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| AADT | Annual Average Daily Traffic |
| :--- | :--- |
| AD | Anno Domini |
| AIRO | All-Island Research Observatory |
| AM | Ante Meridiem (Before Midday) |
| ASI | Archaeological Survey of Ireland |
| BC | Before Christ |
| BC1 | Arable crops |
| BL3 | Comilt land and artificial surfaces |
| CAF | Candidate Special Area of Conservation |

c.
circa
CSEA Clifton Scannell Emerson Associates
Co. County
DMRB Design Manual for Road and Bridges
DMURS Design Manual for Urban Roads and Streets
DTTS Department of Transport, Tourism and Sport
DU Dublin
E Extreme / East
e.g. Exempli Gratia (For Example)

EPA Environmental Protection Agency
ERBD Eastern River Basin District
ERM Eastern Regional Model
EU European Union
FCC Fingal County Council
FDP Fingal Development Plan
FPO Flora Protection Order

GA1 Improved agricultural grassland

GA2 Amenity grassland
GDA Greater Dublin Area
GDACNP Greater Dublin Area Cycle Network Plan
GSI Geological Survey of Ireland
H High
ha Hectares
i.e. Id Est (In other words)

IED Industrial Emissions Directive
IE_EA_09_221 European Code for groundwater body in the Kellystown area
IFI Inland Fisheries Ireland
IGI Institute of Geologists of Ireland
IPPC Integrated Pollution Prevention and Control
km Kilometre
$\mathrm{km}^{2} \quad$ Square kilometre
km/h Kilometre per hour
L Low
LAP Local Area Plan
LI Locally Important Aquifer
Liffey-180 Sub-catchment of the River Liffey
LUAS Tram/light rail system in Dublin
m metre

M Moderate
M3 Motorway linking Dublin City and Navan, Co. Meath
M4 Motorway linking Dublin City and Sligo
M50 Orbital Motorway to the west of Dublin City
N
North

| N2K | Natura 2000 Network of Protected Areas in the European Union |
| :---: | :---: |
| N/A | Not Applicable |
| NBDC | National Biodiversity Data Centre |
| MCA | Multi Criteria Analysis |
| NCM | National Cycle Manual |
| NDFM | National Demand Forecasting Model |
| NE | Northeast |
| NHA | Natural Heritage Area |
| NMI | National Museum of Ireland |
| no. | Number |
| NPF | National Planning Framework |
| NPWS | National Parks and Wildlife Service |
| NRA | National Roads Authority |
| NTA | National Transport Authority |
| NW | Northwest |
| OD | Ordnance Datum |
| PAG | Project Appraisal Guidelines |
| Part 8 | Planning Application procedure in which a Planning Authority applies for planning permission within its own administrate area in pursuant to the Planning and Development Acts 2000-2018 and Part 8 of the Planning and Development Regulations 2000-2017 |
| PI | Poor Aquifer |
| PM | Post Meridiem (After Midday) |
| PMG | Project Management Guidelines |
| pNHA | Proposed Natural Heritage Area |
| PSC | Public Spending Code |
| QBC | Quality Bus Corridor |
| R | Regional, when accompanied by a road number |
| R. | River |


| RA | Residential Areas |
| :---: | :---: |
| RBD | River Basin District |
| RFC | Ratio of Flow to Capacity |
| RMP | Record of Monuments and Places |
| RMPDU | Record of Monuments and Places for Dublin |
| RPS | Record of Protected Structures |
| RSA | Road Safety Authority |
| RSES | The Regional Spatial and Economic Strategy (Eastern and Midland Regional Assembly) 2019 - 2031 (RSES) |
| S | South |
| SAC | Special Area of Conservation |
| SATURN | Computer model that calculates transport assignment on road networks |
| SCl | Special Conservation Interests |
| SDZ | Strategic Development Zone |
| SE | Southeast |
| SFILT | Strategic Framework for Investment in Land Transport |
| S.I. | Statutory Instrument |
| SMR | Sites and Monuments Record |
| SPA | Special Protection Area / Source Protection Area |
| SUDS | Sustainable Urban Drainage Systems |
| SW | Southwest |
| TA | Technical Advice |
| TII | Transport Infrastructure Ireland |
| UCD | University College Dublin |
| W | West |
| WD | Non-native woodland |
| WFD | Water Framework Directive |
| WL1 | Hedgerow |


| WL2 | Treeline |
| :--- | :--- |
| WMU | Water Management Unit |
| WN | Semi-natural woodland |
| WS1 | Scrub |
| $\%$ | Percentage |
| $<$ | Less than |
| $>$ | Greater than |
| $£$ | Pound |
| $€$ | Euro |

## 1 Introduction

### 1.1 The Brief

Clifton Scannell Emerson Associates (CSEA) have been commissioned by Fingal County Council (FCC) to identify the preferred routes for the proposed Kellystown Road Scheme ("the Project") from the Diswellstown Road Extension to the proposed Ongar Barnhill Distributor Road, and to deliver the appropriate Statutory Approvals.

The Study Area for the Kellystown Road is located to the south west of the currently developed areas of Clonsilla, Diswellstown/Carpenterstown and Blanchardstown. The area is bordered to the north and west by the Royal Canal and the Dublin-Maynooth rail line (and the Sligo/Longford line also to the north), to the south by the R121 Luttrellstown Road, and to the east by the Porterstown Road/Porterstown Link Road, and it is bisected by the R121 Clonsilla Road. Figure 1.1, overleaf, shows the Study Area, and its relationship to the surrounding road and other infrastructure network.

Blanchardstown is a main urban area within the administrative area of FCC, and is the largest commercial and residential centre within the Metropolitan Area of FCC, and will continue to be promoted as a key urban settlement within the County providing retail, social, cultural, leisure and administrative services Blanchardstown had a recorded population of 87,908 in the 2011 Census, which had increased by at least $8 \%$ in the 2016 Census. The Study Area is within the Blanchardstown South area of the Fingal Development Plan 2017-2023 (FDP), and development of the Kellystown LAP lands (LAP 13.C) will allow for this anticipated increase in population.

Figure 1.1: Kellystown Road Study Area (also attached as Drawing No 18_015_CSE_GEN_ZZ_DR_C_1050 in Appendix A)

### 1.2 Scheme Background

Fingal County Council propose the development of a road link through the Study Area, from Diswellstown Road Extension to the Barnhill lands. The Kellystown Local Area Plan lands (LAP 13.C) from Porterstown to the R121 Clonsilla Road (south of Clonsilla train station) are zoned for residential development and open space in the Fingal Development Plan 2017-2023. The lands to the west of the R121 Clonsilla Road are zoned as high amenity, and the lands to the west of the Royal Canal and rail line are zoned for residential development as part of the Barnhill LAP. An extract from Sheet No. 13 Blanchardstown South of the Final Development Plan 2017-2023 is given in Figure 1.2.

Objective MT41 of the Fingal Development Plan is to: 'Seek to implement the Road Improvement Schemes indicated in Table 7.1 within the Plan period, subject to assessment against the criteria set out in Section 5.8.3 of the NTA Transport Strategy for the GDA, where appropriate and where resources permit. Reserve the corridors of the proposed road improvements free of development.' Kellystown Road is listed in Table 7.1.


Figure 1.2: Fingal Development Plan 2017-2023 - Extract from Sheet No. 13 Blanchardstown South

The proposed Kellystown Road Scheme (from the Diswellstown Road Extension to the proposed Ongar Barnhill Distributor Road) has three unique sections, shown in Figure 1.3 below:

- The first section (shown in lilac in Figure 1.3) runs through the Kellystown LAP lands, from the Diswellstown Road extension to Clonsilla Road. Part of this area has been zoned for residential development, and requires a road scheme to open up these lands for development, in line with the Fingal Development Plan. The Fingal Development Plan shows this road running through the Kellystown LAP lands with the residential development lands to the north and open space to the south. This road would also allow access to the proposed open space, and sports facilities that may be provided there.
- The second section (shown in green in Figure 1.3), from the Clonsilla Road westwards to the R121 Westmanstown Road, is zoned high amenity, and currently holds the 5 hectare FCC owned Beech Park, and the FCC owned Shackleton's Gardens.
- The third section (shown in orange in Figure 1.3), from the R121 Westmanstown Road westwards to the proposed Ongar- Barnhill Road, is zoned high amenity and for residential, and is the section that requires a crossing over the Royal Canal and the Maynooth-Dublin rail line. Some of this area of the Study Area falls within the Ongar-Barnhill LAP lands.


Figure 1.3: Map showing the three unique sections of the Study Area

### 1.3 Project Objectives

### 1.3.1 Overview

The objectives of the proposed Kellystown Road project are detailed in this section, and are set out based on multiple criteria outlined by the Department of Transport, Tourism and Sport (DTTS) in their guidance document 'Common Appraisal Framework for Transport Projects and Programmes (March 2016)'. The multi-criteria headings are as follows:

- Economy;
- Safety;
- Physical Activity;
- Environment;
- Accessibility \& Social Inclusion; and
- Integration.

Additionally, the scheme is assessed against the criteria set out in Section 5.8.3 of the NTA Transport Strategy for the GDA, as is required by Objective MT41 of the FDP. Section 5.8.3 of the NTA Transport Strategy, states that it is intended that road development in the Greater Dublin Area will be undertaken in accordance with the following principles:

- That there will be no significant increase in road capacity for private vehicles on radial roads inside the M50 motorway;
- That each proposed road scheme is consistent with this Strategy and with Government policies related to transport;
- That the travel demand or the development needs giving rise to the road proposal are in accordance with regional and national policies related to land use and development planning;
- That the development of the road scheme does not diminish in any significant way the expected beneficial outcomes of the Strategy;
- That the road scheme, other than a motorway or an express road proposal, will be designed to provide safe and appropriate arrangements to facilitate walking, cycling and public transport provision; and
- That alternative solutions, such as public transport provision, traffic management or demand management measures, cannot effectively and satisfactorily address the particular circumstances prompting the road proposal or are not applicable or appropriate.

This scheme is in accordance with these principles.

### 1.3.2 Economy

It is an objective of the Kellystown Road project to open up the Kellystown LAP lands for residential development (Obj01). It is anticipated that a proposed road through the Study Area will enhance the arterial road network in the area, facilitating future housing development on zoned lands, catering for projected transport demand and facilitating the upgrade of the Maynooth - Dublin rail line by enabling the possible future closure of the level crossing network on the rail line (objectives MT01, MT02, MT30 \& MT31 of the Fingal Development Plan). Any proposed road through the Study Area would be designed to operate without traffic congestion, provide connectivity to the existing and future road network in the area (including the Ongar-Barnhill Road), and should allow for journey time reliability for all road users including public transport. It is also an objective to support Smarter Travel objectives by providing a safe new road link for pedestrians, cyclists and buses within the existing and proposed road network (Obj02).

### 1.3.3 Safety

It is an objective of the Project to provide improved road safety by delivering a road to current road design standards, including accesses to new developments from this proposed road (Obj03). The proposed road scheme shall be designed and constructed as an arterial street in accordance with the relevant current standards/guidelines. The road shall be designed so that it can form part of a highly connected network within the Kellystown LAP lands, maximising permeability, particularly for pedestrians and cyclists. The scheme will be designed using guidance documents such as the Design Manual for Urban Road and Streets (DMURS) in 2013 and the National Cycle Manual (NCM) in 2011. This road scheme has the potential to facilitate the future closing of level crossings on the Maynooth Dublin rail line in consultation with other stakeholders and as part of wider ND/NPF/NTA strategies (Obj04). Closure of the level crossings would be considered a safety improvement for the transport network in the area due to the removal of these signalised crossings, which cause delays for road users, and lead to poor road user behaviour related to road users trying to avoid stopping at the signals, and striking or having near misses with the barriers. Level crossings represent a safety risk on the rail network, and it is an objective of Irish Rail and the NTA to close these level crossings as part of an upgrade of the Maynooth - Dublin rail line.

The assessment of collisions in the surrounding environs highlights that there have been numerous minor collisions, occurring at uncontrolled junctions in particular.

### 1.3.4 Physical Activity

It is an objective of the proposed scheme to provide increased opportunity for the local population to engage in physical activity (Obj05). It is proposed to provide high quality pedestrian and cyclist infrastructure as part of the Kellystown Road scheme. This will assist in encouraging modal shift from vehicular traffic to healthier modes of travel such as walking and cycling.

The Greater Dublin Area (GDA) Cycle Network Plan includes Porterstown Link Road and Diswellstown Road Extension as Secondary Route No. 5, and Diswellstown Road as Route No. 5B. The scheme will provide connectivity between the proposed development (residential and amenity) in the Kellystown area to this GDA secondary route, and will also connect the Secondary Route No. 5 and 5B to the Royal Canal Greenway, which is currently at preliminary design stage.

Furthermore, the inclusion of dedicated at-grade and raised cycle lanes as part of the scheme would provide an important piece of cycle lane infrastructure that would further attract the residents of the surrounding area to embrace cycling as a form of physical activity.

### 1.3.5 Environment

The scheme would have positive impacts for vulnerable road users (i.e. pedestrians and cyclists) by providing pedestrian and cycle facilities where they do not currently exist, and providing pedestrian and cycle links through the Kellystown LAP lands. It would also allow people to live close to the employment centre of Blanchardstown, and adjacent reliable public transport to the City Centre.

The road scheme would provide for development within the development boundary and directly adjacent existing development.

The road route and design will minimise impact on the existing environment (Obj06).

### 1.3.6 Accessibility \& Social Inclusion

The proposed Kellystown Road project will improve road based transport at a local level (Obj07). The road will be designed and meet the required standards to provide high quality infrastructure for all road users including the mobility impaired and those with other disabilities.

The adherence to the National Cycle Manuals "five needs of the cyclist" is key to ensuring that the infrastructure is user friendly and accessible to cyclists of all abilities.

The project will also address the objectives of the Fingal County Development Plan, National Spatial Strategy and the Transport Strategy for the Greater Dublin Area 2016-2035 to generally improve quality of life and improve accessibility to work, education and other activities for both motorised and non-motorised modes of travel (Obj08).

The development lands that are proposed for Kellystown are at the development boundary of the Blanchardstown area. Facilitating residential development in this location, with the provision of a road, allows people to live close to the employment centre of Blanchardstown, and is also directly adjacent the existing railway station at Clonsilla, allowing access to employment in the City Centre via reliable public transport.

### 1.3.7 Integration

It is an objective of the project to integrate with the surrounding National Secondary Road network and Regional Road network to minimise delays and journey times on these neighbouring routes (Obj09). The proposed project has the potential to connect the Ongar, Barnhill and Hansfield residential development area to the proposed amenities in Kellystown, such as parks and sports facilities, and existing amenities such as Beechpark. The scheme also has the potential to alleviate the existing congestion at the Porterstown Road/Diswellstown Road Extension junction. The scheme also has the potential to allow the closure of the Barnhill Level Crossing and to reduce traffic demand at the Clonsilla Level Crossing.

The project will also facilitate housing development potential in the Kellystown area, which can be integrated, not just with the surrounding road network, but also with the existing public transport including rail and bus (Obj10). In addition, the scheme gives the opportunity to integrate with existing and proposed pedestrian and cycling networks including the proposed Royal Canal Greenway (Obj11).

### 1.4 Purpose of this Report

The purpose of this report is to detail the route selection process undertaken to arrive at the preferred route option. The following steps were undertaken as part of the route selection process:

- identify a suitable Study Area;
- identify key constraints within that Study Area;
- develop feasible Route Options;
- carry out a systematic assessment of these options;
- review stakeholder consultation; and
- determine a Preferred Route Corridor.


### 1.5 Route Selection Methodology

A suitable Study Area was identified, and a Constraints Study was carried out to identify key constraints. This is detailed in Chapter 4 of this report. Feasible Route Options for the Kellystown Road were identified and subjected to a Stage 1 Preliminary Options Assessment, and a Stage 2 Project Appraisal was then undertaken to identify a Preferred Route Corridor.

As set down in the TII's Project Appraisal Guidelines for National Roads Unit 4.0 Consideration of Alternatives and Options, the systematic assessment of feasible route options for this project is described as follows:


Figure 1.4: Stages of the Route Selection Process (Section 6.1 of TII's PAG Unit 4.0)

Stage 1 - Preliminary Options Assessment - develop a number of feasible options and carry out a MultiCriteria Analysis (MCA) under the assessment criteria of Engineering, Environment and Economy. This will result in a refined number of options (10No. options have been considered including a No Nothing).

Stage 2 - Project Appraisal Matrix - following Stage 1, carry out a full MCA of the quantifiable and nonquantifiable impacts of these options (under the six CAF Criteria of Economy, Safety, Environment, Accessibility \& Social Inclusion, Integration and Physical Activity).

Stage 3 - Preferred Option - after the completion of Stage 2, select a Preferred Option for the Scheme.

### 1.6 Defining the Study Area

The Study Area for the scheme, is indicated in Figure 1.1, and is defined as an area bordered by the Luttrellstown Road to the south, Barberstown Road to the west, Porterstown Road to the east and the Royal Canal and Dublin-Maynooth rail line corridor to the north.

### 1.6.1 Stage 1 Preliminary Options Assessment

The Stage 1 Preliminary Options Assessment for the proposed Kellystown Road used a Framework Matrix (comprising the assessment criteria of Engineering, Environment and Economy) to determine the preferred route options.

The Study Area includes a number of east to west oriented Route Options. All options connect from the Porterstown Road/Diswellstown Road and Barberstown Road and cross the R121 Clonsilla Road. These Route Options are described in Chapter 6 of this report.

The feasible Route Options that provide the greatest benefit, with regard to Engineering, Environmental and Economic constraints were progressed to the Stage 2 Project Appraisal of the Route Options. Further details of the Stage 1 Preliminary Options Assessment are included in Chapter 6 of this report.

### 1.6.2 Stage 2 Project Appraisal of Route Options

On completion of the Stage 1 - Preliminary Options Assessment, the refined route options were brought forward to a Stage 2 Project Appraisal. The Stage 2 Project Appraisal was undertaken using an Appraisal Matrix under the headings identified in the project objectives:

- Economy;
- Safety;
- Physical Activity;
- Environment;
- Accessibility \& Social Inclusion; and
- Integration.

The Stage 2 Project Appraisal process is detailed in Chapter 7 of this report.

### 1.7 Stakeholder Consultation

Stakeholder consultation was carried out through meetings with the various relevant parties, correspondence by email, and a round table internal FCC meeting. These included:

- Fingal County Council Archaeology
- Fingal County Council Biodiversity
- Fingal County Council Parks
- Fingal County Council SEE - Surface Water/Flood Studies
- Fingal County Council Heritage
- Fingal County Council Conservation
- Fingal County Council Planning
- Irish Rail
- Waterways Ireland

In addition, the Fingal County Council project team carried out land registry searches and contacted landowners within the study area to facilitate necessary topographical and arboriculture survey work. The team met any landowners who wished to discuss the project further. It was indicated that further contact would be made once the route options study had been completed.

## 2 Identification of Need

### 2.1 Strategic Fit and Priority

### 2.1.1 General

The need for the Kellystown Road has been identified in and/or is consistent with the following National, Regional and Local planning policy documents: -

## National Policy Context

- The Project Ireland 2040 National Planning Framework;
- Smarter Travel: A Sustainable Transport Future 2009-2020;
- Building on Recovery - Infrastructure and Capital Investment 2016-2021;
- Investing In Our Transport Future: A Strategic Framework For Investment in Land Transport;
- Road Safety Authority Road Safety Strategy 2013 - 2020;
- National Cycle Policy Framework 2009 - 2020;
- National Statement of Housing Supply and Demand 2016 (and Outlook for 2017-18);


## Regional Policy Context

- Transport Strategy for the Greater Dublin Area 2016-2035;
- Regional Spatial and Economic Strategy (Eastern and Midland Regional Assembly) 2019 2031;

Local Policy Context

- Fingal Development Plan 2017-2023.


### 2.1.2 National Context

### 2.1.2.1 Project Ireland $\mathbf{2 0 4 0}$ - National Planning Framework

The National Planning Framework (NPF) is the Government's high-level strategic plan for shaping the future growth and development of Ireland out to the year 2040. It is a framework to guide public and private investment, to create and promote opportunities for people, and to protect and enhance our environment - from our villages to our cities, and everything around and in between.

The National Planning Framework sets in train a process by which more detailed planning documents must follow to include spatial planning, infrastructure planning, social and economic planning. The framework also outlines principles that these plans will have to follow. The document seeks to set out a single vision and a shared set of goals for all communities across the country.

The National Planning Framework identifies three regions. Dublin, including Fingal and Kellystown, is located within the Eastern and Midland Regional Assembly Area shown in Figure 2.1.1 below. The Framework Plan identifies that the creation of compact development in existing urban centres or "Compact Growth" as the first National Strategic Outcome. The outlined policies and actions which the proposed development of Kellystown Road supports include;

- Improving accessibility to and between centres of mass and scale and better integration with their surrounding areas - by providing infrastructure which will provide access to the residential development and open space zoned Kellystown LAP lands and access from the Kellystown LAP lands to high amenity zoned lands and to the urban centre of Blanchardstown, and provides improved access between the residential zoned Barnhill lands to the east of the Study Area to the open space and high amenity zoned lands in the Study Area.
- Ensure transition to more sustainable modes of travel (walking, cycling, public transport) and energy consumption (efficiency, renewables) within an urban context. - through the provision of high quality pedestrian and cyclist infrastructure as part of the proposed road scheme.


Figure 2.1.1: National Planning Framework -Ireland's Regional Assembly Areas and Northern Ireland

### 2.1.2.2 Smarter Travel - A Sustainable Transport Future

Smarter Travel, a Sustainable Transport Future (2009-2020) is the transport policy for Ireland. It was introduced by the Government in 2009, with the following policy objectives;

- Enhance our communities;
- Improve our environment;
- Make our economy more efficient and competitive; and
- Significantly add to the quality of life for all our citizens.

Chapter 3 of this policy document outlines the Key Goals of the initiative as follows:

- Improve quality of life and accessibility to transport for all and, in particular, for people with reduced mobility and those who may experience isolation due to lack of transport;
- Improve economic competitiveness through maximising the efficiency of the transport system and alleviating congestion and infrastructural bottlenecks;
- Minimise the negative impacts of transport on the local and global environment through reducing localised air pollutants and greenhouse gas emissions;
- Reduce overall travel demand and commuting distances travelled by the private car; and
- Improve security of energy supply by reducing dependency on imported fossil fuels.

These goals, as defined above, are aligned with the main objectives of the Kellystown Road Scheme. The Kellystown Road provides access to the Kellystown LAP lands by connecting to the existing road network. It provides improved access to amenities with the area. Residential development in the Kellystown LAP lands will be directly connected with the commercial centre of Blanchardstown, and the future provision of housing in this area, in conjunction with existing public transport, has the potential to reduce commuting distances and travel demand by private car.

Chapter 5 of the document sets out actions to deliver alternative ways of travelling other than car use. It is acknowledged that roads will continue to be the main source of transport for people and goods. Thus, it is recognised that there is a need to improve the efficiency of motorised modes of transport and limit "the development of traffic jams with their associated negative consequences for fuel consumption and emissions" (page 51).

There is also recognition that the "efficient movement of goods is vital to our competitiveness and economic welfare" (page 36). Transport by roads is vital to the efficient movement of goods and people. Therefore continued investment in roads will remain an important element of sustainable travel to 2020 while relieving congestion problems.

The policy document sets out 49 actions to achieve the above mentioned goals. Development of the Kellystown Road Scheme supports many of these actions insofar as they relate to a road scheme. In particular, the scheme compliments actions set out that support improvements in pedestrian and cycle facilities, safety measures, congestion alleviation, and pressure reduction on the local road network.

The introduction of the Kellystown Road Scheme will:

- Be of importance to transport management and the efficient movement of buses, people, goods and other services in the GDA and beyond.
- Provide a safer environment and thus allow for the promotion of local commuting by walking and cycling; and
- Allow residential development in close proximity to the commercial centre of Blanchardstown, and adjacent a high quality public transport link to Dublin City Centre.


### 2.1.2.3 Building on Recovery - Infrastructure and Capital Investment 2016-2021

Building on Recovery is the Capital Plan that presents the Government's new framework for infrastructure investment in Ireland over the period 2016 to 2021. The plan which was launched in September 2015 aims to invest $€ 27$ billion in the key areas of transport, education, health and enterprise, with $€ 10$ billion targeted at transport elements of the plan. The plan recognises that high-quality infrastructure is an important element of a modern society and economy. It strengthens economic growth through enhancing efficiency, productivity and competitiveness and underpins social cohesion.

The plan states that the transport capital allocation is largely framed by the recommendations and priorities set out in the "Strategic Investment Framework for Land Transport" and identifies three key priorities which are identified and discussed in Section 2.1.2.4 below.

### 2.1.2.4 Investing in Our Transport Future - a Strategic Framework for Investment in Land Transport

The Strategic Framework for Investment in Land Transport (SFILT) was published by the Department of Transport, Tourism, and Sport (DTTS) in April 2015. This document outlines the key principles against which national and regional, comprehensive mode and single mode based plans and programmes will be drawn up and assessed. The framework does not set out a list of projects to be prioritised. However, it does set out key priorities and principals for future investment.

The following key priorities are noted for future investment:

- Priority 1 - Achieve steady state maintenance;
- Priority 2 - Address urban congestion; and
- Priority 3 -Maximise the contribution of land transport networks.

In terms of Priority 2, the report states that the "priority is to address urban congestion and improve the efficiency and sustainability of the urban transport systems".

The following key principles are noted for land transport investment proposals:

- Maintain and improve the quality of life of citizens and be consistent with environmental, climate and biodiversity objectives, imperatives and obligations, including those arising from the EU Habitats Directive;
- Maintenance and renewal of identified strategically important elements of the existing land transport system, so as to protect earlier investment and maintain essential functioning ( $1^{\text {st }}$ priority).
- Measures to address current and future urban congestion and to improve the efficiency and sustainability of urban transport ( $2^{\text {nd }}$ priority);
- Further investment should be targeted to maximise the contribution of the land transport networks by enhancing the efficiency of the existing network ( $3^{\text {rd }}$ priority).
- Transport projects must be implemented in conjunction with the implementation of supportive national and regional spatial planning policies, along with other demand management measures where appropriate.

The Kellystown Road Scheme is consistent with these key principles. The preferred route option will:

- improve quality of life by reducing journey times and facilitating more options for walking and cycling through improved cycling and pedestrian facilities;
- environmental, climate and biodiversity objectives will be taken into account in the decision making process through the evaluation method;
- The proposed development has been designed taking supportive national and regional spatial planning policies, along with other demand management measures into account.


### 2.1.2.5 Road Safety Authority Road Safety Strategy 2013-2020

The Road Safety Authority (RSA) Road Safety Strategy 2013 - 2020, sets outs targets to be achieved in terms of road safety in Ireland as well as policy to achieve these targets. The primary target of this strategy is:
"A reduction of road collision fatalities on Irish roads to 25 per million population or less by 2020 is required to close the gap between Ireland and the safest countries. This means reducing deaths from 162 in 2012 to 124 or fewer by 2020".

The plan sets out strategies for engineering and infrastructure in terms of the benefits that result in terms of reducing collisions. The provision of the new section of road proposed by this project will support this RSA strategy.

The strategy also targets a focus on serious injuries. "In addition to continuing to reduce fatalities, a number of actions will be taken within the Strategy to refine the definition of a serious injury with a target for doing so. With a target of 124 fatalities by 2020, a realistic target for serious injuries should be in the region of 330 by 2020 or 61 per million population. Reduced fatalities and serious injuries will realise benefits for public health policy objectives, as well as reduced demands on the emergency services. A safer road environment will encourage more road users to walk and cycle, thus improving their wellbeing, reducing congestion and improving the environment. Better driving will reduce fuel costs and transport related emissions which will benefit everyone, especially those involved in business and industry".

The Kellystown Road Scheme will support this strategy by providing an alternative to the existing Luttrellstown Road, and through the provision of pedestrian and cycling facilities

### 2.1.2.6 National Cycle Policy Framework 2009-2020

The National Cycle Policy Framework (NCPF) 2009 - 2020 states the vision / reason to promote cycling as:
"The mission is to create a strong cycling culture in Ireland. The vision is that all cities, towns, villages and rural areas will be bicycle friendly. Cycling will be a normal way to get about, especially for short trips."

The relevant objectives of the NCPF include:
"Objective 1: Support the planning, development and design of towns and cities in a cycling and pedestrian friendly way."
"Objective 2: Ensure that the urban road infrastructure (with the exception of motorways) is designed /retrofitted so as to be cyclist-friendly and that traffic management measures are also cyclist friendly." "Objective 4: Provide cycling-friendly routes to all schools, adequate cycling parking facilities within schools, and cycling training to all school pupils."
"Objective 8: Ensure proper integration between cycling and public transport."
Of particular relevance in the planning and design of the Kellystown Road with be Chapter 2 of the NCPF, Interventions - Planning and Infrastructure. The planning and design of Kellystown Road will consider the needs of cyclists. The proposed road will be designed to be cycling friendly. Cyclingfriendly means that routes taken by cyclists are safe, direct, coherent, attractive and comfortable.

### 2.1.2.7 National Statement of Housing Supply and Demand 2016 (and Outlook for 2017-18)

A key message of this Statement is that 'housing supply remains below demand requirements, particularly in urban areas.'

This study does not consider the full extent of housing delivery or 'pent-up demand'. It notes that identified minimum housing requirements are based on projections of natural population growth and migration utilising the cohort component model methodology in addition to an assessment of trends in person-household size and changes in housing stock informed by Census 2016 data. The Statement other studies have estimated the level of future demand for housing on the basis of household formation rates and project that demand for housing is likely to increase at a steady rate in the coming years before reaching approximately 30,000 units per annum by 2024.


Figure 2.1.2: Extract from Figure 3.7 Housing Supply Requirements in Ireland's Urban Settlements, 2016-2020 (from the National Statement of Housing Supply and Demand 2016)

The map from the National Statement of Housing Supply and Demand above shows that there is a shortfall of 35,242 houses in the Dublin City Region. Development of the residentially zoned land in Kellystown has the potential to make up some of this shortfall.

### 2.1.3 Regional Context

### 2.1.3.1 Transport Strategy for the Greater Dublin Area 2016-2035

On the $6^{\text {th }}$ April 2016 the National Transport Authority (NTA) announced that its work in preparing the Transport Strategy for the Greater Dublin Area (GDA) 2016 to 2035 had concluded. The Strategy outlines a suite of public transport and highway proposals to be implemented through the GDA over the period 2016 to 2035. The Strategy is intended to guide decisions on transport throughout the GDA and will contribute to the economic, social and cultural progress of the GDA by providing for the efficient, effective and sustainable movement of people and goods.

The NTA Transport Strategy comprises a longer term analysis of the needs of the transport network within the GDA. The Strategy builds upon the previous 2011 Draft Transport Strategy which recognised the need to reduce car commuting mode share, and aimed to reduce car commuting mode share to $45 \%$ by 2030. The Strategy therefore recognises the need to invest in public transport solutions for the long term sustainable development of the GDA.

The Strategy states:
"This corridor contains two major Inter-Urban roads, the N/M2 and the N/M3. Given the limited role of rail in meeting the demand for radially-based trips within this corridor, the management of transport demand across a range of modes on these inter-urban roads will be of critical importance in catering efficiently for future demand."

