

# Preface

THIS ENVIRONMENTAL IMPACT ASSESSMENT REPORT CONSISTS OF THE FOLLOWING DOCUMENTS:

## Volume 1

### ❖ NON TECHNICAL SUMMARY

## Volume 2

- ❖ Main Report

## Volume 3

- ❖ Figures

## Volume 4

- ❖ Appendices

## Document Control

Status	Issued For	Signed	Date	Approved
<i>Final</i>	<i>Publication</i>	<i>Fergus Meehan<sup>1</sup></i>	<i>February 2019</i>	<i>Emer Concannon<sup>2</sup></i>

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# Acknowledgments

This Environmental Impact Assessment Report (hereafter referred to as **EIAR**), has been prepared and coordinated by the TII National Roads Project Office of Sligo County Council, under the auspices of Transport Infrastructure Ireland. The following are the key bodies responsible for the project delivery.

*Table 1-1: N16 Lugatober, Project Team – Engineering & Project Management*

Study/Element	Body Responsible
Engineering & Project Management	TII National Roads Project Office (Sligo County Council)
Ground Investigation (& Factual Report)	Priority Geotechnical
Stage 1 Road Safety Audit	Atkins
Geotechnical Interpretive Report	Roughan & O'Donovan

*Table 1-2: N16 Lugatober, Project Team – Environment*

Study/Element	Body Responsible
Population & Human Health	Optimize Consulting and Dr. Martin Hogan
Noise & Vibration	Invest Environmental
Air Quality & Climate Change	
Biodiversity	McCarthy Keville O' Sullivan (with input from Denyer Ecology and Dr. Maria Long)
Soils and Geology	Barry Transportation
Hydrology & Hydrogeology	Hydro Environmental (Galway)
Landscape & Visual	RPS Ireland Ltd.
Material Assets and Land – Agriculture	John Bligh & Associates
Material Assets and Land – Non-Agriculture	
Archaeology, Architecture & Cultural Heritage	CRDS

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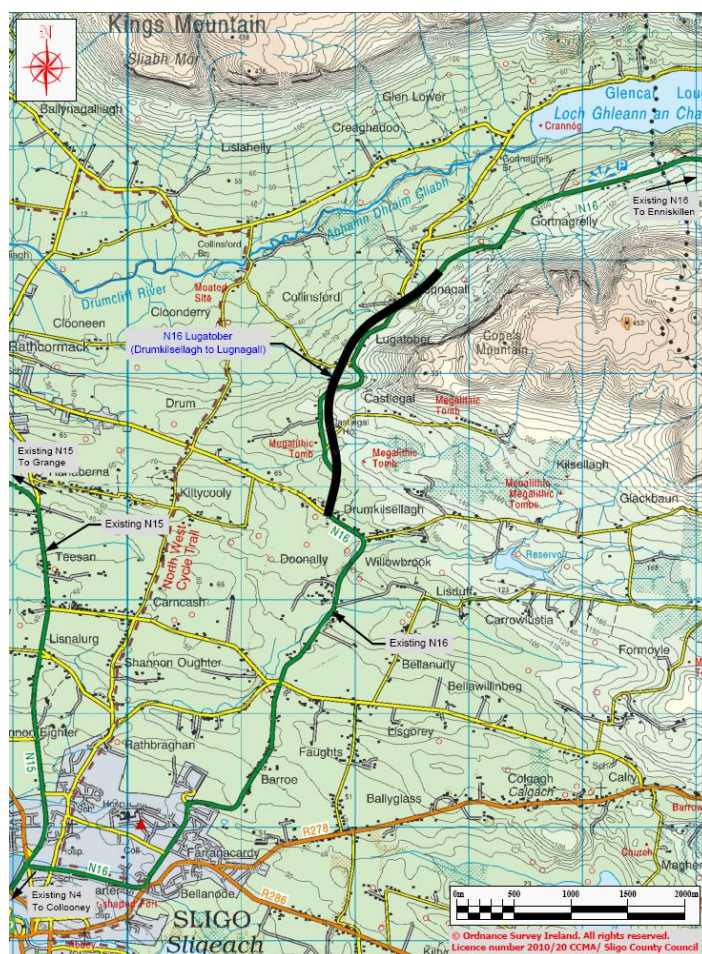


# 1 Introduction & Background

## 1.1 General

This Non-Technical Summary Report is a brief summary of the Environment Impact Assessment Report (EIAR) for the N16 Lugatober (Drumkilsellagh to Lugnaqall) *Proposed Road Development*. The main body of the EIAR is contained in Volume Two, with supporting Figures and Appendices in Volumes Three and Four respectively, these volumes read in conjunction with each other, provide a statement of the likely impacts of the construction and the long-term future operation of the *Proposed Road Development* on the receiving environment. They should in this regard be referred to for a more detailed consideration of the Environmental Impact Assessment process.

Figure 1-1: Location of Proposed Road Development



## 1.2 Background to the Proposed Road Development

### 1.2.1 General

The section of the N16 being improved by the *Proposed Road Development*, forms part of a wider N16 National Primary route which links the Republic of Ireland with Northern Ireland and more specifically, Sligo on the west coast with Belfast and Dundalk on the east coast.

The N16 emanates from Sligo and passes through Manorhamilton in Co. Leitrim and Blacklion in Co. Cavan, before it connects with the A4 at the border with Northern Ireland. It extends as the A4 to Enniskillen and Dungannon, before it becomes the M1 motorway, which passes Lurgan, Craigavon and Lisburn before terminating in Belfast.

At 49 kilometres (30 miles), the N16 is one of the shorter National Primary routes, as it forms only part of a major route from Sligo to Enniskillen and onwards to Belfast.

In terms of the Trans European Road Network, the EU have designated<sup>3</sup> the Belfast/Sligo road as part of a:

*...comprehensive network of routes, feeding into the core network at regional and national level. The aim is to ensure that progressively, throughout the entire EU, the TEN-T will contribute to enhancing internal market, strengthening territorial, economic and social cohesion and reducing greenhouse gas emissions.*

This emphasises the routes strategic importance in linking the peripheral north-west of Ireland with Belfast and the north-eastern ports.

In County Sligo, the route carries modest volumes of traffic in comparison to other routes, with typical values of between 2,800 and 3,400 Average Annual Daily Traffic on the rural sections. Traffic Assessments (based on the National Transport Model and a site-specific assessment) have concluded that the primary destination point for traffic on the N16 is the urban centre of Sligo, or, its environs.

From an economic perspective, journey times on the route are particularly poor, with a typical average of circa 67kph. This factor is reflective of the existing geometric parameters, which are more akin to 50kph, 60kph and 70kph design speed standards, rather than the design speed objective for a National Primary route, which would typically be 100kph.

### 1.2.2 Physical Characteristics

The Physical Characteristics of the *Proposed Road Development* are contained within the townlands of *Drumkilsellagh*, *Doonally (ED Drumcliff East)*, *Castlegal (ED Glencar)*, *Drum East*, *Lugatober* (occurring predominately within), *Collinsford* and *Lugnaqall*. These characteristics are expanded upon in detail within Chapter 4 of the main report (Volume 2); however they generally comprise:

- Circa 2.54km of Realignment to the existing N16 National Primary Route (c. 0.79km online and c. 1.75km offline);
- Junction Improvements including:
  - One At Grade Roundabout;
  - Six Simple T Junctions, including two Right/Left Staggered T Junctions;
- Circa 1.5km of realignment to the existing local road network (tie-in works);
- Three Direct Access connections to the National Primary network;
- Circa 1.5km of Vulnerable Road Users (Unsegregated cycle and pedestrian) tracks located predominately with the mainline verge space, interlinking as necessary with alternative offline routes;
- One Vulnerable Road Users Subway underpass;
- One River/Stream Clear Span Structure;

<sup>3</sup> Trans-European Transport Network; Annex I Maps of the Comprehensive and the Core Network



- Culverts and associated diversions of existing minor watercourses and drainage ditches;
- All the necessary drainage works associated with the *Proposed Road Development*;
- The diversion of services and utilities;
- Earthworks operations;
- One no. steepened cut side slope in the townland of *Lugatober*;
- One no. Soil Repository/Borrow Pit;
- Environmental mitigation works;
- The other consequential construction works necessary in order to complete the project.



## 2 The Need for the *Proposed Road Development*

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### 2.1 General

The Main Report of the EIAR provides a detailed description of the ‘Need’ for the *Proposed Road Development*. This includes, as summarised below, reference to Policy Context, Existing Geometric Parameters, and Problem Definition.

#### 2.1.1 Policy Context

The following is the range of policy and regional studies which demonstrate a ‘Need’ for the *Proposed Road Development*:

- European Policy (The Trans European Network);
- National Policy;
  - Building Irelands Future, National Planning Framework
- Regional Policy;
  - Regional Planning Guidelines for the Border Region, 2010-2022
- Local Policy;
- Regional Corridor Studies.

