

Leitrim County Council  
**N4 Carrick-on-Shannon to  
Dromod Project**  
Option Selection Report

274219-ARUP-02-OS-RP-Z-000006

P07 | 14 March 2023

This report takes into account the particular instructions and requirements of our client.

It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

Job number 274219-00

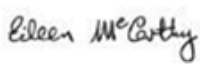
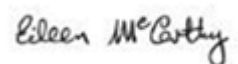
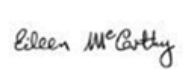
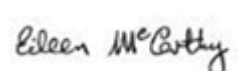
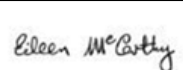
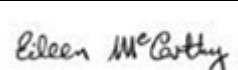
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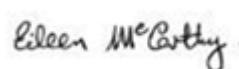
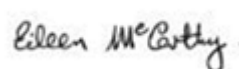
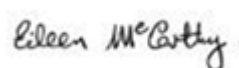
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# Document verification

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|----------------|---------------|-----------------------------------------|--------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| Job title      |               | N4 Carrick-on-Shannon to Dromod Project |                                                                                                        | Job number                                                                           |                                                                                       |
|                |               |                                         |                                                                                                        | 274219-00                                                                            |                                                                                       |
| Document title |               | Option Selection Report                 |                                                                                                        | File reference                                                                       |                                                                                       |
|                |               |                                         |                                                                                                        |                                                                                      |                                                                                       |
| Document ref   |               | 274219-ARUP-02-OS-RP-Z-000006           |                                                                                                        |                                                                                      |                                                                                       |
| Revision       | Date          | Filename                                | 274219-ARUP-02-OS-RP-Z-000006.docx                                                                     |                                                                                      |                                                                                       |
| P01            | 26 Nov 2021   | Description                             | First draft of Chapters 1, 2 and 3 to Client<br>(Issued as part of File 274219-ARUP-02-OS-RP-Z-000002) |                                                                                      |                                                                                       |
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| P02            | 15 Feb 2022   | Filename                                | 274219-ARUP-02-OS-RP-Z-000006.docx                                                                     |                                                                                      |                                                                                       |
|                |               | Description                             | Response to Client Comments on Chapter 1                                                               |                                                                                      |                                                                                       |
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| P03            | 11 March 2022 | Filename                                | 274219-ARUP-02-OS-RP-Z-000006.docx                                                                     |                                                                                      |                                                                                       |
|                |               | Description                             | Issued for Peer Review                                                                                 |                                                                                      |                                                                                       |
|                |               |                                         | Prepared by                                                                                            | Checked by                                                                           | Approved by                                                                           |
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| P04            | 08 April 2022 | Filename                                | 274219-ARUP-02-OS-RP-Z-000006.docx                                                                     |                                                                                      |                                                                                       |
|                |               | Description                             | Issued for Peer Review                                                                                 |                                                                                      |                                                                                       |
|                |               |                                         | Prepared by                                                                                            | Checked by                                                                           | Approved by                                                                           |
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| P05            | 22 July       | Filename                                | 274219-ARUP-02-OS-RP-Z-000006.docx                                                                     |                                                                                      |                                                                                       |

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|                                           | 2022          | Description | Issue                                                                              |                                                                                    |                                                                                      |
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| P06                                       | 22 July 2022  | Filename    | 274219-ARUP-02-OS-RP-Z-000006.docx                                                 |                                                                                    |                                                                                      |
|                                           |               | Description | Final OSR Draft                                                                    |                                                                                    |                                                                                      |
|                                           |               |             | Prepared by                                                                        | Checked by                                                                         | Approved by                                                                          |
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| P07                                       | 14 March 2023 | Filename    | 274219-ARUP-02-OS-RP-Z-000006.docx                                                 |                                                                                    |                                                                                      |
|                                           |               | Description | Final OSR                                                                          |                                                                                    |                                                                                      |
|                                           |               |             | Prepared by                                                                        | Checked by                                                                         | Approved by                                                                          |
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| Issue Document verification with document |               |             |                                                                                    |                                                                                    | <input checked="" type="checkbox"/>                                                  |

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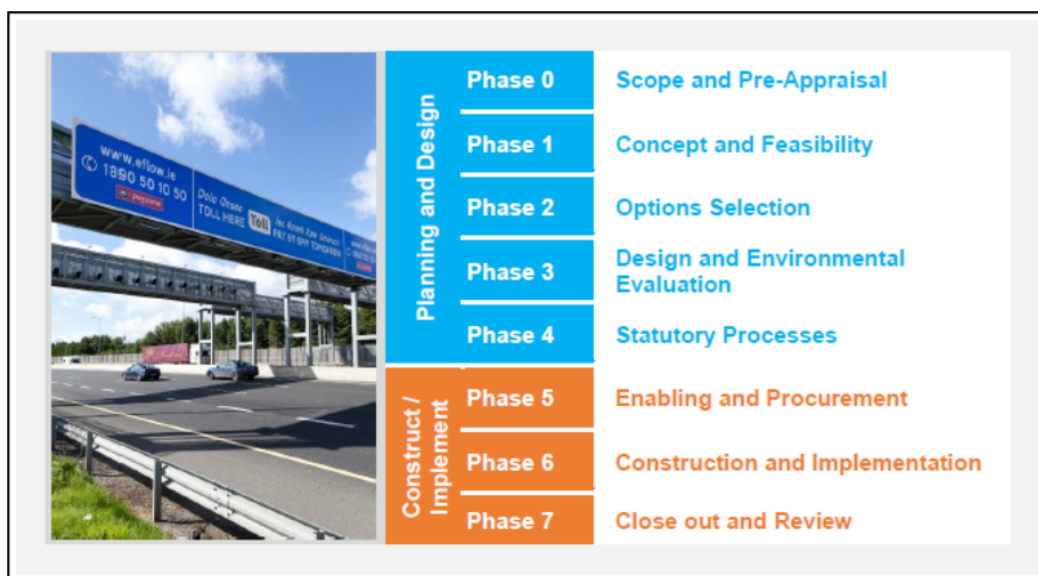
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# 1 Introduction

## 1.1 General

Leitrim County Council appointed Arup in March 2020 to undertake consultancy services for the N4 Carrick-on-Shannon to Dromod Project in accordance with Phase 1 – 4 of the Transport Infrastructure Ireland (TII) Project Management Guidelines (PMG)<sup>1</sup>. The purpose of this Phase 2 Option Selection Report is to identify a Preferred Option Corridor that allows for a sustainable transport solution over the existing N4 corridor extents under consideration; whilst also providing efficient connectivity to the Northern and Western Regions.