The Kellystown Road Scheme will support this strategy by allowing the opening of residential development lands directly adjacent an existing railway station, providing connectivity to the existing road network, and by facilitating improved access for pedestrians, cyclists and bus.

The Kellystown Road Scheme also provides the opportunity for the National Transport Authority (NTA) and Irish Rail to seek to close the level crossing at Barberstown by providing an alternative crossing of the rail line. This is in line with the objective "to extend DART to Maynooth by electrifying this line and by removing the level crossings."

### 2.1.3.2 Regional Spatial and Economic Strategy (Eastern and Midland Regional Assembly) 2019 2031

The Regional Spatial and Economic Strategy (Eastern and Midland Regional Assembly) 2019 - 2031 (RSES) identifies the wider Blanchardstown area as part of Dublin City and Suburbs, as shown on Figure 2.1.3 below. The proposed road development will support the aims of the Settlement Strategy from the RSES.

## Settlement Strategy

## Dublin City and Suburbs

Support the consolidation and re-intensification of infill/brownfield sites to provide high density and people intensive uses within the existing built up area and ensure that the development of future development areas is co-ordinated with the delivery of key water and public transport infrastructure.

## Regional Growth Centres

Support significant population and economic growth to drive effective regional
development, with a vision for Athlone to act as a lead town for the Midlands growing to around 30,000 by 2031. The vision for Drogheda and Dundalk is for both to reach a target population in the region of 50,000 by 2031 .

## Key Towns

Provide for the sustainable, compact, sequential growth and urban regeneration in the town core of identified Key Towns by consolidating the built footprint through a focus on regeneration and development of identified Key Town centre infill/ brownfield sites


## Self-Sustaining Growth Towns

Settlements with strong service and employment functions may have the capacity to support a level of commensurate population and employment growth to become more self-sustaining, in line with their capacity of public transport, services and infrastructure, to be determined by local authorities.

## Self-Sustaining Towns

Some settlements, particularly those that have undergone rapid residential expansion will require targeted investment in local employment and services to grow at a more sustainable level appropriate to their position in the hierarchy, to be determined by local authorities.

## Rural Places

Support the sustainable growth of rural areas by promoting the revitalisation of rural towns and villages, including ready to go regeneration profects coupled with investment where required in local employment and services and targeted rural housing policies, to be determined by local authorities.

Dublin City \& Suburbs


Dublin-Belfast Corridor
Regional Growth Centres
Key Towns
Gateway Region
Key road
Rail
Figure 2.1.3: An Extract from 'Figure 4.2 Settlement Strategy' from the RSES

The Kellystown Lands are within the North-West strategic residential and employment development corridor, see Figure 2.1.4 below. The proposed Kellystown Road supports the targets of at least 50\% of all new homes within or contiguous to the existing built up area in Dublin.

| Corridor | Residential | Employment/ Mixed Use | Phasing/Enabling infrastructure |
| :---: | :---: | :---: | :---: |
| North-West corridor <br> (Maynooth/ Dunboyne commuter line /DART) | Dublin 15 lands - continued development of Hansfield linked to the future development of Barnhill and Kellytown landbanks to the south and east | Further development of largescale employment in Dublin Enterprise Zone ${ }^{\star \star}$ and synergies with Blanchardstown IT | Short term <br> Public transport, Clonsilla Station, water network and waste water upgrades. |
| line /DART) <br> Population capacity <br> Short 24,000 <br> Medium 10,000 | Leixlip - strategic greenfield lands near Confey station with capacity for phased development, improve links to Leixlip and adjoining Dublin/Meath lands | Large scale former Hewlett Packard site and Collinstown site to strengthen employment base for North Kildare | Short to Medium term <br> LUAS extension to Maynooth, roads upgrades, community and social infrastructure, waste water and local water network upgrades |
| Long 3,000 <br> Total 37,000 | Maynooth - Significant strategic residential capacity at Railpark lands and to the north and west of the town near Maynooth University | New Research \& technology Park adjoining Maynooth University | Short to Medium term <br> DART expansion, road upgrades, bridge, Maynooth Outer Orbital Route, waste water and local water network upgrades |
|  | Dunboyne - Sequential development prioritising zoned and serviced lands near the railway station and town centre and at Dunboyne North / M3 Parkway station | Space intensive 'big box' employment at Portan. Mixed use 'live - work' development at Dunboyne North | Medium to Long term <br> Outer Orbital road, distributor road, additional watermains and waste water upgrades |

Figure 2.1.4: An Extract from 'Strategic Development Areas and Corridors, Capacity Infrastructure and Phasing' from the RSES

The project complies with the Regional Policy Objective relating to Sustainable Transport, RPO 5.3, as the road will be 'designed in a manner that facilitates sustainable travel patterns, with a particular focus on increasing the share of active modes (walking and cycling) and public transport use and creating a safe attractive street environment for pedestrians and cyclists.'

### 2.1.4 Local Policy Context

### 2.1.4.1 Fingal Development Plan 2017-2023

The Fingal Development Plan 2017-2023 sets out the Council's proposed policies and objectives for the development of the County over the Plan period. The Development Plan seeks to develop and improve, in a sustainable manner, the social, economic, environmental and cultural assets of the County. A 'Main Aim' of the 'Strategic Policy' of the Plan is to 'Consolidate the growth of the major centres of Blanchardstown and Balbriggan by encouraging infill development and intensification of development within appropriate locations.'

This Development Plan has an objective to prepare and/or implement the Kellystown Local Area Plan within the lifetime of the Plan.

The non-exhaustive list of main elements to be included in the Local Area Plan is as follows:

- Provide for a programme for the phasing of construction of residential and commercial development in tandem with the delivery of transport, recreational, community and educational infrastructure.
- Facilitate the development of a new railway station on the existing Dublin-Maynooth line at Porterstown if required.
- Facilitate re-location of St. Mochtas FC grounds to a new site north of the Luttrellstown Road. This new site will be in addition to a proposed 8 hectare public park.
- Provide pedestrian and cyclist access routes to the subject lands from the Riverwood/ Carpenterstown area.
- Create a new neighbourhood public park of a minimum of 8 hectares. This park shall be linked to Porterstown Park, Luttrellstown Road and Beech Park by dedicated pedestrian and cyclist facilities.
- Protect the rural character and setting of Luttrellstown Road and enhance its use for pedestrians and cycling.
- Provide a study of the trees, hedgerows and other features of biodiversity value suitable for retention and a programme agreed with the Council's Biodiversity Officer as to how these features can be protected or improved and the biodiversity value of the Canal maintained or improved.

The Kellystown Road is included within the Road Construction and Improvement Measures outlined in the Plan, specifically within Table 7.1 Road Schemes and under Objective MT41. The Plan notes that whilst Fingal is committed to the promotion of sustainable means of travel, and the encouragement of modal change from the private car, it is recognised that the roads infrastructure maintains a central position in the overall transportation network, catering for the movement of buses, goods vehicles, pedestrians, cyclists, as well as the private car, and that a number of key road improvements are required to facilitate the movement of goods and people throughout the County and to ensure ease of access, especially for major areas of new development.

The Plan also notes that any works undertaken will include as an aim, enhanced provision for public transportation, cyclists and pedestrians, as appropriate, and will be subject to environmental considerations.


## Zoning Objectives Legend



Figure 2.1.5: Fingal Development Plan 2017-2023 - Extract from Sheet No. 13 Blanchardstown South

This Development Plan also has an objective to prepare and/or implement the Barnhill Local Area Plan (LAP) within the lifetime of the Plan. This LAP has progressed, and is expected to be published in late 2018. Part of the Barnhill site is within the Study Area for the Kellystown Road, and the Kellystown Road may connect to the Ongar Barnhill Road at its western extent. The Ongar Barnhill Road will connect from the Barnhill lands, to the west of our Study Area, to the Hansfield SDZ lands to the north of the Barnhill lands. This connectivity will be for motor vehicles, pedestrians and cyclists.

Route Selection Report

### 2.2 Existing Road Network

This section of the report describes the existing road characteristics of the network within the proposed Study Area. The roads located within the Study Area are listed below:-

- Diswellstown Road
- Diswellstown Road Extension
- Porterstown Road
- Porterstown Link Road
- R121 Luttrellstown Road
- R121 Clonsilla Road
- R121 Westmanstown Road
- Barberstown Lane North
- Barberstown Lane South

Figure 2.2: Kellystown Road Study Area (also attached as Drawing No 18_015_CSE_GEN_ZZ_DR_C_1050 in Appendix A)


### 2.2.1 Diswellstown Road

The Diswellstown Road runs west-east from a signalised junction with the Diswellstown Road Extension/Porterstown Link Road Junction in the west to a roundabout with Carpenterstown Road to the east. The road has a typical carriageway width of 7.6 m . The roadway is also comprised of a grass verge of 2.0 m width and a footway and cycletrack both of 1.45 m width each on both sides of the carriageway. The total cross sectional width is approximately 17.5 m wide. Currently, the cycling infrastructure on this main road does not have clear priority over the side road/estate entrance roads due to outdated cycle infrastructure design standards having been used in their design. Numerous housing developments, and a school and community centre are accessed from this road. The speed limit is 50 kph .

### 2.2.2 Diswellstown Road Extension (Dr Troy/Porterstown Bridge)

The Diswellstown Road Extension runs from a junction with the Diswellstown Road/Porterstown Link Road Junction in the south to a roundabout with Clonsilla Road to the north. The road has a typical carriageway width of 7.6 m . The roadway is also comprised of a grass verge of 2.7 m width on the eastern side, a footway of 1.4 m width, and a cycletrack both of 1.6 m width each on both sides of the carriageway. The total cross sectional width is approximately 16.6 m wide. The road provides a link to Blanchardstown, Clonsilla and the N3. The Porterstown/Dr Troy Bridge crosses the Maynooth-Dublin rail line and the canal. The speed limit is 60 kph .

### 2.2.3 Porterstown Road

The Porterstown Road is a rural road running from a t-junction with Clonsilla Road to the north to a spur road from the Porterstown Link Road to the south, which currently accesses Scoil Choilm Community National School. The Porterstown Road has a typical carriageway width of 4.7 m , and footpath of 1.6 m in width on its eastern side, giving a total width of 6.3 m . The spur road runs eastwest and has a carriageway width of 9.6 m . The roadway is also comprised of a grass verge of 1.5 m width on the northern side, a footway of 1.8 m width, and a cycletrack both of 1.5 m width each on both sides of the carriageway. There are no cycle facilities on Porterstown Road. The total cross sectional width is approximately 18.0 m wide. The Porterstown Road crosses the Dublin - Maynooth rail line by means of a level crossing. The speed limit is 50 kph on both Porterstown Road and the spur road.

### 2.2.4 Porterstown Link Road

The Porterstown Link Road runs north-south from a signalised junction with the Diswellstown Road to a signalised junction with Luttrellstown Road to the south. The road has a typical carriageway width of 7.5 m . The roadway is also comprised of a footway of 1.8 m width and cycletrack of 1.5 m width each on both sides of the carriageway. The total cross sectional width is approximately 17.5 m wide. There is a school and a number of private properties accessed from this road. The speed limit is 50 kph .

### 2.2.5 R121 Luttrellstown Road

The R121 Luttrellstown Road runs from east to west, and is the southern boundary of the Study Area. The road has a varying carriageway width from approximately 5.0 m to 8.0 m wide. The wall of Luttrellstown Castle is on the southern side of the road, and there is a verge, trees and a mound on the northern side. There are a limited number of properties accessed from this road. The speed limit is 60 kph . Luttrellstown Road has a junction with the Clonsilla Road within the Study Area.

### 2.2.6 R121 Clonsilla Road

The R121 Clonsilla Road runs north-south from Clonsilla Train Station and Level Crossing to at-junction with Luttrellstown Road. The road has a varying carriageway width of approximately 6.0 m wide, with a footpath of varying width on the western side, 1.5 m to less than 1.0 m wide. There are a limited
number of properties accessed from this road. Directly adjacent the Level Crossing, the road crosses the Royal Canal with a hump back bridge. The speed limit is 60 kph .

### 2.2.7 R121 Westmanstown Road

The R121 Westmanstown Road runs from north to south from a junction with Luttrellstown Road and Barberstown Lane North. The road has a varying carriageway width from approximately 5.0 m to 8.0 m wide. The wall of Luttrellstown Castle is on the eastern side of the road, and there is a trees lined hedgerow on the western side. There are a limited number of properties accessed from this road. The speed limit is 60 kph .

### 2.2.8 Barberstown Lane North

The Barberstown Lane runs from a junction with Luttrellstown Road at its south-eastern extent to in a north-westerly direction crossing over the Dublin - Maynooth rail line by means of a level crossing and the Royal Canal over a hump back bridge, and passes a junction with Barberstown Lane South, before continuing in a north-westerly direction. The road has a varying carriageway width from approximately 6.0 m to 8.0 m wide. There are no footpaths or cycle facilities in this road. There are a limited number of properties accessed from this road. The speed limit is 50 kph .

### 2.2.9 Barberstown Lane South

The Barberstown Lane South runs from a junction with Barberstown Lane North just north of the level crossing in a north in a south-westerly direction. It then runs south-westerly towards a proposed junction with the future Ongar Barnhill Road. The road has a varying carriageway width from approximately 6.0 m to 8.0 m wide. There are no footpaths or cycle facilities in this road. There are a limited number of properties accessed from this road. The speed limit is 50 kph .

### 2.3 Existing Traffic Conditions

There is no significant traffic congestion on most of the existing roads in the Study Area, however, the junction of Diswellstown Road Extension, Porterstown Link Road and Diswellstown Road experiences significant congestion during the AM Peak (07:00-10:00) and PM Peak (16:00-19:00) periods. This congestion relates to high volumes of traffic moving between Diswellstown Road and Diswellstown Road Extension (left and right turning movements) during peak times. Traffic volumes within the Study Area are detailed in Chapter 3 of this report.

### 2.4 Road Safety Conditions

The Road Safety Authority maintains a database of road collision statistics. This database currently covers the nine year period between 2005 and 2014. Accidents in this database are classified into four groups based on severity (fatal, serious, minor and not injured) of the accident.

Figure's 2.4.1, 2.4.2 and 2.4.3 overleaf, indicate the RSA's online maps for vehicular, pedestrian and cyclist collisions in the Kellystown area of Dublin 15.


Figure 2.4.1: RSA Collision Mapping in Ireland (Kellystown), All Vehicles


Figure 2.4.2 RSA Collision Mapping in Ireland (Kellystown), Pedestrians


Figure 2.4.3 RSA Collision Mapping in Ireland (Kellystown), Cyclists

### 2.5 Summary of the Need for the Scheme

The proposed Kellystown Road Scheme will;

- provide an important arterial link in the context of the road network within the wider Blanchardstown area for all road users, and facilitating residential, open space and high amenity development in the Kellystown lands, in particular;
- provide connectivity to the Ongar, Barnhill and Hansfield LAP lands, and an alternative crossing of the Maynooth rail line and Royal Canal;
- Support Smarter Travel objectives by providing a safe new road link for pedestrians, cyclists and buses, open residential development lands adjacent a railway station, and provide connectivity to proposed greenways and secondary cycle networks;
- Provide arterial road with a 50 kph speed limit and in accordance with the Design Manual for Urban Roads and Streets (DMURS) and the National Cycle Manual (NCM) to ensure it provides for all road users and is appropriate in its urban context.


## 3 Traffic Assessment \& Route Cross-Section

### 3.1 Modelling Approach

The scheme proposals were modelled using SATURN macro-modelling software. The National Transport Authority (NTA) Eastern Regional Model (ERM) was used, as it is well developed for the Greater Dublin area and includes a good representation of the road network in Dublin 15.

For the purpose of this study, NTA's Eastern Regional Model (ERM) was modified using the SATURN modelling package to test various case scenarios including Do-Nothing, provision of Kellystown Road without proposed new bridge crossing of the canal and rail line, and provision of Kellystown Road with a proposed new bridge crossing the canal and rail line. Both of these Do-Something scenarios take account of the Ongar-Barnhill Road (north-south) being in place in the Barnhill lands.

The trip demand for the Hansfield, Barnhill and Kellystown residential development zones has been upgraded within the model to account for the likely level of development, and taking account of the strategic location adjacent to high quality public transport.

### 3.2 2012 Eastern Regional Model

The NTA Regional Modelling System comprises five regional transport models covering the Republic of Ireland, centred around the five main cities of Dublin, Cork, Galway, Limerick, and Waterford. Each regional model has the following key attributes:

- Full geographic coverage of the relevant region;
- A detailed representation of the road network;
- A detailed representation of the public transport network \& services;
- A representation of all major transport modes including active modes (walking and cycling) and includes accurate mode-choice modelling of residents;
- A detailed representation of travel demand of four time periods (AM, Inter-Peak, PM and OffPeak); and
- A prediction of changes in trip destination in response to changing traffic conditions, transport provision and/or policy.

Modelling for this study was carried out using the NTA's Eastern Regional Model (ERM), which has a base year of 2012, and was calibrated in 2016.

The ERM focuses on counties within Leinster and the Greater Dublin Area (GDA), as shown in Figure 3.2. These areas are represented by 1844 detailed zones, with travel between these areas and the rest of Ireland represented by 7 external zones. It is a strategic multi-modal, network based transport model and includes all the main surface modes of travel (car, bus, rail, LUAS, heavy goods vehicles, walking and cycling).

The National Demand Forecasting Model (NDFM) provides inputs to the ERM and interacts with key regional model components. The NDFM includes a set of models and tools that are used to derive
levels of trip making (nationally). It utilises planning data to estimate levels of travel demand at the smallest available spatial aggregation (Census Small Area) for input into each of the Regional Models. A number of different data sources were utilised in the development of the NDFM and ERM, including data from the National Household Travel Survey and various traffic count information.

The model represents an average weekday with five separate peak periods modelled as follows;

- AM peak (07:00-10:00);
- Morning Inter peak (10:00-13:00);
- Afternoon Inter peak (13:00-16:00);
- PM peak (16:00-19:00); and
- Off peak (19:00-07:00).


Figure 3.2: Area Covered by NTA's Eastern Regional Model (ERM)

### 3.3 Proposals

The traffic modelling assesses the traffic impact the completion of three housing developments will have on the surrounding road network, and confirms the infrastructural measures required to facilitate the additional traffic these developments will generate. The housing and road infrastructure proposals are discussed below.

### 3.3.1 Proposed Housing Development

Three areas in Blanchardstown South are zoned for residential housing. Figure 3.3 shows a land use map taken from Sheet 13 of Fingal County Councils Development Plan, with 'Residential Areas' shown in light brown on the map. The zoning objective of a Residential Area (RA) is to 'Provide for new residential communities subject to the provision of the necessary social and physical infrastructure'.

These include the Hansfield Residential Area Zone (Hansfield Strategic Development Zone - light brown area to north of map), Barnhill Residential Area zone (light brown area below Hansfield to west of map) and Kellystown Residential Area zone (light brown area to east of map).


Zoning Objectives Legend


Figure 3.3: Fingal Development Plan 2017-2023 - Extract from Sheet No. 13 Blanchardstown South

### 3.3.2 Proposed Hansfield Housing Development

The area on which the Hansfield housing development is proposed is also referred to as the Hansfield Strategic Development Zone. A report was prepared in 2006 titled 'Hansfield SDZ Planning Scheme April 2006'. This document outlines the type of development proposed for the site and the infrastructural improvements that should be in place before the development is built/ occupied by residents.

There will be a total of 3000 units, with a mix of dwelling types and sizes ranging from 1-4 bedrooms including townhouses, semi-detached dwellings and apartments. The traffic modelling was carried out assuming these 3000 units will be developed on the site. Proposed Barnhill Housing Development Sheet 13 of Fingal County Councils Development Plan 2017-2023 highlights the Barnhill Area as a 'Residential Area', subject to a Local Area Plan (LAP 13A). The preparation of LAP 13A is currently underway. It is anticipated for the purpose of the current assessment that a total of 1500 units will be built on the site.

### 3.3.3 Proposed Kellystown Housing Development

Sheet 13 of Fingal County Councils Development Plan 2017-2023 highlights the Kellystown Area as a 'Residential Area', subject to a Local Area Plan (LAP 13C). The preparation of LAP 13C has not yet begun. It is anticipated for the purpose of the current assessment that a total of 1000 units will be built on the site.

### 3.4 Proposed Road Infrastructure



Figure 3.4.1 shows a visual representation of the proposed overall road network for the area. From west to east, the road infrastructure proposed includes:

1. Ongar-Barnhill North-South Link Road (shown in yellow on Figure 3.4.1) - a dual carriageway distributor road approximately 1.16 km long extending from the Ongar Road roundabout in a southwesterly direction to tie into the existing R149 just south of Barberstown Lane South. This scheme has Part 8 approval.
2. Upgrade of existing Barberstown Lane South (shown in yellow on Figure 3.4.1) - Barberstown Lane South will connect to the proposed Ongar-Barnhill North-South Link Road at the R149/Barberstown Lane junction. Upgrade of 650 metres to a single carriageway is proposed in an easterly direction along the existing link between the R149 \& the R121 towards Pakenham Bridge. The Barberstown Lane South Upgrade, the new roundabout and the Ongar-Barnhill North-South Link Road fall under the same scheme and have Part 8 approval;
3. Barberstown Bridge (shown in pink on Figure 3.4.1) - located adjacent to the existing Barberstown railway level crossing and provides an alternative grade separated crossing over the Royal Canal and Railway line to the existing level crossing. It connects to the Part 8 approved 'Barberstown Lane South Upgrade' on the west side and to the 'Kellystown Road proposal - West of Clonsilla Station' on its east side;
4. Kellystown Road - West of Clonsilla Station (shown in medium blue on Figure 3.4.1) - This road would connect to the road leading from the Barberstown level crossing/ the proposed new Barberstown Bridge at its west end at a point where the existing R121 turns through a 90 degree angle to change alignment from north-south to east-west. It would connect to the 'Kellystown Road- East of Clonsilla Station' at its east end;
5. Kellystown Road - East of Clonsilla Station (shown in dark blue on Figure 3.4.1) - this road proposal is shown on the FCC development plan. It connects to the north-south section of the R121 (at a point approximately 100 south of the Clonsilla Level crossing)/ future proposed Kellystown Road West of Clonsilla Station at its west end. From here it continues east and runs approximately parallel to the Porterstown Road and connects to the recently completed Porterstown Link Road at a point adjacent to and north of Scoil Choilm Community National School at its east end.

### 3.5 Modelling Results

A total of 5 case scenarios were modelled, each for AM and PM peak periods, including 3 base year (2012) case scenarios and 2 horizon year (2035) case scenarios. 2035 is the horizon year for the NTA Transport Strategy for Greater Dublin and corresponds to the NTA future year model for that strategy.

### 3.5.1 2012 Base Year Models

The year 2012 was selected for the base model, as this year corresponds to the NTAs ERM base case.

The following 2012 am and pm peak hour scenarios have been modelled:

| Scenario 1 | 2012 Base Model - Do-Nothing (excludes 3 new housing developments and <br> proposed road infrastructure) |
| :--- | :--- |
| Scenario 2 | 2012 Plan 1-3 new housing developments with Ongar-Barnhill North- South Link <br> and Kellystown Road East of Clonsilla Station |
| Scenario 3 | 2012 Plan 2-3 new housing developments with Ongar-Barnhill Link, the proposed <br> Kellystown Road including the Barberstown Bridge |

Table 3.5.1 2012 Case Scenarios Modelled

The traffic impact on key routes associated with implementing these case scenarios can be summarised in the following tables, which shows link flows for each modelled scenario.

| Model Scenario | Ongar - Barnhill North-South Link Road; $\uparrow$ northbound | R149 - south of Barberstown Lane South $\uparrow$ northbound | Barberstown Level Crossing Bridge <br> $\uparrow$ eastbound | Kellystown Road - West of Clonsilla Station <br> $\uparrow$ eastbound | Kellystown Road - East of Clonsilla Station <br> $\uparrow$ eastbound |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Scenario 1: 2012 Base Model - Do-Minimum (no housing or road development) | $\mathrm{n} / \mathrm{a}$ | $354 \uparrow \downarrow 858$ <br> $571 \uparrow \downarrow 838$ | $\begin{aligned} & 266 \uparrow \downarrow 72 \\ & 91 \uparrow \downarrow 257 \end{aligned}$ | $476 \uparrow \downarrow 251$ <br> $356 \uparrow \downarrow_{446}$ | $\mathrm{n} / \mathrm{a}$ |
| Scenario 2: 2012 Plan 1 <br> -3 housing <br> developments with Ongar-Barnhill N-S Link and Kellystown Link | $\begin{aligned} & 536 \uparrow \downarrow 930 \\ & 812 \uparrow \downarrow 718 \end{aligned}$ | $464 \uparrow \downarrow_{1119}$ <br> $923 \uparrow \downarrow 918$ | $\begin{aligned} & 471 \uparrow \downarrow_{241} \\ & 196 \uparrow \downarrow_{601} \end{aligned}$ | $673 \uparrow \downarrow_{584}$ <br> $593 \uparrow \downarrow 792$ | $394 \uparrow \downarrow 499$ <br> $478 \uparrow \downarrow 643$ |
| Scenario 3: 2012 Plan 2 <br> - 3 housing developments with Ongar-Barnhill Link, Kellystown Link and Barberstown Bridge | $\begin{aligned} & 504 \uparrow \downarrow 823 \\ & 725 \uparrow \downarrow_{582} \end{aligned}$ | $546 \uparrow \downarrow_{1087}$ <br> $953 \uparrow \downarrow 936$ | $610 \uparrow \downarrow_{403}$ <br> $341 \uparrow \downarrow 927$ | $769 \uparrow \downarrow 692$ $651 \uparrow \downarrow_{1032}$ | $378 \uparrow \downarrow_{549}$ <br> $456 \uparrow \downarrow 806$ |
| Table 3.5.2: 2012 Peak Demand Flows Note: $957 \uparrow \downarrow 1381$ = AM Peak Demand |  |  |  |  |  |

The case scenarios tabulated above have traffic implications across the road network, reflected in the variance in link flows recorded on each of the key road links across each case scenarios. In order to determine the performance of existing road infrastructure and the requirement for future proposed road infrastructure (e.g. to mitigate the traffic impact of providing additional housing development or to mitigate the knock on traffic impacts of improving another road), the link capacities associated with key routes, with and without route proposals must be known.

Link capacities for urban roads are provided in 'DMRB Volume 5 Section 1 Part 3 - TA 79/99 - TRAFFIC CAPACITY OF URBAN ROADS'. This document was used to determine the link capacities on 6 key roads to inform the requirement for key road infrastructure in 2012 and 2035 for varying development case scenarios. The DMRB capacities are used as DMURS does not provide similar information.

| Key Road | Ongar - <br> Barnhill <br> North-South | $\begin{aligned} & \text { R149 - south } \\ & \text { of } \\ & \text { Barberstown } \end{aligned}$ | Barberstown Level Crossing/ Bridge |  | Kellystown <br> Road - West of Clonsilla | Kellystown Road - East of Clonsilla |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  | Lv.Cr | Brdg |  |  |
| Road Type | UAP1 | UAP2 | UAP3 | UAP2 | UAP2 | UAP2 |
| SingleCarrigeway/ Dual Carriageway/ pinch point on Single | Single | Single | Pinch Point | Single | Single | Single |
| Two way flow (60/40 directional split except bb level crossing ) | $\begin{gathered} 1320 \uparrow \downarrow 880 \\ =2200 \end{gathered}$ | $\begin{gathered} 1260 \uparrow \downarrow 840 \\ =\underline{2100} \end{gathered}$ | $\begin{aligned} & 450 \uparrow \\ & \downarrow 450 \\ & =900 \\ & \hline \end{aligned}$ | $\begin{gathered} 1260 \uparrow \\ \downarrow 840 \\ =\underline{2100} \end{gathered}$ | $\begin{gathered} 1260 \uparrow \downarrow 840 \\ =\underline{2100} \end{gathered}$ | $\begin{gathered} 1260 \uparrow \downarrow 840 \\ =\underline{2100} \end{gathered}$ |

Table 3.5.3: Link Capacities on 5 Key Roads in the Study Area; Source: DMRB V5, S1, P3.

| Key Road | Peak <br> Hour | Ongar - Barnhill North-South Link Road | $\begin{aligned} & \text { R149 - south } \\ & \text { of } \\ & \text { Barberstown } \\ & \text { Lane South } \end{aligned}$ | Barberstown Level Crossing/ Bridge |  | Kellystown <br> Road - West <br> of Clonsilla <br> Station | Kellystown <br> Road - East of Clonsilla Station |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | Lv.Cr | Brdg |  |  |
| Max Hourly Link Flow Capacity |  | 2200 | 2100 | 900 | 2100 | 2100 | 2100 |
| Scenario 1 <br> Peak Hour <br> Link Flows | AM | n/a | 1212 | 338 | n/a | 727 | n/a |
|  | PM | $\mathrm{n} / \mathrm{a}$ | 1409 | 348 | n/a | 802 | n/a |
| Scenario 2 <br> Peak Hour <br> Link Flows | AM | 1466 | 1583 | 712 | n/a | 1257 | 893 |
|  | PM | 1530 | 1841 | 797 | n/a | 1385 | 1121 |
| Scenario 3 <br> Peak Hour <br> Link Flows | AM | 1327 | 1633 | n/a | 1013 | 1461 | 927 |
|  | PM | 1307 | 1889 | n/a | 1268 | 1683 | 1262 |

Table 3.5.4: Peak Hourly Link Capacities vs Peak hour Demand 2 Way flows on Key Roads for each case scenario

Scenario 1 - The 2012 Do-Nothing scenario includes the relatively recently completed road network upgrades including Porterstown Link Road (connecting Diswellstown Road to Luttrellstown Road), and the N3 Mulhuddart Interchange.

It assumes none of the three housing developments are developed. It also assumes the Ongar- Barnhill North-South Link Road, upgrade to Barberstown Lane South, Barberstown Bridge and improvements to/ extension of the Kellystown Road are not provided.

Tables 3.5.3 and 3.5.4 shows that the existing road infrastructure is sufficient to facilitate the existing peak hour link flows, with the following spare capacities on key roads to facilitate additional demand:

- The R149 - south of Barberstown Lane South has a peak demand of 1212 vehicles during the am peak and 1409 vehicles during the pm peak. With a maximum hourly link flow capacity of

2100 vehicles, this road has $42 \%$ spare capacity in the AM and $33 \%$ spare capacity in the PM peak.

- Barberstown Level Crossing has a peak demand of 338 vehicles during the am peak and 348 vehicles during the pm peak. With a maximum hourly link flow capacity of 900 vehicles, this road has $62 \%$ spare capacity in the AM and $61 \%$ spare capacity in the PM peak.
- Kellystown Road - West of Clonsilla Station has a peak demand of 727 vehicles during the am peak and 802 vehicles during the pm peak. With a maximum hourly link flow capacity of 2100 vehicles, this road has $65 \%$ spare capacity in the AM and $62 \%$ spare capacity in the PM peak.

Scenario 2 - The 2012 Plan 1 scenario includes the relatively recently completed road network upgrades including Porterstown Link Road (connecting Diswellstown Road to Luttrellstown Road), and the N3 Mulhuddart Interchange.