#### 2.1.2 Existing Geometric Parameters

The following sets out the existing geometric condition of the existing N16, pertaining to the section to be replaced by the *Proposed Road Development*. The condition has been determined with reference to:

- TII Standards & Technical Publications;
  - Cross Section;
  - Geometry;
  - Junctions;
  - Stopping Sight Distance; and
  - Drainage

##### 2.1.2.1 TII Standards & Technical Publications

In describing the existing geometric conditions, the TII design standards provide an appropriate scale to measure the deficiency of the existing network against.

The standards specify a hierarchy of thresholds for the design of roads. These standards, represent the various criteria, whose incorporation in the road design would achieve a desirable level of performance in average driving conditions. This is most true in terms of traffic safety, operation, economic effects, environmental effects and sustainability.

*This Standard defines a sequence of parameter values in the form of a hierarchy of geometric design criteria related to Design Speeds. This three tier hierarchy enables a flexible approach to be applied to a range of situations where the strict application of Desirable Minimum standards would lead to disproportionately high construction costs or severe environmental impacts upon people, properties or landscapes. Designs with at*



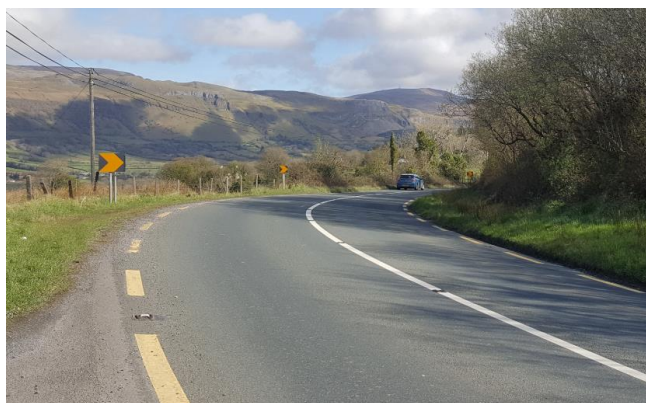
*least Desirable Minimum standards will produce a high standard of road safety and should be the initial objective....<sup>4</sup>*

The following provides a summary of the results of this analysis. The proceeding paragraphs, where applicable, measure the existing characteristics against the aforementioned hierarchy.

### 2.1.2.2 Cross Section

The cross section of the route, generally varies from 6m to 6.5m, with marginal verge widths of circa 0.5m to 1m, interspersed with sections which are devoid of any verge area. The following figures provide examples of the existing route in the general townland of *Lugatober*. This overall cross sectional width is circa 50% less than the desired Type 2 Single Carriageway cross section, which is described in section 4.1.1 of this report.

*Figure 2-1: Existing N16 – Lugatober*



*Figure 2-2: Existing N16 - Lugatober*



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<sup>4</sup> DN-GEO-03031, Section 1.8 (<http://www.tiipublications.ie/>)

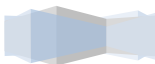


Figure 2-3: Existing N16 - Lugatober



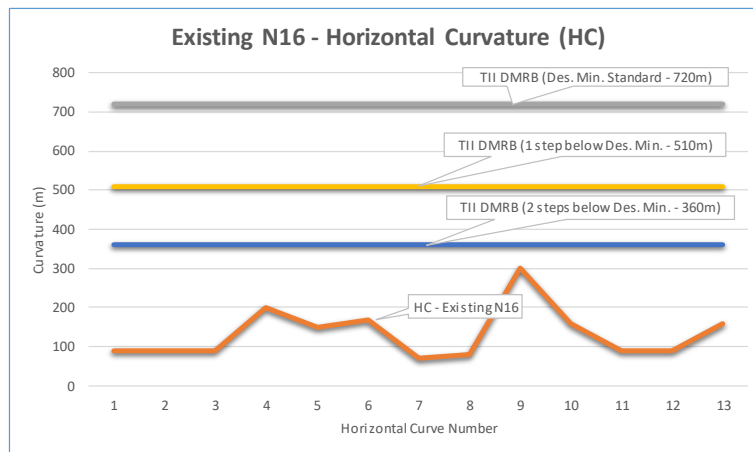
2.1.2.3 Geometry

The geometric properties of the existing route, have been established, using the Road Design computer package MXRoad. The proceeding sections of this chapter describe the horizontal and vertical characteristics of the route, while also comparing them to the Desirable Minimum standards.

**Horizontal Curvature**

In relation to Horizontal Curvature; the curvilinear nature of the route, which generally follows the contours of the topography, results in a proliferation of 13 tight radius bends. These bends, which occur on average every c. 210m, range in Horizontal Curvature values of between 70m and 300m. As outlined in Figure 2-4, such values fall well below the desired requirements of the TII standards and consequently also result in poor Stopping Sight Distance (SSD).

Figure 2-4: Horizontal Curvature of the Existing N16



**Vertical Curvature<sup>5</sup>**

In a similar manner to the Horizontal Curvature; the Vertical Curvature generally follows the topography resulting in 31 vertical curves, an average of 1 every circa 90m. As outlined in Figure 2-6 all the HOG (crest) values fall well below the TII standards; while as outlined in Figure 2-7 only one SAG curve has a value above 2 steps below the Desirable Minimum.

<sup>5</sup> See Figure 2-5 for examples of vertical curvature descriptions.



The deficiency and intensity of these curves is a further significant inhibition on safety and efficiency and in a number of cases severely impacts upon Stopping Sight Distance values.

Figure 2-5: Example of HOG and SAG curves (Vertical Curvature)

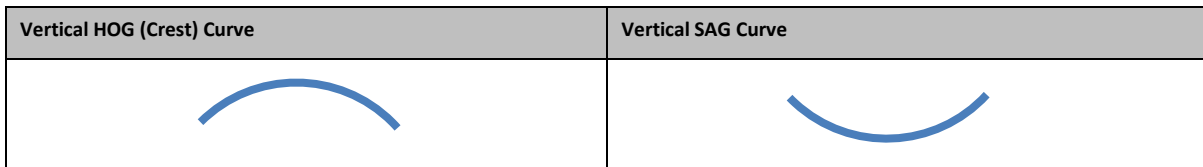


Figure 2-6: Vertical HOG (Crest) Curvature of the Existing N16

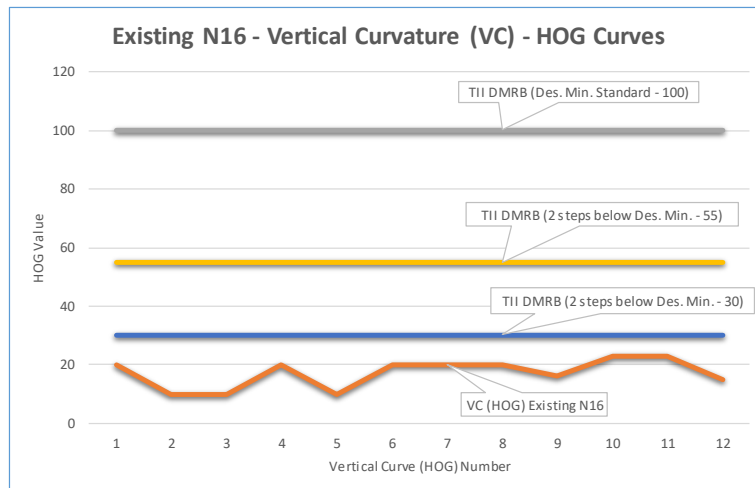
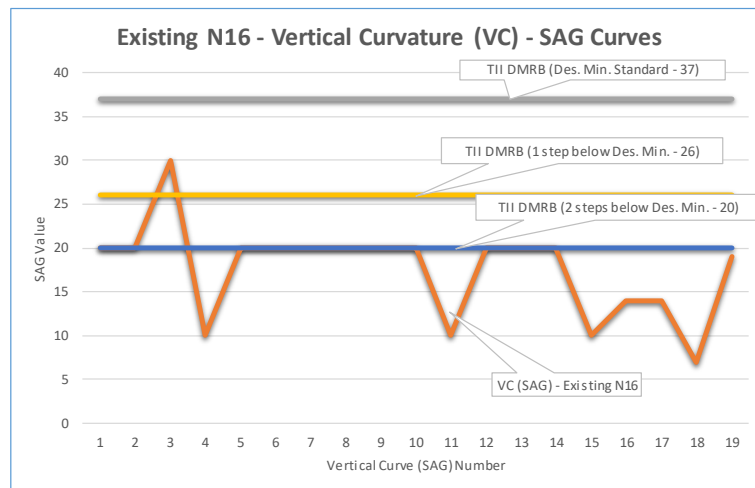


Figure 2-7: Vertical SAG Curvature of the Existing N16



2.1.2.4 Junctions

There are 6 local road junctions occurring along the section of the existing N16 to be replaced by the Proposed Road Development. A significant safety issue in relation to these junctions relates to the siting and the Stopping Sight Distances which are attainable (in most instances well below the desirable minimum of 215m).

