site and reused it is important that it is not stored close to any watercourses or lakes.

Considering the option alignments for the mainline, side roads and junctions in Section 3 there is variance in the volume of materials required. Furthermore, additional volumes of fill material and disposal material are anticipated for all options for the purposes of alluvium replacement and unsuitable material disposal respectively. As such, common assumptions have been applied to each option in terms of material suitability and depth of alluvium to determine indicative material import and disposal quantities.

The earthworks estimates associated with each option are addressed within the Material Assets (non-agricultural) report included in **Appendix D3.9**

A summary of each option and the impacts in terms of waste appraisal is provided in **Table 15-14.**

Table 15-14 Summary of Waste Appraisal

	3A1	3A2	3B1	3B2	3C1	3C2	3D	3E	3F
Impact Description	Slightly Negative	Slightly Negative	Slightly Negative	Slightly Negative	Slightly Negative	Slightly Negative	Slightly Negative	Slightly Negative	Slightly Negative
Approximate Material disposal ('000 m3)	1,198	1,208	1,090	1,100	987	998	926	862	1328
Impact score	3	3	3	3	3	3	3	3	3

15.4.6 Soils, Geology, and Hydrogeology

The soils, geology and hydrogeology assessment examine each option in terms of their importance and the possible impacts resulting from the construction of a proposed option. The options are compared, and impacts assessed from a land, soil, and hydrogeological perspective. In order to compare the options, the assessment has considered and appraised the following attributes.

Soils and Geology:

- Bedrock geology
- Quaternary GeologyGeological heritage sites;
- Landfills and historic waste sites;
- Quarries and mineral resources;
- Aggregate Potential
- Karst features;
- Agricultural soils;
- Landfills
- Geomorphology and
- Extent of peat and soft ground.

Hydrogeology:

- Aquifers;
- Groundwater vulnerability;
- Source Protection Areas; and
- Important abstractions for water supply.

A detailed assessment of the options is included in **Appendix D3.5**.

The assessment was carried out in line with Table 4.2 'Summary of Soil and Geology Impacts for Route Corridor Options' of the 'Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes'

There are no significant receptors such as public supply wells, working quarries, karst features or groundwater dependent terrestrial ecosystems within the study area. The only receptor that has the potential to be impacted is the groundwater within the aquifer (rather than public supplies). The magnitude of impact on the water quality is estimated to be Small Adverse (results in minor impact on integrity of attribute or loss of small part of attribute). Considering the importance of the aquifer attributes (medium) and the magnitude of the impact (small), the overall significance of the impact is assessed to be Slight Adverse for all options. There is no significant difference in the options in terms of impact. The overall impact score for all the options is slightly negative.

Table 15-15 shows the overall Option impacts for Soils, Geology and Hydrogeology.

Table 15-15 Section 3 Summary of Soils, Geology and Hydrogeology Appraisal

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

15.4.7 Hydrology

The hydrology assessment was prepared having regard to the *TII Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes* as recommended by the TII *Project Appraisal Guidelines for National Roads Unit 7.0 – Multi Criteria Analysis*. A comparative evaluation of the options was undertaken, having regard to the specific hydrological impacts associated with each option in order to identify a preferred option(s). This assessment was carried out further to a review of all the available information on the study area. The sources of information have been listed below.

- Aerial photography and mapping of study area (GSI, OSI and online sources);

- Environmental Protection Agency online mapping. (https://gis.epa.ie/EPAMaps);
- Environmental Protection Agency, (website www.epa.ie) – water quality data;
- County Donegal Development Plan 2018-2024;
- Office of Public Works Historical Flood Reports (Website www.floodmaps.ie);
- Water Framework directive 2000 (website www.wfdireland.ie) – river status;
- Interactive CFRAM Mapping, (http://www.cfram.ie/pfra/interactive-mapping) OPW Flood information (https://www.floodinfo.ie);

A detailed assessment of the hydrological impacts of the options is included in the **Appendix D3.6**.

The assessment considered the length of each option within Water Framework Directive catchments, the impact each Option may have on water quality considering EPA water quality results and a review of the recorded flooding events.

Most of the impacts on surface water are at locations where the Options cross existing watercourses. The impact scores assigned to the crossing points are based on the overall impact each option will have throughout the construction and maintenance phase. A bridge/culvert crossing of an existing watercourse has the potential to impact both the existing flow/flood regime along with the water quality, therefore the impact scores on watercourses consider both aspects. Where an Option impacted on a significant flood plain this was included as a separate impact.

Due to it traversing more elevated ground and the fact that it avoids floodplains, Option 3D is the preferred option in terms of water. Options 3B2 and 3C2 are second and third preference respectively. **Table 15-16** provides the impact score of all Section 3 options with respect to Hydrology.

Table 15-16 Section 3 Summary of Hydrology (Water) Appraisal

	3A1	3A2	3B1	3B2	3C1	3C2	3D	3E	3F
Impact Description	Moderately Negative	Moderately Negative	Slightly Negative	Slightly Negative	Slightly Negative	Slightly Negative	Slightly Negative	Moderately Negative	Moderately Negative
Impact Score	2	2	3	3	3	3	3	2	2

15.4.8 Architectural Heritage, Archaeological and Cultural Heritage

The architectural heritage and archaeology assessments (together known as cultural heritage) was undertaken in accordance with *TII Guidelines for the Assessment of Archaeological Heritage Impacts of National Road Schemes (2005)* and *Guidelines for the Assessment of Architectural Heritage Impacts of National Road Schemes (2005)*.

Principles applied in this assessment have been both desk and field-based.

- **Desk-Study**: further expansion of information gathered during the Constraints Study (refer to **Appendix B**), including the examination of historical cartographic sources, NMI files, aerial mapping/photography and relevant published information.
- **Field-Study**: primarily a windshield survey of the environs, topography and landscape and observations therein with a view to identifying significant cultural heritage impacts and/or areas of archaeological potential. This has been coupled with site specific visits, as required, in order to determine level of impact and extent and condition of the heritage asset.

The compilation of a cultural heritage constraints inventory has been undertaken to include core locational and descriptive data, as well as identification of the distance to the options and the type of impact (direct/indirect).

The comparative evaluation of each option was assessed by scoring of impacts to the overall presence of sensitive receptors using the Preference Rating Key per the *Project Appraisal Guidelines for National Roads Unit 7.0 - Multi Criteria Analysis* (TII, 2016). An impact assessment was undertaken on each option to include both quantitative and qualitative assessment. Each option was scored based on the seven-point scale and an integer was assigned according to the overall impact level.

