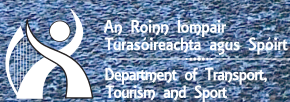
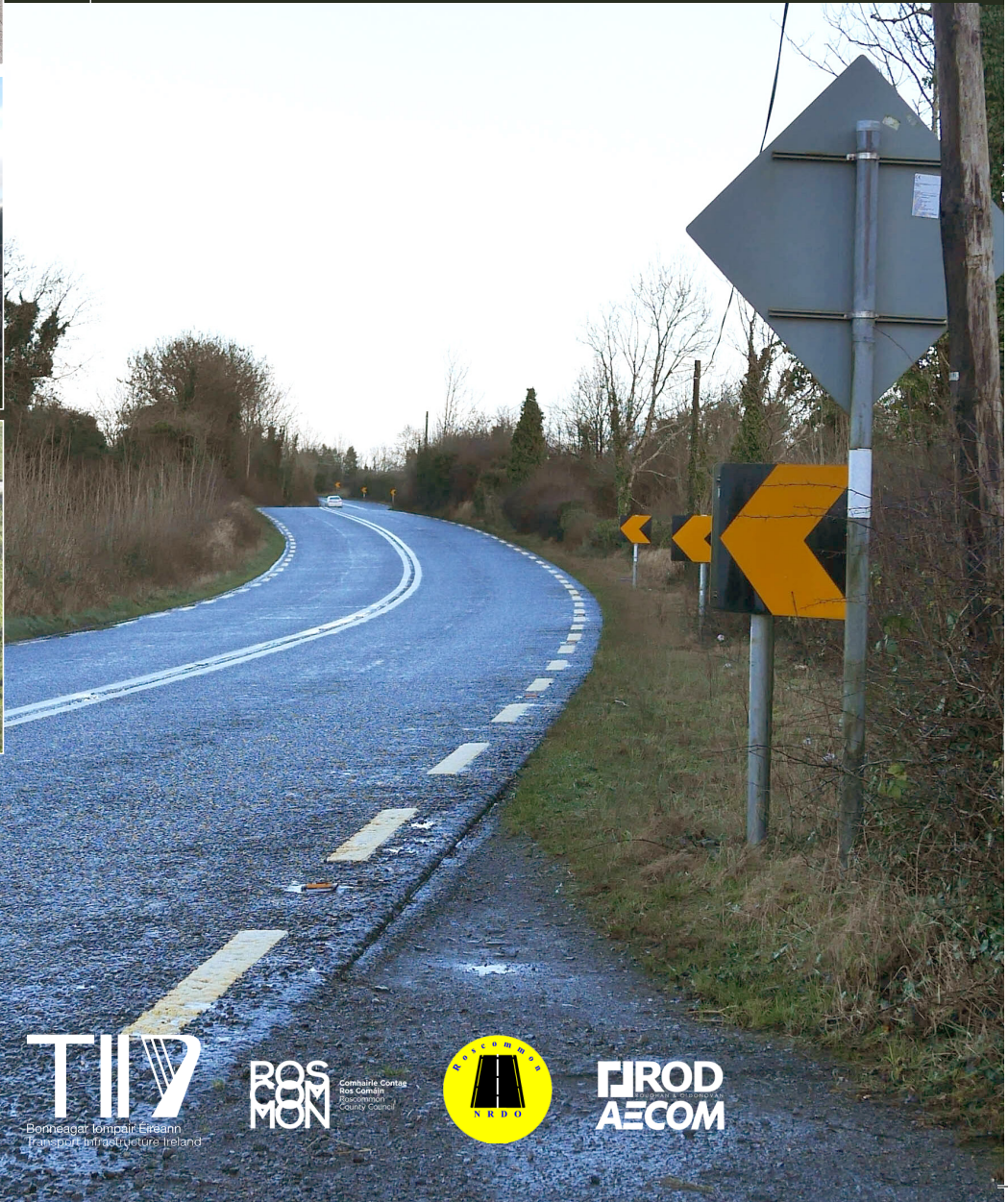


# N5 Ballaghaderreen to Scramoge Road Project Environmental Impact Assessment Report

DECEMBER 2017

Volume 1 | Non Technical Summary





# **N5 Ballaghaderreen to Scramoge Road Project**

## **Volume 1**

### **Non Technical Summary of the Environmental Impact Assessment Report**

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## 1.0 Introduction

This Environmental Impact Assessment Report (EIAR) for the proposed N5 Ballaghaderreen to Scramoge Road Project is “A statement of the effects, if any, which proposed development, if carried out, would have on the environment” (EPA, 2017) and has been prepared in respect of the construction and operation of the proposed new road. The EIAR, as presented has been prepared by Roughan & O'Donovan – AECOM Alliance (ROD-AECOM) and a team of specialist sub consultants, with the assistance of Roscommon National Roads Design Office.

The EIAR is presented in four volumes; the standalone Non-Technical Summary is Volume 1, Volume 2 contains the main text and is presented in two volumes (Volume 2A Chapters 1 - 10 and 2B Chapters 11 – 19, Volume 3 contains the associated Figures and Volume 4 is the Route Selection Report. A separate Natura Impact Statement (NIS) has also been prepared. Figure NTS 1.1 shows the location of the proposed road development.

### 1.1. Overview of the Proposed Road Development

The principal elements of or associated with the proposed road development include the following:

- Approximately 33.4 Kilometres of National Primary Road to Type 1 Single Carriageway standard;
- Approximately 15.4km of realignment of existing roads;
- Five roundabouts (and associated public road lighting);
  - Frenchpark Roundabout (R361 south of Frenchpark);
  - N61 Roundabout (between Tulsk and Elphin);
  - Shankill Roundabout (N61/R369);
  - Strokestown Roundabout (LP-1405);
  - Kildallogh Roundabout (R368/LP-1405);
- At grade mainline T junctions;
  - 16 ‘T’ Junctions, of which 5 are staggered;
- Reconfiguration of a crossroads between the existing N5 and R361 in Frenchpark;
- 3 road under bridges and 1 overbridge;
- 4 River bridges and 14 culverts;
- Approximately 290m of retaining walls at three locations;
- Provision of 9 accommodation underpasses, access roads and accesses;
- Associated earthworks including excavation of peat and unacceptable material, excavation and processing of rock and other material, provision of material deposition areas, and deposition and recovery of unacceptable material for use in the works;
- Temporary site compounds;
- Drainage works;
- Landscaping works;

- Utilities and Services Diversion Works including the diversion of high voltage electricity lines at 3 locations and the provision of associated support towers/ poles;
- Safety Barrier, Public Lighting, Fencing and Accommodation Works; and
- Environmental measures and all other Ancillary Works.

## **1.2. Requirement for an EIAR**

Following the completion of an EIA Screening Report, under Section 50 (1) (c) of the Roads Act 1997-2015 Roscommon County Council considered that the proposed road development would be likely to have significant effects on the environment and submitted an EIA Screening Report to An Bord Pleanála on 11<sup>th</sup> June 2015. On 28<sup>th</sup> July 2015 the Board confirmed their agreement with the conclusions of Roscommon County Council and directed the road authority to prepare an EIS/EIAR in respect of the proposed road development.

## **1.3. Scope of the EIAR**

The preparation of a proposed road development is a systematic and iterative process in which the collation and assessment of environmental data and predicted impacts are essentially linked to the development of the Design. Once the Preferred Route had been identified the EIA Screening process was undertaken which identified the need for the preparation of an EIAR. The process of Scoping the EIAR then followed with a Scoping Document issued in November 2015 requesting comments on the proposed content of the EIS/EIAR and NIS from an extensive list of Statutory Consultees.

## **1.4. National Roads Authority Environmental and Construction Guidelines**

This Environmental Impact Assessment Report has been prepared in accordance with the TII/NRA Environmental Assessment and Construction Guidelines and the Environmental Protection Agency (EPA) Guidelines.

## **2.0 Need for the Proposed Road Development**

### **2.1 Policy Context**

The need for the N5 Ballaghaderreen to Scramoge Road Project has been identified in and/or is consistent with the following European, national, regional and local planning policy documents:

#### **European Policy Context**

- The Trans-European Transport Network (TEN-T).

#### **National Policy Context**

- The National Spatial Strategy 2002 – 2020;
- Ireland 2040 Our Plan. Draft National Planning Framework (NPF)
- National Development Plan 2007-2013;
- Smarter Travel: A Sustainable Transport Future 2009 – 2020;
- Investing In Our Transport Future: A Strategic Framework For Investment in Land Transport;
- Building on Recovery - Infrastructure and Capital Investment 2016 – 2021;
- Road Safety Authority Road Safety Strategy 2013 – 2020;

- A Programme for a Partnership Government – May 2016.

### **Regional Policy Context**

- Regional Planning Guidelines for the West Region, Northern & Western Regional Assembly (formally West Regional Authority) 2010-2022;
- Western Development Commission Policies.

### **Local Policy Context**

- Roscommon County Development Plan 2014 – 2020.

### **Transport Infrastructure Ireland's Studies**

- National Roads Needs Study.

## **2.2 The Existing Road Network**

### **2.2.1 The N5 National Primary Route**

The existing N5 National Primary route, is a single carriageway road, 134km in length that connects Westport in Co Mayo to Longford Town, where it joins the N4-M4 east to Dublin. The full length of the N5 has been upgraded to a minimum standard of Type 1 Single Carriageway, with the exceptions of the section between Westport to Turlough (currently being upgraded to Type 2 Dual Carriageway). The section currently under consideration extends from Ballaghaderreen to Scramoge in County Roscommon and the river Shannon crossing at Termonbarry and is the last rural section of the strategic N5 route that has yet to be upgraded.

The existing N5 progresses south eastward from Ballaghaderreen at the tie-in with the recently constructed N5 Ballaghaderreen Bypass Road Project in the townland of Tibohine and continues in a south easterly direction, crossing the R361 south of Frenchpark. From Frenchpark the alignment heads south towards the village of Bellanagare. Passing through Bellanagare the alignment heads south east towards Tulsk where it bisects the archaeological complex of Rathcroghan. The N5 intersects the N61 – Boyle to Athlone National Secondary Route in the village of Tulsk. From Tulsk the route continues east passing through the townlands of Ardkeenagh, Kilcooley, Lissaphuca, Ardakillin, Cloonfree, Cloonslanor and Lisroyne before reaching the town of Strokestown. The N5 intersects with the R368 in Strokestown at a roundabout located in the centre of the town. From the Roundabout the N5 heads south for approximately 1km to Farnbeg until the alignment turns sharply east. The N5 alignment passes through the townland of Newtown and Bumlin until it reaches Scramoge, where it joins the previously improved section (2004) between Scramoge and Cloonmore.

The existing N5 between Ballaghaderreen to Scramoge intersects the N61 Athlone to Boyle National Secondary Route in the village of Tulsk whilst there are five Regional Roads that intersect the existing N5 route between Ballaghaderreen and Scramoge, as follows:

- *R361: Williamstown to Boyle* – The R361 intersects the existing N5 at Frenchpark.
- *R369: Elphin to Tullaghan* – The R369 terminates at the intersection with the existing N5 at Tullaghan, to the east of Bellanagare.
- *R367: Ballymoe to Tulsk* – The R367 terminates at the intersection with the existing N5 at Tulsk.

- *R368: Carrick-on Shannon to Four-Mile-House* – The R368 connects to a roundabout the existing N5 in the town of Strokestown and on the southern side of Strokestown town centre.
- *R371: Roosky to Ballyleague* – The R371 intersects the existing N5 at Scramoge.

There are numerous local roads along the length of the proposed road development. These roads generally have cross-sections ranging from 3.0 metres – 7.0 metres in width, with limited verges and no hard shoulders. There are 85 local road junctions that intersect the route of the existing N5 between Ballaghaderreen to Scramoge.

## 2.2.2 Character of the Existing N5 Ballaghaderreen to Scramoge

Table 2.2 below provides details of the rural and urban sections of the existing N5, with lengths corresponding to entering and exiting the posted urban speed limit zones. This requirement for speed restrictions on the national primary road delays long distance through traffic, but does not remove the severance and safety concerns for local traffic, and in particular pedestrians, associated with heavy good vehicles and platoons of traffic passing through the main street within the town/village centres.

**Table 2.2 Existing N5 Lengths of Urban & Rural Type**

Start	End	Length	Rural / Urban
N5 Ballaghaderreen Bypass	Frenchpark	4.5km	Rural
Frenchpark		1km	Urban
Frenchpark	Bellanagare	3.3km	Rural
Bellanagare		1km	Urban
Bellanagare	Tulsk	10.2km	Rural
Tulsk		1.5km	Urban
Tulsk	Strokestown	8.6km	Rural
Strokestown		2.2km	Urban
Strokestown	Scramoge	3.6km	Rural
<b>Total Length</b>		<b>35.9km</b>	
Length of Urban		5.7km	15.9%
Length of Rural		30.2km	84.1%

The existing N5 Ballaghaderreen to Scramoge road is a single carriageway road with varying cross section. The existing road cross section is sub-standard with approximately 47% of the road having a paved width less than or equal to 7.3m and only 14% meets the Type 1 Single carriageway width requirement of a 12.3m paved width. The horizontal and vertical alignment are also substandard and do not complement each other. Overall, along the rural sections of the existing N5 between Ballaghaderreen and Scramoge there are a total of 546 junctions and direct accesses. This junction frequency is above 9 junctions and accesses per kilometre outside the speed restricted sections, and is categorised as ‘High’ in accordance with the design standard NRA TD 9, Clause 1.4. Many of these junction and accesses do not provide sufficient visibility to meet safety standards. Fifteen of the Local, Regional and National Secondary roads intersected by the existing N5 form cross-road junctions, which are not permitted under the current design standards due to the high accident rates associated with this junction type.