It assumes that the three housing developments are complete and the Ongar-Barnhill North-South Link, upgrade to Barberstown Lane South and improvements to/ extension of the Kellystown Road are complete. However, it assumes the Barberstown Bridge is not provided.

Table 3.5.3 shows that that the existing and proposed road infrastructure associated with this case scenario is sufficient to facilitate the Scenario 2 peak hour link flows, with the following spare capacities on key roads to facilitate additional demand:

- Ongar - Barnhill North-South Link Road has a peak demand of 1466 vehicles during the am peak and 1530 vehicles during the pm peak. With a maximum hourly link flow capacity of 2200 vehicles, this road has $33 \%$ spare capacity in the AM and $30 \%$ spare capacity in the PM peak.
- The R149 -south of Barberstown Lane South has a peak demand of 1583 vehicles during the am peak and 1841 vehicles during the pm peak. With a maximum hourly link flow capacity of 2100 vehicles, this road has $25 \%$ spare capacity in the AM and $12 \%$ spare capacity in the PM peak.
- Barberstown Level Crossing has a peak demand of 712 vehicles during the am peak and 797 vehicles during the pm peak. With a maximum hourly link flow capacity of 900 vehicles, this road has $21 \%$ spare capacity in the AM and $11 \%$ spare capacity in the PM peak.
- Kellystown Road - West of Clonsilla Station has a peak demand of 1257 vehicles during the am peak and 1385 vehicles during the pm peak. With a maximum hourly link flow capacity of 2100 vehicles, this road has $40 \%$ spare capacity in the AM and $34 \%$ spare capacity in the PM peak.
- Kellystown Road - East of Clonsilla Station has a peak demand of 893 vehicles during the am peak and 1121 vehicles during the pm peak. With a maximum hourly link flow capacity of 2100 vehicles, this road has $57 \%$ spare capacity in the AM and $47 \%$ spare capacity in the PM peak.

Scenario 3 The '2012 Plan 2' case scenario includes the relatively recently completed road network upgrades including Porterstown Link Road (connecting Diswellstown Road to Luttrellstown Road), and the N3 Mulhuddart Interchange.

It assumes that the three housing developments are complete and the Ongar-Barnhill North-South Link, upgrade to Barberstown Lane South, Barberstown Bridge and improvements to/ extension of the Kellystown Road are complete.

Table 3.5.3 shows that the existing and proposed road infrastructure associated with this case scenario is sufficient to facilitate the Scenario 3 peak hour link flows, with the following spare capacities on key roads to facilitate additional demand:

- Ongar - Barnhill North-South Link Road has a peak demand of 1327 vehicles during the am peak and 1307 vehicles during the pm peak. With a maximum hourly link flow capacity of 2200 vehicles for a single carriageway in each direction, this road has $40 \%$ spare capacity in the AM and $41 \%$ spare capacity in the PM peak.
- The R149 -south of Barberstown Lane South has a peak demand of 1633 vehicles during the am peak and 1889 vehicles during the pm peak. With a maximum hourly link flow capacity of 2100 vehicles, this road has $22 \%$ spare capacity in the AM and $10 \%$ spare capacity in the PM peak.
- Barberstown Bridge has a peak demand of 1013 vehicles during the am peak and 1268 vehicles during the pm peak. With a maximum hourly link flow capacity of 2100 vehicles, this road has $52 \%$ spare capacity in the AM and $40 \%$ spare capacity in the PM peak. It should be noted that the introduction of the bridge makes this route more attractive to road users and induces a higher demand than the same route retained as a level crossing.
- Kellystown Road - West of Clonsilla Station has a peak demand of 1461 vehicles during the am peak and 1683 vehicles during the pm peak. With a maximum hourly link flow capacity of 2100 vehicles, this road has $30 \%$ spare capacity in the AM and $20 \%$ spare capacity in the PM peak.
- Kellystown Road - East of Clonsilla Station has a peak demand of 927 vehicles during the am peak and 1262 vehicles during the pm peak. With a maximum hourly link flow capacity of 2100 vehicles, this road has $56 \%$ spare capacity in the AM and $40 \%$ spare capacity in the PM peak.

The following conclusions can be drawn from the results of the 2012 models:

- The proposed upgraded Barberstown Lane South, and the proposed Kellystown Road (sections east and west of Clonsilla Station) all operate within capacity as single carriageway roads for all case scenarios.
- Scenario 3 shows an increase in traffic crossing the bridge compared to traffic (crossing the level crossing) in scenario 2 to an amount above the link capacity associated with the level crossing. The proposed Barberstown Bridge is not necessary in the base year scenario.


### 3.5.2 2035 Horizon Year Models

The following 2035 peak hour case scenarios have been modelled:

| Scenario 4 | 2035 Plan 1-3 new housing developments with Ongar-Barnhill North- South <br> Link and Kellystown Road East of Clonsilla Station |
| :--- | :--- |
| Scenario 5 | 2035 Plan 2-3 new housing developments with Ongar-Barnhill Link, the <br> proposed Kellystown Road including the Barberstown Bridge |

Table 3.5.5: 2035 Peak Hour Case Scenarios Modelled

The results of these tests in terms of flows on the key routes can be summarised in the following tables.


Scenario 4: 2035 Plan 1 - 3 new housing developments with Ongar-Barnhill NorthSouth Link and Kellystown Link

Scenario 5: 2035 Plan 2 - 3 new housing developments with Ongar-Barnhill NorthSouth Link, Kellystown Link and Barberstown Bridge

Table 3.5.6: 2035 Peak Demand Flows

| R149 - south of Barberstown Lane South $\uparrow$ northbound | Barberstown Level Crossing/ Bridge <br> $\uparrow$ eastbound | Kellystown Road - West of Clonsilla Station $\uparrow$ eastbound | Kellystown Road - East of Clonsilla Station $\uparrow$ eastbound |
| :---: | :---: | :---: | :---: |
| $462 \uparrow \downarrow_{1247}$ <br> $1002 \uparrow \downarrow_{1063}$ | $\begin{aligned} & 586 \uparrow \downarrow_{331} \\ & 205 \uparrow \downarrow_{633} \end{aligned}$ | $842 \uparrow \downarrow 649$ <br> $629 \uparrow \downarrow 827$ | $416 \uparrow \downarrow 537$ <br> ${ }_{453} \uparrow \downarrow{ }_{756}$ |
| $\begin{gathered} 606 \uparrow \downarrow_{1211} \\ 1029 \uparrow \downarrow_{1053} \end{gathered}$ | $784 \uparrow \downarrow 605$ <br> $435 \uparrow \downarrow 978$ | $874 \uparrow \downarrow 807$ <br> $747 \uparrow \downarrow_{1092}$ | $425 \uparrow \downarrow 678$ <br> $461 \uparrow \downarrow 882$ |

Note: $957 \uparrow \downarrow_{1381}=$ AM Peak Demand Flows
$946 \uparrow \downarrow_{1352}=$ PM Peak Demand Flow

| Key Road | Peak Hour | Ongar - Barnhill North-South Link Road | R149 south of Barberstown Lane South | Barberstown Leve Crossing/ Bridge |  | Kellystown Road - West of Clonsilla Station | Kellystown Road - East of Clonsilla Station |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | Lv.Cr | Brdg |  |  |
| Max Hourly Link Flow Capacity |  | 2200 | 2100 | 900 | 2100 | 2100 | 2100 |
| Scenario 4 Peak Hour Link Flows | AM | 2064 | 1709 | 917 | n/a | 1491 | 953 |
|  | PM | 1942 | 2065 | 838 | n/a | 1456 | 1209 |
| Scenario 5 <br> Peak Hour <br> Link Flows | AM | 2082 | 1817 | n/a | 1389 | 1681 | 1103 |
|  | PM | 1729 | 2082 | n/a | 1413 | 1839 | 1343 |

Table 3.5.7: Peak Hourly Link Capacities vs Peak hour 2 Way Demand flows on Key Roads for each case scenario

Scenario 4 - The 2035 Plan 1 scenario includes the relatively recently completed road network upgrades including Porterstown Link Road (connecting Diswellstown Road to Luttrellstown Road), and the N3 Mulhuddart Interchange. It assumes that the three housing developments are complete and the Ongar-Barnhill North-South Link, upgrade to Barberstown Lane South and improvements to/ extension of the Kellystown Road are complete. However, it assumes the Barberstown Bridge is not provided.

Tables 3.5 .6 and 3.5 .7 shows that that the existing and proposed road infrastructure associated with this case scenario is for the most part sufficient to facilitate the Scenario 4 peak hour link flows, with the following spare capacities on key roads to facilitate additional demand:

- Ongar - Barnhill North-South Link Road has a peak demand of 2064 vehicles during the am peak and 1942 vehicles during the pm peak. With a maximum hourly link flow capacity of 2200 vehicles, this road has $6 \%$ spare capacity in the AM and $12 \%$ spare capacity in the PM peak.
- The R149 -south of Barberstown Lane South has a peak demand of 1709 vehicles during the am peak and 2065 vehicles during the pm peak. With a maximum hourly link flow capacity of 2100 vehicles, this road has $19 \%$ spare capacity in the AM and $2 \%$ spare capacity in the PM peak.
- Barberstown Level Crossing has a peak demand of 917 vehicles during the am peak and 838 vehicles during the pm. With a maximum hourly link flow capacity of 900 vehicles, this road is saturated in the AM peak with an RFC value of 1.02 and $7 \%$ spare capacity in the PM peak.
- Kellystown Road - West of Clonsilla Station has a peak demand of 1491 vehicles during the am peak and 1456 vehicles during the pm peak. With a maximum hourly link flow capacity of 2100 vehicles, this road has $29 \%$ spare capacity in the AM and $31 \%$ spare capacity in the PM peak.
- Kellystown Road - East of Clonsilla Station has a peak demand of 953 vehicles during the am peak and 1209 vehicles during the pm peak. With a maximum hourly link flow capacity of 2100 vehicles, this road has $55 \%$ spare capacity in the AM and $42 \%$ spare capacity in the PM peak.

Scenario 5 The '2035 Plan 2' case scenario includes the relatively recently completed road network upgrades including Porterstown Link Road (connecting Diswellstown Road to Luttrellstown Road), and the N3 Mulhuddart Interchange. It assumes that the three housing developments are complete and the Ongar-Barnhill North-South Link, upgrade to Barberstown Lane South, Barberstown Bridge and improvements to/ extension of the Kellystown Road are complete.

Table 3.5 .6 shows that that the existing and proposed road infrastructure associated with this case scenario is sufficient to facilitate the Scenario 6 peak hour link flows, with the following spare capacities on key roads to facilitate additional demand:

- Ongar - Barnhill North-South Link Road has a peak demand of 2082 vehicles during the am peak and 1729 vehicles during the pm peak. With a maximum hourly link flow capacity of 2200 vehicles for a single carriageway in each direction, this road has $5 \%$ spare capacity in the AM and $21 \%$ spare capacity in the PM peak.
- The R149 -south of Barberstown Lane South has a peak demand of 1817 vehicles during the am peak and 2082 vehicles during the pm peak. With a maximum hourly link flow capacity of 2100 vehicles, this road has $13 \%$ spare capacity in the AM and $1 \%$ spare capacity in the PM peak.
- Barberstown Bridge has a peak demand of 1389 vehicles during the am peak and 1413 vehicles during the pm peak. With a maximum hourly link flow capacity of 2100 vehicles, this road has $34 \%$ spare capacity in the AM and $33 \%$ spare capacity in the PM peak. It should be noted that the introduction of the bridge makes this route more attractive to road users and induces a higher demand than the same route retained as a level crossing.
- Kellystown Road - West of Clonsilla Station has a peak demand of 1681 vehicles during the am peak and 1839 vehicles during the pm peak. With a maximum hourly link flow capacity of 2100 vehicles, this road has $20 \%$ spare capacity in the AM and $12 \%$ spare capacity in the PM peak.
- Kellystown Road - East of Clonsilla Station has a peak demand of 1103 vehicles during the am peak and 1343 vehicles during the pm peak. With a maximum hourly link flow capacity of 2100 vehicles, this road has $47 \%$ spare capacity in the AM and $36 \%$ spare capacity in the PM peak.

The following conclusions can be drawn from the results of the 2035 models:

- The proposed upgraded Barberstown Lane South, and the proposed Kellystown Road (section east and west of Clonsilla Station) all operate within capacity as single carriageway roads for all case scenarios.
- The proposed Barberstown Bridge over the railway and canal is necessary prior to 2035.


### 3.6 Initial Selection of Road Type and Speed Limits

The proposed speed limit for the Kellystown Road is $50 \mathrm{~km} / \mathrm{h}$. This speed limit is appropriate for an access road of its type, facilitates junctions with accesses to housing and other developments, and tiesin well with existing speed limits in the area. The design speed for the road is $60 \mathrm{~km} / \mathrm{h}$.

The proposed cross-section is indicated in Figure 3.5 below.


Figure 3.5: Potential Road Cross Section for the Kellystown Road

An 19.0 m wide road reservation is proposed for the Kellystown Road. The elemental design widths and their respective design parameters which are outlined as follows:

Footway - Proposed 2.0m Width

- DMURS - Figure 4.34
- 2 m footway width proposed according to function from lower/moderate activity to higher activity as development density increases.
- 2 m Footway - desirable space for two people to pass comfortably.

Cycle Track - Proposed 2.25 m Width

- In accordance with the NATIONAL CYCLE MANUAL, Chapter 1.7.2 'SEGREGATION' and Chapter 1.7.4 'GUIDANCE GRAPH' for 'Distributor Urban Local Speed' (also see DMURS Figure 4.52).
- NATIONAL CYCLE MANUAL, Chapter 1.5.2 'WIDTH CALCULATOR' ;

A 'Inside Edge - Kerb' $=0.25 \mathrm{~m}$
B 'Basic Two-way' $=1.75 \mathrm{~m}$
C 'Outside Edge - Kerb to vegetation' $=0.25 \mathrm{~m}$
$A+B+C=2.25 m$

## Verge - Proposed 2.0m Width

- DMURS - Chapter 4.3.1 - 'on arterial and link streets with no on-street parking, a 1.5 m to 2.0 m wide grass verge is proposed to provide a buffer zone and to facilitate the planting of large street trees and items of street furniture'.
- Future proof for potential access requirements to surrounding lands.
- Protection of potential future service corridor.


## Carriageway - Proposed 6.5m Width (3.25m Per Lane)

- DMURS - Figure 4.55 - 'standard carriageway width for arterial and link streets, range for low to moderate design speeds' (Kellystown Road $=50 \mathrm{~km} / \mathrm{h}$ proposed)

The horizontal and vertical curvature shall be designed in accordance with DMURS, chapter 4.4.6, Table 4.3 'Carriageway geometry parameters for horizontal and vertical curvature'. For junction design, Volume 6 of the Design Manual for Roads and Bridges shall be utilised.

### 3.7 Junction Options

As the route options have various constraints where they cross the existing local road network a number of junction arrangements are considered. In addition, a number of junction types may be appropriate for access to future developments from the proposed road. These consist of:

- Cycle friendly roundabouts.
- Roundabouts.
- Signalised T-junctions or Signalised Cross-Roads - the need for signalised junctions will be dictated by traffic volumes and/or space constraints.
- T-junctions, on the minor local roads connecting to the proposed mainline, where traffic volumes are such that the junction would be appropriate.
- Modifications to existing junctions at tie-in locations.


### 3.8 Junction Analysis

The critical existing junction on the network is the signalised cross junction of Porterstown Link Road, Diswellstown Road Extension and Diswellstown Road. This junction currently experiences congestion in the peak hours, and the proposed Kellystown Road would tie-in to an existing arm of this junction. The dominant movements at this junction currently are a right turn out of Diswellstown Road onto Diswellstown Road Extension, and a left turn from Diswellstown Road Extension onto Diswellstown Road. There is currently a 50 m long dedicated right turn lane from Diswellstown Road, however, there is no dedicated left turn lane from Diswellstown Road Extension. The construction of a dedicated left turn lane from Diswellstown Road Extension to Diswellstown Road would allow the left and right turn lanes to run at the same time as each other. This would add capacity to this junction, allowing for the increased demand the Kellystown Road might place on the junction.

The remaining key junctions along the route occur at Westmanstown Road and at the link to Clonsilla Station (Clonsilla Road). These junctions will require signalisation or roundabout controls given the projected traffic levels. They were modelled as roundabouts for assessment purposes and are proposed as roundabouts in the preferred route option.

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### 3.9 Conclusions

The proposed Kellystown Road, as a single carriageway road, will cater for the transport demands of the Kellystown development at least until 2035, and the transport demands of the Hansfield, Barnhill Developments will be met by the Ongar to Barnhill Road (which should be in place in advance of the Kellystown Road as it is currently at detailed design stage). A number of junction arrangements at proposed accesses and existing roads would meet the projected demand. A left turn lane from Diswellstown Road Extension to Diswellstown Road should be provided.

## 4 Constraints Study

### 4.1 Introduction

As per 'Section 2.5 Constraints Study' of the TII Project Management Guidelines, the initial step in the Route Selection Process is to identify the nature and extent of significant constraints within a defined Study Area. This chapter outlines the process by which the Study Area was defined, and documents significant constraints identified. The purpose of the constraints study is to document and map constraints within the Study Area, so that feasible route options can be designed to avoid such constraints, where possible.

The constraints identification exercise comprised of a desktop study, and the nature of certain constraints were verified by means of site visits. Further constraints were identified during stakeholder consultation meetings. OS Mapping, 'Discovery Series' mapping, orthophotography, and topographical survey were all used to identify and map the constraints.

The purpose of Chapter 4 of this Route Selection Report is to identify all the constraints located within and outside the relevant Study Area. Section 4.2 describes the identification of the Study Area. The TII Project Appraisal Guidelines splits constraints into three categories, Natural Constraints, Artificial Constraints and External Parameters. These are listed in Sections 4.3, 4.4 and 4.5 respectively.

### 4.2 Defining the Study Area

The area selected for investigation should comprise of a viable Study Area holding potential for feasible route options, and exclude those areas which are non-viable because of issues such as topography, urban development, protected sites, and non - fulfilment of purpose.

The 2018 proposed Kellystown Road Study Area is as displayed in Figure 4.2.1 on the following page, and outlined in a continuous red line. The Kellystown Road Study Area covers an area of approximately 145ha, comprising of existing rural hinterland of sufficient size to accommodate all potential route options and their proposed tie-in points to the existing surrounding road network.

The proposed Kellystown Road Study Area was defined taking into consideration the potential viable tie-in locations to the current road network located both east and west of the proposed Study Area. Also taken into consideration when defining the proposed Study Area was land use and fulfilment of the scheme objectives and, in particular, to provide access to the Kellystown residential zoned lands.

The tie-in point to the east is the junction of the Porterstown Link Road, Diswellstown Road and Diswellstown Road Extension, and is as per the Fingal Development Plan 2017 - 2023 indicative alignment. The connection point to the west is the upgraded (as part of the Ongar Barnhill Road) Barnhill Lane South. The northern boundary of the Study Area is the Dublin to M3 Parkway Rail Line, with the Dublin Maynooth Rail Line and the Royal Canal forming the northern boundary also for much of the Study Area until they both change direction from running east to west to north to south in a slow bend through the Study Area. Four potential crossing points of the railway line and canal were explored within the Study Area. The boundary wall of Luttrellstown Castle forms the southern boundary for much of the Study Area.

Figure 4.2.1: Kellystown Road Study Area (also attached as Drawing No 18015 CSE GEN ZZ DR C 1050 in Appendix A)

Figure 4.2.2: Kellystown Road - Known Constraints (see also Drawing No 18_015_CSE_GEN_ZZ_DR_C_1012 in Appendix A)

### 4.3 Natural Constraints (Environmental)

### 4.3.1 Designated Sites \& Protected Areas

The following sub-sections provide information on the European Sites, Natural Heritage Areas (NHA) and proposed Natural Heritage Areas (pNHAs) occurring in the wider area surrounding the Study Area.

## European Sites

The Natural Habitat Regulations S.I. 94/1997 provide the legal basis for the protection of habitats and species of European importance. The legislative protection of habitats and species provided by the Habitats Directive has been implemented in Ireland and throughout Europe through the establishment of a network of designated conservation areas known as the Natura 2000 (N2K) network. The N2K network includes sites designated as Special Areas of Conservation (SACs), under the EU Habitats Directive and Special Protection Areas (SPAs) designated under the EU Birds Directive.

SACs are designated in areas that support habitats listed on Annex I and/or species listed on Annex II of the Habitats Directive. The Annex I habitats and Annex II species for which an SAC is designated are referred to as the qualifying features of interest. SPAs are designated in areas that support: $1 \%$ or more of the all-Ireland population of bird species listed on Annex I of the EU Birds Directive; 1\% or more of the population of a migratory species; and more than 20,000 waterfowl. The bird species and wetland habitats for which SPAs are designated are referred to as Special Conservation Interests (SCIs). Under the Habitat Regulations SACs, including candidate SACs (cSACs) and SPAs are referred to as European Sites.

The evaluation of the nature conservation value of designated conservation areas follows the guidelines outlined in the NRA guidance document Guidelines for Assessment of Ecological Impacts of National Road Schemes (NRA, 2009). These guidelines identify European Sites (SACs \& SPAs) as being of international conservation value (Rating A) and NHAs and pNHAs as being of national conservation value (Rating $B$ ).

A total of four European Sites have been identified within 15 km of the Study Area. A 15 km buffer zone was chosen as a precautionary measure, to ensure that all potentially affected European sites are included in this constraints identification process, as recommended under the best practice publication Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities (DoEHLG, 2010). A preliminary high level assessment is provided in Table 4.3.1.1 to identify those European Sites that are likely to occur within the sphere of influence of a proposed road scheme within the Study Area. At this stage only those European Sites located within or downstream of the Study Area are identified as occurring within the sphere of influence of proposed road project in this area.

The Study Area is located within the River Liffey catchment and surface watercourses draining the Study Area discharge to the River Liffey. The River Liffey, in turn discharges to the Dublin Bay at the Liffey Estuary. Most of the water runoff generated at the Study Area flows via drains to a series of ponds at Luttrellstown Estate and Golf Club before discharging to the River Liffey. The River Liffey in turn drains to Dublin Bay and the South Dublin Bay SAC and the South Dublin Bay River Tolka Estuary SPA.

| Site | Distance (km) | Hydrological Link | Sphere of Influence |
| :--- | :--- | :--- | :--- |
| SACs |  |  |  |
| Rye Water Valley SAC | 3.4 to the west | No | No |
| Glenasmole Valley <br> SAC | 13.7 to the south | No | No |
| South Dublin Bay | 13.8 to the east | Yes | Yes |
| SPAs | 13.8 | Yes |  |
|  <br> Tolka Estuary | 1 | Yes |  |

Table 4.3.1.1: European Sites within a 15km Radius of the Study Area

The qualifying features of interest of the South Dublin Bay SAC are:

- Mudflats and sandflats not covered by seawater at low tide [1140]
- Annual vegetation of drift lines [1210]
- Salicornia and other annuals colonising mud and sand [1310]
- Embryonic shifting dunes [2110]

The special conservation interests of the South Dublin Bay River Tolka Estuary SPA are:

- Light-bellied Brent Goose (Branta bernicla hrota)
- Oystercatcher (Haematopus ostralegus)
- $\quad$ Ringed Plover (Charadrius hiaticula)
- Grey Plover (Pluvialis squatarola)
- Knot (Calidris canutus)
- Sanderling (Calidris alba)
- Dunlin (Calidris alpina)
- Bar-tailed Godwit (Limosa lapponica)
- Redshank (Tringa totanus)
- Black-headed Gull (Croicocephalus ridibundus)
- Roseate Tern (Sterna dougallii)
- Common Tern (Sterna hirundo)
- Arctic Tern (Sterna paradisaea


## Natural Heritage Areas

No NHAs occur within or within the wider area surrounding the Study Area. A total of eleven pNHAs occur within a 15 km radius of the project site. These pNHAs are identified in Table 4.3.1.2 and a preliminary identification of those occurring within the sphere of influence of a proposed road project in Study Area is also provided. pNHAs are deemed to occur in the sphere of influence of the project where:

- They are located within the study area.
- Where a hydrological pathway exists between the study area and the study area

| Site | Distance (km) | Hydrological Link | Sphere of Influence |
| :--- | :--- | :--- | :--- |
| Dodder Valley | 13.5 | No | No |
| Glenasmole Valley | 13.7 | No | No |
| Grand Canal | 5 | No | No |
| Lugmore Glen | 12.5 | No | No |
| Liffey Valley | 1 | No | No |
| North Dublin Bay | 13.5 | No | No |
| Rye Water Valley | 3.4 | No | No |
| Royal Canal | 0.1 | Yes | Yes |
| Santry Demesne | 11.5 | No | No |
| Slade of Saggart and <br> Crooked Glen | 12.5 | No | No |
| South Dublin Bay | 13.8 | Yes | Yes |

Table 4.3.1.2: pNHAs within a 15 km radius of the Study Area
As outlined in Table 4.3.1.2 the most relevant nationally designated site to the Study Area is the Royal Canal pNHA and the Liffey Valley pNHA. A section of the Royal Canal pNHA is located within the Study Area, while the Study Area is located within the catchment of the Liffey Valley pNHA.

### 4.3.2 Topography \& Landscape

### 4.3.2.1 Introduction

The site assessment was undertaken in May 2018.

### 4.3.2.2 Planning Context

An appreciation of the 'weight' to be attributed to any landscape and visual effects arising from development starts with an understanding of the planning context within which any such development is to be tested for its acceptability. Fingal Development Plan (2017-2023) is the current relevant development plan for the site. The Plan identifies "Management of the County's varied landscapes so that change maintains and enhances landscapes of high-quality and improves landscapes." as a key environmental challenge.

The Statutory Process for preparation of the Kellystown Local Area Plan (LAP) has not commenced at present. Specific to the Kellystown area are the aims to be included in the Local Area Plan:
"• Protect the rural character and setting of Luttrellstown Road and enhance its use for pedestrians and cycling.

- Provide a study of the trees, hedgerows and other features of biodiversity value suitable for retention and a programme agreed with the Council's Biodiversity Officer as to how these features can be protected or improved and the biodiversity value of the Canal maintained or improved."


### 4.3.2.3 Preserved Views

The Landscape Character Assessment identifies the Preserved View along the Strawberry Beds Road (Lower Road) 1-1.5km south of the Study Area. There are no preserved views within the Study Area.

### 4.3.2.4 Protect and Preserve Trees, Woodlands, and Hedgerows

The current Fingal Development Plan 2017-2023 identifies a number of trees and hedgerows within the Study Area to be protected and preserved. These mostly fall within the lands between Barberstown Lane and Clonsilla Road, with some in close proximity to the Luttrellstown Road.

### 4.3.2.5 Topography and Landscape of the Constraints Study Area

The Study Area is generally flat and low lying. The lands typically range in elevation from approximately 58 m OD to the west of the Barberstown Level Crossing, to a low of approximately 52m OD on Luttrellstown Road, 58 m OD on Clonsilla Road, and reach a maximum level of 63 m at the tie-in to the Porterstown Link Road at the eastern extent of the Study Area.

The Study Area occurs to the north of the Liffey Valley in the townlands of Kellystown, Clonsilla and Westmanstown, Co. Dublin and is dominated by grassland habitat throughout its extent. The agricultural land use is dominated by pasture grassland grazed by cattle. Areas of cultivated land in the form of allotments and amenity grassland in the form of playing fields and landscaped gardens of private dwellings also occur. Land boundaries within the Study Area are dominated by hedgerows and treelines. The Sligo/Maynooth to Dublin railway corridor forms the northern boundary of the Study Area, while the R121 Luttrellstown Road regional route forms the southern boundary.

### 4.3.3 Hydrology

### 4.3.3.1 Hydrological Environment

On April 17th 2018 the Government published the River Basin Management Plan for Ireland 20182021. The Plan sets out the actions that Ireland will take to improve water quality and achieve 'good' ecological status in water bodies (rivers, lakes, estuaries and coastal waters) by 2027. Under this Plan the former Eastern, South Eastern, South Western, Western and Shannon River Basin Districts will be merged to form one national River Basin District (RBD). The Study Area is located within what was formerly the Eastern River Basin District (ERBD), now the proposed National RBD, in Hydrometric Area No. 09 of the Irish River Network. It is within the River Liffey and Dublin Bay catchment, and is located within the Liffey sub-catchment "Liffey-180" as denoted under the Water Framework Directive. The Royal Canal is located to the north of the majority of the Study Area but flows through the western end of this area.

The River Liffey catchment encompasses an area of approximately $1,369 \mathrm{~km}^{2}$. The river extends from the mountains of Kippure and Tonduff in County Wicklow to the sea at Dublin Bay. The main channel covers a distance of approximately 120 km and numerous tributaries enter along its course.

In accordance with the Water Framework Directive (WFD), each river catchment within the ERBD was assessed and a water management plan detailing the programme of measures was put in place for each. For the River Liffey WMU (Water Management Unit) the main pressure preventing achievement of 'Good Status' is diffuse agricultural pollution.

From a review of the Environmental Protection Agency (EPA) Envision Database, there are water quality monitoring points on the River Liffey downstream of the Study Area before the county boundary between Fingal and Dublin City. There is no water quality monitoring upstream of the Study Area.

### 4.3.3.2 Flooding

## Fluvial Flooding

An unnamed stream (referred to as Barnhill Stream in the 'Barnhill Strategic Flood Risk Assessment' report that was carried out for the Barnhill LAP) enters the Study Area from the west, runs in an open channel in a south-easterly direction through the Study Area before entering a long culvert under Royal Canal and the Maynooth Dublin railway line. Downstream of the railway, the stream continues to flow in a south-easterly directions towards the River Liffey.

The unnamed stream enters the Barnhill site (outlined in red on Figure 4.3.3) from the west through three culverts; a 1.2 m wide arch culvert and twin 600 mm pipes located at a slightly higher level. The open channel of the stream in this area is about 3 m wide and 2 m deep. The stream enters a 1.2 m diameter culvert and then a 1.7 m wide arch culvert under the local road close to the southern boundary of the Barnhill site. Further downstream, it enters a long culvert under the canal and railway. The size of the culvert is believed to be 1 m in diameter. Downstream of the railway, the stream enters an arch culvert under local access road.

The flood modelling carried out for the 'Barnhill Strategic Flood Risk Assessment' shows that there are areas of low-lying lands located to the north and south of the existing stream that are liable to flooding. The flooding is largely caused by the limited capacity of the culvert under the canal and railway. Analysis was undertaken of the proposed Ongar Barnhill Road scheme to determine the effect on the flood plain. The analysis indicates that the road embankment will displace some flood water during
events in excess of the 1 in 25 year return period and is suggested that compensatory storage be provided for.

This stream is the only known waterway with potential for fluvial flooding in the Study Area.


Figure 4.3.3: 1000 Year RP + Climate Change Flood Map with proposed Ongar Barnhill Road in Place

## Pluvial Flooding

Pluvial flooding is usually caused by intense rainfall that may only last a few hours. The resulting water follows natural valley lines, creating flow paths along roads and through and around developments and ponding in low spots, which often coincide with fluvial floodplains in low lying areas. Any areas at risk from fluvial flooding will almost certainly be at risk from pluvial flooding.

## Groundwater Flooding

Groundwater flooding can be due to high water tables and increased recharge following long periods of wet weather. Groundwater flooding typically occurs in areas underlain by limestone and where underlying geology is highly permeable with high capacity to receive and store rainfall. The study area is not affected by groundwater flooding, according to the Groundwater Data Viewer available at dcenr.maps.arcgis.com.