A detailed assessment of the cultural heritage impacts of the options is included in **Appendix D3.7**.

There are many different types of cultural heritage within the study area. For example, there is a presence of several predominantly prehistoric sites however a large majority of the recorded archaeological sites have been noted by the Archaeological Survey of Ireland as having no visible trace. The study area contains several important river networks, landscapes of rolling well-drained drumlin terrain (which would have been very conducive to past human settlement), standing stones, and historic buildings such as various churches, Lifford Castle and Cavanacor House.

The study area for all option alignments traverses through an environment considered to be of high archaeological potential. A total of five extensive areas have been identified within the study area which are common to all nine proposed options. As such, when assessed on a comparative basis, at the time of writing, the hitherto unknown archaeological potential of the proposed options carry equal level and weighting of potential profound impact throughout. In addition, it should be noted that there are two Cultural Heritage constraints which are common to all nine options as they all follow the same alignment and termination at the Lifford extent of the proposed scheme. These sites consist of: the site of a Standing Stone at Murlough (DG070-048) and the attendant grounds of Croaghan House (NIAH 40835028).

Table 15-17 shows the results of the option appraisal and how the options would affect cultural heritage. From a Cultural Heritage perspective and based on a quantitative and qualitative assessment; the F (Pink) Option is the preferred option, followed by, in order of preference: D (Purple), C2 (Orange), C1 (Orange), B2 (Red), B1 (Red), A2 (Blue), A1 (Blue) and E (Cyan).

None of the proposed Options have a direct profound impact on the recorded Cultural Heritage resource.

Table 15-17 Section 3 Summary of Architectural Heritage, Archaeology and Cultural Heritage Appraisal

	3A1	3A2	3B1	3B2	3C1	3C2	3D	3E	3F
Impact Description	Major Negative	Major Negative	Major Negative	Major Negative	Major Negative	Major Negative	Moderately Negative	Major Negative	Moderately Negative
Impact Score	1	1	1	1	1	1	2	1	2

15.4.9 Material Assets (Agricultural)

The following aspects were considered in the assessment for agriculture;

- Land to be acquired;
- Area and orientation of lands severed;
- Removal of farm buildings and/or facilities;
- Farm enterprises;
- Intensity and viability of farming practices.
- Length of centreline;
- Number of constraints potentially affected;
- Number of folios intersected; and
- Number of folios significantly severed.

A detailed assessment of the Material Assets (Agricultural) impacts of the options is included in **Appendix D3.8**.

From this assessment, Option 3C2 is most preferred, being one of the shorter options with an impact on less folios. This is followed by Option 3E being the shortest of all options, but with higher impact on folios than 3C2. Ranked third is Options 3C1 and 3B2, followed by Option 3D which has greater potential to impact sensitive farms. Options 3A2 and 3B1 are joint fifth preference with Options 3A1 and 3F the least preferred of all options. All options have varying impact on the number of folios and severance and are deemed to all have a moderately negative impact at this stage.

Table 15-18 shows the summary of assessment for the scheme.

Table 15-18 Section 3 Summary of Material Assets (Agricultural) Appraisal

	3A1	3A2	3B1	3B2	3C1	3C2	3D	3E	3F
Impact Description	Moderately Negative	Moderately Negative	Moderately Negative	Moderately Negative	Moderately Negative	Moderately Negative	Moderately Negative	Moderately Negative	Moderately Negative
Impact Score	2	2	2	2	2	2	2	2	2

15.4.10 Material Assets (Non-Agricultural)

The assessment was informed by the Transport Infrastructure Ireland (TII) *Project Appraisal Guidelines for National Roads Unit 7.0 – Multi Criteria Analysis (PE-PAG-02031)*[10] with regards to headings to approaching utilities and infrastructural features, for example in this case non-agricultural properties are assessed in this section and agricultural areas are assessed within a separate Material Assets (Agricultural) Technical **Appendix D3.8** and summarised in Section 15.4.9 above. The *EPA Draft Guidelines on the Information to be contained in Environmental Impact Assessment Reports* (EIAR)[11] (EPA, 2017) were consulted for the specific topics to assess under the environmental factor of Material Assets (Non-agricultural).

The principal objectives of the Material Assets (Non-agricultural) assessment is to:

- Complete a desk study and to obtain relevant data relating to material assets including utilities, properties, quarries, transport, infrastructure and other amenities for each option;
- Assess the significance of the likely direct physical impacts of the proposed road scheme on each of these material assets along each option;
- Evaluate and compare the impact on material assets for each option taking into account interaction with other environmental, engineering and economic criteria,
- Assess each option in line with the Project Appraisal Guidelines for National Roads Unit 7.0 – Multi Criteria Analysis TII[12] in October 2016, and
- Compare the options and determine a preference.

The assessment can broadly be categorised into two areas:

- **Infrastructure**
  - Utilities.

[10] http://www.tiipublications.ie/library/PE-PAG-02031-01.pdf
[11] http://www.epa.ie/pubs/advice/ea/EPA%20EIAR%20Guidelines.pdf
[12] The National Roads Authority (NRA) and the Railway Procurement Agency were merged to become Transport Infrastructure Ireland (TII) in 2015.

  - Quarries.
  - Transport Infrastructure.
  - Waste Management.
  - Forestry.
- **Properties**
  - Settlements and Zoning.
  - Residential and Commercial Properties.
  - Community Severance.

A detailed assessment of the Material Assets (Non-agricultural) impacts of the options is included in **Appendix D3.9**.

All options have a similar impact on non-agricultural material assets. The differentiating factors can be summarised as:

- Forestry: Options 3A1, 3B1 and 3C1 which have the eastern crossing of the Swilly Burn have the least impact on a conifer forest in comparison to all other options.
- Impact on telecommunications/fibre optic: Due to the extent of localised realignment of the existing N14, Options 3C1 and 3C2 are least preferred in terms of potential fibreoptic diversions. Options 3A1/3A2 and 3B1/3B2 have a slightly less impact, while Option 3E has the least impact of all options, due to its remote nature. Options 3D and 3F have a slight impact.
- Impact on properties: Options 3D and 3E have a greater quantitative impact on properties than any other option, both impacting 7 properties as opposed to 2.

As such, Options 3D and 3E are least preferred due the quantity of property impacts and their associated sensitivity and significance. All other options have a lesser impact on non-agricultural material assets.