Table 2-1: Junctions on Rural Section (3) of the existing N16

Junction Number	Townland Location	Stopping Sight Distance	
		SSD to the west/south	SSD to the east/north
L-3406-0	Drumkilsellagh	130	325
L-7415-0	Castlegal	90	65
L-74151-0	Drum East/Castlegal	90	160
L-7413-0	Lugatober	90	195
L-34041-0	Collinsford	220	160
L-3404-0	Lugnagall	125	110

There are a further 8 direct (domestic) accesses and 14 agricultural entrances onto the existing route. From a safety point of view, these types of entrances are especially problematic as they create an intensification of right turning movements on the national primary route.

Figure 2-8: Junction with Drum Road (L-3406-0)



2.1.2.5 Stopping Sight Distance

Stopping Sight Distance (SSD) in relation to junction accessibility has already been outlined in section 2.1.2.4. In relation to SSD on the mainline, it has been established from an assessment undertaken in MX Road that:

- Circa 95% of the existing route does not achieve a desirable minimum Stopping Sight Distance of 215m;
- Circa 82% of the existing route does not achieve a one-step below desirable minimum Stopping Sight Distance of 160m;
- Circa 66% of the route does not achieve a two-step below desirable minimum Stopping Sight Distance of 120m;

These statistics are further compounded by the fact that junctions and house entrances occur frequently over much of the route; a fact which in new design circumstances would require the full desirable minimum value to be achieved. Moreover, there are three locations along the route where the Stopping Sight Distance envelope is below 50m.

### 2.1.2.6 Drainage

The existing N16 is generally devoid of a dedicated drainage system. Along the route, verge cuts provide the only means of escape for road runoff, meaning flash floods and aqua-plaining is a common feature following heavy rainfall events. This is exacerbated by the topography of the area, where in some cases the road intercepts sheet flow (following heavy storm events) from the adjacent Copes Mountain.

Figure 2-9: Existing N16 - Flooding/Aqua-plaining



### 2.1.3 Problem Definition

The following section of the EIAR sets out the Problem Definition in the context of the section of the N16 being replaced by the *Proposed Road Development*.

The Problem Definition is measurable in terms of the Common Appraisal Framework and the following criteria:

- Economy;
- Safety;
- Environment;
- Accessibility;
- Integration; and
- Physical Activity.

#### **Economy**

The N16 is a key national and cross border international corridor and delays to traffic have a negative impact upon the economy. From a geometric perspective; in terms of bendiness this particular section of the N16 is significantly deficient and has a greater intensity of tight radii, twists and turns than any other section of the national primary network within county Sligo.

This results in a poor level of service and a very low average journey speed. The N16 Lugatober section has been calculated as having, an average journey speed of approximately 67 kilometres per hour.

This is particularly relevant, considering the dependency on road based transport in the region and the lack of a public transport alternative.

## **Safety**

In general, safety deficiencies of the existing route are reflective of the geometric conditions, which have already been described in section 2.1.2 of this report and summarised in Table 2-2.

*Table 2-2: Existing Network, Design Observations*

Criteria	Design Observation
Horizontal Geometry	The existing network is proliferated with horizontal curves, which are well below any design standard. This impacts on driver comfort and safety.
Vertical Geometry	Existing vertical curvature consists of a series of crests and sags, which are almost all, well below any design standards. This impacts on driver comfort and safety.
Junction Siting	All the junctions and direct accesses along the route are sited within locations where a desirable minimum Stopping Sight Distance is not achievable.
Stopping Sight Distance	Almost all of the route has Stopping Sight Distances which are at least 2 times less than what is required on a national primary route. This causes safety issues in terms of reduced breaking time upon visibility of an obstruction/ hazard.
Cross Section Widths	The existing pavement width is only 6-6.5m, with verge widths of between 0.5m and 1m commonly occurring. These factors present some locations which may cause driver alarm, where the existing topography falls away sharply away the road, this factor would be exacerbated during icy conditions
Drainage	There is no dedicated drainage system along the route. Aquaplaning routinely occurs following rainfall events.

There have been 3 minor collisions, on this section of the national primary route between 2009 and 2015. In addition, a fatality also occurred on the N16 in 2016 at *Drumkilsellaigh*.

This equates to approximately 14.75 accidents per 100 Million Kilometres of travel, which is almost twice the national average between the years 2009 to 2014.

## **Environment**

There currently are no provisions for drainage along the existing N16 corridor. An environmental problem associated with this fact is that existing runoff from the road surface, is not subjected to treatment and attenuation, prior to discharge to the receiving environment.

## **Accessibility and Social Inclusion**

The condition of the existing route, which is grossly substandard, presents a network which is difficult to gain access to, difficult to drive upon and difficult to egress from. These factors inhibit Accessibility and Social Inclusion for both local trips and for longer inter-regional international trips.

## **Integration**

The current condition of the existing N16, inhibits the provision of a ‘...safe and efficient...’ road network and in its current form, does not support the various national, regional and county planning policies.

## **Physical Activity**

Pedestrian and Cyclist activity on the existing route is inhibited by the daily flow of traffic and the geometrically deficient nature of the route.

## 3 Consideration of Alternatives

### 3.1 Introduction

The consideration of alternatives is a key element of the planning process, as it recognises the importance of avoiding impacts at an early stage.

In the context of the *Proposed Road Development*, the study and consideration of alternatives, commenced at an early stage, in advance of the identification of the project extents or location.

This initial study took the form of a route selection assessment for the full N16 between Sligo town and the county boundary with Leitrim. The wider corridor was examined and appraised in order to ensure that prioritised sectional improvements to the N16 would tie in, in the long term, with what is considered to be the most desirable and optimal corridor for the entire route. The following section of this Non-Technical Summary briefly describes the alternatives considered at Route Selection Stage together application alternatives during the subsequent design process.

### 3.1 N16 Sligo to County Boundary, Route Selection Report

An appraisal (in the form of a route selection study) of the full N16 route corridor as it occurs in County Sligo commenced in Quarter (Q) 4 of 2015 with the establishment of a Constraints Study Area and concluded in Q2 of 2017 with the publication of the N16 SCB RSR and the selection of an Emerging Preferred Route.

The following section summarises the background and findings of the N16 Sligo To County Boundary Route Selection Report. Figures 2.1, 3.1, 3.2, 3.3, and 3.4 (provided in Appendix A to this Non-Technical summary) outline the various options considered in the context of the wider corridor study.

#### 3.1.1 Option's selection and appraisal

##### 3.1.1.1 Range of alternatives

The range of alternatives considered, were generally classified under the following headings:

- 'Do-Nothing' and 'Do-Minimum' alternatives;
- 'Do-Something' alternatives, including:
  - Public transport alternative;
  - Traffic management alternative;
  - Upgrade in accordance with TII Publications (Design Standards);

The process evolved to indicate, that the only viable solution to the interventions required, on the N16 in County Sligo, was an upgrade which was consistent with the requirements of a national primary route and the appropriate design standards. The following section, outlines the process used to develop the 'Feasible Route Options' for this solution.

##### 3.1.1.2 Key Design Stages

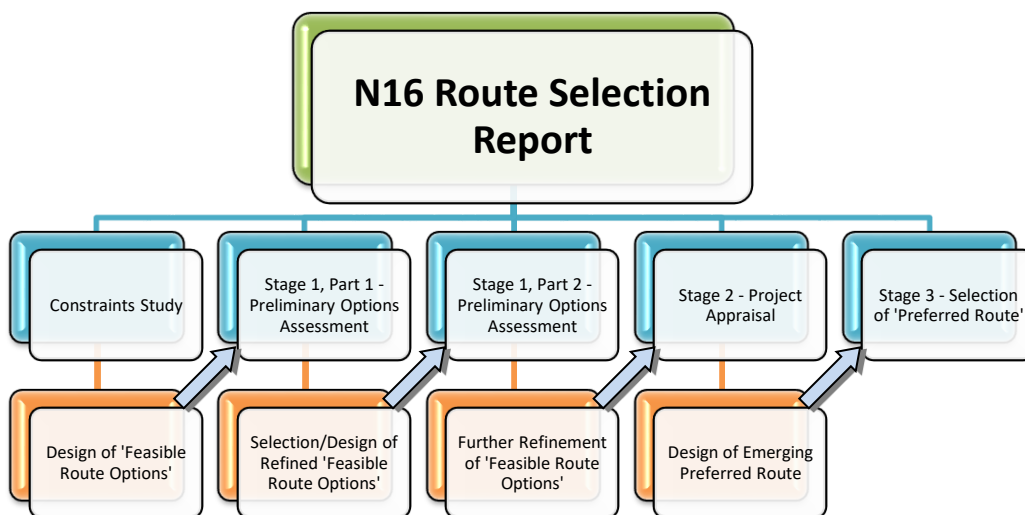
The ensuing selection of the preferred route for the N16 was an iterative process, supported by a number of key stages as summarised in *Figure 3-1*. These stages as described below included:

- (1) Establishment of a Constraints Study Area;
  - A Constraints Study Area was defined within which it was likely all design options would take place. An overview of this Constraints Study Area is provided in Figure 2.1 contained within Appendix A to this Non-Technical Summary;



- (2) Design Phase 1 – Feasible Route Options;
  - 13 initial route options were initially developed as outlined in Figure 3.1 contained within Appendix A to this Non-Technical Summary;
- (3) Stage 1, Part 1; Preliminary Options Assessment;
  - The 13 aforementioned route options were refined down to 4 general options as outlined in Figure 3.2 contained within Appendix A to this Non-Technical Summary ;
- (4) Stage 1, Part 2: Preliminary Options Assessment;
  - A second refinement took place which reduced the options down to 3 general arrangements as outlined in Figure 3.3 contained within Appendix A to this Non-Technical Summary;
- (5) Stage 2; Project Appraisal & Selection of Preferred Route;
  - The final stage of the process involved an appraisal of the aforementioned 3 options and a subsequent selection of an emerging preferred route as outlined in Figure 3.4 contained within Appendix A to this Non-Technical Summary

Figure 3-1: Stages of N16 SCB RSR



### 3.2 Application of Design Alternatives

The consideration of alternatives continued into the design process of the *Proposed Road Development*, evolving in tandem with the increasing detail of the design and focusing more closely on discreet considerations.