### 4.3.4 Lands, Soils \& Geology

### 4.3.4.1 Sources of Information

Desk-based geological information on the substrata (both Quaternary deposits and bedrock geology) underlying the extent of the site was obtained through accessing databases and other archives where available. Data was sourced from the following:

- Geological Survey of Ireland (GSI) - on-line mapping, Geo-hazard Database, Geological Heritage Sites \& Sites of Special Scientific Interest, Bedrock Memoirs and 1:100,000 mapping;
- Teagasc soil and subsoil database;
- Ordnance Survey Ireland - aerial photographs and historical mapping;
- Environmental Protection Agency (EPA) - website mapping and database information;
- National Parks and Wildlife Services (NPWS) - Protected Site Register.


### 4.3.4.2 Baseline Land, Soils and Geology

## Land and Subsoils

The constraints Study Area is generally flat and low lying. The lands typically range in elevation from approximately 58 m OD to the west of the Barberstown Level Crossing, to a low of approximately 52 m OD on Luttrellstown Road, 58 m OD on Clonsilla Road, and reach a maximum level of 63 m at the tie-in to the Porterstown Link Road at the eastern extent of the Study Area.

The Study Area occurs to the north of the Liffey Valley in the townlands of Kellystown, Clonsilla and Westmanstown, Co. Dublin and is dominated by grassland habitat throughout its extent. The agricultural land use is dominated by pasture grassland grazed by cattle. Areas of cultivated land in the form of allotments and amenity grassland in the form of playing fields and landscaped gardens of private dwellings also occur. Land boundaries within the Study Area are dominated by hedgerows and treelines. The Clonsilla to Dublin railway corridor forms the northern boundary of the Study Area, while the R121 Regional Road forms the southern boundary.

Overall, this whole area is underlain by fine loamy drift with limestones. Based on a review of the GSI aquifer vulnerability maps for the area, it is assessed that the subsoil is generally not greater than 10 metres in thickness, with exposed rock in places.

## Bedrock Geology

The bedrock geology of the area consists predominately of limestones and shale. The bedrock geology including formation names for distinct geological units under the scheme are presented in Figure 4.3.4 below.


Figure 4.3.4: Bedrock Geology Map
The Kellystown area is underlain by Tober Colleen Formation of Calcareous shale, limestone conglomerate (green). The rest of the Study Area is Lucan Formation of dark limestone and shale (very light green).

The Ballysteen Formation underlies the majority of the Study Area and comprises of dark-grey bioclastic limestone and subsidiary shale from the same era.

The Carrighill Formation underlies the southern and south-easterly portion of the Study Area. The Carrighill Formation is made up of deep marine turbidite sequence; mudstone, greywacke \& conglomerate.

### 4.3.4.3 Geological Heritage Sites and Protected Habitats

There are no recorded geological heritage sites within the Study Area. The closest geological heritage site is Mulhuddart Well which is 3.5 km from the Study Area.

### 4.3.4.4 Quarrying

There are no quarries within the Study Area. The closest current prospecting licence designated 'Open - Exploration Incentives' is 3.5 km from the Study Area.

### 4.3.4.5 Integrated Pollution Prevention and Control (IPPC)/ Industrial Emissions Directive (IED) Sites and Licensed Waste Facilities

There are no registered IPPC/IED sites and licenced waste facilities noted within the Study Area. The closest licenced sites are 3.5 km and 7 km from the Study Area.

### 4.3.4.6 Agricultural Land Use

A significant portion of the Study Area is currently used for agricultural use. The Study Area is underlain by moderately drained and moderate fertility soils.

### 4.3.5 Hydrogeology

This section identifies any existing constraints in terms of the underlying hydrogeological conditions. This study is based on a desk top assessment.


Figure 4.3.5.1: Aquifer Classification Map
In the Kellystown area, the aquifer is classified as 'Pl' 'Poor Aquifer - Bedrock which is Generally Unproductive except for Local Zones' (lightest beige) and for the rest of the Study Area the aquifer is 'Ll' "locally important aquifer" which is 'moderately productive only in local zones' (beige).

### 4.3.5.1 Aquifer Vulnerability

The bedrock geology predominately consists of limestone and shale. This is overlain by made ground, glacial deposits/tills and alluvium. A review of the subsoil thickness indicates depth to bedrock is generally not greater than 10 metres below land surface with exposed rock/near surface rock in places. The vulnerability of the aquifer ranges from "moderate to extreme" across the constraints Study Area, as sourced from the Environmental Protection Agency maps found at gis.epa.ie. Table 4.3.5.1 below explains the range of permeability and thickness of subsoils that result in aquifer classifications.

| Vulnerability <br> Rating | Hydrogeological Conditions |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Subsoil Permeability (Type) and Thickness |  |  |  |  |  | Unsaturated <br> Zone | Karst <br> Features |
|  | High <br> permeability <br> (sand/gravel) | Moderate <br> permeability <br> (e.g. Sandy subsoil) | Low permeability <br> (e.g. Clayey subsoil, <br> clay, peat) | (Sand/gravel <br> aquifers <br> only) | $(<30 \mathrm{~m}$ <br> radius) |  |  |  |
|  | $0-3.0 \mathrm{~m}$ | $0-3.0 \mathrm{~m}$ | $0-3.0 \mathrm{~m}$ | $0-3.0 \mathrm{~m}$ | - |  |  |  |
| High (H) | $>3.0 \mathrm{~m}$ | $3.0-10.0 \mathrm{~m}$ | $3.0-5.0 \mathrm{~m}$ | $>3.0 \mathrm{~m}$ | $\mathrm{~N} / \mathrm{A}$ |  |  |  |
| Moderate (M) | $\mathrm{N} / \mathrm{A}$ | $>10.0 \mathrm{~m}$ | $5.0-10.0 \mathrm{~m}$ | $\mathrm{~N} / \mathrm{A}$ | $\mathrm{N} / \mathrm{A}$ |  |  |  |
| Low (L) | $\mathrm{N} / \mathrm{A}$ | $\mathrm{N} / \mathrm{A}$ | $>10.0 \mathrm{~m}$ | $\mathrm{~N} / \mathrm{A}$ | $\mathrm{N} / \mathrm{A}$ |  |  |  |

Notes: (1) N/A = not applicable.
(2) Precise permeability values cannot be given at present.
(3) Release point of contaminants is assumed to be $1-2 \mathrm{~m}$ below ground surface.

## Table 4.3.5.1: Groundwater Vulnerability Guidelines



Figure 4.3.5.2: Aquifer Vulnerability Map

Figure 4.3.5.2 shows that much of the northern half of the constraints Study Area is an area of 'Extreme' (pale pink) and 'High' (orange ) aquifer vulnerability. The rest of the Study Area is an area of 'Moderate' (yellow) vulnerability. The dark pink denoted 'rock at or near the surface or karst'.

### 4.3.5.2 Water Supplies

There are no regional groundwater supplies or SPA identified within the Study Area. The nearest SPA site is at Dunboyne 4 km from the Study Area, and this source is not connected to the Study Area.


Figure 4.3.5.3: GSI Well Data Map
The GSI Well Card Index is a record of wells drilled in Ireland. It is noted that this record is not comprehensive, as licensing of wells is not currently a requirement in Ireland. This current index shows springs and wells drilled near the Study Area. The nearest recorded wells located in close proximity of the Study Area are presented in Figure 4.3.5.2 above as black circles. There is one located in Clonsilla, and a number to the west of the map extents.

### 4.3.5.3 Water Framework Directive Water Status

The Water Framework Directive (WFD) classification scheme for water quality includes five status classes: high, good, moderate, poor, and bad. 'High status' is defined as the biological, chemical and morphological conditions associated with no or very low human pressure. This is also called the 'reference condition' as it is the best status achievable - the benchmark. These reference conditions are type-specific, so they are different for different types of rivers, lakes or coastal waters so as to take into account the broad diversity of ecological regions in Europe.

Assessment of quality is based on the extent of deviation from these reference conditions, following the definitions in the Directive. 'Good status' means 'slight' deviation, 'moderate status' means 'moderate' deviation, and so on. The definition of ecological status takes into account specific aspects of the biological quality elements, for example "composition and abundance of aquatic flora" or "composition, abundance and age structure of fish fauna". Data from the Irish Water Framework Directive (WFD) monitoring programmes for Groundwater, Rivers, Lakes, Transitional and Coastal Waters are used by the Environmental Protection Agency (EPA) to determine status for all water bodies.

The groundwater body in the Kellystown area has been assigned 'Good' status, see Figure 4.3.5.3 below, sourced from EPA maps at gis.epa.ie. The relevant European code is IE_EA_G_008.


Figure 4.3.5.4: Groundwater body status map of the surrounding area

### 4.3.6 Ecology

### 4.3.6.1 Introduction \& Methodology

Mr Pat Doherty, MSc, MCIEEM of Doherty Environmental Consultants Ltd., as part of the Clifton Scannell Emerson Associates design team, undertook this ecological constraints study in May 2018. The specific objective of this study is to identify the international, national, county and local ecological constraints occurring within the Study Area so that a sensitive scheme design, which aims to minimise adverse ecological effects, can be prepared from the outset. This was desk-based study that involved collating and reviewing publicly available baseline ecological data for the study area.

A walkover field survey was completed of the study area on the 8th May 2018. The purpose of the walkover survey was to ground-truth the broad habitat types identified during the desk study and to map any significant differences in land cover from that identified during the desk study.

The National Parks and Wildlife Service (NPWS) GIS shapefile for designated conservation areas in Ireland was downloaded and mapped onto a project GIS database to identify the location of all Designated Conservation Areas (DCAs) occurring within and adjacent to the study area.

DCA's in Ireland include European Sites i.e. Special Areas of Conservation (SACs) Special Protection Areas (SPAs), Natural Heritage Areas (NHAs), proposed NHAs and Statutory Nature Reserves (SNRs).

Habitat shapefiles from national datasets published by the Department of Culture, Heritage and the Gaeltacht were also downloaded from the website data.gov.ie and mapped onto the project GIS database. The datasets downloaded and reviewed include:

- Ancient and Long-established Woodland Inventory 2010;
- Irish Semi-natural Grassland Survey 2007 - 2012;
- National Survey of Native Woodlands 2003-2008; and
- National Juniper Survey 2009 - 2012.


### 4.3.6.2 Desktop Study

## Habitat Mapping

Land cover occurring within the study area has been examined using aerial photography, Ordnance survey maps and historical maps. GIS data, published by the NPWS, for habitats listed on Annex 1 of the EU Habitats Directive or other semi-natural habitats have been downloaded and reviewed to establish the occurrence of any such habitats within or adjacent to the study area. The lists of habitat datasets reviewed are provided in Section 4.3.6.1 above. The Environmental Protection Agency's (EPA) published shapefile for watercourses was also reviewed to identified the presence of streams and rivers within or adjacent to the Study Area.

Following the review of the above information sources a draft, desk-based habitat map was prepared prior to completing a field walkover survey. The classification of habitats identified during this deskbased exercise follows the Heritage Council's A Guide to Habitats in Ireland and EU Habitats Directive habitat code and name for Annex 1 habitats.

## Fauna \& Flora

A range of data sources were reviewed to identify records of rare and protected fauna and flora. These sources include:

- A review of National Parks and Wildlife Service (NPWS) Protected Species Records for the four 10km squares;
- A review of Biodiversity Ireland Species Report for the four hectads O14, 015, O24 and O25;
- A review of Bat Conservation Ireland Records for the study area;
- A review of BirdWatch Ireland Records;
- A review of IFI Reports
- A review of ecological reports associated with previous planning applications made in the study area (with particular emphasis placed on information gathered for the Metro North Environmental Impact Statement (2008) and the Swords WWTP Appropriate Assessment (2012).


## Ecological Evaluation

The nature conservation value of habitats and ecological sites occurring within the study area are based upon an established geographic hierarchy of importance as outlined by the National Roads Authorities (NRA, 2009). The outline of this geographic hierarchy is provided below and this has been used to determine ecological value in line with the ecological valuation examples provided by the NRA (see NRA, 2009). The geographic evaluation hierarchy is as follows:

- International Sites (Rating A);
- National Importance (Rating B);
- County Importance (Rating C);
- Local Importance (higher value) (Rating D); and
- Local Importance (lower value) (Rating E).


### 4.3.6.3 Terrestrial Habitats

Generic descriptions of each of the terrestrial habitats identified during the desk-based review are provided in the following subsections. An outline evaluation of each of these habitats is provided also provided.

## Freshwater Habitats

The Barnhill Stream flows east along the western boundary of the Study Area. No other watercourses occur within the Study Area. This stream flows into the artificial ponds within Luttrellstown Castle and Golf Club. The waters from these ponds eventually drain into the River Liffey. The confluence of these waters and the River Liffey is located within the Liffey Valley pNHA. The Royal Canal is located to the north of the Study Area in the townlands of Kellystown and Clonsilla and flows through the Study Area in the townland of Westmanstown. The Royal Canal is a pNHA.

Drainage ditches occur throughout the Study Area along hedgerow field boundaries. Many of these drainage ditch are ephemeral and only convey water during times of spate. The majority of them were dry during the field walkover survey in early May 2018.

## Grassland

Grassland habitats occurring in the Study Area are dominated by improved agricultural grassland (GA1) and amenity grassland (GA2) in the form of amenity parks and private garden. These grassland habitats are intensively managed for agricultural or recreational purposes and generally support a restricted range of species indicative of enriched conditions. These habitats are of low nature conservation value and are, based on our assessment, at most representative of local importance (lower value) - Rating E.

## Woodland

Woodland habitats occurring within the Study Area include semi-natural woodland (WN), non-native woodland (WD), scrub (WS1), treelines (WL2) and hedgerows (WL1).

Hedgerow and treeline field boundaries occurring throughout the Study Area are important for their role in supporting wildlife and connecting habitat patches in a landscape that is otherwise intensively managed. Many of the field boundary linear habitats within the Study Area are associated with old estates and their boundaries and support mature standard trees from a range of different species. These field boundaries and trees have potential to support nesting birds and roosting bats. In light of the above these linear woodland habitats are considered to be of, at least, local (high value) (Rating D) importance.

## Cultivated Land

Cultivated land in the form of arable crops (BC1) is located towards the centre of the Study Area. This land is intensively managed and subject to routine disturbance. Based on the desk study and initial walkover survey this habitat is considered to be representative of local (lower value) (Rating E) importance.

## Built Land and Artificial Surfaces

Built land and artificial surfaces (BL3) consists mainly of period houses, out-houses and farm buildings. The majority of the structures occurring within the Study Area have high potential to support roosting bats and nesting bird species, particularly summer migrants such as swallows, swifts and house martins. It is likely that some of the out-buildings and farm sheds associated with the old estates in the Study Area have the potential to support barn owls. As such the structures within the Study Area are provisionally considered to be of at least local importance (Rating D).

### 4.3.6.4 Protected \& Threatened Plant Species

The Study Area is located within the hectad (i.e. the 10km² grid) 003. All hectads are labelled in Ireland by Ordnance Survey Ireland. The National Biodiversity Data Centre (NBDC) records for the hectad O03 were searched for the presence of protected and threatened plant species occurring within this hectad. Certain plant species in Ireland are afforded statutory protection under the Flora Protection Order (FPO) 2015. Schedule A and B of the FPO list the species of vascular and lower plants protected in Ireland. In addition to these the Irish Red Data Book for Vascular Plants (Curtis \& McGough, 1988) lists all threatened vascular plant species in Ireland. All threatened bryophytes in Ireland are listed by Lockhart et al. (2012). Records for the following protected and/or threatened flowering plants were identified:

- Green Figwort (Scrophularia umbrosa): threatened species. This species occurs in moist woodland and by freshwater habitats. The potential for this species to occur within the study area is likely to be limited.
- Hairy St John's-wort (Hypericum hirsutum): endangered species, protected under the Flora Protection Order. This species occurs in calcareous grassland and in scrub and open woodlands.
- Lamiastrum galeobdolon subsp. Montanum: threatened species. This species is generally associated with area of undisturbed and long established woodland.
- Meadow Barley (Hordeum secalinum): protected under the Flora Protection Order. This species generally occurs in old meadows and in coastal areas. It is not likely to occur within the study area.
- Opposite-leaved Pondweed (Groenlandia densa): protected under the Flora Protection Order. This species occurs in aquatic habitats and the potential for it to occur within the study area is likely to be limited and
- Spring Vetch (Vicia lathyroides): vulnerable species. This species generally occurs in dry sandy grassland, especially by the sea and the potential for it to occur within the study area is likely to be limited.

Records for the following threatened or protected lower plants were identified:

- Fringed Heartwort (Ricciocarpos natans): a near threatened liverwort species. This species occurs in mineral rich pools, ditches, canals and slow-flowing streams. Suitable habitat for this species occurs within the study area. and
- Ribbonwort (Pallavicinia lyellii): protected under the Flora Protection Order and an endangered liverwort species. This species occurs in woodlands either on sandstone, damp, sandy soil or leaf litter. It
- Hook-beak Tufa-moss (Hymenostylium recurvirostrum): a near threatened moss species. This species is associated with tufa springs in upland habitats. However it is also known to occur on the mortar of old walls, the latter of which occur within the study area.
- Lance-leaved Pottia (Tortula lanceola): a critically endangered moss species. This species occurs on well-drained, disturbed calcareous soils. The potential for it to occur in the study area is likely to be limited.
- Many-seasoned Thread-moss (Bryum intermedium): protected under the Flora Protection Order and an endangered liverwort species. This species favours areas polluted by metals and is not likely to occur in the study area.


### 4.3.6.5 Protected and Threatened Fauna

The NBDC was searched for records of protected and threatened fauna within the hectad O03 in which the Study Area is located. Table 4.3.6.1 lists all records for such fauna species held by the NBDC.

| Species name | Date of last <br> record | Title of dataset | Designation | Likelihood of occurring within <br> the study area |
| :--- | :--- | :--- | :--- | :--- |
| Common Frog <br> (Rana <br> temporaria) | 41479 | Amphibians and <br> reptiles of <br> Ireland | Protected Species: EU Habitats <br> Directive \|| Protected Species: EU <br> Habitats Directive >> Annex V \|| <br> Protected Species: Wildlife Acts | Likely to occur in association <br> with stagnant drainage ditch <br> and the Royal Canal. |
| Smooth Newt <br> (Lissotriton <br> vulgaris) | $18 / 05 / 2012$ | Ireland's <br> BioBlitz | Protected Species: Wildlife Acts | Likely to occur in association <br> with drainage ditch and the <br> Royal Canal. |
| Barn Owl <br> (Tyto alba) | $29 / 04 / 2014$ | Birds of Ireland | Protected Species: Wildlife Acts \|| <br> Threatened Species: Birds of <br> Conservation Concern \|| Threatened <br> Species: Birds of Conservation <br> Concern >> Birds of Conservation <br> Concern - Red List | Agricultural buildings <br> associated with estates in the <br> study area may have the <br> potential to support barn owl <br> nest sites. Suitable foraging <br> habitat occurs in the study <br> area. |
| Barn Swallow <br> (Hirundo <br> rustica) | $16 / 09 / 2017$ | Birds of Ireland | Protected Species: Wildlife Acts \|| <br> Threatened Species: Birds of <br> Conservation Concern \|| Threatened <br> Species: Birds of Conservation <br> Concern >> Birds of Conservation <br> Concern - Amber List | Agricultural buildings have the <br> potential to support breeding <br> swallows. Suitable foraging <br> habitat occurs in the study <br> area. |


| Black-headed Gull (Larus ridibundus) | 25/10/2013 | Birds of Ireland | Protected Species: Wildlife Acts \|| <br> Threatened Species: Birds of Conservation Concern \|| Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List | May forage opportunistically in grassland habitats. |
| :---: | :---: | :---: | :---: | :---: |
| Common Coot (Fulica atra) | 31/12/2011 | $\begin{aligned} & \text { Bird Atlas } 2007 \text { - } \\ & 2011 \end{aligned}$ | Protected Species: Wildlife Acts \|| <br> Protected Species: EU Birds Directive <br> \|| Protected Species: EU Birds <br> Directive >> Annex II, Section I Bird <br> Species \|| Protected Species: EU <br> Birds Directive >> Annex III, Section II <br> Bird Species \|| Threatened Species: <br> Birds of Conservation Concern \|| <br> Threatened Species: Birds of <br> Conservation Concern >> Birds of <br> Conservation Concern - Amber List | Likely to be supported by the section of the Royal Canal within the study area. |
| Common Grasshopper Warbler (Locustella naevia) | 31/12/2011 | $\begin{aligned} & \text { Bird Atlas } 2007 \text { - } \\ & 2011 \end{aligned}$ | Protected Species: Wildlife Acts \|| <br> Threatened Species: Birds of Conservation Concern \|| Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List | Potential to occur in woodland habitats in less disturbed areas of the study area. |
| Common Kestrel (Falco tinnunculus) | 27/11/2014 | Birds of Ireland | Protected Species: Wildlife Acts \|| <br> Threatened Species: Birds of Conservation Concern \|| Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List | Likely to forage within the study area. Mature trees provide potential nest sites within the study area. |
| Common Kingfisher (Alcedo atthis) | 30/11/2014 | Birds of Ireland | Protected Species: Wildlife Acts \|| <br> Protected Species: EU Birds Directive <br> \|| Protected Species: EU Birds <br> Directive >> Annex I Bird Species \|| <br> Threatened Species: Birds of <br> Conservation Concern \|| Threatened <br> Species: Birds of Conservation <br> Concern >> Birds of Conservation <br> Concern - Amber List | Known to forage along the Royal Canal and likely to forage within the section occurring in the study area. |
| Common Linnet (Carduelis cannabina) | 31/12/2011 | $\begin{aligned} & \text { Bird Atlas } 2007 \text { - } \\ & 2011 \end{aligned}$ | Protected Species: Wildlife Acts \|| <br> Threatened Species: Birds of Conservation Concern \|| Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List | Likely to occur in the study area, especially during winter. |
| Common Pheasant (Phasianus colchicus) | 24/10/2014 | Birds of Ireland | Protected Species: Wildlife Acts \|| <br> Protected Species: EU Birds Directive <br> \|| Protected Species: EU Birds <br> Directive >> Annex II, Section I Bird <br> Species \|| Protected Species: EU <br> Birds Directive >> Annex III, Section I <br> Bird Species | Likely to occur within the study area. |


| Common <br> Pochard <br> (Aythya ferina) | 31/12/2011 | Bird Atlas 2007- $2011$ | Protected Species: Wildlife Acts \|| <br> Protected Species: EU Birds Directive <br> \|| Protected Species: EU Birds <br> Directive >> Annex II, Section I Bird <br> Species \|| Protected Species: EU <br> Birds Directive >> Annex III, Section II <br> Bird Species \|| Threatened Species: <br> Birds of Conservation Concern \|| <br> Threatened Species: Birds of <br> Conservation Concern >> Birds of <br> Conservation Concern - Amber List | Royal Canal provides suitable habitat for this species. |
| :---: | :---: | :---: | :---: | :---: |
| Common <br> Redshank <br> (Tringa <br> totanus) | 31/12/2011 | $\begin{aligned} & \text { Bird Atlas } 2007 \text { - } \\ & 2011 \end{aligned}$ | Protected Species: Wildlife Acts \|| <br> Threatened Species: Birds of Conservation Concern \|| Threatened <br> Species: Birds of Conservation <br> Concern >> Birds of Conservation <br> Concern - Red List | Not likely to rely on the study area for breeding, roosting or foraging habitat. |
| Common <br> Snipe <br> (Gallinago <br> gallinago) | 17/12/2016 | Birds of Ireland | Protected Species: Wildlife Acts \|| Protected Species: EU Birds Directive || Protected Species: EU Birds Directive >> Annex II, Section I Bird Species || Protected Species: EU Birds Directive >> Annex III, Section III Bird Species || Threatened Species: Birds of Conservation Concern || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern Amber List | May occur in grassland habitat but the suitability of the habitat is low. |
| Common Starling (Sturnus vulgaris) | 16/09/2017 | Birds of Ireland | Protected Species: Wildlife Acts \|| <br> Threatened Species: Birds of Conservation Concern \|| Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List | Likely to occur in the study area during breeding and winter season. |
| Common Swift (Apus apus) | 18/05/2012 | Ireland's BioBlitz | Protected Species: Wildlife Acts \|| <br> Threatened Species: Birds of Conservation Concern \|| Threatened <br> Species: Birds of Conservation <br> Concern >> Birds of Conservation <br> Concern - Amber List | Buildings within the study area have the potential to support breeding swift. Likely to forage over the study area. |
| Common Wood Pigeon (Columba palumbus) | 04/06/2017 | Birds of Ireland | Protected Species: Wildlife Acts \|| Protected Species: EU Birds Directive || Protected Species: EU Birds Directive >> Annex II, Section I Bird Species || Protected Species: EU Birds Directive >> Annex III, Section I Bird Species | Suitable woodland habitat occurs throughout the study area. |
| Corn Crake (Crex crex) | 31/07/1991 | The Second Atlas of Breeding Birds in Britain and Ireland: 19881991 | Protected Species: Wildlife Acts \|| Protected Species: EU Birds Directive || Protected Species: EU Birds Directive >> Annex I Bird Species || <br> Threatened Species: Birds of Conservation Concern \|| Threatened | Not likely to occur in the study area. No recent records for this species in the wider area. |


|  |  |  | Species: Birds of Conservation <br> Concern >> Birds of Conservation <br> Concern - Red List |  |
| :---: | :---: | :---: | :---: | :---: |
| Eurasian Curlew (Numenius arquata) | 29/02/1984 | The First Atlas of Wintering Birds in Britain and Ireland: 1981/821983/84. | Protected Species: Wildlife Acts \|| <br> Protected Species: EU Birds Directive <br> \|| Protected Species: EU Birds <br> Directive >> Annex II, Section II Bird <br> Species \|| Threatened Species: Birds <br> of Conservation Concern \|| <br> Threatened Species: Birds of <br> Conservation Concern >> Birds of <br> Conservation Concern - Red List | May forage opportunistically in grassland habitat in the study area. Not likely to rely on the study area for breeding, roosting or foraging habitat. |
| Eurasian Oystercatcher (Haematopus ostralegus) | 29/02/1984 | The First Atlas of Wintering Birds in Britain and Ireland: 1981/821983/84. | Protected Species: Wildlife Acts \|| <br> Threatened Species: Birds of Conservation Concern \|| Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List | May forage opportunistically in grassland habitat in the study area. Not likely to rely on the study area for breeding, roosting or foraging habitat. |
| Eurasian Teal <br> (Anas crecca) | 31/12/2011 | $\begin{aligned} & \text { Bird Atlas } 2007 \text { - } \\ & 2011 \end{aligned}$ | Protected Species: Wildlife Acts \|| <br> Protected Species: EU Birds Directive <br> \|| Protected Species: EU Birds <br> Directive >> Annex II, Section I Bird <br> Species \|| Protected Species: EU <br> Birds Directive >> Annex III, Section II <br> Bird Species \|| Threatened Species: <br> Birds of Conservation Concern \|| <br> Threatened Species: Birds of <br> Conservation Concern >> Birds of <br> Conservation Concern - Amber List | Royal Canal provides suitable habitat for this species. |
| Eurasian Tree Sparrow (Passer montanus) | 31/12/2011 | $\begin{aligned} & \text { Bird Atlas } 2007 \text { - } \\ & 2011 \end{aligned}$ | Protected Species: Wildlife Acts \|| <br> Threatened Species: Birds of Conservation Concern \|| Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List | Woodland habitat within the study area provides suitable habitat for this species. |
| Eurasian Wigeon (Anas penelope) | 31/12/2011 | $\begin{aligned} & \hline \text { Bird Atlas } 2007 \text { - } \\ & 2011 \end{aligned}$ | Protected Species: Wildlife Acts \|| <br> Protected Species: EU Birds Directive <br> \|| Protected Species: EU Birds <br> Directive >> Annex II, Section I Bird <br> Species \|| Protected Species: EU <br> Birds Directive >> Annex III, Section II <br> Bird Species \|| Threatened Species: <br> Birds of Conservation Concern \|| <br> Threatened Species: Birds of <br> Conservation Concern >> Birds of <br> Conservation Concern - Amber List | Royal Canal provides suitable habitat for this species. |
| Eurasian Woodcock (Scolopax rusticola) | 29/02/1984 | The First Atlas of Wintering Birds in Britain and Ireland: 1981/821983/84. | Protected Species: Wildlife Acts \|| <br> Protected Species: EU Birds Directive <br> \|| Protected Species: EU Birds <br> Directive >> Annex II, Section I Bird <br> Species \|| Protected Species: EU <br> Birds Directive >> Annex III, Section <br> III Bird Species \|| Threatened <br> Species: Birds of Conservation | Limited suitable habitat for this species in the study area. |


|  |  |  | Concern \|| Threatened Species: <br> Birds of Conservation Concern >> <br> Birds of Conservation Concern - <br> Amber List |  |
| :---: | :---: | :---: | :---: | :---: |
| European Golden Plover (Pluvialis apricaria) | 31/12/2011 | Bird Atlas 2007 - $2011$ | Protected Species: Wildlife Acts \|| <br> Protected Species: EU Birds Directive <br> \|| Protected Species: EU Birds <br> Directive >> Annex I Bird Species \|| <br> Protected Species: EU Birds Directive <br> >> Annex II, Section II Bird Species \|| <br> Protected Species: EU Birds Directive <br> >> Annex III, Section III Bird Species <br> \|| Threatened Species: Birds of <br> Conservation Concern \|| Threatened <br> Species: Birds of Conservation <br> Concern >> Birds of Conservation <br> Concern - Red List | May forage opportunistically in grassland habitat in the study area. Not likely to rely on the study area for breeding, roosting or foraging habitat. |
| Gadwall (Anas strepera) | 31/12/2011 | $\begin{aligned} & \text { Bird Atlas } 2007 \text { - } \\ & 2011 \end{aligned}$ | Protected Species: Wildlife Acts \|| Protected Species: EU Birds Directive <br> \|| Protected Species: EU Birds Directive >> Annex II, Section I Bird Species || Threatened Species: Birds of Conservation Concern || <br> Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List | Royal Canal provides suitable habitat for this species. |
| Goosander (Mergus merganser) | 31/12/2011 | $\begin{aligned} & \hline \text { Bird Atlas } 2007 \text { - } \\ & 2011 \end{aligned}$ | Protected Species: Wildlife Acts \|| <br> Protected Species: EU Birds Directive <br> \|| Protected Species: EU Birds <br> Directive >> Annex II, Section II Bird <br> Species \|| Threatened Species: Birds <br> of Conservation Concern \|| <br> Threatened Species: Birds of <br> Conservation Concern >> Birds of <br> Conservation Concern - Amber List | Royal Canal provides suitable habitat for this species. |
| Great Blackbacked Gull (Larus marinus) | 31/12/2011 | $\begin{aligned} & \text { Bird Atlas } 2007 \text { - } \\ & 2011 \end{aligned}$ | Protected Species: Wildlife Acts \|| <br> Threatened Species: Birds of Conservation Concern \|| Threatened <br> Species: Birds of Conservation <br> Concern >> Birds of Conservation <br> Concern - Amber List | May forage opportunistically in grassland habitat in the study area. Not likely to rely on the study area for breeding, roosting or foraging habitat. |
| Great <br> Cormorant <br> (Phalacrocora <br> x carbo) | 30/04/2015 | Birds of Ireland | Protected Species: Wildlife Acts \|| <br> Threatened Species: Birds of Conservation Concern \|| Threatened <br> Species: Birds of Conservation <br> Concern >> Birds of Conservation <br> Concern - Amber List | Limited suitable habitat for this species in the study area. Unlikely to occur. |
| Great Crested Grebe (Podiceps cristatus) | 31/07/1972 | The First Atlas of Breeding Birds in Britain and Ireland: 1968-1972. | Protected Species: Wildlife Acts \|| <br> Threatened Species: Birds of Conservation Concern \|| Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List | Limited suitable habitat for this species in the study area. Unlikely to occur. |