Table 15-19 Section 3 Summary of Material Assets (Non-agricultural) Appraisal

	3A1	3A2	3B1	3B2	3C1	3C2	3D	3E	3F
Impact Description	Slightly Negative	Slightly Negative	Slightly Negative	Slightly Negative	Slightly Negative	Slightly Negative	Moderately Negative	Moderately Negative	Slightly Negative
Impact Score	3	3	3	3	3	3	2	2	3

15.5 Accessibility and Social Inclusion

The basis of the appraisal covers two key areas:

- Deprived Geographical Areas
- Vulnerable Groups

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 of 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, including the Rural Social Scheme. It is anticipated that participants in the Rural Social Scheme reside within the study area and could benefit from improved accessibility to/from areas of employment and economic activity.

As Donegal is fully reliant on road network for transport, buses are the only public transport mode available to individuals. National Bus services from Letterkenny to Dublin travel along the N14, serving Lifford. As such, any proposed improvement to the N14 will improve the journey time and journey time reliability on the 17km section between Manorcunningham to Lifford on the journey to Dublin.

The assessment report is included in **Appendix C3.3** which concludes all options will have a similar, neutral impact in terms of Vulnerable Groups and all options are preferred. Although there is likely to be some improvement to the local areas in terms of accessibility and social inclusion, it is not anticipated the impact will be significant or perceptible.

Table 15-20 shows the options assessment with respect to Deprived Geographical Areas, while **Table 15-21** provides the assessment for Vulnerable Groups

Table 15-20 Summary of Deprived Geographical Areas Assessment

	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

Table 15-21 Summary of Vulnerable Groups Assessment

	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

15.6 Integration

The basis of the appraisal covers the following key areas:

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

The aim of this section is to compare the impact of each Option on achieving objectives of EU and Government Policy. A copy of the assessment report is included in **Appendix C3.4** which concludes that all of the new route corridors provide an improvement in infrastructure with a positive impact on the region.

15.6.1 Transport Integration

In terms of Transport integration, the Section 3 of the TEN-T 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 on the N13 at Pluck, and the proposed N14/N15 to A5 Link. An upgraded N14 road may make public transport by bus (the only mode available) more desirable and improve connectivity to Dublin and other urban centres and transport hubs. Furthermore, the currently proposed cross-section adopts a segregated cycle track within the mainline corridor. Connecting this new facility to the existing Donegal Cycle Route would be of great benefit to existing cyclists and may attract more users. Overall, there will be benefits in terms of connectivity of the strategic road network, connectivity between transport modes, support for sustainable transport modes and access to other transport infrastructure.

Table 15-22 Summary of Integration Appraisal – Transport Integration

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

15.6.2 Land Use Integration

With regard to Land Use Integration, Section 3 aligns with the Transportation Strategy set out in the 2018-2024 County Development plan, which highlights 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*." Section 3 Options all have a positive impact in terms of strategic connectivity for long distance trips. All options also comply with the objectives as set out in the National Planning Framework (NPF).

Table 15-23 Summary of Integration Appraisal – Land Use Integration

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

15.6.3 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. The plan recognises Letterkenny, with Derry City and Strabane as functioning as a "cross-border city region". Furthermore, National Strategic Outcome 2 – Enhanced Regional Accessibility, aims to complete linkages to Dublin by a "high-quality road network" recognising that the North-West region has been "comparatively neglected" in this regard.

The plan also provides for investment to support the ambition for development of the border region, listing projects that improve accessibility to the North-West, including "the N14 Manorcunningham to Lifford".

All options perform equally in satisfying the goals of the NDP. 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.

Table 15-24 Summary of Integration Appraisal – Geographical Integration

	3A1	3A2	3B1	3B2	3C1	3C2	3D	3E	3F
Impact Description	Major Positive	Major Positive	Major Positive	Major Positive	Major Positive	Major Positive	Major Positive	Major Positive	Major Positive
Impact Score	7	7	7	7	7	7	7	7	7

15.6.4 Other Government Policy Integration

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. 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 route corridors score equally under this criterion, which is highly positive.

Table 15-25 Summary of Integration Appraisal – Other Government Policy

	3A1	3A2	3B1	3B2	3C1	3C2	3D	3E	3F
Impact Description	Major Positive	Major Positive	Major Positive	Major Positive	Major Positive	Major Positive	Major Positive	Major Positive	Major Positive
Impact Score	7	7	7	7	7	7	7	7	7

All of the options provide for an improvement in infrastructure which in turn are likely to have a positive impact with respect to integration. All options also correlate well with objectives of local regional and national policy. 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, followed closely by Options 3B2 and then Options 3C1 and 3C2.

15.7 Physical Activity

At the point where assessments were being undertaken, there was no available information on the number of cyclists currently using the N14. Therefore, 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 the required sub-criteria:

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

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 shared pedestrian / cycle facilities along the mainline corridor. 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 15-26 Summary of Physical Activity Appraisal

	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

15.8 Project Appraisal Matrix (Multi-criteria Analysis)

The appraisal of each option for each section was undertaken as set out in Section 7.3. An overall multi-criteria project appraisal matrix for Section 3 combines the above assessments. This is represented in **Table 15-27,** where the impact scores under each sub-criterion are summed to give a total impact score for each option, where the higher the score, the better the option performs.

In reviewing total impact scores in the Option Impact Assessment Matrix, Options 3B2 and 3C2 achieve the overall top score of 108 followed closely by Options 3A2, 3B1 and 3C1 with scores of 107. It must be emphasised that summing up of impact scores does not take account of the relative importance of each sub criteria or the individual impacts or preferences, but provides an initial comparison between the overall, non-weighted performance of each option. As such, Options 3B2 and 3C2 emerge to the front as options performing well, on balance, considering all impacts.

Options 3B2, 3C2 and 3F are the only options with one Highly Negative impact score for any sub-criteria, while all other options have two or more. Options 3A1, 3B1 and 3C1 has one extra highly negative impact score in comparison to Options 3A2, 3B2 and 3C2 respectively in the Biodiversity element. This Highly Negative score reflects the impact these options would have on a whooper swan foraging area in the low-lying fields of improved agricultural grassland along the Swilly Burn floodplain in the townlands of Mulnaveagh and Tullyrap. Significant numbers of whooper swans have been recorded in this area, making this site of potentially national importance for the species. For this reason, Options 3A1, 3B1 and 3C1 have a much higher negative impact than Options 3A2, 3B2 and 3C2, and therefore are less preferable, even though there is only 1 overall score difference between the two routes.