Following pavement rehabilitation and resurfacing works undertaken on the existing N5 between Ballaghaderreen and Scramoge between 2000 and 2005, a large proportion of the existing road pavement surface is generally in good condition, with only short sections displaying visible signs of distress. With regard overtaking opportunities on the existing N5, 9% of the eastbound 35km length has overtaking visibility while there is 10% in the westbound direction. Current design standards for a Type 1 Single Carriageway road require a minimum of 30% of the total length of the proposed road development to have overtaking sight distance. The minimal overtaking opportunities, in combination with frequent junctions and accesses, many of which have restricted visibility, is substandard and detrimental to both road safety and average journey times, with platoons forming behind slower moving vehicles. The limited lengths of hard shoulder and verge along this length coupled with the agricultural activities further limit the opportunities for vehicles to overtake slow moving vehicles.

No designated cycle or pedestrian facilities are provided along the existing N5 between Ballaghaderreen and Scramoge, with the exception of footpaths within the towns/villages. The high volume of vehicles using this route makes it particularly unsafe for non-motorised users. Due to the absence of hard shoulders, pedestrians and cyclists are forced to use the trafficked lanes along the large majority of this length of the route.

### **2.2.3 Traffic Volumes and Journey Times**

Based on the traffic model for the proposed road development, traffic flows on the various sections of the N5 between Ballaghaderreen and Scramoge are generally in the range of 4,600 to 6,800 AADT with Heavy Commercial Vehicle (HCV) contents of between 7.7% and 10%. These are predicted to increase to 5,400 to 8,100 AADT with HCV contents of 10% to 12.6% in the design year 2035. These modest flows do not of themselves indicate a significant traffic capacity deficiency. The key issues are the effects of the poor standard of the N5 on journey times and level of service. The existing average end to end journey time along the existing 35.2km of the N5 corridor is approximately 32 minutes. The average speed of 66kph is below the target minimum average speed set by TII for an inter-urban national primary road. Under the US Highway Capacity Manual Classification, the Level of Service (LOS) for the N5 is currently LOS F. This minimum level of Service is below that recommended for the inter-urban national road network under TII's policy.

## **2.3 Project Objectives and Needs**

In accordance with the "TII/NRA Project Appraisal Guidelines" the provision of and need for improved transport systems is based on the following five criteria:

- Economy;
- Safety;
- Environment;
- Accessibility and Social Inclusion; and
- Integration.

### **2.3.1 Economy**

The proposed road development will form part of the Comprehensive European Union (EU) Trans European Transport Network (TEN-T) which aims to promote growth and competitiveness, remove bottlenecks, upgrade infrastructure and streamline cross border transport operations for passengers and businesses throughout the EU. The proposed road development will promote growth and



competitiveness in County Roscommon and the wider Western Region by upgrading the N5 national primary route corridor to meet the requirements of the EU TEN-T road network regulations.

The increased efficiency of the road network will improve journey times and journey time reliability along the N5 corridor between the N5 Ballaghaderreen Bypass and Scramoge, especially for long distance traffic between the Western region, the Midlands and onwards to the East Coast.

It is also anticipated that the proposed N5 road development will support the economic performance of the counties of Mayo and Roscommon and the linked hub of Castlebar and Ballina and the Midlands and Dublin gateways through the provision of improved transport infrastructure which will reduce the cost of travel for business and tourism and assist in reducing the overall cost of production thereby improving competitiveness.

### **2.3.2 Safety**

The road currently has a poor safety record with numerous sections of the N5 corridor between Ballaghaderreen and Scramoge having a collision rate above or twice above the national average rate. Alongside this, the RSA Road Safety Strategy (2013 – 2020) targets a reduction in road fatalities on Irish roads through engineering and infrastructure improvements.

A reduction in accidents along the length of the existing route is one of the major objectives of the proposed road development. The introduction of an appropriate carriageway cross section, the provision of adequate hard shoulders and verges, providing appropriate a horizontal and vertical alignment for the design speed, the reduction in the number of junctions and direct accesses along the route will all contribute to a safer road.

Examining the recent accident history along the N5 corridor, the data shows quite a significant accident history. Over the period from 1996 to 2012 there have been eleven fatalities and an estimated 689 injuries along the N5 between Ballaghaderreen and Scramoge. An analysis of the locations of these accidents identifies that many are within the 9km from east of Bellanagare, through Rathcroghan and just west of Tulsk. These clusters are on the section of road through the Rathcroghan archaeological landscape and the medieval settlement at Tulsk. Previous efforts to make improvements to this section of road have been limited by these archaeological and cultural historic constraints, and unless these can be overcome then the safety of this section of road cannot be improved. Analysis of the accident data also shows that despite the recent pavement rehabilitation schemes and ongoing routine maintenance carried out over the length of the existing N5, the inherent safety issues associated with the existing road still remain and that further routine maintenance will not adequately address this.

#### **Do-Minimum Accident Forecasts for the N5**

As traffic flow increases on the N5 in future years, the number of accidents will increase in proportion. The traffic modelling suggests that traffic growth over the 30-years of the appraisal will be between 20% and 36% along the length of the proposed road development. In the absence of the proposed road development, the continued use of the existing road network with increasing traffic is predicted to result in the following casualties:

- 8 fatalities;

- 23 serious injuries; and
- 461 minor injuries.

This is clearly a substantial impact with quite notable consequences for those individuals and their communities.

### **Potential Safety Benefit of the Proposed Road Development**

The development of the N5 project is needed to address a notable road safety deficiency along the existing N5 between Ballaghaderreen and Scramoge. The proposed road development would achieve this through provision of a safer cross section and alignment, significantly reduce the severity of single vehicle accidents, ensure alternative routes are available for vulnerable road users, and lead to safety improvements for those who would continue to use existing roads by reducing traffic volumes on those roads.

The proposed road development will improve safety as a result of three major changes as follows:

- Traffic using the N5 will be provided with a safer route, leading to a substantial reduction in the number of accidents along that corridor;
- The local traffic utilising the existing N5, will not be in conflict with the long-distance through traffic, improving safety for road users and vulnerable users within the population centres on the existing N5; and
- Traffic on other corridors (e.g. alternative local and regional roads) will re-route to instead follow the N5 corridor. As such, traffic flows on alternative routes will reduce, thereby leading to a reduction in accidents on those other routes. This can often lead to a strong improvement in the casualty rate given the relatively poor safety record on some non-national routes.

For the proposed road development, collisions predicted using the COBALT analysis indicates the following reduction in accidents when the improved road network is compared to the Do-Minimum scenario:

- A reduction of 8 fatalities;
- A reduction of 23 serious injuries; and
- A reduction of 461 minor injuries.

This reduction in injuries is substantial and demonstrates the scale of the benefits associated with the proposed road development, in support of the RSA Road Safety Strategy 2013-2020.

### **2.3.3 Environment**

The environment of the study area is dominated by Rathcroghan Archaeological complex, one of the country's former royal seats, which is on the tentative list, as part of the Royal Sites of Ireland, submitted for consideration as a UNESCO World Heritage Site. Rathcroghan is one of six major royal sites in ancient Ireland and is represented as an archaeological complex of over 100 monuments set in a pastoral landscape, located to the north west of Tulsk. The existence of these numerous constraints have greatly restricted any previous attempts to upgrade the existing N5, leading to the retention of its winding and undulating alignment, narrow cross-section and congested roadside.

As vehicle numbers, size and speed have increased, their impact on the surrounding environment has also increased, and is predicted to continue to do so. In the absence of a new off-line alignment these existing and growing traffic impacts will continue to traverse through the heart of the towns and villages of Frenchpark, Bellanagare, Tulsk, Strokestown and the main features of the Rathcroghan Archaeological Landscape. Similarly, road drainage will continue to discharge unattenuated and untreated into the sensitive surrounding watercourses. These growing environmental impacts can only be reduced by the construction of a new off-line alignment that diverts around the Rathcroghan Archaeological complex.

The proposed development will enhance environmental quality most particularly in terms of air quality and noise in the towns of Frenchpark, Bellanagare, Tulsk and Strokestown and along the existing route of the N5 with its extensive ribbon/housing development. Although it is anticipated that the construction of the proposed road will have an impact on the receiving environment, the reductions in traffic through towns and villages along the route will be of benefit to inhabitants through an improvement in air quality, noise and community severance which are discussed in more detail in the respective chapters of the EIAR.

#### **2.3.4 Accessibility (and Social Inclusion)**

The proposed road development will improve road based public transport at local, regional and national level, by reducing travel costs along this section of the N5 corridor. The reduction in traffic volume on the existing N5 alignment will decrease severance in the local towns with particular benefit to vulnerable groups such as school children, older people and people with disabilities.

Reducing journey times along the N5 corridor and improving journey time reliability will improve access to key facilities for both private car and public transport users through reduced travel cost and improved quality and reliability. The reduced transport costs delivered through the upgrading of the overall N5 corridor have the potential to generate wider benefits and help encourage investment in the region.

#### **2.3.5 Integration**

The proposed road development is consistent with European, National, Regional and Local policy, and is included as a specific objective in various European, National, Regional and Local plans.

The proposed road development will support Smarter Travel through improving journey time reliability for long distance and rural public transport services, improving the potential for strong growth in walking and cycling within the settlements that are bypassed and improve the fuel efficiency of long distance traffic bypassing the population centres. Its alignment will support consolidation of development within the bypassed settlements. The proposed road development will support more efficient driving through the provision of higher quality infrastructure, and create new cycle and pedestrian linkages.

The proposed road development will facilitate the overall improvement of the N5 corridor to TEN-T standard. The proposed road development will integrate with the wider investment in the national road network, in particular between Dublin and Westport and also improve connectivity to Ireland West Airport Knock, thereby supporting initiatives to bring investment into the Western Region.

## **3.0 Alternatives Considered**

### **3.1 Base Case**

The Base Case represents the minimum intervention, which acts as the basis against which alternatives and options are appraised. The 'Do-Nothing' option as the name implies is an assessment of the status quo. This has been described in some detail in Chapter 2 sections 2.3 to 2.7 inclusive. The 'Do-Minimum' option involves consideration of any planned improvements to the surrounding transport network that will impact on the corridor under consideration. The 'Do-Minimum' network for the N5 Ballaghaderreen to Scramoge Road Project includes the existing road network properly maintained over time, and the upgrade works along the N61 at Ratalen and Treanagry completed recently.

### **3.2 Do-Something**

The Do-Something options assessed included Alternative Modes, Management Options and Investment Options. Alternative modes can include road, rail, bus, air, water and non-motorised alternatives. However, as such, non-motorised alternatives such as improved pedestrian or cycling facilities or air and water alternatives would also not meet the objectives of the proposed road development. Increasing bus services along the N5 corridor may potentially reduce traffic levels on the N5 corridor however these also would not meet the objectives of the proposed road development as outlined in Chapter 2. The development of a new rail line is not considered a viable alternative due to the low-density population which it would serve. Based on the above the only realistic alternative that would meet the objectives of the project is a road based alternative.

With regard management options, the need for the proposed road development as detailed in Chapter 2 identified that the primary issues along the existing N5 corridor are largely due to the sub-standard alignment and deficient cross-section of the majority of the existing route between Ballaghaderreen and Scramoge, as distinct from congestion due to high traffic volumes. The examination of the accident history presented in Section 2.6 indicates a high proportion of single vehicle collisions distributed along the road which relate to the general standard of the road rather than specific hazards that may be addressed individually. Consequently, there are no management options that would meet the project objectives.

As far back as the 1998 National Road Needs Study, TII (then NRA) determined that the section of the N5 under consideration should be upgraded to Standard Single Carriageway, now known as Type 1 Single Carriageway. In December 2006, Roscommon County Council published a Constraints Study report that identified a broad study area for the proposed road development and major constraints, which would impact the identification of alternative route corridors during subsequent phases. In March 2010, following a route corridor selection process, Roscommon County Council published a route corridor selection report which identified a preferred route corridor for the proposed road development. Due to budgetary constraints in 2010, the further development of the project was suspended for a number of years.

With similar studies ongoing for the N4, N5 and N17 corridors, TII (then NRA) commissioned a strategic review of the three corridors, to consider whether as an alternative to the ongoing separate considerations, a more significant re-configuration of the national road network might provide a better outcome. This study considered

various strategies and concluded that upgrading both the existing N5 and N4 corridors was preferred and would provide the greatest overall benefit.

The further development of the project was re-activated in 2014 with the appointment by Roscommon County Council of Roughan & O'Donovan - AECOM Alliance in order to progress the proposed road development through the statutory planning process.

### **3.3 Public Consultations**

#### **Public Consultation No. 1 – Constraints Study**

Public Consultation No.1 (PC1) was undertaken in July 2005 which presented the Constraints Study Area for the proposed road project. Two public consultations were carried out simultaneously in different electoral areas within the constraints study area, namely at, Ballaghaderreen and Strokestown.

#### **Public Consultation No. 2 – Emerging Preferred Route Corridor**

Public Consultation No. 2 was undertaken in May/June 2007. Drawings highlighting the seven Route Corridor Options under consideration and the Emerging Preferred Route Corridor were on display in the Community Hall in Bellanagare on 31<sup>st</sup> May 2007 and subsequently available for inspection at the offices of Roscommon County Council.

Approximately 226 people attended the second public consultation, a further 60 people visited the Design Team Offices to discuss the proposed road development and an additional 135 written submissions/letters/questionnaires were received. All individual submissions received were evaluated and the information they contained was recorded and considered as part of the route selection process.

#### **Public Consultation No. 3 – Emerging Route Alignment**

Following Roughan & O'Donovan – AECOM Alliances' appointment to review and update the Emerging Preferred Route Corridor previously identified and to progress the project through the subsequent project planning phases, a preliminary alignment was developed within the previously identified preferred route corridor.