The N4 Carrick-on-Shannon to Dromod Project is being implemented in accordance with TII's PMGs<sup>1</sup> and the Project Appraisal Guidelines (PAG). These guidelines provide a framework for the management, development and delivery of national road and public transport capital projects. The PMGs<sup>1</sup> divide the evolution and progression of a project into an eight-phase process (Phase 0 – 7 inclusive) as illustrated in Plate 1.1 below.



**Plate 1.1 TII PMG Project Phases**

Following the completion of the Phase 1 Concept and Feasibility Studies in June 2020, Phase 2 of the project was progressed through 2021 and early 2022 culminating in the completion of this Option Selection Report.

<sup>1</sup> TII 2020. Project Management Guidelines PE-PMG-02041, December 2020. These guidelines have since been updated in July 2022 and the updates do not affect the content of this report. Available from: <https://www.tiipublications.ie/library/PE-PMG-02041-04.pdf>

## 1.2 Overview of the Proposed Project

The planning, design, implementation and safe operation of national roads in Ireland is the responsibility of TII under Section 17 of the Roads Act, 1993. Working in partnership with the Department of Transport, the National Transport Authority (NTA) and local authorities, TII strives to provide sustainable transport infrastructure and services, delivering better quality of life, supporting economic growth and respecting the environment.

The national primary route N4, Dublin to Sligo is a strategic corridor from Dublin to the northwest and is approximately 198km in length. It is recognised as being of particular importance in enhancing accessibility to some of the most peripheral areas in the northwest (including Leitrim / Roscommon / Sligo and Donegal) and west of the River Shannon.

The N4 forms part of the EU TEN-T comprehensive network providing a strategic link between Dublin and Sligo - with Sligo being identified as a regional centre in the 2021-2030 National Development Plan<sup>2</sup> and the National Planning Framework (NPF)<sup>3</sup>. The N4 connects directly with the N5 and N6 national primary routes which also form part of the EU TEN-T comprehensive network. The N4 is defined as part of the TEN-T comprehensive network for reasons of national and international importance. Such a designation carries a requirement to be a high-quality road to serve an important role in long-distance freight and passenger traffic. It also is required to integrate the main urban and economic centres, interconnect with other transport modes and connect peripheral regions.

The Northern and Western Region encompasses eight counties Galway, Mayo, Sligo, Roscommon, Leitrim, Cavan, Monaghan and Donegal. It is predominantly rural, with Galway being the only city, with the towns of Sligo, Athlone and Letterkenny serving the rural hinterland.

Accessibility and mobility within the region, i.e. the ease with which people can get around for leisure, education and work, have a direct effect on the region's economic competitiveness as well as the attractiveness of the region as a favourable living, working and visiting environment. People moving to, from or between workplaces, and the movement of commodities and products are important components of the regional economy. An attractive, effective transport infrastructure system is necessary to attract and retain skilled labour to the region and thus stem the population loss in the region.

Significant lengths of the N4 have been improved / upgraded to dual carriageway in the recent past. With these upgrades, especially the opening of the N4 Dromod Roosky Bypass, and the N4 Collooney to Castlebaldwin dual carriageway, Carrick-on-Shannon has become a bottleneck for long distance, strategic and regional

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<sup>2</sup> Department of Public Expenditure and Reform. 2021. National Development Plan 2021-2030. Available from: <https://www.gov.ie/en/publication/774e2-national-development-plan-2021-2030/>

<sup>3</sup> Department of Housing Planning and Local Government, 2018. Project Ireland 2040, National Planning Framework. Available from: <https://npf.ie/wp-content/uploads/Project-Ireland-2040-NPF.pdf>

traffic. Carrick-on-Shannon remains the only regional strategic centre on the N4 between Dublin and Sligo which has not been bypassed to date.

The section of the N4 under consideration is approximately 20km long, comprising both rural sections (approx. 16km combined length) and urban sections (4.2km combined length). The proposed project will commence at an appropriate tie-in point on the existing N4 in the townland of Drumharlow, north of Carrick-on-Shannon to Faulties townland, south of Aghamore. The main towns and villages along the route are Cortober, Carrick-on-Shannon, Drumsna and Aghamore. The town of Carrick-on-Shannon and the town of Cortober are separated by the River Shannon and for the purposes of this report, where Carrick-on-Shannon is referenced, it is taken to mean the towns of both Carrick-on-Shannon and Cortober.