The design alternatives considered included an examination of:

- Junction siting and side road arrangement;
- Vulnerable Road Users; and
- Siting of other ancillary infrastructure.

### 3.3 Public Consultation

The following outlines the nature and extent of non-statutory Public Consultation carried out to date in the design of the *Proposed Road Development*. These consultations generally took place as part of the Route Selection Process. Additional, more informal consultations have taken place on a one-to-one basis as the project design has evolved.



### 3.3.1 N16 Sligo to County Boundary, Route Selection – Public Consultation

#### **Public Consultation No. 01 – Constraints Study Area**

In order to initiate the participation of the public at the earliest possible opportunity; a Public Consultation process in relation to the Constraints Study Phase was conducted between the 29<sup>th</sup> of July and the 14<sup>th</sup> of August, 2015. This process included two information days held in the Clarion Hotel (Sligo) on the 29<sup>th</sup> and 30<sup>th</sup> of July, 2015. As part of this process, this consultation period encouraged feedback from the general public in relation to aspects of the project. In this regard a predefined questionnaire was completed by 31 respondents (See Section 5.5.1 of the Sligo to County Boundary Route Selection Report for further details) prior to the closing date for submissions.

Statutory and non-statutory bodies were also written to as part of this consultation period.

#### **Public Consultation No. 02: Feasible Route Options**

The 2<sup>nd</sup> Public Consultation for the Route Selection Process commenced on the 13<sup>th</sup> of January, 2016, with 2 open days/evenings in the Clarion Hotel, Sligo. The consultation period, extended to the 12<sup>th</sup> of February, during which time, submissions were requested from the Public. During this period, the design team were available to discuss and explain aspects of the Route Selection Process, to the Public.

In total, there were 63 submissions. Each submission was examined and information, where made available, was used to inform the assessment process (e.g. Socio Economic, Agricultural and Non-Agricultural Property). Of the submissions made, 90% related to property, or community impacts

Statutory and Non Statutory Bodies were also written to as part of this consultation period.

#### **Public Consultation No. 03: Refined ‘Feasible Route Options’**

A third Public Consultation for the Route Selection Process commenced on the 27<sup>th</sup> of July, 2016, with 2 open days/evenings in the Clarion Hotel, Sligo. The consultation period, extended to the 8<sup>th</sup> of September.

Although questionnaires did not form part of this particular consultation, additional submissions were encouraged. 16 submissions were received, each of which were subsequently considered in the proceeding Stage 1, Part 2; Preliminary Options Assessment.

#### **Public Consultation No. 04: Emerging Preferred Route’**

A fourth Public Consultation commenced in the Clayton Hotel (previously Clarion Hotel), Sligo, on the 06<sup>th</sup> of June, 2017. The purpose of this consultation, which extended to the 21<sup>st</sup> of July, was to inform the public of the ‘Emerging Preferred Route Corridor’.

Further submissions were encouraged from the Public during this process, which it was articulated, would assist in further refinements during the design phase. Submissions received during this stage were retained on file and were (or will depending on location) be referred to during the design stage.

## 4 Description of the *Proposed Road Development*

### 4.1 Introduction

Chapter 4 of the EIAR (Main Report) provides a detailed description of the Design<sup>6</sup> for the *Proposed Road Development*. The following section of this Non-Technical Summary provides a brief overview of general aspects relating to the project.

#### 4.1 The road type and cross section

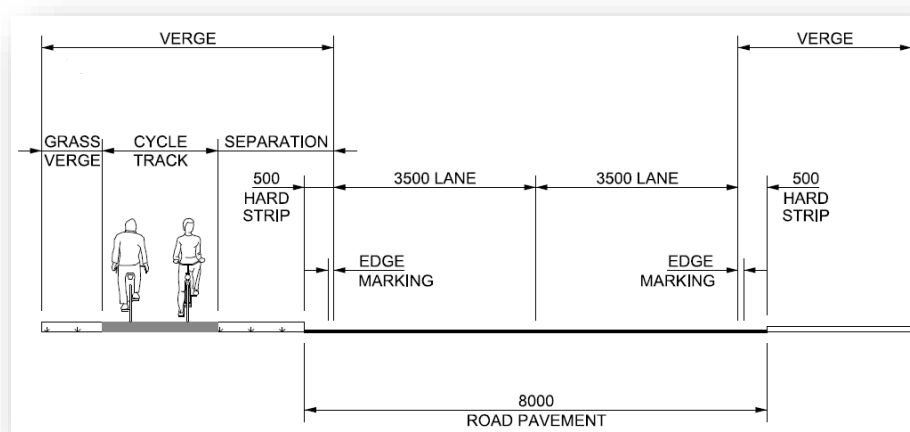
The following outlines the road type and cross section of the *Proposed Road Development*.

##### 4.1.1 Mainline cross section

###### 4.1.1.1 Cross section

The cross section for the N16 was established following an assessment undertaken as part of the N16 Sligo to County Boundary Route Selection Report<sup>7</sup> to be a Type 2 Single Carriageway arrangement as outlined in Figure 3-2. This arrangement will include provision for cycle tracks where alternative off road routes are not available.

Figure 3-2: Type 2 Single Carriageway



##### 4.1.2 Junction strategy, side roads and access tracks

The design of the *Proposed Road Development* has included detailed consideration of the local roads which the proposed N16 intercepts. The junction strategy for each of these local roads is described figuratively in Figures 4.1.1 to 4.1.2, which are attached as an appendix to this Non-Technical Summary.

<sup>6</sup> Design means a design to satisfy the requirements of Phase 3 of the NRA Project Management Guidelines.

<sup>7</sup> [http://www.sligococo.ie/N16/RouteSelectionReport/Volume2/N16SCB\\_RSRVol2EngPARTB.pdf](http://www.sligococo.ie/N16/RouteSelectionReport/Volume2/N16SCB_RSRVol2EngPARTB.pdf)

With the exception of the roundabout selected for the southern tie-in, all the junctions selected for the project are simple T junctions. Considering traffic volumes and turning movements, there is no requirement for a ghost island at any of the junction locations; however, each junction, will be supplemented with 2m wide nearside passing bays.

Figure 3-3 provides an indicative pictorial overview of the proposed junctions.

Figure 3-3: DN-GEO-03060; Simple T Junction with Right/Left Stagger



The dwell area (15m approach) of the junctions as they intercept the national primary route, will be either 7m, or 8m wide (0.5m hard strip). Outside the dwell area, the cross section considers the existing cross sectional width of the local road's (which in some cases are less than 3m) and applies in most cases similar road widths, with a minimum defined width of 4m; the verges are considered in a similar way with an applied minimum width of 2m.

#### 4.1.2.1 Access tracks (agricultural, domestic and drainage service)

Direct accesses are defined in the Transport Infrastructure Ireland (TII) standards, as accesses which *...connects directly to a national road including field accesses and accesses serving one or more properties....*

The existing situation has 22 direct accesses connecting to the national network. The overriding principle during the design process was to ensure direct vehicular accesses onto the proposed N16 could be avoided insofar as was reasonably practicable. However, due to the fact that the project predominately follows the existing alignment (although of a generally greenfield nature), there are instances where the provision of direct agricultural access are unavoidable due to existing access arrangements. In this regard, there are four no. direct accesses proposed along the c. 2.54km realigned section; this includes two agricultural accesses, one combined agricultural/maintenance access, and one further maintenance access.

These accesses are outlined in Figures 4.1.1 and 4.1.2 which are attached as an appendix to this Non-Technical Summary.

The cross sections proposed for direct accesses will be generally 4m overall carriageway widths, with 2m wide verges provided on each side, for agricultural/maintenance access tracks.

## 4.1 Description of mainline alignment

The mainline alignment which is outlined in Figures 4.1.1-4.1.2 attached as an appendix to this Non-Technical Summary has been designed to produce a continuous flowing arrangement throughout.