The emerging route alignment was placed on public display and comment sought during Public Consultation No.3 (PC3) on the 4<sup>th</sup> March 2015 in the Percy French Hotel, Strokestown and the 5<sup>th</sup> March 2015 in Bellanagare Health and Leisure Centre, Co. Roscommon.

Both public consultations saw a large turnout from the local community with over 500 members of the public in attendance. Information regarding landownership was obtained to inform the development of local access routes, along with comments from attendees regarding the route of the mainline.

#### **Landowner Consultation and Public Information Event**

In December 2015, a series of landowner consultations were held, initially with those effected by significant changes to the alignment, in the offices of Roscommon NRDO. Subsequently all landowners affected by the draft compulsory purchase orders for the proposed road development were invited for a scheduled meeting with a member of Roscommon NRDO and the design team to discuss the draft compulsory purchase order and design proposals. Meetings for those landowners included within the CPO were held in Bellanagare Community Centre on 14<sup>th</sup> and 15<sup>th</sup> and the Percy French Hotel in Strokestown on 16<sup>th</sup> and 17<sup>th</sup>. This series of meetings culminated in a public information event, held in the Percy French Hotel on the afternoon and evening of

17<sup>th</sup> of December, where members of the public were invited to view the final road design and discuss any issues with members of the design team.

### 3.4 Constraints

The principal constraints identified within the Study Area during the development of the proposed road development are set out below.

- Topography;
- Existing development, existing properties and planning permissions including the settlements of Frenchpark, Bellanagare, Tulsk and Strokestown;
- Land use and land zoning;
- Community facilities and recreational areas;
- Known archaeological sites, protected buildings, and national monuments;
- Environmental conservation areas including: cSACs (candidate Special Areas of Conservation), SPAs (Special Protection Areas), NHAs (Natural Heritage Areas) and pNHAs (proposed Natural Heritage Areas);
- Other areas of ecological interest such as watercourses, wetlands and woodland habitats;
- The landscape features including areas of woodland, estate landscapes, and particular landscape types, including views from protected archaeological sites.

The high density of individual protected archaeological sites is immediately obvious throughout the study area. The large archaeological complexes of Rathcroghan and Carnfree dominate the centre of the study area. The Rathcroghan archaeological complex (Rathcroghan Mound shown in Plate 3.2) is now included on the UNESCO World Heritage Tentative list as part of The Royal Sites of Ireland. In addition, Tulsk Medieval Borough, Ardkillin, Cloonfree and the adjacent Cloonfinlough, and the eighteenth century planned town of Strokestown are all important protected sites that constrain improvements along the existing N5 corridor.



**Plate 3.1 Rathcroghan Mound Immediately Adjacent to the Existing N5**

The major sites of ecological protection include Bellanagare Bog (SAC, SPA and pNHA), Cloonshanville Bog (SAC and pNHA), Annaghmore Lough (SAC and pNHA), Mullygollan Turlough (cSAC and pNHA), Castleplunkett Turlough (pNHA), Brierfield Turlough (pNHA), Corbally Turlough (pNHA) and Brierfield Lough (NHA). Adjoining sites also include Tullaghanrock Bog (SAC and pNHA), Callow Bog (SAC), Lough Gara (SAC, SPA and pNHA), Ardagh Bog (pNHA) and Ardakilin Lough (pNHA).

In addition to the protected archaeological and ecology sites there are numerous bodies of water, particularly in the area between the Rathcroghan archaeological complex and Annaghmore Lough (SAC and pNHA).

### **3.5 Selection of an Emerging Preferred Route and Design Development**

The proposal for the N5 Ballaghaderreen to Scramoge Road Project has progressed through a number of stages including the Constraints Study, followed by the Route Selection Study, which was followed by the design of the Preferred Route.

As part of the route selection process seven route corridors were developed by Roscommon NRDO and a detailed description of each of route is provided in the route selection report. The different route options were named route option 1, 1A, 2, 2A, 2B, 3 and 4. Each route option was then compared against the route assessment criteria of Engineering, Environment and Economics and the Emerging Preferred Route Corridor (Option 1A) preferred route was selected.

### **3.6 Route Development**

Having reviewed the previous studies and confirmed that no significant changes had occurred that might compromise the established selection of the Preferred Route Corridor in 2014; further work was done to update the assessment in line with current guidance. Subsequently design development and environmental assessment has led to various further amendments to the proposed alignment. These changes were presented to the public at Public Consultation No.3 in March 2015 and any subsequent changes were presented in December 2015 at the Landowner Consultations and Public Information Event.

Following the landowner consultations in December 2015 some further localised amendments were made to the design, which was then submitted to TII for Peer Review in accordance with the TII/NRA Project Management Guidelines 2010. Those landowners directly affected by changes made to the road alignment post December 2015 were invited to meet with the Design Team on 19<sup>th</sup> August 2016, when the changes were explained to them. Following these meeting very minor adjustments to the alignment of Cregga Lane and some field accesses were implemented to address severance issues. All other adjoining property owners with a potential interest in the changes were written to and provided with a drawing showing the final arrangement in relation to their property.

## **4.0 Description of the Proposed Road Development**

### **4.1 General Description of the Proposed Road Development**

The principal elements of or associated with the proposed road development include the following:

- Approximately 33.4 Kilometres of National Primary Road to Type 1 Single Carriageway standard;
- Approximately 15.4km of realignment of existing roads;

- Five roundabouts (and associated public road lighting);
  - Frenchpark Roundabout (R361 south of Frenchpark);
  - N61 Roundabout (between Tulsk and Elphin);
  - Shankill Roundabout (N61/R369);
  - Strokestown Roundabout (LP-1405);
  - Kildallogh Roundabout (R368/LP-1405);
- At grade mainline T junctions;
  - 16 'T' Junctions, of which 5 are staggered;
- Reconfiguration of a crossroads between the existing N5 and R361 in Frenchpark;
- 3 road under bridges and 1 overbridge;
- 4 River bridges and 14 culverts;
- Approximately 290m of retaining walls at three locations;
- Provision of 9 accommodation underpasses, access roads and accesses;
- Associated earthworks including excavation of peat and unacceptable material, excavation and processing of rock and other material, provision of material deposition areas, and deposition and recovery of unacceptable material for use in the works;
- Temporary site compounds;
- Drainage works;
- Landscaping works;
- Utilities and Services Diversion Works including the diversion of high voltage electricity lines at 3 locations and the provision of associated support towers/poles;
- Safety Barrier, Public Lighting, Fencing and Accommodation Works; and
- Environmental measures and all other Ancillary Works.

## 4.2 Purpose of Providing the Proposed Road Development

The implementation of the Proposed Road Development will achieve the following:

- Provide a road that is fit for purpose and which is designed and constructed in accordance with current design standards;
- Provide a consistent cross section which will allow efficient movement of persons and goods in safety and comfort;
- Provide full stopping sight distance along its entire length;
- Provide appropriate junction and accesses with visibility in accordance with current design standards;
- Provide a road with appropriate safe overtaking opportunities;
- Provide a safer road, by eliminating a large number of roadside hazards and providing a forgiving roadside, with appropriate protection where required;
- Provide road surface water runoff collection and treatment facilities to ensure that rainfall is effectively removed from the road surface and is treated before discharge to the existing water environment. This includes provision for cut-off and storage in the event of a road accident causing spillage of deleterious materials.



- Completing the missing link in previous investments and improvements on the N5 corridor allows a realisation of the benefits from the accumulated development on the N5 corridor.

### 4.3 Alignment

The N5 Ballaghaderreen to Scramoge proposed road development has been developed in accordance with the Transport Infrastructure Ireland (TII) Design Manual for Roads and Bridges (TII/NRA DMRB).

The mainline alignment has been divided into four sections A to D, as indicated in the table below;

Section	Segment	Chainage
A	N5 between the tie-in to the N5 Ballaghaderreen By-Pass (East) and Frenchpark Roundabout on the R361 (Junction 5).	1+000 – 5+697
B	N5 between the Frenchpark Roundabout (Junction 5) and the N61 Roundabout at Gortnacranagh (Junction 14) including N61 Upgrade to Shankill Roundabout.	10+000 – 24+200
C	N5 between the N61 Roundabout (Junction 14) and the Strokestown Roundabout at Lavally (Junction 19)	30+000 – 40+542
D	N5 between the Strokestown Roundabout (Junction 19) and the tie-in to the existing N5 in the townland of Scramoge.	50+000 – 53+970

The proposed alignment commences east of Ballaghaderreen at a tie-in with the newly constructed N5 Ballaghaderreen Bypass and continues eastwards, bypassing Frenchpark to the south. The alignment crosses to the north of the existing N5 at Cashel and continues in an easterly direction largely parallel to the R369 through the townlands of Kilvoy and Corry East towards the N61 approximately 3km south of Elphin. The alignment continues eastwards from the N61, passing to the north of Clooncullaan Lough before turning in a south-easterly direction bypassing Strokestown to the east before rejoining the existing N5 in Scramoge.

### 4.4 Cross Section

The proposed N5 Ballaghaderreen to Scramoge road project has been designed with a Type 1 single carriageway cross section. From the traffic predictions (Chapter 05 of this EIAR), the provision of a Type 1 single carriageway cross-section would provide a Level of Service (LoS) C throughout it's length.

In recent years, a number of road improvement projects have been implemented on the N5 between Longford and Westport. These schemes have consisted of upgrading the existing N5 to a Type 1 single carriageway cross-section, with the exception of the N5 Westport to Turlough Road Project which is a Type 2 Dual Carriageway. The provision of a Type 1 single carriageway will therefore provide a continuity of carriageway cross-section on the N5.

The table below indicates the carriageway, verge and hard shoulder width appropriate for each road class that has been incorporated into the design of the project. In general, the proposed width of a realigned local road will reflect the existing road width. However, if an existing road is less than 4m a minimum cross section of 4m carriageway with 1m verges has been applied.

Road Type	Road Class	Carriageway Width	Hard Shoulder Width	Verge Width
Type 1 Single Carriageway	National Road	7.3m	2.5m	3.0m
Type 2 Single Carriageway	National and Regional Roads	7.0m	0.5m Hard Strip	3.0m where footway/cycleway is not present and 5.0m where cycleway/footway is incorporated in the verge (Includes 0.5m hard-strip)
Type 3 Single Carriageway	Local Roads and Regional Roads	6.0m	0.5m hard strip	3.0m where footway/cycleway is not present and 5.0m where cycleway/footway is incorporated in the verge (Includes 0.5m hard-strip)
Other Single Carriageway	Local Roads	4.0 – 6.0m	N/A	1.0 – 2.5m

#### 4.5 Local Road Upgrades

The mainline intersects the local road network at a number of locations. Alterations to the neighbouring road network are required in order to facilitate the proposed road development. There are two major neighbouring road upgrades proposed as part of the project, with the majority of the neighbouring roads realigned in the vicinity of their junction with the proposed realigned mainline. The existing N61 National Secondary road is sub-standard in the vicinity of the proposed N5, particularly at Shankill cross-roads which has been identified as an accident blackspot. In conjunction with the largely online improvement to the N61, the design incorporates the provision of a new roundabout at Shankill to eliminate this accident blackspot from the National Secondary road network. The existing R368 regional road and local road LP-1405 are also sub-standard. The LP-1405 will be upgraded and realigned as part of the works between the proposed R368 Kildallogge roundabout to the north of Strokestown and the proposed Strokestown roundabout in the townland of Lavally.

#### 4.6 Pedestrian and Cycle Provision

Along the length of the proposed road development, cyclists and pedestrians are facilitated by the provision of the Type 1 cross-section which includes a 2.5m wide hard shoulder on either side of the road. The proposed road will create new linkages to nearby villages and areas for both long distance cycling on the N5 corridor and local cycling movements.

No formal cycle or pedestrian facilities exist within the extents of the proposed road development, other than at the tie-in to the northern extents of Strokestown, however a number of informal walking/cycling routes are impacted by the proposed road development. Three walking/cycling routes have been identified through consultation with members of the public through the preferred route public consultation event held in March 2015.

- Bellanagare - This informal looped walking route to the north of Bellanagare Village utilises the existing local road network providing a 3.9km route.
- Lavally to Strokestown – This route provides a direct link to the northern extremity of Strokestown and is approximately 1.4km in length.

- Scramoge – This informal looped walking route is 4.8km in length, utilising the LS-6144, LS-6084, LS-6083 and R371 to the north and south of Scramoge Cross Roads on the existing N5.

#### 4.7 Junctions

The primary function of the national road network is to provide for the safe and efficient movement of long distance through traffic whilst also collecting traffic from other National Routes and the Regional Roads in particular. As a secondary function, the network caters for local and short distance traffic. There are positive safety and route capacity benefits in minimising the number of junctions and access onto national routes. Notwithstanding this, the proposed road development is an all purpose road and as such does provide junctions and accesses for the National, Regional and local Road network where to do otherwise would have resulted in considerable disruption and severance to the local communities.

#### 4.8 Structures

The proposed road development includes 34 structures, which can be broken down into the following types:

Road Overbridges	1 No.
Road Underbridges	3 No.
Farm Underpasses	9 No.
River Bridges	4 No.
Watercourse Culverts	14 No.
Retaining Walls	3 No.

There is one road overbridge and three road underbridges along the proposed road development. The road overbridge is located at 19+740 while the road underbridges are located at LP-1412, R368 and LS-6144 and their primary function is to carry the proposed N5 under and over the existing realigned local roads. The minimum headroom to be provided over each of the side roads is 5.3m in accordance with TII/NRA TD27.

There are nine agricultural underpasses along the proposed road development. The primary function of the agricultural underpasses is to provide agricultural access under the proposed N5 road. The following types of underpass proposed are as follows;

- 5 No. 4m wide x 4.5m high - Machinery Underpass
- 3 No. 3.3m wide x 3.0m high – Livestock Underpass
- 1 No. 8.5m wide x 4.5m high – Combined Machinery and Pedestrian/Cyclist Underpass.