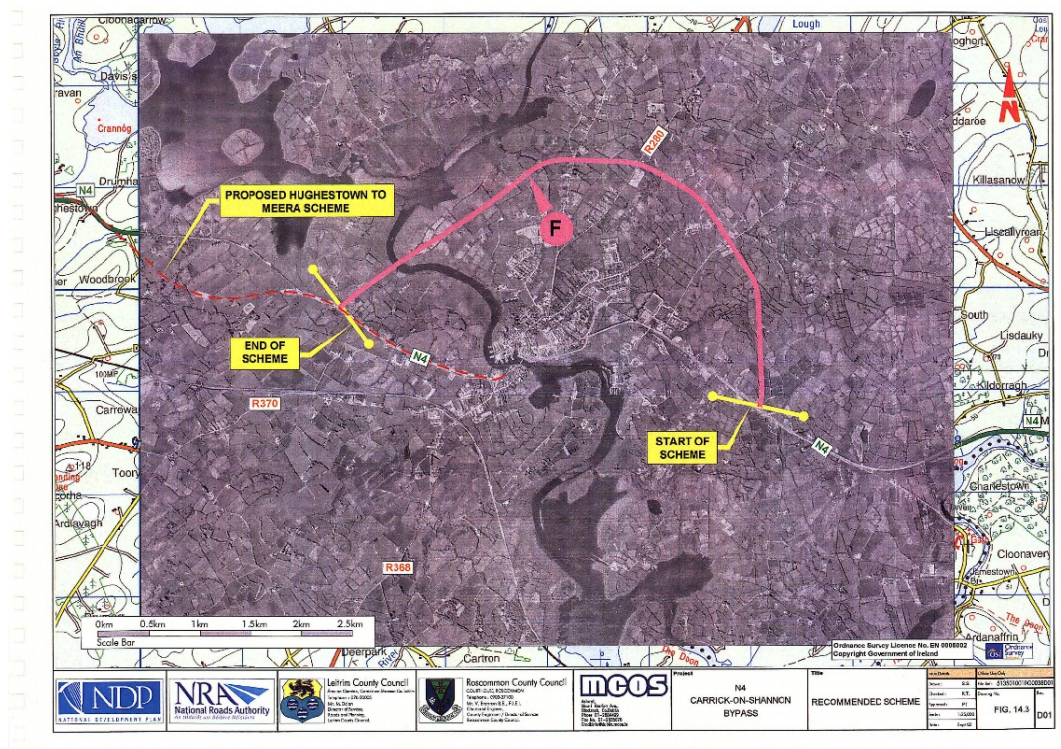
This section of the N4 traverses two local authority boundaries, with the section west of the River Shannon within Roscommon County Council (RCC) and the section east of the River Shannon within the boundary of Leitrim County Council (LCC). A Section 85 agreement has been entered into by both local authorities, which appoints LCC as the Lead Local Authority and Sponsoring Agency of the project. Transport Infrastructure Ireland (TII), acting as the Approving Authority, have appointed Roscommon National Roads Regional Office (RNRRO) to project manage the delivery of the project. The study area as shown in Figure 4.1.1.1 represents the anticipated study area within which alternatives and options will be developed.

## 1.3 Previous Studies

### 1.3.1 N4 Carrick-on-Shannon Bypass

In 2001 Leitrim County Council appointed M.C. O'Sullivan and Company Ltd (MCOS) to provide engineering consultancy services for an N4 Carrick-on-Shannon Bypass Project.

The study area considered for this project extended over an area of approximately 6km in diameter centred on the town of Carrick-on-Shannon and the town of Cortober. The studies culminated in the production of a Constraints Study report, a Route Selection Report and the identification of a preferred route corridor, which was a 6.3km bypass generally to the north of Carrick-on-Shannon (refer to Plate 1.2). It included an at-grade junction with the R280 Regional Road.



**Plate 1.2 N4 Carrick-on-Shannon Bypass Previous Route 2002 (Pink Line)**

### 1.3.2 N4 Carrick-on-Shannon to Dromod Project

In February 2009 Leitrim County Council appointed Roughan & O'Donovan Consulting Engineers (ROD) to provide engineering consultancy services for the N4 Carrick-on-Shannon to Dromod Project.

The study area was considerably extended and incorporates the existing N4 road section from Carrick-on-Shannon to the northern tie-in of the N4 Dromod Roosky Bypass, which opened in 2007. This commission culminated in the production of a route corridor selection report which identified the preferred route corridor as shown on Plate 1.3. The preferred route corridor is currently reserved in the Leitrim County Development Plan 2015-2021.

Due to unprecedented financial constraints brought on by the 2008 Irish economic recession, the project was suspended in 2012. In the intervening years, laws, regulations, and policies have developed and changed; in addition to changes in how we live and work. In this context the preferred route corridor identified for a road based transport solution may no longer be the optimum transport solution however, it will also be reviewed as part of this project.

This northern corridor, which is currently reserved in the Leitrim County Development Plan 2015-2021, has been in the public domain for the past 10 years, and as such, the perception was that any future project would also select a northern corridor for a bypass should a bypass form part of any preferred transport solution.



**Plate 1.3 N4 Carrick-on-Shannon to Dromod Preferred Route 2012**

## 1.4 Adjacent Project

### 1.4.1 N4 Mullingar to Longford (Roosky)

Westmeath County Council is working in partnership with Longford County Council and in association with Transport Infrastructure Ireland, to develop a scheme along a section of the N4 between Mullingar and Longford (Roosky). This 52km section of the N4 is a single carriageway road that passes through or close to several settlements, including Ballinalack, Rathowen, Edgeworthstown, Longford and Newtownforbes. This project terminates at the eastern end of the Dromod Roosky Bypass, with the N4 Carrick-on-Shannon to Dromod Project commencing at the western end of the Dromod Roosky Bypass.

Again, as noted above, the N4 serves a vast geographical area and provides a strategic function in terms of connecting the West and Northwest regions of Ireland to the Midlands and the east of the country. Many businesses in these areas depend on the N4 corridor for access to both national and international markets. The main aims of this project are to deliver on policy and improve road safety.

Co-ordination meetings are taking place between the two project teams to discuss overlaps and interfaces between the two projects such as the transport modelling, rail assessment and environmental studies.