### 4.1 Existing and Projected Traffic Conditions

Other than a removal of traffic from sections of the existing N16 severed by the *Proposed Road Development* there will be no reassignment of traffic as a result of the project. An average annual daily traffic figure of circa 2,800 to 3,500 in 2018 is expected to increase in line with annual growth rates.

Journey time calculations shows that the *Proposed Road Development*, in the Do-Something scenario provides a journey time saving of over 50 seconds over the Do-Nothing situation. At circa 36%, this is an appreciable reduction in journey time.

## 4.2 Road Safety

From a qualitative perspective, the construction of the project will provide safety and amenity benefits to future users of the existing route while maintaining to a large degree existing travel patterns of users on the existing local roads. The following engineering improvements will also provide significant safety benefits:

- An overall reduction in road length of circa 250m (c. 10%);
- The transference of 19 existing direct accesses from the national primary route;
- The improvement of Stopping Sight Distances at all junction locations to the Desirable Minimum standard for a 100kph road;
- The provision of dedicated facilities for Vulnerable Road Users;
- The provision of a dedicated drainage system which will remove current aqua plaining conditions on the road surface;

## 4.3 Structures

### 4.3.1 Introduction

There are a number of structures associated with the implementation of the *Proposed Road Development*. The main more significant structures include those outlined in *Table 3-1*.

*Table 3-1: Principal Structures*

Structure	Location	Description
Clear Span River Bridge	Ch. 605m	A 15m clear span structure required to traverse the <i>Proposed Road Development</i> across the Tully Stream.
Vulnerable Road Users Underpass	Ch. 1,310	A 2.7m high x 4m wide x 34m long Vulnerable Road Users Underpass
Steepened Side Slope (Reinforced Earth Structure)	Ch. 1,350 – 1,420m	A 45m long x c. 3m-4.5m deep reinforced side slope to reduce impacts to a residential property in the townland of Lugatober.

Other, more minor structures include:

- Box Culverts for the realignment of existing watercourses;
- Circle pipe culverts for the realignment and diversion of new and existing drainage ditches; and
- Low level retaining walls (c. 0.5m high) which will be used in verge spaces to limit landtake on Residential properties, particularly within the townlands of *Drumkilsellagh* and *Doonally*.



## 4.4 Drainage Design

The drainage design for the project includes the provision of a range of infrastructure including:

### Land Drainage

- Toe drains and cut off drains;
- Watercourse diversions;
- Culverts and river bridges (as already outlined);

### Road Drainage

- A road runoff drainage system including kerb & gully and surface water channels (concrete and grassed);
- Attenuation Ponds (to slow down the rate of runoff to the receiving environment);
- By pass petrol interceptors;

## 4.5 Geotechnical

The road design is characterised by a series of cuts (excavations below ground level) and fills (filled sections above ground level). The majority of these sections are generally less than 5m in depth and height respectively; that is with the exception of one deep cut in Castlegal (13m at its deepest section) and one high fill (embankment in excess of 10m) in the townland of *Lugatober*. The material removed from the cut section (which is predominately rock) will be used to construct the embankment in Lugatober townland.

### 4.1 Route Lighting

The Southern tie-in, which comprises a three arm roundabout arrangement, is the only location which requires lighting on the *Proposed Road Development*.

It is proposed to light the roundabout with 10m columns and no bracket arms, situated around the periphery, each carrying a high quality LED lantern. The new route north of the roundabout will be lit with a single sided arrangement of lights to a distance of 139 metres from the roundabout. The single-carriageway south of the roundabout will be lit also to a distance of 139 metres with a single-sided arrangement of lights. The L3406-0 will be lit to a distance of 111 metres from the roundabout.

The lights on each of the roundabout approaches, will be 10 metre columns without bracket arms, and LED lanterns.

### 4.2 Vulnerable Road Users

Vulnerable Road Users will be catered for, via the provision of a path (two way facility) which is generally 2m wide located within the verge area of the *Proposed Road Development*. This will be complemented by an offline facility (incorporating appropriate lining and signage) between *Drumkilsellagh* and *Castlegal*.

Conflict points with the local network and direct accesses are considered, due to the low volume of traffic concerned, to be low risk, and as such are designed as uncontrolled crossings, these crossings are in this regard designed as bend out crossings as outlined indicatively in *Figure 3-4*.

Figure 3-4: Extract from DN-GEO-03060, Figure 5.7, Bend out Crossing

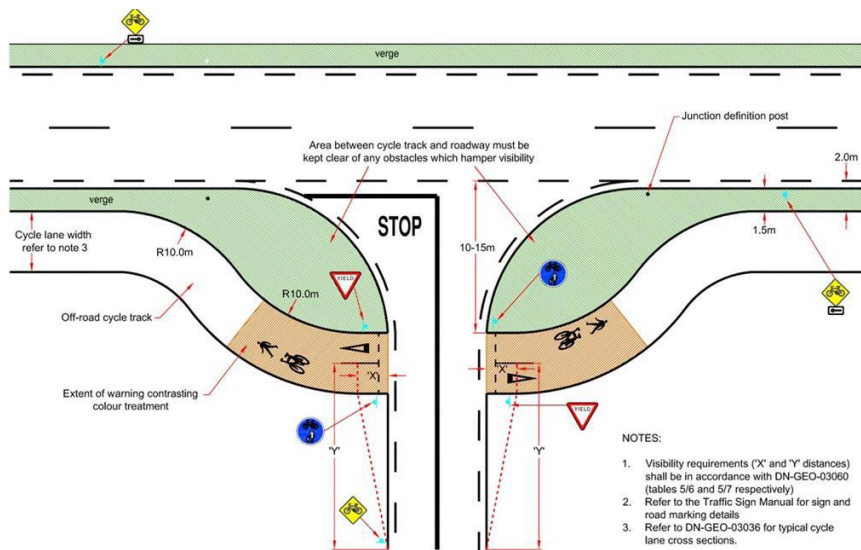
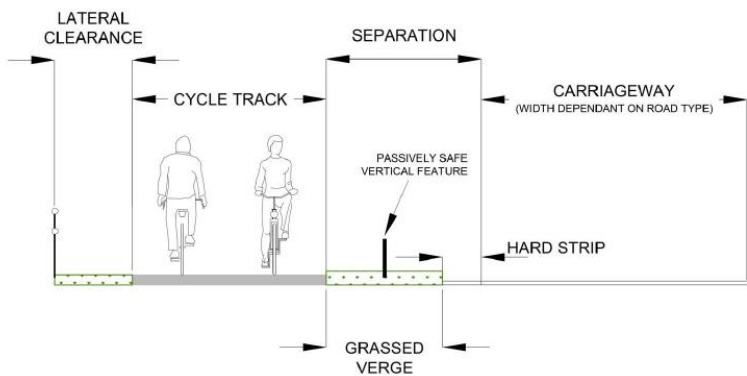


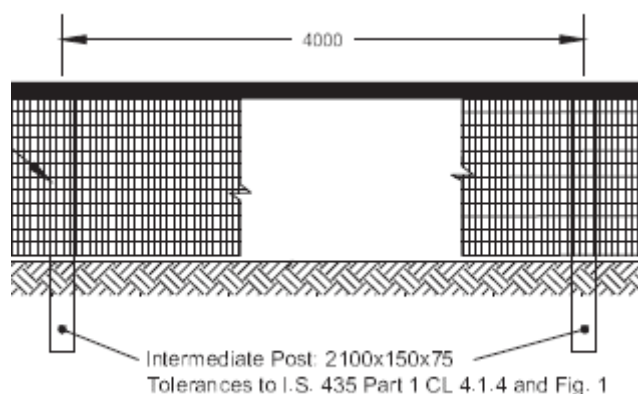
Figure 3-5: DN-GEO-03036: Ref. Figure 3.3: Off-Road Two-Way Cycle Track



### 4.3 Boundary Fencing

Boundary fencing for the *Proposed Road Development* will be timber post and tension mesh fence as outlined indicatively in *Figure 3-6*.

*Figure 3-6: Boundary Fence*



### 4.4 Utilities and Services

The construction of the *Proposed Road Development* will generally result in some limited impact on existing utilities.

### 4.5 Construction of the Proposed Road Development

#### 4.5.1 Programme & Contract

Subject to satisfactory completion of the statutory procedures and to the availability of finance; it is anticipated that advance works will commence in late 2019, with construction work commencing in 2020.

The construction period is anticipated to last approximately 18 months. Normal hours of work, unless specific restrictions are placed on certain activities within certain chapters of the EIAR will be:

- Monday to Friday: 08:00 to 19:00 hours;
- Saturday: 08.00 to 14:00 hours;
- Sunday: No Working.

Certain operations may however be carried out, outside of these hours with the permission of the contracting authority.

Where restrictions are placed on the Contractor due to seasonal constraints, consideration will be given to advance works being undertaken where appropriate.