#### 4.9 Road Drainage

The proposed drainage design incorporates measures to treat the surface water run-off from the paved surfaces of the proposed road development, collection and conveyance of overland surface water flow intercepted by the proposed route, and provides details of the proposed treatment of existing watercourses crossed or affected by the proposed road development.

A large proportion of the proposed road development is located within areas of karst aquifer. In general a closed drainage system will be used where an underlying karst

aquifer is present, in particular within a groundwater source protection area. This sealed system will also be used adjacent to sensitive ecological wetland areas.

Where areas require ground water control, e.g. a cutting with high water table, a filter drain would usually provide for both the road drainage and the groundwater. However, in karst areas a closed drainage system will be provided to drain the road surface and a separate filter drain or fin drain will be provided to collect groundwater. Due to the environmental sensitivity of the receiving water environment, over-the-edge drainage is not proposed on the mainline.

The drainage design incorporates facilities to limit the discharge to the receiving watercourses. The restricting of discharge rates requires the provision of storage/attenuation ponds at the drainage outfalls. The attenuation system is designed to accommodate the first flush surface water runoff within a forebay. First flush flows are those that arrive at the outfall first after a rainfall event and contain greater levels of contamination than normal runoff. A penstock is also provided so that in the event of an accidental spillage entering the pond, the system can be closed and the contaminant removed by pumping.

All discharges of road drainage runoff will pass through a water quality improvement system. This is incorporated in the design of the attenuation ponds. Due to the high aquifer vulnerability, the main body of the pond will be lined with cohesive material or an impermeable liner and outlet by infiltration will not be permitted. The pond will be suitably planted to promote the removal of contaminants.

#### **4.10 Earthworks and Pavement**

The preliminary earthworks quantities for the construction of the proposed road development have been determined and are summarised in the table below:

1	2	3	4	5	6	7	8	9	10	11	12
Chainage	Total General Cut Volume(m <sup>3</sup> )* - Underside of topsoil to base of capping	Acceptable material for Re-use bulked (m <sup>3</sup> )*	Marginal material suitable for processing (m <sup>3</sup> )	Acceptable Rock Excavation (m <sup>3</sup> )	Unacceptable Material bulked within EW outline (m <sup>3</sup> )	Fill requirements for Embankments – Underside of topsoil to base of capping	Fill requirements to replace Peat, Alluvium below formation	Total General Fill Required excluding Capping and assuming full excavation and replacement (m <sup>3</sup> )	Cut to Fill (m <sup>3</sup> ) – Including rock assuming full excavate and replace	Topsoil Strip (m <sup>3</sup> )	Topsoil Re-soil (m <sup>3</sup> )
<b>Section A CH 1+000 – 5+610</b>	19,840	9,920	4,960	-	4,960	81,038	36,787	117,825	(102,945)	26,392	11,745
<b>Section B CH 10+000 – 24+100</b>	794,043	308,432	150,058	185,496	150,058	504,068	451,001	955,069	(311,083)	120,367	89,077
<b>Section C CH 30+000 – 40,943</b>	2,007,714	672,596	327,518	682,034	325,566	821,977	160,403	982,380	699,768	118,003	78,000
<b>Section D CH 50+000 – 54+350</b>	88,344	44,172	22,086	-	22,086	258,567	92,049	350,616	(284,358)	33,629	31,890
<b>TOTAL Section A, B, C &amp; D</b>	<b>2,909,941</b>	<b>1,035,119 (35%)</b>	<b>504,622 (17%)</b>	<b>867,530 (30%)</b>	<b>502,670 (18%)</b>	<b>1,665,650</b>	<b>740,240</b>	<b>2,405,890</b>	<b>1,382<sup>1</sup></b>	<b>298,391</b>	<b>210,712</b>

\*A bulking factor of 1.0 has been conservatively assumed for all excavated soils and rocks.

<sup>1</sup> This quantity does not take into account rock material required for use as capping nor the volume of material used to form visual / noise screen bunds from Class 4 material. (This reduces the requirement for a specifically engineered such as Class 1 or Class 2 fill to be used to form visual / noise screen bunds). 117,575m<sup>3</sup> of rock will be required as capping and 100,624m<sup>3</sup> of Class 4 material will be required to form visual / noise screen bunds changing this surplus to a deficit of 15,570m<sup>3</sup>.

Section A is constructed predominately at grade / on a slight embankment and requires approximately 81,000m<sup>3</sup> of acceptable fill material.

The alignment over the next 14 kilometres through Section B generally varies between cut and fill, generating approximately 308,000m<sup>3</sup> of acceptable general material plus 185,500m<sup>3</sup> of rock for fill. Based on the assessment of the ground investigation results, it is considered that 150,000m<sup>3</sup> of marginal material could be processed to provide further suitable acceptable fill. A quantity of approximately 955,000m<sup>3</sup> of fill material is required for embankment construction and replacement of soft ground.

In Section C, there are a number of large cuttings which generate approximately 672,000m<sup>3</sup> of general fill material. The largest cuttings occur between Ch. 32+050 to Ch. 33+100, Ch. 35+100 to Ch. 36+470 and Ch 36+900 to Ch 37+650. Cuts between Ch. 35+150 to Ch. 36+475 and Ch 36+900 to Ch 37+650 are likely to generate a significant quantity of rock. The total volume of suitable cut material arising from the cuttings within this section is 672,000m<sup>3</sup> of general fill and 682,000m<sup>3</sup> of rock giving a combined total of 1,354,000m<sup>3</sup> approximately. It is assessed that a further 327,000m<sup>3</sup> of marginal material could be processed to provide further suitable fill material. Assuming the rock arising from the cuttings will be processed to provide the capping material for the proposed road development and the surplus rock is utilised as drainage blanket within Section C, the surplus of general fill material for this section of the project is 699,000m<sup>3</sup>.

Section D is constructed predominantly on embankment with two small cut areas, resulting in a deficit of 284,000m<sup>3</sup>.

The conclusions drawn from the assessment of earthworks volumes are that there is a largely balanced earthworks design, optimising the re-use of materials arising from the site within the works.

The earthworks volumes developed to date include an assessment of the potential reuse of the materials and the quantity of material required to backfill over-excavated material below the earthworks outline, such as Peat and other unacceptable material.

Of acceptable earthworks material:

- Section A has an overall deficit of 102,945m<sup>3</sup>
- Section B has an overall deficit of 311,083m<sup>3</sup>
- Section C has an overall surplus of 699,768m<sup>3</sup>
- Section D has an overall deficit of between 284,358m<sup>3</sup>
- Project wide Capping requirement of 118,000m<sup>3</sup>

The earthworks volumes stated above indicate that the proposed development will generate sufficient materials within the works to meet the acceptable material requirements for the proposed embankments and has sufficient land incorporated into the development to accommodate the anticipated deposition of unacceptable materials arising from the works.

It is anticipated that 50% of the overburden material arising from the cuttings will be suitable for use as general fill and that a further 25% of this material may be made suitable by soil improvement techniques

The Peat and Alluvium will not be suitable for reuse as earthworks material and will therefore be placed in material deposition areas.

It is anticipated that through the optimisation of the various options available, an overall earthworks balance will be achieved and that there will be no requirement to dispose of unacceptable material off site.

#### **4.11 Utilities / Services**

The proposed road development crosses largely greenfield rural environment, encountering a minimal number of utilities requiring diversion or protection.

Eir is the predominant telecommunication service impacted as part of the proposed road development. The customer service network is supplied largely by overhead cables, with a number of underground cables of varying size, including two fibre optic cables.

A Vodafone mast is located within the forestry south of the alignment at Ch 04+550, although not directly impacted by the proposed road development, the mast is located in close proximity to the boundary fence for the road.

The majority of conflicts with ESB services are on the Local Distribution Network. The impact of these is such that some will require diversion while raising the height of the conductors in others will be sufficient. In addition to the local distribution network, the proposed development impacts on three high voltage lines as detailed below:

- (i) 38kV Distribution Line - Ch.22+050 Overhead
- (ii) 220kV Cashla to Flagford Transmission Line - Ch.23+050 Overhead
- (iii) 110kV Flagford to Lanesboro Transmission Line- Ch.53+350 Overhead

Proposed plans for Eirgrid Grid West project indicates two route options for the high voltage transmission line from north Mayo to Flagford, in Roscommon. The southern option which is a 220kV overhead line crosses the proposed N5 alignment east of Frenchpark.

Roscommon County Council's Water Services Department and Irish Water were consulted to determine the extent of public and Private Water and Wastewater services within the study area.

An assessment of the water mains has indicated a number of impacts on minor supply mains which will require diversion or protection as part of the proposed works. A number of distribution mains are impacted by the proposed project as described below:

- (i) Ch 1+460 – Reservoir Supply Main
- (ii) Ch. 15+800 – Peak Mantua Group Water Supply Scheme Main
- (iii) Ch. 39+100 – Lettreen reservoir distribution mains

#### **4.12 Land Acquisition**

The provision of the proposed road development requires the acquisition of land for the construction and operation of the development. The area of land required is determined by a number of related parameters including:

- Road construction;

- Construction of verges, embankments, cuttings, utilities/services, pedestrian/cycle facilities, junction realignments, drainage and associated facilities, structures, landscaping, work space, boundary treatment, maintenance strip and ancillary road construction and operation requirements;
- Accommodation Works and Access Roads,
- Acquisition of severed plots;
- Ground/soil conditions;
- Material Deposition requirements; and
- Other road engineering, safety and environmental considerations.

Approximately 375 hectares of land is included in the Compulsory Purchase Order for the proposed road development. There is approx. 259.1 hectares classified as land (including agricultural land and facilities, bog and access tracks). A further 78.4 hectares are classified as forestry, 1.1 hectares are classified as residential or commercial land and the remaining 18.5 hectares are currently classified as road bed. The proposed land acquisition is necessary for the construction, operation and maintenance of the proposed road development.

#### **4.13 Construction**

It is likely that the detailed Design and Construction of the proposed road development will take place as part of a Design and Build Contract (D&B). The successful Contractor will be responsible for the detailed design of the proposed road development in compliance with the Employer's Requirements, including compliance with this EIAR and Natura Impact Statement for the development and any planning conditions.

It is likely that the construction of the proposed road development will be progressed as a single construction contract with the construction phase potentially lasting between 30 – 36 months (2.5 – 3 years).

Archaeological investigation works including testing and any follow-on resolution works will be undertaken prior to the main works contract commencing on site. Pre-construction works are likely also to include diversion works of services and utilities including electricity, particularly the high voltage overhead lines, telecommunications and water services. Due to the nature of some of the diversions a number of these service diversions will only be possible during the main construction works.

Advance tree clearance, hedgerow clearance and fencing contracts may also be undertaken dependant on the anticipated seasonal timing of the award of the contracts.

#### **4.14 Construction Management Plan**

Prior to any demolition, excavation or construction a Construction Management Plan (CMP) will be produced by the successful contractor. A Construction Management Plan deals with the Contractor's overall management and administration of a construction project. A CMP is prepared by the Contractor during the pre-construction phase, to ensure commitments included in the statutory approvals are adhered to, and that it integrates the requirements of the Construction Erosion Sediment Control Plan (CESCP), Environmental Operating Plan (EOP) and the Waste Management Plan (WMP).



### **Environmental Operating Plan**

The Environmental Operating Plan (EOP) is defined as a document that outlines procedures for the delivery of environmental mitigation measures and for addressing general day-to-day environmental issues that can arise during the construction phase of a national road scheme.

### **Waste Management Plan**

Included within the CMP will be the Waste Management Plan (WMP) which clearly sets out the Contractor's proposals regarding the treatment, storage and disposal of waste. An outline WMP has been prepared for the proposed road development.

### **Construction Erosion and Sediment Control Plan**

A detailed Construction Erosion and Sediment Control Plan (CESCP) has been prepared for the proposed road development. All of the measures, mitigations, controls, requirements, procedures, etc. included therein will be implemented in full and will ensure that sediment laden runoff from the construction site does not enter watercourses or water bodies.

## **5.0 Traffic Analysis**

The proposed road development will significantly improve traffic safety by re-routing traffic from the existing road network onto the proposed road. The existing average end to end journey time along this section of the N5 corridor is approximately 32 minutes. With the proposed development in place this end to end journey time would reduce by 10 minutes to a journey time of 22 minutes. This improvement in journey time which equates to a 30% reduction in end to end journey time would apply throughout the day as the existing delays experienced by drivers along this section of the N5 are related to the poor road alignment as opposed to the high level of traffic on the N5 corridor. The time saving leads to the transfer of approximately 70% of traffic from the existing N5 to the proposed development, removing over 4000 vehicles from Frenchpark, Bellanagare, Tulsk and Strokestown each day.

The Do-Something scenario for the proposed project is forecast to carry between 3,800 and 6,600 Annual Average Daily Traffic (AADT) by 2020. This will result in a net increase in traffic using the N5 corridor due to the re-routing of traffic from the local and regional road network to access the proposed development. By design year 2035, the proposed road development is forecast to carry between 4,3000 and 7,400 AADT resulting in similar benefits. The proposed road development will be of a higher safety standard and will therefore contribute to a network wide reduction in collisions. This is forecast to lead to a reduction of 324 collisions over the 30 year scheme appraisal period. This equates to a reduction of 462 casualties categorised as follows:

- 8 Fatalities;
- 23 Serious Injuries; and
- 461 Slight Injuries.