## 1.5 Development of the Project

### 1.5.1 Phase 0 Scope and Pre-Appraisal

As shown in Plate 1.1, TII projects are broken into phases. The first phase of the project is Phase 0 which involves the preparation of a scoping document, namely the Project Appraisal Plan (PAP), which sets out the proposed approach to the appraisal of a project in advance of any significant data collection being undertaken. Phase 0 PAP was completed by Roscommon National Roads Regional Office (RNRRO), in accordance with TII PAG Unit 2.1 (October 2016)<sup>4</sup>, on behalf of Leitrim County Council in July 2018. The PAP was submitted by TII to the Department of Transport, Tourism and Sport (DTTas) Strategic Research and Analysis Division (SRAD) for review. A review of the PAP was undertaken by SRAD who confirmed in July 2018 that the PAP was compliant with the Public Spending Code and the Common Appraisal Framework.

The Phase 0 Project Brief for the N4 Carrick-on-Shannon to Dromod Project was completed by RNRRO on behalf of Leitrim County Council in January 2019 and submitted to TII for approval alongside the request to proceed to Phase 1. The approval to proceed to Phase 1 was granted by TII in July 2019.

### 1.5.2 Phase 1 Concept and Feasibility

Phase 1 commenced with the appointment of Arup in March 2020. The purpose of Phase 1 is to gain a better understanding of the issues and constraints and to assist in planning the direction of further studies. The project aim is to identify, evaluate, and resolve the transportation issues in Carrick-on-Shannon, its environs, and the broader national road network – in particular the N4 corridor over the extents defined above. To this end, it was necessary during Phase 1 to first identify the transportation issues, then establish the project objectives, and thereafter determine an appropriate sustainable solution which meets these project objectives. To achieve this outcome, it is necessary to assess possible and sustainable solutions which include alternative transport modes and infrastructural options within the study area. “Alternatives”, in the context of project appraisal in accordance with the requirements of the TII Project Appraisal Guidelines, refer to a specific transport mode (road, rail, bus, air, etc.) or demand management proposals (fiscal, control, ITS measures, etc) which could address the need for an intervention and “options” refer to the specific road measures that may be developed as part of the road alternative.

The Phase 1 studies include a detailed examination of conditions on the existing national route. These studies identify numerous transportation issues in the study area, including:

- Carrick-on-Shannon is the social and economic focal point in the study area and region as a whole; however, the N4 passes through Carrick-on-Shannon and

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<sup>4</sup> The current TII PAG Unit 2.1 at the time of undertaking Phase 0 of the project was October 2016. Those guidelines make reference to a Project Appraisal Plan (PAP) which is now referred to as a Strategic Assessment Report in the current guidelines.

crosses the River Shannon on the only bridge crossing in Carrick-on-Shannon. This hinders the economic and cultural development of the town, generates noise and air quality issues and creates an unsafe environment for urban life.

- The cross-section on the River Shannon bridge is extremely sub-standard and this results in considerable congestion and safety issues in the heart of the town where the streets serve both a social function as well as a transport function.
- There are 197 direct accesses on the section of the N4 under consideration which includes 113 farm accesses, 58 domestic accesses and 24 commercial accesses which create conflict points and compromise safety.
- Empirical journey time measurements recorded average journey speeds within the section of the N4 under consideration at 65km/h for weekday peak and inter peak periods, dropping to 57km/h during the Friday PM peak. These journey speeds are significantly below the National Planning Framework target of 90km/h for inter-urban roads and impact on regional accessibility which in turn restrains economic growth of the Northwest Region.
- A relatively low demand exists for rail at stations along the Sligo-Dublin corridor within, and close to, the study area which is likely reflective of the limited number of services available and dispersed population within the study area, which fosters an unsustainable dependency on the private car.
- There are a very limited number of bus services available in the study area with only one route serving the entire section of the N4 under consideration (BÉ route 23) again which fosters dependency on the private car.

The results of the Phase 1 studies determine that a strong justification for the advancement of the N4 Carrick-on-Shannon to Dromod Project to Phase 2 exists. A number of feasible transportation measures meriting more rigorous assessment were identified, including public transport alternatives, demand management solutions and road improvements options.

The N4 Carrick-on-Shannon to Dromod Project is currently at Phase 2, the output from which is the publication of this Option Selection Report (OSR). The structure of the OSR is set out in Section 1.9 and generally follows the process of Phase 2.

## 1.6 Project Objectives

After identifying and assessing the existing transportation problems in the study area, the objectives of the N4 Carrick-on-Shannon to Dromod Project were defined. These are framed in accordance with the Department of Transport (DoT) publication Common Appraisal Framework for Transport Projects and Programmes (October 2019)<sup>5</sup> (V02 in effect at time of the development of the Project Objectives)

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<sup>5</sup> Department of Transport, Tourism and Sport, 2019. Common Appraisal Framework for Transport Projects and Programmes, July 2019 This was updated October 2021 and the update does not change the project objectives. Available at: <https://www.gov.ie/en/organisation-information/800ea3-common-appraisal-framework>

An additional appendix dated 7 March 2022 containing interim guidance on the alignment of land transport investment proposals with the National Investment Framework for Transport in Ireland (NIFTI) was published in April 2022. This additional appendix is addressed in Section 1.7.

and Unit 3.0 of the TII Project Appraisal Guideline (PAG)<sup>6</sup>. They are summarised in the section below.

The project objectives have also been reviewed in the context of the National Planning Framework (NPF) and its National Strategic Outcomes (NSOs). While not all objectives align directly with an NSO, nor is each NSO covered by a project objective, reference to an NSO is added to a project objective below where appropriate.