#### 4.5.2 Earthworks Volumes & the Management of Soft Soil

The construction of the *Proposed Road Development* will by its nature necessitate the excavation and movement of topsoil, subsoil and rock from the existing site. It is expected that the vast majority of required earthworks will be sourced from the site itself both from cut sections and from a Soil Repository/Borrow Pit located onsite. There will however be some requirement to import acceptable material fill material.

### 4.5.3 Construction & Demolition Waste Management Plan

An *Outline* Construction and Demolition Waste Management Plan has been prepared for the *Proposed Road Development*. This plan initiates the Construction and Demolition Waste Management process and an obligation as part of the contract documents for the project will be placed on the Contractor to develop, maintain and operate a more detailed Construction and Demolition Waste Management Plan.

### 4.5.4 Construction Compounds

A Construction Compound will be required for the duration of the works. Provision has been made for this compound to the west of the proposed mainline alignment at circa Ch. 500m as outlined in Figure 4.1.1 which is provided in Appendix A to this Non-Technical Summary.

The activities at the compounds may include stores, offices, materials storage areas, materials processing areas, plant storage, parking of site and staff vehicles, and other ancillary facilities and activities. Controls in relation to the development and operation of the compound are described in section 5.3.5 of the Outline Erosion and Sediment Control Plan described in section 4.5.8 of this EIAR.

### 4.5.5 Temporary Access and Construction Traffic

Construction traffic will be generated by movement of material, equipment and supply vehicles. A small amount of traffic will be generated by site personnel.

Primary access to the site for all construction vehicles will be provided from the existing N16:

- At the southern tie in;
- In the townland of *Drumkilsellagh* at c. Ch. 400m;
- In the townland of *Lugatober* at c. Ch. 1,120m;
- In the townland of *Lugatober* at c. Ch. 2,150m;

It is anticipated that construction traffic will also use a haul road along the road corridor itself (within the landtake area), for access. The use by construction traffic of local roads will be limited to the works which are required to construct each particular local road.

Vehicle movements will be required for the movement of material on haul roads within the site boundary. At the peak construction times this may result in approximately 200 traffic movements a day (approximately 30 movements an hour).

In order to minimise disruption, a traffic management plan for the construction period will be developed.

The Contractor will be responsible for daily inspection and maintenance of roads to ensure that they are free of construction debris, dust and mud.

### 4.5.6 Temporary Road Diversions

The locations where temporary diversions during construction of the realignment are listed within the EIAR Main Report. These diversions will in most cases be accommodated within the land-take required for construction of the *Proposed Road Development*. However, there are localised instances where diversions will be required via alternative routes on the local and regional road network; this will include some diversions on the regional road between Sligo and Manorhamilton (for on line works to the N16) and local diversions on the L7413-0 (*Lugatober*) and L3404-0 (*Lugnaqall*).



All diversions will be planned in a manner, which will include advance notification and publicity of the diversion times and duration. The diversion routes themselves will be subject to appropriate traffic management and control which will include directional signing along the prescribed route.

In all additional cases, local road access shall be maintained throughout the construction process via localised treatment measures within the landtake required for the *Proposed Road Development*.

#### 4.5.7 Construction Works

The following outlines the likely stages of the construction works, general impacts and mitigation measures that will be employed during this stage.

##### 4.5.7.1 Pre-Construction Works

Archaeological surveys and testing will be undertaken prior to the main works starting in order to resolve archaeological issues. Following resolution of the archaeology, site clearance will require the use of large machinery and vehicles. Advance works will include diversion of services where required and vegetation clearance.

##### 4.5.7.2 Main Earthworks Activities

The main earthworks activities required onsite will include:

- Site Clearance & earthworks cut off drainage;
- Site Fencing;
- The removal of various soft spots within the existing subsoil;
- Creation of embankments;
- Excavation of cut sections including the removal of subsoil and rock; and
- The creation of foundations for various structures.

#### 4.5.8 Construction Stage Water Quality Considerations

Water quality will be managed during the construction process through the implication of a range of measures which are defined in an Outline Erosion and Sediment Control Plan (contained within volume 4 of the EIAR).

#### 4.5.9 Monitoring of Environmental Commitments

The environmental commitments outlined in this EIAR will be included within an Environmental Operating Plan to be developed by the Contractor. The Employer's Representative appointed by the Local Authority will be responsible for the auditing of this plan and for ensuring that commitments described in this EIAR are implemented by the contractor.

## 4.6 Operation and Maintenance

During a period of 24 months after construction, remedial and maintenance works will be undertaken as required. During the period of establishment, landscaping maintenance will be carried out.

Routine maintenance on National Primary Roads is normally undertaken by the Local Authority. In general, routine maintenance comprises grass cutting, road sweeping, gully emptying, street light maintenance and landscape maintenance.

## 4.7 Other Statutory Considerations

### 4.7.1 Compulsory Purchase Order Considerations

The *Proposed Road Development* by its nature will require a permanent Compulsory Purchase Order (CPO) for an area of c. 23.85 Hectares of land (including roadbed) comprising in the main agricultural lands.

All lands included are considered necessary for the construction of the *Proposed Road Development*.

The following parameters have been used to identify the land required for the construction and operation of the *Proposed Road Development*:

- Proposed road footprint;
- Proposed footprints of attenuation wetland pond facilities;
- Areas required for other drainage elements including outfalls, culverts, ditches and petrol interceptors;
- Access tracks;
- Areas for landscaping;
- Areas for construction;
- Maintenance strip;
- Acquisition of severed land plots; and
- Areas required for soil repositories/borrow pits;

In addition, further areas required under a temporary Compulsory Purchase Order include:

- Areas required for temporary sediment controls which are described in the Outline Erosion and Sediment Control Plan contained within Volume 4 of this EIS and described in 4.5.8 of this chapter;
- Areas required for construction of the permanent fence boundary;
- Areas required to construct retaining walls to domestic properties;
- Area required for the proposed site compound.

#### 4.7.1.1 Accommodation Works

Accommodations works are carried out to mitigate adverse effects of the *Proposed Road Development* on individual land and property owners. These works will be carried out as part of the main roadwork's contract and generally consist of providing items such as gateways, walls and fences, cattle pens, replacement services and such like.

#### 4.7.1.2 Extinguishments of Rights of Way

There are a number of both public and private rights of way, which shall be extinguished as a result of the *Proposed Road Development*.

Private rights of way are also being extinguished as a result of the *Proposed Road Development*. These are rights of way noted on landowners Land Registry Folios or where landowners have stated that one exists to their knowledge. Where a private right of way is extinguished an alternative access either exists or a new access is being provided as part of the *Proposed Road Development*. It is possible that

further private rights of way which are not known about may exist across land being compulsorily acquired which will also be extinguished.

#### 4.7.2 Effects on European Sites

In relation to European sites, an Appropriate Assessment Screening Assessment and Natura Impact Statement have been prepared to provide the competent authorities with the information necessary to complete an Appropriate Assessment.

As outlined in section 9.4.2.2 (Biodiversity Chapter of the EIAR – Main Report, Volume 2):

*... This EIAR chapter and the NIS concludes that the that the Proposed Development, individually or in combination with other plans or projects, will not adversely affect the integrity of any European Site.*

## 5 Environmental Impacts and Mitigation

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### 5.1 General

This section provides an overview of the environmental impacts of the N16 Lugatober (Drumkilsellagh to Lugnaqall) *Proposed Road Development*.

Environmentally sensitive areas in the vicinity of the proposed route were initially identified during the constraints and route selection phases. Throughout the environmental assessment process mitigation by avoidance has been adopted where possible and changes have been made to the design to reduce or eliminate adverse impacts. In areas where this has not been possible mitigation measures have been suggested to reduce or eliminate the impacts.

The following is intended to provide an overall appreciation of environmental impacts; therefore no reliance should be placed on the fullness of the information contained herein. Where additional information is required, the reader is recommended to refer to the full body of the EIAR.

#### 5.1.1 Population and Human Health

##### Population

The assessment of population generally addresses effects at a community level, rather than for individuals or identifiable properties, although effects for individual businesses are discussed where these are located beside the road or are very dependent on road traffic or accessibility. Effects on individual properties are addressed separately in Chapters 14 and 15 of the EIAR (Main Report), which deal with Agricultural Property and Non-Agricultural Property.

Following mitigation, the *Proposed Road Development* will have a *significant positive* effect on journey amenity including road safety. There can be expected to be a *slight positive* effect on accessibility and journey times to Sligo and the east which will benefit people living in the local community. Journey amenity and tourism potential will also be significantly improved by the inclusion of the cycle track along the *Proposed Road Development*. The positive residual effect will be enhanced by a reduction in the severance on households beside the existing road due to both the effect of crossing facilities and the presence of the cycle lane.

The positive regional economic effect will also be enhanced by applying the proposed mitigation to minimise any local economic effects on small businesses. In addition, the *Proposed Road Development* will provide regional economic benefits to cross-border trade and interaction.