## 6.0 Population and Human Health

The principal impacts, positive and negative, of the proposed road development from the perspective of population are as follows:

- Low level of construction impacts relevant to “human beings”;
- Reduced journey time for regional traffic;
- Closer connection between Elphin and the National Primary Route;
- Improved journey amenity for regional and all modes of local traffic;
- Improved general amenity due to transference of traffic from the local communities of Frenchpark, Bellanagare, Tulsk and Strokestown;
- Impact on general amenity of partial severance of circular walking trail in Bellanagare;
- Improved general amenity and landscape integrity of Rathcroghan complex;
- Low severance impact due to connections between many local roads and either the proposed road development or the existing N5;
- Positive economic impact linked to reduced journey time and improved journey time reliability at regional level and at local level for some businesses;
- Significant loss of passing trade for some businesses beside the existing road;
- Potential to use improvements in general amenity of towns and heritage attractions to encourage more amenity use and tourism visits to the local area.

Of the local social and economic impacts, the most significant positive impact is the effect of the transference of traffic on the general amenity of local towns and improved journey amenity on the existing N5. The most significant negative impacts are the direct and indirect implications of the effect on passing trade and the amenity (if not physical) severance of the Bellanagare walking circuit, albeit lightly used.

A Human Health Risk Assessment was carried out under the United States Environmental Protection Agency (USEPA) Human Health Risk Assessment Methodology. The USEPA methodology comprises of the following four steps:

- Step 1 Hazard Identification
- Step 2 Dose-Response Assessment
- Step 3 Exposure Assessment
- Step 4 Risk Characterisation

The impact on human health was assessed in relation to emissions to air, emissions to water and noise emissions while also including an assessment of impacts on Human Health not due to emissions. It was found that only one receptor in the entire scheme will have even moderate effect and that only barely so. For no other receptor will the adverse Human Health Impact be more than Slight and at most receptors will be Imperceptible. In addition, there will be an imperceptible or positive impact for a considerable number of properties along the existing N5 where traffic will be removed, resulting in an overall imperceptible or positive impact of the scheme.

## 7.0 Biodiversity

An assessment of the proposed road development on the biodiversity of the area was undertaken in accordance with the National Roads Authority's Guidelines for Assessment of Ecological Impacts of National Road Schemes Rev 2 (TII/NRA, 2009). A Natura Impact Statement has also been prepared in relation to this proposed development and is available as a separate publication.

Multidisciplinary site surveys were carried out for terrestrial and aquatic flora and fauna, during the optimum seasons for the habitats and species. The surveys were carried out in accordance with best practice and in compliance with the NRA's Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes (2009). The habitats found in the study area are classified in accordance with the guidelines set out in *A Guide to Habitats in Ireland* (Fossitt, 2000), which classifies habitats based on the vegetation present and management history. In addition the Draft Guidelines for a National Survey and Conservation Assessment of Upland Vegetation and Habitats in Ireland (Perrin et al., 2012) was used as a reference to aid refinement of some of the Fossitt (2000) classifications as appropriate.

The proposed road alignment does not traverse the boundaries of any European or Nationally designated sites important for nature conservation. There will be no direct impacts on any designated site as a result of the construction and operation of the proposed alignment. The nearest designated site Bellanagare Bog SAC (NPWS Site Code: 000592) is located 0.2 km south of the proposed road (See Figure NTS 7.1).

The Ecological Receptor evaluation system follows the NRA Geographic Context for Determining Value set out in the *Guidelines for Assessment of Ecological Impacts of National Road Schemes* (NRA, 2009). In the context of national road projects, these KERs have been identified as ecological resources of 'Local Importance (higher value)' and above.

Following the implementation of mitigation the proposed road development will not result in any significant impacts on any of the identified KERs. In the case of nine of the KERs the potential for impacts was eliminated altogether through the use of appropriate and robust design and mitigation. No potential for impacts on receptors of International Importance were identified following mitigation. No impacts on receptors of National Importance were identified following mitigation.

A further 18 of the KERs were considered to be subject to very minor changes following mitigation with no significant adverse impacts anticipated. These minor residual impacts were associated with receptors of Local Importance (Higher Value).

One receptor of County importance will be affected by the proposed road. This is a population of Whooper Swan at Cregga Turlough (and surrounding fields). Impacts on this receptor include foraging habitat loss, which has been concluded to be of Moderate Significance but could not be considered to be Significant as this field only constitutes a very small fraction of their potential (and actual) foraging habitat in the wider area and in addition they do not show strict fidelity to foraging areas and move around based on availability and quality of forage. Given that there is an abundance of suitable foraging habitat in the wider area the permanent loss of a small area consisting of 4ha is not considered significant. Other impacts on this receptor are potential disturbance, displacement and fragmentation during construction and operation of the proposed road. Following mitigation Whooper Swans in the area are considered likely to habituate to the proposed road development over time and significant disturbance/displacement or fragmentation impacts are not anticipated.

A Natura Impact Statement (NIS) has also been completed for the project to facilitate the Appropriate Assessment of the project by the Competent Authority. The NIS concludes that in view of best scientific knowledge and on the basis of objective information, the proposed road development either individually or in combination with other plans or projects, is not likely to have significant effects on the European Sites.

In conclusion, the proposed development is not anticipated to have a significant impact on the environment.

## 8.0 Soils and 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. Where possible, naturally occurring materials will be processed to reduce moisture content and/or improve grading in order to maximise suitability for re-use.

A number of areas were identified and assessed as suitable material deposition areas. This resulted in the selection of 17 material deposition areas which have been included in the design and the land acquisition boundary for the proposed road development. In total these areas are able to accommodate 988,000m<sup>3</sup> of material. This is sufficient to accommodate the maximum volume of peat and alluvium that might be generated by the proposed road development and the unacceptable material that may not be able to be processed into Class 4 fill material eliminating the likelihood of having to remove materials offsite.

Impacts related to karst can be adequately mitigated by application of appropriate engineering design controls such as the use of basal reinforcement, sealed drainage systems and providing liners to prevent changes in groundwater levels and patterns.

## 9.0 Hydrogeology

The dominant subsoil type in the area is Till derived either from Sandstone or Limestone drift. These tills have shaped the topography of the area and the route passes through the Mid Roscommon Ribbed Moraines at the eastern end. Pockets of cutover peat with limited areas of Raised Bog are also in distinct units along the proposed development. Bedrock is close to the surface in many areas with outcrops frequent. The proposed development primarily overlies Limestone of the Visean formation which is highly karstified in many areas. A portion of the proposed development overlies Sandstone of the Boyle and Fearnaght formations. A number of fault lines are traversed by the proposed route at Frenchpark and Strokestown. These faults form part of the Strokestown and Castlerea Inliers. Bedrock is expected to be intercepted at a number of cut sections along the proposed road development with major cuttings proposed in the karstified limestone bedrock at Cregga.

The proposed development is predominantly located within a Regionally Important Karstified Aquifer, dominated by conduit flow. Locally important aquifers are also crossed by the proposed road development, which are considered to be moderately productive with this productivity limited to local zones in some areas. There are 5 separate hydrogeologically defined Groundwater Bodies (GWB) traversed by the proposed development. These GWB are: Carrick on Shannon, Carrick on Shannon 4, Castletrea Bellanagare 1, Scramoge North and Scramoge South. The Carrick on Shannon GWB has been assessed as having poor status with the remaining GWB's assessed as having "Good" water quality status. Measures are required to protect the existing status of these GWB. Given that much of the proposed alignment

overlies karst bedrock which is close to the surface and that the GWB water quality status is “Poor”, the proposed measures typically involve sealed road drainage systems with wetland systems provided at the outfalls to provide treatment and containment.

The groundwater vulnerability along the majority of the proposed road alignment is classified as High to Extreme due to the shallow depths of overburden (till or peat) and frequent rock outcropping. Point sources in karstified areas provide additional risks to groundwater with swallow holes and surface depressions providing direct linkages to the underlying aquifer. Areas of moderate vulnerability are also traversed by the proposed alignment corresponding to areas of low permeability tills and peat. The risk to groundwater from routine road drainage for the road project has been classified as low due to the incorporation of sealed drainage systems in vulnerable areas with no filter drains or infiltration incorporated in the design in these sections of the proposed alignment.

The impact on the vulnerability of the underlying aquifer throughout the road project will be low however cut sections may locally increase aquifer vulnerability by exposing bedrock particularly in deep cut sections. These impacts are localised and represent a very small fraction of the underlying GWB given the areas involved. The use of sealed drainage systems in these areas will mitigate the risk posed by road drainage runoff to groundwater quality. In general, no specific mitigations other than good practice of control of spillages etc. during the construction stage and the use of a sealed drainage system will be required.

The North Roscommon Regional Water Supply Scheme provides water in the vicinity of Ballaghaderreen and is sourced from a surface water abstraction from Lough Gara. A large proportion of domestic and commercial water supplies along the route have water supplies sourced from groundwater either through private wells and springs or Group Water Supply Schemes (GWS). The proposed alignment passes within close proximity to two group water supply schemes. The Peak Mantua GWS is sourced from a spring located in a highly karstified area known as the Rathcroghan uplands. Another GWS scheme, Curracreigh GWS, is also located in the Rathcroghan upland area and is also sourced from groundwater fed springs. The proposed alignment is outside the estimated zone of contribution for both of these supplies. In the vicinity of Strokestown potable water is sourced from a high yielding borehole at Kiltristan. Twelve private groundwater supplies have been identified within 200m of the proposed alignment. Eight of these supplies have been identified as being used for domestic purposes with the remaining supplies used for agriculture. The proposed road development will result in the loss of two spring supplies which are used for agricultural purposes.

The impact of routine road drainage runoff on groundwater quality will be imperceptible and at worst case represents a local slight negative impact. However, the sensitivity of adjacent wetlands and karst features will require specific mitigation measures in respect to the drainage collection system and road design, with the proposed drainage system comprising of sealed collection systems with spillage control and treatment ponds. The main potential hydrogeological impact arising from the proposed road cut sections will be the potential to cause localised dewatering of adjacent soils and subsoils which may impact on groundwater sensitive habitats. Open drains which are located at the toe of road embankments will be kept shallow with check dams provided at intervals adjacent to blanket bog, cutover bog and wet grassland areas to maintain wet conditions. The proposed road development, involving replacement of peat beneath the road formation with granular fill material, could potentially exert a measureable influence on the local subsurface drainage of

the adjoining wetland and peat subsoils resulting in the potential for local dewatering. In order to protect wetland habitats adjacent to the road development a subsurface flow barrier will be incorporated in the design for locations where blanket bog or wetland areas are located close to the road. A drainage blanket is provided beneath the road adjacent to an area of Fen a Tullyloyd to ensure subsurface flow paths. Karst features have been avoided where possible and road drainage has been routed away from these features. Where the alignment passes within close proximity to these features at Kilvoy and Corry East, a drainage blanket is provided beneath the road with subsurface flow barriers incorporated in the design. The area surrounding Cregga Turlough presents an interaction between surface and groundwater flow, for which interceptor drains and a permeable distribution area underneath the alignment in this location are provided, to ensure the water balance of the Turlough is maintained.

In conclusion there will be no perceptible hydrogeological impact to any wetland habitat as a result of potential dewatering of the surrounding groundwater by the road development at cuttings or by the replacement of subsoil by granular material beneath the road formation level. Karst features such as swallow holes and Cregga Turlough will be protected from pollution with the existing water balances maintained.

## 10.0 Hydrology

The rivers and lakes along the proposed development are located entirely within the Shannon International River Basin District (Shannon IRBD). The proposed route of the development crosses five major watercourses:

- Carricknabrahah River;
- Owennaforeesha River;
- Owenur River;
- Strokestown River; and,
- Scramoge River.

The Carricknabrahah and Owennaforeesha Rivers feed the Upper Shannon Catchment via the Breedoge River and Lough Gara which is designated as a Special Area of Conservation. In addition the proposed alignment also crosses a number of minor streams, watercourses and local drainage channels. The Owenur River flows to the Upper Shannon via Lough Nablaly and is fed by Clooncullaan Loughs. The Strokestown and Scramoge Rivers confluence to become the Mountain River and then flow to the Upper River Shannon via Kilglass Lough. The Carricknabrahah, Owennaforeesha and Scramoge Rivers have been identified as Salmonid and important with respect to fisheries.

The wetland ecology of the study area, which is directly influenced by hydrology, is sensitive however the route does not pass within or adjacent to any candidate Special Areas of Conservation (cSACs).

There are 5 No. major watercourse crossings along the proposed route together with a number of other crossings of minor watercourses and surface water outfall discharge locations. The watercourses encountered range from local drainage channels to large rivers/streams with the largest upstream catchment area being that of the Scramoge River estimated at 188km<sup>2</sup>. The proposed road will replace the existing drainage system which, for the current road, is practically non-existent. These include the use of filter drains, closed drainage systems and the use of a

vegetated lined wetland system upstream of all road drainage outfalls. These wetland treatment systems treat the road surface water runoff before entering the receiving waters. Each watercourse crossing has been assessed for flow capacity in accordance with the standards set out by the OPW for Section 50 (of the Arterial Drainage Act 1945) Approval. This standard is typically the 1-in-100year flood flow with an allowance for climate change and a typical freeboard of 0.3m.

All potential moderate to significant impacts arising from this proposed road development to the watercourses and lake systems are associated with potential water quality impacts during the construction stage, and for a short period of establishment post construction, and by their nature are temporary impacts. A number of ecologically sensitive surface waters are located along the proposed route, with a number of the rivers having salmonid potential and the presence of Oligotrophic and Mesotrophic lakes downstream of the road. Consequently, constructional impacts through inadequate handling of constructional runoff or worst case accidental spillages could, without mitigation, represent a temporary moderate-to-significant impact to these sensitive waters. In addition the karstic nature of the underlying bedrock results in some watercourses having “losing” sections either through linear or point discharges. In these areas the sensitivities extend to the underlying bedrock aquifer.