### **Economy**

- To provide a reliable transport system over the N4 corridor extents under consideration and to contribute to efficient connectivity between the Northern and Western Regions with Dublin and the Eastern and Midland Regions to balance regional development (NSO 2, 3)
- To provide a solution that offers good value for money and reduces the cost of travel (NSO 1)
- To provide opportunities to enhance the future tourism and economic prospects of Carrick-on-Shannon and the wider northwest regions of Roscommon, Leitrim, Sligo and Donegal (NSO 3)

### **Safety**

- To reduce the potential for collisions and severity of collisions by providing a safer travelling environment for all road users over the N4 corridor extents under consideration supporting the RSA Road Safety Strategy 2021-2030
- To reduce the potential for conflict with vulnerable road users within built-up areas of Carrick-on-Shannon, Cortober and Aghamore (NSO 1)

### **Environment**

- To provide opportunities to enhance the local amenity and heritage value of the area (NSO 7)
- To ensure consideration of sustainable development principles and measures to minimise the effects on the environment to support the government's Climate Action Plan (NSO 4, 8)
- To minimise impacts on designated Natura 2000 sites in the vicinity of the study area (NSO 7)
- To minimise the impact to local watercourses and associated flood plains, in particular the River Shannon (NSO 9)
- The proposed scheme will seek to reduce noise and air impacts in the various settlements along the corridor (NSO 4)

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<sup>6</sup> TII, 2016. Project Appraisal Guidelines for National Roads Unit 3.0 – Project Brief PE-PAG-02012, October 2016. Available from: <https://www.tiipublications.ie/library/PE-PAG-02012-01.pdf>

### **Accessibility and Social Inclusion**

- Improve accessibility to key facilities, such as employment, education, transport and healthcare to satisfy transport demand for all trip types for all modes of transport on the national road transport network (NSO 10)
- To provide opportunities to enable the successful creation of place making and generation of a vibrant community in Carrick-on-Shannon (NSO 3, 5)
- Facilitate the enhancement of sustainable travel and improved connectivity to public transport opportunities (NSO 4)
- To improve connectivity across the River Shannon and in turn support social and economic development within this regional strategic town and its hinterland (NSO 2, 5)

### **Integration**

- To support sustainable growth in Carrick-on-Shannon through the creation of an attractive environment to encourage sustainable trips (NSO 1, 4)
- To achieve the goals of the TEN-T comprehensive network by providing high quality links which will contribute to enhancing social cohesion within Ireland and across the EU, further supporting the integration of all transport modes within the wider region, integrating with regional public transport facilities (NSO 2)
- To support the integration objectives to balance the social and economic development in the Northwest Region as set out in national and regional policies (NSO 2)

### **Physical Activity**

- To enable walking and cycling opportunities in a safer environment for the communities along the corridor (NSO 4)
- To create a healthy environment conducive to active travel for the communities along the corridor (NSO 3)

Once the existing problems were defined and the project objectives established, it was then possible to proffer preliminary potential solutions for appraisal.

## **1.7 Alignment with NIFTI Investment Priorities**

The National Investment Framework for Transport in Ireland (NIFTI) establishes a set of Investment Priorities, in addition to Modal and Intervention Hierarchies, which serve to guide land transport investment. In accordance with the interim guidance issued by the Department of Transport in March 2022, it is necessary to consider and demonstrate how project objectives are strategically aligned with the NIFTI Investment Priorities. A qualitative assessment of how each project objective relates to the four NIFTI Priorities is outlined in Table 1 below.

**Table 1 Alignment of Project Objectives with NIFTI Investment Priorities**

| Criteria       | Project Specific Objective                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Alignment with NIFTI Investment Priority                                                                                                                                                                                                                                                                                                                                                       | Mitigation where not aligned                                                                                                                                                                                                                                                                                                                                                                         |
|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Economy</b> | <p>E1: To provide a reliable transport system over the N4 corridor extents under consideration and to contribute to efficient connectivity between the Northern and Western Regions with Dublin and the Eastern and Midland Regions to balance regional development.</p> <p>E2: To provide a solution that offers good value for money and reduce the cost of travel.</p> <p>E3: To provide opportunities to enhance the future tourism and economic prospects of Carrick-on-Shannon and the wider northwest regions of Roscommon, Leitrim, Sligo and Donegal.</p> | <p>Strongly aligns with <i>Mobility of People and Goods in Urban Areas</i></p> <p>The current N4 is part of the TEN-T comprehensive network, but this section of the corridor is stymying sustainable transport measures in the urban areas of Carrick-on-Shannon and Cortober, which is dependent on a transport solution which releases the existing streets for more sustainable modes.</p> | <p>Any amount of new construction would have a negative impact on the Decarbonisation priority. To mitigate this any potential solution must seek to enable active travel and public transport usage, whilst also maximising reuse of the existing infrastructure and assets, to achieve the NIFTI priority of ensuring the resilience of the most strategically important parts of the network.</p> |
|                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <p>Strongly aligns with <i>Protection and Renewal</i></p> <p>The transport solution will seek to reuse and upgrade the existing national road asset to the largest degree possible with an aim to minimise unnecessary journey length and thus offer value for money.</p>                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                      |
|                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <p>Strongly aligns with <i>Enhanced Regional and Rural Connectivity</i></p> <p>The E1 and E3 objectives seek to provide connectivity to the northwest region and address the bottleneck caused by the River Shannon bridge crossing, thus fostering economic competition and efficiency, as well as ensuring reliable access to amenities and essential services.</p>                          |                                                                                                                                                                                                                                                                                                                                                                                                      |
|                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <p>Moderately aligns with <i>Decarbonisation</i></p> <p>A reliable transport system by its nature will provide the most appropriate solution for each trip. As such, a holistic transport solution will be sought to enable sustainable modes as an attractive option.</p>                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                      |