| Grey Partridge (Perdix perdix) | 31/07/1991 | The Second Atlas of Breeding Birds in Britain and Ireland: 19881991 | Protected Species: Wildlife Acts \|| <br> Protected Species: EU Birds Directive <br> \|| Protected Species: EU Birds <br> Directive >> Annex II, Section I Bird <br> Species \|| Protected Species: EU <br> Birds Directive >> Annex III, Section I <br> Bird Species \|| Threatened Species: <br> Birds of Conservation Concern \|| <br> Threatened Species: Birds of <br> Conservation Concern >> Birds of <br> Conservation Concern - Red List | Limited suitable habitat for this species within the study area. It is unlikely to occur. |
| :---: | :---: | :---: | :---: | :---: |
| Herring Gull (Larus argentatus) | 18/05/2012 | Ireland's BioBlitz | Protected Species: Wildlife Acts \|| <br> Threatened Species: Birds of Conservation Concern \|| Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List | May forage opportunistically in grassland habitat in the study area. Not likely to rely on the study area for breeding, roosting or foraging habitat. |
| House Martin (Delichon urbicum) | 31/12/2011 | Bird Atlas 2007 2011 | Protected Species: Wildlife Acts \|| <br> Threatened Species: Birds of Conservation Concern \|| Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List | Suitable breeding and foraging habitat within the study area. |
| House <br> Sparrow <br> (Passer domesticus) | 31/12/2011 | $\begin{aligned} & \hline \text { Bird Atlas } 2007 \text { - } \\ & 2011 \end{aligned}$ | Protected Species: Wildlife Acts \|| <br> Threatened Species: Birds of Conservation Concern \|| Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List | Suitable breeding and foraging habitat within the study area. |
| Lesser Blackbacked Gull (Larus fuscus) | 31/12/2011 | Bird Atlas 2007 2011 | Protected Species: Wildlife Acts \|| <br> Threatened Species: Birds of Conservation Concern \|| Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List | May forage opportunistically in grassland habitat in the study area. Not likely to rely on the study area for breeding, roosting or foraging habitat. |
| Little Egret (Egretta garzetta) | 12/10/2017 | Birds of Ireland | ```Protected Species: Wildlife Acts \|| Protected Species: EU Birds Directive || Protected Species: EU Birds Directive >> Annex I Bird Species``` | No suitable habitat within the study area. Not expected to occur. |
| Little Grebe <br> (Tachybaptus ruficollis) | 19/05/2012 | Ireland's <br> BioBlitz | Protected Species: Wildlife Acts \|| <br> Threatened Species: Birds of Conservation Concern \|| Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List | Suitable habitat provided by the Royal Canal within the study area. |
| Mallard (Anas platyrhynchos ) | 13/03/2016 | Birds of Ireland | Protected Species: Wildlife Acts \|| <br> Protected Species: EU Birds Directive <br> \|| Protected Species: EU Birds <br> Directive >> Annex II, Section I Bird <br> Species \|| Protected Species: EU <br> Birds Directive >> Annex III, Section I <br> Bird Species | Suitable habitat provided by the Royal Canal within the study area. |


| Merlin (Falco columbarius) | 31/07/1972 | The First Atlas of Breeding Birds in Britain and Ireland: 1968-1972. | Protected Species: Wildlife Acts \|| <br> Protected Species: EU Birds Directive <br> \|| Protected Species: EU Birds <br> Directive >> Annex I Bird Species \|| <br> Threatened Species: Birds of <br> Conservation Concern \|| Threatened <br> Species: Birds of Conservation <br> Concern >> Birds of Conservation <br> Concern - Amber List | No suitable habitat for this species in the study area. Not likely to occur in the area. |
| :---: | :---: | :---: | :---: | :---: |
| Red Grouse (Lagopus lagopus) | 31/12/2011 | $\begin{aligned} & \text { Bird Atlas } 2007 \text { - } \\ & 2011 \end{aligned}$ | Protected Species: Wildlife Acts \|| <br> Protected Species: EU Birds Directive <br> \|| Protected Species: EU Birds <br> Directive >> Annex II, Section I Bird <br> Species \|| Protected Species: EU <br> Birds Directive >> Annex III, Section I <br> Bird Species \|| Threatened Species: <br> Birds of Conservation Concern \|| <br> Threatened Species: Birds of <br> Conservation Concern >> Birds of <br> Conservation Concern - Red List | No suitable habitat for this species in the study area. Not likely to occur in the area. |
| Red Kite (Milvus milvus) | 02/09/2016 | Birds of Ireland | Protected Species: Wildlife Acts \|| <br> Threatened Species: Birds of Conservation Concern \|| Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List | May forage over the study area. |
| Rock Pigeon (Columba livia) | 31/12/2011 | Bird Atlas 2007- $2011$ | Protected Species: Wildlife Acts \|| <br> Protected Species: EU Birds Directive <br> \|| Protected Species: EU Birds <br> Directive >> Annex II, Section I Bird Species | No suitable breeding habitat within the study area. No likely to occur in the area. |
| Sand Martin (Riparia riparia) | 31/12/2011 | $\begin{aligned} & \text { Bird Atlas } 2007 \text { - } \\ & 2011 \end{aligned}$ | Protected Species: Wildlife Acts \|| <br> Threatened Species: Birds of Conservation Concern \|| Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List | No suitable breeding habitat noted within the study area. No likely to occur in the area. |
| Sky Lark (Alauda arvensis) | 05/07/2016 | Birds of Ireland | Protected Species: Wildlife Acts \|| <br> Threatened Species: Birds of Conservation Concern \|| Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List | May breed within the study area although intensive agricultural land use decreases the likelihood. |
| Spotted <br> Flycatcher <br> (Muscicapa <br> striata) | 31/12/2011 | Bird Atlas 20072011 | Protected Species: Wildlife Acts \|| <br> Threatened Species: Birds of Conservation Concern \|| Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List | Suitable habitat is provided by woodland habitat within the study area. |


| Stock Pigeon (Columba oenas) | 31/07/1991 | The Second Atlas of Breeding Birds in Britain and Ireland: 19881991 | Protected Species: Wildlife Acts \|| <br> Threatened Species: Birds of <br> Conservation Concern \|| Threatened <br> Species: Birds of Conservation <br> Concern >> Birds of Conservation <br> Concern - Amber List | Suitable habitat is provided by woodland habitat within the study area. |
| :---: | :---: | :---: | :---: | :---: |
| Tufted Duck (Aythya fuligula) | 31/12/2011 | $\begin{aligned} & \text { Bird Atlas } 2007 \text { - } \\ & 2011 \end{aligned}$ | Protected Species: Wildlife Acts \|| <br> Protected Species: EU Birds Directive <br> \|| Protected Species: EU Birds <br> Directive >> Annex II, Section I Bird <br> Species \|| Protected Species: EU <br> Birds Directive >> Annex III, Section II <br> Bird Species \|| Threatened Species: <br> Birds of Conservation Concern \|| <br> Threatened Species: Birds of <br> Conservation Concern >> Birds of <br> Conservation Concern - Amber List | Suitable habitat provided by the Royal Canal within the study area. |
| Yellowhamme r (Emberiza citrinella) | 31/12/2011 | $\begin{aligned} & \text { Bird Atlas } 2007 \text { - } \\ & 2011 \end{aligned}$ | Protected Species: Wildlife Acts \|| <br> Threatened Species: Birds of Conservation Concern \|| Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List | Suitable habitat is provided by woodland habitat within the study area. |
| European Eel (Anguilla anguilla) | 20/05/2011 | Ireland's BioBlitz | Threatened Species: OSPAR Convention \|| Threatened Species: Critically Endangered | Suitable habitat occurs in the Royal Canal and flowing drainage ditches. |
| Freshwater White-clawed Crayfish (Austropotam obius pallipes) | 02/09/2016 | River Biologists' Database (EPA) | Protected Species: EU Habitats <br> Directive \|| Protected Species: EU <br> Habitats Directive >> Annex II \|| <br> Protected Species: EU Habitats <br> Directive >> Annex V \|| Protected <br> Species: Wildlife Acts | Suitable habitat is provided by the Royal Canal and this species is known to occur in the canal. |
| Chaetarthria seminulum | 31/12/1987 | Water Beetles of Ireland | Threatened Species: Data deficient | Suitable habitat is provided by the Royal Canal and other aquatic habitats within the study area. |
| Minutest Diving Beetle (Bidessus minutissimus) | 12/08/1899 | Water Beetles of Ireland | Threatened Species: Regionally Extinct | Suitable habitat is provided by the Royal Canal and other aquatic habitats within the study area. |
| Nebrioporus (Nebrioporus) depressus | 10/07/1930 | Water Beetles of Ireland | Threatened Species: Data deficient | Suitable habitat is provided by the Royal Canal and other aquatic habitats within the study area. |
| Dingy Skipper (Erynnis tages) | 29/05/1977 | Distribution <br> Atlas of Butterflies in Ireland 1979 (An Foras Forbartha) | Threatened Species: Near threatened | Suitable habitat likely to be limited to areas of calcareous grassland along the Royal Canal. |
| Gatekeeper <br> (Pyronia tithonus) | 05/07/2014 | Irish Butterfly Monitoring Scheme | Threatened Species: Near threatened | Not likely to occur in the study area. This species is generally restricted to coastal locations. |


| Marsh <br> Fritillary <br> (Euphydryas aurinia) | 31/12/1970 | All Ireland Marsh Fritillary Database | Protected Species: EU Habitats <br> Directive \|| Protected Species: EU <br> Habitats Directive >> Annex II \|| <br> Threatened Species: Vulnerable | Not likely to occur in the study area. This species is restricted to areas with abundant Succisa pratensis which is not likely to be abundant in the study area. |
| :---: | :---: | :---: | :---: | :---: |
| Small Blue (Cupido minimus) | 27/05/1976 | Distribution Atlas of Butterflies in Ireland 1979 (An Foras Forbartha) | Threatened Species: Endangered | Suitable habitat likely to be limited to areas of calcareous grassland along the Royal Canal. |
| Small Heath (Coenonymph a pamphilus) | 30/06/1985 | Moths Ireland | Threatened Species: Near threatened | Suitable habitat likely to be limited to areas of calcareous grassland along the Royal Canal. |
| Wall <br> (Lasiommata megera) | 21/06/1977 | Distribution Atlas of Butterflies in Ireland 1979 (An Foras Forbartha) | Threatened Species: Endangered | Suitable habitat likely to be limited to areas of calcareous grassland along the Royal Canal and in garden areas within the study area. |
| Andrena <br> (Andrena) fucata | 31/05/2008 | Bees of Ireland | Threatened Species: Near threatened | Suitable foraging habitat for this species is likely to be occur along the Royal Canal, in gardens and along field edges. |
| Andrena (Andrena) praecox | 23/04/1978 | Bees of Ireland | Threatened Species: Vulnerable | Suitable foraging habitat for this species is likely to be occur along the Royal Canal, in gardens and along field edges. |
| Andrena (Melandrena) nigroaenea | 06/05/1977 | Bees of Ireland | Threatened Species: Vulnerable | Suitable foraging habitat for this species is likely to be occur along the Royal Canal, in gardens and along field edges. |
| Andrena <br> (Taeniandrena ) wilkella | 31/05/2008 | Bees of Ireland | Threatened Species: Data deficient | Suitable foraging habitat for this species is likely to be occur along the Royal Canal, in gardens and along field edges. |
| Barbut's Cuckoo Bee (Bombus (Psithyrus) barbutellus) | 27/08/1942 | Bees of Ireland | Threatened Species: Endangered | Suitable foraging habitat for this species is likely to be occur along the Royal Canal, in gardens and along field edges. |
| Dark Nomad Bee (Nomada sheppardana) | 27/07/1902 | Bees of Ireland | Threatened Species: Regionally Extinct | Suitable foraging habitat for this species is likely to be occur along the Royal Canal, in gardens and along field edges. |


| Halictus <br> (Seladonia) <br> tumulorum | $30 / 07 / 2008$ | Bees of Ireland | Threatened Species: Near <br> threatened | Suitable foraging habitat for <br> this species is likely to be <br> occur along the Royal Canal, <br> in gardens and along field <br> edges. |
| :--- | :--- | :--- | :--- | :--- |
| Hill Cuckoo <br> Bee (Bombus <br> (Psithyrus) <br> rupestris) | $26 / 08 / 1930$ | Bees of Ireland | Threatened Species: Endangered | Suitable foraging habitat for <br> this species is likely to be <br> occur along the Royal Canal, <br> in gardens and along field <br> edges. |
| Hylaeus <br> (Prosopis) <br> brevicornis | $26 / 06 / 1930$ | Bees of Ireland | Threatened Species: Endangered | Suitable foraging habitat for <br> this species is likely to be <br> occur along the Royal Canal, <br> in gardens and along field <br> edges. |
| Large Red <br> Tailed Bumble <br> Bee (Bombus <br> (Melanobomb <br> us) lapidarius) | $28 / 05 / 2017$ | Bees of Ireland | Threatened Species: Near <br> threatened | Suitable foraging habitat for <br> this species is likely to be <br> occur along the Royal Canal, <br> in gardens and along field <br> edges. |
| Megachile <br> (Delomegachil <br> e) <br> willughbiella | $31 / 05 / 2008$ | Bees of Ireland | Threatened Species: Near <br> threatened | Suitable foraging habitat for <br> this species is likely to be <br> occur along the Royal Canal, <br> in gardens and along field <br> edges. |
| Ephemerella <br> notata | $31 / 12 / 1996$ | Mayflies <br> (Ephemeroptera | of Ireland |  |


| Rhithrogena germanica | 31/12/1947 | Mayflies (Ephemeroptera ) of Ireland | Threatened Species: Vulnerable | Suitable habitat is likely to be restricted to the Royal Canal and some drainage ditches. |
| :---: | :---: | :---: | :---: | :---: |
| Brown Snail (Zenobiella subrufescens) | 16/03/2008 | All Ireland NonMarine Molluscan Database | Threatened Species: Vulnerable |  |
| Common Oyster (Ostrea edulis) | 21/05/2011 | Ireland's BioBlitz | Threatened Species: OSPAR Convention |  |
| Common <br> Whorl Snail <br> (Vertigo <br> (Vertigo) <br> pygmaea) | 21/05/2011 | Ireland's BioBlitz | Threatened Species: Near threatened | This species is known to occur along the Royal Canal. |
| Desmoulin's Whorl Snail (Vertigo (Vertigo) moulinsiana) | 25/07/1945 | All Ireland NonMarine Molluscan Database | Protected Species: EU Habitats <br> Directive \|| Protected Species: EU <br> Habitats Directive >> Annex II \|| <br> Protected Species: Wildlife Acts \|| <br> Threatened Species: Endangered | This species is known to occur along the Royal Canal. |
| Duck Mussel (Anodonta (Anodonta) anatina) | 21/05/2011 | Ireland's BioBlitz | Threatened Species: Vulnerable | This species is most likely to be supported by the Royal Canal within the study area. |
| Ear Pond Snail (Radix auricularia) | 21/05/2011 | Ireland's BioBlitz | Threatened Species: Vulnerable | This species is most likely to be supported by the Royal Canal within the study area. |
| English <br> Chrysalis Snail (Leiostyla (Leiostyla) anglica) | 26/09/1981 | All Ireland NonMarine Molluscan Database | Threatened Species: Vulnerable | This species is most likely to be supported by the Royal Canal within the study area. |
| Field Slug (Deroceras (Deroceras) agreste) | 31/12/1940 | All Ireland NonMarine Molluscan Database | Threatened Species: Data deficient | This species is most likely to be supported by the Royal Canal within the study area. |
| Globular Pea <br> Mussel <br> (Pisidium hibernicum) | 06/04/2003 | All Ireland NonMarine Molluscan Database | Threatened Species: Near threatened | This species is most likely to be supported by the Royal Canal within the study area. |
| Glutinous Snail (Myxas glutinosa) | 06/04/2003 | All Ireland NonMarine Molluscan Database | Threatened Species: Endangered | This species is most likely to be supported by the Royal Canal within the study area. |
| Lake Orb Mussel (Musculium lacustre) | 06/04/2003 | All Ireland NonMarine Molluscan Database | Threatened Species: Vulnerable | This species is most likely to be supported by the Royal Canal within the study area. |
| Lesser Bulin (Merdigera obscura) | 16/03/2008 | All Ireland NonMarine Molluscan Database | Threatened Species: Endangered | This species is most likely to be supported by the Royal Canal within the study area. |


| Pisidium pseudosphaeri um | 06/04/2003 | All Ireland NonMarine Molluscan Database | Threatened Species: Endangered | This species is most likely to be supported by the Royal Canal within the study area. |
| :---: | :---: | :---: | :---: | :---: |
| Pisidium pulchellum | 26/03/2003 | All Ireland NonMarine Molluscan Database | Threatened Species: Endangered | This species is most likely to be supported by the Royal Canal within the study area. |
| Plated Snail (Spermodea lamellata) | 26/09/1981 | All Ireland NonMarine Molluscan Database | Threatened Species: Endangered | This species is most likely to be supported by the Royal Canal within the study area. |
| Point Snail (Acicula fusca) | 26/09/1981 | All Ireland NonMarine Molluscan Database | Threatened Species: Vulnerable | This species is most likely to be supported by the Royal Canal within the study area. |
| Prickly Snail (Acanthinula aculeata) | 26/09/1981 | All Ireland NonMarine Molluscan Database | Threatened Species: Near threatened | This species is most likely to be supported by the Royal Canal within the study area. |
| Swan Mussel (Anodonta (Anodonta) cygnea) | 06/04/2003 | All Ireland NonMarine Molluscan Database | Threatened Species: Vulnerable | This species is most likely to be supported by the Royal Canal within the study area. |
| Brown Longeared Bat (Plecotus auritus) | 28/04/2011 | National Bat Database of Ireland | Protected Species: EU Habitats <br> Directive \|| Protected Species: EU <br> Habitats Directive >> Annex IV \|| <br> Protected Species: Wildlife Acts | Buildings and trees within the study area have the potential to support this species. This species is known to forage along the Royal Canal. |
| Daubenton's Bat (Myotis daubentonii) | 31/08/2014 | National Bat Database of Ireland | Protected Species: EU Habitats <br> Directive \|| Protected Species: EU <br> Habitats Directive >> Annex IV \|| <br> Protected Species: Wildlife Acts | Buildings and trees within the study area have the potential to support this species. This species is known to forage along the Royal Canal. |
| Eurasian Badger (Meles meles) | 02/04/2017 | Mammals of Ireland 20162025 | Protected Species: Wildlife Acts | Suitable locations for this species occur along woodland habitats. |
| Eurasian <br> Pygmy Shrew <br> (Sorex <br> minutus) | 03/10/2015 | Atlas of Mammals in Ireland 20102015 | Protected Species: Wildlife Acts | Likely to occur within woodland within the study area. |
| Eurasian Red Squirrel (Sciurus vulgaris) | 24/01/2015 | Atlas of Mammals in Ireland 20102015 | Protected Species: Wildlife Acts | Likely to occur within woodland within the study area. |
| European Otter (Lutra lutra) | 15/05/2016 | Mammals of Ireland 20162025 | Protected Species: EU Habitats <br> Directive \|| Protected Species: EU <br> Habitats Directive >> Annex II \|| <br> Protected Species: EU Habitats <br> Directive >> Annex IV \|| Protected <br> Species: Wildlife Acts | The Royal Canal is known to support otters. |


| Lesser Noctule <br> (Nyctalus leisleri) | 05/09/2011 | National Bat Database of Ireland | Protected Species: EU Habitats <br> Directive \|| Protected Species: EU <br> Habitats Directive >> Annex IV \|| <br> Protected Species: Wildlife Acts | Buildings and trees within the study area have the potential to support this species. This species is known to forage along the Royal Canal. |
| :---: | :---: | :---: | :---: | :---: |
| Nathusius's Pipistrelle (Pipistrellus nathusii) | 12/08/2007 | National Bat Database of Ireland | Protected Species: EU Habitats <br> Directive \|| Protected Species: EU <br> Habitats Directive >> Annex IV \|| <br> Protected Species: Wildlife Acts | Buildings and trees within the study area have the potential to support this species. This species is known to forage along the Royal Canal. |
| Natterer's Bat (Myotis nattereri) | 30/09/2008 | National Bat Database of Ireland | Protected Species: EU Habitats <br> Directive \|| Protected Species: EU <br> Habitats Directive >> Annex IV \|| <br> Protected Species: Wildlife Acts | Buildings and trees within the study area have the potential to support this species. This species is known to forage along the Royal Canal. |
| Pine Marten (Martes martes) | 06/07/2017 | Mammals of Ireland 20162025 | Protected Species: EU Habitats <br> Directive \|| Protected Species: EU <br> Habitats Directive >> Annex V \|| <br> Protected Species: Wildlife Acts | Suitable habitat is provided within woodland habitat within the study area. |
| Pipistrelle <br> (Pipistrellus <br> pipistrellus <br> sensu lato) | 06/06/2013 | National Bat Database of Ireland | Protected Species: EU Habitats <br> Directive \|| Protected Species: EU <br> Habitats Directive >> Annex IV \|| <br> Protected Species: Wildlife Acts | Buildings and trees within the study area have the potential to support this species. This species is known to forage along the Royal Canal. |
| Red Deer (Cervus elaphus) | 31/12/2008 | Deer of Ireland Database | Protected Species: Wildlife Acts | This species is not likely to occur within the study area. |
| Soprano Pipistrelle (Pipistrellus pygmaeus) | 19/08/2013 | National Bat Database of Ireland | Protected Species: EU Habitats <br> Directive \|| Protected Species: EU <br> Habitats Directive >> Annex IV \|| <br> Protected Species: Wildlife Acts | Buildings and trees within the study area have the potential to support this species. This species is known to forage along the Royal Canal. |
| West <br> European <br> Hedgehog <br> (Erinaceus <br> europaeus) | 28/10/2016 | Mammals of Ireland 20162025 | Protected Species: Wildlife Acts | This species is likely to occur within woodland habitat within the study area. |
| Whiskered Bat (Myotis mystacinus) | 03/09/2005 | National Bat Database of Ireland | Protected Species: EU Habitats <br> Directive \|| Protected Species: EU <br> Habitats Directive >> Annex IV \|| <br> Protected Species: Wildlife Acts | Buildings and trees within the study area have the potential to support this species. This species is known to forage along the Royal Canal. |

Figure 4.3.6.1: Record of Protected and Threatened Fauna

### 4.3.6.6 Protected Terrestrial Species <br> Bats

All bat species occurring in Ireland are protected under national and European legislation. Up to six species of bats have been recorded in the wider area surrounding the Study Area in the past. The Royal Canal is known to function as foraging habitat for Soprano pipistrelle, Common pipistrelle, Leisler's bat, Whiskered Bat, Brown long-eared bat and Daubenton's Bat (Bat Eco Services, 2013; Bat Conservation Ireland Batlas).

Bats are vulnerable to impacts arising from road construction and operations. Construction effects can include the loss of roost sites resulting from the demolition of structures or the felling of mature trees and the loss of foraging and/or commuting habitat; and habitat severance and fragmentation. Operational effects can include direct fatalities due to collision with vehicles and adverse effects to foraging and commuting habitat and behaviour as a result of poor road side lighting design.

The NRA's Best Practice Guidelines for the Conservation of Bats in the Planning of National Road Schemes" highlights that habitat with good potential for bats should be identified and, where possible avoided, during the Route Corridor Selection Study. High value bat foraging habitat occurs along the Royal Canal and is also likely to occur along some of the field boundaries within the Study Area. Potential roosting opportunities may be provided by some of the mature standard trees along field boundaries and also in the old estate buildings and associated farm structures that occur throughout the Study Area.

## Otters

Otters are protected under national and European legislation. They are listed on Annex 2 of the EU Habitats Directive and are therefore afforded special conservation protection throughout Europe.

Otters are known to occur within the Study Area along the Royal Canal. In general a proposed road development could result in adverse effects to otters by directly affecting resting and breeding areas (i.e. couches/holts), by installing obstacles to otter movement along rivers such as culverts, through increased noise and disturbance during construction works and increased accessibility by pedestrians and dogs. Adverse effects to the water quality of freshwater and transitional waters upon which they rely will could reduce prey availability for otters. A detailed assessment of otter activity along these river systems in the Study Area will be required as part of any proposed road development.

It is noted that aside from the Royal Canal and the Barnhill Stream that bounds the Study Area's western boundary no other watercourses occur within the area. The drainage ditches occurring within the Study Area are ephemeral and are not of high value for otters. As such otters are likely to be restricted to the Royal Canal and the Barnhill Stream within the study area.

## Other Mammals

Badger, Irish stoat, Irish hare and hedgerow have all been recorded in the Study Area. The resting places of these mammals are protected under the law. As badgers are known to occur within the Study Area it is likely that their territories will be impacted by the proposed road. Where possible impacts to active badger setts, and particularly main setts, should be avoided. Detailed badger surveys will be required to establish the potential impacts of the proposed scheme to terrestrial mammals and assessments should be informed by existing NRA guidance documents such as the Guidelines for the Treatment of Badgers Prior to the Construction of National Road Schemes.

Potential effects to Irish stoat will be similar to that of otters while the principal impact to Irish hares occurring in the Study Area will be potential fragmentation of habitat.

## Herpetofauna

Common frog and smooth newt occur throughout the Study Area and given the presence of extensive areas of grassland within the study area it is possible that common lizard also occurs (Irish Wildlife Trust, 2007). The presence of wetland habitat suitable for breeding amphibians should be recorded as part of detailed assessments for the proposed scheme. The loss of such habitats will represent a negative impact to these species.

## Protected Bird Species

The majority of birds occurring in Ireland are protected under the Wildlife Acts. Bird species of conservation concern are associated with the Royal Canal. Of particular note is the Kingfisher which is known to occur along the Royal Canal and the red-listed Yellowhammer which has been recorded breeding in the 10 km square in which the Study Area is located.

Baseline information on the role (if any) the Study Area plays in supporting breeding pairs of sensitive species such as Kingfisher and Yellowhammer will be required as part of an assessment for the proposed scheme.

The transitional and coastal habitats associated with the Broadmeadow/Malahide Estuary downstream of the Study Area are outlined in Section 3.2.1 above.

Fish sampling in the Broadmeadow Estuary downstream from the Study Area in 2010 (IFI 2010) recorded 12 species of fish and the estuary was assigned "good" status.

## Fish

The Royal Canal represents the principal fisheries habitat occurring within the study area. Electrofishing surveys were completed along the canal in 2011 by the IFI and a total of seven species were recorded. These include roach, perch, pike, roach-bream hybrid, tench, bream and eel.

### 4.3.6.5 Summary of Key Sensitive Ecological Receptors

While the majority of the footprint of the Study Area is dominated by intensively managed agricultural or built land, a range of sensitive ecological receptors have been identified within the Study Area.

The key sensitive ecological receptors occurring within the Study Area are:

1. The Royal Canal pNHA and the Liffey Valley pNHA and the range of species that these semi-natural corridors protect.
2. The presence of mature and historical field boundaries that have the potential to function as important commuting corridors for fauna and important foraging resources for a range of species including ground dwelling mammals such as badgers, breeding birds, bats and invertebrates.
3. A range of terrestrial mammal species protected under the Wildlife Act (Ecological Evaluation Rating $C$ to $B$ )
4. Breeding Kingfisher and breeding Yellowhammer, a red-listed species (Ecological Evaluation Rating C to B )

### 4.4 Artificial Constraints (Engineering)

### 4.4.1 Existing Road Network



Figure 4.4.1: Roads, Railway Stations and Navigable Waterways
The Diswellstown Road runs from a signalised junction with the Diswellstown Road Extension and Porterstown Link at its western extent to a roundabout with Carpenterstown Road to the east, and has a speed limit of 50kph. The Diswellstown Road Extension runs from a junction with the Diswellstown Road and Porterstown Link at its southern extent to a roundabout with the R121 Clonsilla Road to the north, and has a speed limit is 60 kph .

The Porterstown Road is a rural road running from a t-junction to the R121 Clonsilla Road to the north to a spur road from the Porterstown Link Road to the south, which currently accesses Scoil Choilm Community National School. There is existing footway infrastructure on one side of Porterstown Road. The Porterstown Road crosses the Porterstown Level Crossing. The speed limit is 50 kph on both Porterstown Road and the spur road. The Porterstown Link Road runs north-south from a signalised junction with the Diswellstown Road to a signalised junction with Luttrellstown Road to the south, and the speed limit is also 50 kph .

The R121 Luttrellstown Road runs from east to west, and is the southern boundary of the Study Area. The speed limit is 60 kph . Luttrellstown Road has a junction with the R121 Clonsilla Road within the Study Area. The R121 Clonsilla Road runs north-south from Clonsilla Train Station and Level Crossing to a t-junction with Luttrellstown Road. There is existing footway infrastructure on one side of Clonsilla Road. The speed limit is also 60kph.

The Barberstown Lane North runs from a junction with the R121 Luttrellstown Road at its southeastern extent in a north-westerly direction, crossing Barberstown Level Crossing and the Royal Canal over a hump back bridge, and passes a junction with Barberstown Lane South. The Barberstown Lane South runs from a junction with Barberstown Lane North just north of the level crossing in a northwesterly direction. The speed limit on both these roads is 50 kph .

### 4.4.2 Traffic

Chapter 2 addresses the existing constraints on the current road network, including an assessment of recent accidents. Chapter 3 addresses current and projected traffic volumes.

### 4.4.3 Other Transport Modes

### 4.4.3.1 Pedestrians \& Cyclists

The existing Diswellstown Road, Diswellstown Road Extension and Porterstown Link Road all provide off road cycle and footway facilities. There is existing footway infrastructure on one side of Porterstown Road and one side of Clonsilla Road within the Study Area. There are no existing pedestrian or cycle facilities on Luttrellstown Road or Barberstown Lane North and South.

Porterstown Link Road, Porterstown Road, and the spur road between them are shown as pedestrian and cycle routes in the Fingal Development Plan. In the Fingal Development Plan, it is a Strategic Vision for the County to 'Promote active and healthy lifestyles through increased opportunities for walking, cycling and active sport and recreation.' and a characteristic of a successful and sustainable community is that it is 'easily accessible by a range of transport modes including cycling and walking'.

The Fingal Development Plan states the following policy in relation to transportation: 'Promote and facilitate movement to, from, and within the County of Fingal, by integrating land use with a high quality, sustainable transport system that prioritises walking, cycling and public transport.' and Objective MT13 is to 'Promote walking and cycling as efficient, healthy, and environmentally-friendly modes of transport by securing the development of a network of direct, comfortable, convenient and safe cycle routes and footpaths, particularly in urban areas.' Objective MT19 states that we should 'Design roads and promote the design of roads, including cycle infrastructure, in line with the Principles of Sustainable Safety in a manner consistent with the National Cycle Manual and the Design Manual for Urban Roads and Streets.'