The operational impacts of the proposed road development have been designed out through avoidance by realignment of road and good engineering design (detailed assessment and design of watercourse crossings and drainage design) and represent negligible to slight impacts not requiring further mitigation. The proposed road drainage system represents an improvement over the existing situation (on the N5 and associated regional and local road network) in that it will provide better protection to the receiving waters with containment facilities provided upstream of the outfalls should a serious traffic accident spillage occur. The proposed drainage will also provide improved attenuation and settlement (wetland attenuation ponds) prior to discharge. In one instance the road drainage outfalls to a watercourse which has a point discharge to ground downstream at a swallow hole. A two stage wetland treatment system is therefore proposed upstream of this outfall to further treat and improve water quality and ensure the highest level of protection to both surface and groundwater. The drainage system follows closely the existing topography and consequently there are no significant changes to the drainage direction and contributing catchment areas. The highly undulating nature of the catchments has resulted in a number of significant cut sections along the proposed alignment with portions of the route also located on steep hillslopes. Existing overland and interflow will be maintained by intercepting clean runoff water in a series of cut-off ditches discharging to the associated catchment surface water body. The proposed road development will not alter the hydrology of existing streams and rivers nor will it impact on flooding or flood risk to the area.

The main focus of hydrological mitigation is for protection of the sensitive waters during construction and the establishment phase and in particular the control and management of activities that may give rise to siltation from sediment laden runoff. A comprehensive construction erosion and sediment control plan has been prepared for the entire road development, which sets out robust and comprehensive procedures, including monitoring systems and oversight throughout the construction phase. In respect to the operational phase, avoidance of encroachment into watercourses, including clear spanning structures, has been proposed at the salmonid watercourse crossings. A specific construction programme has been developed in the vicinity of Cregga Turlough to ensure the water balance is

maintained in this sensitive habitat during the advancement of deep cuttings up-gradient.

Another significant source of pollution risk to downstream sensitive waters during the construction and establishment phase is from the material recovery areas. The proposed mitigation for the control of these sites is to provide engineered bunding so as to retain the material in situ and minimise risk of escape via overtopping, seepage via the base and cracking and slippage. Management of runoff waters will involve cut-off drains to divert upstream clean waters around such areas, and provision of a settlement pond and wetland areas capable of providing 100-year storm flow detention for settlement of sediments, and a single controlled outflow to the receiving drains. These material recovery deposit areas will be managed and monitored during the construction phase.

There are no likely significant impacts on the hydrological environment as a result of the proposed road development following mitigation. A detailed and robust construction erosion and sediment control plan will protect sensitive waters and karst surface water features from constructional impacts associated with the road construction and the material recovery areas. The proposed hydrological mitigation will ensure that there will be no cumulative or in-combination negative hydrological impacts from the proposed road development.

## 11.0 Landscape & Visual Analysis

The proposed road development crosses a rural and often remote open landscape where residential development is varyingly dispersed and clustered along local and other roads, most notably west of Frenchpark; at Cashel / Ballaghcullia; west and east of Mantua, north of Clooncullaan Lough and from Cregga south to Strokestown Demesne.

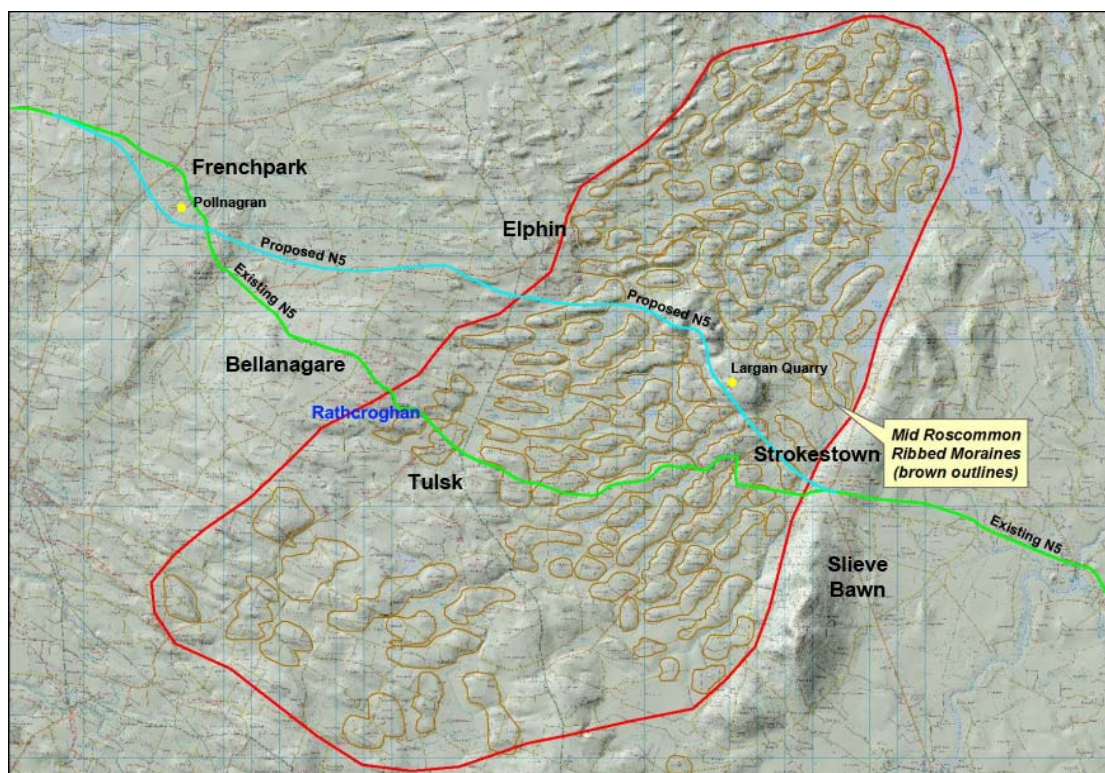
In this landscape, the provision of the proposed road development will inevitably give rise to significant alteration and significant impact on the local landscape and on views from properties sited in vicinity of the road development. The landscape and visual impacts will be most pronounced during the construction and initial operation stages, after which landscape mitigation measures will be increasingly effective in integrating the road within the landscape and in reducing landscape and visual impacts.

It is noted that the removal of the majority of traffic from the existing N5 has potential for significant positive landscape and visual impact for Rathcroghan Archaeological Complex – a landscape of exceptional value and national / international importance – as well as for existing residential and community properties, including schools, located along the section of the existing N5 to be bypassed by the proposed N5 road.

The proposed road development crosses a generally rural low-lying to rolling drumlin landscape which is predominantly in agricultural use but interspersed with small areas of semi-natural woodland; areas of peat / bogland; scrub; wetlands; lakes; and coniferous plantations. Residential properties are a common feature along sections of the corridor, particularly east and north of Strokestown. Within this landscape, the construction associated with the road will give rise to incidents of significant negative impact in terms of disturbance to the existing landscape and its character. While these landscape impacts will tend to be most pronounced during the construction and initial operation stages, the proposed road development will, in common with all road schemes, also have a residual or permanent impact on the landscape.



The County Geological Sites includes a reference to the 'Mid Roscommon Ribbed Moraines' (*a ribbed moraine field with superimposed drumlins*). The geological feature is described as approx. 100 ribbed moraine features within an area of 10 by 20 kilometres to the northwest of Slieve Bawn, refer to Plate 11.1. The existing N5 passes through this landscape, as does the eastern portion of the proposed N5, in the area between Elphin and Scramoge.



**Plate 11.1: Mid Roscommon Ribbed Moraines (Annotated Extract County Geological Site Report)**

While the proposed road development as a whole will have some degree of inevitable impact on the landscape, significant impacts are limited to a number of areas of more distinctive character along the proposed road development.

In the context of road development, residential development will be likely to experience significant visual impact where it is located at proximity to either the proposed road and/or re-aligned local roads. Open remote agricultural landscapes, distinctive drumlins and open ridges, Clooncullaan Lough and semi-natural habitats are amongst the most sensitive and significant landscape features along the proposed road development.

General mitigation measures will be applied over the entire proposed road development, depending on the nature of the particular road section. The provision of screening bunds, screening areas and replacement planting is proposed to ameliorate the impact of the proposed road development on the landscape. In areas where impacts are more profound, specific mitigation measures will be implemented.

It is considered that some level of local slight to moderate residual impact will remain along the proposed road development generally, with significant residual impacts limited to the Clooncullaan Lough and Cregga landscape areas. The proposed road

development will have no residual negative impact on demesne landscapes or on aspects of landscape planning.

## 12.0 Noise & Vibration

The potential noise and vibration impacts have been considered for both the construction phase and the operational phase of the proposed road development. The surveying programme encompassed attended surveys at 85 no. locations and unattended surveys at 22 no. locations.

A total of three hundred and seventy four (374 No.) receiver locations have been considered in the assessment. All receptors within 400m of the centreline of the proposed N5 road have been modelled.

Mitigation measures in the form of bunds or barriers or a combination of both are required for a total of ten locations. With these mitigation measures in place all locations along the proposed road development will comply with the adopted criteria.

As a result of the proposed development the traffic volumes along the existing N5 are expected to reduce significantly. This will result in a decrease in the traffic noise levels at those properties located along the existing roads.

During the construction phase for the proposed road development, noise and vibration will potentially be generated by site preparation works, excavation and infilling works. For the construction phase, in order to ensure that the noise limits at any potentially negatively affected sensitive properties in the area is achieved, a programme of monitoring should be implemented to ensure that condition limits are not exceeded and that all the relevant recommendations are met. The contract documents will clearly specify that the Contractor undertaking the construction of the works will be obliged to take specific noise abatement measures and comply with the recommendations of *BS 5228-1:2009+A1:2014 Code of Practice for Noise and Vibration Control on Construction and Open Sites - Noise* and the European Communities (Noise Emission by Equipment for Use Outdoors) Regulations, 2001.

Mitigation measures to reduce impacts from blasting will be the application of best practice mitigation measures and a communication strategy with local residents. Further guidance will be obtained from the recommendations contained within *BS5228-2:2009+A1:2014 Code of Practice for Noise and Vibration Control on Construction and Open Sites – Vibration*.

## 13.0 Air Quality & Climate

The impacts on air quality and climate associated with both the constructional and operational phases of the proposed road development have been assessed. Baseline air quality data has been derived from site specific kerbside rural monitoring undertaken along the existing N5 and proposed road development coupled with reference to the EPA National Air Quality Monitoring Programme. All Nitrogen Dioxide (NO<sub>2</sub>) concentrations measured during the survey period were well below the limit values for human health set by the European Union.

A prediction of ground level concentrations of traffic-derived pollutants was carried out using the procedures outlined in the local model of the UK DMRB. Predictions of the main polluting emissions oxides of nitrogen (NO<sub>x</sub>) and particulate matter (PM<sup>10</sup>) were carried out in this modelling study.

Although some increases in the maximum pollutant concentrations may occur at the identified receptors as a result of the development, no significant increase in pollutant levels will occur. In addition, the proposed road will divert traffic from densely populated areas and thus air quality in these areas will improve.

The construction phase impact for air quality will be limited through application of a dust minimisation plan.

Due to the size and nature of the construction activities, any emissions during construction will have a negligible impact on climate.

## 14.0 Archaeological and Cultural Heritage

The Archaeology and Cultural Heritage Chapter considers the historic environment including the candidate UNESCO World Heritage Site of the Rathcroghan Archaeological Complex, national monuments, recorded archaeological monuments (RMP), sites and monuments (SMR), stray finds, archaeological artefacts, historic landscapes, cultural heritage features, place names, and inherited traditions, events and people as part of the assessment for the N5 Ballaghaderreen to Scramoge Road.

The chapter assesses the impact of the proposed road development on the immediate recorded monuments, cultural heritage features and potential sites revealed as a result of surveys undertaken for this study within the constraint corridor (taken as 100m on either side of the centre line of the proposed road development).

Professional judgement was used to assess the wider receiving archaeological and cultural heritage environment and considered the candidate UNESCO World Heritage site of the Rathcroghan Archaeological Complex. As part of this assessment, this report has reviewed the tentative list submission of the Royal Sites of Ireland and addition to this, consideration has been given to the ICOMOS Guidelines on Heritage Impact Assessment for Cultural Heritage Properties (2011) when evaluating the overall impact of the proposed road development. A review has also taken place on the existing documentation which supports the conservation and details the significance of the complex through research and investigation (Oxford Archaeology 2007, Waddell et al 2009, Herity 1991). Finally an assessment took place of the cartographic sources to provide an understanding of settlement patterns within the Roscommon landscape prior to the Famine.

In addition to documentary and cartographic research, aerial photography, field survey, LiDAR survey and assessment, geophysical survey, test excavation and photomontages assisted in providing an understanding of the receiving recorded archaeological and cultural heritage environment and potential.

Extensive consultation has taken place throughout the evolution of the proposed road development with the statutory authorities, academic institutions, archaeologists, heritage consultants as well as landowners, the wider public and stakeholders. A key consideration through the consultation process and the development of route options was the significance of Rathcroghan and Carnfree and to avoid developing a route through these areas of immense archaeological sensitivity and acknowledged national importance.

The placement of the final route alignment (both in plan and vertical height) has been an iterative process with constant refinement so the final design solution has avoided as many recorded monuments and newly revealed features as possible.

The proposed road development is sufficiently distant (over 2km from the conservation area study and 378m from the RMP archaeological complex) and well-integrated within the existing landscape, using the natural topography, plantation forestry and general vegetation so as not to give rise to any adverse visual impact on the Rathcroghan complex or its setting. This assessment is supported by, and the effect, illustrated on the photomontages prepared from viewpoints in the Rathcroghan landscape. The setting of monuments within the key constraint area is seen as integral to the significance of the complex and this setting will be preserved.