| Criteria | Project Specific Objective                                                                                                                                                                                                                                                                                                                                                                     | Alignment with NIFTI Investment Priority                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Mitigation where not aligned                                                                                                                                                                                                                                                                                                                                    |
|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Safety   | <p>S1: To reduce the potential for collisions and severity of collisions by providing a safer travelling environment for all road users over the N4 corridor extents under consideration supporting the RSA Road Safety Strategy 2021-2030.</p> <p>S2: To reduce the potential for conflict with vulnerable road users within built-up areas of Carrick-on-Shannon, Cortober and Aghamore.</p> | <p>Strongly aligns with <i>Mobility of People &amp; Goods in Urban Areas</i></p> <p>Safety Objective S2 seeks a reduction of potential for conflict with vulnerable road users. This aligns with the priority of delivering sustainable mobility objectives of urban settlement plans as safe movement by all is only possible when conflicts are removed in the towns and villages.</p>                                                                                                                                                                                                                                                                                                                                                                                                                        | <p>Any amount of new road construction provided to meet the objective of significantly reducing the number of conflict points would have a negative impact on the Protection and Renewal priority. To mitigate this any potential solution must seek to repurpose the existing infrastructure to the fullest extent to provide safe active travel measures.</p> |
|          |                                                                                                                                                                                                                                                                                                                                                                                                | <p>Moderately aligns with <i>Protection and Renewal</i></p> <p>The existing N4 has almost 200 private direct accesses onto it and is the singular piece of infrastructure for all modes across the River Shannon.</p> <p>As such, the reuse of the existing N4 at the River Shannon bridge crossing may be incompatible with the resolution of the conflict points and associated conflict points within the urban areas of Carrick-on-Shannon and Cortober, as some new infrastructure may be required.</p> <p>The potential for upgrade and renewal of the existing N4 over the project is high and therefore has the potential to strongly align with the NIFI priorities and represents a key enabler in enhancing active travel provision and the rationalisation and removal of many conflict points.</p> |                                                                                                                                                                                                                                                                                                                                                                 |
|          |                                                                                                                                                                                                                                                                                                                                                                                                | <p>Strongly aligns with <i>Enhanced Regional and Rural Connectivity</i></p> <p>The proposed transport solution will seek to address the existing safety deficiencies of the multiple accesses, thereby facilitating safe, accessible, reliable and efficient travel on the network connecting the regions.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                 |

| Criteria           | Project Specific Objective                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Alignment with NIFTI Investment Priority                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Mitigation where not aligned                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <p>Moderately aligns with <i>Decarbonisation</i></p> <p>Supportive of the investment priority to decarbonise through the project's commitment to provide safer conditions for active travel, which is necessary to promote modal shift to sustainable transport alternatives.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Environment</b> | <p>Env 1: To provide opportunities to enhance the local amenity and heritage value of the area.</p> <p>Env 2: To ensure consideration of sustainable development principles and measures to minimise the effects on the environment to support the government's Climate Action Plan.</p> <p>Env 3: To minimise impacts on designated Natura 2000 sites in the vicinity of the study area.</p> <p>Env 4: To minimise the impact to local watercourses and associated floodplains, in particular the River Shannon.</p> <p>Env 5: The proposed scheme will seek to reduce noise and air impacts in the various settlements along the corridor.</p> | <p>Strongly aligns with <i>Mobility of People &amp; Goods in Urban Areas</i></p> <p>Any proposed transport solution seeks to reduce traffic and associated air quality impacts, plus noise levels in urban areas. This will help restore the attractiveness and vitality of these areas for urban living and sustainable mobility.</p>                                                                                                                                                                                                                                                                                                                                                                                                          | <p>Mitigation is already included in the environmental objectives as maximising the reuse of the existing infrastructure and assets along the N4 could minimise conflict with the <i>Protection and Renewal</i> and <i>Decarbonisation</i> priorities.</p> <p>Any new construction in the vicinity of the settlements to reduce air and noise impacts will seek to mitigate those impacts by enabling active travel and public transport in the settlements.</p> |
|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <p>Moderately aligns with <i>Protection and Renewal</i></p> <p>These objectives seek to provide opportunities to enhance local amenity, reduce noise and air quality impacts on sensitive receptors, minimise impacts on local watercourses, ecological sites and floodplains. The proposed transport solution may involve the construction of new infrastructure which could result in moving the traffic away from the urban areas thus delivering on the project objectives. It could also seek to reutilise or repurpose the existing infrastructure. Alignment with this NIFTI priority would then be achieved through renewing and repurposing the existing asset both in the urban areas and on sections of upgraded infrastructure.</p> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <p>Strongly aligns with <i>Enhanced Regional and Rural Connectivity</i></p> <p>Objectives to reduce traffic related impacts on the human environment are inextricably linked to enhancing regional and rural connectivity as once the conflicts are resolved, connectivity is possible. There are numerous existing conflicts between these two entities along the N4 corridor through</p>                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