A secondary appraisal matrix showing the preferences of each option across each sub-criterion were prepared to ensure the consideration of other factors that will inform a decision on the emerging preferred option. **Table 15-28** provides the preferences for the different options indicating the preferred (green), intermediate preferred (orange) and least preferred (red) preferences. In reviewing the preference scores Options 3B2 and 3C2 are the preferred options, followed by Options 3A2 and 3D. Options 3A1, 3B1 and 3C1 are not preferred options due to the significance of the Biodiversity preferences as a result of the Whooper Swans.

Table 15-27 Multi-Criteria Project Appraisal Matrix for Section 3

Option	3A1	3A2	3B1	3B2	3C1	3C2	3D	3E	3F
Environment									
Air Quality & Climate	3	3	3	3	3	3	3	3	3
Noise	4	4	4	4	4	4	4	5	4
Landscape & Visual	1	1	2	2	2	2	1	1	1
Biodiversity	1	3	1	2	1	2	1	2	3
Waste	3	3	3	3	3	3	3	3	3
Soils, Geology and Hydrogeology	3	3	3	3	3	3	3	3	3
Hydrology	2	2	3	3	3	3	3	2	2
Cultural Heritage	1	1	1	1	1	1	2	1	2
Material Assets - Agricultural	2	2	2	2	2	2	2	2	2
Material Assets - Non-agricultural	3	3	3	3	3	3	2	2	3
Environment Sub-Total	**23**	**25**	**25**	**26**	**25**	**26**	**24**	**24**	**26**
Safety									
Security of Road Users	6	6	6	6	6	6	6	6	6
Collision Reduction	7	7	7	7	7	7	7	7	6
Road Safety Audit (Stage F)	7	7	7	7	7	7	6	6	6
Road Safety Impact Assessment	7	7	7	7	7	7	7	6	6
Safety Sub-Total	**27**	**27**	**27**	**27**	**27**	**27**	**26**	**25**	**24**
Physical Activity									
Physical Activity	6	6	6	6	6	6	6	6	6
Physical Activity Sub-Total	**6**	**6**	**6**	**6**	**6**	**6**	**6**	**6**	**6**
Economy									
Transport Efficiency and Effectiveness	4	4	4	4	4	4	4	4	3
Wider Economic Impacts	5	5	5	5	5	5	5	5	5
Funding Impacts	5	5	5	5	5	5	5	5	5
Economy Sub-Total	**14**	**14**	**14**	**14**	**14**	**14**	**14**	**14**	**13**
Accessibility and Social Inclusion									
Deprived Geographical Areas	4	4	4	4	4	4	4	4	4
Vulnerable Groups	4	4	4	4	4	4	4	4	4
Accessibility and Social Inclusion Sub-Total	**8**	**8**	**8**	**8**	**8**	**8**	**8**	**8**	**8**
Integration									
Transport Integration	6	6	6	6	6	6	6	6	6
Land use Integration	6	6	6	6	6	6	6	6	6
Geographical Integration	7	7	7	7	7	7	7	7	7
Other Government Policy Integration	7	7	7	7	7	7	7	7	7
Integration Sub-Total	**26**	**26**	**26**	**26**	**26**	**26**	**26**	**26**	**26**
Totals	**104**	**106**	**106**	**107**	**106**	**107**	**104**	**103**	**103**

Table 15-28 Preference Matrix for Section 3 Options

Option	3A1	3A2	3B1	3B2	3C1	3C2	3D	3E	3F
Environment									
Air Quality & Climate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate
Noise	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Preferred	Intermediate
Landscape & Visual	Least Preferred	Least Preferred	Preferred	Intermediate	Preferred	Intermediate	Least Preferred	Least Preferred	Least Preferred
Biodiversity	Least Preferred	Preferred	Least Preferred	Intermediate	Least Preferred	Intermediate	Intermediate	Intermediate	Preferred
Waste	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate
Soils, Geology and Hydrogeology	Least Preferred	Least Preferred	Intermediate	Intermediate	Preferred	Preferred	Intermediate	Intermediate	Preferred
Hydrology	Least Preferred	Least Preferred	Intermediate	Preferred	Intermediate	Preferred	Preferred	Least Preferred	Least Preferred
Cultural Heritage	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Preferred	Least Preferred	Preferred
Material Assets - Agricultural	Least Preferred	Least Preferred	Intermediate	Intermediate	Intermediate	Preferred	Intermediate	Preferred	Least Preferred
Material Assets - Non-agricultural	Preferred	Preferred	Preferred	Preferred	Intermediate	Intermediate	Least Preferred	Least Preferred	Preferred
Safety									
Security	Preferred	Preferred	Preferred	Preferred	Preferred	Preferred	Preferred	Preferred	Preferred
Collision Reduction	Preferred	Preferred	Preferred	Preferred	Preferred	Preferred	Preferred	Preferred	Intermediate
Road Safety Audit (Stage F)	Preferred	Preferred	Preferred	Preferred	Preferred	Preferred	Intermediate	Intermediate	Intermediate
Road Safety Impact Assessment	Preferred	Preferred	Preferred	Preferred	Preferred	Preferred	Preferred	Intermediate	Intermediate
Physical Activity									
Physical Activity	Preferred	Preferred	Preferred	Preferred	Preferred	Preferred	Intermediate	Intermediate	Intermediate
Economy									
Transport Efficiency and Effectiveness	Intermediate	Intermediate	Preferred	Preferred	Preferred	Preferred	Intermediate	Intermediate	Least Preferred
Wider Economic Impacts	Preferred	Preferred	Preferred	Preferred	Preferred	Preferred	Preferred	Preferred	Preferred
Funding Impacts	Preferred	Preferred	Preferred	Preferred	Preferred	Preferred	Preferred	Preferred	Preferred
Accessibility and Social Inclusion									
Deprived Geographical Areas	Preferred	Preferred	Preferred	Preferred	Preferred	Preferred	Preferred	Preferred	Preferred
Vulnerable Groups	Preferred	Preferred	Preferred	Preferred	Preferred	Preferred	Preferred	Preferred	Preferred
Integration									
Transport Integration	Preferred	Preferred	Preferred	Preferred	Preferred	Preferred	Preferred	Preferred	Preferred
Land use Integration	Intermediate	Intermediate	Preferred	Preferred	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate
Geographical Integration	Preferred	Preferred	Preferred	Preferred	Preferred	Preferred	Preferred	Preferred	Preferred
Other Government Policy Integration	Preferred	Preferred	Preferred	Preferred	Preferred	Preferred	Preferred	Preferred	Preferred

Due to the fact, that the above summary tables do not indicate a clear preferred option, a pairwise competition was conducted to compare the best performing option with each other option in turn to identify the preferred option. Overall Options 3B2 and 3C2 appear to score best taking all multi criteria analysis into account. To confirm the emerging preferred option a pairwise comparison is undertaken between these two options.