### Findings

Pre-mitigation there will be 36 direct impacts on archaeological assets during the construction phase of the proposed road development. These include the following:

- 10 direct impact with an impact significance level of significant
- 19 direct impacts with an impact significance level of moderate
- 7 direct impacts with an impact significance level of slight

### Site Types

Site Type / Impact Level	Slight	Moderate	Significant
RMP	1	1	0
SMR	1	0	2
Newly Identified Site	0	1	5
Site of Archaeological Potential	5	17	2
Archaeological Area	0	0	1
<b>Total</b>	<b>7</b>	<b>19</b>	<b>10</b>

Furthermore five rivers will be traversed by the proposed road development: the Carricknabraher River (AH6), the Owennaforeesha River (AH21), the Owenur River (AH64), the Strokestown River (AH104) and the Scramoge River (AH108) and an area of historic bogland (AH7).

There will be 54 direct impacts and no indirect impacts on cultural heritage assets during the construction phase of the proposed road development. These include the following:

- 0 direct impacts with an impact significance level of significant
- 52 direct impacts with an impact significance level of moderate
- 1 direct impact with an impact significance level of low
- 1 direct impact with an impact significance level of imperceptible

### Site Types

Site Type / Impact Level	Imperceptible	Slight	Moderate	Significant
Cultural Heritage Site	0	0	7	0
'Site of'	0	0	42	0
Former Demesne Lands	1	1	3	0
<b>Total</b>	<b>1</b>	<b>1</b>	<b>52</b>	<b>0</b>

In order to gain a better understanding of the pit field features, a number of areas throughout the proposed road development were subject to archaeological investigation. In the past, both geology and archaeology have been used to explain the origin of these pits. Test excavation and a hydrogeological assessment (Meehan 2016) has suggested that the pit like depressions are possible natural enclosed karstic depressions and of no archaeological significance (O'Connell 2016) in Kilvoy, Corry East and Cloonyeffe townlands. While in Lavalley and Vesnoy townlands there are no strong indications of an archaeological origin apart from a sherd of post medieval pottery. The pit from where this pottery was retrieved has been dated to the post medieval/ early modern period (AD 1687-1927). It was concluded, that at the time of the archaeological resolution of the pits, the presence of a geologist will allow for recording of further data in order to determine a more conclusive interpretation for the origin of the pits. The proposed development will also impact upon 42 townland boundaries. Figure NTS 14.1 shows the location of the proposed development in relation to the Rathcroghan area and other key archaeological sites in the area.

The proposed road development has been located so that it will not diminish the setting of individual monuments or groupings of monuments or affect protected key views and/or disrupt the inter-visibility between significant monuments. As such it does not threaten the world heritage nomination by maintaining the justification of the outstanding universal value (OUV), and authenticity while improving the integrity of the complex.

The research and surveys conducted for Chapter 14 has provided a greater understanding of the historic landscape character and the historic processes that have formed the present landscape. This knowledge has led to the development of a road design that has minimised the impact on recorded archaeological sites and the local historic character where possible. While views to and from nine of monuments will be changed due to the presence of the new route, the main historic influences which have formed and define the present day landscape through the above ground physical expression of well-preserved monuments, groupings of monuments and their setting will be preserved.

### **Mitigation**

Mitigation proposals have been proposed in relation to individual sites. It is proposed that features and sites identified within the CPO landtake will be subject to preservation by record (partial or full) unless where preservation by design (in situ) is a viable option.

Roscommon County Council and TII will make provision to allow for and to fund any necessary archaeological monitoring and inspection work that may be required during the route preparation phase of development. It is anticipated that lands requiring monitoring will primarily consist of areas that could not previously be assessed due to environmental, safety or access constraints. Adequate financial provision will be made available for post-excavation work, the conservation of artefacts and the publication of archaeological excavation results.

Mitigation measures shall be undertaken as directed by the Minister of the DAHRRGA in compliance with national policy guidelines and statutory provisions for the protection of archaeology and cultural heritage. It is anticipated that after mitigation measures have been applied to direct impacts that there will be no significant residual archaeological and cultural heritage impacts. With excavation and planned recording, preservation by record will be achieved throughout the

proposed road development at the pre-construction and construction stage of the development.

Most significantly the removal of a significant level of existing traffic from the N5 through the Rathcroghan Archaeological Complex will have a significant positive impact on the visual context and setting of this important landscape. The proposed road project is sufficiently distant and well-integrated within the existing landscape, by means of ridges and valleys, plantations and general vegetation so as not give rise to any adverse landscape or visual impact on the Rathcroghan Complex or its setting.

## **15.0 Architectural Heritage**

The built heritage assessment examines buildings and other structures along the route of the proposed road and assesses the architectural significance of those structures with the anticipated effect of the road on their character. The emphasis is on structures still standing. For a structure to have architectural significance it need not survive intact and ruins, or even fragments of buildings may be of importance.

The building survey examines forty-eight structures of which twenty-nine structures have some level of built heritage significance. Eight of these will be affected to a greater or lesser extent by the proposed road project, one of which will need to be safeguarded to avoid damage during construction. Nineteen of the forty-eight structures assessed have no built heritage significance or will classify as “record only”. In nineteen cases the effect will be of sufficient significance to warrant mitigation and this includes those that are not of heritage significance but classify as “record only” and hence will need to be recorded before they are removed.

Following examination of the various structures within the CPO line and in the immediate vicinity, it is concluded that this road development will not have any significant effects on built heritage. The small number of structures that will be removed to facilitate construction of the proposed road are of minor interest and it will be sufficient to record them prior to removal. In other cases the proposed road development will be either at a significant distance such that there will be no appreciable effect, such as at Urney Church and Strokestown Park House or they have been so altered over time that little survives of their original character, such as at the demesnes of Hermitage, Bettyfield and Strokestown Park House.

All mitigation shall be carried out under Direction of the Minister for Arts, Heritage and the Gaeltacht, as proscribed under the National Monuments (Amendment) Act, 2006. It is envisaged that following the recommended mitigation the proposed road development will have no significant effect on built heritage.

## **16.0 Material Assets & Land – Agriculture**

The proposed road development will directly impact on 170 agricultural properties. The agricultural area to be removed from affected holdings is approximately 349.4 hectares. Land use is mostly grassland with areas of forestry and peat bog. The predominant farm enterprise is beef and beef as part of the mixed livestock enterprises. Agriculture along the proposed road development is generally extensive to moderately intensive in nature.

The baseline rating of farms in the study area is deemed to be High on 36 farms, Medium on 99 farms, Low on 32 farms and Very Low on 3 farms.

The magnitude of the impact on agricultural property will be Very High on 6 farm holdings, High on 35 farms, Medium on 64 farms, Low on 56 farms and Very Low on 9 farms.

The significance of impact will be Profound on two farms, Significant on 30 farms, Moderate on 65 farms, Slight on 64 farms and Imperceptible on 9 farms.

Mitigation measures are recommended for adverse impacts such as land severance, impacts on access to land, disturbance of field drainage and interruption of water and power supply. Further mitigation is recommended for the temporary impacts of noise and vibration, dust, access to lands and disturbance of drainage and services during the construction period.

Following recommended mitigation measures in relation to severance the impact on one farm will have a Profound level of significance. The impact will be Significant on 2 farms, Moderate on 82 farms, Slight on 74 farms and Imperceptible on 11 farms.

## **17.0 Material Assets & Land – Non-Agriculture**

The proposed road development will directly impact on 40 non-agricultural properties involving the permanent acquisition of approximately 7.791ha. This landtake area consists of a permanent acquisition of 0.811ha of non-agricultural lands, 1.334ha agricultural lands and 5.646ha of public road.

The 40 non-agricultural properties directly affected by the proposed project include 35 residential properties, 1 development sites and 4 community properties. The baseline impact will be high on 39 properties and medium on one property. The magnitude of impact will be High on 5 properties, Medium on 4 properties, Low on 5 properties and Very Low on 26 properties. The significance of the impact on non-agricultural property will be Profound on five properties, Significant on 4 properties, Slight on five properties and Imperceptible on 26 properties.

Mitigation measures are recommended for adverse impacts such as reinstatement of access and boundary treatment. Further mitigation of construction impacts is recommended for temporary impacts of access to property, noise and vibration, dust and disturbance of drainage systems and services.

Following recommended mitigation measures in relation to severance the impact on two properties will have a Profound level of significance. The impact will be Significant on three properties, Slight on nine properties and Imperceptible on 26 properties.

Compensation payments for loss of land will be the subject of a separate process. Where an access to a property is affected the access will be reinstated to match the existing.

## **18.0 Further 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:

- Roscommon County Council, The Courthouse, Abbey St, Roscommon
- Roscommon County Council, National Roads Design Office, Racecourse Road, Roscommon, County Roscommon.

Copies of the full EIAR and/or Natura Impact Statement (NIS) may be purchased from Roscommon County Council Offices and the National Roads Design Office. Alternatively the EIAR can be viewed on the Roscommon County Council website at <http://www.roscommoncoco.ie/en/Services/Roads/N5-Ballaghaderreen-to-Scramoge-Road-Project/>

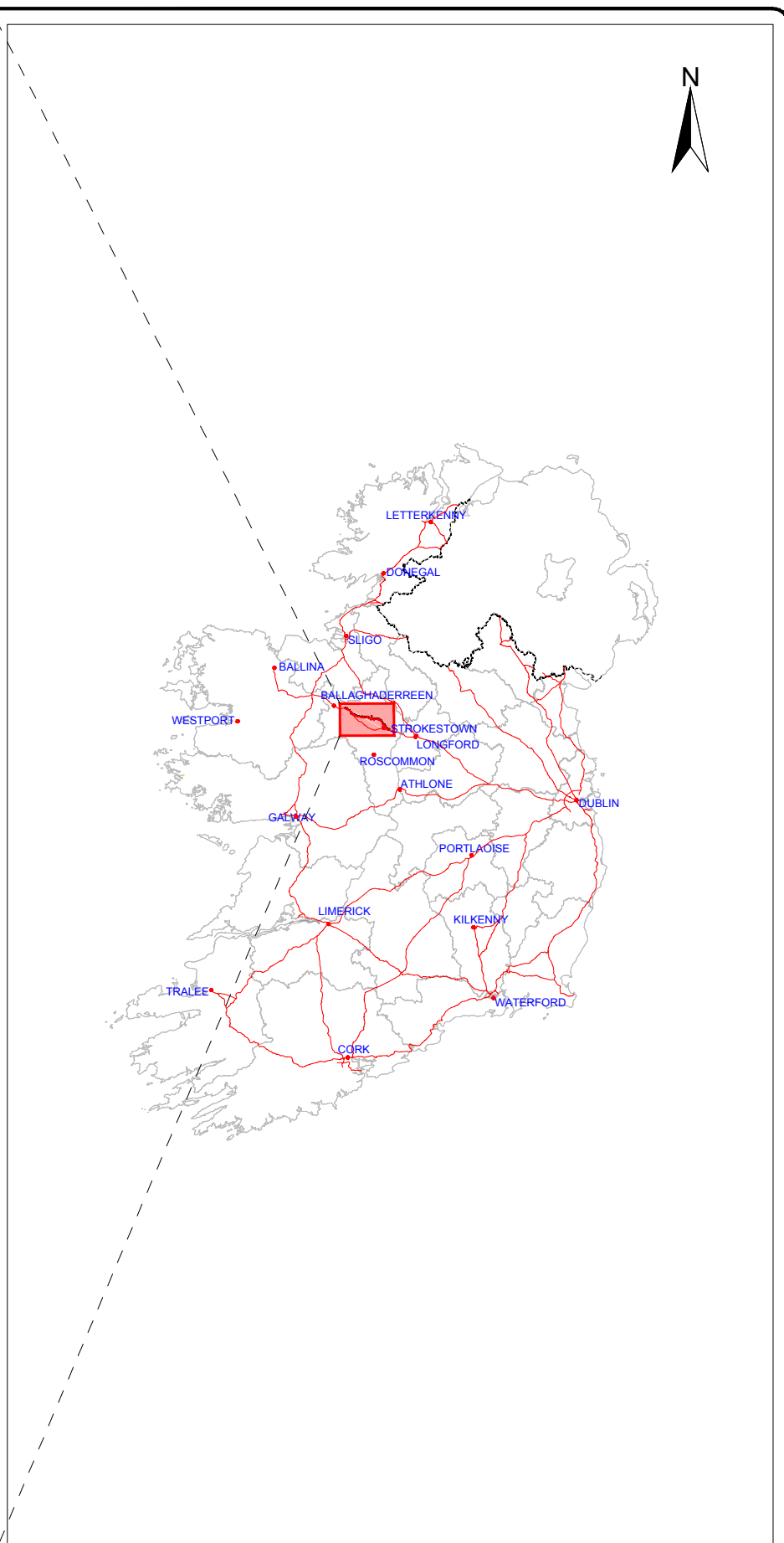
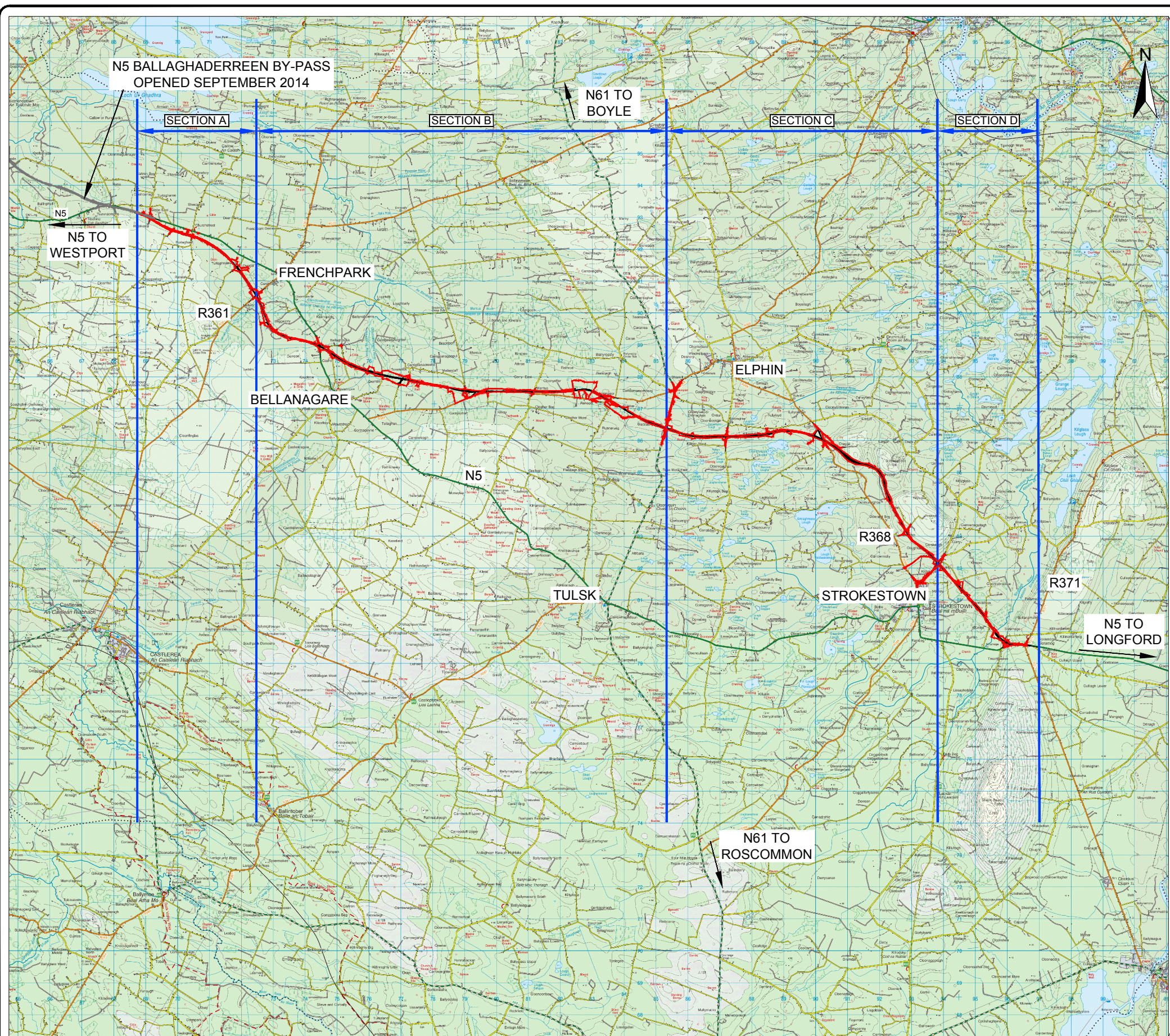
## **19.0 What Happens Next?**