| Criteria                                  | Project Specific Objective                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Alignment with NIFTI Investment Priority                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Mitigation where not aligned       |
|-------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|
|                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <p>the urban area of Carrick-on-Shannon, Cortober and also a multitude of residential and agricultural accesses in the rural areas. If these conflicts are resolved, then connectivity is enhanced.</p> <p>Moderately aligns with <i>Decarbonisation</i></p> <p>Reducing traffic related impacts on existing communities is an integral element in enabling more sustainable development and sustainable mobility patterns to thrive in such areas – a key necessary step in decarbonisation. Support of the Climate Action Plan is wholly supportive of this NIFTI priority.</p> |                                    |
| <b>Accessibility and Social Inclusion</b> | <p>A&amp;S 1: Improve accessibility to key facilities, such as employment, education, transport, and healthcare to satisfy transport demand for all trip types for all modes of transport on the national road transport network.</p> <p>A&amp;S 2: To provide opportunities to enable the successful creation of place making and generation of a vibrant community in Carrick-on-Shannon.</p> <p>A&amp;S 3: Facilitate the enhancement of sustainable travel and improved</p> | <p>Strongly aligns with <i>Mobility of People and Goods in Urban Areas</i></p> <p>Enhanced accessibility for all communities currently severed by the N4 in particular Carrick-on-Shannon and Cortober, thus ensuring easier, safer access to community facilities and amenities, especially for vulnerable road users.</p>                                                                                                                                                                                                                                                       | No further mitigation is required. |
|                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <p>Strongly aligns with <i>Protection and Renewal</i></p> <p>Improving accessibility among existing communities enables a potential for renewal of Carrick-on-Shannon and Cortober as places for living and sustainable mobility – becoming vibrant communities.</p>                                                                                                                                                                                                                                                                                                              |                                    |
|                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <p>Strongly aligns with <i>Enhanced Regional and Rural Connectivity</i></p> <p>A&amp;S1 explicitly states its aim to reduce social exclusion and this will be achieved by enhancement and improvement in access to key facilities and seeks to remove the current stifling of connectivity in the local area as well as regionally.</p>                                                                                                                                                                                                                                           |                                    |

| Criteria           | Project Specific Objective                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Alignment with NIFTI Investment Priority                                                                                                                                                                                                                                                                                                                                                                                                 | Mitigation where not aligned                                                                                                                                                                                                                                                                                                                                                                                            |
|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                    | <p>connectivity to public transport opportunities.</p> <p>A&amp;S 4: To improve connectivity across the River Shannon and in turn support social and economic development within this regional strategic town and its hinterland.</p>                                                                                                                                                                                                                                              | <p>Strongly aligns with <i>Decarbonisation</i></p> <p>The improvement of accessibility of active modes and sustainable travel are critical to achieving decarbonisation targets. In addition, by creating vibrant communities within which the community want to stay as set out in A&amp;S 2, decarbonisation will be facilitated through reduced number of journeys and journey distance, further contributing to decarbonisation.</p> |                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Integration</b> | <p>I1: To support sustainable growth in Carrick-on-Shannon through the creation of an attractive environment to encourage sustainable trips.</p> <p>I2: To achieve the goals of the TEN-T Comprehensive network by providing high quality links which will contribute to enhancing social cohesion within Ireland and across the EU, further supporting the integration of all transport modes within the wider region, integrating with regional public transport facilities.</p> | <p>Strongly aligns with <i>Mobility of People and Goods in Urban Areas</i></p> <p>I2 aims to support mobility of people and goods both in the urban areas and wider regions through integration with other sustainable transport modes which aligns with this NIFTI priority.</p>                                                                                                                                                        | <p>To offset the impacts of new road construction on <i>Decarbonisation</i> priority, the existing N4 will be optimised and reused to the maximum extent to ensure minimal additional kilometres are travelled in the final scheme, thus minimising operational carbon emissions increase.</p> <p>New construction will be targeted specifically in areas to promote sustainable mobility for shorter trip lengths.</p> |
|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <p>Strongly aligns with <i>Protection and Renewal</i></p> <p>I2 seeks to enable a renewal of Carrick-on-Shannon for sustainable mobility whilst also promoting the improvement and optimisation of the existing N4 to a high-quality link serving the regions.</p>                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <p>Strongly aligns with <i>Enhanced Regional and Rural Connectivity</i></p> <p>The integration objectives seeks an improvement and optimisation of the existing N4 to a high-quality link which may support enhanced connectivity as well as provide opportunities to better regional public transport connectivity for busses.</p>                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                         |

| Criteria          | Project Specific Objective                                                                                                                                                                                                            | Alignment with NIFTI Investment Priority                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Mitigation where not aligned |
|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|
|                   | I3: To support the integration objectives to balance the social and economic development in the Northwest Region as set out in national and regional policies.                                                                        | <p>Moderately aligns with <i>Decarbonisation</i></p> <p>The TEN-T policy aims to promote efficient, safe and environmentally friendly mobility via the provision of a high-quality strategic road for the N4. This has the potential to lead to additional new road construction, but this should also be viewed in the context of the enabling of more sustainable modes by the segregation of strategic trips from local trips both in the urban settlements and the rural area, hence why is moderately aligns with the NIFTI priority for decarbonisation.</p>                                                                   |                              |
| Physical Activity | <p>PA1: To enable walking and cycling opportunities in a safer environment for the communities along the corridor.</p> <p>PA2: To create a healthy environment conducive to active travel for the communities along the corridor.</p> | <p>Strongly aligns with <i>Mobility of People &amp; Goods in Urban Area</i></p> <p>Both Physical Activity Objectives support the enhancement of walking and cycling opportunities which subsequently fundamentally align with the aim of the EU's Transport Policy to promote a mobility that is efficient, safe, secure, and environmentally friendly. An Active Travel solution along the N4 corridor and along desire lines between population centres, community facilities and employment centres can significantly enhance sustainable mobility choices and uptake through provision of an attractive, integrated network.</p> | Not applicable.              |
|                   |                                                                                                                                                                                                                                       | <p>Strongly aligns with <i>Protection and Renewal</i></p> <p>Both Physical Activity Objectives aim to support active travel to safely cater for sustainable trips. As the existing desire line along the existing N4 connecting communities does not make safe provision for active travel, especially in the rural areas, every effort will be made to protect and renew/reuse the existing N4 to maximum extent for active travel.</p>                                                                                                                                                                                             |                              |

| Criteria | Project Specific Objective | Alignment with NIFTI Investment Priority                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Mitigation where not aligned |
|----------|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|
|          |                            | <p>Strongly aligns with <i>Enhanced Regional and Rural Connectivity</i></p> <p>Both Physical Activity Objectives aim to ensure that a sustainable alternative to private car transport is delivered as an integral component of the scheme. To provide a meaningful alternative capable of attracting significant mode share, active travel networks need to be safe, connected, and inclusive. The Physical Activity objectives will align with the NIFTI Investment Priority by enhancing connectivity indicated by modelled desire lines at a local and regional level to other communities along the N4 corridor and to key employment zones.</p> |                              |
|          |                            | <p>Moderately aligns with <i>Decarbonisation</i></p> <p>An improvement of accessibility of active modes is critical to achieving decarbonisation targets.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                              |