15.8.1 Pairwise Competition

15.8.1.1 Option 3B2 vs Option 3C2 Preferred Option Choice

Options 3B2 and 3C2 have similar alignments over approximately 90% of their length. They differ over approximately 2.5km between the townlands of Drumcairn and Sheskinapoll. Both options also perform best in terms of impact and have the same score. A pairwise competition was conducted on these Options to establish the better of the two options based on the impact score and preference of each option under each criterion.

Table 15-29 Pairwise Competition Options

Pairwise Competition Options: 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.
Biodiversity	Both options have a moderately negative impact and have a similar preference
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 - Agricultural	Option 3B2 impacts on 72 folios and severs approx. 80 fields while Option 3C2 affects the least number of folios (69) and approx. 72 fields. Therefore, Option 3C2 is marginally preferred over Option 3B2.
Material Assets - Non-agricultural	Both options have a minor negative impact score, but Option 3B2 is slightly preferred over option 3C2 with respect to the existing road network, telecommunications and properties/community severance. Option 3C2 separates clusters of residences and isolates properties between the proposed and existing N14.
Cultural Heritage	Both route 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 higher 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 options 3B2 and 3C2 have a similar 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. It is noted that the differences are marginal and as such, there is not a significant benefit of one option over the other in terms of road safety.
Summary – Safety	Both options perform similarly as they are very similar along their length, however Option 3C2 is marginally preferred over option 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 route
Other Factors	As Options 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 options 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 option 3C2 due to closer alignment with the reserved corridor in the County Development Plan

Option 3C2 vs Option 3B2 Preferred Option Choice

As the impacts of both Options 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 scored 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 3C2 is marginally preferred over Option 3B2 but it is noted that there is no discernible difference in terms of Safety. 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.

Following this option 3B2 versus option 3C2 pairwise comparison, the better performing option, option 3B2 was compared against options 3A2, 3B1, 3C1 and 3D to confirm the emerging preferred option. A pairwise comparison comparing option 3B2 against options 3A1, 3E and 3F was not necessary as option 3B2 was sufficiently better when comparing the Impact and Preferences. The full pairwise comparison is contained in **Appendix C3.5.** This pairwise competition concluded that Option 3B outperformed all other Options.

15.8.2 Option Assessment

In reviewing the full spectrum of appraisals, evaluating the number and significance of impacts that each option has and comparing the preferences of the Options, Option 3B2 is identified as the Emerging Preferred Option Corridor. This is supported qualitatively, by reviewing balance of preferences across each criterion, and quantitatively by considering the cumulative impact of each option and the significance of those impacts. The result is also supported by a pairwise comparison of Option 3B2 with every other option. During each comparison, Option 3B2 has been identified as the preferred Option.

Option 3F performs worse than all other options across a number of criteria due to poor performance across Economy and Safety, partly due to it being the longest option. Therefore, this is the least viable option.

Options 3A1, 3B1 and 3C1 all have a significant impact on an ecological site of County / National importance at the Feddyglass/Swilly Burn Whooper Swan foraging area. For this reason, these options are not viable options.

Options 3A2 and 3C2 are less preferred than Option 3B2, generally due to Option 3B2 being preferred in terms of Economy and Integration. Options 3D and 3E are less preferred than option 3B2 in terms of Economy, Environment, Safety and Integration. A significant factor in the low preferences is the Highly Negative effect on Non-Agricultural Material Assets. Both options impact upon five properties, while all other options impact on two.

Therefore, it is concluded the Option 3B2 is the Emerging Preferred Option for Section 3.

15.9 Recommendation

Having completed the assessment of Stage 2 Project Appraisal for the Section 3 for the TEN-T Priority Route Improvement Project, Donegal, the Preferred Option has been identified as the Option 3B2, which will be taken forward to Stage 3 of the Phase 2 Option Selection process.

16 STAGE 3 PREFERRED OPTION

Following completion of Stage 2 of the Option Selection process, the identified Preferred Option has been identified as Option 3B2 and this will be taken forward to Stage 3 of the Option Selection process.

A Project Appraisal Balance Sheet has been prepared for the TEN-T Priority Route Improvement Project, Donegal, based on the preferred routes for each section of the scheme. Refer to Chapter 17 for details.

17 PROJECT APPRAISAL BALANCE SHEET

17.1 General

The Project Appraisal Balance Sheet (PABS) is a summary appraisal of project (Sections 1, 2 and 3) impacts based on the outputs of various forms of assessment carried out during the planning and design stages of project development. The PABS acts as a tool in summarising the expected impacts of proposed investment. The PABS is completed at the end of the Option Selection stage on the preferred options and is subsequently updated throughout the latter stages of the project.

The PABS is based on a qualitative and quantitative evaluation of a range of criteria and elements as outlined in the Department of Transport Common Appraisal Framework namely, Environment, Safety, Physical Activity, Economy, Accessibility & Social Inclusion and Integration. A detailed multi-criteria assessment under each of these criteria was carried out on the various options under consideration in Chapter 7. This summary assessment is now completed using the PABS template on the emerging preferred option.

The PABS is made up of four sections as follows:

- Part A: This section contains general information on the project.
- Part B: This section deals only with the environmental appraisal of the project. A summary rating of the scale of impact on each environment element is included. At the end of the spreadsheet, a summary ranking for the Environment section is automatically generated based on the individual scales included for each element.
- Part C: This section includes each of the remaining five appraisal criteria namely Safety, Physical Activity, Economy, Accessibility & Social Inclusion, Integration.
- Part D: This section is the PABS Summary Sheet which is automatically populated based on Part A, B and C inputs.

The completed PABS for Phase 2 Option Selection using the medium growth scenario is presented in the following sections.

A copy of the Project Appraisal Balance Sheet is contained in **Volume H**.

17.1.1 PABS Part A

Part A of the PABS contains general project information namely the project title, project reference number, project contact details and a brief description of the project.

17.1.2 PABS Part B

Part B of the PABS deals with the Environmental appraisal of the project. The environmental assessments provided in Sections 9.4, 12.4 and 15.4 of this report are used in the compilation of Part B. The overall scaling statement when all environmental disciplines are considered is Moderately Negative.

17.1.3 PABS Part C

Part C of the PABS deals with the remaining five criteria for assessment namely Safety, Physical Activity, Economy, Accessibility & Social Inclusion and Integration.