Written submissions relating to the likely environmental effects of the proposed road development may be made to An Bord Pleanála (the Board) by the public or by prescribed bodies prior to the date specified in published newspaper notices. An Oral Hearing may be held should the statutory requirements for one be met. Written submissions, together with any representations made at any oral hearing, will be considered by the Board in making its decision on whether or not to approve the proposed road development with or without modifications. The Board's decision will be published in one or more newspapers circulating in the area, including where appropriate, particulars of any modifications to the proposed road development.

All submissions in relation to this development should be sent to the Board at the following address:

An Bord Pleanála,  
64 Marlborough Street,  
Dublin 1.





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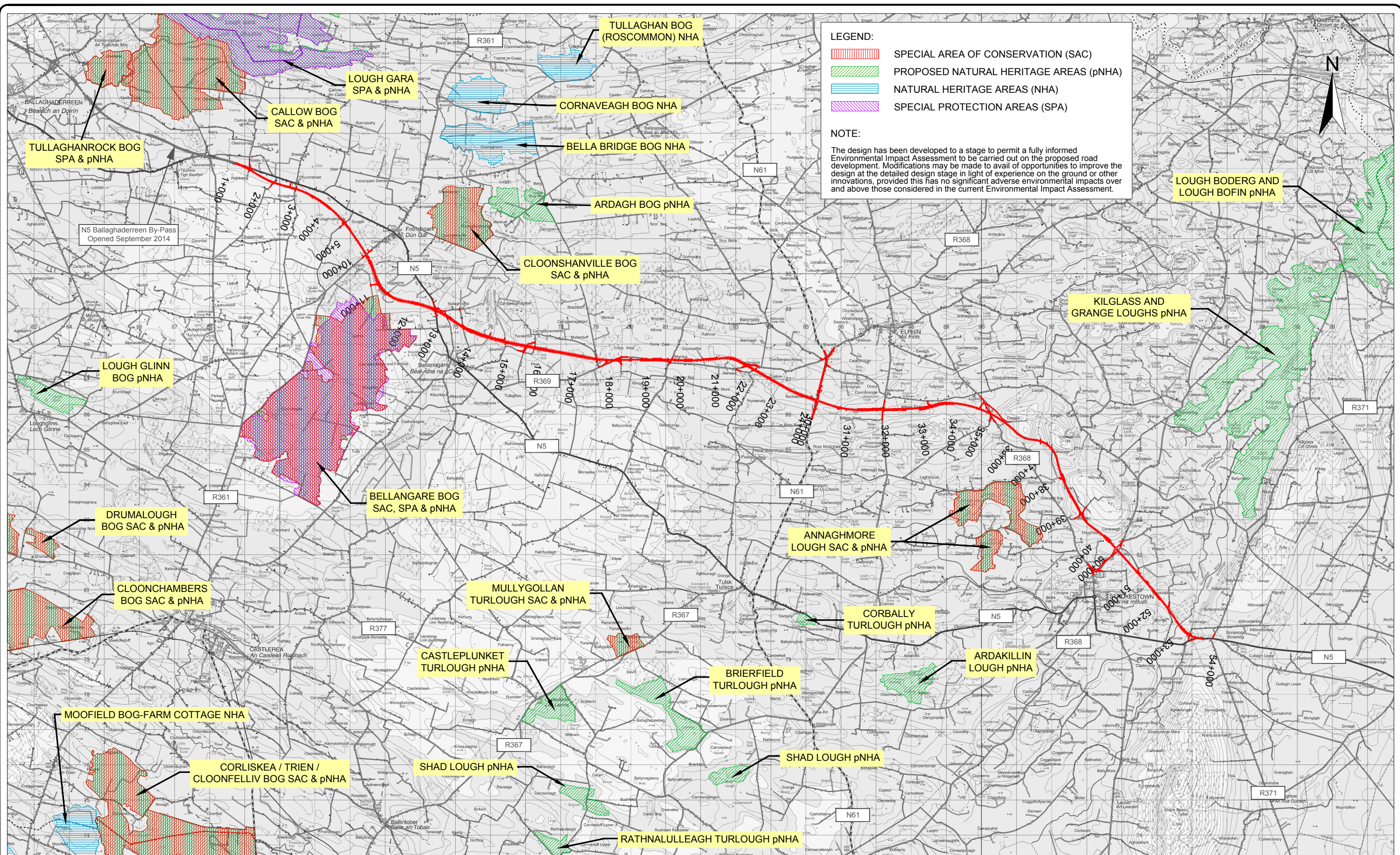
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Project  
**N5 BALLAGHADERREEN TO SCRAMOG  
ROAD PROJECT**

**ENVIRONMENTAL IMPACT  
ASSESSMENT REPORT**

Title		Location Plan	
Designed: RJS	File:	Status:	E.I.A.R.
Drawn: LA	Job No: 14.155		
Checked: BC	Scale: N.T.S. (@ A3)	Drawing No:	NTS 1.1
Approved: JET	Date: December 2017	Rev:	

DO NOT SCALE USE FIGURED DIMENSIONS ONLY



**LEGEND:**

- SPECIAL AREA OF CONSERVATION (SAC)
- PROPOSED NATURAL HERITAGE AREAS (pNHA)
- NATURAL HERITAGE AREAS (NHA)
- SPECIAL PROTECTION AREAS (SPA)

**NOTE:**

The design has been developed to a stage to permit a fully informed Environmental Impact Assessment to be carried out on the proposed road development. Modifications may be made to avail of opportunities to improve the design at the detailed design stage in light of experience on the ground or other innovations, provided this has no significant adverse environmental impacts over and above those considered in the current Environmental Impact Assessment.

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**Roughan & O'Donovan-AECOM Alliance**

**ROD AECOM**

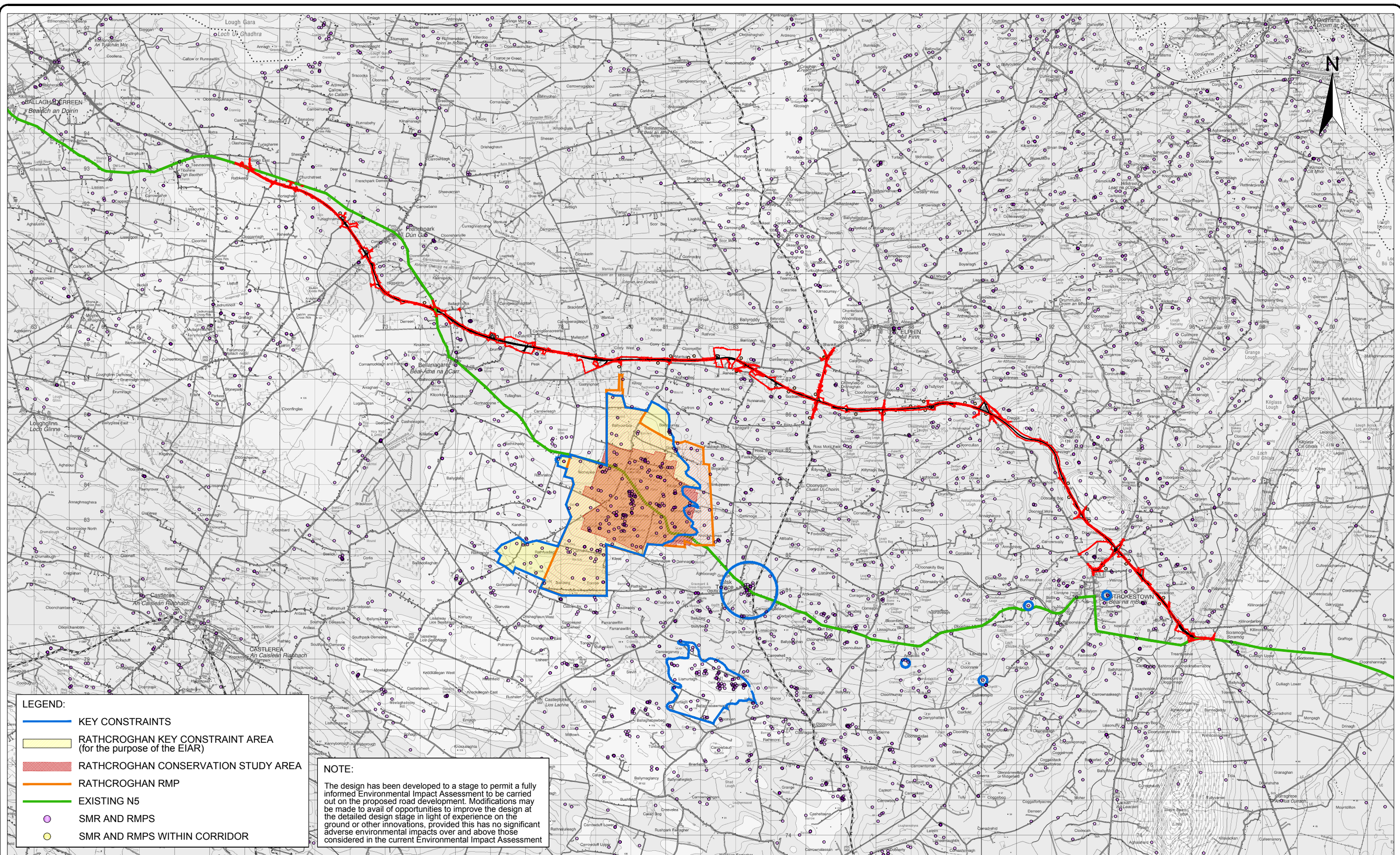
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Project  
**N5 BALLAGHADERREEN TO SCRAMOGE ROAD PROJECT**

**ENVIRONMENTAL IMPACT ASSESSMENT REPORT**

Title		Designated Areas	
Designed: BC	File: 14.155	Status: E.I.A.R.	
Drawn: MM	Job No: 14.155		
Checked: BC	Scale: 1:100,000 (@ A3)	Drawing No: NTS 7.1	Rev:
Approved: JET	Date: December 2017		

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- LEGEND:**
- KEY CONSTRAINTS
  - RATHCROGHAN KEY CONSTRAINT AREA (for the purpose of the E.I.A.R)
  - RATHCROGHAN CONSERVATION STUDY AREA
  - RATHCROGHAN RMP
  - EXISTING N5
  - SMR AND RMPs
  - SMR AND RMPs WITHIN CORRIDOR

**NOTE:**

The design has been developed to a stage to permit a fully informed Environmental Impact Assessment to be carried out on the proposed road development. Modifications may be made to avail of opportunities to improve the design at the detailed design stage in light of experience on the ground or other innovations, provided this has no significant adverse environmental impacts over and above those considered in the current Environmental Impact Assessment

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**ROD**  
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Project  
**N5 BALLAGHADERREEN TO SCRAMOGE ROAD PROJECT**

**ENVIRONMENTAL IMPACT ASSESSMENT REPORT**

Title		Rathcroghan Archaeological Complex & Key Constraints	
Designed: PM	File: 14.155	Status: E.I.A.R.	
Drawn: LA	Scale: 1:100,000 (@ A3)	Drawing No: NTS 14.1	Rev:
Checked: BC	Date: December 2017		
Approved: JET			

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