To 'Protect the rural character and setting of Luttrellstown Road and enhance its use for pedestrians and cycling.' is listed as a main element to be included in the Local Area Plan for Kellystown.

The Greater Dublin Area (GDA) Cycle Network Plan includes Porterstown Link Road and Diswellstown Road Extension as Secondary Route No. 5, and Diswellstown Road as Route No. 5B. Please see in Figure 4.4.3.1 the proposed GDA routes as discussed above. Objective MT14 of the Fingal Development Plan is that 'The Council will work in cooperation with the NTA and adjoining Local Authorities to implement the Greater Dublin Area Cycle Network Plan'.

The Royal Canal Greenway, which is currently at preliminary design stage, may run through our Study Area adjacent the Royal Canal.


Figure 4.4.2 Proposed GDA Cycle Network Plan

### 4.4.3.2 Railways

The Maynooth - Dublin Railway line runs through and borders the Study Area, following the line of the Royal Canal. Trains to and from Maynooth run to either Grand Canal Dock, Pearse Station or Connolly Station Dublin City Centre. These trains run up to 40 times daily each way, at times intervals of between 10 minutes and one hour apart. Up to 8 of these trains per day commence or terminate in Sligo. Maynooth - Dublin trains stop in Clonsilla Station, which is on the border of the Study Area, except for those that commence or terminate in Sligo.

In addition to the Maynooth - Dublin rail line, the M3 Parkway to Dublin rail line borders the northern extent of the Study Area along its entire length. The M3 Parkway - Dublin rail line stopped at two stations that border the Study Area, Clonsilla and Hansfield. The Hansfield station was constructed as part of the Hansfield SDZ development, and this rail line was opened as far as the newly constructed station at M3 Parkway ( 2 km north of Dunboyne in County Meath) in 2010. This was Phase 1 of the reopening of the Dublin to Navan rail line. Trains travel from Grand Canal Dock station to M3 Parkway and back up to 24 times per day in each direction, stopping in Hansfield and Clonsilla.

### 4.4.3.3 Bus

A number of bus routes run through and in close proximity to the Study Area. These include:

- Dublin Bus No 37 runs between Blanchardstown Town Centre and Wilton Terrace, Baggot Street in Dublin City Centre (via Diswellstown Road) at between 20 and 30 minutes intervals up to 57 times per day in each direction
- Bus Eireann No 239 which runs from Blanchardstown Centre to Liffey Valley (via Clonsilla Road and Luttrellstown Road) at between 1 hour and 3 hour intervals up to 12 times daily in each direction
- Dublin Bus No 39 runs between Ongar and Burlington Road in Dublin City Centre (via Clonsilla

Road) at between 20 and 30 minutes intervals up to 42 times per day in each direction

### 4.4.4 Navigable Waterways

The Royal Canal, which crosses the Study Area, is a 'navigable waterway'.

### 4.4.5 Planning Control

A desktop assessment of the open planning applications for residential and commercial developments within the Study Area of the proposed Kellystown Road was carried out. The current planning applications for developments within close proximity of the Study Area were harvested from the Fingal County Council Planning database.


Zoning Objectives Legend


Figure 4.4.3: Fingal Development Plan 2017-2023 - Extract from Sheet No. 13 Blanchardstown South

Three areas in Blanchardstown South are zoned for residential housing in recent years. Figure 2.1 shows a land use map taken from Sheet 13 of Fingal County Councils Development Plan, with 'Residential Areas' shown in light brown on the map. The zoning objective of a Residential Area (RA) is to 'Provide for new residential communities subject to the provision of the necessary social and physical infrastructure'.

These include the Hansfield Residential Area Zone (Hansfield Strategic Development Zone - light brown area to north of map), Barnhill Residential Area zone (light brown area below Hansfield to west of map) and Kellystown Residential Area zone (light brown area to east of map).

In addition, the dark green is zoned Open Space, the medium green is zoned High Amenity and the light green is zoned Greenbelt. The area to the northeast of the red dashed line is inside the Development Boundary, and the area to the south east of the purple broken line is within an Architectural Conservation Area.

The grey broken line between LAP 13C (light brown) and the Open Space below it is the indicative line of the Kellystown Road.

The proposed Kellystown Road starts at the spur road between the Porterstown Link Road and Porterstown Road and runs east-west through the Kellystown Land. It crosses the Clonsilla Road between two residential properties on each side of this road. The indicative line terminated to the west of the Clonsilla Road without indicating a tie-in point.

There is a total of 1 No. live granted planning application within the Study Area. This is Planning Application No. 1 (Ref: 17A/0234), a part of which is located in the Study Area. The application relates to 155 no. residential units to be constructed within the Hansfield SDZ with a new vehicular access onto the Hansfield Road. As part of this application, Class 1 public open space (c.9,310 sq.m) is being provided on separate lands at Beechwood Park, Clonsilla Road, Dublin 15, and this land is located in the middle of the Study Area.

### 4.4.6 Archaeology \& Cultural Heritage

### 4.4.6.1 Introduction \& Site Description

This archaeological constraints study was carried out by the Irish Archaeological Consultancy Ltd, as part of the Clifton Scannell Emerson Associates design team. This constraints study has been carried out to ascertain the potential impact of the proposed development on the archaeological and historical landscape by identifying recorded sites and by seeking to identify previously unrecorded sites, or areas of potential archaeological significance. The constraints study involved a detailed study of the archaeological and historical background of the proposed development site and the surrounding area. This included information from the Record of Monuments and Places, the topographical files of the Irish Antiquities Division of the National Museum of Ireland, previous excavations within the environs of the study area and all available cartographic and documentary sources for the area.

Archaeological test-trenching took place at Kellystown at the possible ring-barrow site (RMP DU013:018) in order to define the nature and extent of the RMP site (Lynch 2006). The investigation revealed the remains of a bank and ditch and it was concluded that the site was an 'embanked ringditch' (as defined by Newman 1997, 153-160). This site lies within the Study Area.

This is a largely green field site from the Kellystown townland to the Barnhill townland in Clonsilla, Fingal.

### 4.4.6.2 Method Statement

The following sources were consulted in the preparation of this report:

- Record of Monuments and Places for Dublin;
- Topographical files of the National Museum of Ireland;
- Excavations Bulletin (1970-2003);
- Cartographic and written sources relating to the Study Area;
- Aerial photography (provided by the client);
- Fingal County Development Plan.


### 4.4.6.2.1 Legislative Background

Archaeological and cultural heritage protection in Ireland is provided by a number of international and national mechanisms. These include but are not limited to:

- National Monuments Acts. 1930-2004;
- Architectural Heritage \& Historic Monuments Act. 1999.;
- Planning \& Development Act. 2000, as amended;
- European Convention on the Protection of the Archaeological Heritage. 1992.

The Framework and Principles for the Protection of the Archaeological Heritage (1999) outlines that avoidance of developmental impacts on archaeological heritage and preservation in situ of archaeological sites and monuments are always the preferred option. When a site, or part of a site, has to be removed due to development, then preservation by record must be undertaken, i.e. through excavation and recording.

### 4.4.6.2.2 Fingal County Development Plan 2017-2023

The Development Plan also lists Beech Park as a protected structure (RPS:708). This site is therefore afforded legislative protection under the National Monuments Legislation (1930-2004) and the Local Government (Planning and Development) Act 2000.

In terms of the remainder of the Study Area which is predominantly greenfield/surviving demesne landscapes (e.g. Beech Park House Estate); there is the potential, as with any greenfield site, to reveal previously unrecorded archaeological remains which may present no surface expression.

### 4.4.6.3 Archaeological Background

### 4.4.6.3.1 Archaeological and Historical Background

## General

The Study Area for the Kellystown to Barnhill Road extends west from Kellystown to Barnhill. The Study Area is located south of the village of Clonsilla in North Dublin, lying immediately south of the Royal Canal and the Maynooth railway line, crossing these at their western extremities. The Study Area extends through predominantly greenfield lands, to the north of Luttrellstown demesne. The nearest recorded archaeological sites to the Study Area include the ring barrow at Kellystown (DU013:018), and the ecclesiastical remains at Clonsilla (DU013:014). These sites are located within and less than 500 metres from the Study Area.

## Prehistoric Period

The topographical files of the Irish Antiquities Division of the National Museum of Ireland notes the discovery of a polished stone axehead in Kellystown (NMI 1997:104) dating to the Neolithic Period (c.4000-2400BC). The geology of the stone axe was provenanced to Kingscourt in Co, Meath indicating the occurrence of trade and exchange in the area in the Neolithic period.

Evidence of Bronze Age (c.2500-600BC) activity within the wider W Dublin area was uncovered during an excavation in the townland of Porterstown, c. 1.7 km to the SE of Kellystown, where a gully and some post-holes, which produced a sherd of Bronze Age pottery, were found on the site of an apparently levelled ringfort (DU017-005) (Cotter 1990).

Barrows are earthen burial monuments, which consist of a circular area surrounded by a fosse/ditch often with an external bank. Barrows have been constructed in Ireland since the Middle Neolithic and were in use until the early centuries AD; however, excavation has revealed that a significant number of barrows belong to the Iron Age (600BC-400AD) while many also date to the Bronze Age. It is generally accepted that barrows were used for burial purposes but excavation has failed to confirm this in every case (O’Riordáin 1979, 138-142).

The identification of possible barrows on the site at Kellystown, Clonsilla, points to activity or occupation in the area during the prehistoric period. Archaeological test-trenches were inserted through the one of the three ring barrow sites contained within the RMP archaeological constraint area (DU013:018) at Kellystown. The site was determined to be a type of ring-barrow known as an 'embanked ring-ditch' (as defined by Newman 1997, 153-160) and, by inference, it is highly likely that all three barrows at Kellystown can be thus classified due to their similar typology, proximity (conjoined in places) and their size in relation to the excavated by Lynch (2006).

## Early Medieval Period

The site on which the current Church of Ireland (Saint Mary's) now stands in Clonsilla (c. 150m N of the Study Area) has an ecclesiastical history dating back to AD 500. One of the most visible traces of Early Medieval settlements is the ecclesiastical enclosure, which is a circular boundary which marked the sacred precinct of the church. In Clonsilla, this possible ecclesiastical enclosure is reflected in the street plan. There is little documentary evidence of a building or church in Clonsilla until c.1215-1217AD. The lands were then owned by the "priory of Little Malvern", to which all revenues were sent.

Many holy wells are associated with early ecclesiastical sites. Holy wells have been identified in the townlands of Mulhuddart (DU013-009), c. 3.5 km to the NE and at Diswellstown (DU017:011) c.3km E of Clonsilla.

During the Early Medieval period, the area was somewhat sparsely settled in terms of secular sites. Ringforts are roughly circular (and arguably defensive) enclosures, known as, were constructed to demarcate, and/or protect, farmsteads. They are defined as a broadly circular enclosure delimited by a bank and ditch. This site type is considered to be the most common indicator of settlement during the period, however, there are relatively few recorded ringforts (c.105) in Dublin, and there are very few in Fingal. This may be as a result of successive agricultural practices over time and modern accelerated development in W Fingal has led to the discovery of sub-surface archaeological remains of ringfort sites such as that at Porterstown (Cotter 1990, 27), c. 500 metres to the E of the Study Area at Kellystown. A possible levelled ringfort (DU017-005) has been identified in the townland of Porterstown, c. 1.7km SE of the E extent of the Study Area.

## Medieval Period

Clonsilla was part of a grant of lands made to Hugh Tyrrell during the Anglo-Norman settlement of Ireland following their arrival in 1169. The grant was centred on the lands of the parish of Castleknock, and it was at Castleknock Castle that Hugh Tyrell and his descendants based themselves. By the end of the $13^{\text {th }}$ century, a number of families had become established on the Castleknock lands, either by grant from the Crown or from the Tyrrell's. One such family were the Luttrell's who had been granted lands by the Tyrrell's at Clonsilla.

The first member of the Luttrell family to come to Ireland was Sir Geoffrey Luttrell, who had been a loyal follower of King John, when Earl of Mortain, and became one of the monarch's favourite ministers after his accession to the throne. Luttrell's connection with Ireland appears to have begun in 1204 when, at the beginning of that year, he was appointed a commission to settle disputes between the justiciary and the Anglo-Norman magnates in the country. In 1210, he accompanied King John on a visit to Ireland. He later died when sent on an embassy to the Pope, but had already established the lineages of both the Irish and English lines of the Luttrell family (Ball 1906, 1-3).

The present house at Luttrellstown, situated 700 m from the southern boundary of the Study Area, incorporates portions of an earlier fortification in its NE end. It is said that King John occupied one of the apartments. The only major portion surviving from Luttrell's time is the library, which was the original entrance hall to the castle (DU017-004).

The Church of Coolmine, though originally the most important place of worship in the parish of Clonsilla, was in decline by the $13^{\text {th }}$ century. It was mentioned in the time of Archbishop Henry de Loundres, who held the See of Dublin from 1212 to 1228 , as one of the churches in his gift. That prelate, however, consecrated another church as the Priory of Little Malvern, the site of which is now occupied by the present church of Clonsilla, which completely superseded the church of Coolmine. In 1486 the
lands were made over to Saint Mary's Abbey, under the name of the White Chapel of Saint Machtus of Clonsilla (Ball 1906).

## Post Medieval Period

The Medieval Castle at Luttrellstown was probably adapted and modified during this time. A dwelling is recorded at Westmanstown (DU013-034) c. 1.5 km to the SE of the extents of the Study Area at Barnhill. To the NE of Study Area, there are some medium to large sized houses such as Hansfield House and Clonsilla Lodge. Beech Park and Barberstown Houses are examples of small to medium sized estates located within the townland of Clonsilla.

## Industrial Period

By the middle of the $18^{\text {th }}$ century a number of proposals were being considered for building canals through Ireland. In 1755, two alternative roads were put before the Irish Parliament. The southern road was chosen and work commenced on constructing the Grand Canal. In the 1780s a disgruntled director of the Grand Canal Company decided to build a rival link to the Shannon using a more northerly road, roughly following the same path as the originally rejected itinerary. A parliament grant was received for the purpose of constructing the canal and work commenced in 1790.

The Royal Canal finally reached the river at Clondra, Co. Longford, in 1817 at a total cost of $£ 1,421,954$. It enjoyed modest success for about 30 years following its completion but never attracted the same level of traffic as the Grand Canal. The railway age signalled the demise of the canal and in 1845 the Midland Great Western Railway Company purchased the entire canal for $£ 289,059$, principally to use the property to lay a new railway. The Railway Company was legally obliged to continue the canal business, but inevitably canal traffic fell into decline and by the 1950s there was virtually no traffic and the canal was officially closed in 1955 (information taken from The Office of Public Works leaflet The Royal Canal).

The advent of the railway to Ireland completely radicalised Irish transport, transforming concepts of speed and travel and allowing for the movement of people and goods as never before. In the summer of 1845 an Act of the British Parliament gave the newly-formed "Midland" Company the right to build a rail line from Dublin to Mullingar. The new line quickly reached Enfield and was opened for traffic in June 1847, running along the bank of the Royal Canal, and reached Galway by 1851. This railway runs along the $S$ bank of the Royal Canal to the $N$ and $W$ of the Study Area.

In 1858 the Dublin and Meath Railway was established with a view to developing a rail link from Athboy and Trim to Dublin; however, this ran into difficulties soon after work began and the developers turned their attentions to developing a line from Navan to Clonsilla. This 26-mile road opened in August 1862. This line became known as 'The Meath Road' but the company suffered financial difficulties and went into receivership in 1868. The Midland and Great Western Railway took a lease on the Clonsilla-Navan line before eventually buying it in 1888. The Midland and Great Western Railway Company was absorbed by Great Southern Railways in 1925 and in 1947, following a huge decline in rail passengers the line was permanently suspended.

### 4.4.6.3.2 Record of Monuments \& Places

The Record of Monuments and Places (RMP) is a statutory inventory of archaeological sites protected under the National Monuments Acts 1930-2004 (Section 12, 1994 Act), compiled and maintained by the Archaeological Survey of Ireland (ASI). The inventory concentrates on pre-1700 AD sites and is
based on a previous inventory known as the Sites and Monuments Record (SMR) which does not have legal protection or status (see www.archaeology.ie).
There is one recorded archaeological sites located within the Study Area. This is illustrated on Figure 4.4.2 (page 54), and consist of DU013:018 the possible ring barrows at Kellystown.

The National Monuments Legislation (1930-2004) and the policies of the National Monuments Section of the Department of the Environment, Heritage and Local Government advocate the preservation in situ of recorded archaeological sites (i.e. avoidance).

| RMP No.: | DU013-018 |
| :--- | :--- |
| Townland: | Kellystown |
| Parish: | Clonsilla |
| Barony: | Castleknock |
| Classification: | Possible Ring Barrows |
| Description: | Three conjoined barrows, which comprise of an external bank and internal <br> ditch enclosing slightly raised interiors. Average internal diam. 11m. Bank <br> width 2.5m, height 0.6m. Ditch 2m wide and 0.25m deep. All three monuments <br> are very clearly defined within the aerial photographs taken of the area. |
| Ref.: | SMR file |
| Distance: | Option 1: c.210metres <br> Option 2: extends through the RMP archaeological constraint area <br> Option 3 c.360 metres |
| RMP No.: | DU013-017 |
| Townland: | Clonsilla |
| Parish: | Clonsilla |
| Barony: | Castleknock |
| Classification: | Church (01) Graveyard (02) Graveslab (03) |
| Description: | A 19th century Church of Ireland, which is located on the site of a medieval <br> parish church. There is no visible trace of the earlier church present; however, <br> there is a 17 ${ }^{\text {th }}$ century tombstone within the graveyard. |
| Ref.: | SMR file |
| Distance: | Option 1: c.450metres <br> Option 2: c.250 metres <br> Option 3 c.360 metres |

Table 4.4.6.1.: Archaeological sites within 1000m of the proposed Study Area

### 4.4.6.3.3 Topographical Files

## Topographical Files, Irish Antiquities Division, National Museum of Ireland

Consultation of the above archive revealed that a polished stone axehead was discovered in Kellystown (NMI 1997:104) dating to the Neolithic Period. The find was provenanced to a garden in Weaver's Row, in Kellystown.

Information on artefact finds from the Study Area in County Dublin has been recorded by the National Museum of Ireland since the late $18^{\text {th }}$ century. Location information relating to these finds is important in establishing archaeological activity in the environs of the Study Area.

| Museum No: | 1997:104 |
| :--- | :--- |
| Townland: | Kellystown |
| Parish: | Clonsilla |
| Barony: | Castleknock |
| Find: | Polished stone axehead |
| Find place: | Weavers Row south of the road running from church, in rear garden |
| Description: | Roughly trapezoidal in outline, oval in cross section and butt missing, <br> convex symmetrical cutting edge chipped in places, Both broad faces near <br> the cutting edge are well polished, the remaining surfaces are more <br> roughly ground. L 15.7cm max width at cutting edge 7.9m, max thickness <br> 4.3m |
| Dr Jackson's report. "The material is a melanocratic igneous rock of <br> intermediate texture. Feldspar and ferromagnesian hemihedral crystals <br> are visible with a low power hand-lens, and interstitial ore (magnelite) <br> occurs. The rock is dolerite, slightly weather and is not of local origin. The <br> nearest outcrop of this type of rock occurs near Navan Co. Meath c. 25m <br> to the NNW and is the Kingscourt area. The artefact could conceivably <br> have been made from a glacial erratic of local provenance but, because <br> such cobble-size erratics tend to be weathered and decayed it appears <br> more probably that the artefact was brought into the area" |  |
| Reference: | Topographical files, Irish Antiquities Division, National Museum of Ireland |

Table 4.4.6.2: Stray archaeological finds in the vicinity of the Study Area

### 4.4.6.3.4 Cartographic Sources

Analysis of historic mapping can show human impact on landscape over a prolonged period. Large collections of historical maps (pre- and early Ordnance Survey maps as well as Estate or private maps) are held at the Glucksman Map Library, Trinity College and other sources (UCD Library, Ordnance Survey Ireland, local libraries and published material).

The results of the cartographic analysis revealed that the footprint of the estates and demesnes of Kellystown, Green Mount House, Luttrellstown, Beech Park House and Barberstown remain on the whole intact. No additional features of potential archaeological significance were noted in the constraints Study Area, through cartographic analysis.

### 4.4.6.3.5 Aerial Photography

Aerial photography (or other forms of remote sensing) may reveal certain archaeological features or sites (earthworks, crop marks, soil marks) that for many reasons may not be appreciated at ground level. There are a number of available collections including the National Monuments Section, Geological Survey of Ireland (1970-73), Ordnance Survey of Ireland (1995, 2000, 2005), National Museum of Ireland (St Joseph CUCAP Collection) and Air Corps (1950's-1970's).

Inspection of the aerial photographic coverage of the Study Area revealed that the footprint of the demesnes of Kellystown, Green Mount House, Luttrellstown, Beech Park House and Barberstown remain on the whole intact. The Study Area consists of demesne lands/greenfield areas, and as with all greenfield areas, there is the potential to reveal previously unrecorded archaeological remains
through ground disturbance associated with construction activity. No features of potential archaeological significance were noted in the Study Area, through aerial photographic analysis.

### 4.4.6.3.6 Summary of Previous Archaeological Fieldwork

## Kellystown

## Licence Ref.: 06E0348

## RMP sites DU013-018 (Ring-Barrow possible)

Rob Lynch of Irish Archaeological Consultancy Ltd carried out licenced archaeological testing (Licence Ref.: 06E348), to study the exact nature of the RMP site DU013-018, classified in the RMP file as possible ring-barrows at Kellystown, Clonsilla, Dublin 15 -RMP Sheets 3129/3195.

The SMR file reported "three conjoined barrows, which comprise of an external bank and internal ditch enclosing slightly raised interiors. Average internal diameter 11 m . Bank width 2.5 m , height 0.6 m . Ditch 2 m wide and 0.25 m deep. All three monuments are very clearly defined within the aerial photographs taken of the area".

The programme of testing at Kellystown, Clonsilla located an internal bank in one of the three circular features. Deposits were noted in the two other trenches at points where the trenches intersect the banks. These deposits can tentatively be identified as bank collapse which may overlie and obscure further ditches; however, the presence of the ditch in one of the circular features alone establishes this feature as a type of ring-barrow known as an 'embanked ring-ditch' (as defined by Newman 1997, 153-160) and, by inference, it is highly likely that all three can be thus classified due to their similar typology, proximity (indeed, they conjoin) and their size (Lynch 2006).

## Luttrellstown

Licence Ref.: 04E0558
RMP DU017-004 (Luttrellstown Castle)
Seven areas were investigated archaeologically as a planning requirement for the re-development of the lands of the castle as a hotel/recreational area by Linzi Simpson of Margaret Gowen \& Co. Ltd (Simpson 2004). No features of archaeological interest were noted which is relatively unusual given the size of the development and its location in the Liffey Valley.

### 4.4.6.3.7 Architectural Heritage

Local Authorities have a statutory responsibility to safeguard architectural heritage in accordance with Part IV of the Planning and Development Act 2000. Under S. 51 (1), a County Council must compile a Record of Protected Structures (RPS), which lists all structures which are of special architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest. The protection, unless otherwise stated, includes the exterior and interior of the structure, lands lying within its curtilage (boundary), other structures and their interiors within the curtilage, plus all fixtures and fittings which form part of the interior or exterior of any of these structures. Buildings can be added to, or deleted from the RPS at any time, though generally this occurs when the County Development Plan is being reviewed. The National Inventory of Architectural Heritage (NIAH) was established on a statutory basis under the provisions of the Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act 1999. Its purpose is to identify, record, and evaluate the post-1700 architectural heritage of Ireland, uniformly and consistently as an aid in the protection and conservation of the built heritage. It is intended to provide a basis for recommendations of the Minister
for Arts, Heritage and the Gaeltacht to Local Authorities for the inclusion of particular structures in Records of Protected Structures (RPS).

The Study Area contains the Beech Park House which has the Protected Structure Nos. 709 and 710 which comprise the 'former outbuildings of Beech Park house' and the 'house, lodge and gates'.

The walls of the Luttrellstown Estate form the southern boundary of a significant portion of the Study Area.

### 4.4.7 Utilities Apparatus

As part of the constraints study a desktop study was undertaken to identify all utility constraints within the Study Area. Utility providers were contacted to obtain information on the location and type of services within the defined Study Area.

The desktop study identified that the following companies have apparatus within the Kellystown Road Study Area;

- ESB - Power Supply
- Gas Networks Ireland (GNI) - Gas Supply
- Eir-Telecommunications
- Virgin Media - Telecommunications
- Fingal County Council - Storm Water \& Foul Wastewater
- Irish Water - Water Supply and Sewerage


### 4.4.7.1 ESB

The ESB network equipment located throughout the Kellystown Study Area comprises of low voltage overhead lines along Clonsilla Road and Porterstown Road, and connections to private properties.

### 4.4.7.2 Gas Networks Ireland (GNI)

Existing Gas main infrastructure has been identified at the extents of the proposed Kellystown Road Study Area. There is an existing 200 dia ST40 Bar high pressure gas main that runs along Luttrellstown Road as far a Clonsilla Road, where it diverts onto the grounds of Luttrellstown Castle. It is within the Study Area only in the vicinity of the junction of Clonsilla Road and Luttrellstown Road.

### 4.4.7.3 Telecommunications

Existing Telecommunications infrastructure has been identified within the footprint of the proposed Study Area on Clonsilla Road and connecting into Scoil Choilm Community National School at the eastern extent of the Study Area.

### 4.4.7.4 Stormwater

There is existing stormwater sewers located in the Study Area including a 1600 mm concrete surface water pipe that crosses the Study Area towards the western extents. This 1600 mm diameter pipe is 4 6 m deep through the Study Area.

### 4.4.7.5 Watermain

There are existing twin 700mm diameter concrete watermains crossing the Study Area. These are believed to be at some depth below ground level (>2 metres).

### 4.4.8 Population, Economy, Business \& Tourism

The Strategic Policy of the Fingal Development Plan will deliver on the Main Aims by seeking to: "Promote enterprise and employment throughout the County, particularly in the growth centres of Swords, Blanchardstown and Balbriggan". The Plan outlines the strength of the Information and Communication Technology and retail sectors as employers in the Blanchardstown area.

The population growth for Fingal between the 2011 and 2016 Censuses was $8 \%$, with growth of $8 \%$ seen in the Blanchardstown - Blakestown area which is directly to the north of the Study Area, and includes the Hansfield SDZ, and growth of 9\% in the Lucan North area in which the Study Area lies (medium blue areas on Figure 4.4 .8 .1 below). In addition, the population grew by $27 \%$ in Blanchardstown - Abbotstown and The Ward, and by 53\% in Blanchardstown - Tyrrelstown (dark blue areas on Figure 4.4.8.1 below).


Figure 4.4.8.1 Population Growth from 2011 - 2016 (source Airo Census Mapping)

It can be seen that there are high levels of housing stock in the areas surrounding the Study Area with Blanchardstown - Blakestown 12,456 units, Blanchardstown - Coolmine 3,760 units and Castleknockmaroon 6,806 units (all dark blue areas on Figure 4.4.8.2). However, the area in which the Study Area lies, Lucan North, currently has 419 housing units (pale yellow area on Figure 4.4.8.2).


Figure 4.4.8.2 Housing Stock at Census 2016 (source Airo Census Mapping)

A 'Main Aim' of the 'Strategic Policy' of the Fingal Development Plan is to 'Consolidate the growth of the major centres of Blanchardstown and Balbriggan by encouraging infill development and intensification of development within appropriate locations.' The Kellystown Lands are within the North-West strategic residential and employment development corridor in the RSES. The proposed Kellystown Road supports the targets of at least $50 \%$ of all new homes within or contiguous to the existing built up area in Dublin.

### 4.4.9 Amenities

Shackleton's Gardens and house are in the Study Area, as are the lands of Beech Park, and the Fingal County Council owned Beech Park, and Westmanstown Gaels sports pitches. In the north of the Study Area there are extensive allotments.

Luttrellstown Castle Golf and Country Club are directly to the south of the Study Area, and Westmanstown Sports Centre is to the south west.

### 4.4.10 Noise \& Vibration

### 4.4.10.1 Existing Environment

The existing environment of the Study Area is predominately rural in nature but is on the boundary of the sub-urban areas of wider Blanchardstown area. The land use within the Study Area is predominately a mixture of greenfield lands used for farming, residential properties, some Fingal County Council parkland and existing school. Review of Ordnance Survey, aerial and digital mapping noted that the main contributors to the noise environment are likely to be from road traffic along the existing regional and minor local roads, the rail line, farm yard activities and general environmental sources including bird song and rustling foliage.

The Dublin Agglomeration Environmental Noise Action Plan (2013-2018) presents an overview of the contribution of road traffic to noise levels. As part of the noise mapping requirements, all roads with traffic flows greater than 3 million vehicle trips per annum (approximately 8,000 AADT) were required to be mapped in terms of the $L_{\text {den }}$ and the $L_{\text {night }}$ parameter. AADT is the annual average daily traffic volume on a road in both directions.

Fingal County Council (FCC) have produced a draft Noise Action Plan for Fingal County 2019-2023 to provide an overview of the regulations, to review the results of the latest strategic noise maps for the FCC administrative area within the Dublin Agglomeration, to set out an approach to the strategic management and control of environmental noise for the period 2018-2023, and to help inform the overall Dublin Agglomeration Noise Action Plan. In the vicinity of the Study Area, sections of the M50, N3, R121 Clonsilla Road and Luttrellstown Road, and the R149 from Lucan to Clonee have been mapped. The maps are presented in noise contour bands in increments of 5 decibels starting at 55 dB $L_{\text {den. }}$

Figures 4.4.10.1 and 4.4.10.2 display an overview of the $L_{\text {night }}$ and $L_{\text {den }}$ noise contour maps in the vicinity of Kellystown and in proximity to the route selection Study Area.


Figure 4.4.10.1 Lnight Noise Contours for Kellystown area (Source: Noise Action Plan for Fingal County 2019-2023)


Figure 4.4.10.2 Lden Noise Contours for Kellystown area (Source: Noise Action Plan for Fingal County 2019-2023)

Reference to Figure 4.4.10.1 indicates that the contribution from road traffic noise during night-time periods is typically below 40dB Lnight in the Study Area and reference to Figure 4.4.10.2 indicates that
the $L_{\text {den }}$ noise level associated with road traffic noise is typically below 55 dB in the Study Area and all are below the onset threshold for noise management, i.e. 70 dB Lden.

### 4.4.10.2 Mitigation Options

Noise mitigation would be focused on boundary areas of existing and proposed residential properties to reduce noise levels.

Mitigation measures will typically consist of one or a combination of the following measures:

- Locating the route away from sensitive locations to avoid the need for further mitigation measures.
- Using local topography to provide screening along the route alignment, where possible (e.g. the use of false cuttings to provide acoustic and visual screening.
- Noise barriers which can take many forms, e.g. an earth bund, a stone wall or a proprietary timber noise barrier.
- The use of low noise pavements.
- Earth mounds or bunds are often used to screen infrastructural developments from noise sensitive locations.
- A number of types of barriers are available on the market. These range from timber barriers (typically the most frequently used barriers along roadsides in Ireland) to sheet metal, concrete/brick, plastic (PVC) and bio barriers. The extent and height of noise barriers will be defined as detailed alignments of the proposed scheme are assessed.