17.1.3.1 Safety

Safety considers two principal road safety impacts, accident reduction and security of road users. There is a high level of traffic transferred on to a newer safer road. The scheme is predicted to result in significant reductions in collisions and casualties. A segregated cycle track is being provided for the full extent of the

mainline. The segregated shared pedestrian / cyclist facilities being provided as part of the scheme will enhance the security of vulnerable road users.

The overall scaling statement in terms of safety is Highly Positive.

17.1.3.2 Economy

The key measure of economic efficiency is the BCR, which shows how projects could increase overall welfare after allowing for the cost of implementation of the project. The project has a very positive BCR.

However, the BCR does not capture all potential economic benefits of a project. It is anticipated that this project will improve Wider Economic Benefits by improving accessibility to the north west and therefore internal markets and the wider national markets.

In terms of inward investment, this project has been scored as neutral. However, with improved access to ports, airports and other major urban centres there is the potential to attract further investment, most markedly in the areas of Letterkenny,

This project represents value for money as it has the potential to generate significant return on investment of public funds.

The overall scaling statement in terms of Economy is Slightly Positive.

17.1.3.3 Accessibility and Social Inclusion

The scheme provides improved access to the north western region. The scheme improves accessibility between Lifford and Letterkenny and subsequently to/from Dublin. It will also improve access from Sligo to Letterkenny thereby improving the access to jobs, key facilities and social opportunities in Letterkenny, Ballybofey, Lifford and other areas of Donegal.

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, particularly for Section 3. The scheme will improve accessibility from rural areas to Letterkenny, Ballybofey and Lifford. The construction of the scheme will also provide short term employment opportunities.

The overall scaling statement in terms of Accessibility and Social Inclusion is Neutral.

17.1.3.4 Integration

The provision of the three sections of the TEN-T network in Donegal (N15/N13 Ballybofey / Stranorlar Urban Region, N56/N13 Letterkenny to Manorcunningham and N14 Manorcunningham to Lifford / Strabane) will significantly improve connectivity to the strategic road network. There is no existing rail network in Donegal so therefore the improvements will 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. The desirable cross-section to be applied on the preferred option is a Type 2 Dual carriageway. This cross-section includes a cycle track within the corridor which is separated from the paved road surface. The scheme will improve access to Dublin Airport, Dublin Port, Ireland West Airport at Knock and to Belfast International and City Airports and Sea Port.

The provision of the three sections is an objective of the County Development Plan. The N13, N14 and N15 proposed to be upgraded as part of this scheme are identified as a Comprehensive Corridor on the Trans-European Transport Network, meaning it has regional significance. The scheme replaces the full length of the existing routes with an improved route alignment with a wider cross-section, which will subsequently improve the capacity, operation and safety of the N14. The scheme provides for limited connectivity to national and regional roads and will therefore be a protected road regarding future access.

The TEN-T Priority Route Improvement Project, Donegal is part of the Trans European Transport Network (TEN-T), meaning it has National and European significance and provides cross-border, international connectivity.

Upgrade of TEN-T network in Donegal (N15/N13 Ballybofey / Stranorlar Urban Region, N56/N13 Letterkenny to Manorcunningham and N14 Manorcunningham to Lifford / Strabane / A5 Link) is a key objective of the National Development Plan 2018-2027 and the National Planning Framework - Project Ireland 2040.

The overall scaling statement in terms of Integration is Moderately Positive.

17.1.3.5 Physical Activity

The provision of segregated shared pedestrian/cyclist facilities adjacent to the proposed road scheme along with the reduced traffic on the existing network is likely to result in increased journey ambience for cyclists and pedestrians and also increased physical activity which in turn is likely to have a minor beneficial effect on work absenteeism.

Segregated shared pedestrian/cyclist facilities are being provided by means of new infrastructure adjacent to the proposed mainline alignment which will reduce risks to pedestrians and cyclists.

The overall scaling statement in terms of Physical Activity is Moderately Positive.

17.1.4 PABS Part D

Part D of the PABS is a summary statement of the assessment which is compiled based on the input to Parts A, B, and C. The assessment is carried out under six criteria. A Highly Positive scaling statement is achieved for two of the criteria – Safety and Integration, a Moderately Positive scaling statement is achieved on Physical Activity, a Slightly Positive scaling statement is achieved on Economy, a Neutral scaling statement is achieved on Accessibility and Social Inclusion and a Moderately Negative scaling statement is attributed to the Environment criterion.

17.2 Project Objectives

Table 17-1 outlines how the Preferred Option meets the project objectives.

Table 17-1 Preferred Option and Scheme Objectives

Criteria	Scheme Objective	Preferred Option
Economy	To improve the efficiency of the transport network by improving journey time and journey time reliability.	The project provides significant Transport Efficiency and Effectiveness benefits primarily through journey time savings. The project also improves journey time reliability.
Safety	To reduce the frequency and severity of collisions on the road network to improve the overall safety of the national road network in Donegal. To improve safety for vulnerable users by separating strategic traffic from local traffic through towns, villages and rural communities.	The scheme is predicted to result in significant reductions in collisions and casualties, based on default accident rates, under the central growth scenario. A total reduction in collisions of approximately 247 over the 30 year appraisal period is predicted, with an associated reduction in casualties of approximately 6 fatal, 19 serious and 354 slight casualties, suggesting the scheme will have a highly positive impact on safety within the vicinity of the improvement. The above accident reduction includes for reductions in accidents of vulnerable road users due to removal of strategic traffic from local traffic through towns, villages and rural communities. In addition, it is proposed to provide cyclist facilities as part of the scheme.