##### Health

From a community perspective overall, there are potential benefits in terms of human health protection. These arise from overall reductions in noise levels and improvements in air quality in these areas. Unfortunately, there are individuals who have slight negative impacts because of their proximity to the *Proposed Road Development*. The implementation of the mitigation measures will result in a residual slightly positive impact.

Similarly, from a psychological health point of view overall from community perspective the impacts of the *Proposed Road Development* are assessed as being positive. The residual impact will be positive.

There is the potential for a very significant opportunity for health improvements associated with the *Proposed Road Development*. These include the potential for economic development as well as tourism which in itself is associated with an improvement in health status. There is the potential for

improvements in social health with a reduction in unemployment and particularly long-term unemployment. Such a potential if realised will bring with it benefits including reduced inequality in society. There is the potential for reduced traffic accidents with a corresponding reduction in mortality and morbidity. Ease of access and egress has the potential to improve social interaction. It also will allow quicker and more reliable access for emergency services such as ambulances. The residual impact will be positive.

There is potential for significant improvement in access to services. The benefits of this apply to both the residents of Sligo and beyond. Easier access to national road network will allow greater availability of national services such as major hospitals and others. The residual impact will be positive.

### 5.1.2 Noise and Vibration

During the construction phase for the *Proposed Road Development*, noise and vibration will potentially be generated by site preparation works, excavation and infilling works. During the operation phase of the *Proposed Road Development*, noise and vibration will potentially be generated by vehicular engine and tyre noise on the road. Therefore, the potential noise and vibration impacts on noise sensitive receiver properties have been considered for both the construction and the operational phases of the project.

A baseline environmental noise survey was undertaken at 6 No. representative noise sensitive locations (N1-N6) in proximity to the *Proposed Road Development*

The ground works associated with the construction of the *Proposed Road Development* will include excavations, embankments and fill sections, road paving and installation of signage and services etc. along the proposed development alignment. Equipment and noise sources, such as rock breakers, excavators, generators, dump trucks and road rollers, etc. will be the main noise sources associated with the construction phase of the *Proposed Road Development*. It is also likely that blasting may be required to remove rock material.

The most active location during the construction process will be a deep cut (into limestone bedrock) and soil repository/borrow pit between approx Ch. 750m to 1150m and transitioning into a high fill section between approx Ch. 1,150m to 1,340m.

Noise & Vibration arising from these construction works, will be limited to specific thresholds as outlined in the main chapter of the EIAR (Main Report). These limits provides for protection against the vibration nuisance and is comfortably within the limit for potential cosmetic damage; this will include any activities relating to any potential blasting at the proposed cutting and soil repository/borrow pit at Castlegal.

Property condition surveys will be offered for all buildings within 50m of the development boundary (in addition to all those properties within 500m of any potential blast site).

In relation to operational stage (post road opening) noise and vibration; there will be either 'No Change' or a 'Negligible' increase or decrease in traffic noise levels at 34 of 46 noise sensitive receiver locations assessed in proximity to the *Proposed Road Development*. No receivers were deemed to require mitigation measures in the Year of Opening (2021) or the Design Year (2036) as the predicted traffic noise levels at noise sensitive receiver locations comply with the TII design goal criteria. It is proposed that in order to allow for a reduction in road traffic noise levels, a Stone Mastic Asphalt road surface, i.e. a Low Noise Surface, will be used in the *Proposed Road Development*.

The main changes in noise levels are a noticeable to very substantial positive change in noise levels at 11 properties. There is predicted significant improvement in noise levels at these properties as the *Proposed Road Development* will move these properties further from the national primary route and there will also be a benefit from the use of the low noise surface. There will be a 'noticeable' increase

in noise levels of approximately 3 dB(A) and hence, a negative impact in noise levels at one property. This property is located approximately 140m from the existing N16 alignment and will be approximately 60m from the centreline of the new N16 alignment. However, there will be no mitigation required at this location as the predicted noise level is well below the 60 dB  $L_{den}$  design goal as specified in the TII Guidelines.

### 5.1.3 Air Quality and Climate Change

The main Air Quality and Climate Change impacts relating to construction will relate to the same activities which have already been described in section 5.1.2 (Noise & Vibration). To minimise the potential dust impact, a series of dust mitigation measures are presented in the EIAR (Main Report). Construction related dust impacts at sensitive receiver locations located in proximity to the proposed construction works is likely to result in a 'Temporary Slight Adverse' impact. As stated, dust mitigation measures will be put in place to reduce the impact level.

From an operational perspective, there will no significant change in traffic volumes in proximity to the *Proposed Road Development*. Therefore, there will be no long-term residual impact. At the level of changes presented for the proposed alignment coupled with the insignificant change in traffic volumes the predicted air quality impact on air quality sensitive receiver locations is classed as 'Negligible'

### 5.1.4 Biodiversity

The Biodiversity Chapter of the EIAR quantifies any potential impacts relating to biodiversity and Key Ecological Receptors (KER's) and identifies the measures required to avoid, reduce and mitigate likely significant impacts. Identification of impacts and prescribed mitigation has been derived following a collaborative approach working with a multi-disciplinary team including project engineers, hydrologists, ecologists, landscape specialists and hydrogeologists. The results of ecological surveys have been utilised to inform the design of the *Proposed Road Development*, thereby minimising potential impacts on sensitive habitats and species of conservation interest.

Following consideration of the residual effects (post-mitigation) the *Proposed Road Development*, will not result in any significant effects on any of the identified KERs. No significant residual effects on receptors of International, National or County or Local Importance were identified.

The potential for effects on the European designated sites are fully described in the Natura Impact Statement (NIS) that accompanies this application. Key findings of the assessment are summarised in section 9.4.2.2 of this EIAR. The NIS states that the Proposed Development, individually or in combination with other plans or projects, will not adversely affect the integrity of any European Site.

No potential for significant effect on Nationally Designated Sites exists given that all identified pathways for impact are robustly blocked by the project design and mitigation contained in the EIAR.

The *Proposed Road Development* will be constructed and operated in strict accordance with the design, best practice and mitigation that is described within the EIAR and as such, significant effects on ecology are not anticipated at any geographical scale on any of the identified KERs.

### 5.1.5 Soils & Geology

Importation of materials from outside the site will be minimised by ensuring that materials arising from within the site are used to the greatest extent possible.

A review of the GSI's County Geological Sites of County Sligo (Geological Survey of Ireland, 2016e), indicated there are no County Geological Sites (CGS) identified within the study area. There are five County Geological Heritage sites within 10km of the *Proposed Road Development*, three of which have been recommended as a Geological National Heritage Area. The Geological Heritage Sites outside the

study area are not considered sensitive to the development due to their distance from the road footprint.

The impact assessment relating to construction related activities focussed on the following criteria:

- Earthworks: Excavation and Replacement;
- Importation of Road Construction Materials;
- Sub soil removal;
- Bedrock Removal;
- Karst Features;
- Economic Geology;
- Erosion, Storage and Stockpiles;
- Sealing of overburden material; and
- Contaminated Land;

An overall analysis of the impacts in light of the proposed mitigation measures concludes that all of the potential impacts (both construction and operational impacts) are predicted to be reduced to neutral quality, imperceptible significance

### 5.1.6 Hydrology and Hydrogeology

Road projects given their scale and nature have significant potential for causing impact to the surface and groundwater environments both during their construction and during their on-going operation and consequently require careful planning and detailed assessment to ensure the best solution is attained.

Key hydrological attributes identified along the *Proposed Road Development* include:

- European Designated Sites that include Cummeen Strand / Drumcliff Bay SAC and pNHA (000627), Cummeen Strand SPA (004035) and Drumcliff Bay SPA (004013) in the coastal and estuarine waters and shoreline area to the west and downstream of the Road.
- Shellfish Waters within the transitional and coastal zones of Drumcliff Bay and Cummeen Strand/ Garavoge Estuary.
- Crochauns/Keelogyboy Bogs NHA (002435) to the southeast and upstream of the existing and proposed N16 road;
- Ecologically sensitive surface water features and catchment systems including fishery streams either locally or downstream, Fens, flushes and wetlands including petrifying springs and tufa habitat.

Key hydrogeological attributes that have been considered along the *Proposed Road Development* include:

- High yielding springs and wells used for groundwater supply and their surrounding Source Protection Zones (SPZs);
- Low-yielding wells used mainly for domestic and farm water supply; and
- Any significant natural hydrogeological features (including large springs or groundwater dependent habitats);
- The dominant hydrogeological characteristics (aquifer classification) of the underlying strata;
- Sensitive karst features and groundwater systems.

There will be no significant negative residual impacts from the *Proposed Road Development* on the surface water and groundwater hydrology, with no predicted residual impacts to the hydrological regime (both quantity and quality) within the salmonid watercourses, water dependent habitats and

on the any designated European site. There are no significant residual impacts to water resources including water supplies as a result of the *Proposed Road Development*.

### 5.1.7 Landscape and Visual

The *Proposed Road Development* is located in proximity to a number of landscape character areas identified as; Sligo Lowland Agricultural Landscape; Sligo Urban Landscape; Glencar Lake Valley Landscape; Copes Mountain Upland Landscape.