## 1.8 Purpose of the Option Selection Report

This Option Selection Report represents the primary deliverable for Phase 2. The purpose of Phase 2 is to identify a suitable study area for the examination of alternatives and options, to identify key constraints within that study area, to develop feasible transportation alternatives and options and to carry out a systematic assessment of these alternatives and options leading to the selection of a preferred solution. The purpose of the Option Selection Report is to document each step in the analysis during Phase 2 of the project, recording the assessments and decisions undertaken in order to identify and make a recommendation on the preferred solution.

The Option Selection assessments and reporting structure aligns with the TII Project Management Guidelines and follows the three-stage process outlined below:

- **Stage 1 – Preliminary Options Assessment.** A number of feasible alternatives and options which respond to the transportation problems identified are developed in accordance with TII PAG and a multi-criteria analysis is carried out under the assessment criteria of Engineering, Environment and Economy.
- **Stage 2 – Project Appraisal Matrix.** The alternatives and options advanced from Stage 1 are further evaluated by undertaking a full cost benefit analysis and multi-criteria analysis of the quantifiable and non-quantifiable impacts under the headline criteria of, Economy, Safety, Environment, Accessibility & Social Inclusion, Integration and Physical Activity.
- **Stage 3 – Preferred Option.** After the completion of Stage 2, a preferred option for the project will be selected based on the multi-criteria analysis and a Project Appraisal Balance Sheet (PABS) will be prepared for the preferred option only.

## 1.9 Structure of the Report

This Option Selection Report comprises of four separate volumes, namely:

- Volume 1 – Executive Summary
- Volume 2 – Main Report
- Volume 3 – Figures
- Volume 4 – Appendices

Volume 2 comprises nine separate chapters, as follows:

- Chapter 1 – *Introduction*.
- Chapter 2 – *Identification of Need*, presents the justification for the progression of the project in terms of its strategic fit within transport development policy at European, national, regional and local levels, together with an exploration of the existing transport deficiencies which further support the urgent need to advance the project.
- Chapter 3 – *Traffic Assessment and Intervention Required*, provides an overview of the scope and methodology adopted for the transport modelling

undertaken to inform alternative and option appraisal and selection. This chapter also examines the various factors relevant to informing the most appropriate level of intervention required.

- Chapter 4 – *Constraints Study*, defines the study area identified for the project and presents an overview of the principal artificial, natural and external parameter constraints identified and mapped.
- Chapter 5 – *Consideration of Alternatives and Options*, discusses the range of options and alternatives considered as part of the Phase 2 process, including both feasible and non-feasible alternatives and options.
- Chapter 6 – *Stage 1 Alternatives Assessment*, describes the initial comparative assessment of Alternatives carried out under the headings of Environment, Engineering and Economy.
- Chapter 7 – *Stage 1 Option Corridors Assessment*, describes the initial comparative assessment of Option Corridors carried out under the headings of Environment, Engineering and Economy.
- Chapter 8 – *Stage 2 Project Appraisal*, provides detail on how the alternatives and option corridors retained from Stage 1 were further developed, identifies any new options/alternatives introduced following Stage 1 and sets out the basis for the more detailed Stage 2 appraisal process. It presents a summary of the detailed comparative multi-criteria analysis undertaken to inform the recommendation of the preferred transport solution under the headings of Economy, Safety, Environment, Accessibility & Social Inclusion, Integration and Physical Activity.
- Chapter 9 – *Stage 3 Preferred Transport Solution and Project Appraisal Balance Sheet*, identifies the preferred transport solution and the Project Appraisal Balance Sheet (PABS) provides a concise summary of the expected impacts and benefits of the proposed development in consideration of the objectives of the project. Following this a third public display was held in May 2022 to inform the public of the Preferred Transport Solution.

## 1.10 Project Operational Goals and Design Strategies

As discussed in Section 1.6 above, the project objectives centre around the six criteria, Economy, Environment, Accessibility and Social Inclusion, Physical Activity, Integration and Safety.

The overall transport solution is to be developed to satisfy the project objectives and is assessed against the following performance targets, which are developed to ensure that the project objectives are achieved:

- Congestion relief in Carrick-on-Shannon to enable “Place Making” thereafter
- Improve accessibility to the Northwest Region
- Reduction in vehicular collisions
- Improve journey time reliability

The design strategy is based on the assessment of various alternatives and options. To assess the most viable transport solution, the design team have assessed both the natural and physical constraints to the project in addition to all external parameters potentially impacting the project.

The environmental assessment is conducted and compiled by Arup with input and assistance from the following specialist environmental sub-consultants:

- Biodiversity (Scott Cawley Ltd.)
- Hydrology (Hydro Environmental Ltd.)
- Landscape and Visual (Brady Shipman Martin)
- Planning (Coakley O'Neill)
- Archaeology, Cultural and Architectural Heritage (Irish Archaeological Consultancy (IAC))
- Material Assets - Agriculture (Curtin Agricultural Consultants Ltd.)
- Noise and Vibration (AWN Consulting Ltd.)
- Human Beings (Optimize Consultants Ltd.)
- Traffic (Systra)
- Valuation (Lisney)
- Human Health (Corporate Health Ireland)