Criteria	Scheme Objective	Preferred Option
Environment	To reduce overall air pollution levels near sensitive receptors and vulnerable road users caused by platooning and queuing of vehicles. To reduce traffic noise levels experienced by sensitive receptors and residents, many of which are residing along the existing TEN-T network through ongoing ribbon development. To reduce watercourse pollution on the existing road network.	Platooning and queuing of vehicles will be reduced significantly thereby potentially reducing overall air quality pollution levels. It is also anticipated that overall noise levels may be reduced due to a significant reduction in vehicles using the existing TEN-T network. Further detailed analysis of air pollution and noise will be undertaken at Phase 3 Design stage. The existing road network will have a significant reduction in vehicles with the resulting potential for reduction in contaminants from the road polluting adjacent watercourses. The new road infrastructure will be designed using sustainable drainage systems incorporating pollutant treatment measures.
Accessibility and Social Inclusion	Improve accessibility to/from the North West region, helping to reduce deprivation caused by the geographic location of Donegal, which is currently an area covered by the Rural Social Scheme. Remove strategic and commercial traffic from local towns and communities, thereby making these communities more inviting and encourage more travel independence for non-motorised users and vulnerable groups. Improve accessibility to employment in regional and national centres including Donegal, Letterkenny, Derry, Belfast, Dublin, Sligo and Galway. Improve accessibility to regional health services including hospitals in Letterkenny and Sligo. Improve network resilience such as access to Letterkenny where the N56 Four Lane Road is a “Lifeline Route” being the only strategic access into Letterkenny and northwest Donegal.	The scheme provides improved access to the north western region as a whole. It is considered that this will result in improved to jobs, key facilities and social opportunities in Letterkenny, Ballybofey, Lifford and other areas of Donegal. The scheme will remove strategic and commercial traffic from local towns and communities, thereby making these communities more inviting. The provision of cycle facilities along with a reduction in traffic on the existing roads will encourage more travel independence for non-motorised users and vulnerable groups. The scheme improves accessibility between Lifford and Letterkenny and subsequently to/from Dublin. It will also improve access from Sligo to Letterkenny thereby improving the access to employment opportunities. The scheme will also improve accessibility to regional health services including hospitals in Letterkenny and Sligo. The scheme will improve network resilience. The N56 link which will provide a second strategic access into Letterkenny and remove reliance on the N56 Four Lane Road.
Integration	Meet the objectives of the TEN-T Regulations 1315/2013 to enhance geographic integration. To support the transport objectives contained in national, regional and local planning policies and strategies, including provision of “efficient and integrated national transport system with adequate capacity, and levels of service comparable to other countries”, to equip Ireland and the North West region to “compete for investment”. To be compatible with land use objectives as set out in regional and local land use plans. To improve connectivity to/from other transport modes, such as ports at Killybegs, Foyle (Derry), Belfast, Shannon and Dublin, and airports at Derry, Knock, Belfast, Dublin and Shannon.	The provision of the scheme meets the objectives of the TEN-T Regulations to enhance geographic integration, including improving cross border connectivity. The scheme meets the objectives as set out in national, regional and local planning policies with benefits of increased levels of service and a transport network comparable to other counties. The scheme is compatible with land use objectives as set out in regional and local plans. The scheme improves connectivity to/from other transport modes, such as ports at Killybegs, Foyle (Derry), Belfast, Shannon and Dublin, and airports at Derry, Knock, Belfast, Dublin and Shannon.
Physical Activity	To encourage active travel in towns/villages and longer distance non-motorised travel on strategic routes	Cycle facilities are being provided by means of new infrastructure adjacent to the proposed mainline alignment which will encourage non-motorised travel on strategic routes. The reduction in traffic through the towns and villages will encourage non-motorised travel in the towns / villages.

17.3 Recommendation

Project Appraisal of the TEN-T Priority Route Improvement Project, Donegal has demonstrated that this is a project with a positive scaling statement on four of the six assessment criteria, a neutral scaling statement on one criterion and a negative scaling statement on one criterion. The economic assessment has demonstrated that, based on the scheme costs developed to date and the associated forecast performance of the transport network, the proposed option (a road component) represents value for money. The environmental assessment has shown a Moderately Negative scaling statement however during Phase 3 - Design further measures to avoid and reduce impacts will be developed. Where impacts occur mitigation to minimise impacts on sensitive receptors within the receiving environment will be implemented.

The recommendation of this TEN-T Priority Route Improvement Project, Donegal, Phase 2 Option Selection Report is to adopt the preferred options (shown in **Figure 17-1** to **17-3** below) as the optimum options for additional road infrastructure that meet the project objectives outlined in Chapter 1 of this Report.