It should be noted that timber barriers can be used in combination with mounds/berms in order to develop an overall barrier of a required height (e.g. 1.5 m berm with 1 m timber barrier to give a mitigation measure of overall 2.5 m height).

## Clifton Scannell Emerson

### 4.4.11 Air Quality

### 4.4.11.1 Air Pollutant Sources

It is likely that the major source of air pollution within the Study Area is road traffic, with some air pollution also resulting from agricultural. This are the only current known sources of air pollution within the Study Area. Air quality is variable and subject to significant spatial variation, with concentrations generally falling significantly with distance from major road sources (UK DEFRA, 2007). The highest levels of existing air pollution is experienced at the junction of Porterstown Link Road with Diswellstown Road, with the remainder of the Study Area generally experiencing rural background concentrations of pollutants.

### 4.4.11.2 Meteorological Data

A key factor in assessing temporal and spatial variations in air quality is the prevailing meteorological conditions. Depending on wind speed and direction, individual receptors may experience very significant variations in pollutant levels under the same source strength (i.e. traffic levels) (WHO, 2006). Wind is of key importance in dispersing air pollutants and for ground level sources, such as traffic emissions, pollutant concentrations are generally inversely related to wind speed. Thus, concentrations of pollutants derived from traffic sources will generally be greatest under very calm conditions and low wind speeds when the movement of air is restricted. In relation to PM10 (particulate matter that has a mass median diameter of less than 10 micrograms), the situation is more complex due to the range of sources of this pollutant, and thus measured levels of PM10 can be a nonlinear function of wind speed.

The nearest representative weather station collating detailed weather records is Casement Airport meteorological station which is located approximately 9 km southwest of the proposed Kellystown Road. Casement Aerodrome meteorological station collects data in the correct format and has data capture collection of greater than $90 \%$ for the required parameters. Long-term hourly observations at Casement Aerodrome meteorological station provide an indication of the prevailing wind conditions for the region. Results indicate that the prevailing wind direction is from southerly to westerly in direction over the period 2012-2016. The mean wind speed is approximately $5.5 \mathrm{~m} / \mathrm{s}$ over the period 1981-2010.

### 4.4.11.3 Air Quality Zones

Four air quality zones have been defined in Ireland for air quality management and assessment purposes. Dublin is defined as Zone A. and Cork as Zone B. Zone C is composed of 24 cities and towns with a population of greater than 15,000 . The remainder of the country, which represents rural Ireland but also includes all towns with a population of less than 15,000 is defined as Zone D.

In terms of air monitoring, the study area is predominantly categorised as Zone A covering Dublin and its environs.

### 4.4.11.3.1 Review of EPA Monitoring Data

Air quality monitoring programs have been undertaken throughout Ireland in recent years by the EPA and Local Authorities. Although no EPA or Local Authority monitoring has been carried out within the Study Area to date, there is currently EPA monitoring ongoing in Blanchardstown.

TII Guidelines for the Treatment of Air Quality during the Planning and Construction of National Road Schemes (2011) state that the local air quality assessment should focus on $\mathrm{NO}_{2}$ and $\mathrm{PM}_{10}$, as these are the pollutants of greatest concern with respect to road traffic conditions.

The Blanchardstown monitoring currently shows $\mathrm{NO}_{2}$ and PM 10 concentrations that are lower than the limit value, with this monitoring taking place directly adjacent the N3 Dublin to Navan national road, and within 500 m of the M50 (the orbital motorway around Dublin city). As there are no national routes within the Study Area it is assumed that the prevailing $\mathrm{NO}_{2}$ concentrations within the Study Area are also below the limit value.

### 4.4.11.3.2 Sensitive Receptors

The number of receptors sensitive to air quality within 50 m of the edge of the Study Area will be determined in the Stage 1 Route Assessments as per TII guidelines. Receptors for the purpose of this assessment are regarded as residential buildings. At this early stage assessment no further distinction is made between different types of property.

### 4.4.11.3.3 Impacts on Sensitive Ecosystems

The EC Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (the "Habitats Directive") requires an Appropriate Assessment to be carried out where there is likely to be a significant impact upon a European protected site. Transport Infrastructure Ireland (TII) requires an Air Quality Specialist to liaise with an ecologist on schemes where there is a European protected site within 2 km of the route. However, as the potential impact of a scheme is limited to local level, detailed consideration only needs to be given to roads where there is a significant change to traffic flows (>5\%) and the designated site lies within 200 m of the road centre line. Where these two requirements are fulfilled, the assessment at the route selection stage involves a calculation of nitrogen oxides ( $\mathrm{NO}_{\mathrm{x}}$ ) concentrations using the DMRB screening method. The closest protected site is roughly 700 m from the Study Area. Therefore, no routes require assessment for air quality impacts on sensitive ecosystems.

### 4.4.12 Housing

Lands zoned for residential development in Kellystown and Barnhill lie within the Study Area. The bulk of existing housing for the Blanchardstown is currently provided in housing estates to the north and east of the Study Area.

Currently there are a number of large one off houses, with associated outhouses and farm buildings.

There is a halting site accessed from Porterstown Road to the east of the Study Area.

### 4.4.13 Land Use

### 4.4.13.1 Land Use Zoning

Figure 4.4 .13 shows a land use map taken from Sheet 13 of Fingal Development Plan, with 'Residential Areas' shown in light brown on the map. The zoning objective of a Residential Area (RA) is to 'Provide for new residential communities subject to the provision of the necessary social and physical infrastructure'. These include the Kellystown Residential Area zone (light brown area to east of map extract). Dark green areas are currently zoned for Open Space, and medium green for High Amenity.


Zoning Objectives Legend


Figure 4.4.13: Fingal Development Plan 2017-2023-Extract from Sheet No. 13 Blanchardstown South

### 4.5 External Parameters (Economy)

### 4.5.1 Funding and Cost

### 4.5.1.1 Cost

The cost of each route option has been estimated taking account of high level unit costs for construction and land acquisition to allow a comparison of the options.

### 4.5.1.1.1 Mainline Road Works Cost Estimates

The unit costs for road works used in this chapter are based on the Road Works Unit Rate Database (Version 2 - Base date July 2013) published by the NRA (now TII), and also indicative costs from past tenders received by Clifton Scannell Emerson Associates for similar Local Authority road schemes. The estimated construction cost per kilometre of mainline roadway is $€ 2.5$ million/kilometre for the initially selected road type as noted in Section 3.6 of this report. For works to the existing road where an upgrade only is provided, $€ 1.5$ million/kilometre is assumed.

### 4.5.1.1.2 Junction Works Cost Estimates

Estimated construction costs for both signalised and non-signalised junctions have also been prepared. A sum of $€ 500,000$ has been estimated for provision of a fully signalised junction or large diameter roundabout. To accommodate the provision for tying into an existing roundabout, upgrade of existing T junctions and the introduction of a staggered junction (all referenced as non-signalised), a $€ 200,000$ sum has been estimated.

### 4.5.1.1.3 Bridge Works Cost Estimates

The unit cost per square metre for bridge crossing the railway line is estimated at $€ 2500$ per square metre.

## 5 Stage 1 Preliminary Option Assessment

### 5.1 Introduction

As part of the Stage 1 Route Selection assessment process, feasible route options have been developed to allow an accurate comparison of the alternative options which could form Kellystown Road. Each option has been developed to a sufficient level of detail to ensure that the option is a potentially feasible route.

The proposed scheme shall be designed to comply with all relevant design standards [TII Publications (standards) and DMURS], legislation and guidance documents (including NRA 2010 Project Management Guidelines, the 2016 DTTS Common Appraisal Framework, and the Public Spending Code).

### 5.2 Stage 1 Route Options

Figure 5.2 shows the location of the proposed Route Options within the Kellystown Road Study Area. The following route option descriptions should be read in conjunction with Figure 5.2.

### 5.2.1 Do Nothing

An analysis of the Do Nothing scenario was undertaken to set a baseline for route comparison. The Do Nothing options represents our assessment of a non-road alternative. The Fingal Development Plan 2017-2023 Objective MT41 seeks to implement the Kellystown Road during the life of the Plan. The road is required to provide access for all modes to the Kellystown LAP lands, and to provide cycle and pedestrian linkage between the development lands, the surrounding network, and the Barnhill lands. In the event of a non-road alternative, there would be no opportunity to access the Kellystown LAP lands, the existing Luttrellstown Road and Barberstown Level crossing would remain as the only access between Clonsilla Road and Barberstown.

### 5.2.2 Route Option 1 (Red)

Proposed Route Option 1 commences at the existing signalised junction with Porterstown Link Road and Diswellstown Road. The route corridor initially follows the alignment of the Kellystown Road shown in the Development Plan before diverting around the back of Greenmount and other residential properties on Clonsilla Road, and crossing Clonsilla Road with a junction in close proximity to the Clonsilla Level Crossing. It then runs through the northern area of the Study Area, parallel to the line of the Maynooth-Dublin rail line before crossing the railway and then canal with two separate bridge structures and tying-in to the existing Barberstown Lane South (which will be upgraded as part of the proposed Ongar Barnhill Road scheme). The approximate length of proposed Route Option 1 is 3.00 km .

### 5.2.3 Route Option 1A (Cyan)

Proposed Route Option 1A follows a similar line to Route Option 1 until it runs south prior to crossing the railway and canal, allowing this option to cross the railway and canal with one bridge structure (using the line of Route Option 3) before it ties-in to the existing Barberstown Lane South (which will be upgraded as part of the proposed Ongar Barnhill Road scheme). The approximate length of proposed Route Option 1 A is 3.00 km .

### 5.2.4 Route Option 2 (Green)

Proposed Route Option 2 commences at the existing signalised junction with Porterstown Link Road and Diswellstown Road. The route corridor initially follows the alignment of the Kellystown Road shown in the Development Plan before running to the south of Greenmount and other residential properties on Clonsilla Road, and crossing Clonsilla Road with a junction in close proximity to these properties. It then runs to the north of the Beech Park lands, before crossing the railway and then canal with two separate bridge structures and tying-in to the existing Barberstown Lane South (which will be upgraded as part of the proposed Ongar Barnhill Road scheme). The approximate length of proposed Route Option 2 is 3.00 km .

### 5.2.5 Route Option 2A (Purple)

Proposed Route Option 2A commences at the existing signalised junction with Porterstown Link Road and Diswellstown Road. The route corridor follows the alignment of the Kellystown Road shown in the Development Plan including running between, and in very close proximity, to Greenmount and another residential properties on Clonsilla Road, with a junction between, and in very close proximity, to these properties. It then runs to the north of the Beech Park lands, before crossing the railway and then canal, on the line of Route 2, with two separate bridge structures and tying-in to the existing Barberstown Lane South (which will be upgraded as part of the proposed Ongar Barnhill Road scheme). The approximate length of proposed Route Option 2A is 2.90 km .

### 5.2.6 Route Option 2B (Mustard)

Proposed Route Option 2B commences at the existing signalised junction with Porterstown Link Road and Diswellstown Road, and follows the line of Route Option 2 until after it runs to the north of the Beech Park lands, before it turns south prior to crossing the railway and canal, allowing this option to cross the railway and canal with one bridge structure (using the line of Route Option 3) before it tiesin to the existing Barberstown Lane South (which will be upgraded as part of the proposed Ongar Barnhill Road scheme).The approximate length of proposed Route Option 2B is 3.00 km .

### 5.2.7 Route Option 2C (Blue)

Proposed Route Option 2C commences at the existing signalised junction with Porterstown Link Road and Diswellstown Road and follows the line of Route Option 2 until it runs to the north of Beech Park. It then joins Route Option 1 to run through the northern area of the Study Area, parallel to the line of the Maynooth-Dublin rail line before crossing the railway and then canal with two separate bridge structures and tying-in to the existing Barberstown Lane South. The approximate length of proposed Route Option 2C is 3.00 km .

### 5.2.8 Route Option 3 (Yellow)

Proposed Route Option 3 commences at the existing signalised junction with Porterstown Link Road and Diswellstown Road, and initially follows the route of Kellystown Road from the Development Plan before it diverts south to the junction of Luttrellstown Road and Clonsilla Road. This Option then runs along Luttrellstown Road providing an upgrade of the existing road, including pedestrian and cycle facilities. The upgrade of Luttrellstown Road along its existing line is a Do Minimum option for this section of the scheme, with the proposal to upgrade and provide traffic management on the existing road as an alternative to construction of a new road. It then crosses the railway and canal with a single bridge structure before joining the existing upgraded Barberstown Lane South (upgraded as part of the proposed Ongar Barnhill Road scheme). The footpath and cycletrack would be provided behind the existing tree line and hedgerow. Route Option 3 has an approximate length of 2.80 km .

### 5.2.9 Route Option 3A (Moss)

Proposed Route Option 3A commences at the existing signalised junction with Porterstown Link Road and Diswellstown Road, and initially follows the route of Kellystown Road from the Development Plan before it diverts south to the junction of Luttrellstown Road and Clonsilla Road. This Option then runs along Luttrellstown Road providing an upgrade of the existing road, including pedestrian and cycle facilities, and diverting stretches of the road into adjoining land in order to achieve sightlines and a vertical alignment that is in line with the DMRB. It would then cross the railway and canal with a single bridge structure before joining the existing upgraded Barberstown Lane South (upgraded as part of the proposed Ongar Barnhill Road scheme). Route Option 3A has an approximate length of 2.90 km .

### 5.2.10 Route Option 3B (Dark Blue)

Proposed Route Option 3B runs along the line of Route Option 3 (or 3A) until it diverts south of Route Option 3 to cross the railway and canal with a shorter bridge crossing before joining the existing upgraded Barberstown Lane South (upgraded as part of the proposed Ongar Barnhill Road scheme). Route Option 3A has an approximate length of 2.90 km .

Figure 5.2: Kellystown Road - Proposed Route Options Layout (see also Drawing No 18_015_CSE_GEN_ZZ_DR_C_1013 in Appendix A)

### 5.3 Stage 1 Preliminary Options Assessment

In order to identify the high preference options for further detailed assessment, a Stage 1 Preliminary Options Assessment was based on the TII's NRA Project Management Guidelines 2010. The route options were assessed under the criteria headings of Engineering, Environment and Economy. In addition to the feasible route options described above, the Stage 1 Assessment also assesses the DoNothing option. The objective of the Stage 1 Assessment is to reduce the number of feasible route options to a minimum of three and a maximum of five which will then be subjected to a more rigorous assessment.

Route options were assessed in terms of High, Medium and Low Preference under the sub headings listed below. Table 5.3.4.1 details the overall Stage 1 route options assessment summary matrix.

## Engineering:

- Traffic Assessment;
- Smarter Travel;
- Extent of on Street Works;
- Land \& Property;
- Utilities Apparatus;
- Technical Standards/Safety.


## Environment:

- Compatibility with Development Policy;
- Landscape and Visual;
- Hydrology;
- Geology and Hydrogeology;
- Air Quality;
- Noise \& Vibration;
- Archaeology \& Cultural Heritage;
- Ecology;
- Agriculture (incl. other Agri-business).


## Economic:

- Cost (estimated);
- Traffic Benefits.

The scheme objectives as defined in Chapter 1 of this report are as follows:
Obj01: To open up the Kellystown LAP lands for residential development (Obj01).
Obj02: To support Smarter Travel objectives by providing a safe new road link for pedestrians, cyclists and buses within the existing and proposed road network.
Obj03: To provide improved road safety by delivering a road to current road design standards, including accesses to new developments from this proposed road.
Obj04: To facilitate the future closing of level crossings on the Maynooth Dublin rail line in consultation with other stakeholders and as part of wider ND/NPF/NTA strategies.
Obj05: To provide increased opportunity for the local population to engage in physical activity.
Obj06: That the road route and design will minimise impact on the existing environment.
Obj07: To improve road based transport at a local level.

Obj08: To address the objectives of the Fingal County Development Plan, National Spatial Strategy and the Transport Strategy for the Greater Dublin Area 2016-2035 to generally improve quality of life and improve accessibility to work, education and other activities for both motorised and non-motorised modes of travel.
Obj009: To integrate with the surrounding National Secondary Road network and Regional Road network to minimise delays and journey times on these neighbouring routes (Obj09).
Obj10: To facilitate housing development potential in the Kellystown area, which can be integrated, not just with the surrounding road network, but also with the existing public transport including rail and bus.
Obj11: To integrate with existing and proposed pedestrian and cycling networks including the proposed Royal Canal Greenway.

### 5.3.1 Engineering Assessment

The Stage 1 Preliminary Options Assessment examined Engineering under the sub headings of:

- Traffic Assessment,
- Smarter Travel,
- Extent of on Street Works,
- Comparison on Land \& Property,
- Utilities Apparatus,
- Technical Standards.


### 5.3.1.1 Traffic Assessment

All of the proposed route options (with the exception of the Do-Nothing scenario) meet the traffic needs of the Kellystown and wider area (as per details given in Chapter 3) (and meet objectives Obj01, Obj07, Obj08, Obj09 of the scheme objectives). However, some of the routes have particular advantages and disadvantages over the other, a non-exhaustive list of these includes:

- Route Options 3, 3A and 3B have a traffic advantage over the other routes as they have the potential to maintain existing traffic destined for the City Centre using Luttrellstown Road instead of diverting onto the new road through the Kellystown lands. Maintaining usage of the Luttrellstown Road as it travels towards Castleknock would be positive for traffic flows within the wider area. The junction of Porterstown Link Road and Diswellstown Road (where the proposed Kellystown Road will tie-in) currently experiences some congestion due to the high levels of traffic travelling from Diswellstown Road Extension to Diswellstown Road. Maintaining a split between Luttrellstown Road and Kellystown Road would remove some pressure from this junction.
- Routes 1, 2, 2A and 2C do not provide good connectivity to Luttrellstown Road as it runs north south towards Strawberry Beds.
- Route Options 1 and 1A would require their junction with Clonsilla Road to be signalised and synchronised with the Clonsilla Level Crossing. This would be a large junction with safety and potential congestion issues.

Route 3, 3 A and 3 B perform the best in terms of the level of traffic that they are attracting, and the resulting lower levels of traffic on the junction of the proposed Kellystown Road with Porterstown Link Road and Diswellstown Road. Upgrade of the Luttrellstown Road, as proposed in these options, would make this an attractive route for all road users, while allowing the opening of the Kellystown lands for development.

Table 5.3.1.1, below, gives a summary of the traffic assessment.

| Route Option | Traffic Assessment |
| :---: | :---: |
| Do-nothing | Low Preference |
| Route 1 (Red) | Low Preference |
| Route 1A (Cyan) | Low Preference |
| Route 2 (Green) | Medium Preference |
| Route 2A (Purple) | Medium Preference |
| Route 2B (Mustard) | High Preference |
| Route 2C (Blue) | Medium Preference |
| Route 3 (Yellow) | High Preference |
| Route 3A (Moss) | High Preference |
| Route 3B (Dark Blue) | High Preference |

Table 5.3.1.1 Traffic Assessment Summary Table

### 5.3.1.2 Smarter Travel Assessment

In assessing the Do-nothing for Smarter Travel a Low Preference has being assigned to this criteria as the absence of dedicated cycle lanes or standardised/upgraded footways restricts the travel choices available to the existing residents.

All of the proposed route options meet objective Obj02 'to support Smarter Travel objectives by providing a safe new road link for pedestrians, cyclists and buses within the existing and proposed road network':

- Route Options 1, 2, 2A and 2 C have been ranked as Medium Preference as they would provide dedicated footways and cycle ways as part of the standard cross section, in addition the connections to the existing and proposed future infrastructure at Porterstown Link Road and the Royal Canal, etc., and allow the opening up of development lands adjacent Clonsilla railway station. However, the longer bridge structures over the railway and canal make these options less attractive to pedestrians and cyclists, and to the west of railway line the route potentially sterilises land that is currently zoned for open space but may in the future be appropriate for residential development due to tis close proximity to the Hansfield train station.
- Route Option 1A and 2B have also been assigned a Medium Preference as the route detours between Clonsilla Road and Barberstown Lane South while the more direct Luttrellstown Road continue to have no pedestrian and cycle facilities.
- Route Options 3, 3A and 3B have been assigned a high preference as they provide dedicated footways and cycleways, allow land adjacent Clonsilla train station to be developed for housing, and provide direct connectivity with the existing networks.


### 5.3.1.3 Extent of on Street Works

'On Street Works' are upgrade works along the line of the existing road. They will impact on the existing road during the works with potential traffic restrictions or road closures and diversions required, and may take longer and cost more than works in a greenfield or brownfield site. The Do Nothing scenario has been ranked as High Preference under this sub-heading as this would, by definition, create no impacts.

All nine Route Options would impact on the existing road network at proposed junction locations. However, the impacts for Route Options 1, 1A, 2, 2A, 2B and 2C have been ranked as Medium Preference as their only impact is at tie-in locations.

Route Options 3, 3A and 3B would have significant impact on the operation of Luttrellstown Road during construction. These Routes have been ranked as Low Preference.

### 5.3.1.4 Land \& Property (including Planning and Housing)

This Comparison on Land \& Property assesses the potential for land take, land severance, land use and residential acquisitions. It also assesses impact on existing and future planning, including objectives of the Fingal Development Plan.

The Do Nothing scenario has been ranked as Low Preference under this sub-heading as, while there would be no impact on existing property, there would be no opportunity to access the Kellystown lands for residential development in line with the objectives of the Fingal Development Plan (objective Obj01).

Route Options 1, 2 and 2C have been ranked as Medium Preference as they provide access to the development lands, however, the longer bridge structures over the railway and canal require increased land take, and to the west of railway line the route would impact on land that is currently zoned for open space directly adjacent to the Hansfield train station. Route Option 1A and 2B have also been assigned a Medium Preference as the route requires significant land take between Clonsilla Road and Barberstown Lane South while twinning a route that exists currently as Luttrellstown Road. Route Option 2A is given a Low Preference as it has severe impact on two private residential properties on Clonsilla Road.

Route Option 3 has been ranked as High Preference. For almost half its length this route closely follow existing road alignments with limited need for land take, while also providing access to the Kellystown development lands. It crosses the railway and canal with limited additional landtake, and they minimises the extent of impact on the floodplain (as per the Barnhill Strategic Flood Risk Assessment) to the western extent of the Study Area (thereby minimising the land required for compensatory floodplain). Route Options 3A has been ranked Low Preference due to its impact on the gate lodge of Beech Park, as it segregates the gate lodge from the main house. Route Option 3B has been ranked as Medium Preference as it runs through an increased area of floodplain (on both sides of the canal and railway) and would therefore require additional landtake for compensatory floodplain.

### 5.3.1.5 Utilities Apparatus

The Do-Nothing has been assigned a Medium Preference as this scenario would have minimal potential for impact on existing utility apparatus but would not provide any provision for new service alignments.

A medium preference has been assigned to all Route Options under consideration as, while diversions may be required, there is also scope to increase utility capacity as part of the development of the scheme. Preliminary assessment of impact on utilities indicates that there should not be any need for major disruption to existing utility apparatus.

### 5.3.1.6 Technical Standards/Safety

- The Do Nothing scenario has been assigned a Low Preference due to the existing alignment of Luttrellstown Road, and the absence of any cycle facilities, and infrequent and substandard provision of footpaths within the Study Area.
- Following a preliminary assessment, it appears that Route Options 1, 1A, 2, 2A, 2B, 2C, 3A, and $3 B$ can be designed in accordance with current design requirements, and the opportunity exists to limit the number and location of access points to the new stretches of road.
- Following a more detailed preliminary assessment of Luttrellstown Road, it was established that this Route Option 3 could be designed to a safe minimum standard, by the increase of a number of curve radii (within the existing carriageway width) leading to an increase in stopping sight distance, and the introduction of traffic management measures, such as a gateway features. For this reason Route Option 3 is given a Medium Preference.
- Route Options 1 and 1A have been assigned a Low Preference due to their close proximity to the Clonsilla Level Crossing. Both of these options introduce a junction within 40m of the level crossing. This junction will need to be signalised and synchronised with the level crossing in order to avoid queuing of cars over the level crossing from the junction, however, the large area of road that would be in the middle of the junction would raise safety concerns, with risk that cars would remain in the middle of this signalised junction when the signals have turned red. In addition, the timing of the signals on the junction would need to work in sequence with the scheduling of the trains. At the train schedule is not flexible, the traffic signals would need to accommodate the train schedule, which may not be efficient for traffic travelling on Kellystown Road.
- Route Options 2, 2A, 2B, 2C, 3A and 3B have been assigned a High Preference. These options all meet objective Obj03 from Section 1.3 of this report.


### 5.3.2 Environment Assessment

The preliminary options assessment process examined the potential impacts and benefits to the environment under the sub headings of Compatibility with Development Policy, Landscape \& Visual, Hydrology, Geology \& Hydrogeology, Air Quality, Noise \& Vibration, Archaeology \& Cultural Heritage, Ecology and Agriculture (incl. other Agri-business). Objective Obj06 relates to minimising impacts on the existing environment.

### 5.3.2.1 Compatibility with Development Policy

The population of the wider Blanchardstown area is projected to continue to grow significantly over the period to the horizon year 2035. The population growth for Fingal between the 2011 and 2016 Censuses was $8 \%$, with growth of $8 \%$ seen in the Blanchardstown - Blakestown area which is directly to the north of the Study Area, and includes the Hansfield SDZ, and growth of 9\% in the Lucan North area in which the Study Area lies. In addition, the population grew by $27 \%$ in Blanchardstown Abbotstown and The Ward, and by 53\% in Blanchardstown - Tyrrelstown. There is also a corresponding growth in employment projected.

A 'Main Aim' of the 'Strategic Policy' of the Fingal Development Plan is to 'Consolidate the growth of the major centres of Blanchardstown and Balbriggan by encouraging infill development and intensification of development within appropriate locations.' The Kellystown Lands are within the North-West strategic residential and employment development corridor in the RSES. The proposed Kellystown Road supports the targets of at least $50 \%$ of all new homes within or contiguous to the existing built up area in Dublin.

The Do Nothing scenario does not allow for development of the Kellystown lands, nor does it allow connectivity with the Ongar Barnhill lands, or remove significant deficiencies on a stretch of the Luttrellstown Road between both these proposed development sites.

All of the nine Route Options allow for the opening up of the Kellystown lands meeting objective Obj01. In addition, they all allow connectivity between the Ongar Barnhill residential development lands and the significant open space proposals for the Kellystown area. All options comply with the Fingal Development Plan objective to provide Kellystown Road between Diswellstown Road Extension and Clonsilla Road. A route through the lands to the west of Clonsilla Road and crossing the railway and canal is not defined in the Development Plan. All routes provide for walking and cycling, but Options 3, 3A and 3B specifically provide for cycling and walking on Luttrellstown Road as per the objectives of the Development Plan.

For these reasons:

- Do Nothing is given a Low Preference.
- Options 1, 1A, 2, 2A, 2B, 2C are given a medium preference.
- Options 3, 3A, 3B are given a High Preference.


### 5.3.2.2 Landscape and Visual

The route options assigned a High Preference are those with the fewest individual landscape and visual constraints. The Do Nothing option is assigned a High Preference under this criteria as there would be no change to the landscape due to this option.

Route Options 1, 2, 2A and 2C have been assigned a Low Preference under this criteria as these options have a significant long term effect on landscape character. These options have the most significant structures with extensive visual impact, including on the Ongar Barnhill development lands, and on the proposed open space to the west of the canal. In addition, these routes run through the high amenity zoned lands to the north of Beech Park and Shackleton's Gardens. The road would be on embankment and visible from the parklands.

Route Options 1A and 2B have been given a Medium Preference as while the embankment through the parklands might be visually intrusive, these routes take a shorter crossing over the rail line and canal.

A Medium Preference has been assigned to Route Option 3A as this option requires the road to divert from the alignment of the existing Luttrellstown Road in order to improve the alignment. This route would require the removal of mature trees and significant native hedgerow.

A High Preference has been assigned to Route Options 3 and 3B as these routes follow the alignment of the existing Luttrellstown Road, while providing footpath and cycletrack along the route corridor but behind the existing line of trees and hedgerow.

### 5.3.2.3 Hydrology

The Fingal Development Plan dictates that Sustainable Drainage Systems (SuDS) to rainwater management must be included in all new developments. By using SuDS techniques, water is either infiltrated or conveyed more slowly to the drainage system and ultimately to water courses via permeable paving, swales, detention basins, ponds and wetlands. These facilities are designed to prevent pollution of streams and rivers and to slow down runoff from sites, therefore helping to prevent downstream flooding and improve water quality. This closely mimics natural catchment behaviour where rainfall either infiltrates through the soil or runs off slowly over the ground surface to the nearest watercourse. This is known as the 'Treatment Train' approach. Ponds, artificial wetlands and water features can make a positive contribution to the provision of Sustainable Drainage Systems (SuDS) and to the amenity of an area.

The Do Nothing option is assigned a High Preference under this criteria. The existing drainage infrastructure does not have any environmental protection measures in terms of SuDS and hydrocarbon interceptors, which would be included in any new works. However, although the proposed scheme would be designed using SuDS techniques, any road scheme through a greenfield site will greatly increase the extent of hard standing.

All Route Options will discharge surface water to nearby watercourses, following attenuation and flow through hydrocarbon interceptors. In addition, drainage would be provided in open ditches where possible. The scheme falls from a level of approximately 62 m OD at the eastern Porterstown extent to a low point of approximately 59 m 500 m to the west. There is an existing drainage ditch crossing farmland at this location. There may be potential to provide an attenuation feature in this location for approximately 600 m in length of the proposed road. The remaining scheme running westward as far as the top of the bridge over the railway falls to a low point that crosses through the Beech Park lands from north to south, running through the property and crossing the Luttrellstown Road to the west of the gate lodge. An attenuation feature would be required at this location also.

In relation to hydrology:

- Route Options 3 and 3A have been assigned a Medium Preference as they do not significantly increase the hardstanding between Clonsilla Road and Barberstown Lane South, however, they do have some impact on the floodplain to the south west of the Study Area, as per Figure 4.3.3: 1000 Year RP + Climate Change Flood Map with proposed Ongar Barnhill Road in Place (from the Barnhill Strategic Flood Risk Assessment).
- Option 3B is assigned a Low Preference as it runs through floodplain for approximately 800 m and would therefore have a more significant impact than Options 3 and 3A, as per Figure 4.3.3: 1000 Year RP + Climate Change Flood Map with proposed Ongar Barnhill Road in Place (from the Barnhill Strategic Flood Risk Assessment).
- Options 1, 1A, 2, 2A, 2B, and 2C all significantly increase the hard standing area with the provision of a new road through this area in addition to the new road through the Kellystown lands. For this reason, these have been assigned a Low Preference.


### 5.3.2.4 Geology \& Hydrogeology

The impact which the different routes will have on geology and hydrogeology have been assessed using the methodology defined in the Environmental Protection Agency (EPA) 'Advice Notes on Current Practice (in the preparation of Environmental Impact Statements)', 2003 and in accordance with 'Draft Guidelines on the Information to be contained in Environmental Impact Statements' (EPA, 2017), the Institute of Geologists of Ireland (IGI) 'Guidelines for the Preparation of Soils, Geology and

Hydrogeology Chapters of Environmental Impact Statements' (IGI 2013) and 'Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes' (NRA, 2009).