The *Proposed Road Development* has been predicted to have the following landscape effects;

- When Sligo Lowland Agricultural landscape impacts are assessed during the operational stage they will be Minor adverse in proximity to the *Proposed Road Development* and Negligible to Minor adverse beyond 1km. No significant effects are predicted;
- When Glencar Lake Valley landscape impacts are assessed during the operational stage they will be Minor to Moderate adverse in proximity to the *Proposed Road Development* and Minor adverse beyond 1km. No significant effects are predicted;
- The Copes Mountain Upland Landscape has a high sensitivity to the type of change proposed. The predicted change in landscape resource is no change. No significant effects are predicted;
- The proposal will have no direct or indirect landscape effects on the Sligo Urban landscape.

The landscape planting will assist in blending the new alignment of the N16 into the landscape further and reduce the predicted landscape effects during the operation stage.

An assessment of the Sligo County Development Plan has been completed to establish potential effects of landscape & visual designations. It has been predicted that there will be no significant landscape or visual effects for any relevant landscape policy and designations in the Plan in particular with regards to Scenic Routes, Visually Vulnerable Areas and Sensitive Rural Landscapes.

A detailed visual impact assessment for residential properties in proximity to the *Proposed Road Development* has been completed. Before mitigation a total of:

- 3 properties are predicted to have Major to Substantial negative impact;
- 5 properties are predicted to have a Moderate to Major negative impact;
- 3 properties are predicted to have a Minor to Moderate negative impact;
- 14 properties are predicted to have a Minor negative impact;
- 29 properties are predicted to have No impact;
- 1 property has Minor beneficial impact; and
- 2 properties have Moderate to Major beneficial impact.

Following completion of the proposed Specific Landscape Mitigation measures the visual impacts are reduced as follows:

- No properties are predicted to have a Major to Substantial negative impact;
- 3 properties are predicted to have a Moderate to Major negative impact;
- 5 properties are predicted to have a Minor to Moderate negative impact;
- 3 properties are predicted to have a Minor negative impact; and
- 43 properties are predicted to have No impact;
- 1 property has Minor beneficial impact; and
- 2 properties have Moderate to Major beneficial impact.



### 5.1.8 Archaeology, Architecture and Cultural Heritage

#### Archaeology and Cultural Heritage

This chapter of the EIAR illustrates the extent to which specific archaeological heritage constraints may be impacted on the *Proposed Road Development*. In addition to the identified archaeological sites, there may be previously unidentified sub-surface archaeological remains surviving. In order to mitigate for the potential impact that construction of the Proposed Road Development would have on the surviving and potential archaeological and cultural heritage, a range of mitigation measures have been specified, these include measures relating to:

- Consultation;
- Ministerial Direction;
- Avoidance;
- Archaeo-geophysical Survey;
- Topographical and Photographic Survey;
- Wade Survey;
- Photographic Survey and Written Record;
- Targeted Test Excavations;
- Blanket Test Excavation;
- Archaeological Excavation;
- Preservation In Situ

Archaeological and cultural heritage issues will be resolved where possible at the pre-construction stage of the development. In any areas where this is not possible archaeological test excavation or archaeological monitoring will take place at construction stage. There are four recorded archaeological monuments, wholly or partially outside of but, in close proximity to the Proposed Road Development (CHC 01 – RMP SL009-028, CHC 02 – RMP SL009-027, CHC 11 - RMP SL009-026, and CHC 12 - RMP SL009-035). Their location and the requirement to avoid impacting them will be communicated to advance work contractors and to the construction contractors.

It is not anticipated that any significant residual impacts will remain where full archaeological, archaeological and cultural heritage mitigation measures are undertaken.

#### Architectural Heritage

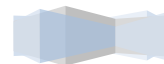
Avoidance of architectural heritage is the preferred mitigation measure, although either direct or indirect impacts on architectural heritage could occur within a new road development.

Mitigation by architectural record involves the production of a written account generally supplemented by measured drawing and a photographic survey. The level of recording will depend on the significance of the building in question.

The minimum level of documentation should involve:

- An accurate and succinct description of the structure.
- An assessment by competent expert of its architectural heritage merit.
- The extent of the structure set out on a map of sufficient scale.
- A sufficient number of photographs taken before demolition with a clear indication of scale that illustrates the built form and architectural heritage significance.
- An assessment of the impact which the development is likely to have on the structure.
- Supporting information e.g. research documents, sketch plans of each floor level of structures which are directly impacted.

This will be applied to the following structures AHC 42, AHC 43, and AHC 47.



The landscape screening provided as part of this Proposed Road Development will minimise the visual impact (during the operational stage) from the *Proposed Road Development* at the following structures: AHC 41 and AHC 44.

It is not anticipated that any significant residual impacts will remain where full architectural heritage mitigation measures are undertaken. The Proposed Road Development will have a slight negative impact on the setting of two architectural heritage constraints namely two buildings (AHC 41 and AHC 44). The landscape screening which will be provided at these sites (see Chapter 12 of the EIA Main Report) will minimise the visual impact of the Proposed Road Development.

### 5.1.9 Material Assets and Land – Agriculture

There are twenty one agricultural properties directly impacted by the proposed development. Landtake will comprise of approximately 20.8 hectares of agricultural lands. All landowners directly impacted by the *Proposed Road Development* were consulted. The agricultural impact on properties was completed using information gathered from the roadside survey and available mapping.

Impacts on agricultural properties arising from construction and operation of the *Proposed Road Development* include:

- Landtake;
- Land severance;
- Impact on farm buildings / facilities; and
- Other impacts such as on land drainage and services.

Following mitigation, there are no farm holdings on which the agricultural impact will be Profound, Very Significant or Significant.

The residual impact (impact after mitigation) will be Moderate on eight farms, Slight on eleven farms and Imperceptible on two farms.

### 5.1.10 Material Assets and Land – Non- Agriculture

There are eleven non-agricultural properties comprising eleven residential properties, one development site and local authority property comprised of public road. The baseline rating for property will be High on twelve properties, Medium on two properties and Low on one property.

The impact on property is limited to property directly impacted by the *Proposed Road Development*. This landtake area consists of a permanent acquisition of non-agricultural property and public road.

Measures to mitigate the adverse effects of the *Proposed Road Development* are described in the main Chapter of the EIA.

Following mitigation, there are no properties on which the non-agricultural impact will be Profound, Significant or Moderate.

The residual impact will be Slight on seven properties and Imperceptible on eight properties.

## 6 Further Information

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### 6.1 Inspection & Information

The Environmental Impact Assessment Report and Natura Impact Statement will be available for inspection at the following locations as detailed in the published newspaper notices:

- Sligo County Council, The County Hall, Riverside, Sligo;
- The TII Sligo National Roads Project Office, Sligo County Council, Business Centre, Market Yard, Sligo.

Copies of the full EIAR and/or Natura Impact Statement (NIS) may be purchased from Sligo County Council and the National Roads Project Office. Alternatively the EIAR can be viewed on the Sligo County Council website at: <http://www.sligococo.ie/n16lugatober/>.

## 7 What Happens Next

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### 7.1 Next Steps

Construction of the project is dependent on An Bord Pleanála approval and funding being available from Transport Infrastructure Ireland.

Written submissions relating to the environmental effects of the *Proposed Road Development* may be made to An Bord Pleanála as per the date specified in the published newspaper notices. All submissions should be sent to the Board at the following address:

An Bord Pleanála,  
64 Marlborough Street,  
Dublin 1.

An Bord Pleanála, at its discretion, may hold an Oral Hearing.

The written submission, together with any representations made at the Oral Hearing will be considered by An Bord Pleanála before making their decision on whether or not to approve the *Proposed Road Development* (with or without modifications).

The Board's decision shall be published in one or more newspapers circulating in the area, including, where appropriate, particulars of any modifications to the *Proposed Road Development*.

## 8 Appendix A: Figures associated with the Non-Technical Summary

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### 8.1.1 Figures contained in Non-Technical Summary

The following figures have been produced specifically for the purposes of this Non-Technical Summary. Volume 3 of the EIAR should be referred to for a fuller overview of the various figures:

- Fig. 1.0 Proposed Road Development, Location Map;
- Fig. 2.1: N16 Sligo to County Boundary RSR, Constraints Study Area;
- Fig. 3.1: N16 Sligo to County Boundary RSR, Feasible Route Options;
- Fig. 3.2: N16 Sligo to County Boundary RSR, Refined Feasible Route Options;
- Fig. 3.3: N16 Sligo to County Boundary RSR, Refined Feasible Route Options (2);
- Fig. 3.4: N16 Sligo to County Boundary RSR, Emerging Preferred Route;
- Fig. 4.1: *Proposed Road Development* Location Map: Design Overview, Plan Mainline; Key Sheets;
- Fig. 4.1.1: Plan Mainline; Ch. 0m to Ch. 1,460m
- Fig. 4.1.2: Plan Mainline; Ch. 1,460m to Ch. 2,540m