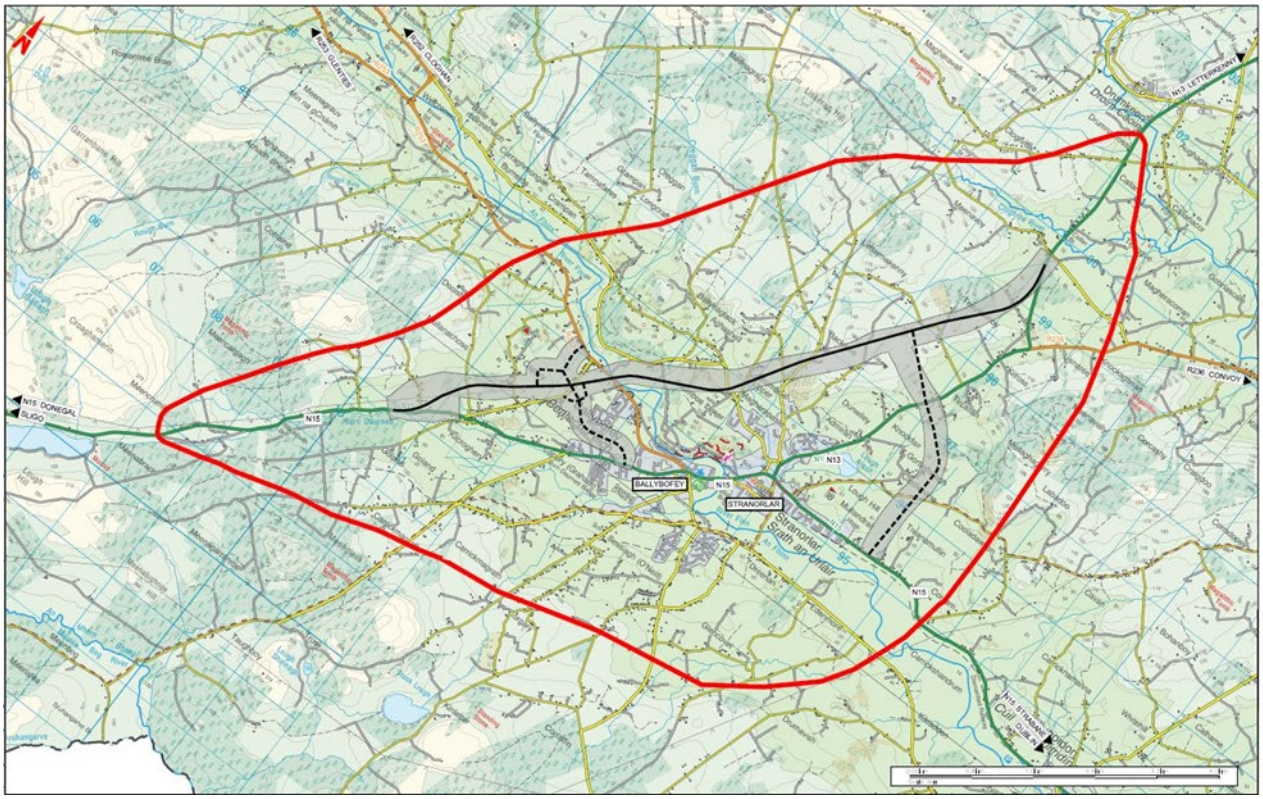

Figure 17-1 Section 1 Preferred Option

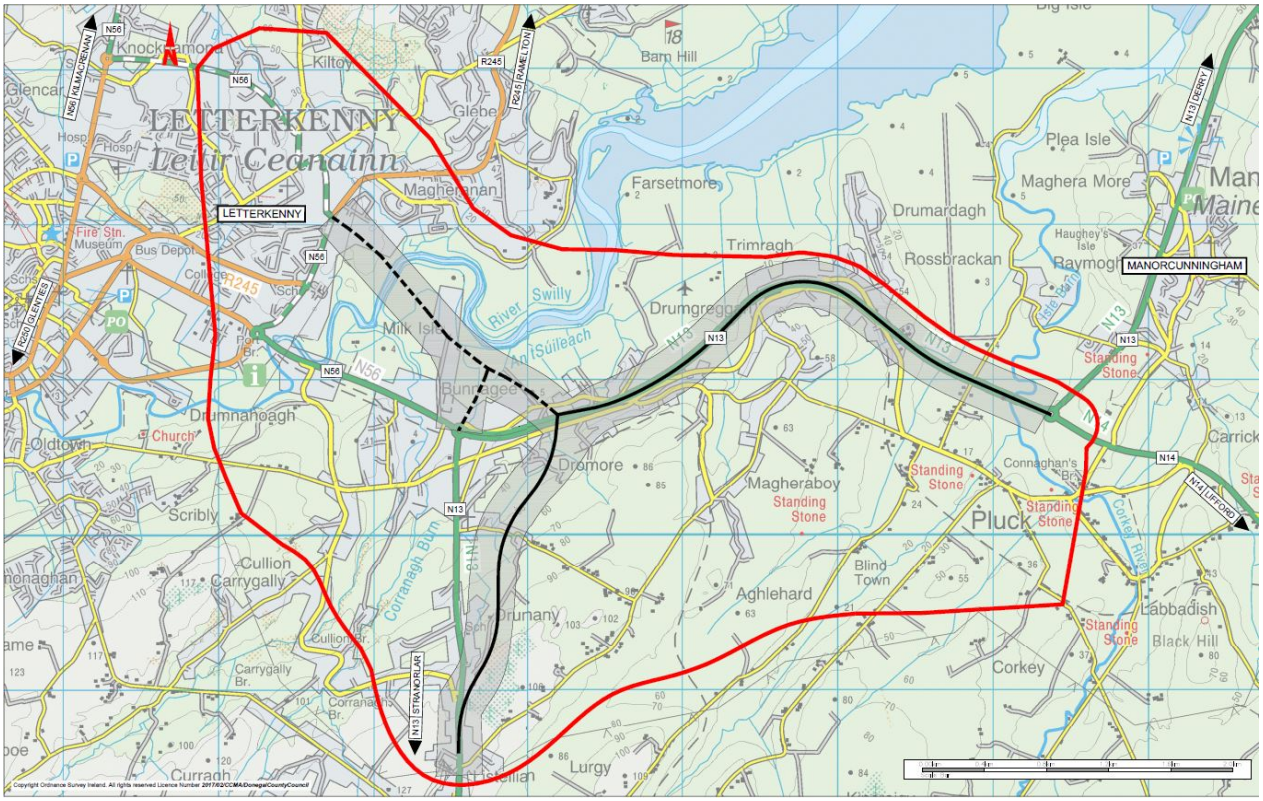

Figure 17-2 Section 2 Preferred Option

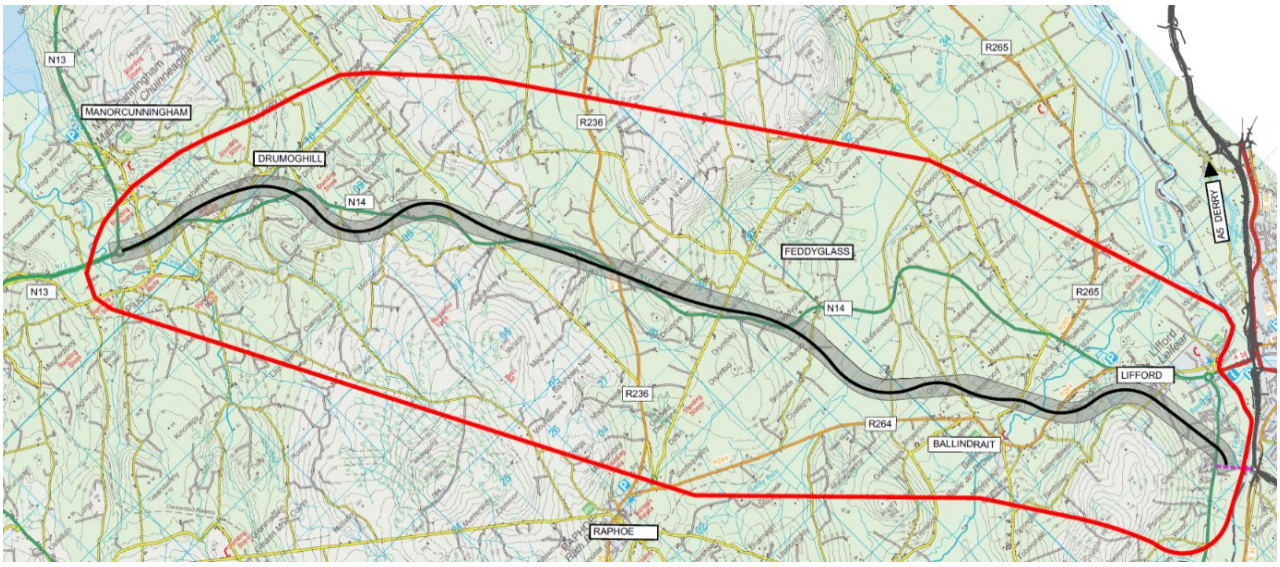

Figure 17-3 Section 3 Preferred Option