The Do Nothing option is assigned a High Preference under this criteria as it would not introduce any new impacts on vulnerable rocks and soils, aquifers and wells.

There is no likely significant adverse impact on the underlying aquifer or the Royal Canal NHA as a result of development of any of the Route Options as there is not expected to be any significant cut or dewatering requirement. All routes are considered to result in no measurable changes in soils and geology. However, there is an extremely vulnerable aquifer lying beneath the northern and eastern extents of the Study Area. Accordingly,

- Options 1, 1A, 2, 2A, 2B, and 2C are all assigned a low proximity due to this extremely vulnerable aquifer along much of their routes.
- Route Options 3, 3A and 3C are assigned a Medium Preference under this assessment criteria as they are only above the extremely vulnerable aquifer at the tie-in point.


### 5.3.2.5 Air Quality

The Do Nothing scenario is assigned a High Preference under this criteria as, although the traffic modelling predicts increased levels of traffic congestion under this scenario, leading to increased air pollution along the existing road network in the vicinity of the Study Area, without the construction of the Kellystown Road there will be reduced development in the area and reduced additional traffic.

All route options have been assigned a High Preference due to the requirement for the road to avoid future traffic congestion thereby avoiding increased air pollution.

### 5.3.2.6 Noise and Vibration

The Do Nothing option is assigned a High Preference under this criteria as, although the traffic modelling predicts increased level of traffic congestion under this scenario leading to increased air pollution along the existing road network in the vicinity of the Study Area, without the construction of the Kellystown Road there will be reduced development in the area and reduced additional traffic.

All route options have been assigned a High Preference as none of the proposed routes impact significantly on a large number of existing properties, and some of them bring the scope to improve the existing noise and vibration levels by improvements to existing roads.

### 5.3.2.7 Archaeology and Cultural Heritage

The assessment criteria in relation to Archaeology and Cultural Heritage involved identification and recording of the location, nature and dimensions of any archaeological or cultural heritage features, fabric or artefacts that may be impacted by the proposed works.

The Do Nothing option is assigned a High Preference under this criteria due to there being little or no new impacts introduced. Route Option 3 has the least potential impact on cultural heritage and has been assigned a High Preference.

Route Option 1 and 1A has been assigned a Low Preference as it directly impacts on an archaeological feature (Ring Barrows RPS:708).

Route Options 2, 2B, 2C, 3A and 3B have being assigned a Medium Preference due to a comparatively higher level of impact on cultural heritage features relating to The Courtyard, Beech Park House (RPS:709) and Beech Park House (RPS:710), and its gate lodge.

### 5.3.2.8 Ecology

The assessment criteria in relation to ecology involved establishing the magnitude of impact of the proposed routes on the nature conservation value of the ecological features under consideration.

While the Do Nothing option does not introduce any new impacts on ecology, and for this reason the Do Nothing option is assigned a High Preference under this criteria.

Route Option 3 has been assigned a High Preference as this route has the least potential impacts to habitats and fauna occurring within the Study Area. Its high preference relates to the route utilising the line of the existing Luttrellstown Road for more than 1 km in length, which reduces the overall impact on green field land and associated habitats.

All other options will result in minor negative impacts through the loss and severance of a small number of hedgerows/tree lines. This has the potential to result in minor impact on bats and birds. All of these options have been assigned a Medium Preference. The impacts are considered minor as the existing greenfield sites that all routes travel through are intensively farmed with the only losses occurring along the hedgerows and tree lines between the large areas of farmland.

### 5.3.2.9 Agriculture (including other agri-businesses)

The assessment of this criteria was based on the potential impact that each route corridor has on agriculture and other agri-businesses. The Do Nothing scenario would pose little or no impact and have therefore been ranked as High Preference.

Route Options 3, 3A and 3B have relatively minor impacts on agricultural land that is not zoned for residential development and have been ranked as High Preference.

The remaining Route Options 1, 1A, 2, 2A, 2B and 2C would each have significantly further impacts on agriculture, through land severance. These Route Options have all been ranked as Low Preference.

### 5.3.3 Economic Assessment

The Stage 1 Preliminary Options Assessment process looked at the economic benefits under the sub headings of Estimated Cost and Transport Benefit.

### 5.3.3.1 Estimated Cost

The rates used to estimate costs for mainline road construction, signalised/roundabouts/nonsignalised junctions, bridges and land acquisition are outlined in Section 4.5 of this report. The length of the route options, number of junctions and land take required (including approximate compensatory floodplain) is outlined in Table 5.3.3.1 below.

| Route Options | Route Length (km) | Bridge Structure Length (m) | No. <br> Signalised Junctions / Roundabout | No. <br> Nonsignalised Junctions / Entrances | Residential Land-take (acre) | Agricultural Land-take (acre) |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Route 1 (Red) | 2.85 | 154 | 3 | 5 | 8.0 | 10.5 |
| Route 1A <br> (Cyan) | 2.85 | 75 | 3 | 5 | 8.0 | 10.5 |
| Route 2 (Green) | 2.85 | 103 | 3 | 5 | 7.5 | 11.0 |
| Route 2A <br> (Purple) | 2.75 | 103 | 3 | 5 | 7.5 | 10.5 |
| Route 2B <br> (Mustard) | 2.85 | 75 | 3 | 5 | 7.5 | 11.0 |
| Route 2C (Blue) | 2.85 | 154 | 3 | 5 | 7.5 | 11.0 |
| Route 3 (Yellow) | 2.65 | 75 | 3 | 5 | 7.5 | 6.0 |
| Route 3A (Moss) | 2.75 | 75 | 3 | 5 | 7.5 | 10.0 |
| Route 3B (Dark Blue) | 3.2 | 64 | 3 | 5 | 7.5 | 10.5 |

Table 5.3.3.1: Basis of Cost Estimate Information

The overall cost estimated for each of the route options under consideration is summarised in Table 5.3.3.2 below. Each option has been assigned a ranking based on their cost. It should be noted that these figures are preliminary estimates of costs, and are subject to change as the scheme progresses. A contingency of $20 \%$ has been added, which is considered appropriate for this early stage of the scheme. The Stage 1 cost estimates exclude the costs of professional fees and third party costs as these costs will be the same for all options (except for the Do Nothing).

| Route Options | Mainline Cost Estimate ( $€$ ) | Bridge Cost <br> Estimate (€) | Junction Cost Estimate ( $€$ ) | Land <br> Acquisition <br> Estimate ( $($ ) | Total Cost Estimate ( $€$ ) (ex VAT) | Economic Assessment Rating |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Route 1 (Red) | 8,550,000 | 6,930,000 | 3,000,000 | 1,212,000 | 19,692,000 | Low Pref |
| Route 1A (Cyan) | 8,550,000 | 3,375,000 | 3,000,000 | 1,212,000 | 16,137,000 | Medium Pref |
| Route 2 (Green) | 8,550,000 | 4,635,000 | 3,000,000 | 1,164,000 | 17,349,000 | Medium Pref |
| Route 2A <br> (Purple) | 8,250,000 | 4,635,000 | 3,000,000 | 1,152,000 | 17,037,000 | Medium Pref |
| Route 2B <br> (Mustard) | 8,550,000 | 3,375,000 | 3,000,000 | 1,164,000 | 16,089,000 | Medium Pref |
| Route 2C <br> (Blue) | 8,550,000 | 6,930,000 | 3,000,000 | 1,164,000 | 19,644,000 | Low Pref |
| Route 3 (Yellow) | 6,570,000 | 3,375,000 | 3,000,000 | 1,044,000 | 13,989,000 | High Pref |
| Route 3A <br> (Moss) | 8,250,000 | 3,375,000 | 3,000,000 | 1,140,000 | 15,765,000 | Medium Pref |
| Route 3B <br> (Dark Blue) | 9,600,000 | 2,880,000 | 3,000,000 | 1,284,000 | 16,764,000 | Medium Pref |

Table 5.3.3.2: Cost Estimate Summary
Based on the above tabulated cost estimates, proposed Route Option 3 would be the least expensive, and are therefore ranked as High Preference. Route Options 1A, 2, 2A, 2B, 3A and 3B would be considered to be of Medium Preference. Route Option 1 and 2C would be most expensive and are ranked as Low Preference.

The Do Nothing scenarios would be considered High Preference as there would be no cost.

### 5.3.3.2 Transport Benefits

The Do Nothing scenario has been assessed as not providing transport benefits in the vicinity of the Study Area. It does not meet the scheme objectives of providing a road that opens up the Kellystown lands for development (in accordance with the Fingal Development Plan). It does not meet economic, transport (private vehicles, public transport, pedestrians and cyclists) or integration needs of the wider Kellystown area. For these reasons, this option has been assessed as Low Preference.

Route Options 3, 3 A and 3 B have a transport benefit over the other routes as they have the potential to maintain existing traffic destined for the City Centre using Luttrellstown Road instead of diverting onto the new road through the Kellystown lands. Maintaining usage of the Luttrellstown Road as it travels towards Castleknock would be positive for traffic flows within the wider area. The junction of Porterstown Link Road and Diswellstown Road (where the proposed Kellystown Road will tie-in) currently experiences some congestion due to the high levels of traffic travelling from Diswellstown Road Extension to Diswellstown Road. Maintaining a split between Luttrellstown Road and Kellystown Road would remove some pressure from this junction.

Routes 3, 3A and 3B form a junction with Clonsilla Road at the junction with Luttrellstown Road. This junction location provides the best connectivity between the new road and the existing road network. It is some distance from the Clonsilla Level Crossing, and will not impact on this level crossing from a traffic or safety point of view.

Routes 1, 2, 2A and 2C do not provide good connectivity to the R121 Westmanstown Road, and on towards Lucan and beyond. In order to travel from the proposed Ongar Barnhill Road to the R121 Westmanstown Road, a vehicle would need to travel east along the Kellystown Road as far as the R121 Clonsilla Road, and would then need to travel back west along the R121 Luttrellstown Road. Route Options 1 and 1A would require their junction with Clonsilla Road to be signalised with the Clonsilla Level Crossing. This would be a large junction with safety and potential congestion issues.

Route 3, 3A and 3B perform the best in terms of the level of traffic that they are attracting, and the resulting lower levels of traffic on the junction of the proposed Kellystown Road with Porterstown Link Road and Diswellstown Road. Upgrading of the Luttrellstown Road, as proposed in these options, would make this an attractive route for all road users, while allowing the opening of the Kellystown lands for development.

For the reasons outlined above:

- Do Nothing, 1 and 1 A are given Low Preference.
- Option 2, 2A and 2C are given Medium Preference.
- Options 2B, 3, 3A and 3B are given High Preference.


### 5.3.4 Stage 1 Route Assessment Summary

The Stage 1 Route Assessment is summarised in the Stage 1 Route Assessment Summary Matrix in Table 5.3.4.1 overleaf.

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|  | Do Nothing | Option 1 <br> (Red) | Option 1A (Cyan) | Option 2 <br> (Green) | Option 2A (Purple) | Option 2B (Mustard) | Option 2C (Blue) | Option 3 <br> (Yellow) | Option 3A (Moss) | Option 3B (Dark Blue) |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Engineering |  |  |  |  |  |  |  |  |  |  |
| Traffic Assessment |  |  |  |  |  |  |  |  |  |  |
| Smarter Travel |  |  |  |  |  |  |  |  |  |  |
| Extent of on Street Works |  |  |  |  |  |  |  |  |  |  |
| Land \& Property |  |  |  |  |  |  |  |  |  |  |
| Utilities Apparatus |  |  |  |  |  |  |  |  |  |  |
| Technical Standards/Safety |  |  |  |  |  |  |  |  |  |  |



Economy
Transport Benefits
Table 5.3.4.1: Stage 1 Route Options Assessment Summary Matrix

### 5.3.5 Stage 1 Preliminary Options Assessment Conclusion

Table 5.3.5.1 below summarises the findings of the Stage 1 Assessment.

| Overall | Engineering | Environment | Economy | Progress to <br> Stage 2? <br> (Yes/No) |
| :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  |
| Do-nothing | Low Preference | High Preference | Medium Preference | No |
| Route 1 (Red) | Low Preference | Low Preference | Low Preference | No |
| Route 1A (Cyan) | Low Preference | Low Preference | Low Preference | No |
| Route 2 (Green) | High Preference | Low Preference | Medium Preference | No |
| Route 2A (Purple) | Medium Preference | Low Preference | Medium Preference | No |
| Route 2B <br> (Mustard) | High Preference | Low Preference | High Preference | No |
| Route 2C (Blue) | High Preference | Low Preference | Low Preference | No |
| Route 3 (Yellow) | High Preference | High Preference | High Preference | Yes |
| Route 3A (Moss) | Medium Preference | High Preference | High Preference | Yes |
| Route 3B (Dark <br> Blue) | High Preference | Medium Preference | High Preference | Yes |

Table 5.3.5.1 Stage 1 Assessment Table
Arising from the Stage 1 Preliminary Options Assessment it was concluded that Options 3, 3A and 3B should be taken to the more detailed Stage 2 Assessment, and that the following corridors would not be considered further during the further development of the route options:

- Do Nothing;

The Do-Nothing scenario fails to address the need for a road scheme that allows for development of the Kellystown lands to allow for expansion of the Blanchardstown area to meet projected needs. It does not provide a safe link between Clonsilla Road and Barberstown for all road users, including pedestrians and cyclists. It does not provide a high quality link over the railway and canal for the large residential development zones of Ongar, Barnhill and Hansfield to access the open space and recreational facilities that will be provided in the Kellystown area.

## - Route Options 1 and 1A;

Route Options 1 and 1A does not provide connectivity to the surrounding road network with the same benefits as other options. It requires a junction directly adjacent the Clonsilla Level Crossing which may cause congestion, and would create a safety issue. Both schemes would have a visual impact on the Beech Park lands, and the two large bridges required for Option 1 would have a significant visual impact on both the Beech Park lands and Barnhill. These schemes create a significant increase in hard standing over alternative options, which would need to be drained to the surrounding waterways. The schemes run over an extremely vulnerable aquifer for much of their length, in particular, Option 1. Both options impact directly on an
archaeological feature, and cause significant severance of land. The scheme is more expensive than others and, and does not have the transport benefits of some of the other options.

## - Route Option 2, 2A and 2C;

Route Options $2,2 \mathrm{~A}, 2 \mathrm{~B}$ and 2 C would have a significant visual impact on the Beech Park lands as they run close to the houses and Shackleton's Gardens, where the route would be on embankment, and the two bridges required for options 2, 2A and 2C would have a significant visual impact on both the Beech Park lands and Barnhill. These schemes create a significant increase in hard standing over alternative options, which would need to be drained to the surrounding waterways. The routes, in particular Route 2 C , run over an extremely and highly vulnerable aquifer for much of their length. These options cause significant severance of land. For Option 2A the junction with Clonsilla Road has significant impacts on a number of private properties. Options 2 C has a greater cost than most other options.

## 6 Stage 2 Project Appraisal of Route Options

### 6.1 Methodology

The Stage 2 Project Appraisal of Route Options was based on the three routes identified in Stage 1, in Chapter 5, to progress for further appraisal.

The three Route Options have been compared under each of the following appraisal criteria:

- Economy
- Safety
- Environment
- Integration
- Accessibility \& Social Inclusion

In accordance with TII's "NRA 2010 Project Management Guidelines" for a stage 2 Project Appraisal of the routes the options are ranked as being either 'Preferred', 'Similar', 'Intermediate', or 'Least Preferred'. These assessments were then compiled for each of the above criteria in a Project Appraisal Matrix (see Section 6.8) to determine the overall ranking of the Stage 2 Route Options.

### 6.2 Economic Appraisal

### 6.2.1 Cost Estimate

Table 6.2.1.1 below shows the Cost Estimate for each of the Stage 2 Route Options. It should be noted that these figures are preliminary estimates of costs, and are subject to change as the scheme progresses. A contingency of $20 \%$ has been added to the construction costs, which is considered appropriate for this early stage of the scheme. The Stage 2 cost estimates include estimates of the costs of professional fees and third party costs.

| Costs <br> (Excluding VAT) | Route Option <br> $\mathbf{3}$ | Route Option <br> 3 3A | Route Option <br> $3 B$ |
| :--- | :---: | :---: | :---: |
| Route Length | 2.65 km | 2.75 km | 3.20 km |
| Professional Fees | $€ 1.5 \mathrm{~m}$ | $€ 1.5 \mathrm{~m}$ | $€ 1.5 \mathrm{~m}$ |
| Third Party Costs | $€ 0.5 \mathrm{~m}$ | $€ 0.5 \mathrm{~m}$ | $€ 0.5 \mathrm{~m}$ |
| Main Contract Construction | $€ 14.0 \mathrm{~m}$ | $€ 15.8 \mathrm{~m}$ | $€ 16.8 \mathrm{~m}$ |
| Main Contract Supervision | $€ 0.50 \mathrm{~m}$ | $€ 0.50 \mathrm{~m}$ | $€ 0.50 \mathrm{~m}$ |
| Total | $€ 16.5 \mathrm{~m}$ | $€ 18.3 \mathrm{~m}$ | $€ 19.3 \mathrm{~m}$ |

Table 6.2.1.1: Cost Estimate Appraisal
From Table 6.2.1.1 above it can be seen that Route Option 3 is estimated to be the lowest cost option. It benefits from requiring the least Land \& Property costs and also the least Main Contract Construction costs. Route Option 3 has been ranked as Preferred.

Route Options 3A and 3B are estimated to cost over 30\% more than Route 3. The reasons for the higher cost are a combination of longer length, greater land take (including compensatory floodplain), and additional new road build off line. Option 3A is ranked as Intermediate and Option 3B is Least Preferred.

### 6.2.2 Traffic Benefits

The three Route Options are all ranked Similar in terms of traffic benefits.

### 6.2.3 Economic Ranking

Table 6.4.3.1 below shows the ranking applied under each of the Economic sub-headings and also gives the Overall Economic ranking for each of the Stage 2 Route Options.

|  | Route Option <br> $\mathbf{3}$ | Route Option <br> $\mathbf{3 A}$ | Route Option <br> $\mathbf{3 B}$ |
| :--- | :---: | :---: | :---: |
| Cost Estimate | Preferred | Intermediate | Least Preferred |
| Traffic Benefits | Similar | Similar | Similar |
| Economic - Overall | Preferred | Intermediate | Least Preferred |

Table 6.2.3.1:Economic Appraisal Summary

### 6.3 Safety Appraisal

The safety of each of the Stage 2 Route Options has been appraised under the sub-headings Accident Benefits, Direct Accesses, Junctions, Extent of On Street Works and Compliance with Design Standards. Route Options were ranked under each of these sub-headings and then given an overall ranking for Safety.

Due to the similarities between each option under all of these headings, all three have been ranked as Similar.

### 6.4 Physical Activity

Each of the Stage 2 Route Options provide the same levels of provision for pedestrians and cyclists to encourage the take up or more frequent participation in physical activity. They each provide safe, attractive and well-designed facilities for pedestrians and cyclists. Increased physical activity will help reduce health risk and provide absenteeism benefits. For this reason they have all been ranked Similar.

### 6.5 Environmental Appraisal

The Stage 1 Project Appraisal of Route Options included an Environmental Appraisal under the subheadings Landscape \& Visual, Hydrology, Soils \& Geology, Hydrogeology, Ecology, Archaeology \& Cultural Heritage, Noise \& Vibration, Air Quality and Land Use.

The findings of this Environmental Appraisal for each of the Stage 2 Route Options have been carried forward to the Project Appraisal Matrix in Section 6.8 of this report. Route Options will be ranked as 'Preferred', 'Similar', 'Intermediate', or 'Least Preferred'.

### 6.5.1 Landscape and Visual

The Preferred option from a landscape and visual impact perspective is Route Option 3 as it maintains much of the existing trees and hedgerows on Luttrellstown Road. Options 3A and 3B are ranked as Least Preferred.

### 6.5.2 Hydrology

All three Stage 2 Route Options have been appraised as having an imperceptible significance on the hydrology during construction and operation. Based on the TII Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes the magnitude of impact is considered to be negligible i.e. "results in an impact on the attribute but of insufficient magnitude to affect either use or integrity".

It can therefore be concluded that for the attributes of hydrology and drainage, all four route options would have a similar low impact on the environment. However, based on additional hard standing created by Options 3A and 3B, and the additional floodplain impacted by Option 3B, Option 3 is ranked Preferred, Option 3A is ranked Intermediate, and Option 3B is ranked Least Preferred.

### 6.5.3 Soils and Geology

All three Stage 2 Route Options are considered to have impacts of imperceptible significance for the Soils and Geology sub-heading of the environmental appraisal during construction and operation. Based on the TII guidelines all routes are considered to have a Negligible magnitude of impact i.e. with no measurable changes in soil and geological attributes.

It can therefore be concluded that for the attributes of soil, and geology that all four Route Options would have a similar low impact on the environment. Each of the Route Options have been assigned a ranking of Similar.

### 6.5.4 Hydrogeology

All three Stage 2 Route Options are considered to have a negligible to small impact based on the presence of medium to extremely vulnerability underlying sections of all routes, and the likely local removal of unsaturated zone during route development.

There is no likely significant impact on the underlying aquifer or an SAC/NHA as a result of development of any of these three Route Options as there is not expected to be any significant cut or dewatering requirement.

All Route Options have been ranked Similar.

### 6.5.5 Ecology

A broad assessment has been undertaken of the likely impacts of each of the route options on the ecological features, with an indication as to which, if any, of these are likely to be significant. The impact significance is determined by assessing the magnitude of an impact against the nature conservation value of the ecological feature. Impact magnitude refers to changes in the extent and integrity of an ecological receptor.

The assessment of the route options potential impacts to designated conservation areas will be influenced by the presence of any hydrological pathways connecting the route options to designated conservation areas downstream. Due to the distance of the Study Area and all route options from the nearest designated conservation area there will be no potential for any of the routes to be connected to these sites via other impact pathways such as noise or air emission pathways.

Where no hydrological pathways occur the potential effect of the route option will be neutral. Where a hydrological pathway does occur the magnitude of the potential impact magnitude is assessed as being imperceptible. This is due to the remote distance between the project site and the nearest designated conservation area downstream; and the results of the assessment of potential impacts to local surface water hydrology.

The principal potential impacts associated with route options within the Study Area relates to the additional hard standing created by Options 3A and 3B, which must be drained to a local watercourse, and the additional floodplain impacted by Option 3B. In addition, Options 3A and 3B have additional potential for hedgerow/treeline severance, and the associated impacts to fauna that may rely on these habitats.

For these reasons, Option 3 is ranked Preferred, Option 3A is ranked Intermediate, and Option 3B is ranked Least Preferred.

### 6.5.6 Archaeology \& Cultural Heritage

Route Options 3, 3A and 3B have moderate archaeological potential along their routes, in particular when they traverse the greenfield site of Kellystown.

Options $3 A$ and $3 B$ allow for realigning of the Luttrellstown Road to behind the gate lodge of Beech Park. As this will severe the gate lodge from the house these options have been ranked Least Preferred and Option 3, which keeps the road to the front of the Beech Park boundary but runs a footpath and cyclepath behind the gate lodge, has been ranked Preferred.

### 6.5.7 Noise \& Vibration

As all Route Options are along the same corridor they are all ranked Similar under this heading.

### 6.5.8 Air Quality

As all Route Options are along the same corridor they are all ranked Similar under this heading.

### 6.5.9 Land Use

All options have similar impacts on Land Use. However, Option 3 has been ranked Preferred as it requires least land take, Option 3 A has been ranked Intermediate as it requires some additional landtake, and Option 3B has been ranked Least Preferred as it requires additional land take included a significant portion of compensatory floodplain.

### 6.5.10 Environment Summary

Table 6.5.10.1 below shows the ranking applied under each of the Environment sub-headings and also gives the Overall Environment ranking for each of the Stage 2 Route Options.

|  | Route Option 3 | Route Option 3A | Route Option 3B |
| :---: | :---: | :---: | :---: |
| Landscape \& Visual | Preferred | Least Preferred | Least Preferred |
| Hydrology | Preferred | Intermediate | Least <br> Preferred |
| Soils \& Geology | Similar | Similar | Similar |
| Hydrogeology | Similar | Similar | Similar |
| Ecology | Preferred | Intermediate | Least <br> Preferred |
| Archaeology \& Cultural Heritage | Preferred | Least Preferred | Least <br> Preferred |
| Noise \& Vibration | Similar | Similar | Similar |
| Air Quality | Similar | Similar | Similar |
| Land Use | Preferred | Intermediate | Least <br> Preferred |
| Environment - Overall | Preferred | Intermediate | Least <br> Preferred |

Table 6.5.10.1: Environment Appraisal Summary

### 6.6 Integration Appraisal

Integration considers the extent to which the project being evaluated promotes integration of transport networks and is compatible with a range of Government policies, including national spatial and planning policy.

### 6.6.1 Integration

All three of these route options meet objective Obj09 (from Section 1.3 of this report) of this project to integrate with the surrounding National Secondary Road network and Regional Road network to minimise delays and journey times on these neighbouring routes. Additionally, they all meet objectives Obj10 and Obj11, from Section 1.3 of this report, by facilitating housing development potential in the Kellystown area, which can be integrated, not just with the surrounding road network, but also with the existing public transport including rail and bus, and by giving the opportunity to integrate with existing and proposed pedestrian and cycling networks.

### 6.7 Accessibility \& Social Inclusion Appraisal

The Accessibility and Social Inclusion benefits of each of the Stage 2 Route Options have been appraised under this heading.

### 6.7.1 Accessibility \& Social Inclusion

All three routes options will meet objective Obj07 (from Section 1.3 of this report) by improving road based transport at a local level. All three route options address the objectives of the Fingal County Development Plan, National Spatial Strategy and the Transport Strategy for the Greater Dublin Area 2016-2035 to generally improve quality of life and improve accessibility to work, education and other activities for both motorised and non-motorised modes of travel satisfying objective Obj08 from Section 1.3 of this report.

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### 6.8 Project Appraisal Matrix

Table 6.8.1.1 below provides a summary of the project appraisal for each of the Stage 2 Route Options under the Common Appraisal Criteria and their overall ranking.

|  | Route Option 3 | Route Option 3A | Route Option 3B |
| :--- | :---: | :---: | :---: |
| Economy | Preferred | Intermediate | Least Preferred |
| Safety | Similar | Similar | Similar |
| Physical Activity | Similar | Similar | Similar |
| Environment | Preferred | Intermediate | Least Preferred |
| Integration | Similar | Similar | Similar |
|  <br> Social Inclusion | Similar | Similar | Similar |
|  |  |  |  |
| Overall Ranking | $1^{\text {st }}$ Preferred | $2^{\text {nd }}$ Preferred | 3rd <br> Preferred |

Table 6.8.1.1:Project Appraisal Matrix

### 6.9 Conclusion

From the above Stage 2 Project Appraisal of Route Options it is recommended that Route Option $\mathbf{3}$ is taken forward as the Preferred Route for the Kellystown Road.

## 7 Preferred Scheme

### 7.1 Route Option 3

As per the conclusions of the Stage 2 Project Appraisal of Route Options given in Chapter 6, we propose that Route Option 3 should proceed as the preferred option. The overall preferred road layout can be seen on Drawing No. 18_015_CSE_GEN_ZZ_DR_C_1060. In this Chapter we will give further details of the three unique sections of the Kellystown Road (as per Section 1.2 of this report) that Route Option 3 would deliver.

### 7.1.1 Diswellstown Road Extension to Clonsilla Road

Drawings No. 18_015_CSE_GEN_ZZ_DR_C_1064 \& 1065, in Appendix A, show the eastern stretch of the proposed scheme. It ties-in to the existing spur road from Porterstown Link Road at the eastern extent of the scheme and runs west along the boundary of the lands zoned for residential development in the Fingal Development Plan, skirting a private residence and farm buildings, before forming a junction with the R121 Clonsilla Road and Luttrellstown Road close to the existing T-junction between these two roads. The entrance to Luttrellstown House (at the junction with the existing R121 Clonsilla Road) would be facilitated with access onto Luttrellstown Road.

### 7.1.2 Clonsilla Road to Westmanstown Road

Drawings No. 18_015_CSE_GEN_ZZ_DR_C_1062 \& 1063, in Appendix A, show the middle stretch of the proposed scheme from a junction with Clonsilla Road/Luttrellstown Road to a junction with Westmanstown Road. The scheme requires the removal of some trees and a berm inside the Fingal County Council Beech Park, however, during preliminary and detailed design it will be possible to retain the highest quality trees by localised widening of the grass verge or providing a grass verge between the cycletrack and footpath.

From the boundary of the FCC Beech Park (road chainage 1400) to west of the Beech Park gate lodge (road chainage 850 m ) it is proposed to split the cycletrack and footpath from the road, and to run the cycletrack and footpath inside of the gate lodge and hedgerow. The route would thread through a number of high quality trees at the boundary of the FCC park and continue through the Beech Park land to a copse of high quality trees inside the gate lodge of Beech Park. The preferred route for this stretch of cycletrack and footpath would be to thread a line through the high quality trees approximately 30 m from the main gate (shown on Drawings No. 18_015_CSE_GEN_ZZ_DR_C_1062 \& 1063). There is potential to reduce this path in width (say from 5 m wide to 3 m wide) for a short stretch $(25-30 \mathrm{~m})$ in order to minimise any impact on the high quality trees, and this could be constructed as a bridge structure to cross an area with a large level difference directly behind the gate lodge in order to avoid the need for embankment. Splitting the cycletrack and footpath from the carriageway reduces the impact on the Beech Park gate lodge and the Beech Park boundary, and reducing the cycletrack and footpath in width in the vicinity of the gate lodge would further reduce any impact.

Through this area from road chainage 850 - 1400, the upgrade of the existing Luttrellstown Road would improve sight distances and curve radii as shown in notes on Drawings No. 18_015_CSE_GEN_ZZ_DR_C_1062 \& 1063 This 550m stretch of road would be traffic calmed for road safety as the design speed is $40 \mathrm{~km} / \mathrm{h}$. Traffic calming could be achieved by the use of gateway features or other appropriate measures.

From chainage 850 to the junction with Westmanstown Road, it is proposed to reconstruct the Luttrellstown Road to the north of the existing carriageway in order to improve sightlines and curve radii. This can be achieved without impacting on any high quality trees.

### 7.1.3 Crossing of the Royal Canal and Maynooth-Dublin Railway Line

Drawings No. 18_015_CSE_GEN_ZZ_DR_C_1061, in Appendix A, shows this stretch of the proposed scheme. The preferred scheme gives 5.3 m clearance over the Maynooth - Dublin rail line. Discussions with Irish Rail indicate that 5.3 m clearance would be required over the rail line to facilitate electrification of the line, however, due to the close proximity of the Barberstown Level Crossing, in the preferred location of our bridge structure, 5.8 m clearance would be required should the Barberstown Level Crossing remain open to traffic. Constructing the bridge at the higher level would have a number of negative implications for this scheme such as increased gradient and travel distance for all users, including vulnerable road users, reduced stopping sight distance and increased cost. For these reasons, we would propose closing the Barberstown Level Crossing to traffic as part of the preferred scheme.

The scheme ties-in to the proposed Ongar Barnhill Road at its western extent.

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## Appendix A











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